Topics in Theoretical Asian Linguistics

Studies in honor of John B. Whitman

Edited by

Kunio Nishiyama

Hideki Kishimoto

Edith Aldridge

John Benjamins Publishing Company

Topics in Theoretical Asian Linguistics

Linguistik Aktuell/Linguistics Today (LA)

Linguistik Aktuell/Linguistics Today (LA) provides a platform for original monograph studies into synchronic and diachronic linguistics. Studies in LA confront empirical and theoretical problems as these are currently discussed in syntax, semantics, morphology, phonology, and systematic pragmatics with the aim to establish robust empirical generalizations within a universalistic perspective.

For an overview of all books published in this series, please see
http://benjamins.com/catalog/la

Volume 250

Topics in Theoretical Asian Linguistics. Studies in honor of John B. Whitman
Edited by Kunio Nishiyama, Hideki Kishimoto and Edith Aldridge

Topics in Theoretical Asian Linguistics

Studies in honor of John B. Whitman

Edited by

Kunio Nishiyama
Ibaraki University

Hideki Kishimoto
Kobe University

Edith Aldridge
University of Washington

John Benjamins Publishing Company

Amsterdam / Philadelphia

∞™ The paper used in this publication meets the minimum requirements of the American National Standard for Information Sciences – Permanence of Paper for Printed Library Materials, ANSI z39.48-1984.

Table of contents

Part II. Interfaces

Part III. Diachrony

Part IV. Psycholinguistics

Part V. Phonology

Introduction

Kunio Nishiyama, Hideki Kishimoto and Edith Aldridge
Ibaraki University / Kobe University / University of Washington

Asian languages encompass several distinct families, including Japanese, Korean, Chinese, Austronesian, Indo-Aryan, and Tai. They also exhibit a diverse array of typological characteristics. All common word order types are represented, including SOV (e.g. Korean, Japanese, Hindi), SVO (e.g. Chinese, Thai, Indonesian), as well as the VSO and VOS orders found in various Austronesian languages, especially those spoken in Taiwan and the Philippines. While *wh*-in-situ is the norm in East and South Asian languages, many Austronesian languages exhibit *wh*-movement. It is also possible in many Asian languages for multiple nominative NPs to appear in a single clause. This is especially true in Korean and Japanese but is also found on a limited basis in Chinese and Indonesian.

On the morphological side, Austronesian languages display intricate voice systems. Many East Asian languages have productive processes of V-V compounding. And while Thai, Vietnamese, and Chinese are isolating languages, Japanese and Korean make extensive use of agglutinative morphology. One of the most interesting phonological characteristics found widely among Asian languages is tone, as in Thai, Vietnamese, and Chinese, where many words are distinguished solely on the basis of tone. This typological diversity consequently provides fertile ground for testing hypotheses and generalizations in linguistic theory.

17 articles are included in this volume, which are dedicated to John Whitman. Professor Whitman's work itself spans the fields of syntax, morphology, and phonology, from both synchronic and diachronic perspectives. He has examined a wide range of phenomena in numerous Asian languages, including (but by no means limited to) Japanese, Korean, Chinese, and Burmese. It is to honor his substantial contribution to the field of linguistics that this volume presents a wide array of theoretical works targeting languages of the entire Asian region. The contributors include his former students, colleagues, and friends, some of whom are leading scholars in their respective fields. All the authors are pleased to show their gratitude to him with their contributions.

All the papers present original research results on specific topics, and the major strength of this volume is to provide a forum for cutting-edge theoretical research on various topics relating to Asian languages. Some of the papers take a comparative perspective, which will contribute to our understanding of the features of Asian languages. Reflecting the breadth of the honoree's research interests, in particular in Asian languages, the topics of the papers include (combinations of) syntax, semantics, morphology, phonology, acquisition, and processing of Asian languages, with synchronic and/or diachronic perspectives. Overall, the volume illuminates certain theoretical questions, as well as presents a broad range of empirical coverage.

We have broadly divided the volume into five parts: Syntax/Morphology, Interfaces, Diachrony, Psycholinguistics, and Phonology. Below are short descriptions of the articles, sorted in paragraphs according to this division.

Syntax/Morphology: Yoshida's article argues that complementizer selection employs the same mechanism in Spanish and Japanese, namely the semantic categories proposed by Lahiri (1991, 2002). Park's article discusses two types of passive in Korean and Japanese with a focus on the syntactic and semantic properties of their *by*-phrases and other related issues. Kishimoto, Hook and Pardeshi's article argues that picture-noun constructions in Marathi and Japanese have a constituent structure where the imagee NP (selected by the picture noun) controls PRO in the complement clause. Kishimoto's article discusses scope interaction between *wh*/focus questions and pseudo-cleft constructions in Sinhala and shows that the traditionally well-known overt vs. covert (i.e. LF) movement analysis for island effects and facts concerning an argument-adjunct asymmetry do not in themselves produce a comprehensive analysis of *wh*/non-*wh* focus constructions in this language, and he consequently proposes alternative analyses. Toyoshima's article argues that typologically well-behaved agglutinative Japanese does have augmentative and diminutive morphology, realized autosegmentally (as voicing and palatalization, respectively) in mimetics.

Interfaces: Dobashi and Yim's article discusses two similar but crucially different sentence-medial particles in Korean and Japanese, and argues that the difference is reduced to prosodic factors. Yun's article investigates syntactic and semantic behaviors of *wh*-indefinites in Chinese, Japanese and Korean when they receive an existential reading and identifies the source of such a reading in the three languages.

Diachrony: Meisterernst and Aldridge's article proposes an account of the reanalysis of the Chinese morpheme *yǐ* 已 from an intransitive verb meaning 'end, terminate' into a functional category marking completive aspect. Yanagida's article provides an account for active alignment in Old Japanese, arguing that the division of case marked versus zero-marked form can be seen as an instance of

"differential subject marking" and the OSV word order can be accounted for in terms of Alexiadou and Anagnostopoulou's (2001) "subject-in-situ generalization." Nishiyama's article analyzes the structure and derivation of possessive nominal phrases in Lamaholot, with special focus on the mechanism behind the word order change in the Austronesian context from head noun – possessor to possessor – head noun.

Psycholinguistics: Yamakoshi et al.'s article confirms the existing claim that productive causatives are acquired later than lexical causatives in Japanese by conducting experiments on the comprehension of causatives. Chen and Hale's article discusses Chinese relative clause comprehension that involves both formal grammar fragments and non-structural features like animacy and shows that the theoretical predictions made by the proposed model correctly derive several reported animacy effects in the psycholinguistic literature.

Phonology: Vance's article shows how Japanese long vowels are romanized in general, and why the spelling for /oH/ as in *too* 'ten' and *ooi* 'numerous' ends up being inconsistent. Kubozono's article argues that loanword accent in Kyungsang Korean is captured by a mora-based account more elegantly than previous syllable-based accounts and notes similarities in accent between Kyungsang Korean and Tokyo/Osaka Japanese. Hwang's article explores a pattern of speech perception in Korean and Japanese with special attention to the American English vowel /æ/. Cohn and Kurniawan's article discusses the status of schwa in a colloquial variety of Indonesian based on a naturalistic corpus and concludes that observed patterns are due to optional deletion of underlying schwa, conditioned by multiple factors, including phonological and morphological structure, orthography, and stylistic factors. Pittayaporn's article argues that the restricted distribution of contour tones in present-day Thai is captured by both quantitative and qualitative restrictions, and discusses sound changes and lexical changes that gave rise to the tonal distribution.

Finally, we thank the contributors who also acted as a reviewer, and the following external reviewers: Seongyeon Ko, Takashi Nakajima, Masao Okazaki, Douglas Roland, Koji Sugisaki, Rint Sybesma, and Elizabeth Zsiga. We also thank Yuko Yanagida for helping us with the early stage of the editorial process.

List of works by John B. Whitman
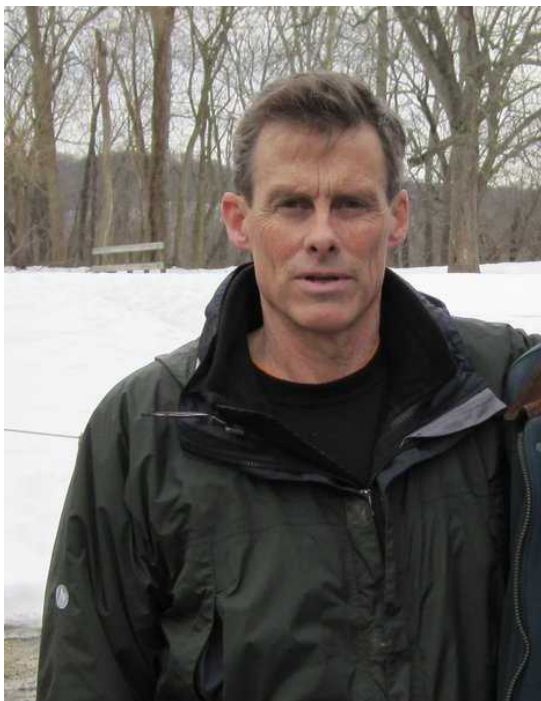
Photograph by Yuko Yanagida

Books

The Phonological Basis for the Comparison of Japanese and Korean. Accepted for publication. Ann Arbor, Michigan Monographs in Japanese Studies.

The Syntax of Korean (with Donna Gerdts). Cambridge: Cambridge University Press. Manuscript to be submitted March 2018.

Korean: A Linguistic Introduction (with Sungdae Cho). Under contract. Cambridge: Cambridge University Press.

Nichieigo hikaku sensyo, volume 9: Kaku to gojun to tōgo kōzō. (Case, word order, and syntactic structure) (co-author, with Koichi Takezawa). 1998. Tokyo, Kenkyûsha.

Edited books

Ryūkyū shogo to Kodai Nihongo: Nichiryū sogo no saiken ni mukete (Ryūkyūan and Premodern Japanese: Toward the Reconstruction of Proto-Japanese-Ryūkyūan) (co-editor, with Yukinori Takubo and Tatsuya Hirako). 2016. Tokyo: Hitsuji Shobō.

Grammatical Change: Origins, Nature, Outcomes (with Dianne Jonas and Andrew Garrett). 2011. Oxford: Oxford University Press.

Proto-Japanese (with Bjarke Frellesvig). 2008. Amsterdam, John Benjamins.

Studies in Korean Syntax and Semantics by Susumu Kuno (with Young-Key Kim-Renaud). 2004. Seoul, Pajigong Press.

Syntactic and Functional Explorations: A festschrift for Susumu Kuno (with Ken-ichi Takami and Akio Kamio). 2000. Tokyo, Kuroshio Press.

Korean Syntax and Semantics: *Proceedings of the LSA Institute Workshop* (with Chungmin Lee). 2000. Seoul, Thaehaksa.

Syntactic Theory and First Language Acquisition, volume 1: Heads and projections (with Barbara Lust and Magui Suñer). 1994. Hillsdale, N.J., Lawrence Erlbaum Associates.

Edited special issues

Millets, rice, and farming/language dispersals in East Asia (special issue editor, with Mark Hudson). 2017. *Language Dynamics and Change* 7.1.

Honorifics and politeness in Korean (special issue editor, with Lucien Brown). 2017. *Korean Linguistics* 17.2.

*Lecture vernaculaire des textes classique Chinois/Reading classical texts in the vernacular (*special issue editor, with Franck Cinato). 2014. *Histoire Epistémologie Langage* 36. Paris: Laboratoire Histoire des Théories Linguistiques (Université Paris Diderot).

Korean Historical Linguistics (special issue editor, with Young-key Kim-Renaud). 2013. *Korean Linguistics* 15.2.

Nominalizations in linguistic theory (special issue editor, with Jaklin Kornfilt). 2011. *Lingua* 121.7, 1159–1313.

Kugyŏl/Kunten (with J. R. P. King). To appear in *Sino-Platonic Papers,* University of Pennsylvania.

Special Issue: First Language Acquisition of East Asian Languages (with Yasuhiro Shirai). 2000. *Journal of East Asian Linguistics* 9.4.

Refereed articles and book chapters

Topic prominence (with Waltraud Paul). 2017. In Everaert, Martin, Henk Van Riemsdijk, Rob Goedemans, Bart Hollebrandse (eds.) *Blackwell Companion to Syntax*, 2nd Edition, 4473–4504. New York: Wiley.

Diachronic interpretations of word order parameter cohesion (with Yohei Ono). 2017. In Mathieu, Eric and Robert Truswell (eds.) *From Micro-change to Macro Change*, 43–60. Oxford and New York: Oxford University Press.

A Statistical Reanalysis of Tsunoda, Ueda and Itoh (1995a) (with Yohei Ono, Ryozo Yoshino, and Fumi Hayashi). Accepted, 2017. *Keiryō kokugogaku* (Mathematical Linguistics).

Honorifics and politeness in Korean (with Lucien Brown). *Korean Linguistics* 17.2, 127–131.

Nichiryū sogo no on'in taikei to rentaikei, izenkei no kigen (The Phonological System of proto-Japanese-Ryūkyūan and the origin of the adnominal and realis forms). 2016. In Takubo, Yukinori, John Whitman, and Tatsuya Hirako (eds.) *Ryūkyū shogo to Kodai Nihongo: Nichiryū sogo no saiken ni mukete* (Ryūkyūan and Premodern Japanese: Toward the Reconstruction of Proto-Japanese-Ryūkyūan), 21–38. Tokyo: Hitsuji Shobō.

Tōhoku Aziagengo chīki no ichizuke ni mukete (Toward the establishment of Northeast Asia as a linguistic area). March 2016. *NINJAL Project Review* 6, 69–82.

The historical source of the bigrade transitivity alternations in Japanese (with Bjarke Frellesvig). 2016. In Kageyama, Taro and Wesely Jacobsen (eds.) *Transitivity and valency alternations: Studies on Japanese and beyond,* 289–312. Berlin: Mouton de Gruyter.,

Old Korean. 2015. In Brown, Lucien and Jae Hoon Yeon (eds.) *The Handbook of Korean Linguistics*, 421–438. London: Wiley-Blackwell.

Raten-go kyōten no dokuhō to butten no kundoku [The reading of Latin clerical texts and vernacular reading of Classical Chinese] (in Japanese). 2015. In Niikawa Tokio (ed.) *Bunmei idō toshite no Bukkyō* [Buddhism as Cultural Movement], 105–146. Tokyo: Benseisha.

Iwayuru Ajia-shiki kankeisetsu ni tuite [On so-called Asian-type relative clauses]. 2015. In Fukuda, S., Nishida, K., and Tamura, T. (Eds.), *Gengo kenkyū no shiza* [Perspectives of Linguistic Research]. Tokyo: Kaitakusha, 188–203.

Comparative consequences of the tongue root harmony analysis for proto-Tungusic, proto-Mongolic, and proto-Korean (with Seongyeon Ko and Andrew Joseph) 2014. In Robbeets, Martine, and Walter Bisang (eds.) *Paradigm change in the Transeurasian languages and beyond,* 141–176. Amsterdam: John Benjamins.

Uncertainty in processing relative clauses across East Asian languages (with Jiwon Yun, Zhong Chen, Tim Hunter and John Hale. 2015. *Journal of East Asian Linguistics 24*(2), 113–148.

Présentation du projet: Reading Classical Texts in the Vernacular. In Whitman, John and Franck Cinato (eds.) *Lecture vernaculaire des textes classique Chinois/Reading classical texts in the vernacular*. To appear, 2014. In *Histoire Epistémologie Langage* 36. Paris: Laboratoire Histoire des Théories Linguistiques (Université Paris Diderot).

Postpositions vs. prepositions in Mandarin Chinese: The articulation of disharmony (with Redouane Djamouri and Waltraud Paul). 2013. In Theresa Biberauer (ed.) *Theoretical Approaches to Disharmonic Word Order*. Oxford, Oxford University Press.

Syntactic change in Chinese and the argument-adjunct asymmetry (with Redouane Djamouri and Waltraud Paul). 2013. In Cao Guangshun, H. Chappell, R. Djamouri, and T. Wiebusch (eds.). *Breaking down the barriers: Interdisciplinary studies in Chinese linguistics and beyond* [*Language and Linguistics* monograph series 50]. Taipei: Academia Sinica, vol. 2, 577–594.

The relationship between Japanese and Korean. 2012. In Tranter, David N (ed.) *The Languages of Japan and Korea*. London: Routledge, 24–38.

The formal syntax of alignment change (with Yuko Yanagida). 2012. In Charlotte Galves, Sonia Cyrino, Ruth Lopes, Filomena Sandalo, Juanita Avelar (eds.) *Parameter Theory & Linguistic Change*. Oxford: Oxford University Press, 177–195.

Genitive subjects in TP nominalizations (with Jaklin Kornfilt). In G. Iordachioaia (ed.) *Proceedings of JeNom 4*; Working Papers of the SFB 732; Stuttgart: OPUS; 39–72.

Misparsing and syntactic reanalysis. 2012. In Kemenade, Ans van & N. de Haas (eds.). *Historical Linguistics 2009: Selected Papers from the 19th International Conference on Historical Linguistics*. Amsterdam, John Benjamins, 69–87.

Northeast Asian linguistic ecology and the advent of rice agriculture in Korea and Japan. 2011. *Rice* 4.3–4, 149–158.

The ubiquity of the gloss. 2011. *Scripta* 3, 95–121. Introduction (with Dianne Jonas and Andrew Garrett). *Grammatical Change: Origins, Nature, Outcomes* 2011. Oxford: Oxford University Press, 1–12.

Introduction: Nominalizations in linguistic theory (with Jaklin Kornfilt). 2011. In Kornfilt, Jaklin and John Whitman (eds.) *Nominalizations in linguistic theory* (special issue), *Lingua*.121.7, 1160–1163.

Afterword: Nominalizations in linguistic theory (with Jaklin Kornfilt). 2011. In Kornfilt, Jaklin and John Whitman (eds.) *Nominalizations in linguistic theory* (special issue), *Lingua*.121.7, 1297–1313.

Toward an international vocabulary for research on vernacular reading of Chinese texts (*Hanwen xundu*) (with Miyoung Oh, Jinho Park, Valerio Luigi Alberizzi, Masayuki Tsukimoto, Teiji Kosukegawa, and Tomokazu Takada). 2010. *Scripta* 2, 61–84.

Hitei no kōzō to rekishiteki henka – shuyōbu to hitei kyokusei hyōgen o chūsin ni – (The structure of negation and historical change – with a focus on headedness and negative polarity expressions –). 2010. In Katō, Yasuhiko et al (eds.) *Hitei to gengo riron (Negation and linguistic theory)*, 141–169. Tokyo: Kaitakusha.

Applicative structure and Mandarin distransitives (with Waltraud Paul) 2010. In Susan Huidbro et al (eds.) *Argument Structure and Syntactic Relations*, 261–182. Amsterdam: John Benjamins.

The Syntax of overmarking and *kes* in child Korean. 2010. In Lee, C. (ed.) *The Handbook of Korean Psycholinguistics*, 221–230. New York, Cambridge University Press.

Alignment and word order in Old Japanese (with Yuko Yanagida). 2009. *Journal of East Asia Asian Linguistics* 18, 101–144.

Kokugogaku vs. gengogaku: Language process theory and Tokieda's construction of Saussure, 60 years after. 2009. In Bourdaghs. M. (ed.) *The Linguistic Turn in Contemporary Japanese Literary Studies: Textuality, Language, Politics*. Ann Arbor: University of Michigan Center for Japanese Studies Publications.

Ninshō to kakkaku ruikei – Jōdai Nihongo no daimeishi taikei no kanten kara (Person and active typology – from the standpoint of the promonimal system of Old Japanese) (with Yuko Yanagida). 2009. In Tsubomoto, A. et al (eds) *Uchi to soto no gengogaku (The linguistics of "inside" and "outside")*, 175–216. Tokyo, Kaitakusha.

The classification of constituent order generalizations and diachronic explanation. 2008. In Good, J. (ed.), *Language Universals and Language Change* 233–252. Oxford: Oxford University Press.

The complement structure of *shi…de* clefts (with Waltraud Paul). 2008. In Bartos, H. (ed.) *European Studies in Chinese Linguistics*. Amsterdam, John Benjamins.

The source of the bigrade conjugation and stem shape in pre-Old Japanese. 2008. In Frellesvig, B. and J. Whitman (eds.) *Proto-Japanese*, 159–174. Amsterdam, John Benjamins.

Evidence for seven vowels in proto-Japanese (with Bjarke Frellesvig). 2008. In Frellesvig, B. and J. Whitman (eds.) *Proto-Japanese*, 15–42. Amsterdam, John Benjamins.

Reanalysis and conservancy of structure in Chinese (with Waltraud Paul). 2005. In Batllori, M. et al (eds.) *Grammaticalization and Parametric Variation*, 82–94. Oxford, Oxford University Press.

Preverbal negation in Japanese and Korean. 2005. In Cinque, G. and R. Kayne (eds.) *Handbook of Syntactic Variation*, 880–902. Oxford, Oxford University Press.

Licensing multiple negative polarity items. 2005. With Susumu Kuno. In Y. Kim-Renaud & J. Whitman (Eds.), *Studies in Korean Syntax and Semantics by Susumu Kuno*, 207–228.

The vowels of proto-Japanese (with Bjarke Frellesvig). *Japanese Language and Literature* 38.2, 281–299

Kayne 1994: p. 143, fn. 3. 2001. In Alexandrova, G. and O. Artunova (eds*.), The Minimalist Parameter*, 77–100. Amsterdam, John Benjamins.

Relabeling. 2001. In Pintzuk, S, G. Tsoulas, & A. Warner, *Diachronic Syntax: Models and Mechanisms*, 220–240. Oxford, Oxford University Press.

Right dislocation in English and Japanese. 2000. In Takami, K., A. Kamio, and J. Whitman (eds.) *Syntactic and functional explorations: A festschrift for Susumu Kuno*, 445–470. Tokyo, Kuroshio Press.

A type of head in situ construction in English (with A. Tsubomoto). 2000. *Linguistic Inquiry* 30.4, 176–183.

Personal pronoun shift in Japanese: A case study in lexical change and point of view. 1999. In Kamio, A. and K. Takami (eds.) *Function and Structure: In Honor of Susumu Kuno*, 357–386. Amsterdam, John Benjamins.

The category of relative clauses in Japanese and Korean. (with T. Kaplan). 1995. *Journal of East Asian Linguistics* 4.1, 29–58.

Syntactic representation and interpretive preference. (with B. Pritchett). 1995. In R. Mazuka and N. Nagai (eds.) *Japanese Language Processing*, 65–76. Hillsdale, N.J., Lawrence Erlbaum Associates.

The accentuation of nominal stems in proto-Korean. 1994. In Y.-K. Kim-Renaud (ed.) *Theoretical Issues in Korean Linguistics*. Stanford, CSLI, 425–440.

In defense of the Strong Continuity account of the acquisition of Verb-Second. 1994. In B. Lust, M. Suñer, and J. Whitman (eds.)*Syntactic Theory and Second Language Acquisition, Volume 1: Heads, Projections, and Learnability*, 273–286. Hillsdale, N.J., Lawrence Erlbaum Associates.

Scope and optionality: Comments on the papers on wh-movement and quantification. 1994. In G. Hermon, B. Lust, and J. Kornfilt (eds.) *Syntactic Theory and Second Language Acquisition, Volume 2: Binding, Dependencies, and Learnablity*, 417–426. Hillsdale, N.J., Lawrence Erlbaum Associates.

Verb Raising and VP Ellipsis (with K. Otani). 1991. *Linguistic Inquiry* 22.2, 345–358.

A rule of medial *-r- loss in pre-Old Japanese. 1990. In P. Baldi (ed.) *Linguistic Change and Reconstruction Methodology*, 511–546. Berlin, Mouton de Gruyer.

Argument positions and configurationality. 1989. In C. Georgopolous & R. Ishihara (eds.) *Interdisciplinary Approaches to Language: Essays in Honor of S.-Y.Kuroda*, 615–228. Dordrecht, Kluwer.

Varieties of discourse ellipsis. 1988. In Linguistic Society of Korea (ed.) *Linguistics in the Morning Calm II: Papers from the Second Seoul International Conference on Linguistics*, 149–176. Seoul, Hanshin.

Configurationality parameters. 1987. In M. Saito & T. Imai (eds.) *Issues in Japanese Linguistics*, 351–374. Dordrecht, Foris.

Papers in refereed conference proceedings

Deconstructing clausal noun modifying constructions. (with Anna Bugaeva). 2015. In *Japanese/Korean Linguistics* 23. Stanford: CSLI.

A Korean grammatical borrowing in Early Middle Japanese *kunten* texts and its relation to the syntactic alignment of earlier Korean and Japanese (with Yuko Yanagida). To appear, 2014. In Seungho Nam, Heejeong Ko, and Jongho Jun (eds.) *Japanese/Korean Linguistics* 21. Stanford: CSLI.

The diachronic consequences of the RTR analysis of Tungusic vowel harmony (with Andrew Joseph). 2013. In Umut Özge (ed.) *Proceedings of the 8th Workshop on Altaic Formal Linguistics.* Cambridge, Massachusetts: MIT Working Papers in Linguistics, 159–176.

The prehead relative clause problem. 2013. In Umut Özge (ed.) *Proceedings of the 8th Workshop on Altaic Formal Linguistics.* Cambridge, Massachusetts: MIT Working Papers in Linguistics, 361–380.

The Genesis of Indefinite Pronouns in Japanese and Korean (with Tomohide Kinuhata). To appear, 2011. In W. McClure (ed.) *Japanese/Korean Linguistics 18*. Stanford, CSLI.

Prenominal Complementizers and the Derivation of Complex NPs in Japanese and Korean (with Bjarke Frellesvig). 2011. In W. McClure (ed.) *Japanese/Korean Linguistics 18*. Stanford, CSLI.

Subject-Object Asymmetries in Korean Sentence Comprehension (with Jiwon Yun and John Hale). 2010. *Proceedings of the annual meeting of the cognitive science society 2010.*

Multiple focus clefts in Japanese and Korean (with Sungdae Cho and Yuko Yanagida). *Proceedings of the 44th Meeting of the Chicago Linguistic Society*, 1:61–77. University of Chicago: Chicago Linguistic Society.

The Japanese-Korean vowel correspondences (with Bjarke Frellesvig). 2008. In Endo Simon, M. and P. Sells (eds.) *Japanese/Korean Linguistics* 12. Stanford, CSLI.

Ditransitive and applicative structure in Greek (with Effi Georgala). 2008. In *Proceedings of the 43rd Meeting of the Chicago Linguistic Society*, University of Chicago.

Thematic and expletive applicatives (with Effi Georgala and Waltraud Paul). 2007, *West Coast Conference on Formal Linguistics* 25, University of California, Berkeley.

Direct movement passives in Korean and Japanese (with Sang Doh Park). 2003. In W. McClure (ed.) *Japanese/Korean Linguistics* 11. Stanford, CSLI, 307–321.

Kakarimusubi from a comparative perspective. 1997. In Sohn, H. and J. Haig (eds.) *Japanese and Korean Linguistics VI.* Stanford, CSLI, 161–178.

Syntactic movement of overt wh-Phrases in Japanese and Korean. (with Kunio Nishiyama and Eun-Young Yi). 1996. In Akatsuka, N., S. Iwasaki, and S. Strauss (ed.) *Japanese and Korean Linguistics V.* Stanford, CSLI, 337–352.

The syntax of CP in early child German: The Strong Continuity Hypothesis (with K. Boser, B. Lust, and L. Santelmann). 1991. *Proceedings of the Northeast Linguistic Society* 22.

Continuity of the Principles of Universal Grammar in First Language Acquisition: The Issue of Functional Categories (with K-O. Lee & B. Lust). 1990. *Proceedings of the Northeast Linguistic Society* 21.

The Internal structure of NP in verb-final languages. 1981. *Papers from the Seventeenth Regional Meeting of the CLS*, 1981.

Scrambled, over easy, or sunnyside up. 1979. *Papers from the Fifteenth Regional Meeting of the Chicago Linguistics Society*, 1979.

Other publications

Millets, rice, and farming/language dispersalsin East Asia : Introduction (with Mark Hudson). 2017. *Language Dynamics and Change* 7.1, 147–151.

Atogaki {Afterward}. 2016. In *Ryūkyū shogo to Kodai Nihongo: Nichiryū sogo no saiken ni mukete* (Ryūkyūan and Premodern Japanese: Toward the Reconstruction of Proto-Japanese-Ryūkyūan) (co-editor, with Yukinori Takubo and Tatsuya Hirako). 2016. Tokyo: Hitsuji Shobō.

WALS (World Atlas of Language Structures) no gengo ruikeironteki parameta no tokeironteki bunseki to sono tsujironteki kaishaku (A statistical analysis of the typological features in WALS and its diachronic interpretation) (with Yohei Ono). 2014. *Bulletin of the Edward Sapir Society of Japan* 28, 1–15. Tokyo: Edward Sapir Society of Japan.

Review of Lee, Ki-moon and Robert Ramsey A history of Korean. In *Korean Historical Linguistics* (special issue editor, with Young-key Kim-Renaud). 2013. *Korean Linguistics* 15.2.

Kundoku wa kanji bunkaken dake no mono ka. (Is kundoku found only in the Sinosphere?) *Nihongogaku* 2013.11 (vol. 32.13), 26–41.

Tagengo o jigengo de yomu koto: "kundoku" no fuhensei ni tsuite. (Reading a foreign language in the vernacular: the universality of "kundoku") 2013. In Takada, Tomokazu and Teiji Koskegwa (eds) *Kunten shiryō no kozoka kijutu seika hōkokusho*. National Institute of Japanese Linguistics *Kyōdō Kenkyū Hōkoku* 12.0.

Nihongo shinhakken: Sekai kara mita Nihongo. (*Rediscovery of Japanese: Japanese from the world's perspective*) 2013. National Institute of Japanese Linguistics *NINJAL Forum Series* 3 (editor).

Gengo shigen tosite no Nihongo (Japanese as a linguistic resource) (with Satoshi Kinsui, Yasuyuki Shimizu, and Tsutomo Yada). 2011. *Bungaku* 12.3, 2–51.

Review of J. M. Unger (2009) *The Role of Contact in the Origins of the Japanese and Korean Languages. The Journal of Asian Studies* 69.4 (November 2010), 1268–1270.

Review of M. Nakayama (ed.) *Issues in East Asian language acquisition.* 2006. *Language* 82.3, 662–5.

Licensing of Multiple Negative Polarity Items (with Susumu Kuno). 2004. In Kim-Renaud, Y. and John Whitman (eds.) *Studies in Korean Syntax and Semantics by Susumu Kuno*. Seoul, Pajigong Press, 207–228.

The proto-Korean Shape of *ha-* 'do'.2003. In Lee, S.-O. (ed.) *Pathways into Korean Language and Culture: Essays in Honor of Young-Key Kim-Renaud*. Seoul, Pajigong Press, 463–470.

Review of M. Hudson (1999) *Ruins of Identity: Ethnogenesis in the Japanese Islands. Harvard Journal of Asiatic Studies.*62.1 (June 2002).

Give as a Higher Verb: Reassessing Nakau (1973). 2001. In Minoru Nakau Festschrift Editorial Committee (eds*.) Imi to katachi no intaafeesu* (The interface of meaning and form). Tokyo, Kuroshio Press, 785–796.

Tongsa Kulcŏl-ŏ ŭi suptŭk kwa paltal ŭi pulyŏnsoksong (Acquisition of verbal inflection and discontinuities in development). 2000. In Cho, S.-K. (ed*) Ingan un ono lul otohke suptuk ha-nun ga* (How do human beings acquire language?). Seoul, Akhanet Publishers, Translated by S.-K. Cho.

Adjunct Major Subjects in Korean. 2000. In Lee, C. and J. Whitman (eds.), *Korean Syntax and Semantics*: *Proceedings of the LSA Institute Workshop*. Seoul, Thaehaksa, 1–8.

Wh gimonbun to yes/no gimonbun no bimyô na sa (A subtle difference between wh- and *yes/no* questions). 1996. *Kôkô Eigo Tenbô.* Tokyo, Shogakukan, Tokyo.

Hatarakikake no 'want' (Hortative 'want'). 1996. *Kôkô Eigo Tenbô.* Tokyo, Shogakukan.

Kanbun kundoku ni yorite tsutaeraretaru (Ei)gohô (Grammatical usage (of English) based on the Japanese tradition of reading Chinese). 1995. *Kôkô Eigo Tenbô.* Tokyo, Shogakukan.

Review of W. Poser (ed.) *Japanese Syntax. Language.* 1992.

On the Acquisition of Functional Categories in Korean: A Study of the First Language Acquisition of Korean Relative Clauses (with K-O. Lee & B. Lust). 1990. In E-J. Baek (ed.) *Papers from the Seventh International Conference on Korean Linguistics.* Toronto, University of Toronto Press.

Topic, Modality, and IP Structure. 1988. In S. Kuno et al (eds.) *Proceedings of the Third Harvard Workshop on Korean Linguistics.* Seoul, Hansin.

Korean Morphological Passives and Causatives (with S. Hahn). 1988. In E-J. Baek (ed.) *Papers from the Sixth International Conference on Korean Linguistics.,* Toronto, University of Toronto Press.

Korean Clusters. 1986. In S. Kuno et al (eds.) *Proceedings of the First Harvard Workshop on Korean Linguistics.*

Nonpronominal Aspects of Zero Pronoun Phenomena. 1985. In *San Diego Working Papers in Linguistics.*

Syntax and morphology

On complement selection in Spanish and Japanese

Tomoyuki Yoshida
International Christian University

This paper focuses on some curious parallelism between Spanish and Japanese. In particular, it shows that complement clause selection in these languages can be captured by the semantic categories proposed by Lahiri (1991, 2002). It demonstrates that these two languages obey the exact same constraints on complement selection by examining Japanese data along the lines of Lahiri's verbal classification. It also shows that the analysis of Japanese complementizers proposed by Saito (2010) should be extended to account for a wider range of Japanese data. This extended analysis is shown to be able to capture all the shared parallelisms between the two languages.

Keywords: complement selection, semantic category, utterance, proposition, question, complementizer

1.   Introduction

The main purpose of this paper is to show that the semantic categories for complement selection proposed by Lahiri (1991, 2002) and the Japanese complementizer system (C-system) perfectly interlock with each other. By comparing data from Spanish and Japanese, it will be shown that the analysis of the Japanese C-system proposed by Saito (2010, 2015) should be extended to account for all the relevant data in Japanese. It will be made clear that these two languages exhibit remarkable similarities.

The paper is organized as follows. Section 2 provides a brief overview of the Japanese C-system and points out a problem in the standard analysis of complement selection based on the non-interrogative vs. interrogative feature distinction. Section 3 reviews Saito's solution to this problem along the lines of Plann's (1982) analysis of Spanish indirect questions. Section 4 demonstrates that Lahiri's (2002) semantic selection (s-selection) frames can be used to explain certain parallelism

between Spanish and Japanese. Section 5 takes up some observations made by Plann (1982) and shows further parallelism between the two languages. Section 6 summarizes the main discussion of the paper.

2.   Complementizers in Japanese

Japanese complementizers can be divided into two types: simplex and complex. The former includes *-to*, *-ka*, and *-no*, and the latter *-no-ka* and *no-ka-to*. The simplex complementizers *-ka* and *-to* conform to a standard non-interrogative vs. interrogative complement selection pattern, as shown below.

(1) a. *Taroo-wa Hanako-ga   zitensya-o katta-*ka/-to   omotta.*
         Taro-TOP Hanako-NOM bike-ACC bought-*KA/TO thought
         'Lit. Taro thought *Q/that Hanako bought a bike.'

     b. *Taroo-wa Hanako-ga   zitensya-o katta-ka/*-to   tazuneta.*
         Taro-TOP Hanako-NOM bike-ACC bought-KA/*TO asked
         'Lit. Taro asked Q/*that Hanako bought a bike.'

The verb *omou* 'think' takes a non-interrogative complement, which is marked by *-to*. The verb *tazuneru* 'ask', on the other hand, takes an interrogative complement, which is marked by *-ka*. The simplex complementizer *-no* also marks a non-interrogative complement. One salient formal difference between *-no* and *-to* is that the former must be followed by a case-marker, while the latter normally cannot be.[1]

(2) a. *Taroo-wa Hanako-ga   zitensya-o katta-no-*(o)   oboeteita.*
         Taro-TOP Hanako-NOM bike-ACC bought-NO-*(ACC) remembered
         'Taro remembered that Hanako bought a bike.'

     b. *Taroo-wa Hanako-ga   zitensya-o katta-to-(*o)   omotta.*
         Taro-TOP Hanako-NOM bike-ACC bought-TO-(*ACC) thought
         'Taro thought that Hanako bought a bike.'

Turning now to complex complementizers (C-comps), let us consider the following examples.

---

1. Though nominative and accusative case markers cannot be attached to a *-to* headed CP, genitive marker *-no* can be attached to *-to*, as shown below.

(i) *Hanako-ga   zitensya-o katta-to-no   hookoku*
     Hanako-NOM bike-ACC bought-TO-GEN report
     'The report that Hanako bought a bike.'

(3) a. *Taroo-wa Hanako-ga   nani-o   katta-(no)-ka   *omotta/tazuneta.*
         Taro-TOP *Hanako-NOM what-ACC bought-(NO)-KA *thought/asked
         'Lit. Taro thought/asked C-comp Hanako bought what.'

     b. *Taroo-wa Hanako-ga   nani-o   katta-(no)-ka-to   omotta/tazuneta.*
         Taro-TOP Hanako-NOM what-ACC bought-(NO)-KA-TO thought/asked
         'Lit. Taro thought/asked C-comp Hanako bought what.'

In the C-comps *-(no)-ka* and *-(no)-ka-to*, *-no* is optional as indicated.[2] The grammatical contrast shown in (3a) can be described by the standard non-interrogative vs. interrogative distinction, just as in (1) above. The lack of such grammatical contrast in (3b), on the other hand, cannot be properly explained along the same line. Since the C-comp *-(no)-ka-to* can be used for both non-interrogative and interrogative complements, we need to account for examples like (3b) independently of this dichotomy.

3.   Saito's account for the C-comp *-(no)-ka-to*

Saito (2010, 2015) proposes the following C-system for Japanese.

(4)   *-no* marks propositions
         -ka marks questions
         -to marks paraphrases of direct discourse (reports) and direct quotes

Saito (2010) describes the C-comp *-(no)-ka-to* in the following manner: A proposition can be marked by *-no*, a question can be formed by attaching *-ka* to a proposition, and a question can be marked by *-to* to make a paraphrase of a question or a direct quote of a question. Pointing out that *-to* in the C-comp behaves like *que* 'that' in Spanish indirect questions, Saito argues that *-(no)-ka-to* is only compatible with verbs that can select a paraphrase of direct discourse (or a report). This selectional property is independent of the standard analysis of complement selection.

To grasp the gist of Saito's analysis, let us first consider relevant Spanish data. As shown in (5) below, *que* may precede a *wh*-phrase in indirect questions, but sometimes it cannot, as shown in (6) (Rivero 1978, 1980; Plann 1982; Suñer 1991, 1993; Lahiri 1991, 2002, etc.).

---

2. See Yamakoshi (1997), Saito & Haraguchi (2012), and Saito (2010, 2015) for discussions of the C-comp *-(no)-ka-to*. The presence or absence of *-no* seems to have no obvious syntactic import. What is important here is the fact that both *-no-ka* and *-ka* can mark interrogative complement clauses.

(5) a. *Te preguntan que para qué quieres el préstamo.*
   you ask that for what want the loan
   'They ask you what you want the loan for.'

b. *Pensó que cuáles serían adecuados.*
   thought that which ones would be appropriate
   'She wondered which ones would be appropriate.'

(6) a. **El detective sabe que quién la mató.*
   the detective knows that who her killed
   'Lit. The detective knows that who killed her.'

b. **Investigaron que qué sucedió.*
   investigated that what happened
   'Lit. They investigated that what happened.'

Plann (1982) shows that verbs that allow the *que + wh* sequence can also take a direct quote as their complement, as shown in (7) , while verbs that do not allow the *que + wh* sequence cannot, as shown in (8) .

(7) a. *Te preguntan: "¿Para qué quireres el préstamo?"*
   you ask for what want the loan
   'They ask you, "What do you want the loan for?"'

b. *Pensó: "¿Cuáles serían adecuados?"*
   thought which ones would be appropriate
   'She thought, "Which ones are appropriate?"'

(8) a. **El detective sabe: "¿Quién la mató?"*
   the detective knows who her killed
   'Lit. The detective knows, "Who killed her?"'

b. **Investigaron: "¿Qué sucedió?"*
   investigated what happened
   'Lit. They investigated, "What happened?"'

Saito (2010) argues that the indirect question with the C-comp *-(no)-ka-to* obeys the same condition as the Spanish indirect question with *que*. That is, complement CPs headed by *-(no)-ka-to* are only allowed for those verbs that can take a direct quote. The verbs *omou* 'think' and *tazuneru* 'ask', for instance, can take a direct quote, as shown in (9a) below. As (9b) shows, these verbs also allow the C-comp *-(no)-ka-to* to appear.

(9) a. *Taroo-wa "dare-ga boku-no uti-ni kuru-ka-na?"-to*
   Taro-TOP who-NOM 1SG-GEN house-to come-KA-SFP-TO
   omotta/tazuneta.
   thought/asked
   'Taro thought/asked, "Who will come to my house?"'

b. *Taroo-wa dare-ga   zibun-no uti-ni   kuru-(no)-ka-to*
Taro-TOP who-NOM self-GEN house-to come-(NO)-KA-TO
omotta/tazuneta.
thought/asked
'Lit. Taro thought/asked C-comp who will come to his house.'

The fact that (9a) involves direct quotation is indicated by the first person pronoun and the use of the sentence final particle -*na* at the end of the complement clause. Notice that Japanese differs from Spanish in the sense that an overt marker -*to* must be attached to a direct quote. Thus (9a) becomes ungrammatical if -*to* is dropped.

(10) **Taroo-wa "dare-ga   boku-no uti-ni   kuru-ka-na?" omotta/tazuneta.*
      Taro-TOP   who-NOM   1SG-GEN house-to come-KA-SFP thought/asked
      'Lit. Taro thought/asked, "Who will come to my house?"'

Based on these observations, Saito concludes that verbs selecting a paraphrase of direct discourse (or a report) can take CPs headed by the C-comp -*(no)-ka-to*. Further examples like the following support Saito's conclusion.

(11) a. **Taroo-wa "dare-ga   kuru-ka-na?"-to sinzita/sitteita/soosasita.*
          Taro-TOP   who-NOM come-KA-SFP-TO believed/knew/investigated
          'Lit. Taro believed/knew/investigated, "Who will come?"'
      b. **Taroo-wa dare-ga   kuru-(no)-ka-to   sinzita/sitteita/soosasita.*
          Taro-TOP who-NOM come-(NO)-KA-TO believed/knew/investigated
          'Lit. Taro believed/knew/investigated C-comp who will come.'

Thus, just as Spanish does not allow the appearance of *que + wh* sequence for verbs that cannot select direct quotation, Japanese verbs that do not select direct quotation cannot take CPs headed by -*(no)-ka-to*.

Let us now go back to the basic data in (3) , which is repeated here as (12) .

(12) a. *Taroo-wa Hanako-ga   nani-o   katta-(no)-ka   *omotta/tazuneta.*
          Taro-TOP Hanako-NOM what-ACC bought-(NO)-KA *thought/asked
          'Lit. Taro *thought/asked C-comp Hanako bought what.'
      b. *Taroo-wa Hanako-ga   nani-o   katta-(no)-ka-to   omotta/tazuneta.*
          Taro-TOP Hanako-NOM what-ACC bought-(NO)-KA-TO thought/asked
          'Lit. Taro thought/asked C-comp Hanako bought what.'

Under Saito's analysis, the grammatical contrast shown in (12a) is due to the standard complement selection requirement based on the non-interrogative and interrogative distinction. The complementizer -*(no)-ka* marks an interrogative complement. The verb *omou* 'think' cannot take such complement, but *tazuneru* 'ask' can. The complementizer -*to*, on the other hand, marks a paraphrase of direct discourse (or a report), which both of these verbs are allowed to take. Saito's analysis,

therefore, captures the parallelism between Spanish *que + wh* and Japanese *-(no)-ka-to*. In the next section, it will be shown that examination of a wider range of Japanese data reveals more parallelisms between these two languages.

4.   Verb classification based on semantic categories

This section demonstrates that Lahiri's (2002) semantic categories and classification of verbs can explain complement selection patterns in both Spanish and Japanese in a systematic fashion. It will also be suggested that Saito's analysis of the complementizer *-to* should be extended to include a function of marking propositions, in addition to marking a direct quote and a report.

4.1   Lahiri (2002)

Lahiri postulates three semantic categories for complement selection: <propositions>, <questions> and <utterances>. The following is a list of s-selection frames of Spanish verbs.

(13)   Class I (*creer* 'to believe'): <propositions>
       Class II (*preguntar* 'to ask'): <questions, utterances>
       Class III (*gemir* 'to groan'): <utterances>
       Class IV (*saber* 'to know'): <propositions, questions>
       Class V (*repetir* 'to repeat'): <propositions, questions, utterances>
       Class VI (*investigar* 'to investigate'): <questions>

According to Lahiri, the semantic categories <propositions> and <questions> can be syntactically realized as propositional complements and indirect questions, respectively. For the semantic category <utterances>, there are two ways to realize them syntactically: One is to realize them as direct quotes, and the other as reports (or paraphrases of direct discourse in Saito's terminology). In the following subsections, it will be shown that Lahiri's verb classification can easily be extended to Japanese verbs.

4.2   Class I verbs

In Lahiri's analysis, Class I verbs can only select the semantic category <propositions>. He argues that *creer* 'to believe' in Spanish is a type of verb that selects <propositions> but not <questions> or <utterances>. Let us consider the following examples.

(14) a.   *Creo   que quedan diez días para las vacaciones.*
           believe that remain ten days for   the holidays
           'I believe that ten days remain for the holidays.'

    b.   **Creo: "Quedan diez días para las vacaciones."*
           believe   remain ten days for   the holidays
           'Lit. I believe, "Ten days remain for the holidays."'

    c.   **Creo   cuántos   días quedan para las vacaciones.*
           believe   how many days remain for   the holidays
           'Lit. I believe how many days remain for the holidays.'

    d.   **Creo: "¿Cuántos días quedan para las vacaciones?"*
           believe how many days remain for   the holidays
           'Lit. I believe, "How many days remain for the holidays?"'

    e.   **Creo   que cuántos   días quedan para las vacaciones.*
           believe that how many days remain for   the holidays
           'Lit. I believe that how many days remain for the holidays.'

The complement clause in (14a) cannot be construed as a report because direct-discourse complements (both declarative and interrogative) are not allowed, as shown in (14b) and (14d). This means that Class I verbs cannot select <utterances>. The ill-formedness of (14e) follows from this, because its complement clause is a report of a question. As noted above, both direct quotes and reports are syntactic realizations of the semantic category <utterances>. If a verb cannot take a direct quote, it cannot take a report, either. Hence, Lahiri takes the complement clause in (14a) to be a proposition.[3] Moreover, the ill-formedness of (14c) follows if Class I verbs cannot select <questions>.

   Turning now to Japanese data, the verb *sinziru* 'believe' behaves similarly to *creer* 'believe' in Spanish with respect to s-selection. Consider the following examples.

(15) a.   *Taroo-wa Hanako-ga   kuru-to sinziteita.*
           Taro-TOP Hanako-NOM come-TO believed
           'Taro believed that Hanako will come.'

    b.   **Taroo-wa "Hanako-ga   kuru-zo"-to   sinziteita.*
           Taro-TOP   Hanako-NOM come-SFP-TO believed
           'Lit. Taro believed, "Hanako will come."'

---

3. Noting that it is controversial to define what propositions are, Lahiri identifies propositions as sets of possible worlds (see e.g. Thomason 1980; Chierchia & Turner 1988; Higginbotham 1991; Larson & Ludlow 1993). The detailed semantics of the semantic categories <propositions>, <questions> and <utterances> is not directly relevant to the discussion in this paper. Following Lahiri, I assume: <propositions> to be sets of possible worlds, <questions> to be sets of propositions constituting the possible (true) answers, <utterances> are a special sort of individuals.

c. *Taroo-wa dare-ga   kuru-(no)-ka   sinziteita.
    Taro-TOP who-NOM come-(NO)-KA believed
    'Lit. Taro believed who will come.'

d. *Taroo-wa "dare-ga   boku-no uti-ni   kuru-ka-na"-to   sinziteita.
    Taro-TOP   who-NOM 1SG-GEN house-to come-KA-SFP-TO believed
    'Lit. Taro believed, "Who will come to my house?"'

e. *Taroo_j-wa dare-ga   kare_j-no uti-ni   kuru-(no)-ka-to   sinziteita.
    Taro-TOP who-NOM 3SG-GEN house-to come-(NO)-KA-TO believed
    'Lit. Taro_j believed C-comp who will come to his_j house.'

The well-formedness of (15a) parallels Spanish (14a). It seems natural to assume that the complement clause marked by -to here is a proposition, just as in Spanish. If this is true, however, it diverges from Saito's (2010, 2015) claim that Japanese -to can only mark reports and direct quotes. Let us examine the other examples in (15) to see if this is indeed the case. The fact that sinziru 'believe' cannot take a direct quote can be observed in (15b) and (15d). The former contains a direct quote of an assertion, and the latter a direct quote of a question. As for (15e), the complement clause in this example can only be taken as a report of a question, with the interpretation of the third person pronoun kare referring to Taro. Given the ill-formedness of (15e) as well as (15b), it should be concluded that -to marking a report is not allowed for the verb sinziru. Since a direct quote and a report are two instances of syntactic realization of the semantic category <utterances>, the ill-formedness of (15b), (15d), and (15e) follows directly if Class I verbs cannot select <utterances>. Moreover, the fact that the complement clause cannot be marked by -ka in (15c) suggests that sinziru cannot select <questions>. Given all of these observations, the well-formedness of (15a) can only be explained by assuming that the verb sinziru selects <propositions> marked by -to. This means that -to in Japanese can be employed to mark three different complement types: propositions, reports and direct quotes. The following summarizes the function of Japanese -to and Spanish que.

(16) Japanese -to Spanish que
      -to for propositions   que for propositions
      -to for reports   que for reports
      -to for direct quotes   no overt marking for direct quotes

The parallelism shown in (14) and (15) is captured if we extend Saito's analysis of -to by including the function of marking propositions.

4.3   Class II verbs

In Lahiri's system, Class II verbs select the semantic categories <questions> and <utterances>, but not <propositions>. He shows that the Spanish verb *preguntar* 'to ask' belongs to this class.

(17) a. **Te   preguntan que quieres el   préstamo.*
           you ask   that want   the loan
           'Lit. They ask you that you want the loan.'

    b. **Te   preguntan: "Quieres el   préstamo."*
           you ask   want   the loan
           'Lit. They ask you, "You want the loan."'

    c. *Te   preguntan para qué   quieres el   préstamo.*
           you ask   for   what want   the loan
           'They ask you what you want the loan for.'

    d. *Te   preguntan: "¿Para qué   quieres el   préstamo?"*
           you task   for   what want   the loan
           'They ask you, "What do you want the loan for?"'

    e. *Te   preguntan que para qué   quieres el   préstamo.*
           you ask   that for   what want   the loan
           'They ask you that what you want the loan for.'

The ungrammaticality of (17a) can be explained if this verb does not select propositional complements. Lahiri postulates the following principle to explain the ill-formedness of (17b) and the well-formedness of (17c), (17d) and (17e).

(18) **Principle R**: If a predicate V selects categories $X_1, \ldots, X_n$, as well as utterances, and nothing else, then the utterance complements of V must be utterances of categories restricted to $X_1, \ldots, X_n$. No such restriction applies to predicates that select utterances only.

Since Class II verbs select <utterances> and <questions>, they are subject to this principle. According to Principle R, utterance-complements of a verb must be restricted to categories selected by the verb. (17c) is grammatical since *preguntar* 'to ask' selects a question. (17d) and (17e) are both allowed because their complement clauses are realizations of a question-utterance. (17b), on the other hand, is a realization of a statement-utterance. Hence, Principle R disallows it.

    Class II verbs in Japanese show a complete parallelism. The verb *tazuneru* 'ask' appears to belong to this class. Consider the following.

(19) a. **Taroo-wa Hanako-ga   kuru-to   tazuneta.*
           Taro-TOP Hanako-NOM come-TO asked
           'Lit. Taro asked that Hanako will come.'

b. *Taroo-wa "Hanako-ga   kuru-yo"-to   tazuneta.
    Taro-TOP   Hanako-NOM come-SFP-TO asked
    'Lit. Taro asked, "Hanako will come."'

c. Taroo-wa dare-ga   kuru-(no)-ka   tazuneta.
    Taro-TOP   who-NOM come-(NO)-KA asked
    'Taro asked who will come.'

d. Taroo-wa "dare-ga   kuru-ka-na"-to   tazuneta.
    Taro-TOP who-NOM come-KA-SFP-TO asked
    'Taro asked, "Who will come?"'

e. Taroo-wa dare-ga   kuru-(no)-ka-to   tazuneta.
    Taro-TOP who-NOM come-(NO)-KA-TO asked
    'Lit. Taro asked C-comp who will come.'

These examples can be accounted for in the manner Lahiri accounts for the corresponding Spanish examples. The ill-formedness of (19a) follows if <propositions> cannot be selected by *tazuneru* 'ask'. The ill-formedness of (19b) is explained by Principle R, just as in Spanish. The well-formedness of (19c) follows if *tazuneru* selects the semantic category <questions>. (19d) involves a direct quote of a question, and (19e) a report of a question. Both are allowed by Principle R.

4.4   Class III verbs

Under Lahiri's analysis, Class III verbs can only select the semantic category <utterances>. He shows that the Spanish verb *sollozar* 'to whimper' belongs to this class.

(20) a. Sollozó   que cinco píldoras debía   tragar.
          whimpered that five   pills   had to swallow
          'She whimpered that she had to take five pills.'

      b. Sollozó: "Cinco píldoras debo   tragar."
          whimpered   five   pills   have to swallow
          'She whimpered, "I should take five pills."'

      c. *Sollozó   cuántas   píldoras debía   tragar.
           whimpered how many pills   had to swallow
          'Lit. She whimpered how many pills she had to take.'

      d. Sollozó: "¿Cuántas   píldoras debo   tragar?"
          whimpered   how many pills   had to swallow
          'She whimpered, "How many pills should I take?"'

      e. Sollozó   que cuántas   píldoras debía tragar.
          whimpered that how many pills   had to swallow
          'Lit. She whimpered that how many pills she had to take.'

Class III verbs can take any types of direct-discourse complements. Thus, (20b), (20d) and (20e) are all expected to be well-formed, because these are regarded as syntactic realizations of <utterances>. The ill-formedness of (20c) is accounted for if Class III verbs cannot select <questions>. Lahiri takes the complement clause in (20a) to be a report of an assertion, because a propositional complement is not allowed for Class III verbs.

A similar pattern of complement selection can be observed in Japanese. Class III verbs in this language should include *umeku* 'groan' and *omou* 'think'. Let us consider the following examples.

(21) a. *Taroo-wa Hanako-ga   kuru-to   umeita/omotta.*
          Taro-TOP Hanako-NOM come-TO groaned/thought
          'Taro groaned/thought that Hanako will come.'
      b. *Taroo-wa "Hanako-ga   kuru-yo"-to   umeita/omotta.*
          Taro-TOP   Hanako-NOM come-SFP-TO groaned/thought
          'Taro groaned/thought, "Hanako will come."'
      c. **Taroo-wa dare-ga   kuru-(no)-ka   umeita/omotta.*
           Taro-TOP who-NOM come-(NO)-KA groaned/thought
          'Lit. Taro groaned/thought who will come.'
      d. *Taroo-wa "dare-ga   kuru-ka-na"-to   umeita/omotta.*
          Taro-TOP   who-NOM come-KA-SFP-TO groaned/thought
          'Taro groaned/thought, "Who will come?"'
      e. *Taroo-wa dare-ga   kuru-(no)-ka-to   umeita/omotta.*
          Taro-TOP who-NOM come-(NO)-KA-TO groaned/thought
          'Lit. Taro groaned/thought C-comp who will come.'

Just as in Spanish, Japanese Class III verbs cannot select <questions>, and the ungrammaticality of (21c) directly follows from this restriction. The well-formed (21b), (21d) and (21e) follow from the fact that the semantic category <utterances> can be syntactically realized as follows: as a direct quote of an assertion for (21b), as a direct quote of a question for (21d), and as a report of a question for (21e). The proposition-denoting complement of (21a) can be taken as a report of an assertion marked by *-to*, just as in the Spanish case in (20a).

It is worth noting here that verb classification itself is a means of grouping verbs that share the same complement selection pattern. There are verbs that may not fit in the six classes listed in (13) above. Let us take a look at a difference between *umeku* 'groan' and *omou* 'think'. They both belong to Class III but the latter has a use of Class I verbs as well. That is, *omou* can take a proposition as its complement but *umeku* cannot. This is illustrated by the following contrast.

(22)   a.   *Hanako-wa musuko-ga tensai-da-to   sinzitei-nai-ga, soo umeita.*
    Hanako-TOP son-NOM   genius-be-TO believe-not-but so groaned
    'Hanako does not believe that her son is a genius, but (she) groaned so.'

   b.   #*Hanako-wa musuko-ga tensai-da-to   sinzitei-nai-ga, soo omotteiru.*
    Hanako-TOP son-NOM   genius-be-TO believe-not-but so think
    'Hanako does not believe that her son is a genius, but (she) thinks so.'

The verb *sinziru* 'believe' is a Class I verb selecting a proposition, and denying its propositional complement does not conflict with the Class III verb *umeku*. Thus (22a) is felicitous. To explain the contradiction exhibited by (22b), we must say that *omou* must select <propositions> whenever it takes a *to*-marked indirect-discourse complement. We can, then, attribute the contradiction to the conflict between negating the embedded proposition with *sinziru* and confirming it with *omou*. Therefore, we need to postulate the following lexical entry for *omou*.

(23) $omou_1$: <propositions>   (Class I)
   $omou_2$ <utterances>   (Class III)

The verb *umeku*, on the other hand, lacks the use of Class I verbs, and hence its *to*-marked complement is construed as a report of an assertion.

   Another Class III verb *meiziru* 'order' shows an interesting complement selection pattern. It selects <utterances> but only in a command form.[4]

(24)   a.   *Taroo-wa Hanako-ni   "boku-no uti-ni   koi"-to   meizita.*
    Taro-TOP Hanako-DAT 1SG-GEN house-to come-TO ordered
    'Taro ordered Hanako, "Come to my house!"'

   b.   *Taroo$_j$-wa Hanako-ni   kare$_j$-no uti-ni   koi-to   meizita.*
    Taro-TOP Hanako-DAT 3SG-GEN house-to come-TO ordered
    'Taro$_j$ ordered Hanako (that she should) come to his$_j$ house.'

(24a) has a direct-discourse command, and (24b) a report of a command. Principle R allows these two examples. Other types of complements, however, are not allowed for this verb.

(25)   a.   **Taroo-wa Hanako-ga   kuru-to   meizita.*
    Taro-TOP Hanako-NOM come-TO ordered
    'Lit. Taro ordered that Hanako will come.'

   b.   **Taroo-wa "Hanako-ga   kuru-zo"-to   meizita.*
    Taro-TOP Hanako-NOM come-SFP-TO ordered
    'Lit. Taro ordered, "Hanako will come."'

---

4. See Rivero (1994) for discussion of a type of imperatives in Spanish that can only be selected by verbs selecting <utterances>. See also Uchibori (1997), Saito (2010), etc. for a similar observation for Japanese.

c. *Taroo-wa dare-ga   kuru-(no)-ka   meizita.*
   Taro-TOP who-NOM come-(NO)-KA ordered
   'Lit. Taro ordered who will come.'

d. *Taroo-wa "dare-ga boku-no uti-ni   kuru-ka-na"-to   meizita.*
   Taro-TOP who-NOM 1SG-GEN house-to come-KA-SFP-TO ordered
   'Lit. Taro ordered, "Who will come to my house?"'

e. *Taroo$_j$-wa dare-ga   kare$_j$-no uti-ni   kuru-(no)-ka-to   meizita.*
   Taro-TOP who-NOM 3SG-GEN house-to come-(NO)-KA-TO ordered
   'Lit. Taro$_j$ ordered C-comp who will come to his$_j$ house.'

This fact suggests that Principle R is compatible with semantic categories with more fine-graded distinctions.

4.5   Class IV verbs

Lahiri classifies those verbs selecting the semantic categories <propositions> and <questions> into Class IV. He shows that the verb *saber* 'to know' in Spanish belongs to this class.

(26) a. *Sabía que yo iba darles   una prueba el martes.*
   knew that I was going to give them a   test   on Tuesday
   'He knew that I was going to give them a test on Tuesday.'

b. **Sabía: "Yo iba darles   una prueba el martes."*
   knew   I was going to give them a   test   on Tuesday
   'Lit. He knew, "I was going to give them a test on Tuesday."'

c. *Sabía cuándo iba yo darles   una prueba.*
   knew when   I was going to give them a   test
   'He knew when I was going to give them a test.'

d. **Sabía: "¿Cuándo ibas yo darles   una prueba?"*
   knew   when   I was going to give them a   test
   'Lit. He knew, "When am I going to give a test?"'

e. **Sabía que cuándo iba yo darles   una prueba.*
   knew that when   I was going to give them a   test
   'Lit. He knew that when was I going to give me a test.'

Since Class IV verbs select <propositions> and <questions>, the well-formedness of (26a) and (26c) is expected. The semantic category <utterances>, however, cannot be selected by verbs in this class. The ill-formedness of (26b), (26d) and (26e) directly follows from the lack of <utterances>.

Japanese verbs such as *sitteiru* 'know' should be included in Class IV. Consider the following examples.

(27)   a.   *Taroo-wa Hanako-ga   kuru-to   sitteita.*
　　　　　Taro-TOP Hanako-NOM come-TO knew
　　　　　'Taro knew that Hanako will come.'

　　　b.   **Taroo-wa "Hanako-ga   kuru-yo"-to   sitteita.*
　　　　　 Taro-TOP   Hanako-NOM come-SFP-TO knew
　　　　　'Lit. Taro knew, "Hanako will come."'

　　　c.   *Taroo-wa dare-ga   kuru-(no)-ka   sitteita.*
　　　　　Taro-TOP who-NOM come-(NO)-KA knew
　　　　　'Taro knew who will come.'

　　　d.   **Taroo-wa "dare-ga   kuru-ka-na"-to   sitteita.*
　　　　　 Taro-TOP   who-NOM come-KA-SFP-TO knew
　　　　　'Lit. Taro knew, "Who will come?"'

　　　e.   **Taroo-wa dare-ga   kuru-(no)-ka-to   sitteita.*
　　　　　 Taro-TOP who-NOM come-(NO)-KA-TO knew
　　　　　'Lit. Taro knew C-comp who will come.'

Just as in Spanish, since <utterances> cannot be selected by Class IV verbs, the examples involving a direct quote or a report are disallowed. Hence, (27b), (27d) and (27e) are all ill-formed. The well-formed (27a) suggests that *-to* here marks a proposition, rather than a report. Therefore, the complement selection pattern of Class IV verbs also asks for the extension of Saito's (2010) analysis of *-to* suggested in Section 4.2. (27c) contains a question in its complement clause. This is allowed since Class IV verbs select <questions>.

4.6   Class V verbs

Lahiri argues that Class V verbs are properly viewed as being ambiguous between Class III and Class IV. They can select all of the proposed semantic categories: <propositions>, <questions> and <utterances>. Thus, the following Spanish examples are all well-formed.

(28)   a.   *Repitieron que no querían ir.*
　　　　　repeated   that not wanted to go
　　　　　'They repeated that they didn't want to go.'

　　　b.   *Repitieron: "llegarían."*
　　　　　repeated   would arrive
　　　　　'They repeated, "They would arrive."'

　　　c.   *Repitieron cuándo llegarían.*
　　　　　repeated   when   would arrive
　　　　　'They repeated when they would arrive.'

     d.   *Repitieron: "¿Cuándo llegarían?"*
         repeated   when   would arrive
         'They repeated, "When would they arrive?"'
     e.   *Repitieron que cuándo llegarían.*
         repeated   that when   would arrive
         'Lit. They repeated that when they would arrive.'

Like Class III verbs, Class V verbs allow any types of direct-discourse comple-
ments. (28b) and (28d), therefore, are both well-formed. (28a) and (28e) can be
understood as a report of an assertion and a report of a question, respectively.
The complement in (28a) may also have a propositional interpretation because
Class V verbs select <propositions>. Since Class V verbs select <questions>, (28c)
is also possible.

    The Japanese verb *iituzukeru* 'say repeatedly' appears to belong to this class.
Thus, the following examples are all grammatical as well.

(29) a. *Taroo-wa Hanako-ga   kuru-to   iituzuketa.*
         Taro-TOP Hanako-NOM come-TO said repeatedly
         'Taro said repeatedly that Hanako will come.'
     b. *Taroo-wa "Hanako-ga   kuru-zo"-to   iituzuketa.*
         Taro-TOP   Hanako-NOM come-SFP-TO said repeatedly
         'Taro said repeatedly, "Hanako will come?"'
     c. *Taroo-wa dare-ga   kuru-(no)-ka   iituzuketa.*
         Taro-TOP who-NOM come-(NO)-KA said repeatedly
         'Taro said repeatedly who will come.'
     d. *Taroo-wa "dare-ga   boku-no uti-ni   kuru-ka-na"-to*
         Taro-TOP   who-NOM 1SG-GEN house-to come-KA-SFP-TO
         iituzuketa.
         said repeatedly
         'Taro said repeatedly, "Who will come to my house?"'
     e. *Taroo$_j$-wa dare-ga   kare$_j$-no uti-ni   kuru-(no)-ka-to*
         Taro-TOP   who-NOM 3SG-GEN house-to come-(NO)-KA-TO
         iituzuketa.
         said repeatedly
         'Lit. Taro$_j$ said repeatedly C-comp who will come to his$_j$ house.'

Just as in Spanish, all of these examples are well-formed. The *-to* marked comple-
ment clause in (29a) can be interpreted either as a proposition (Class V) or a re-
port of an assertion (Class III).

4.7   Class VI verbs

Lahiri argues that Spanish verbs such as *investigar* 'to investigate' selects the semantic category <questions> alone, based on examples like the following.

(30) a.   *Investigaron que el   SIDA se   puede curar.*
              investigated that the AIDS self can   cure
              'Lit. They investigated that AIDS can be cured.'
      b.   *Investigaron: "El   SIDA se   puede curar."*
              investigated   the AIDS self can   cure
              'Lit. They investigated, "The AIDS can be cured."'
      c.   *Investigaron cómo se   puede curar el   SIDA.*
              investigated how self can   cure the AIDS
              'They investigated how AIDS can be cured.'
      d.   *Investigaron: "¿Cómo se   puede curar el   SIDA?"*
              investigated   how self can   cure the AIDS
              'Lit. They investigated, "How can AIDS be cured?"'
      e.   *Investigaron que cómo se   puede curar el   SIDA.*
              investigated that how self can   cure the AIDS
              'Lit. They investigated that how AIDS can be cured.'

The well-formedness of (30c) and the ill-formedness of (30a), (30b), (30d) and (30e) all follow from the s-selection requirement imposed on verbs of this class.

   Corresponding Japanese examples also show that Class VI verbs in Japanese can only select <questions> as their complement as well.[5] The following examples can receive the same explanation given for the Spanish examples in (30) .

(31) a.   *Taroo-wa Hanako-ga   kuru-to   sirabeta.*
              Taro-TOP Hanako-NOM come-TO examined
              'Lit. Taro examined that Hanako will come.'
      b.   *Taroo-wa "Hanako-ga   kuru-yo"-to   sirabeta.*
              Taro-TOP   Hanako-NOM come-SFP-TO examined
              'Lit. Taro examined, "Hanako will come."'

---

5. For some native speakers, (31d) and (31e) may sound OK, but they seem to be interpreting examples like these with an implicit supplementary verb like *omotteiru* 'thinking', as shown below.

(i) a.   *Taroo-wa "dare-ga   kuru-ka-na"-to   omotte   sirabeta.*
              Taro-TOP   who-NOM   come-KA-SFP-TO thinking investigated
              'Taro examined (it), thinking "Who will come?"'
     b.   *Taroo-wa dare-ga   kuru-(no)-ka-to   omotte   sirabeta.*
              Taro-TOP who-NOM come-KA-SFP-TO thinking investigated
              'Lit. Taro examined (it), thinking C-comp who will come.'

    c.   *Taroo-wa dare-ga   kuru-(no)-ka sirabeta.*
        Taro-TOP who-NOM come-(NO)-KA examined
        'Taro examined who will come.'

    d.   **Taroo-wa "dare-ga   kuru-ka-na"-to   sirabeta.*
        Taro-TOP who-NOM come-KA-SFP-TO examined
        'Lit. Taro examined, "Who will come?"'

    e.   **Taroo-wa dare-ga   kuru-(no)-ka-to   sirabeta.*
        Taro-TOP who-NOM come-(NO)-KA-TO examined
        'Lit. Taro examined C-comp who will come.'

The preceding subsections reveal close parallelism in complement selection between Spanish and Japanese and show that Lahiri's analysis based on Spanish can also be applied to Japanese.

5.   Further parallelisms

This section takes up some more shared parallelisms between the two languages based on Plann's (1982) observations.

It has been noted that *que* in the *que + wh* sequence is optional for certain verbs but not for others (Rivero 1978; Plann 1982; Lahiri 2002, etc.)

(32) a. *Te preguntan (que) para qué quieres el préstamo.*   (Class II)
        you ask   (that) for   what want   the loan
        'Lit. They ask you (that) what do you want the loan for.'

     b. *Repitieron (que) cuándo llegarían.*   (Class V)
        repeated   (that) when   would arrive
        'Lit. They repeated (that) when they would arrive.'

     c. *Sollezó   *(que) cuántas   pídoras debía tragar.*   (Class III)
        whimpered *(that) how many pills   had to swallow
        'Lit. She whimpered *(that) how many pills she had to take.'

In Lahiri's system, the grammatical contrast in (32) can be explained by saying that *que* can be dropped only with verbs that select both <utterances> and <questions>, which are Class II and Class V verbs. The following examples suggest that Japanese *-to* in the *-(no)-ka-to* sequence can also be dropped with the same classes of verbs.

(33) a. *Taroo-wa dare-ga   kuru-(no)-ka-(to)   tazuneta.*   (Class II)
        Taro-TOP who-NOM come-(NO)-KA-(TO) asked
        'Lit. Taro asked C-comp who will come.'

b. *Taroo-wa dare-ga   kuru-(no)-ka-(to)   iituzuketa.*   (Class V)
    Taro-TOP who-NOM come-(NO)-KA-(TO) said repeatedly
    'Lit. Taro said repeatedly C-comp who will come.'

c. *Taroo-wa dare-ga   kuru-(no)-ka-*(to)   umeita.*   (Class III)
    Taro-TOP who-NOM come-(NO)-KA-*(TO) groaned
    'Lit. Taro groaned C-comp who will come.'

Plann (1982) also notes that the presence or absence of *que* makes some semantic difference. Consider the following examples.

(34) a. *Repitieron que cuándo llegarían.*
          repeated   that when   would arrive
          'They repeated when they would arrive.'

b. *Repitieron cuándo llegarían.*
    repeated   when   would arrive
    'They repeated when they would arrive.'

c. *Repitieron: "¿Cuándo llegaríamos?"*
    repeated   when   would arrive
    'They repeated, "When would we arrive?"'

According to Plann, the complement clause of (34a) is interpreted as a reported question while that of (34b) is interpreted as a reported assertion. (34a), therefore, can be understood as a paraphrase of (34c). A similar observation can be made in Japanese as well. Thus, (35a) can be a paraphrase of (35b).

(35) a. *Taroo-wa dare-ga   kuru-(no)-ka-to   iituzuketa.*
          Taro-TOP who-NOM come-(NO)-KA-TO said repeatedly
          'Lit. Taro said repeatedly C-comp who will come.'

b. *Taroo-wa "dare-ga   kuru-(no)-ka"-to   iituzuketa.*
    Taro-TOP   who-NOM come-(NO)-KA-TO said repeatedly
    'Taro said repeatedly, "Who will come?"'

Here, what Taro keeps repeating is the question "Who will come?" However, with *-to* dropped as in (36) below, a different interpretation is created.

(36) *Taroo-wa dare-ga   kuru-(no)-ka   iituzuketa.*
      Taro-TOP who-NOM come-(NO)-KA said repeatedly
      'Taro said repeatedly who will come.'

In this case, just as in Spanish, what Taro keeps repeating becomes a reported assertion such as "Hanako will come."

6.   Concluding remarks

The comparison of Spanish and Japanese presented in this paper has revealed some parallelism between these two languages. It was shown that Lahiri's (2002) semantic categories for s-selection provides a systematic account for data in Japanese as well as Spanish. Saito's (2010, 2015) claim concerning the C-comp *-(no)-ka-to* in Japanese was confirmed by further data. That is, *-(no)-ka-to* is only allowed for those verbs selecting the semantic category <utterances> (Class II, Class III and Class V). It was also suggested that *-to* in Japanese has a function of marking propositions in addition to marking direct quotes and reports, which are syntactic realizations of the semantic category <utterances>.

Acknowledgments

References

Chierchia, G., & Turner, R. 1988. Semantics and property theory. *Linguistics and Philosophy* 11: 261–302. https://doi.org/10.1007/BF00632905

Higginbotham, J. 1991. Belief and logical form. *Mind and Language* 6: 344–369. https://doi.org/10.1111/j.1468-0017.1991.tb00261.x

Kuno, S. 1988. Blended quasi-direct discourse in Japanese. In *Papers from the Second International Workshop on Japanese Syntax*, W. Poser (ed.), 75–102. Stanford CA: CSLI.

Lahiri, U. 1991. *Embedded Interrogatives and Predicates that Embed them*. PhD dissertation. MIT.

Lahiri, U. 2002. *Questions and Answers in Embedded Contexts*. Oxford: OUP.

Larson, R. & Ludlow, P. 1993. Interpreted logical forms. *Synthese* 95: 305–355. https://doi.org/10.1007/BF01063877

Plann, S. 1982. Indirect questions in Spanish. *Linguistic Inquiry* 13(2): 297–312.

Rivero, M. L. 1978. Topicalization and wh movement in Spanish. *Linguistic Inquiry* 9(4): 513–517.

Rivero, M. L. 1980. On left-dislocation and topicalization in Spanish. *Linguistic Inquiry* 11(2): 363–393.

Rivero, M. L. 1994. On indirect questions, commands, and Spanish quotative *que*. *Linguistic Inquiry* 25(3): 547–554.

Saito, M. 2010. On the nature of the complementizer *to*. *Journal of Japanese Linguistics* 26: 85–100.

Saito, M. 2015. Cartography and selection: Case studies in Japanese. In *Beyond Functional Sequence: The Cartography of Syntactic Structures*, U. Shlonsky (ed.), 255–274. Oxford: OUP.

Saito, M. & Haraguchi, T. 2012. Deriving the cartography of the Japanese right periphery: The case of sentence-final discourse particles. *Iberia* 4(2): 104–123.

Suñer, M. 1991. Indirect questions and the structure of CP: Some consequences. In *Current Studies in Spanish Linguistics*, H. Campos & F. Martínez-Gil (eds.), 283–312. Washington DC: Georgetown University Press.

Suñer, M. 1993. About indirect questions and semi-questions. *Linguistics and Philosophy* 16(1): 45–77. https://doi.org/10.1007/BF00984722

Thomason, R. 1980. A model theory for propositional attitudes. *Linguistics and Philosophy* 5(1): 47–70. https://doi.org/10.1007/BF00351813

Uchibori, A. 1997. Opacity and subjunctive complements in Japanese. In *Japanese/Korean Linguistics* 6, H. Sohn & J. Haig (eds.), 339–414. Stanford CA: CSLI.

Yamakoshi, K. 1997. Doubly filled COPM in Spanish and the cooccurrence of a question particle and a complementizer in Japanese. Ms, Cornell University.

The syntactic status of *by*-phrases in Korean and Japanese

Sang Doh Park

Korea Soongsil Cyber University

Traditional analyses of Japanese syntax make a distinction between *ni* passives and *ni yotte* passives depending on the type of *by*-phrases. These two patterns of passives correspond semantically to HI passives and CI passives in Korean respectively in that the subject in *ni* passives and HI passives typically bears an Affectee role whereas the subject in *ni yotte* passives and CI passives is not constrained by this semantic requirement. Despite the superficial similarities between Japanese and Korean passives, however, the *by*-phrases behave like arguments in both types of Korean passives whereas their Japanese counterparts demonstrate adjunct-like properties in *ni yotte* passives. While unveiling what mechanism operates in generating each type of passive construction, this chapter investigates the syntactic status of *by*-phrases and the origin that triggers the affectedness constraint observed in these East Asian languages.

Keywords: passive, Korean, Japanese, *by*-phrase, affectedness constraint, implicit argument, thematic structure, ontological salience

1.   Introduction

Korean and Japanese bear more than a superficial resemblance in various aspects of syntactic structure in such a way that an analysis of a particular construction in one of these languages may often carry over to the other. Passive constructions do not appear, at a glance, to make an exception to this generalization in that similar patterns of passives are found in both of these languages. A careful investigation reveals, however, that those apparent similarities do not arise from the identical process of derivation. The main purpose of this chapter is to identify what kind of mechanism operates behind the superficial similarities shared by Japanese and Korean passive constructions. Specifically, I will discuss two types of passives in each of these languages with a focus on the syntactic and semantic properties of their *by*-phrases and other related issues.

This chapter is organized as follows. First, I will introduce the basic facts observed in two types of passives in Korean and Japanese, and point out the syntactic differences hidden under the semantic similarities between the Korean passives and their Japanese counterparts. Second, I will identify the syntactic status of *by*-phrases in each type of passive in these languages. While addressing this issue, I will show that Japanese *ni* and *ni yotte* passives are subsumed under the same kind of construction. Finally, I will discuss what triggers the affectedness constraint, commonly found in a particular pattern of passive in these languages, as it relates to the *by*-phrase. This discussion will show that the seemingly identical semantic constraint in these East Asian languages emerges from different kinds of mechanisms.

2.   Two types of passives in Korean and Japanese

2.1   Korean passives and an Agent-oriented adverb

While various kinds of passive constructions are attested in Korean, our discussion will be limited to the following two types of passives:

(1)   *Inho-ka   Mina-eykey cap-hi-ess-ta.*
      Inho-NOM Mina-DAT   catch-PASS-PST-IND
      'Inho was caught by Mina.'

(2)   *Inho-ka   Mina-ey uyhay ponay-ci-ess-ta.*
      Inho-NOM Mina-by   send-PASS-PST-IND
      'Inho was sent by Mina.'

Some descriptive grammarians classify the pattern of passive in (1), derived with the passive morpheme *-i-/-hi-/-li-/-ki-* concatenated, as 'lexical passive' in the belief that the passive verb is an indecomposable lexical item.[1] For the sake of expository convenience, I will call the passives of this type HI passives. The pattern exemplified by (2) behaves in parallel with English verbal passives in that the majority of Korean transitive verbs can be passivized with this morpheme *-ci-* attached.[2] I will refer to the passives of this type as CI passives.

---

1. Refer to Suh (1996) and the references therein for an overview of Korean passives in descriptive grammar. See also Footnote 6.

2. Some researchers refer to *-ci-* as inchoative rather than passive since it denotes the change of state, attached to not only transitive but also intransitive verbs. See Suh (1996) and Wu (1997) for related discussion.

A notable point about HI passives is that they demonstrate some causative qualities when they contain an Agent-oriented adverb, which reminds us of English *get*-passives:[3]

(3) *Inho-ka   Mina-eykey ilpwule   cap-hi-ess-ta.*
     Inho-NOM Mina-DAT   on purpose catch-PASS-PST-IND
     'Inho got (himself) caught by Mina on purpose.'

(4) John got caught by Mary on purpose.

The adverb *ilpwule* must be construed with the surface subject (instead of the *by*-phrase) in the HI passive, just as the same pattern is exhibited in *get*-passives. This fact indicates that the surface subject (rather than the *by*-phrase) in HI passives has the status of a logical subject as well as functions as the syntactic subject, on the assumption that HI passives are mono-clausal.[4] This pattern is not observed, however, in CI passives:

(5) *Inho-ka   Mina-ey uyhay ilpwule   Boston-ulo ponay-ci-ess-ta.*
     Inho-NOM Mina-by   on purpose Boston-to send-PASS-PST-IND
     'Inho was sent by Mina on purpose to Boston.'

(6) John was sent to Boston by Mary on purpose.

In the CI passive, the Agent-oriented adverb can be associated only with the *by*-phrase in the same fashion as the English *be*-passive strongly favors the interpretation in which the equivalent adverb is construed with the *by*-phrase. This indicates that the *by*-phrase in CI passives has the status of an external argument (or an adjunct to which the theta-role assigned to the external argument is transferred through the mechanism proposed by Jaeggli (1986)).

Predictably, the contrast between HI and CI passives carries exactly over to their respective short passives where the *by*-phrase is deleted:

(7) *Inho-ka   ilpwule   cap-hi-ess-ta.*
     Inho-NOM on purpose catch-PASS-PST-IND
     'Inho got (himself) caught on purpose.'

(8) *Inho-ka   ilpwule   Boston-ulo ponay-ci-ess-ta.*
     Inho-NOM on purpose Boston-to send-PASS-PST-IND
     'Inho was sent (by someone) on purpose to Boston.'

---

3. Refer to Lasnik & Fiengo (1974) for related discussion of *get*-passives.

4. I assume that the *get*-passive in English is a biclausal construction where PRO movement takes place. Refer to Bowers (2002) and Park (2005) for related discussion.

In sum, the so-called *by*-phrase in HI passives, whether it is phonetically overt or covert, does not qualify as an Agent argument, whereas CI passives behave in the same way as English verbal passives where the logical subject is syntactically present as a *by*-phrase or as an implicit argument.[5]

2.2   Idiosyncrasies of HI passives

What is unique about HI passives is that they often show mysterious morphological and syntactic irregularities in the process of being derived from their active counterparts. For instance, we can find no obvious reason why some verbs do not allow HI passivization:[6]

(9)   *sa-i-ta* (to be bought), *kaluchi-i-ta* (to be taught),
       mantul-li-ta (to be made), *chac-ki-ta* (to be found)

Nor is it possible to formulate a general principle or constraint that can account for the idiosyncrasies observed with HI passive constructions. Consider first the following data:

(10)   *So-ka   saca-eykey mek-hi-ess-ta.*
       cow-NOM lion-DAT   eat-PASS-PST-IND
       'A cow was eaten by a lion.'

(11)   *?*Sakwa-ka saca-eykey mek-hi-ess-ta.*
        apple-NOM lion-DAT   eat-PASS-PST-IND
       'An apple was eaten by a lion.'

(12)   *I chayk-i   caknyen-ey Inho-eykey ssu-i-ess-ta.*
        this book-NOM last year-in Inho-DAT   write-PASS-PST-IND
       'This book was written by Inho last year.'

The contrast between (10) and (11)–(12) seems to indicate that the affectedness constraint is imposed on the subject in HI passives. That is, what qualifies as the subject in this pattern of passive is an animate entity that may 'suffer' from some kind of physical or mental damage. As the inanimate subject in (11) cannot be

---

5. Refer to Collins (2005) and Bowers (2010), who argue that the external argument is not suppressed but syntactically present in the canonical external argument position in English verbal passives.

6. Wu (1997: 119) points out that some HI passive verbs appearing in the Korean literature in the 1930s have been either obsolete or replaced by CI passive verbs in contemporary Korean (e.g., *kki-i-ta, mey-i-ta, phye-i-ta*). This observation leads us to suspect that HI passive verbs, which used to be more productive, may have been grammaticalized as indecomposable lexical items and that many of them have disappeared from the current inventory of HI passives.

an affected entity, this sentence sounds less natural than (10), failing to meet the semantic requirement. It is obvious that (12) is completely deviant because there is no room whatsoever for a book to be affected while it is being written. One way to establish what causes the affectedness constraint can be found in Klaiman's (1991: 171–175) analysis of HI passives, according to which nominals must comply with the following agency or animacy hierarchy, depending on their ontological salience:[7]

(13) 1st person pronominal > 2nd person pronominal >
      3rd person pronominal > proper noun >
      human common noun > animate common noun >
      inanimate common noun   (Dixon 1979: 85)

This hierarchy may be simplified to the following version for the sake of our discussion:

(14) Animate Noun > Inanimate Noun

This hierarchy correctly predicts the deviance of (11), where the inanimate noun *sakwa* (apple) occupies a higher syntactic position than the animate noun *saca* (lion), whether this word order is obtained as a result of internal Merge or external Merge in the minimalist terms (Chomsky 2000, 2001). Given that the *by*-phrase in HI passives tends to represent a person who performs the action denoted by the verb, the surface subject is likely to be an animate entity because an inanimate entity appearing as the subject ends up violating the proposed animacy hierarchy. If this is correct, the so-called affectedness constraint should be a consequence that follows from the semantic relation between the arguments.

   Notice, however, that (11) sounds unnatural regardless of the presence of a *by*-phrase whereas (12) becomes perfect with the *by*-phrase deleted:

(15) *?*Sakwa-ka mek-hi-ess-ta.*
       apple-NOM eat-PASS-PST-IND
      'An apple was eaten.'

(16) *I chayk-i   caknyen-ey ssu-i-ess-ta.*
      this book-NOM last year-in write-PASS-PST-IND
      'This book was written last year.'

---

7. Refer also to Silverstein (1976), Klaiman (1984), and Yeon (2015) for related discussion.

Neither of these sentences violates the animacy hierarchy because they have only one (overt) argument, but there is a clear contrast between these two sentences.[8] Hence, this hierarchy alone cannot provide a satisfactory account of what triggers the deviance (11) and (12).

Additional idiosyncrasies are observed with HI passives:

(17) *San-i   (Inho-eykey) po-i-ess-ta.*
      mountain-NOM (Inho-DAT)   see-PASS-PST-IND
      'A mountain was seen (by Inho).'
      (A mountain was visible (to Inho).)

(18) **Yenghwa-ka (Inho-eykey) po-i-ess-ta.*
       movie-NOM (Inho-DAT)   see-PASS-PST-IND
      'A movie was seen (by Inho).'

The verb *po-ta* (*to see* or *watch*) is not passivizable when the logical subject *Inho* has the intention to watch, as observed in these sentences. That is, (17) can mean that *the mountain came into Inho's sight*, but not that *Inho looked at the mountain consciously*. No syntactic approach could account for this mystery, which is to be unveiled later under a lexical analysis.

The contrast between the following sentences is also problematic in that it contradicts what the animacy hierarchy predicts:

(19) *Ku sosik-i   (Inho-eykey) mit-ki-ci-an-ass-ta.*
      that news-NOM (Inho-DAT)   believe-PASS-COMP-NEG-PST-IND
      'The news was not believed by Inho.'

(20) **Mina-ka   (Inho-eykey) mit-ki-ci-an-ass-ta.*
       Mina-NOM (Inho-DAT)   believe-PASS-COMP-NEG-PST-IND
      'Mina was not believed by Inho.'

It is not obvious why the animacy hierarchy is reversed in these sentences in such a way that the inanimate nominal (i.e., *ku sosik*) should rank higher than the animate nominal when the passive verb *mit-ki-ta* is used.

Finally, there are some idiomatic HI passive expressions that have no corresponding active counterparts:

(21) *Nalssi-ka   pwul-li-ess-ta.*
      weather-NOM untie-PASS-PST-IND
      'Weather was untied.' (The weather became mild.)

---

8. If we assume that a covert *by*-phrase is present in these sentences and that covert elements are also constrained by the animacy hierarchy, then, both sentences should be equally deviant contra fact.

(22) *Cha-ka   mil-li-ess-ta.*
      car-NOM push-PASS-PST-IND
      'Cars were pushed.' (The traffic was congested.)

These passive verbs just appear to be monadic predicates that have no relation to their active counterparts, given that it is impossible to conceive of any kind of Agent who instigates the action expressed by the verbs *pwul-li-ta* (to be untied) or *mil-li-ta* (to be pushed). Hence, it makes every sense that they do not have a *by*-phrase.

I have presented a series of irregularities in Korean HI passives that cannot be accounted for under a general syntactic theory. In Section 3.2, I will argue that all these idiosyncrasies can slot into place under the proper characterization of thematic structures for different types of passive verbs.

2.3   Japanese passives and their Korean counterparts

The inventory of passive constructions in Japanese is no less diverse and complicated than in Korean. It comes as no surprise, therefore, that various competing analyses have been proposed over the past decades by different researchers (Kuno 1973; Kuroda 1979; Hoshi 1994, 1999; Shibatani 1990; Ishizuka 2012, among others). Basically, the following three different patterns of Japanese passives have been the focus of research:

(23) *Ni* Direct Passive[9]   (Hoshi 1999: 191)
      Sensei-ga   gakusei-ni   hihans-are-ta.
      teacher-NOM student-DAT criticize-PASS-PST
      'The teacher$_i$ was affected by his student's criticizing him$_i$.'

(24) *Ni Yotte* Passive   (Hoshi 1999: 194)
      Sensei-ga   gakusei-ni yotte hihans-are-ta.
      teacher-NOM student-by   criticize-PASS-PST
      'The teacher was criticized by his student.'

(25) Indirect Passive   (Hoshi 1999: 191)
      Sensei-ga   gakusei-ni   kurasu-de   nak-are-ta.
      teacher-NOM student-DAT classroom-in cry-PASS-PST
      'The teacher was affected by his student's crying in the classroom.'

---

9. I modified Hoshi's (1999) English glosses slightly for the sake of consistency of glossing in this paper. Henceforth, I will gloss *X-ni* and *X-ni yotte* as *X-DAT* and *X-by*, respectively.

There is a semantic correspondence between Japanese *ni* passives and Korean HI passives in that both of them may carry adversative connotations, as demonstrated in the following data:

(26)   Japanese   (Hoshi 1999: 198)

    a.   *Tyuui-ga John-ni   haraw-are-ta.*
        heed-NOM John-DAT pay-PASS-PST
        'Heed was affected by John paying it.'

    b.   *Tyuui-ga   John-ni yotte haraw-are-ta.*
        heed-NOM John-by   pay-PASS-PST
        'Heed was paid by John.'

(27)   Japanese

    a.   *Hune-ga   kaizoku-ni sizume-rare-ta.*
        ship-NOM pirate-DAT sink-PASS-PST

    b.   *Hune-ga   kaizoku-ni yotte sizume-rare-ta.*
        ship-NOM pirate-by   sink-PASS-PST
        'A ship was sunk by the pirates.'

(28)   Korean

    a.   *?Sakwa-ka John-eykey mek-hi-ess-ta.*
        apple-NOM John-DAT   eat-PASS-PST-IND
        'An apple was eaten by John.'

    b.   *Sakwa-ka   John-ey uyhay ponay-ci-ess-ta.*
        apple-NOM John-by   send-PASS-PST-IND
        'An apple was sent by John.'

(29)   Korean

    a.   *Cokwuk-i   cek-eykey   cispalp-hi-ess-ta.*
        home country-NOM enemy-DAT trample-PASS-PST-IND

    b.   *Cokwuk-i   cek-ey uyhay cispalp(a)-ci-ess-ta.*
        home country-NOM enemy-by   trample-PASS-PST-IND
        'Home country was trampled by the enemy.' (Our country was invaded
        by the enemy.)

In (26a), the subject is an abstract concept that cannot be under any kind of influence, and therefore the sentence sounds deviant as a result of a semantic mismatch between the subject and the predicate (including the *by*-phrase) that carries the connotation of exerting influence. A similar pattern is also witnessed in Korean HI passives, as in (28a). The subjects in (27a) and (29a), though inanimate, can be somehow associated with suffering experience, either because they are physically damaged, or because they evoke the speaker's empathy. All of the (b) sentences

in (26)–(29) are well-formed because they are not liable to the relevant semantic constraint.

There are some crucial differences, however, between *ni* and HI passives. Recall that HI passives pattern with English *get*-passives in that an Agent-oriented adverb is construed with the surface subject instead of the *by*-phrase:

(30) *Inho-ka   Mina-eykey ilpwule   cap-hi-ess-ta.*
Inho-NOM Mina-DAT   on purpose catch-PASS-PST-IND
'Inho got (himself) caught by Mina on purpose.'

In Japanese *ni* passives, on the other hand, an Agent-oriented adverb can be associated with the *by*-phrase:

(31) *Taroo-ga   Hanako-ni   wazato   nagur-are-ta.*
Taroo-NOM Hanako-DAT on purpose hit-PASS-PST
'Taro was hit on purpose by Hanako.' (Either Hanako's or Taro's intention)

(32) *Hune-ga   kaizoku-ni wazato   sizume-rare-ta.*
ship-NOM pirate-DAT on purpose sink-PASS-PST
'A ship was sunk on purpose by the pirates.'

The contrast between (30) and (31)–(32) is a telling piece of evidence showing that the *by*-phrase in Japanese *ni* passives can have the syntactic status of an external argument bearing an Agent role whereas its counterpart in Korean HI passives cannot. This is quite surprising in that *ni* passives correspond semantically to HI passives, but behave syntactically like CI passives.

The second difference between *ni* and HI passives is the availability of the implicit argument. The deviance of the following sentence suggests that Korean HI passives lack an implicit Agent argument when their *by*-phrase is deleted:

(33) **Kulim-i   ilpwule   oynccok pyek-ey kel-li-ess-ta.*
 picture-NOM on purpose left wall-on   hang-PASS-PST-IND
'A picture was hung on the left wall on purpose.'

In contrast, Japanese short passives, obtained by deleting the *ni*-phrase, have an implicit argument that can be associated with an Agent-oriented adverb:

(34) *Hune-ga   wazato   sizume-rare-ta.*
ship-NOM on purpose sink-PASS-PST
'A ship was sunk on purpose (by someone).'

The third difference between HI and *ni* passives lies in the mechanism that triggers the affectedness effects. Consider HI passives in Korean again:

(35) *So-ka*   *(saca-eykey) mek-hi-ess-ta.*
      cow-NOM (lion-DAT)   eat-PASS-PST-IND
      'A cow was eaten (by a lion).'

(36) **?Sakwa-ka (saca-eykey) mek-hi-ess-ta.*
       apple-NOM (lion-DAT)   eat-PASS-PST-IND
      'An apple was eaten (by a lion).'

While the subject bears an Affectee role in HI passives, the *by*-phrase has no bear-
ing on the theta-marking mechanism in Korean, given that (36) is unnatural re-
gardless of the presence of the *by*-phrase. Japanese *ni* passives show a different
pattern. Consider (26) again, repeated here:

(37) a.   **Tyuui-ga John-ni   haraw-are-ta.*
           heed-NOM John-DAT pay-PASS-PST
          'Heed was affected by John paying it.'
     b.   *Tyuui-ga   John-ni yotte haraw-are-ta.*
          heed-NOM John-by   pay-PASS-PST
          'Heed was paid by John.'

The contrast between these sentences may be presented as prima facie evidence
indicating that the type of *by*-phrases (i.e., *ni-* vs. *ni yotte*-phrases) is associated
with generating the affectedness constraint by which the surface subject must be
assigned an Affectee role. Consider now the perfectly well-formed 'short' passive
that is supposedly derived from (37):

(38) *Tyuui-ga   haraw-are-ta.*
      heed-NOM pay-PASS-PST
      'Heed was paid.'

In principle, a short passive sentence may be potentially either *ni* passive or *ni
yotte* passive on the assumption that *by*-phrases are optional in any kinds of pas-
sive constructions. If this is correct, the difference between *ni* and *ni yotte* passives
may be simply attributed to the choice of a *by*-phrase: If a *ni*-phrase is selected, the
passive predicate generates the affectedness constraint that requires an affected
subject; If a *ni yotte*-phrase is selected, the affectedness effects do not occur, so that
the semantic restriction does not apply in selecting the subject. This issue will be
further discussed in Section 4.

3.   The syntactic status of *by*-phrases

According to Goro (2006) and Fukuda (2011), there is a fundamental difference between *ni*-phrases and *ni yotte*-phrases in terms of theta-role assignment. They argue that *ni yotte* can assign a theta-role (e.g., Agent or Causer) independently to its complement whereas *ni* cannot. Their proposal is empirically supported by the following data (Fukuda 2011: 255):

(39) a.   *teki-ni yotte-no-kogeki*
           enemy-by-GEN-attack
      b. * *teki-ni-no-kogeki*
           enemy-DAT-GEN-attack
           'the enemy's attack'

As observed in these data, *ni yotte* can assign an Agent role to its complement *teki* (enemy) without a passive predicate, but this kind of theta-marking is impossible with *ni.*

I will show in what follows that the distinction between the two types of *by*-phrases in Japanese carries partially over to Korean *by*-phrases. In addition, I will clarify the syntactic status of each type of *by*-phrase in these languages.

3.1   Thematic properties of *ey uyhay*-phrases

Recall the contrast between HI and CI passives in Korean regarding an Agent-oriented adverb:

(40) *Inho-ka   Mina-eykey ilpwule   cap-hi-ess-ta.*
      Inho-NOM Mina-DAT   on purpose catch-PASS-PST-IND
      'Inho got (himself) caught by Mina on purpose.'

(41) *Inho-ka   Mina-ey uyhay ilpwule   Boston-ulo ponay-ci-ess-ta.*
      Inho-NOM Mina-by   on purpose Boston-to send-PASS-PST-IND
      'Inho was sent by Mina on purpose to Boston.'

This fact suggests that the *ey uyhay*-phrase in CI passives bears an Agent role whereas the *eykey*-phrase in HI passives does not. There are two plausible scenarios regarding where the agentivity of the *ey uyhay*-phrase originates from. One is that this phrase occupies the canonical external argument position (i.e., Spec, *v* (Chomsky 1995), or Spec, Pr (Bowers 1993, 2002)) and that it is assigned an Agent role by the passive predicate in the same fashion as the external argument, which is to be realized as the subject in an active sentence, is theta-marked by the active predicate. The other is that *ey uyhay* is an inherent theta-maker that assigns an

Agent role, just like *ni yotte* in Japanese. The second scenario is feasible when we take into account the fact that *ey uyhay* derives from the deponent verb *ey uyha-ta* (*to be based on/caused by*), which can theta-mark its complement:

(42)   *Inho-ey uyha-n   senthayk*
        Inho-caused by-MOD choice
        'a choice made by Inho'

Notice, however, that an *ey uyhay*-phrase may bear an Experiencer role in the CI passive although *ey uyhay* cannot assign an Experiencer role independently:

(43)   *Turandot-ka   manhun umak ayhoka-ey uyhay culki(e)-ci-ess-ta.*
        Turandot-NOM many music lover-by   enjoy-PASS-PST-IND
        'Turandot was enjoyed by many music lovers.'

                                                            (Park & Whitman 2003: 310)

(44)   **Inho-ey uyhan   kongpho*[10]
         Inho-caused by-MOD fear
        'fear (experienced) by Inho'

In (43), *manhun umak ayhoka* (many music lovers) in the *ey uyhay*-phrase bears an Experiencer role, but it cannot be true that the DP is theta-marked by *ey uyhay* because this postposition alone is unable to assign an Experiencer role, as seen in (44). Notice also that the *ey uyhay*-phrase may carry a recipient role:

(45)   *Ku sopho-ka   Inho-ey uyhay pat(a)-ci-ess-ta.*[11]
        the parcel-NOM Inho-by   receive-PASS-PST-IND
   'The parcel was received by Inho.'

In sum, *ey uyhay* behaves like *by* in English in that both of them can either function as inherent theta-markers that assign an Agent role, or form a *by*-phrase bearing a non-Agent role assigned by the (passive) predicate:

(46)   a book by Chomsky

(47)   The professor was feared by students.

Based on what has been discussed, I suggest that the *ey uyhay*-phrase may occupy the external argument position in CI passives, as illustrated below:

---

10. This phrase is acceptable if it is intended to mean 'fear caused by Inho'.

11. This sentence does not sound perfect, mainly because the passive verb '*pat(a)-ci-ta* (to be received)' is not commonly used. However, the *by*-phrase makes no substantial contribution to the unnaturalness of this sentence.

(48)

```
        TP
       ╱╲____
      ╱      PrP
     ╱      ╱  ╲
Ey uyhay-P    Pr′
             ╱  ╲
            VP   Pr
```
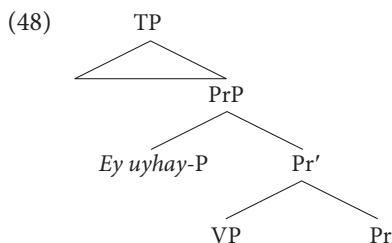
In other constructions, the *ey uyhay*-phrase can be used as an adjunct because *ey uyhay* can theta-mark its complement, just as its Japanese counterpart *ni yotte* can:

(49) *Inho-ka   Mina-uy   son-ey uyhay cwuk-ess-ta.*
      Inho-NOM Mina-GEN hand-by   die-PST-IND
      'Inho died by the hand of Mina.' (Inho was killed by Mina.)

3.2   Thematic properties of *eykey*-phrases

In Section 2.2, we observed various idiosyncrasies of HI passives, which are too wayward to capture with a general syntactic principle. I will show in this section that the seemingly unpredictable properties of HI passives can fall into place when their thematic structures are properly defined. I suggest that there are three sub-types of HI passives, each of which has the following thematic structure:[12]

(50) Adversity Passive: (Affectee (Affector) V))

(51) Monadic Non-adversity Passive: (Theme (V))

(52) Dyadic Non-adversity Passive: (Theme (Goal) V))

The passive verbs like *cap-hi-ta* (to be caught) and *mek-hi-ta* (to be eaten) fall under the category of adversity passive:

(53) *So-ka   (saca-eykey) mek-hi-ess-ta.*
      cow-NOM (lion-DAT)   eat-PASS-PST-IND
      'A cow was eaten (by a lion).'

Given that the surface subject *so* (cow) is affected because of the action denoted by the passive verb, it is reasonable to claim that the verb has the thematic structure by which an Affectee role is assigned to the subject. If there is an entity that is affected, it is also logical to assume that there should be another entity that exerts

---

12. My analysis of HI passives is based on the premise that they are derived without movement from the internal argument position. Refer to Park (2013) for evidence in support of this non-movement approach.

influence on the affected one. I refer to this as 'Affector', and suggest that the adversity passive verbs have the thematic structure in (50).[13]

The following data, which have the flavor of middles, may pose a potential problem for my proposal:

(54) *Yocum   pap-i   na-eykey cal an mek-hi-n-ta.*
      these days rice-NOM me-DAT   well not eat-PASS-PRS-IND
      'Rice is not well eaten by me these days.' (I have a poor appetite these days.)

(55) *Yocum   i chayk-i   haksayngtul-eykey cal ilk-hi-n-ta.*
      these days this book-NOM students-DAT   well read-PASS-PRS-IND
      'This book reads well among students these days.'

The subjects in these sentences are inanimate entities (i.e., *rice, book*) that are neither affected nor able to carry the speaker's empathy.[14] Therefore, they are not semantically suitable candidates to get an Affectee role, but these sentences are well-formed. In order to account for this fact, I suggest that the passive verbs in these sentences have the thematic structure in (52). Since these verbs do not express 'influence', it is obvious that the subject and the *by*-phrase do not form an Affectee-Affector relation, and that the thematic structure for these verbs requires a different type of characterization. Notably, *rice* moves into the eater's body in (54), and the *information* or *knowledge* in the book moves, in the figurative sense, into the reader's mind in (55). Hence, the eater and the reader appearing in the *eykey*-phrase can count as Goal arguments.

Recall now that some HI passives cannot have an *eykey*-phrase:

(56) *I chayk-i   caknyen-ey ssu-i-ess-ta.*
      this book-NOM last year-in write-PASS-PST-IND
      'This book was written last year.'

(57) *Nalssi-ka   pwul-li-ess-ta.*
      weather-NOM untie-PASS-PST-IND
      'Weather was untied.' (The weather became mild.)

(58) *Cha-ka   mil-li-ess-ta.*
      car-NOM push-PASS-PST-IND
      'Cars were pushed.' (The traffic was congested.)

---

13. Recall that the Agent-oriented adverb is construed with the surface subject (the Affectee) rather than the *by*-phrase (the Affector) in HI passives. I take this empirical fact to indicate that the Affectee qualifies as the Proto-Agent that has more Agenthood entailments than the Affector in the sense of Dowty (1991). Although this claim may be counterintuitive, the empirical fact leads us to reach this conclusion.

14. Refer back to (29a), where an inanimate entity can be affected in HI passives.

I suggest that these sentences are generated with the monadic passive verbs that have the thematic structure in (51). This is the reason why they cannot co-occur with an *eykey*-phrase bearing an Affector or Goal role. However, an *ey uyhay*-phrase may be optionally added to these sentences because *ey uyhay* can act as an independent theta-marker assigning an Agent/Causer role:

(59) *I chayk-i   caknyen-ey Inho-ey uyhay ssu-i-ess-ta.*
this book-NOM last year-in Inho-by   write-PASS-PST-IND
'This book was written by Inho last year.'

(60) *Nalssi-ka   ttattushan kokiap-ey uyhay pwul-li-ess-ta.*
weather-NOM warm   high pressure-by untie-PASS-PST-IND
'Weather was untied by warm high atmospheric pressure.' (The weather became mild because of a warm anticyclone.)

Consequently, some HI passives may have an *ey uyhay*-phrase (merged as an adjunct) whereas others occur with an *eykey*-phrase in compliance with the thematic structures in (50) or (52).

3.3   Thematic properties of *ni*-phrases

Despite some semantic similarities between Korean HI passives and Japanese *ni* passives, we have observed that there is a notable syntactic difference between the two:

(61) *Inho-ka   Mina-eykey ilpwule   cap-hi-ess-ta.*
Inho-NOM Mina-DAT   on purpose catch-PASS-PST-IND
'Inho got (himself) caught by Mina on purpose.'

(62) *Taroo-ga   Hanako-ni   wazato   nagur-are-ta.*
Taroo-NOM Hanako-DAT on purpose hit-PASS-PST
'Taro was hit on purpose by Hanako.' (Either Hanako's or Taro's intention)

(63) *Hune-ga   kaizoku-ni wazato   sizume-rare-ta.*
ship-NOM pirate-DAT on purpose sink-PASS-PST
'A ship was sunk on purpose by the pirates.'

These data show that *ni*-phrases can bear an Agent role, unlike *eykey*-phrases. Given that *ni* cannot be an inherent theta-marker that assigns an Agent role, as pointed out by Fukuda (2011), we can reasonably assume that *ni*-phrases occupy the external argument position. If this is correct, *ni*-phrases are expected to bear a wide range of theta-roles, just like *by*-phrases in English. In fact, this prediction

is borne out, as shown in the following sentence where the *ni*-phrase carries an Experience role (Ishizuka 2012: 124):[15]

(64)   *Sono kyoozyu-ga   gakuseitati-ni kowagar-are-ta.*
       that   professor-NOM students-DAT fear-PASS-PST
       'That professor was feared by the students.'

3.4   Thematic properties of *ni yotte*-phrases

According to Teramura (1982) and Park and Whitman (2003), *ni yotte*-phrases do not naturally occur with the passive form of psychological predicates (e.g., to *love, fear,* etc.):

(65)   *Kare.no Haru-no   umi-wa ooku.no hito-ni/*ni yotte ais-are-te iru.*
       his   Spring-GEN Sea-TOP many people-DAT/by   love-PASS-ing is
       'His "Spring Sea" is loved by many people.'

                                                        (Park & Whitman 2003: 310)

The deviance of this sentence caused by selecting a *ni yotte*-phrase indicates that this type of *by*-phrase does not occupy the external argument position where it can receive the theta-role from the passive predicate. If this is correct, the DP in the *ni yotte*-phrase is theta-marked by *ni yotte* rather than by the passive predicate, which is the same conclusion reached by Fukuda (2011).

On the assumption that *ni yotte* is an independent theta-marker, we can predict that the *ni yotte*-phrase can be used as an adjunct. The prediction is borne out, as demonstrated in the following data (Ishizuka 2012: 129):
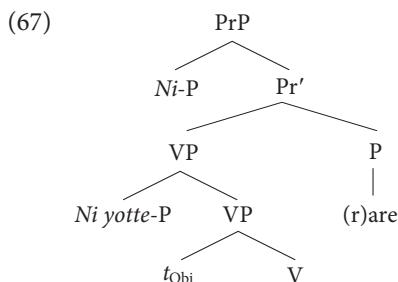
(66)   *Doroboo-ga keikan-ni   konboo-ni yotte nagur-are-ta.*
       thief-NOM   policeman-DAT stick-by   hit-PASS-PST
       'A thief was hit by a policeman with a stick.'

Note that a *ni*-phrase and a *ni yotte*-phrase co-occur in a single clause.[16] This empirical fact is not puzzling at all since the *ni*-phrase is selected as the (external) argument whereas the *ni yotte*-phrase is an adjunct that may be optionally added to *ni* passives.

---

15. Refer to Ishizuka (2012: 123–125) for the exhaustive inventory of the theta-roles that can be assigned to *ni*-phrases.

16. Based on this sentence, Ishizuka (2012) claims that it is meaningless to make a distinction between *ni* and *ni yotte* passives.

What has been discussed regarding Japanese *by*-phrases so far can be summarized with the following tree diagram:[17]

(67)

```
                        PrP
                     ╱       ╲
                 Ni-P         Pr′
                            ╱      ╲
                        VP           P
                     ╱      ╲        │
              Ni yotte-P    VP     (r)are
                          ╱    ╲
                       t_Obj    V
```

The proposed structure can provide a simple and straightforward account of how *ni*-phrases can bear a wide range of theta-roles; since they occupy the canonical external argument position, they can be assigned any theta-role that an external argument can bear. The DP that appears in the *ni yotte*-phrase, on the other hand, is theta-marked by *ni yotte*, and therefore it can bear an Agent/Causer role only.

It is obvious that *ni yotte*-phrases can be deleted since they are adjuncts. It is also entirely possible to assume that *ni*-phrases appear optionally, not only because *by*-phrases are optional in any kinds of passive constructions across languages, but also because subjects, objects, and other syntactic elements can be phonetically unrealized in Japanese. When the *ni*-phrase is deleted, PRO is assumed to be present as the external argument. A positive consequence that follows from this analysis is that *ni*, *ni yotte*, and short passives are subsumed under one kind of passive construction.

4.   The origin of the affectedness constraint in Japanese

We observed in Section 2 that Korean HI and Japanese *ni* passives often exhibit affectedness effects in such a way that their surface subject needs to be an entity influenced as a result of the action denoted by the passive predicate. I suggested in Section 3.2 that the affectedness constraint in Korean HI passives originates from the thematic structure of the passive verbs. It still remains to be explained how this constraint is generated in Japanese *ni* passives. Arguing that *ni* passives are biclausal constructions, just like indirect passives, Kuroda (1979) suggests that the subject in *ni* passives gets an Affectee role from the passive morpheme *-(r)are*, as illustrated below:

---

17. Refer to Ishizuka (2012: 128–130) for additional evidence showing that the *ni*-phrase ranks syntactically higher than the *ni yotte*-phrase.

(68)
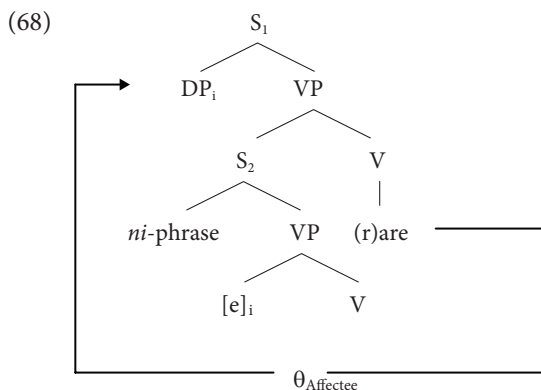
His analysis may be appealing when we consider the following sentence where the affectedness constraint applied to an inanimate subject results in a deviant sentence:

(69) *Tyuui-ga John-ni   haraw-are-ta.
       heed-NOM John-DAT pay-PASS-PST
       'Heed was paid by John.'

However, the following data pose a problem for Kuroda's analysis:

(70) Kodomo-ga Hanako-ni   yob-are-ta.
      child-NOM Hanako-DAT call-PASS-PST
      'The child was called by Hanako.'

(71) Taroo-ga   Hanako-ni   kodomo-o yob-are-ta.
      Taroo-NOM Hanako-DAT child-ACC call-PASS-PST
      'Taro was affected by Hanako's calling his child.'   (Miyagawa 1989: 167)

Notice that the subject in (70) is not 'affected', unlike the subject in (71). If the affectedness effects originate from the passive morpheme, one is hard pressed to explain why the affectedness constraint does not apply to (70). Hence, it is necessary to provide an alternative account of what triggers this semantic constraint in *ni* passives.[18]

As pointed out in Section 2, (69) becomes perfect with the *by*-phrase deleted, and this fact suggests that the presence of the *by*-phrase plays some kind of role in generating affectedness effects. Recall now that the animacy hierarchy in (14) was established on the basis of what Klaiman (1991) calls ontological salience.

---

18. Refer to Park (2016) for discussion of how the affectedness effects are generated in Japanese indirect passives.

Building up on her analysis, I propose the following generalization for Japanese *ni* passives:

(72)   Salience-Based Minimality Condition (SBMC)
       An argument X can move over another argument Y iff one of the following
       conditions is satisfied:
       (i)   X is no less animate than Y;
       (ii) Y has no control over the action exerted on X;
       (iii) X evokes empathy for the speaker.

The term 'salience' is not necessarily synonymous with 'agentivity', 'animacy', or 'controllability' although all these concepts are overlapped to some degree. The conditions suggested in (72) amount to stating that an argument X can move to subject position over another argument Y that is not more salient than X. SBMC is able to give a straightforward account of the contrast between (69) and (70). In (69), the internal argument (*Tyuui*) moves over a more salient entity (*John*) in violation of SBMC, and therefore this sentence is correctly ruled out. (70), on the other hand, complies with SBMC in that both of the arguments are equally salient.
       Let us consider additional data to see how SBMC works:

(73)   *Sono koto-ga   Taroo-ni   wasure-rare-ta.*
       the thing-NOM Taroo-DAT forget-PASS-PST
       'That was forgotten by Taro.'

(74)   *Kodomo-ga kuruma-ni tobas-are-ta.*
       child-NOM   car-DAT   run over-PASS-PST
       'A child was run over by the car.'

(75)   *Hune-ga   kaizoku-ni sizume-rare-ta.*
       ship-NOM pirate-DAT sink-PASS-PST
       'A ship was sunk by the pirates.'

Notice that (73) is similar in pattern to (69) in that the subjects are inanimate nominals and that animate nominals appear in the *ni*-phrases. Kuroda's analysis would predict incorrectly that (73) is deviant because the passive morpheme is expected to assign an Affectee role to the subject under his proposal. The crucial difference between (69) and (73) is that the *by*-phrase in the former bears the role of an Agent who supposedly has control over the activity of 'paying attention' whereas the *by*-phrase in the latter bears the role of an Experiencer who has no control over 'forgetting something'. Hence, (73) satisfies SBMC (i.e., (72-ii)), and the sentence is correctly ruled in. In terms of an animacy hierarchy, (74) and (75) show a mirror image, but neither of them violates SBMC. In (74), the car has no control over 'running over a child' because it is an inanimate object. (75) shows

the same pattern of animacy hierarchy as (69) and (73) since the subject is an in-animate nominal and the *by*-phrase has an animate nominal, but the conditions in (72i-ii) are overridden or irrelevant because the subject in (75) is imbued with the speaker's empathy arising from an atrocious act of brutality.

In conclusion, the affectedness constraint is a by-product that emanates from the competition of salience between the *by*-phrase and the internal argument, and this semantic constraint does not apply to *ni yotte* passives, presumably because *ni yotte*-phrases are adjuncts that are not amenable to SBMC.

5.   Concluding remarks

We have investigated different types of passive constructions in Korean and Japanese with a focus on the syntactic and semantic properties of their *by*-phrases. The *by*-phrases in Korean HI and CI passives have the status of arguments, but they are assigned a theta-role in fundamentally different manners. The *ni*-phrase in Japanese has the status of an argument whereas the *ni yotte*-phrase is a kind of adjunct that expresses an Agent/Causer role. While exhibiting some superficial semantic similarities in passive constructions, the two East Asian languages have different mechanisms that operate behind those similar phenomena. The affected-ness constraint is a consequence that stems from the lexical properties of Korean HI passive verbs whereas it follows from a semantic constraint imposed on move-ment of arguments in Japanese *ni* passives.

Acknowledgments

References

Bowers, J. 1993. The syntax of predication. *Linguistic Inquiry* 24: 591–656.
Bowers, J. 2002. Transitivity. *Linguistic Inquiry* 33: 183–224.
       https://doi.org/10.1162/002438902317406696
Bowers, J. 2010. *Arguments as Relations*. Cambridge MA: The MIT Press.
       https://doi.org/10.7551/mitpress/9780262014311.001.0001
Chomsky, N. 1995. *The Minimalist Program*. Cambridge MA: The MIT Press.

Chomsky, N. 2000. Minimalist inquiries. In *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, R. Martin, D. Michaels & J. Uriagereka (eds.), 89–155. Cambridge MA: The MIT Press.

Chomsky, N. 2001. Derivation by phase. In *Ken Hale: A Life in Language*, M. Kenstowicz (ed.), 1–52. Cambridge MA: The MIT Press.

Collins, C. 2005. A smuggling approach to the passive in English. *Syntax* 8: 81–120. https://doi.org/10.1111/j.1467-9612.2005.00076.x

Dixon, R. M. W. 1979. Ergativity. *Language* 55: 59–138. https://doi.org/10.2307/412519

Dowty, D. 1991. Thematic proto-roles and argument selection. *Language* 67: 547–619. https://doi.org/10.1353/lan.1991.0021

Fukuda, S. 2011. Two *by*-phrases in Japanese passive. In *Japanese/Korean Linguistics* 18, W. McClure & M. den Dikken (eds.), 253–265. Stanford CA: CSLI.

Goro, T. 2006. A minimalist analysis of Japanese passives. In *Minimalist Essays*[Linguistik Aktuell/Linguistics Today 91], C. Boecks (ed.), 233–248. Amsterdam: John Benjamins. https://doi.org/10.1075/la.91.16gor

Hoshi, H. 1994. Theta role assignment, passivization, and excorporation. *Journal of East Asian Linguistics* 3: 147–178. https://doi.org/10.1007/BF01736125

Hoshi, H. 1999. Passives. In *The Handbook of Japanese Linguistics*, N. Tsujimura (ed.), 191–235. Oxford: Blackwell.

Ishizuka, T. 2012. *The Passive in Japanese: A Cartographic Minimalist Approach*[Linguistik Aktuell/Linguistics Today 192]. Amsterdam: John Benjamins. https://doi.org/10.1075/la.192

Jaeggli, O. 1986. Passive. *Linguistic Inquiry* 17: 587–622.

Klaiman, M. H. 1984. The grammar of doing and undergoing in Korean. *Language Research* 20: 331–343.

Klaiman, M. H. 1991. *Grammatical Voice*. Cambridge: CUP.

Kuno, S. 1973. *The Structure of the Japanese Language*. Cambridge MA: The MIT Press.

Kuroda, S. -Y. 1979. On Japanese passives. In *Exploration in Linguistics: Papers in Honor of Kazuko Inoue*, G. Bedell, E. Kobayashi & M. Muraki (eds.), 305–347. Tokyo: Kenkyusha.

Lasnik, H. & Fiengo, R. 1974. Complement object deletion. *Linguistic Inquiry* 5: 535–571.

Miyagawa, S. 1989. *Syntax and Semantics, Vol. 22 (Structure and Case Marking in Japanese)*. San Diego CA: Academic Press.

Park, S. D. 2005. Parameters of Passive Constructions in English and Korean. PhD dissertation, Cornell University.

Park, S. D. 2013. Korean passive constructions without movement from the internal argument position. *The Journal of Linguistic Science* 67: 65–84.

Park, S. D. 2016. Another unified approach to Japanese passives. *The Journal of Linguistic Science* 77: 59–79.

Park, S. D. & Whitman, J. 2003. Direct movement passives in Korean and Japanese. In *Japanese/Korean Linguistics* 12, W. McClure (ed.), 307–321. Stanford CA: CSLI.

Shibatani, M. 1990. *The Languages of Japan*. Cambridge: CUP.

Silverstein, M. 1976. Hierarchies of features and ergativity. In *Grammatical Categories in Australian Languages*, R. M. W. Dixon (ed.), 112–171. Atlantic Highlands NJ: Humanities Press.

Suh, C. -S. 1996. *Kwuke mwunpep* (Korean grammar). Seoul: Hanyang University Press.

Teramura, H. 1982. *Nihongo no shintakusu to imi I (Japanese syntax and meaning I)*. Tokyo: Kuroshio.

Wu, I. 1997. *Wulimal phitong yenkwu* (Research on Korean passives). Seoul: Hankwuk Mwunhwasa.

Yeon, J. 2015. Passives. In *The Handbook of Korean Linguistics*, L. Brown & J. Yeon (eds.), 116–136. Oxford: Wiley Blackwell. https://doi.org/10.1002/9781118371008.ch7

CHAPTER 3

Displaced modification

Picture-noun constructions in Marathi and Japanese

Hideki Kishimoto, Peter Hook and Prashant Pardeshi
Kobe University / Universities of Virginia and Michigan / NINJAL

The picture-noun construction in Marathi has a constituent structure in which the imagee-NP marked with genitive case appears outside the participial complement clause, i.e. it does not appear as a direct argument to the verb in the complement clause. It is shown that Japanese has the same type of picture-noun construction, which is not an instance of the genitive-subject construction derived by nominative-genitive conversion. In the picture-noun construction, the genitive NP, which is structurally related to the picture noun head, is interpreted as the subject of the complement clause. We argue that the imagee NP controls an invisible pronoun residing in the complement clause, and is thus understood as the subject of that clause. We discuss a number of empirical facts regarding the picture-noun complements in Marathi and Japanese that provide support for this analysis.

Keywords: picture noun, participial complement, imagee NP, control, Marathi, Japanese

1.   Introduction

In his seminal work on the syntactic-semantic relationship between the modifying phrase and the noun it modifies in the modified nominal construction in Japanese, Teramura (1969: 71) offers the following examples of the 'picture-noun' construction as an instance of modified nominal construction with an outer relationship.

(1)   a.   [[<*kooeihei-ga*   *senro-no   ue-o   arui-te   i-ru*>] *syasin*]
           Red.Guard-NOM tracks-GEN top-ACC walk-GER be-PRS photo
           'a photo of the Red Guard walking along the train tracks.'
      b.   [[<*arui-te   i-ru*> *kooeihei-no*]   *syasin*]
           walk-GER be-PRS Red.Guard-GEN photo
           'a photo of a Red Guard walking'.

The modified nominal construction of the 'outer relationship' is the construction "in which the underlying sentence from which the modifying phrase is derived does not contain the same noun as the modified noun" (Teramura 1969: 66). In (1), the modifying phrases are indicated by the angle brackets ("<" and ">") and the relevant modified head is *syasin* 'picture'. Teramura notes that head nouns appearing in this type of noun-modifying construction denote 'some kind of physical perception, such as sight, hearing, smelling, etc.' In (1a), the imagee NP is marked with nominative case, and appears in the modifying phrase, but in (1b), the imagee NP is marked in the genitive case, and immediately precedes the image NP (viz. *syasin*).

There is another variant exemplified in (2), not mentioned by Teramura, in which the 'imagee' (viz. *kooeihei*) in the genitive case precedes the modifying phrase.

(2) [[*kooeihei-no*   (*iti-mai-no*)   <*arui-te i-ru*>] *syasin*]
      Red.Guard-GEN (one-CL-GEN) walk-GER be-PRS photo
      'one photo of the Red Guard walking'.

In an analysis of 'picture-noun' constructions in Marathi that bears some similarity to the distinction of "outer" versus "inner" relationships put forth by Teramura (1969), Hook and Pardeshi (2013) focus on functional-semantic aspects of the alternation between the two variants of the construction as these are exemplified in (3).

(3) a. [<*ghāṭā-var ubhyā   as-lel-yā*>   *māṇsā-ʦā phoṭo*] *phār.aʦ*
           ghat-on   standing be-PST.PTCP-OBL man-GEN photo very.EMPH
           khās!
           special
           'The photo of the man standing on the ghat is really great!'
                                               [Hook & Pardeshi (2013: 88), ex. (58)]

     b. [*mājhyā   čhoṭyā   mulā-ʦā* <*khiḍki-t ubhā*
           1SG.GEN.OBL small.OBL child-GEN window-in standing
           as-lel-ā>   *phoṭo*] *pāṭhv-un dilā*
           be-PST.PTCP-M.SG photo   send-GER gave
           'I sent off a photo of my little boy standing in the window.'
                                               [Hook & Pardeshi (2013: 88), ex. (59)]

According to Hook and Pardeshi, the prenominal participial phrase (PPP) is 'matched' when it does not intervene between the imagee and the image, as in (3a).

On the other hand, the PPP is 'mismatched' when it occurs between the imagee and the image, as in (3b).[1]

_____

1. In Marathi, but not in Japanese, the mismatches [or 'displacements'] involve apparently 'misplaced' agreement in gender, number, and case of an adnominal participle with a head noun expressing an image as in (i).

(i) [*gaṇ.pati-ts-ā   nṛty   kar-ṇār-ā*]   *phoṭo*
    Ganpati-GEN-Msg dance do-PRS.PRT-Msg photo.Msg
    'Ganpati's dancing photo …'   <marathi.eenaduindia.com>

From the point of view of semantics, a false modificational relation is created here, viz. *nṛty kar-ṇār-ā phoṭo* 'dancing photo', which is 'semantically aberrant'.

However, instead of a present participial phrase showing gender, number, and case agreement with picture nouns like *phoṭo* 'photo', *čhāyāčitr* 'photograph', *čhabi* 'image', *tasvir* 'picture', *vhiḍio* 'video', etc. as in (i), the embedded clause may take an adverbial complement in *-tānā* '-ing' (glossed as ADV.PRT), which does not show agreement. In example (iic) we see the construction of an imaging predicate that is parallel to the construction that is in general use in expressions of perception (iia) and (iib).

(ii) a. *khiḍakī-tun   mi   ti-lā   [ye-tānā]   pāhi.la*
        window-through I.ERG her-ACC come-ADV.PRT saw
        'Through the window I saw her approaching.'
                                        <books.google.com/books?id=k2dhAwAAQBAJ>
    b. *tyān-nā   [nṛty   kar-tānā]   dākhav-la   ge.la*
        them-ACC dance do-ADV.PRT show-PASS.PRT went
        'They were shown dancing.'   <meeashich.blogspot.com>
    c. *ekā bhājap kāry.kartyā-ne [polisān-nā   mār.hāṇ kar-tānā]   vhiḍio kāḍh.lā*
        one B.J.P. worker-ERG   police-ACC assault do-ADV.PRT video took
        'A BJP worker videoed police assaulting [the public].'
                                        <dakshsatara.com/mla-police>

As complex predicates like *vhiḍio kāḍh-ṇe* 'to video' and *phōṭō ghe-ṇe* 'to photograph' contain a noun expressing an image, their imagees are usually expressed with a genitive rather than with an accusative postposition.

(iii)[*tyā-tsā   phōṭō kāḍh-tānā*]   *tyā-ne mādzhā phōṭō kāḍh.lā*
     his-GEN photo take-ADV.PRT he-ERG my.GEN photo took
     'He photographed me photographing him.'
                                        <www.bankapure.com/2014/01/Hatkeshwar.htm>

The adverbial affix *-tānā/-tānnā* may be extended with the genitive postposition.

(iv) [*tumhi bol-at   as-tānnā*]-tsā   *tum.tsā vhiḍio ghet.lā as-tā*
      you   speak-ing be-ADV.PRT-GEN your   video taken be-PST.SBJNCTV
     'If you had taken a speaking video of yourself …' < swingsofmind.blogspot.com>

If present participials are replaced with adverbial participles in *-tānā* '-ing', the false noun-modifying relations do not obtain, and hence the problem of mismatches evaporates. However, while

In the picture-noun construction in (2) and (3), the imagee NP marked with the genitive case appears outside the participial complement, but is understood as the subject of the participial predicate. Japanese has the same type of picture-noun construction. One attested example is given below.

(4)   [<*kawaii isyoo-de odot-te   i-ru> (iti-mai-no) kodomo-no*] *syasin*]
     cute   dress-in dance-GER be-PRS one-CL-GEN child-GEN   photo
    'one photo of the child dancing wearing a cute dress'.

<div align="right"><http://machi1.seesaa.net/category/18361826-1.html>
[*(iti-mai-no)* added to the attested example by the authors].[2]</div>

Just like in (2) and (3), in (4), the imagee NP is marked with genitive case, and it is understood to be the subject of the predicative predicate (in the angle brackets).[3] As we will discuss at length below, on the basis of the surface forms alone, the picture-noun construction in Japanese is often not distinguishable from the genitive-subject construction derived via so-called 'nominative-genitive' conversion, if the genitive imagee NP occurs in front of the predicate complement. Nevertheless, we argue that the picture-noun construction possesses structural properties that allow us to distinguish it from the genitive-subject construction. It is shown that the picture-noun construction has a reduced complement clause (comprising an inaudible pronoun PRO), but the genitive-subject construction has a full complement clause in which the subject is included.

In this paper, we argue that the picture-noun constructions in Marathi and Japanese have constituent structures where the imagee NP (selected by the picture noun) controls PRO in the complement clause. This analysis brings to light the fact that the picture-noun constructions in (2), (3) and (4) have a special structural property, in that the reduced complement clause establishes a

---

resolving the issue of present participials (*-ṇār-*), this replacement strategy cannot be extended to past participials (*- lel-*).

(v)   *yān-nī* [*lahān mulā-tse hātā-t   bhagavā dhvaj ghet-lele*]   *čhāyāčitr   kāḍh.le*
    he-ERG   small boy-GEN hand-in orange   banner take-PST.PRT photograph took
    'He photographed a small boy clutching an orange banner in his hand.'

In (v) the past participle *ghet-lele* 'taken' agrees in number gender and case with the head noun *čhāyāčitr* 'photograph' and not with the word for 'boy' which it actually modifies. For past tense modified nominal constructions, then, mismatches remain a problem to be solved.

2. Example (4) is taken from the internet, but a classifier is added for the purpose of ensuring that it counts as a type of picture-noun construction.

3. Neither topic phrases nor sentence-final particles can be accommodated in the complement clause.

subject-predicate relation with the imagee NP via control. From the viewpoint of syntactic structures, the picture-noun constructions can be seen as possessing an outer relationship (rather than an inner relationship) to the modifying head (in the sense of Teramura (1969, 1975–1978)). It is also shown that in Japanese, the picture-noun constructions under investigation select an imagee NP plus a participial control complement, but can also have variants where a full complement clause is embedded.

The discussion proceeds as follows. In Section 2, we will discuss the basic properties of the picture-noun constructions, and then advance our proposal that the constructions under investigation select an imagee NP plus a control complement clause. We will provide an array of empirical evidence in support of the proposal. Section 3 offers the Japanese data showing that genitive subjects in the picture-noun constructions, unlike genitive subjects derived by nominative-genitive conversion, are located outside the complement clauses. Section 4 shows that sensorial nouns (other than picture nouns) may fit into the picture-noun constructions, as Teramura (1969: 70–71) suggests. Section 5 briefly discusses some theoretical implications derived from our proposal. A conclusion is presented in Section 6.

2.   Marathi and Japanese picture-noun constructions

2.1   The basic properties

The picture-noun construction in Marathi contains a prenominal participial phrase (PPP)—present or past participial—which modifies the picture noun.[4] In (5a), a participial phrase intervenes between the imagee NP marked with genitive case (viz. the child) and the image (viz. the photo). The picture-noun construction in (5a) has a counterpart in which the image 'photo' and the imagee are adjacent, as shown in (5b).

(5)   a.   [*mājhyā čhoṭyā   mulā-tsā <khiḍki-t   ubhā   as-lel-ā>*
           1SG.GEN small.OBL child-GEN   window-in standing be-PST.PTCP-M.SG
           phoṭo] *pāṭhv-un dilā*
           photo   send-GER gave
           'I sent off a photo of my little boy standing in the window.'
                <majhekavadase.blogspot)> [Hook & Pardeshi (2013: 88), ex (59)]

---

4. Participial forms are used in not only the picture-noun constructions but also relative clauses. In both types of constructions, the participial predicate agrees with its modified head noun.

b.   [<*ghāṭā-var ubhyā   as-lel-yā*>   *māṇsā-ťsā phoṭo*] *phār.aťs*
     ghat-on   standing be-PST.PTCP-OBL man-GEN photo very.EMPH
khās!
special
'The photo of the man standing on the ghat is really great!'
               <www.misalpav.com> [Hook & Pardeshi (2013: 88), ex (58)]

In Marathi picture-noun constructions, there are factors governing the preferences for the order of the imagee NPs and PPPs, as discussed by Hook and Pardeshi (2013). To be concrete, observe, first of all, that 'personal pronoun' imagee NPs (e.g. *āplā* 'self's' in (6a)) almost always and 'proper noun' imagee NPs (e.g. *modi.n-ťsā* 'Modi's' in (6b)) often precede PPPs, giving rise to the 'imagee NP + PPP' order.

(6) a.   [*āplā* <*lāmb kes as-lel-ā*>   *phoṭo*] *ti-ne   aploḍ ke-lā*
           self's   long hair be-PST.PTCP-M.SG photo she-ERG upload do-PST
'She uploaded a photo of her(self) having long hair.'
               <divyamarathi.bhaskar.com> [Hook & Pardeshi (2013: 87), ex. (52)]
     b.   [*modi.n-ťsā sādhe-paṇā dākhav-ṇār.ā   … < dzhāḍu mār-at*
           Modi-GEN simple-ness show-PRS.PTCP … broom   wield-ing
as-lel-ā>   phoṭo]
be-PST.PTCP photo
'… a photo of Modi wielding a broom, showing (his) simplicity, …'.
               <aarsaa.blogspot> [Hook & Pardeshi (2013: 88), ex. (54)]

Secondly, common nouns denoting humans (5a, b) and nouns referring to gods (7a,b) sometimes precede their PPPs, and sometimes do not.

(7) a.   [*gaṇ.pati-či* <*bas-lel-i   pakhvādz vādz.av-ṇār-i*>   *murti*] *āhe*
           Ganesh-GEN sit-PST.PTCP-F.SG drum   play-PRS.PTCP-F.SG image is
'There is a seated drumming image of Ganesha …'.
               <www.maayboli.com/node/622> [Hook & Pardeshi (2013: 87), ex. (48)]
     b.   [<*padmāsanā-madhe bas-lel-yā>   gaṇ.pati*]*-či murti*] *baryā.ts*
           padmasan-in   sit-PST.PRT-OBL Ganesh-GEN image many
ṭhikāṇi pāhāy-lā miḷ.te
places   see-INF available
'Many places you can see an image of Ganesha sitting in the lotus position.'
               <mr.wikipedia.org/wiki> [Hook & Pardeshi (2013: 87), ex. (50)]

When imagees are human nouns, the degree of specificity of the imagee NP also plays a role. In (8a), the imagee NP is generic and follows the PPP while, in (8b), the imagee NP is identified as the photographer's own child and precedes the PPP.

(8) a. [<*ghāṭā-var ubhyā   as-lel-yā*>   *mānsā-ͭsa phoṭo*] *phār.aͭs*
        ghat-on   standing be-PST.PTCP-OBL man-GEN photo very.EMPH
        khās!
        special
        'The photo of the man standing on the ghat is really great!'
                    <www.misalpav.com> [Hook & Pardeshi (2013: 88), ex. (58)]

   b. [*mājhyā čhoṭyā   mulā-ͭsā <khiḍi-t   ubhā   as-lel-ā*>
        1SG.GEN small.OBL child-GEN   window-in standing be-PST.PRT-M.SG
        phoṭo] *pāṭhv-un dilā*
        photo   send-GER gave
        'I sent off a photo of my little boy standing in the window.'
                    <majhekavadase.blogspot> [Hook & Pardeshi (2013: 88), ex. (59)]

Thus, Hook and Pardeshi (2013: 87) conjecture that the referential properties of the imagee NP play an important role in determining the preferred order of the imagee and the PPP. Hook and Koul (2014) demonstrate that similar tendencies are observed in Hindi-Urdu and Kashmiri picture-noun constructions.

In the Marathi picture-noun constructions, the imagee NP appears outside the participial complement (as indicated by the angle brackets), although the imagee NP and the participial phrase are adjacent. This can be seen from the fact that the imagee NP is marked with genitive case rather than verbal case, and also from the fact that the imagee NP can be placed in a position non-adjacent to the participial phrase. Furthermore, in the picture-noun constructions, a numeral or adjectival element modifying the picture noun can appear between them, as illustrated in (9). Note that the numeral in (9a), (9b) and (9c) refers to the number of the head noun.

(9) a. …[*mādzhā* **ek** <*rikšā-t   bas-lel-ā*>   *phoṭo*]   *kāḍh*
        1SG.GEN one   rikshaw-in sit-PST.PTCP-M.SG photo.M.SG take.IMP
        mhaṇā-l-o
        say-PST-M.SG
        '…I said 'Take one photo of me sitting in the rikshaw.'
                                        <www.misalpav.com/node/23339>

   b. …[*mādzhe*   **don-tin** <*rikšā-t   bas-lel-e*>   *phoṭo*]
        1SG.GEN.MPL two-three   rikshaw-in sit-PST.PTCP-M.PL photo.M.PL
        kāḍh   mhaṇā-l-o
        take.IMP say-PST-M.SG
        '…I said 'Take two or three photos of me sitting in the rikshaw.'

   c. [<*khiḍi-t   ubhā   as-lel-e*>   **don** *mājh-yā   čhoṭ-yā*
        window-in standing be-PST.PTCP-M.PL two   1SG.GEN.OBL small-OBL
        mulā-ͭs-e   phoṭo]
        child-GEN-M.PL photo.M.PL
        'two photos of my little boy standing in the window.'

d. [*mahārādzān-ts-ā* **purṇ.unči-ts-ā**   <*dhyānasth   bas-lel-ā*>
   king-GEN-M.SG full.height-GEN.M.SG in.meditation sit-PST.PTCP-M.SG
phoṭo]   *lāv-lel-ā*   *hot-ā*
photo.M.SG hang-PST.PTCP.M.SG be.PST-M.SG
'A full height photo of the king sitting in meditation was hung.'
                   <www.manogat.com/diwali/2009/&/27267.html?&1>

The examples in (9) illustrate that the imagee can either precede or follow the participial phrase, and can have an expression modifying the picture noun head between the imagee and the participial phrase. Note that a modifier needs to be located in the projection of the head it modifies. Thus, if the imagee and the participial predicate are both included in a complement clause, no expression modifying the picture-noun head is allowed to appear between them. Since a modifier of the picture-noun head can be inserted between the imagee and the participial phrase, as in (9), we can state that there is no clausal projection that includes the two elements.

It is important to bear in mind that in the variant of the picture-noun construction where the imagee follows the participial phrase, the relation between the two is not mediated via relativization, i.e. the imagee NP is not a relative-clause head. If it involved relativization, the relative head could not be separated from the relative clause that modifies it, nor could it be fronted across the relative clause. These facts are illustrated in (10).

(10) a. [<*malā   kāl   bheṭ-lel-yā*>   (**don*) *bāi-ts-e   phoṭo*]
     1SG.DAT yesterday meet-PST.PTCP-OBL   two lady-GEN-M.PL photos
     'two photos of that lady whom I met yesterday.'

    b. [<*malā   kāl   bheṭ-lel-yā*>   *bāi-ts-e   pākiṭ*]
     1SG.DAT yesterday meet-PST.PTCP-OBL lady-GEN-M.SG wallet.N.SG
     'the wallet of the lady whom I met yesterday.'

    c. *[*bāi-ts-e   <malā   kāl   bheṭ-lel-yā*>   *pākiṭ*]
     lady-GEN-N.SG   1SG.DAT yesterday meet-PST.PTCP-OBL wallet.N.SG
     'the wallet of the lady whom I met yesterday'.

Example (10a) is unacceptable if a numeral specifying the number of the picture-noun head intervenes between the relative clause and its relative head, which shows that the relative clause must be included (or adjoined to) the phrase projected from the relative head. A comparison of (10b) and (10c) shows that the relative head cannot be placed to the left of the relative clause.

We claim that Japanese has the same type of picture-noun construction that is found in Marathi, although its existence has hitherto gone unnoticed. In Japanese, the type of complement clause appearing in the picture-noun construction cannot be distinguished by looking at their surface forms. Nevertheless, we suggest that

the examples in (11) should be the Japanese counterparts of the Marathi picture-noun constructions with participial complements.

(11) a. [<*nikoniko-to warat-te   i-ru/warat-ta>   (ni-mai-no)   kodomo-no*
              smile   laugh-GER be-PRS/laugh-PST two-CL-GEN child-GEN
         syasin]
         photo
         '(two) photos of the child smiling with a wide grin.'

      b. [*kodomo-no (ni-mai-no) <nikoniko-to warat-te   i-ru/warat-ta>*
          child-GEN two-CL-GEN smile   laugh-GER be-PRS/laugh-PST
         syasin]
         photo
         '(two) photos of the child smiling with a wide grin.'

In both cases in (11), the genitive-marked imagee NP, which is selected by the picture noun, is interpreted as the subject of the embedded predicate. The embedded predicate can take the V-*te iru* or V-*ta* form as long as it describes the imagee of the picture involved. Although Japanese does not distinguish participial from tensed forms morphologically, we can reasonably hypothesize here that the V-*te iru* and V-*ta* forms are participial, because V-*ta* (*warat-ta*) does not refer to a past event and V-*te iru* (*warat-te iru*) does not refer to an ongoing activity, despite their verb forms (cf. Kinsui 1994, 2000). Given these interpretive facts, it is plausible to say that V-*te iru* and V-*ta*, referring to an image in the picture-noun constructions, represent participial predicates, with no tense specification.[5]

––––––––––––––––

5. The past progressive -*te ita* form (*wara-te ita* 'was laughing') is not possible here, because this verb form is necessarily taken to describe a past (progressive) state. The image in the picture-noun construction represents some kind of present state, and thus the -*te ita* form of predicate does not appear in the picture noun construction. In Japanese, it appears that the past participial predicate can appear in certain types of (reduced) relative clauses, exemplified in (i) (Kinsui 1994).

(i) a. *magat-ta miti*
         bend-PST road
         'a winding road.'

     b. *iki-ta   sakana*
         live-PST fish
         'living fish.'

In (i), *magat-ta* and *iki-ta* refer to a present state, rather than a past event, suggesting that the -*ta* form here serves as a kind of participial predicate. This shows that the use of verbs as participial predicates is not limited to the picture noun construction. Observe, in this connection, that when a nominative subject appears in the complement clause, -*ta* form is not acceptable, as in (ii).

Note that in (11) a numeral quantifier can intervene between the predicate phrase and the imagee NP, showing that a clausal constituent is not present that includes the two elements. The examples in (12) illustrate that relative clauses possess properties different from those of the picture-noun constructions.

(12) a. [<*watasi-ga at-ta*>   (*iti-mai-no)* *ano hito-no   syasin*]
          1SG-NOM meet-PST   one-CL-GEN that man-GEN photo
          'one photo of that man whom I met.'
     b. [<*watasi-ga kinoo   at-ta*>   *ano hito-no   ie*]
          1SG-NOM yesterday meet-PST that man-GEN home
          'the home of that man who I met yesterday'
     c. *[*ano   hito-no   <watasi-ga kinoo   at-ta*>   *ie*]
          that   man-GEN 1SG.-NOM yesterday meet-PST home
          'the home of that man who I met yesterday'.

In Japanese, just like Marathi, a numeral quantifier modifying the picture noun cannot intervene between the relative clause and the relative head, as shown in (12a), nor is it possible for the head noun to precede the relative clause, as in (12c), which is allowed in the case of the picture-noun construction. Thus, the facts noted in (11) suggest that Japanese picture-noun constructions are parallel to Marathi picture-noun constructions.

Overall, the acceptability of the picture-noun constructions in Marathi and Japanese, where an expression modifying the picture-noun head appears between the imagee NP and the complement predicate phrase in (9) and (11), coupled with the unacceptability of (10c) and (12c), illustrates that no clausal constituent exists that includes both the imagee and the predicate phrase. The Japanese facts in (11) and (12) also show that the Japanese picture-noun constructions cannot be treated on a par with the genitive-subject construction derived via nominative-genitive conversion. In the Japanese picture-noun constructions, the complement constituent (excluding the subject) can be thought of as participial, even though Japanese does not have overt participial morphology. Since the picture noun is not a relative-clause head, it is identified as having an outer relationship in the sense of Teramura (1969, 1975–1978).

(ii) [*Ken-ga*   {?*warat-ta/warat-te   i-ru*}] *syasin*
       Ken-NOM {laugh-PST/laugh-GER be-PRS} photo
       'a photo of Ken's laughing.'

The semantic deviance of (ii) with the past form verb *warat-ta* can be attributed to the verb's describing a past event, but not a current state. In contrast, *warat-te iru* is possible. The *-te iru* form can refer to the present moment of an ongoing activity which spans over a certain length of time. By extension, *warat-te iru* in (ii) can be taken to refer to an image (as a snapshot of an activity), although the image, strictly speaking, does not indicate that an activity is actually going on.

2.2   The structure

As discussed previously, the imagee NP of the picture-noun construction, which is marked with genitive case, appears outside the predicative complement, but is understood as the subject of the participial predicate (in both Marathi and Japanese). One important theoretical question is how the imagee is identified as the subject of the complement predicate phrase (the PPP in Marathi and the *V-te iru/V-ta* in Japanese). We suggest that Marathi and Japanese picture-noun constructions can be identified as possessing structures where a subject-predicate relation between the imagee and the participial predicate is established via control, and that the picture-noun constructions should have either of the two constituent structures in (13).

(13)   a.   [Imagee-GEN < $_{\text{ParticipialP}}$ PRO V-PPP/V-*te-iru*/V-*ta*>] Pict-N
        b.   [< $_{\text{ParticipialP}}$ PRO V-PPP/V-*te-iru*/V-*ta* >$_i$ Imagee-GEN t_i] Pict-N

We suggest that the imagee NP controls an inaudible pronoun (PRO) residing in the complement clause, and is thus understood as the subject of the participial predicate. Since the PPP is a clausal constituent comprising both subject (PRO) and the participial predicate, it is postulated here that the participial phrase has a structure where ParticipialP selects VP as its complement, as in [$_{\text{ParticipialP}}$ PRO [$_{\text{VP}}$ V]].[6] We assume that the inaudible pronoun is (controlled) PRO, because its antecedent must be the imagee NP, i.e. the subject of the embedded predicate must be the imagee NP. Note that if the inaudible pronoun is *pro* (i.e. an inaudible counterpart of an ordinary pronoun), the referent of this pronoun does not necessarily have to be the same individual as the referent of the imagee NP.[7]

---

6. Matsumoto, Comrie and Sells (2017) term what Hook and Pardeshi (2013) refer to as "prenominal participial phrases" (PPPs) as "general noun modifying clause constructions (GNMCCs)". Linguists differ in the analysis of such modifying expressions: Some identify them as clauses (Matsumoto, Comrie & Sells 2017), while others analyze them as nominalized entities which lack some crucial properties of both full clauses and matrix sentences (cf. Shibatani 2009; see Whitman (2013) for yet another view). For Hook and Pardeshi (2017), however, a complement included in such a construction forms a constituent less than a full clause (and hence, they it call a 'phrase'). Note that in the proposed analysis in this paper, the complement of the picture-noun construction constitutes not a full clause comprising CP like a main clause, but a smaller, and yet clausal, constituent that includes the subject (PRO) and a (participial) predicate projecting to ParticipialP.

7. When the subject in the complement clause is realized as reflexive *zibun* 'self', an asymmetry is observed with regard to the bindability of the reflexive.

(i)   a.   *[<*zibun-ga warat-te   i-ru*>   *Ken-no   syasin*]
            self-NOM laugh-GER be-PRS Ken-GEN photo
            'Ken's photo of self's laughing.'

Under the present proposal couched in the generative framework, we can state that the imagee NP counts as a specifier to the picture noun head and the participial clause is a complement. Since both Marathi and Japanese are languages with SOV word order, (13a) can be thought of as representing an unmarked specifier-complement order, and as having an obligatory control construal where the controller (i.e. the imagee) c-commands PRO.[8,9] This in turn suggests that the configuration in (13b) be created via movement of the complement clause across the imagee NP. Here, a switch in the word order of the imagee NP and the complement predicate clause is in principle allowed, because they are separate constituents appearing inside the picture noun. This fact illustrates that obligatorily controlled PRO can be moved to a position where it is not c-commanded by its controller (Note that this is also true of English, for a control sentence like *To come see you, I promise* (< *I promise to come see you*) is well-formed (cf. Jacobson 1992).

One piece of evidence that the predicative complement in the picture-noun construction includes an inaudible pronoun PRO may be adduced from the facts of depictive predicates. Both Marathi and Japanese have subject-oriented depictive predicates, and they can be embedded in the picture-noun constructions, as shown in (14).

(14)   a.   [*mulā-ʦ-ā*   (*ek*)   <*anvāṇi.pāyā-ne dhāv-at   as-lel-ā*>   *phoṭo*]
           boy-GEN-M.SG (one)   barefoot-with   run-DUR be-PST.PTCP-M.s photo
           '(one) photo of the child running barefoot.'

   b.   [*Ken-no   <zibun-ga warat-te   i-ru>   syasin*]
        Ken-GEN   self-NOM laugh-GER be-PRS photo
        'a photo of Ken's laughing.'

This fact suggests that the NP appearing to the immediate left of the picture noun head is not located in a position high enough to serve as the binder of *zibun*.

8. It is important to note that the idea of 'marked' and 'unmarked' order advanced in the present paper is not the same as the notion of 'matched' and 'mismatched' proposed by Hook and Pardeshi (2013), couched in a typological framework which does not assume a syntactic operation of movement. The latter distinction is made based on the surface adjacency, but not on the derivational relationship, and thus completely differs from the proposal here. The analysis proposed here is due to the first author.

9. Many different theories of control are available in the literature (see Landau 2013). Among them, in the movement theory of control, control construal is claimed to be formed via A-movement (e.g. Hornstein 1999; Boeckx, Hornstein & Nunes 2010). If this theory is applied to (13a), the control relation is established via movement of the imagee NP from within the complement clause to the specifier position of the picture noun. In any case, the important point is that in (13a), where the complement clause functions like an infinitive, PRO is controlled by the imagee NP located in the projection of the picture noun.

b. [<*anvāṇi.pāyā-ne dhāv-at as-lel-yā*> (*ek*) *mulā-ts-ā*
   barefoot-with run-DUR be-PST.PTCP-M.SG (one) boy-GEN-M.SG
   phoṭo]
   photo
   '(one) photo of the child running barefoot.'

c. [*kodomo-no (iti-mai-no)* <*hadasi-de hasit-te i-ru*> *syasin*]
   child-GEN (one-CL-GEN) barefoot-with run-GER be-PRS photo
   '(one) photo of the child running barefoot.'

d. [<*hadasi-de hasit-te i-ru*> (*iti-mai-no*) *kodomo-no syasin*]
   barefoot-with run-GER be-PRS (one-CL-GEN) child-GEN photo
   '(one) photo of the child running barefoot.'

Semantically, the depictive predicates *anvāṇi.pāyā-ne* 'barefoot' (Marathi) and *hadasi-de* 'barefoot' (Japanese) describe the state of the imagees, but are included in the predicative complements. The data in (15) show that these depictive predicates cannot be placed outside the complement clauses.

(15) a. * [*mulā-ts-ā anvāṇi.pāyā-ne ek* <*dhāv-at as-lel-ā*> *phoṭo*]
       boy-GEN-M.SG barefoot-with one run-DUR be-PST.PTCP-M.SG photo
       '(one) photo of the child running barefoot.'

b. * [<*dhāv-at as-lel-yā*> *anvāṇi.pāyā-ne mulā-ts-ā phoṭo*]
       run-DUR be-PST.PTCP-M.SG barefoot-with boy-GEN-M.SG photo
       '(one) photo of the child running barefoot.'

c. * [*kodomo-no hadasi-de iti-mai-no* <*hasit-te i-ru*> *syasin*]
       child-GEN barefoot-with one-CL-GEN run-GER be-PRS photo
       'the photo of the child running barefoot.'

d. * [<*hasit-te i-ru*> *hadasi-de kodomo-no syasin*]
       run-GER be-PRS barefoot-with child-GEN photo
       'the photo of the child running barefoot.'

The examples in (15a) and (15c) are ruled out on the grounds that the numeral expressions *ek* 'one' (Marathi) and *iti-mai-no* 'one' (Japanese) are identified as occurring outside the complement clauses. On the other hand, the examples in (16), where the same numeral expressions are instead omitted or placed to the right of the depictive predicate, are acceptable.

(16) a. [*mulā-ts-ā* (*ek*) <*anvāṇi.pāyā-ne dhāv-at as-lel-ā*> *phoṭo*]
       boy-GEN-M.SG (one) barefoot-with run-DUR be-PST.PTCP-M.SG photo
       '(one) photo of the child running barefoot.'

b. [*kodomo-no (iti-mai-no)* <*hadasi-de hasit-te i-ru*> *syasin*]
       child-GEN one-CL-GEN barefoot-with run-GER be-PRS photo
       'the photo of the child running barefoot.'

The reason the picture-noun constructions in (16) are acceptable is simply that the depictive predicates can be taken to appear in the complement clauses.

In essence, in the picture-noun constructions at issue, while the depictive predicates appear inside the complement clauses, the imagee NPs are located outside them, as illustrated in (17).

(17)   a.   [Imagee-GEN < DepictP V>] Pict-N
     b.   [< DepictP V> Imagee-GEN] Pict-N

It is commonly assumed (e.g. Carnie 2013) that adjuncts are adjoined to the projection in which their modifying target is located. Given this premise, it is reasonable to conclude that the 'subject-predicate' relation between the depictive predicates and the imagee NPs in the picture-noun constructions should be established within the complement clauses. If so, we can state that the predicative complements include an inaudible pronoun PRO of which depictive predicates can be predicated.

(18)   a.   [Imagee-GEN < PRO DepictP V>] Pict-N
     b.   [<PRO DepictP V> Imagee-GEN] Pict-N

The fact that subject-oriented depictive predicates can appear in the complement clauses of the picture-noun constructions provides evidence in support of the view that the imagee NPs located outside the complement clauses are understood as the subjects of the embedded predicates by virtue of establishing a control relation between the phonetically unrealized pronoun PRO and the imagee NP.

3.   Genitive subjects in Japanese

The existence of picture-noun constructions where PRO in the complement clause is controlled by an imagee NP from outside is not easy to confirm in Japanese, especially, because the language has the so-called 'genitive-subject' construction whose subject is marked with genitive case in the complement clause, which, at first sight, looks similar to the picture-noun construction under investigation. These two constructions display distinct behaviors in a number of respects, however. In this section, we will provide some data indicating that the genitive subjects in the picture-noun construction are located outside the complement clauses, while genitive subjects derived by nominative-genitive conversion stay within their complement clauses.

3.1   Nominative-genitive conversion

The genitive-marked subject in the genitive-subject construction can be assumed to emerge by undergoing case conversion, referred to here as 'nominative-genitive' conversion (see Harada 1971; Watanabe 1996; Hiraiwa 2001, and others). This case-marking change operation is applicable when nominative phrases—most typically, subjects—are embedded in a relative or a noun-complement clause.

(19)   a.   [*yuuzin-ga/-no   tot-ta*] *syasin*
               friend-NOM/-GEN take-PST photo
               'the photo which my friend took'.
                              <http://npcmj.ninjal.ac.jp/interfaces> [modified by the authors]

       b.   [*dai-zisin-ga/-no   oki-ru*]   *kanousei*
               big-earthquake-NOM/-GEN happen-PRS possibility
               'the possibility that a big earthquake will happen.'
                              <http://npcmj.ninjal.ac.jp/interfaces> [modified by the authors]

Arguably, in the genitive-subject construction, the genitive-marked subject (of the embedded predicate) appears within the complement clause. (Note that the relative-head comprising the genitive subject could be a picture noun, as in (19a).)

The picture-noun construction in (20) has the same surface form as the genitive-subject construction in (19a), in that the subject in the genitive case occurs in front of the embedded predicate clause.

(20)   [*kodomo-no (iti-mai-no)   <warat-te   i-ru>*] *syasin*
          child-GEN   (one-CL-GEN)   laugh-GER be-PRS photo
          'the photo of the child's laughing'.
                              <http://npcmj.ninjal.ac.jp/interfaces> [modified by the authors]

The imagee NP in (20) and the genitive-marked subject in (19a) (derived via the nominative-genitive (*ga-no*) conversion) can be assumed to occupy distinct structural positions, as schematically illustrated in (21).

(21)   a.   [<Genitive/Nominative Subject … V-*te iru*>] Pict-N   (see (19a))
       b.   [Genitive-imagee NP < PRO …. V-*te iru*>] Pict-N   (see (20))

The difference in the constituent position of the genitive/nominative subject and the imagee NP can be checked by considering whether a modifier of the head noun can be placed after them.

Observe first that in the relative clauses in (22), expressions modifying the head noun (like the demonstrative *sono* 'that') can be placed before, but not after, the subject of the embedded predicate, and can also be placed to the immediate left of the picture noun.

(22) a. [*(sono)* [*Ken-ga*   (**sono*) *mot-te*   *i-ru*]   *(sono) syasin*]
          (that)   Ken-NOM (that)   hold-GER be-PRS (that) photo
          '(that) photo which Ken is holding.'
      b. [*(sono) Ken-no   (*sono) mot-te   i-ru*]   *(sono) syasin*]
          (that) Ken-GEN (that)   hold-GER be-PRS (that) photo
          '(that) photo which Ken is holding.'

The distribution of the demonstrative *sono* is the same regardless of whether the subject in the relative clause is marked with nominative or genitive case. Secondly, an adverbial like *kinoo* 'yesterday' residing in a relative clause can appear on either side of the genitive-marked subject.

(23) a. [*John-no   (kinoo)   unten-si-ta*]   *kuruma*
          John-GEN (yesterday) driving-do-PST car
          'the car which John drove (yesterday).'
      b. [*(kinoo)   John-no   unten-si-ta*]   *kuruma*
          (yesterday) John-GEN driving-do-PST car
          'the car which John drove (yesterday).'

These facts are naturally expected if the genitive subject is located inside the relative clause. Crucially, the demonstrative *sono* 'that' modifying the relative-clause head needs to appear in the projection projected from the head, but not inside the relative clause. Thus, the demonstrative *sono* cannot appear to the right of the genitive subject in the relative clause in (22a). This fact shows that the genitive subject derived by nominative-genitive conversion does not reside in the head-nominal domain, but is located inside the complement clause.

The picture-noun construction behaves differently from the genitive-subject construction with regard to the placement of the demonstrative *sono* 'that'. As shown in (24), the picture-noun construction does allow *sono* to either precede or follow the genitive imagee NP.[10]

---

10. One reviewer suggests the possibility that *sono* can be placed in an embedded clause, based on the acceptability of (i).

(i) *Ken-ga$_i$*   [*sono* ϕ_i *mot-te*   *i-ru*   *syasin*]-*o*   *moyasi-ta*.
     Ken-NOM that   hold-GER be-PRS photo-ACC burn-PST
     'Ken burned that photo which he holds.'

Note that *sono* in (i) modifies *syasin*. The question is whether *sono* is located in the modifying relative clause or in the nominal projection of the relative head. The following example suggests that it does not appear inside the embedded clause.

(24) a. [*kodomo-no (sono) <warat-te   i-ru> syasin*]
        child-GEN   (that)   laugh-GER be-PRS photo
        '(that) photo of the child's laughing'.
                  (http://npcmj.ninjal.ac.jp/interfaces) [modified by the authors]
   b. [*(sono) Ken-no   <warat-te   i-ru> syasin*]
        (that) Ken-GEN   laugh-GER be-PRS photo
        '(that) photo of Ken's laughing'.

The same distribution is observed for genitive possessors. When a genitive possess-or argument is added to a noun phrase, a demonstrative associated with the noun phrase can either precede or follow the genitive possessor, as indicated in (25).

(25) a. [*Ken-no   (sono) hon*]
        Ken-GEN (that) book
        '(that) book of Ken's'.
   b. [*(sono) Ken-no   hon*]
        (that) Ken-GEN book
        '(that) book of Ken's'.

A comparison of (24) and (25) shows that the imagee NP in the picture-noun construction must be located in the head-nominal domain, i.e. it resides outside the complement clause.

    Furthermore, the picture-noun construction is distinguished from the gen-itive-subject construction in regard to the applicability of the so-called 'transi-tivity' restriction (Harada 1971; Watanabe 1996)—a syntactic constraint barring

---

(ii) *Ken-ga$_i$ (isoide/*sakasama-ni)   [sono ϕ$_i$ mot-te   i-ru   syasin]-o   moyasi-ta.*
    Ken-NOM in.a.hurry/upside.down that   hold-GER be-PRS photo-ACC burn-PST
    'Ken burned (in a hurry) the photo which he holds (upside down).'

As seen in (ii), the adverbial *sakasama-ni* 'upside down' modifying the embedded verb, as op-posed to the adverbial *isoide* 'in a hurry' modifying the matrix predicate, is not allowed to pre-cede *sono*. The fact suggests that *sono* appears outside the embedded clause in (i). Note that *sono* does not pattern with an adverbial modifying the embedded predicate, as seen in (iii).

(iii) a. [*Ken-no < (nessin-ni) hon-o   (nessin-ni) yon-de   i-ru>*] *syasin*
       Ken-GEN (eagerly)   book-ACC (eagerly)   read-GER be-PRS photo
       'photos of Ken's reading books (eagerly).'
   b. [*Ken-no   (sono) <hon-o   (*sono) yon-de   i-ru>*] *syasin*
       Ken-GEN (that)   book-ACC (that)   read-GER be-PRS photo
       '(that) photos of Ken's reading books.'

(iiib) shows that *sono*, unlike *nessin-ni*, cannot be placed to the right of the object *hon-o*, because in this case the possibility that *sono* counts as a modifier to the picture noun is excluded. This fact also suggests that *sono* cannot appear inside the complement clause.

nominative-genitive conversion in Japanese. Observe here that in a noun-comple-ment or a relative clause, the nominative case marking on the subject cannot be changed to genitive marking when the complement clause contains an accusative argument, as in (26a).

(26) a. [*Ken-ga/*-no   hon-o   kat-ta*] *mise*
          Ken-NOM/-GEN book-ACC buy-PST shop
          'the shop where Ken bought a book.'

     b. [*Ken-ga/-no   kat-ta*] *hon*
          Ken-NOM/-GEN buy-PST book
          'the book which Ken bought'.

The transitivity restriction is not a constraint pertinent to transitive predicates *per se*, because nominative-genitive conversion is permitted in a transitive clause if no accusative argument appears superficially, as in (26b).

In the picture-noun construction, by contrast, the transitivity restriction is not applicable. Thus, irrespective of whether or not an accusative argument is present in the complement clause of the picture-noun construction, the imagee NP can appear in the genitive case, as in (27).

(27) a. [*watasi-no yuiitu-no <sigoto-o si-te   i-ru> syasin*] *desu.*
          1SG-GEN   only-GEN   job-ACC do-GER be-PRS photo COP
          '(It is) a photo of my doing a job.'
                                  <www.remixayase.blog87.fc2.com/blog-date-201209.html>

     b. [*<kawaii isyoo-de odot-te   i-ru> (iti-mai-no) kodomo-no syasyin*]
          cute   dress-in dance-GER be-PRS one-CL-GEN child-GEN   photo
          'The photo of the child dancing wearing a cute dress'.
                                  <http://machi1.seesaa.net/category/18361826-1.html>
                                  [*(iti-mai-no)* is added by the authors.]

The absence of a 'transitivity constraint' effect can be attributed to the fact that the imagee NP is located outside the complement clause. If the imagee NP does not appear inside the complement clause, the genitive-marked imagee cannot be derived via nominative-genitive conversion, which is constrained by the transitiv-ity constraint.

3.2   Clausal idioms

In this section, by considering how the idiomatic meanings of clausal idioms are obtained, we provide another piece of evidence confirming that genitive subjects in the picture-noun construction are located outside the complement clause, but genitive subjects derived by nominative-genitive conversion reside in their

complement clauses. We show that there is an inaudible pronoun inside the complement clause (the *V-te iru* clause) in the picture-noun construction.

First of all, note that idioms are fixed, idiosyncratic expressions whose meaning cannot be constructed by combining the meanings of their parts compositionally. Idiom formation is subject to the so-called "adjacency condition", and thus, in order for an idiom to obtain an idiomatic meaning, the idiom parts must be adjacent with each other. Japanese has a number of clausal idioms with intransitive verbs such as *kankodori-ga naku* [cuckoo-NOM sing] 'There are less and less customers' and *yoko-yari ga hairu* [side-spear-NOM enter] 'be interrupted'. There are also clausal idioms with transitive verbs, such as *syooziki-mono-ga baka-o miru* [honest-people-NOM fool-ACC look.at] 'Honesty does not pay', *tora-ga kiba-o muku* [tiger-NOM tooth-ACC bare] 'A person shows overt hostility' and *okane ga mono o iu* 'Money talks', although the number of such clausal idioms is fairly limited.

Clausal idioms of the intransitive type are allowed to appear inside a relative or a noun-complement clause, as in (28a). In (28b), the intransitive idiom *kankodori ga naku* appears inside the picture noun *syasyin* 'photo'.

(28) a. [*kankodori-ga/-no nai-te   i-ru*]   *mise*
              cuckoo-NOM/-GEN sing-GER be-PRS store
              'a store attracting less and less customers.'
      b. [*kankodori-ga/-no nai-te   i-ru*]   *syasin*
              cuckoo-NOM/-GEN sing-GER be-PRS photo
              'the photo of there being less customers'.

In both cases in (28), the subject of the idiom can be marked with nominative or genitive case, and the examples are acceptable on the intended idiomatic interpretation, showing that the intransitive idioms allow nominative-genitive conversion, while preserving their idiomatic meanings, obviously, in the absence of an accusative argument. Note that, as shown in (28b), the intransitive clausal idiom is also allowed to appear in the complement clause of the picture-noun construction, because its head noun may select a full complement clause, which can include the entire intransitive clausal idiom, satisfying the adjacency condition.

Interestingly, a transitive clausal idiom like *syooziki-mono-ga baka-o miru* can be embedded in the picture-noun construction (while preserving its idiomatic meaning) when the subject of the idiom is marked with nominative case, but not when it is marked with genitive case. Thus, (29b) has the intended idiomatic interpretation, but (29a) does not.

(29) a. #[*syooziki-mono-no <baka-o   mi-te   i-ru>*] *syasin*
          honest-people-GEN   fool-ACC look.at-GER be-PRS photo
          'the photo of the honest man looking at the fool.'

      b. [*syooziki-mono-ga   baka-o   mi-te   i-ru*] *syasin*
          honest-people-NOM fool-ACC look.at-GER be-PRS photo
          'the photo showing that honesty does not pay'.

In (29a), the genitive marking on the idiom subject cannot be derived via nom-
inative-genitive conversion for the obvious reason that the complement clause
contains an accusative object. The possibility that (29a) is identified as a genitive-
subject construction is excluded by the transitivity restriction constraining nomi-
native-genitive conversion.

The availability or unavailability of the idiomatic interpretation in (29) can
be reduced to the question of whether or not the adjacency condition for idiom
formation is satisfied. When the subject of a transitive clausal idiom is marked
with nominative case, it appears inside the full complement clause, as illustrated
in (30a), but when marked with genitive case, it appears outside the participial
complement clause of the picture-noun construction, as depicted in (30b).

(30) a. [<Subject-NOM Object-ACC V>] PictN
      b. [Imagee NP-GEN < PRO Object-ACC V>] PictN

When the idiom subject, which counts as the imagee NP, is marked with nomina-
tive case, the structure in (30a) is obtained. In this case, the idiomatic interpreta-
tion is available in the absence of intervening material blocking idiom formation.
When the idiom subject, i.e. imagee NP, is marked with genitive case, it is placed
outside the complement clause, as illustrated in (30b). In this case, PRO intervenes
between the idiom subject and the rest of the idiom material. Thus the idiomatic
interpretation is not obtained in violation of the adjacency condition for idiom
formation.[11] This is similar to the case of the English example in (31b).

(31) a. *The cat is out of the bag.*
      b. # *The cat thinks that she is out of the bag.*
      c. # *The cat wants PRO to be out of the bag.*

The idiomatic interpretation available for (31a) is not obtained in (31b-c), even
when the pronoun refers to *the cat* in the matrix clause. The reason is that the pro-
noun *she* and PRO do not constitute material to form part of an idiom constituent.
The same account is extended to the picture-noun construction in (29a). Even if

---

11. Note that even when the subject is located outside the clause, the intended idiomatic in-
terpretation should be available if the subject undergoes raising from within the clause. This is
because the idiom can satisfy the adjacency condition in pre-movement position.

the imagee NP is semantically associated with the predicate by virtue of controlling PRO, the idiomatic interpretation is not obtained because the adjacency condition is not fulfilled there. Hence, the example in (29a) can have only the literal interpretation indicated by the translation.[12,13]

4.   Sensorial nouns

The head nouns appearing in the picture-noun construction are not limited to 'picture nouns', but other nouns (i.e. nouns denoting some kind of physical perception such as sight, hearing, and smelling) can fit into this construction. Teramura (1969, 1975–1978) lists a number of nouns which behave like picture nouns in Japanese, although he does not discuss how they behave syntactically. Hook and Pardeshi (2013: 87–88) claim that 'sensorial' nouns, including *āvādz* 'sound' and *vās* 'smell' nouns, behave like picture nouns.

---

12. Due to some independent grammatical constraints, it is not easy in Marathi to find clausal idioms that can be placed in the picture-noun constructions, so we have to leave open the question of whether it is possible to provide an argument based on Marathi idioms.

13. One reviewer notes that a transitive idiom like *tonbi-ga taka-o umu* [kite-NOM hawk-ACC give.birth] 'A stupid parent gives birth to a smart child' can be embedded under a control construction headed by the predicate *-tagaru* 'want', as in (i).

(i) *Tonbi-ga taka-o   umi-tagar-u.*
      kite-NOM hawk-ACC give.birth-want-PRS
      'A stupid parent wants to have a smart child.'

Interestingly, other transitive idioms do not retain their idiomatic meanings in the same control construction.

(ii) a.   #*Syooziki-mono-ga   baka-o   mi-tagar-u.*
            honest-people-NOM fool-ACC look.at-want-PRS
            'An honest man wants to see a fool.'
      b.   #*Tora-ga   kiba-o   muki-tagar-u.*
            tiger-NOM teeth-ACC bare-want-PRS
            'The tiger wants to show its tooth.'

The sentences in (ii) have only the literal interpretations. This raises the question of why there is a discrepancy in availablity of idiomatic interpretation between (i) and (ii). The crucial difference between in (i) and (iib) seems to be that the verb in *tonbi-ga taka-o umu* carries a literal meaning, while the verbs in other idioms do not. This suggests that *tonbi-ga taka-o umu* is not a genuine clausal idiom, because the VP does not form an idiom sequence. This being the case, it is plausible to state that the subject and the object are interpreted as idioms independently, and hence the idiom interpretation is available in (i).

(32) a. [*dhab.dhabyā-čyā pāṇyā-ʦā <paḍ-ṇār-ā>   āvādz*]…
         waterfall-GEN   water-GEN   fall-PRS.PTCP-M.SG sound
         '… the sound of the waterfall's water falling …'.
                     <mr.wikipedia.org/wiki> [Hook & Pardeshi (2013: 87), ex.(49)]

   b. [[*dhab.dhabyā-ʦā kivāā <dzorā-t paḍ-ṇār-yā>   pāṇyā*]-*ʦā āvādz*]
         waterfall-GEN   or   force-in fall-PRS.PTCP-OBL water-GEN sound
         '… the sound of a waterfall or of plummeting water …'.
                     <1000chandra.blogspot.com> [Hook & Pardeshi (2013: 87), ex.(51)]

   c. [*kāndyā-čyā ʦrʦurit bhajyān-ʦā <taḷ-lel-ā>   vās*]…
         onion-GEN crispy Bhaji-GEN   deep.fry-PST.PTCP.-M.SG smell
         '… the smell of the deep fried crispy onion Bhaji…'.
                           <https://shrikrishnasamant.wordpress.com/2011/08/22/>

   d. [[*nuktyāʦ taḷ-lel-yā   bhajyān*]-*ʦā mast vās*]…
         recently deep.fry-PST.PTCP-OBL Bhaji-GEN   nice smell
         '… the nice smell of recently deep fried Bhaji……'.
                           <http://www.maayboli.com/node/5884?page=1>

In Marathi, the sensorial nouns fit into the picture-noun constructions, and permit the word order alternation between the imagee NP and the PPP in the same way as picture nouns. Thus, we can assume here that the sensory NPs select 'sensee' NPs, just as picture nouns select 'imagee' NPs.

Similarly, some sensorial nouns pattern like picture nouns in Japanese. In effect, sensorial nouns such as *oto* 'sound', including nouns denoting more specific sounds *asi-oto* 'foot sound', *mono-oto* 'sound of things', *koe* 'voice', etc. as well as *nioi* 'smell', can switch the order of the sensee NP and the complement clause, like their Marathi counterparts, as shown in (33).[14]

---

14. In Japanese, nouns like *kiboo* 'hope' and *nozomi* 'wish' can take experiencer arguments as their specifier. Thus, the experiencer and the complement clause can be permeated, as (i) illustrates.

(i) a. [*Ken-no <Tokyo-ni sum-u   toiu> nozomi*]-*ga kanat-ta.*
         Ken-GEN   Tokyo-in live-PRS that   desire-NOM come.true-PST
         'Ken's desire to live in Tokyo came true.'

   b. [*<Tokyo-ni sum-u   toiu> Ken-no   nozomi*]-*ga kanat-ta.*
         Tokyo-in live-PRS that   Ken-GEN desire-NOM come.true-PST
         'Ken's desire to live in Tokyo came true.'

With nouns like *nozomi* 'wish', the complement clause takes a constituent structure (headed by the *toiu* 'that' complementizer), which is different from one taken by picture nouns.

(33) a. [*rinzin-no*   (*kasukana*) [<*rooka-o*   *arui-te*   *i-ru* > *asi-oto*]
    neighbor-GEN (faint)   corridor-ACC walk-GER be-PRS foot-sound
    'the faint sound of a neighbor's footsteps walking along the corridor'.
                                       <blogs.yahoo.co.jp/meroblythe/36588481.html>
                    [(*kasukana*) added to the attested example by the authors]

   b. [<*rooka-o*   *arui-te* *i-ru*> (*kasukana*) *rinzin-no*   *asi-oto*]
    corridor-ACC walk-GER be-PRS (faint)   neighbor-GEN foot-sound
    'the (faint) sound of a neighbor's footsteps walking along the corridor.'

   c. [<*oobun-de yake-te*   *i-ru*> (*honokana*) *sakana-no nioi*]
    oven-in   bake-GER be-PRS (slight)   fish-GEN smell
    'the slight smell of the fish burning in the oven'

   d. [*sakana-no* (*honokana*) <*oobun-de yake-te*   *i-ru*> *nioi*]
    fish-GEN (slight)   oven-in bake-GER be-PRS smell
    'the slight smell of the fish burning in the oven.'

In (33a), since the complement clause comprises an accusative argument, the genitive phrase *rinzin-no* does not count as a subject that has been derived by undergoing nominative-genitive conversion. Rather, it is a sensee NP selected by the sensorial noun *asi-oto* 'footstep' (even without the adjective *kasukana* 'faint', which is taken to modify *asi-oto*). Thus, (33a) is identified as a variant of the picture-noun construction where the embedded predicate phrase is preceded by the sensee NP. In (33b), the complement clause and the NP *rinzin* must be separate constituents because the adjective *kasukana* modifies the sensorial noun *asi-oto*. Thus, (33b) can be seen as a variant of the picture-noun construction where the sensee NP follows the embedded predicate phrase. The same holds true of (33c) and (33d). In (33c) and (33d), the adjective *honokana* 'slight' modifies *nioi* 'smell', but not the other constituents. Sine these examples display crucial properties characteristic of the picture-noun construction, they can be identified as variants of the picture-noun construction.

5.   Theoretical implications

Thus far, our discussion has shown that both Marathi and Japanese have picture-noun constructions where an imagee/sensee NP serves as the subject of the complement predicate via control. The existence of this type of syntactic construction provides insight into modified nominal constructions. Broadly, Teramura (1975–1978) classifies modified nominal constructions into two classes, one which has an inner relationship between the noun head and the modifying phrase (e.g. relative clauses) and the other which has an outer relationship (e.g. noun-complement

clauses or appositive clauses) (see also Oshima 2010). Teramura identifies several varieties of the modified nominal construction with an outer relationship.[15]

While Teramura does not investigate the syntactic structures of picture-noun constructions, we have identified the unique status of complement structures in the picture-noun constructions. In particular, our discussion shows that the picture-noun construction falls into the type of construction comprised of a reduced participial complement containing PRO plus the imagee NP located outside it. Apparently, the same type of construal can be formed on sensorial nouns, because they select a source argument to be identified as an instigator of making sounds, alongside a participial complement predicate phrase describing the event of how the sensee is created by the source. Needless to say, the participial complement structure obtained for picture and sensory nouns differs from the complement structure obtained in other types of noun-modifying constructions (such as relative clauses and noun-complement clauses), where full clauses are embedded inside the head nouns; e.g. a complex NP like *[John-no kuru] kanoosei* ([John-GEN come] possibility) 'the possibility that John will come' possesses a full CP complement clause, and hence does not allow the complement clause to be fronted while leaving the genitive subject behind, as **[kuru] John-no kanoosei*. It must be stressed here that picture nouns in Japanese do not always comprise reduced participial complement clauses, and can contain full-fledged complement clauses. This entails that genitive-marked imagee NPs appearing in picture-noun constructions may be located in the complement clause, in which case the modified nominal construction falls into the genitive-subject construction derived via nominative-genitive conversion.

In Marathi and Japanese picture-noun constructions with reduced participial clauses, it is possible to switch the imagee/sensee NP and the embedded predicate phrase without causing anomaly, due to the syntactic structure where the picture/sensorial noun selects an imagee/sensee NP and a (participial) complement clause (containing PRO). In contrast, relative and noun-complement clauses do not allow a switch of the predicate phrase and the subject, because their heads do not take additional NPs located outside the embedded clauses. Overall, the picture-noun constructions have structural properties that allow us to distinguish them from relative and noun-complement clauses. Crucially, in both Marathi and Japanese,

---

15. Teramura (1969, 1975–1978) suggests that the modified nominal constructions could be distinguished by considering whether the complementizer *toiu* 'that' can be added to the left of the head noun. Presumably, this diagnostic picks out modified nominal constructions that take full noun-complement clauses. The picture-noun constructions comprise complement clauses with an outer relationship (to the picture-noun heads) that do not allow the insertion of *toiu*.

picture nouns as well as sensorial nouns can take a participial complement clause whose inaudible subject is controlled by an imagee/sensee NP outside.

6.   Conclusion

In picture-noun constructions in Marathi, the imagee NP marked with genitive case appears outside the participial complement, i.e. it does not appear as a direct argument to the participial predicate in the complement clause. We suggest that the genitive NP is necessarily interpreted as an imagee of the picture noun, because the participial complement contains an inaudible pronoun (PRO) controlled by the genitive NP. Japanese also has a picture-noun construction where the imagee NP marked with genitive case appears outside the complement clause, but is understood to be the subject of the predicate in the complement clause. This type of Japanese picture-noun construction is not an instance of the genitive-subject construction derived by nominative-genitive conversion. In the Japanese picture-noun construction with a complement clause containing PRO, just like the Marathi picture-noun construction with a PPP, the imagee NP controls the inaudible pronoun PRO, and is thus understood as the subject of the predicate in the complement clause.

Acknowledgment

References

Boeckx, C., Hornstein, N. & Nunes, J. 2010. *Control as Movement*. Cambridge: CUP.
    https://doi.org/10.1017/CBO9780511761997
Carnie, A. 2013. *Syntax: A Generative Introduction*, 3rd edn. Malden MA: Wiley-Blackwell.
Harada, S. I. 1971. *Ga-no* conversion and idiolectal variations in Japanese. *Gengo Kenkyu* 60:
    25–38.

Hiraiwa, K. 2001. On nominative-genitive conversion. *MIT Working Papers in Linguistics*, 39: *A Few from Building E39*, 67–125.

Hook, P. E. & Koul, O. N. 2014. The noun phrase accessibility hierarchy and participial noun-modifying constructions in Hindi-Urdu and Kashmiri. Paper presented at the 11th International Conference of South Asian Languages and Literatures (ICOLSI-11), Banaras Hindu University, Varanasi, 23–25 January.

Hook, P. E. & Pardeshi, P. 2013. Prenominal participial phrases in Marathi, the Noun Phrase Accessibility Hierarchy, and picture nouns. *Lingua Posnaniensis* 55(2): 77–89.
https://doi.org/10.2478/linpo-2013-0015

Hook, P. E. & Pardeshi, P. 2017. Noun-modifying expressions in Marathi. In *Noun-Modifying Clause Constructions in Languages of Eurasia: Rethinking Theoretical and Geographical Boundaries* [Typological Studies in Language 116], Y. Matsumoto, B. Comrie & P. Sells (eds.), 293–329. Amsterdam: John Benjamins. https://doi.org/10.1075/tsl.116.12hoo

Hornstein, N. 1999. Movement and control. *Linguistic Inquiry* 30: 69–96.
https://doi.org/10.1162/002438999553968

Jacobson, P. 1992. Raising without movement. In *Control and Grammar*, R. Larson, S. Iatridou, U. Lahiri & J. Higginbotham (eds.), 149–194. Dordrecht: Kluwer.
https://doi.org/10.1007/978-94-015-7959-9_5

Kinsui, S. 1994. Rentai-syūshoku-no '-ta' nituite (On attributive use of '-ta'). In *Nihongo-no Meishi-Syūshoku Hyōgen* (Noun-modifying expressions in Japanese), Y. Takubo (ed.), 29–65. Tokyo: Kurosio.

Kinsui, S. 2000. Toki-no hyōgen (Expressions of time). In *Toki-Hitei-to Toritate* (Time, Negation and Focus), Y. Nitta & T. Masuoka (eds.), 3–92. Tokyo: Iwanami Shoten.

Landau, I. 2013. *Control in Generative Grammar: A Research Companion*. Cambridge: CUP.
https://doi.org/10.1017/CBO9781139061858

Matsumoto, Y. 1988. Semantics and pragmatics of noun-modifying constructions in Japanese. *Proceedings of the Fourteenth Annual Meeting of the Berkeley Linguistics Society* 14: 166–175.

Matsumoto, Y. 1997. *Noun-Modifying Constructions in Japanese: A Frame-semantic Approach* [Studies in Language Companion Series 35]. Amsterdam: John Benjamins.
https://doi.org/10.1075/slcs.35

Matsumoto, Y., Comrie, B. & Sells, P. 2017. Noun-modifying clause constructions in languages of Eurasia: Rethinking theoretical and geographical boundaries. In *Noun-Modifying Clause Constructions in Languages of Eurasia: Rethinking Theoretical and Geographical Boundaries* [Typological Studies in Language 116], Y. Matsumoto, B. Comrie & P. Sells (eds.), 3–21 Amsterdam: John Benjamins. https://doi.org/10.1075/tsl.116.01mat

Ochi, M. 2001. Move F and *ga/no* conversion in Japanese. *Journal of East Asian Linguistics* 10: 247–286. https://doi.org/10.1023/A:1011224313676

Oshima, M. 2010. *Nihongo Rentai Syūsyoku Kōzō-no Kenkyū* (A study of the structures of noun modifying clauses in Japanese). Tokyo: Hituzi Syobo.

Shibatani, M. 2009. Elements of complex structures, where recursion isn't: The case of relativization. In *Syntactic Complexity: Diachrony, Acquisition, Neuro-cognition, Evolution* [Typological Studies in Language 85], T. Givón & M. Shibatani (eds.), 163–198. Amsterdam: John Benjamins. https://doi.org/10.1075/tsl.85.07ele

Teramura, H. 1969. The syntax of noun modification in Japanese. *The Journal-Newsletter of the Association of Teachers of Japanese* 6(1): 64–74. https://doi.org/10.2307/488720

Teramura, H. 1975–1978. Rentaisyūsyoku-no Syntakusu-to imi (1–4) (The syntax and meaning of noun modification (1–4)). Reprinted in Teramura, H. 1992. *Teramura Hideo Ronbunsyū II* (Collected papers by Hideo Teramura II). Tokyo: Kurosio. English Translations available at http://adnominal-modification.ninjal.ac.jp

Watanabe, A. 1996. Nominative-genitive conversion and agreement in Japanese: A crosslinguistic perspective. *Journal of East Asian Linguistics* 5: 373–410.
https://doi.org/10.1007/BF00132699

Whitman, J. 2013. The prehead relative clause problem. *MIT Working Papers in Linguistics 67: Proceedings of the 8th Workshop on Altaic Formal Linguistics*, 361–380.

Some asymmetries of long distance scope assignment in Sinhala

Hideki Kishimoto
Kobe University

Sinhala is classified as a *wh*-in-situ language; *wh*-phrases do not undergo movement, and most typically, their scope is determined relative to the (LF) position of a separable Q element associated with them. Nevertheless, some *wh*-phrases are not associated with separable Q elements and in such cases, the scope of *wh*-phrases is determined by a null operator base-generated in the local Spec-CP. In pseudo-cleft constructions, different conditions apply to null operator insertion, since a null operator is inserted in the local Spec-CP if true adjuncts (reason and manner adjuncts) are placed in focus position. I argue that when null operator insertion takes place, no A′-movement is implemented, so that the host *wh*-phrases are not allowed to have long distance construal. The difference in conditions on null operator insertion give rise to four distinct patterns of *wh*-questioning in *wh*-focus and pseudo-cleft constructions.

Keywords: *wh*-in-situ, Q element, null operator insertion, *wh*-questioning, pseudo-clefting, Sinhala

1. Introduction

Sinhala is a *wh*-in-situ language where *wh*-phrases do not undergo movement (in *wh*-questions). One notable feature of Sinhala *wh*-questions is that *wh*-phrases are associated with (separable) Q elements, which typically, but not necessarily, occur contiguous with them. When a Q element occurs clause-medially, it delimits a focused *wh*-constituent, and *wh*-scope is signaled by special verbal inflection, i.e. -*e* ending appearing on the predicate. When a Q element occurs in clause-final position, it marks the scope of its host *wh*-phrase, and the predicate does not acquire the -*e* ending. As discussed by Kishimoto (2005), there is good reason to believe that the Q element occupies an operator position encoding the scope of its associ-

ated *wh*-phrase either in overt syntax (when it occurs at the clause end) or at LF (when it occurs in clause-medial position).

In Sinhala, even though the scope of *wh*-phrases is typically determined relative to the (LF) position of their associated Q elements, some *wh*-phrases are not associated with separable Q elements. In the latter cases, the scope of *wh*-phrases is fixed by way of a null operator merged externally with the local CP. I suggest that when the null operator strategy is implemented, *wh*-phrases do not allow long distance interpretation, because a null operator (inserted in its local scope position as a last resort strategy) does not undergo movement into a higher scope position. A comparison of non-cleft *wh*-questions and pseudo-cleft *wh*-questions shows that Sinhala makes use of this null operator insertion to generate scope when focused constituents, which include *wh*-phrases as well as non-*wh*-phrases, are not associated with external operators that can undergo movement. The strategy of null operator insertion is implemented in cleft and non-cleft constructions under different conditions, and this gives rise to some peculiar scope phenomena in *wh*-questions.

The discussion in this paper proceeds as follows. Section 2 illustrates that Sinhala *wh*-questions have some crucial properties as focus constructions in which focused constituents take scope. It is argued that the scope of a *wh*-phrase is determined by the LF position of its associated Q element if it serves as an operator to bind the *wh*-in-situ. Section 3 shows that when a *wh*-phrase is not associated with a separable Q element, the strategy of inserting a null operator is implemented for its scope assignment. The same null operator strategy is used in *wh*-focus and cleft-focus constructions under different conditions, thus giving rise to four distinct patterns of *wh*-questioning. It is also shown that Japanese possesses different *wh*-questioning patterns, owing to the fact that *wh*-phrases are always associated with separable Q elements. A conclusion is presented in Section 4.

2.   *Wh*-constructions with and without pseudo-clefting

This section first describes some general properties of *wh*-questions in Sinhala (Section 2.1), and then argues that a Q element functions as an operator to bind a *wh*-in-situ serving as a variable (Section 2.2). Empirical evidence will be presented in Section 2.3 that when a Q element appears in clause-internal position, it undergoes LF operator movement to its scope position–the constituent position occupied by a clause-final Q element.

2.1   General characteristics

Sinhala has several variants of the focus construction where a focused constituent is specified by a focus marker. In Sinhala, *wh*-questions are classified into one type of focus construction, and one of their characteristic properties is that a Q-element is typically used to signal focus, in which case the predicate has *-e* marking indicating the scope of a *wh*-phrase, as in (1).

(1)   Chitra monəwa **də** gatte?
      Chitra what   Q   bought.E
      'What did Chitra buy?'

In (1), the *wh*-phrase accompanies the Q element *də*, and focus is taken to fall on the constituent marked by *də*, which is separate from the constituent representing presupposition. The examples in (2) illustrate that in a *wh*-question where *də* occurs contiguous with a *wh*-phrase, the scope of the *wh*-phrase is interpreted relative to the *-e* ending.

(2)   a.   Ranjit [Chitra monəwa **də** <u>gatte</u>   kiyəla] dannəwa.
           Ranjit Chitra what   Q bought.E that   know.A
           'Ranjit knows what Chitra bought.'   (Embedded scope)
      b.   Ranjit [Chitra monəwa **də** gatta   kiyəla] <u>danne</u>?
           Ranjit Chitra what   Q bought.A that   know.E
           'What does Ranjit know Chitra bought?'   (Matrix scope)

Example (2a) is understood as an embedded *wh*-question, the lower verb *gatte* 'bought' bearing the *-e* marking. In (2b), the matrix verb *danne* 'know' bears the *-e* marking, and the sentence is understood to be a matrix *wh*-question.

    In *wh*-questions, the *-e* marking appears on the predicate when a Q element is positioned in clause-internal position, but this marking does not obtain when a Q element is placed in clause-final position. Kishimoto (2005) argues that the *-e* ending is a PF reflection of the verb's possessing a formal feature to be deleted via feature checking with the Q element *də*, and thus indicates the position where the Q element to serve as an operator appears at LF. Specifically, if the Q element is overtly moved to its scope position, the verb bears the ordinary *-a* marking, because the formal feature is deleted in narrow syntax. If the Q element is not raised to its scope position overtly, then the formal feature on the predicate remains undeleted until LF, so that the verb bears the *-e* marking. The verbal morphology in *wh*-questions indicates the presence or absence of a formal feature to be used for

the attraction of the Q element at the level of narrow syntax (prior to feeding into LF representations).[1]

The Q element *də* generally cannot be placed clause-finally in direct *wh*-questions. Thus, (3) is ill-formed as an ordinary direct *wh*-question regardless of whether the verb receives the special *-e* ending or the ordinary *-a* ending.

(3)   *Chitra monəwa {gatta/gatte}   **də?**
       Chitra what   {bought.A/bought.E} Q
       'What did Chitra buy?'

This does not mean that *də* can never be placed in clause-final position. In point of fact, there are cases where the clause-final placement of *də* is possible, as in (4).

(4)   a.   Ranjit [kauru aawa   **də** kiyəla] dannəwa.
           Ranjit who   came.A Q that   know.A
           'Ranjit knows who came.'
      b.   Kiidenek   potə kieuwa **də?**
           how.many book read.A   Q
           'How many (people) read the book?'

The Q-particle *də* can be placed in clause-final position (in front of the complementizer *kiyəla*, which marks the clause boundary of the embedded clause) when the host *wh*-phrase appears in the complement clause of a verb like *dannəwa* 'know', as in (4a), and also in direct *wh*-questions formed with *kiidenek* 'how many (animate)' (or *kii-ak* 'how many (inanimate)'), as in (4b). In both cases, the verb hosting a Q element takes the ordinary declarative *-a* ending, and not the special *-e* ending.

In Sinhala, declarative focus constructions can be constructed by making use of a range of particles including emphatic *tamay, yi*, negative *newey*, dubitative *yæ*, hearsay *lu*, hypothetical *naŋ* (if), exhaustive *witəray* (only), and confirmative *ne* (see Chandralal 2010). The examples in (5) represent declarative focus constructions formed by *tamay* 'only' and *newey* 'not'.

(5)   a.   Chitra ee   potə **tamay** kieuwe.
           Chitra that book FOC   read.E
           'It was that book that Chitra read.'
      b.   Chitra ee   potə **newey** kieuwe.
           Chitra that book NEG   read.E
           'It was not that book that Chitra read.'

---

1.   In cases where a null operator appears in scope position, as in pseudo-cleft constructions, the *-e* marking appears on the predicate. For the details of the analysis of the *-e* marking in pseudo-cleft constructions, see Kishimoto (2005).

Declarative focus constructions and *wh*-interrogative focus constructions share the property that the predicate receives the special -*e* marking, which encodes the scope of a focused constituent, as seen in (6).

(6)   a.   Ranjit [Chitra ee   potə **tamay** <u>kieuwe</u> kiyəla] dannəwa.
          Ranjit Chitra that book FOC   read.E that   know.A
          'Ranjit knows that it was that book that Chitra read.'   (Embedded scope)
     b.   Ranjit [Chitra ee   potə **tamay** kieuwa kiyəla] <u>danne.</u>
          Ranjit Chitra that book FOC   read.A that   know.E
          'It is that book that Ranjit knows that Chitra read.'   (Matrix scope)

As indicated by the translations, the focused constituent takes embedded scope when the embedded predicate has the -*e* marking, and matrix scope when the matrix predicate bears the -*e* marking.

    Even though declarative focus constructions and *wh*-interrogative focus constructions belong to the same construction type, a number of differences are observed, and two of them will be discussed below. In the first place, whereas *də* generally cannot be placed clause-finally in direct *wh*-questions, this kind of focus particle placement is legitimate in declarative focus constructions, as the examples in (7) show.

(7)   a.   Ranjit ee   potə kieuwa **tamay**.
          Ranjit that book read.A FOC
          'It was only that Ranjit read that book.'
     b.   Ranjit ee   potə kieuwa **newey**.
          Ranjit that book read.A NEG
          'It was not the case that Ranjit read that book.'

When focus particles such as *tamay* and *newey* occur clause-finally, the verb takes the -*a* ending rather than the -*e* ending. In such cases, the focus particles *tamay* and *newey* do not delimit a focused constituent, and focus may fall on any constituent in the clause. Thus, (7a) can mean 'It was Ranjit who read that book', 'It was that book that Ranjit read' or 'Ranjit did read that book'.

    Secondly, the possibility of multiple foci differs depending on the construction type. On the one hand, *wh*-interrogative focus constructions allow multiple foci, as exemplified in (8).

(8)   Kau **də** monəwa **də** gatte?
     who Q what   Q bought.E
     'Who bought what?'

Example (8) is a multiple focus *wh*-question, which has more than one Q element serving as a focus marker. On the other hand, multiple foci (using the same focus

marker) are not permitted in declarative focus constructions. Thus, the following multiple-focus sentences are not acceptable.

(9)   a.   *Chitra **tamay** ee   potə **tamay** kieuwe.
            Chitra FOC   that book FOC   read.E
            'Only Chitra read only that book.'
      b.   *Chitra **newey** ee   potə **newey** kieuwe.
            Chitra NEG   that book NEG   read.E
            'Not Chitra read not that book.'

The facts illustrate that *wh*-interrogative focus constructions and declarative focus constructions possess distinct properties, even though both fall into the class of focus constructions–the constructions which, most typically, make use of focus particles to mark focused constituents.[2]

2.2   Pseudo-clefting

In Sinhala, pseudo-clefting can be used to create a structure where focus is separated from presupposition syntactically. In the pseudo-cleft construction, a focused constituent is moved to the right of the predicate, which counts as a cleft-focus position, as seen in (10).

(10)   Ranjit kieuwe <u>ee   potə</u>.
        Ranjit read.E   that book
        'It was that book that Ranjit read.'

In (10), the predicate has *-e* ending, which signals the scope of a focused constituent. In the pseudo-cleft construction, a constituent placed in the cleft-focus position may occur with a focus particle optionally, as in (11).

(11)   Ranjit kieuwe <u>ee   potə</u> (**tamay**).
        Ranjit read.E   that book FOC
        'It was only that book that Ranjit read.'

In cases where a *wh*-phrase appears in the cleft-focus position, its associated Q element cannot be omitted, however.

---

2. The Q particle *də* can be used in a yes-no question, but a yes-no question does not allow multiple foci, as exemplified in (i).

(i)   *Chitra **də** ee   potə **də** kieuwe?
       Chitra Q   that book Q   read.E
       'Was it that book that Chitra read?'

(12)   Ranjit kieuwe <u>monəwa *(**də**)</u>?
   Ranjit read.E what Q
   'What was it that Ranjit read?'

This is due to the fact that the Q element assumes the function of specifying the quantificational force of the *wh*-phrase.

  In the pseudo-cleft construction, the scope of a focused constituent is invariably marked by the *-e* ending on the predicate, and notably, both short and long distance focus interpretations are allowed: (13a) is interpreted to take embedded scope, and (13b), matrix scope.

(13) a. Ranjit [Chitra kieuwe <u>ee   potə</u> (tamay) kiyəla] dannəwa.
    Ranjit Chitra read.E that book FOC that know.A
    'Ranjit knows that it was that book that Chitra read.'   (Embedded scope)
  b. Ranjit [Chitra kiewuwa kiyəla] danne <u>ee   potə</u> (tamay).
    Ranjit Chitra read.A that know.E that book FOC
    'It is that book that Ranjit knows that Chitra read.' (Matrix scope)

In both sentences in (13), the predicate involves *-e* ending, i.e. the scope marking on the predicate is not canceled, even though the focused constituent appears in the scope position.

2.3 Island effects and overt particle movement

The Q particle *də* associated with a *wh*-phrase incurs island violations when it is embedded in syntactic islands. In light of this fact, I suggest in this section that a clause-internal Q element is raised to its scope position at the LF level so as to serves as an operator to encode the scope of *wh*-in-situ.

  To begin, observe that overt pseudo-cleft extraction is not legitimate if it involves movement out of syntactic islands. Thus, the examples in (14)–where the focused DPs have been overtly extracted from within a relative clause and a noun complement clause–are ill-formed.[3]

(14) a. *Oyaa [[Chitra t$_i$ dunnə] potə] kieuwe <u>Ranjit-ţə$_i$</u>.
     you Chitra gave book read.E Ranjit-DAT
    'It was to Ranjit$_i$ that you read the book that Chitra gave t$_i$.'
  b. *Chitra [[Ranjit t$_i$ gatta kiənə] kaţəkataawə] æhuwe <u>ee   potə</u>$_i$
     Chitra Ranjit bought.A that rumor heard.E that book
    'It was that book$_i$ that Chitra heard the rumor that Ranjit bought t$_i$.'

---

3. For reasons of space, the discussion of syntactic islands is confined to the two cases of syntactic islands.

The data illustrate that the complex DPs, i.e. relative and noun complement claus-es, constitute syntactic islands for extraction. On the other hand, the sentences are well-formed when the complex DPs are moved as a whole, as shown in (15).

(15) a. Oyaa t$_i$ kieuwe [[Chitra Ranjit-ʈə   dunnə] potə] (tamay)$_i$.
          you   read.E   Chitra Ranjit-DAT gave   book FOC
          'It was the book that Chitra gave to Ranjit that you read.'

      b. Chitra t$_i$ æhuwe [[Ranjit ee   potə gatta   kiənə] kaʈəkataawə]
          Chitra heard.E   Ranjit that book bought.A that   rumor
          (tamay)$_i$.
          FOC
          'It was the rumor that Ranjit bought that book that Chitra heard.'

The well-formedness of the sentences in (15) is naturally expected, since they do not involve extraction out of the islands.

Turning to *wh*-questions, the direct *wh*-questions in (16), where the Q particle *də* is embedded in complex DP islands, are unacceptable just in the same way as those in (14), despite the fact that they do not involve overt extraction.

(16) a. *Oyaa [[Chitra kaa-ʈə   **də** dunnə] potə] kieuwe?
           you   Chitra who-DAT Q gave   book read.E
           'To whom$_i$ did you read the book that Chitra gave t$_i$?'

      b. *Chitra [[Ranjit monəwa **də** gatta   kiənə] kaʈəkataawə] æhuwe?
           Chitra   Ranjit what   Q bought.A that   rumor   heard.E
           'What$_i$ did Chitra hear the rumor that Ranjit bought t$_i$?'

The island effects in (16) are analogous to those observed in overt pseudo-cleft ex-tractions in (14). In (16), the Q element *də* appears contiguous with the *wh*-phrase, but *də* may alternatively be placed to the right edge of an island, separate from its host *wh*-word, as in (17), in which case no island effects are observed.

(17) a. Oyaa [[Chitra kaa-ʈə   dunnə] potə] **də** kieuwe?
          you   Chitra who-DAT gave   book Q   read.E
          'You read the book that Chitra gave to who?'

      b. Chitra [[Ranjit monəwa gatta   kiənə] kaʈəkataawə] **də** æhuwe?
          Chitra   Ranjit what   bought.A that   rumor   Q heard.E
          'Chitra heard the rumor that Ranjit bought what?'

The crucial difference between (16) and (17) is that while the Q particles are con-tiguous with their host *wh*-phrases in (16), the Q particles are attached at the right edge of the islands in (17). In (17), the *wh*-phrases are embedded inside the syn-tactic islands in the same way as those in (16), but the sentences are well-formed.

The data suggest that LF movement of the Q element rather than the *wh*-phrase should be responsible for the island effects observed in (16). In light of this consideration, I suggest that the LF A′-movement of a Q particle violates the island constraints when it occurs inside the islands, as illustrated in (18a).

(18) a. *[$_{CP}$ [$_{TP}$ [$_{ISLAND}$ WH   Q]]   ]
                                             |_____↑

      b.   [$_{CP}$ [$_{TP}$ [$_{ISLAND}$ WH] Q]   ]
                                              |_____↑

Needless to say, the Q particle does not incur island violations when it is adjoined to the islands, as in (18b), since its movement would not involve extraction from the syntactic islands. I assume that the Q element is a non-projecting head, so that it behaves as a phrasal element, although it looks like an X^0 element morphologically (Chomsky 1995). Under the present perspective, the Q particle serves as an operator to move into its scope position to assign scope to the *wh*-in-situ.

Since island violations are typically caused by overt A′-movement, it might be argued that the examples in (16) are rendered unacceptable by virtue of overt rather than covert exaction out of the islands. In effect, given the recent attempts to reduce the distinction between overt and covert movement to the question of whether the head or the tail member of a chain is pronounced (see Brody 1995; Pesetsky 1998; Groat & O'Neil 1996), one might argue that the island effects observed in the *wh*-questions in (16) should come from illicit movement taking place in narrow syntax (prior to LF).

(19) *[[$_{ISLAND}$ WH Q]]   Q̶]
                                    |_____↑

In this analysis, the island effects are incurred by overt extraction of a Q element, and the surface structure, where the Q element stays within the islands, is created by pronouncing the lower copy of the chain that has been formed in narrow syntax. Appealing though this analysis is, the facts of *wh*-questions cannot be fully accounted for under this approach.

There is in fact empirical evidence suggesting that the Q element should undergo movement not in narrow syntax but at LF. To make this point, observe first that (20), where the DP *ee potə* 'that book' has been extracted from the subordinate clause selected by *dannəwa* 'know' via pseudo-clefting, is fully acceptable.[4]

---

4. Factive predicates like *dannəwa* 'know', *matak kərənəwa* [memory do] 'recall', and *waaruta kərənəwa* [report do] 'report', just like non-factive verbs *hitənəwa* 'think' and *ahanəwa* 'ask', can take a CP-complement introduced by *kiyəla*, which is transparent to extraction. In Japanese, by contrast, factive complements selected by *siru* 'know' are necessarily nominalized, so that they

(20)   Oyaa [Chitra Ranjit-ţə   t$_i$ dunna kiyəla] danne <u>ee   potə$_i$</u>
         you   Chitra Ranjit-DAT   gave.A that   know.E that book
         'That book$_i$, you know that Chitra gave t$_i$ to Ranjit.'

The same verb can take an interrogative complement, which comprises a Q element. When the Q element is placed in clause-medial position, it is possible to extract a phrase from the embedded clause via pseudo-clefting in (21).

(21)   Oyaa [Chitra kaa-ţə   də t$_i$ dunna kiyəla] danne <u>ee   potə$_i$</u>.
         you   Chitra what-DAT Q   gave.E that   know.E that book
         'It is that book$_i$ that you know to whom$_j$ Chitra gave t$_i$ t$_j$.'

Example (21), which includes the overtly moved phrase via pseudo-clefting, does not display an island effect. An embedded *wh*-question forms an island for pseudo-cleft extraction, however, when the Q-element is placed clause-finally, as seen in (22).

(22)   ?*Oyaa [Chitra kaa-ţə   t$_i$ dunna **də** kiyəla] danne <u>ee   potə$_i$</u>.
           you   Chitra who-DAT   gave.A Q that   know.E that book
           'It is that book$_i$ that you know who Chitra gave t$_i$.'

The data show that the pseudo-clefting of DP causes a *wh*-island violation when *də* is placed to the left the complementizer, as in (22), but not when it is contiguous with the *wh*-phrase, as in (21).[5]

---

constitute an opaque domain for extraction. In Sinhala, some factive predicates take nominalized complements, as in (ia).

(i)   a.   Ranjit [Chitra ee   potə kieuwa kiəna ekə]   wiswaasə kərənəwa.
           Ranjit Chitra that book read.A that NOML belief   do.A
           'Ranjit believes that Chitra read that book.'
      b.   *Ranjit [Chitra t$_i$ kieuwa kiəna ekə]   wiswaasə kərənne <u>ee   potə$_i$</u>.
            Ranjit Chitra   read.A that NOML belief   do.E   that book
            'It is that book that Ranjit believes that Chitra read.'

Since the complement clause in (ia) constitutes a nominalized clause, a DP cannot be extracted from within the complement clause, as shown in (ib). In Sinhala, there is a correlation between the type of complement clause and the possibility of extraction, and extraction is possible when the verb takes a *kiyəla*-complement clause, regardless of whether the verb is factive or nonfactive. Note further that *kiənəwa* 'say' can take the two types of complements, but expresses a different meaning according to the type of complement it takes: *kiənəwa* counts as a non-factive verb when it takes a *kiyəla*-complement clause, but has a factive meaning when it takes a nominalized clause introduced by *kiəna ekə*.

5. The same contrast that is observed for the extraction of a direct object obtains even when the indirect object of a ditransitive verb is extracted.

The fact that (22) displays a *wh*-island effect for long distance pseudo-clefting can be accounted for, on the grounds that (22) has the configuration in (23a), where the cleft-focus operator resides in the embedded CP.

(23) a. $*[[_{CP}FOC_i [_{TP} [$ WH ~~FOC~~$_i$]   Q] DP$_i$]
  b. $[[_{CP}FOC_i [_{TP} [$ WH Q   ~~FOC~~$_i$]   ] DP$_i$]

I assume that the pseudo-cleft construction involves movement of a null operator FOC, which is co-indexed with the DP in cleft-focus position via predication (see also Section 3.2). In (23a), the Q-element at the end of the embedded clause c-commands the copy of the focus operator. As a consequence, the Q element serves as an intervener to block the long distance movement of the focus operator (FOC). The ill-formednesss of (22) can be attributed to a violation of the Minimality Condition (Rizzi 1990) or the Minimal Link Condition (Chomsky 1995). On the other hand, when the Q element is contiguous with the *wh*-phrase, as in (21), no *wh*-island effect emerges. The Q-element adjoined to the *wh*-phrase is located in such a position that it does not c-command the copy of the focus operator, as represented in (23b), and hence it does not count as an intervener incurring a *wh*-island violation.

The analysis taking a Q element to move in overt syntax, but not at LF, regardless of its surface position falls short of accounting for the facts of (21) and (22), since both sentences should have essentially the same overt constituent structure under this analysis. The absence of a blocking effect in (21) suggests that no operator resides in the scope position of the embedded clause when a Q element occurs contiguous with its associated *wh*-phrase. In contrast, a *wh*-island effect is observed in (22), where the Q element appears at the end of the embedded clause. This shows that an operator element to block overt pseudo-cleft extraction

---

(i) a. Oyaa [Chitra t$_i$ monəwa **də** dunne kiyəla] danne Ranjit-ţə$_i$.
  you   Chitra what   Q gave.E that   know.E Ranjit-DAT
  'It is to Ranjit$_i$ that you know what Chitra gave t$_i$.'

 b. ??Oyaa [Chitra t$_i$ monəwa dunna **də** kiyəla] danne Ranjit-ţə$_i$
   you   Chitra what   gave.A Q that   know.E Ranjit-DAT
   'It is to Ranjit$_i$ that you know what Chitra gave t$_i$.'

The embedded clause forms a syntactic island for extraction via scrambling even when *də* is attached to the right of the complementizer, as shown in (ii).

(ii) ?*Ranjit-ţə$_i$, oyaa [Chitra t$_i$ monəwa dunna kiyəla] **də** danne?
   Ranjit-DAT you Chitra what   gave.A that   Q know.E
   'To Ranjit$_i$, what do you know that Chitra gave t$_i$?'

In (ii), the *-e* ending on the matrix verb marks the scope of the *wh*-phrase, which shows that the Q element is base-generated to the right of the complementizer.

of DP is present in CP in *wh*-questions where a Q element appears in clause-final position. Furthermore, when a Q element is embedded in syntactic islands, island effects are invoked. The data suggest then that a Q element serves as an operator to assign scope to the *wh*-phrase, and that when it appears in clause-internal position, it undergoes LF movement to its scope position indicated by the *-e* marking on the predicate.

3.   The peculiar scope phenomena

In Sinhala, *wh*-phrases are most typically associated with a separable Q element, but some *wh*-phrases (*wh*-adjuncts *æi* 'why' and *mokə də* 'why') are not associated with a separable Q element. In this section, I argue that when a Q element is not usable for scope assignment to a *wh*-phrase, a null operator (OP) is inserted to the local scope position to specify the scope of the *wh*-phrases. In pseudo-cleft constructions, on the other hand, the strategy of null operator insertion is implemented when adverbial adjuncts appear in cleft-focus position. By comparison, Japanese *wh*-phrases are always associated with separable Q elements, so that the strategy of null operator insertion does not apply in non-cleft *wh*-questions.

3.1   *Wh*-phrases with non-separable Q

Wh-adjuncts like *æi* 'why' and *mokə də* 'why' are not associated with a separable Q element; *æi* must stand alone (with no associated Q element), and the Q element *də* appearing in *mokə də* is fixed in a position next to the *wh*-word, and cannot be separate from it. Thus, the examples in (24) are not well-formed.

(24) a. *Ranjit [Chitra æi   **də** aawe   kiyəla] dannəwa.
           Ranjit Chitra why q came.ᴇ that   know.ᴀ
           'Ranjit knows why Chitra came.'
      b. *Ranjit [Chitra mokə aawa   **də**] kiyəla] dannəwa.
           Ranjit Chitra why came.ᴀ q   that   know.ᴀ
           'Ranjit knows why Chitra came.'

Remarkably, these *wh*-adjuncts, which do not occur with a separable Q element, allow only short distance interpretations. When the *wh*-adjuncts appear in the embedded clause, they are allowed to take the embedded scope, but they are prevented from taking the matrix scope, as seen in (25).

(25) a.   Ranjit [Chitra {æi/mokə də} <u>aawe</u>   kiyəla] dannəwa.
            Ranjit Chitra {why/why Q} came.E that   know.A
            'Ranjit knows why Chitra came.'   (Embedded scope)

      b.   *Ranjit [Chitra {æi/mokə də} aawa   kiyəla] <u>danne</u>?
             Ranjit Chitra {why/why Q} came.A that   know.E
             'Why$_i$ did Ranjit know [that Chitra came t$_i$]?'   (Matrix scope)

As previously discussed, a Q element is responsible for determining the scope of
ordinary *wh*-phrases. Nevertheless, this type of scope determination is not pos-
sible with *wh*-adjuncts *æi* 'why' and *mokə də* 'why', because they are not associated
with separable Q elements. Then, the question that immediately arises is how the
scope of the *wh*-adjuncts is determined. I suggest here, in line with Kishimoto
(2005), that when no separable Q element is available, the scope of *wh*-phrases
is fixed by a null operator (OP) inserted directly into its local scope position, as
represented in (26).

(26) [$_{CP}$ [.... [$_{CP}$ OP$_i$ [....why$_i$ ....] that] know]]

In (26), the *wh*-adjunct serves as a variable bound by a null operator (OP) ap-
pearing in the embedded Spec-CP. The absence of long distance interpretation
follows, given that the invisible operator occupying Spec-CP is inserted just for
the purpose of forming an operator-variable structure (as a last resort strategy),
and does not undergo movement (Takahashi 1997; cf. Rizzi 1990). Since the *wh*-
adjuncts are not paired with separable Q elements, their scope needs to be fixed
by appeal to the last resort strategy of null operator insertion. I presume that the
null operator can only be inserted into the closest scope position to the *wh*-ad-
juncts to obtain the optimal (i.e. the most economical) structure to assign scope
to the *wh*-adjuncts.

    The view that a null operator (OP) is responsible for the scope assignment of
the *wh*-adjuncts gains empirical support from the embedded clause's forming an
opaque domain for A′-extraction in (27).

(27) *Ranjit [Chitra {æi/mokə də} t$_i$ gatte   kiyəla] danne <u>ee   potə$_i$</u>.
       Ranjit Chitra {why/why Q}   bought.E that   know.E that book
       'It is that book$_i$ that Ranjit knows why Chitra bought t$_i$.'

In (27), no Q element appears at the end of the embedded clause. Nevertheless,
(27) gives rise to an island effect for the long distance pseudo-cleft extraction.
The fact that *ee potə* 'that book' is prevented from undergoing extraction from
the embedded clause in (27) provides empirical evidence for the existence of a
phonologically-null operator (OP) base-generated in the embedded CP, as in (28).

(28) [$_{CP1}$ [$_{TP}$ … [$_{CP2}$ OP$_i$ [$_{TP}$ … WH$_i$ ….]]]]

If a null operator can be merged only in the clause where the *wh*-word is located, it follows that the long distance extraction of DP out of the island is not possible.

Alternatively, one might argue that the blocking effect is caused by the *wh*-adjuncts *æi* and *mokə də* themselves, if Ko's (2005) hypothesis that 'why'-adjuncts can be base-generated in Spec-CP is granted.

(29) *[$_{CP}$ [.... [$_{CP}$ Why   [....]   that] know] Q]

If a *wh*-adjunct is located in the embedded CP, it can be identified as an element blocking A′-extraction. Since both analyses, illustrated in (28) and (29), are possible theoretically, a question arises as to whether the *wh*-phrase itself or an invisible operator bars A′-extraction in (27).

In the following discussion, I suggest that the analysis taking a null operator to block A′-extraction in (27) is favored over the alternative taking a *wh*-adjunct to be base-generated in the embedded scope position. The present view gains support from the facts of the *wh*-phrase *kiiya da* 'how much', which is not associated with a separable Q element, as seen in (30).

(30) a.   Ranjit [Chitra kiiya   **də** geuwe kiyəla] dannəwa.
           Ranjit Chitra how.much Q paid.E that   know.A
           'Ranjit knows how much Chitra paid.'
      b. * Ranjit [Chitra kiiya   geuwa **də** kiyəla] dannəwa.
           Ranjit Chitra how.much paid.A Q that   know.A
           'Ranjit knows how much Chitra paid.'

The *wh*-phrase *kiiya də* is an argument selected by the verb *gewənəwa* 'pay', but the examples in (30) suggest that the scope of the *wh*-phrase should be generated via null operator insertion. This fact leads to the prediction that the *wh*-phrase *kiiya da* will not allow long distance interpretation, while local interpretation being permitted. This is in fact the case, as seen in (31).

(31) a.   Ranjit [Chitra kiiya   **də** <u>geuwe</u> kiyəla] dannəwa.
           Ranjit Chitra how.much Q paid.E that   know.A
           'Ranjit knows how much Chitra paid.'
      b. * Ranjit [Chitra kiiya   **də** geuwa kiyəla] <u>danne</u>?
           Ranjit Chitra how.much Q paid.A that   know.E
           'How much did Ranjit know that Chitra paid?'

Moreover, this *wh*-phrase induces a blocking effect for long distance pseudo-cleft extraction, even though a Q element does not appear at the end of the embedded clause, as illustrated in (32).

(32)   *[Ranjit [Chitra t$_i$ kiiya   **də** geuwe kiyəla] danne <u>arə kaḍe-di$_i$</u>.
         Ranjit   Chitra   how.much Q paid.E that   know.E that shop-at
         'It is at that shop that Ranji knows [how much Chitra paid].'

If the *wh*-phrase *kiiya də* is an argument selected by the verb *gewənəwa*, but not an adverbial adjunct, it is not possible to claim that it appears in Spec-CP (by way of base-generation). Still, this *wh*-phrase behaves in the same way as the *wh*-adjuncts *æi* and *mokə də*.

    The *wh*-phrase *kiiy-ak də* 'how much', just like *kiiya da*, is selected by the verb *gewənəwa* 'pay'. Interestingly, with the *wh*-phrase *kiiy-ak də*, it is possible to obtain long distance as well as local construal, as in (33).

(33)   a.   Ranjit [Chitra kiiy-ak   **də** geuwa kiyəla] danne?
             Ranjit Chitra how.much Q paid.A that   know.E
             'How much did Ranjit know that Chitra paid?'
        b.   Ranjit [Chitra kiiy-ak   geuwa **də** kiyəla] dannəwa.
             Ranjit Chitra how.much paid.A Q that   know.A
             'Ranjit knows how much Chitra paid.'

The *wh*-phrase *kiiy-ak də* differs from *kiiya də*, in that the former, but not the latter, is associated with a separable Q element. Notably, the separable Q element associated with *kiiy-ak də* blocks long distance A′-extraction via pseudo-clefting when it is placed at the end of the embedded clause, as shown in (34).

(34)   a. $^{??}$Ranjit [Chitra t$_i$ kiiy-ak   geuwa **də** kiyəla] danne <u>arə kaḍe-di$_i$</u>.
             Ranjit Chitra   how.much paid.A Q that   know.E that shop-at
             'It is at that shop that Ranjit knows how much Chitra paid.'
        b.   Ranjit [Chitra t$_i$ kiiy-ak   **də** geuwe kiyəla] danne <u>arə kaḍe-di$_i$</u>.
             Ranjit Chitra   how.much Q paid.E that   know.E that shop-at
             'It is at that shop that Ranjit knows how much Chitra paid.'

The *wh*-phrase *kiiy-ak də* 'how much' behaves as an ordinary *wh*-phrase, in that it does not induce a blocking effect when a Q element occurs contiguous with it.

    Importantly, in (32), unlike (34b), A′-extraction is blocked even without a Q particle at the end of the embedded clause. The *wh*-phrase *kiiya də* in (32) is *not* associated with separable *də*. Since this *wh*-phrase counts as a complement to the predicate *gewənəwa* 'pay', it cannot possibly be base-generated in CP. Given that the *wh*-adjuncts *æi* 'why' and *mokə də* 'why' display exactly the same scope behavior as *kiiya də*, it is plausible to state that in (27), the long distance extraction of the DP is blocked by a null operator inserted in its local scope position, but not by the *wh*-adjuncts. Taken together, the facts illustrate that in Sinhala, an invisible null operator (OP) to assign scope to a *wh*-in-situ appears in the local scope position when a *wh*-phrase is not associated with a separable Q element.

3.2   Null operator strategy in the pseudo-cleft construction

Sinhala pseudo-cleft constructions provide another case where a null operator is inserted into a local scope position for scope assignment (as a last resort strategy), but this syntactic operation is implemented under conditions different from those constraining non-cleft *wh*-questions.

First of all, observe that in pseduo-cleft constructions, arguments are allowed to have long distance as well as local construal, as exemplified in (35).

(35) a. Ranjit [Chitra t$_i$ kieuwa kiyəla] kiiwe <u>ee   potə$_i$</u>.
          Ranjit Chitra   read.A that   said.E that book
          'It was that book$_i$ that Ranjit said [that Chitra read t$_i$].'
      b. [Chitra t$_i$ kieuwe] <u>ee   potə$_i$</u>.
           Chitra   read.E   that book
          'It was that book$_i$ that [Chitra read t$_i$].'

On the other hand, reason and manner adjuncts, which are sometimes referred to as true (adverbial) adjuncts (Aoun & Li 1993a, 1993b), can have a short distance but not a long distance interpretation in the pseudo-cleft construction. The examples in (36) represent a case involving a reason adjunct.

(36) a. *[Ranjit [Chitra t$_i$ aawa   kiyəla] kiiwe] <u>mee heetu-wen$_i$</u>.
           Ranjit   Chitra   came.A that   said.E this reason-with
          'It was for this reason that Ranjit said that Chitra came.'
      b. [Chitra t$_i$ aawe] <u>mee heetu-wen$_i$</u>.
           Chitra   came.E this reason-for
          'It was for this reason that Chitra came.'

The same generalization extends to manner adjuncts, as seen in (37).

(37) a. *[Ranjit [Chitra t$_i$ aawa   kiyəla] kiiwe] <u>ee   widiyə-ṭə$_i$</u>.
           Ranjit   Chitra   came.A that   said.E that way-for
          'It was in that way that Ranjit said that Chitra came.'
      b. [Chitra t$_i$ aawe] <u>ee   widiyə-ṭə$_i$</u>.
           Chitra   came.E that way-for
          'It was in that way that Chitra came.'

The data show that an argument-adjunct asymmetry is observed for long distance pseudo-cleft extraction.

If pseudo-clefting involves movement of a null cleft-focus operator (FOC), it is plausible to state that focused arguments allow their associated focus operator to be generated in a clause-internal position (in the antecedent clause) to which they are related and that the focus operator undergoes A′-movement to its scope position, as illustrated in (38).

(38)   a. $[_{CP}$ FOC$_i$ $[_{TP}$ …. t_i ….]]   DP/PP   ]
        b. $[_{CP1}$ FOC$_i$ $[_{TP}$ $[_{CP2}$ t_i $[_{TP}$ …. t_i ….] that] said] DP/PP]

If pseudo-clefting involves A′-movement, both local and long distance interpretations are allowed. This happens when argument phrases are placed in cleft-focus position, as in (35).

In contradistinction, no long distance interpretation is permitted for reason and manner adjuncts in the pseudo-cleft constructions in (36) and (37). The non-existence of long distance interpretation in (36) and (37) is on a par with the absence of long distance interpretation for *wh*-adjuncts in *wh*-questions. Thus, I suggest that in the pseudo-cleft construction, *wh*-adjuncts cannot be paired with a focus operator (FOC), which can undergo A′-movement, and thus, a null operator (OP) is directly inserted in the local scope position for their scope assignment.[6]

(39)   a. $[[_{CP}$ OP$_i$ [………..]]   ] reason/manner-adjunct]
        b.   *$[[_{CP1}$ OP$_i$ $[_{TP}$ … $[_{CP2}$ t_i $[_{TP}$ …….]]]] reason/manner-adjunct]

Provided no movement is induced when a null operator (OP) is directly inserted into its local scope position, it follows that only the local construal is allowed for manner and reason adjuncts in the pseudo-cleft construction.

3.3   Scope asymmetries

In the pseudo-cleft construction, null operator (OP) insertion is implemented to generate the scope of manner and reason adjuncts. In the *wh*-focus constructions, by contrast, null operator (OP) insertion is applied when *wh*-phrases are not associated with a separable Q particle. Given that *wh*-phrases that do not accompany separable Q elements are not restricted to adverbial adjuncts, the *wh*-focus and pseudo-cleft focus constructions are expected to display different behaviors with regard to *wh*-questioning. In fact, the difference in the conditions imposed on null operator insertion between the two constructions gives rise to some peculiar scope behaviors of *wh*-phrases.[7]

Let us now observe the behavioral patterns of reason adjuncts, which are not associated with a separable Q element. With the reason adjuncts *æi* 'why' and

---

6. For reasons of space, I will not investigate the question of why adjuncts are prevented from obtaining long distance interpretation, but presumably, this can be attributed to the fact that these adjuncts function as non-referential adverbials, as discussed by a number of researchers (see e.g. Rizzi 1990; Aoun & Li 1993a, 1993b).

7. It goes without saying that *wh*-questioning is allowed in the pseudo-cleft construction when a *wh*-phrase is located in the cleft-focus position, as seen by the fact that (i) is a well-formed pseudo-cleft *wh*-question.

mokə də 'why', long distance interpretation is not allowed in both *wh*-focus and pseudo-cleft constructions.

(40) a. *Chitra [Ranjit {æi/mokə də} aawa   kiyəla] kiiwe?
          Chitra Ranjit {why/why Q} came.A that   said.E
          'Why did Chitra say that Ranjit came?'

      b. *Chitra [Ranjit t$_i$ aawa   kiyəla] kiiwe {æi$_i$/mokə də$_i$}?
          Chitra Ranjit   came.A that   said.E {why/why Q}
          'Why was it that Chitra said that Ranjit came?'

                                              (* on the intended interpretation)

This fact is naturally expected, since the null operator strategy must be used for the *wh*-adjuncts in forming *wh*-focus questions as well as pseudo-cleft *wh*-questions, as in (41).

(41) a. *[$_{CP1}$ [$_{TP}$ …. [$_{CP2}$ OP$_i$ [$_{TP}$ ….   WHY$_i$ ….] that] said] (Q)]
      b. *[$_{CP1}$ [$_{TP}$ …. [$_{CP2}$ OP$_i$ [$_{TP}$ ….   t$_i$ ….] that] said] WHY$_i$]

In both types of constructions, the *wh*-adjuncts cannot take matrix scope, since the null operator to assign their scope (as a last resort strategy) can appear only in the embedded clause.

With the manner adjunct *kohomə də* 'how', which is associated with separable *də*, a long distance interpretation is allowed in the *wh*-focus construction, but not in the pseudo-cleft construction, as shown in (42).

(42) a. Ranjit [Chitra Kolombə-ʈə   kohomə də yanəwa kiyəla] kiiwe?
          Ranjit Chitra Columbo-DAT how   Q go.A   that   said.E
          'How does Rajit say that Chitra will go to Columbo?'

      b. ?*Ranjit [Chitra Kolombə-ʈə   t$_i$ yanəwa kiyəla] kiiwe kohomə də$_i$?
          Ranjit Chitra Columbo-DAT   go.A   that   said.E how   Q
          'How was it that Ranjit said that Chitra will go to Columbo?'

(i) [Chitra t$_i$ gatte]   monəwa **də**$_i$?
     Chitra   bought.E what   Q
     'What did Chitra buy?'

Given that the Q element at the end of clause indicates the scope of *wh*-phrase, and that there is no predicate that can bear *-e* marking in (i), it is plausible to assume that the Q element is located in the matrix CP as a result of overt Q movement, as in (ii).

(ii) [$_{CP}$ [[$_{CP}$ FOC$_i$ […. t$_i$]   ] monəwa ɐ] Q]

Under this analysis, the *wh*-phrase is allowed to appear in the cleft-focus position as a result of two syntactic operations, i.e. focus operator (FOC) movement and predication, but not the direct movement of the *wh*-phrase from within the presupposed clause.

The *wh*-phrase *kohomə* accompanies a separable Q element that can undergo movement. This *wh*-phrase can have a long distance interpretation in the *wh*-focus construction (42a), since (43a) is legitimate.

(43) a. $[_{CP1} [_{TP} \ldots [_{CP2} [_{TP} \ldots \quad \text{HOW}_i \quad \ldots] \text{ that }] \text{ said}] \, Q_i]$
      b. $^*[_{CP1} [_{TP} \ldots [_{CP2} \text{OP}_i [_{TP} \ldots \quad t_i \quad \ldots] \text{ that }] \text{ said}] \, \text{HOW}_i]$

In the pseudo-cleft construction, in contrast, the null operator insertion strategy is used for *kohomə də*, which is categorized as an adverbial adjunct, as in (43b). Thus, no long distance interpretation is allowed for this *wh*-phrase when pseudo-clefting is involved, as in (42b).

Let us now proceed to discuss cases involving argument *wh*-phrases. With argument *wh*-phrases, a long distance interpretation is always possible in the pseudo-cleft construction, but in the *wh*-focus construction, the possibility of long distance *wh*-questioning varies, according to whether or not the *wh*-phrases are associated with a separable Q element.

In the first place, argument *wh*-phrases associated with a separable Q element can have long distance interpretations in both *wh*-focus and pseudo-cleft constructions. The examples in (44), which involve *monəwa də* 'what', illustrate this point.

(44) a. Ranjit [Chitra monəwa də gatta   kiyəla] danne?
          Ranjit Chitra what   Q bought.A that   know.E
          'What does Ranjit know Chitra bought?'
      b. Ranjit [Chitra t$_i$ gatta   kiyəla] danne monəwa də$_i$?
          Ranjit Chitra bought.A that   know.E what   Q
          'What is it that Ranjit knows Chitra bought?'

The availability of long distance interpretation in (44) is expected, since an argument *wh*-phrase like *monəwa də* does not appeal to the null operator insertion strategy in the *wh*-focus as well as the pseudo-cleft construction.

(45) a. $[_{CP1} \quad [_{TP} \ldots [_{CP2} \quad [_{TP} \ldots \quad \text{WHAT}_i \quad \ldots] \text{that }] \quad \text{said/knew}] \, Q_i]$
      b. $[_{CP1} \, \text{FOC}_i [_{TP} \quad [_{CP2} \, t_i \, [_{TP} \ldots \quad t_i \quad \ldots] \text{that }] \quad \text{said/knew}] \, \text{WHAT}_i]$

With the argument *wh*-phrase *monəwa,* a Q element, which can undergo movement, is used to fix its scope in the *wh*-focus construction in (44a). In the pseudo-cleft construction in (44b), a cleft-focus operator (FOC) can undergo movement, and thus can be associated with *monəwa* in the focus position. Accordingly, a long distance interpretation for *monəwa* is available in both types of constructions, as in (44).

The *wh*-phrase *kiiya də* 'how much' accompanies a non-separable Q element. With *kiiya də*, long distance construal is permitted in the pseudo-cleft construction, but not in the *wh*-focus construction, as shown in (46).

(46) a. ?*Ranjit [Chitra kiiya   də geuwa kiyəla] kiiwe?
          Ranjit Chitra how.much Q paid.A that   said.E
          'How much did Ranjit say that Chitra paid?'
      b.   Ranjit [Chitra t$_i$ geuwa kiyəla] kiiwe kiiya   də$_i$?
          Ranjit Chitra paid.A that   said.E how.much Q
          'How much$_i$ did Ranjit say that Chitra paid t$_i$?'

The scope of *kiiya də* is determined by way of null operator (OP) insertion into the local scope position in the *wh*-focus construction, as in (47a), so no long distance construal is possible, as seen in (46a).

(47) a. *[$_{CP1}$ [$_{TP}$ …. [$_{CP2}$ OP$_i$ [$_{TP}$ …. HOW.MUCH$_i$ ….] that] said] (Q)]
      b. [$_{CP1}$ FOC$_i$ [$_{TP}$ [$_{CP2}$ t$_i$ [$_{TP}$ …. t$_i$ ….] that] said] HOW.MUCH$_i$]

When the same *wh*-phrase *kiiya də* is placed in the focus position of the pseudo-cleft construction, a focus operator (FOC) appears in its scope position via A′-movement, as in (47b), so the long distance interpretation is allowed in (46b).

Note at this point that a non-*wh* complement taken by the verb *gewənəwa* 'pay', such as *mee taran mudəl-ak* 'this much money', can have a long distance as well as a local interpretation in the pseudo-cleft construction, as seen in (48).

(48) a. Chitra [Ranjit t$_i$ geuwa kiyəla] kiiwe <u>mee taran mudəl-ak$_i$</u>.
          Chitra Ranjit   paid-A that   said-E this much money
          'It was this much money that Chitra said that Ranjit paid.'
      b. [Ranjit t$_i$ geuwe] <u>mee taran mudəl-ak$_i$</u>.
           Ranjit   paid-E this much money
          'It was this much money that Ranjit paid.'

Since *mee taran mudəl-ak* is not an adjunct, movement of a focus operator (FOC) is implemented to fix its scope in the pseudo-cleft construction. Accordingly, *mee taran mudəl-ak* is allowed to have both local and long distance interpretations in the pseudo-cleft construction.

Furthermore, as noted earlier, *kiiy-ak də*, unlike *kiiya də*, is associated with a separable Q element. Thus, a long distance interpretation is allowed for *kiiy-ak də* in both *wh*-focus and pseudo-cleft constructions.

(49) a. Ranjit [Chitra kiiy-ak   **də** geuwa kiyəla] kiiwe?
          Ranjit Chitra how.much Q paid.A that   said.E
          'How much did Ranjit say that Chitra paid?'

    b.   Ranjit [Chitra geuwa kiyəla] kiiwe kiiy-ak   **də?**
       Ranjit Chitra paid.A that   said.E how.much Q
       'How much did Ranjit say that Chitra paid?'

This behavior of *kiiy-ak də* is the same as what is observed for other argument *wh*-phrases accompanying a separable Q element. The data show that both *kiiy-ak də* (occurring with a separable Q element) and *kiiya də* (occurring with a non-separable Q) do not resort to the null operator insertion for their scope assignment when they are placed in the focus position of the pseudo-cleft construction.

    In essence, Sinhala implements either operator movement (Q-particle movement or focus operator movement) or null operator insertion to generate the scope of *wh*-in-situ. When operator movement is involved, *wh*-phrases can have long distance interpretations, but when null operator (OP) insertion takes place in the local scope position, *wh*-phrases can have only the local interpretation. Notably, *wh*-phrases display four distinct patterns with regard to the possibility of long distance interpretation, which are determined by the type of *wh*-phrase, as (50) illustrates.

(50)

	æi/mokə də	*kohomə də*	*kiiya də*	*monəwa də/kiiy-ak də*
Ordinary *wh*	*	√	*	√
Cleft *wh*	*	*	√	√

These four patterns emerge because the conditions on the null operator strategy to be used for the purpose of forming an operator-variable structure differ between *wh*-focus constructions and pseudo-cleft constructions.

3.4   The Japanese case

As a final point, let us briefly discuss what happens in Japanese *wh*-questions. Japanese differs from Sinhala, in that all types of *wh*-phrases are associated with separable Q elements. Thus, in Japanese, only two out of four logically possible patterns of *wh*-questioning are realized.

    To be concrete, in ordinary, non-cleft *wh*-questions in Japanese, there is no difference in availability of long distance reading between adverbial adjuncts and argument *wh*-phrases.

  (51) a.   Ken-wa [Mary-ga   nani-o   kat-ta   to] it-ta   no?
          Ken-TOP Mary-NOM what-ACC buy-PST that say-PST Q
          'What did Ken say that Mary bought?'
      b.   Ken-wa [Mary-ga   {naze/donoyoo-ni} ki-ta   to] it-ta   no?
          Ken-TOP Mary-NOM why/how   come-PST that say-PST Q
          'Why/How did Ken say that Mary came?'

This is precisely because the scope of *wh*-phrases is always fixed relative to the position of a separable Q element.

   On the other hand, the conditions imposed on null operator (OP) insertion in the pseudo-cleft construction are the same in Sinhala and Japanese. Thus, the following contrast in acceptability is observed when pseudo-clefting is invoked.

(52) a. Ken-ga [Mary-ga t_i kat-ta to] it-ta   no   wa nani$_i$ desu ka?
          Ken-NOM Mary-NOM   buy-PST that say-PST NOML TOP what COP Q
          'What was it that Ken said that Mary bought?'
      b. *Ken-ga [Mary-ga t_i ki-ta   to] it-ta   no   wa
           Ken-NOM Mary-NOM   come-PST that say-PST NOML TOP
          {naze$_i$/donoyoo-ni$_i$} desu ka?
          {why/how}   COP Q
          'Why/How was it that Ken said that Mary came?'

The contrast in acceptability between (52a) and (52b) shows that the null operator (OP) is inserted into the local scope position (as a last resort strategy) when reason and manner adjuncts appear in the focus position of the pseudo-cleft construction.[8] In Japanese, since *wh*-phrases are always associated with separable Q elements, only two patterns (out of four logical possibilities) are attested for the long distance scope assignment for *wh*-questioning in cleft and non-cleft constructions.

4.   Conclusion

In this paper, it has been argued that in Sinhala *wh*-questions, a (separable) Q element serves as an operator to encode the scope of its associated *wh*-phrase. In Sinhala, even though the scope of *wh*-phrases is typically determined relative to the (LF) position of a separable Q element associated with them, there is another way of specifying scope for *wh*-phrases, which resorts to a null operator (OP) merged externally with the local Spec-CP. The null operator insertion takes place if the scope of a focused constituent cannot be determined by way of operator movement (Q-particle movement or focus operator movement). When the last resort

---

8. It is worth noting that in Japanese, this adjunct effect is observed for relativization (in addition to pseudo-clefting), as noted by Saito (1985), Takahashi (1997) and Murasugi (1991, 2000). Not surprisingly, Sinhala relativization displays the same adjunct effect, although, for reasons of space, I will not discuss the facts in this paper (see Kishimoto 2005). On the basis of the facts of relative clauses in Japanese, Murasugi (1991) argues that Japanese relativization does not include CP projections. Note that the proposed analysis in this paper makes the suggestion to the contrary, i.e. CP should be projected (in relative clauses) because a null operator is inserted in their scope position when their relative heads are reason and manner adjuncts.

strategy of null operator insertion is implemented in *wh*-questions, long distance interpretation is not allowed for *wh*-phrases. In Sinhala, null operator insertion takes place in *wh*-focus and pseudo-cleft constructions under different conditions, and this leads to some peculiar scope behaviors of *wh*-phrases.

Acknowledgment

I am grateful to Dileep Chandralal for providing me with Sinhala data. Thanks also go to the two reviewers for their comments and suggestions for improvements of an earlier version of the present paper.

References

Aoun, J. & Li, Y. A. 1993a. *Wh*-elements in situ: Syntax or LF? *Linguistic Inquiry* 24: 199–238.

Aoun, J. & Li, Y. A. 1993b. *Syntax of Scope*. Cambridge MA: The MIT Press.

Brody, M. 1995. *Lexico-Logical Form*. Cambridge MA: The MIT Press.

Chandralal, D. 2010. *Sinhala* [London Oriental and African Language Library 15]. Amsterdam: John Benjamins. https://doi.org/10.1075/loall.15

Chomsky N. 1995. *The Minimalist Program*. Cambridge MA: The MIT Press.

Gair, James. 1983. Non-configurationality, movement, and Sinhala focus. Paper presented at the Linguistic Association of Great Britain, Newcastle, September 1983. Published in Gair 1998: 50–64.

Gair, J. 1998. *Studies in South Asian Linguistics: Sinhala and other South Asian Languages*. Oxford: OUP.

Gair, J. & Sumangala, L. 1992. What to focus in Sinhala. In *Proceedings of the Eighth Eastern States Conference on Linguistics*, 93–108. Ithaca NY: CLC Publications.

Groat, E. & O'Neil, J. 1996. Spell-out at the LF interface. In *Minimal Ideas: Syntactic Studies in the Minimalist Framework* [Linguistik Aktuell/Linguistics Today 12], W. Abraham, S. D. Epstein, H. Thráinsson & C. J- W. Zwart (eds.), 113–139. Amsterdam: John Benjamins. https://doi.org/10.1075/la.12.07gro

Hagstrom, P. 1998. Decomposing Questions. PhD dissertation, MIT.

Kishimoto, H. 1992. LF pied piping: Evidence from Sinhala. *Gengo Kenkyu* 102: 46–87.

Kishimoto, H. 2005. *Wh*-in-situ and movement in Sinhala questions. *Natural Language & Linguistic Theory* 23: 1–51. https://doi.org/10.1007/s11049-004-6574-0

Ko, H. 2005. Syntax of why-in-situ: Merge into [Spec, TP] in the overt syntax. *Natural Language & Linguistic* Theory 23: 867–916. https://doi.org/10.1007/s11049-004-5923-3

Murasugi, K. 1991. Noun Phrases in Japanese and English. A Study in Syntax, Learnability, and Acquisition. PhD dissertation, University of Connecticut, Storrs.

Murasugi, K. 2000. Japanese complex noun phrases and the antisymmetry theory. In *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, R. Martin, D. Michaels & J. Uriagereka (eds.), 209–234. Cambridge MA: The MIT Press.

Pesetsky, D. 1998. Some optimality principles of sentence pronunciation. In *Is the Best Good Enough? Optimality and Competition in Syntax*, P. Barbosa, D. Fox, P. Hagstrom, M. McGinnis & D. Pesetsky (eds.), 337–383. Cambridge MA: The MIT Press.

Rizzi, Luigi. 1990. *Relativized Minimality*. Cambridge MA: The MIT Press.

Saito, M. 1985. Some Asymmetries in Japanese and Their Theoretical Implications. PhD dissertation, MIT.

Takahashi, D. 1997. Move-F and null operator movement. *The Linguistic Review* 14: 181–196. https://doi.org/10.1515/tlir.1997.14.2.181

Autosegmental evaluative morphology in Japanese

Augmentative and diminutive mimetics

Takashi Toyoshima

Tohoku Gakuin University

Augmentatives and diminutives have never been recognized as such in grammars of Japanese though they constitute well-recognized classes in many languages, under the rubric of evaluative morphology. This study puts forward a view that the Japanese augmentatives and diminutives are found predominantly in the mimetic vocabulary, and especially as autosegmental subphonemic morphemes, thus escaping recognitions as such, in otherwise segmental agglutinative morphology of Japanese.

Keywords: mimetics, evaluative morphology, autosegmental morphology, subphonemic morpheme, augmentative, diminutive, intensification

1. Introduction

Japanese is typologically known to have rather straightforward agglutinative morphology, concatenating discernable prefixes and/or suffixes whether derivational or inflectional. Compounding is another productive morphological process of word formation in Japanese that also shows the agglutinative trait of concatenative morphology. Other morphological processes for word formation in Japanese include neologism, borrowing, clipping, and reduplication (Shibatani 1990; Tsujimura 1996; i.a.).

Reduplication is generally iconic or sound-symbolic, expressing some tones of intensification, repetition, or continuation (Moravcsik 1978; Rubino 2005; i.a.), and hence it is not unexpected to be prevalent in mimetics, sound-symbolic or ideophonic vocabulary that constitutes an essential part of the Japanese lexicon.

This study is concerned with the Japanese mimetics, many of which often appear in reduplicated forms as below:

(1) a. *kata~kata*
         'homogeneous dry, woody clattering'
     b. *sara~sara*
         'homogeneously smooth, powdery, velvety'

Not all, but many of them come in a set of homorganic voicing and/or palatalization oppositions.

(2) a. *gata~gata*
         'homogeneous large rattling'
     b. *zara~zara*
         'homogeneously rough, coarse, sandy'

(3) a. *katʸa~katʸa*
         'nonhomogeneous small clinking'
     b. *sʸara~sʸara*
         'nonhomogeneous light, shaggy abrading'

(4) a. *gatʸa~gatʸa*
         'nonhomogeneous large clanking'
     b. *zʸara~zʸara*
         'nonhomogeneous crude jangling'

Based on Hamano's (1986) seminal work on the Japanese mimetics, Mester and Itô (1989) offer an autosegmental account of palatalization in Japanese mimetics, claiming that "the palatal prosody is a surface manifestation of an independent autosegmental morpheme" (ibid.: 268ff.), and that the voicing contrast involves the subsegmental [voice] feature as an autosegmental morpheme (ibid.: 284ff.). Since Hamano (op. cit.), many others (Akita 2009, and the references cited therein) have been trying to describe the intricate semantic or pragmatic imports of voicing and palatalization, yet it has proven to be elusive and difficult to contour.

This study suggests that this state of affairs evokes evaluative morphology, and that voicing and palatalization in Japanese mimetics are augmentative and diminutive, respectively, well-founded morphological classes in many typologically diverse languages (Körtvélyessy & Stekauer 2011; Grandi & Körtvélyessy 2015; Körtvélyessy 2015; and the references cited therein), but have escaped their recognitions as such in the grammar of Japanese.[1] This is perhaps due to the autosegmental subphonemic nature of the morphemes, which is very peculiar in otherwise well-behaved agglutinative morphology in Japanese.

---

1. Evaluative morphology has also been called "affective," "alternative," "appreciative," "expressive," or "emotive" morphology in the literature.

2.   Augmentatives and diminutives: Evaluative morphology

Augmentatives and diminutives are words or morphological forms of words that add some derivative meanings to their base words. Augmentatives express a greater degree of size, quantity, quality, intensity, or some other properties, such as seniority or vulgarity. Diminutives are the opposite of augmentatives, expressing a weaker degree of size, quantity, quality, intensity or some other properties, such as delicateness, intimacy, affection, or weakness. Augmentatives (AUG) and diminutives (DIM) are often subsumed under the name of evaluatives or evaluative constructions, together with pejoratives (PJR) and amelioratives (AML).

It is perhaps the pioneering work of Scalise (1984) that sparked the current surge of studies on evaluatives. Scalise (ibid.: 131ff.) proposed evaluative morphology as a third level between derivational and inflectional morphology, identifying six characteristics for evaluative suffixes in Italian.

(5) They change the semantics of the base.
   a. *lume*   > *lumino*
       'lamp'   'little lamp'
   b. *macchina*   > *macchinina*
       'car'   'toy car'

(6) They allow the consecutive application of more than one rule of the same type, and at every application the result is an existent word.
   a. *fuoco*   > *fuoch-erello*   > *fuoch-erell-ino*
                        fire-DIM   fire-DIM-DIM
       'fire'   'little fire'   'nice little fire'
   b. *uomo*   > *om-accio*   > *om-acci-one*
                        man-AUG   man-AUG-AUG
       'man'   'bad man'   'big bad man'

(7) They are always external with respect to other derivational suffixes and internal with respect to inflectional morphemes.
       *contrabbando-iere-**ucolo**-i*   > *contrabbandierucoli*
       contraband-AGENTIVE-**PJR.M.SG**-M.PL   'small-time smuggler'

(8) They allow, although to a limited extent, repeated application of the same rule on adjacent cycles.
       caro   > *car-ino*   > *car-in-ino*
       'nice'   'nice-DIM'   'nice-DIM-DIM'

(9) They do not change the syntactic category of the base they are attached to.
   a. *tavolo*   > *tavolino*   (noun)
       'table'   'small table'

b. *giallo*   >   *giallino*   (adjective)
   'yellow'   'yellowish'

c. *bene*   >   *benino*   (adverb)
   'well'   'so-so'

(10)   They do not change the (morpho)syntactic features or the subcategorization frame of the base.

a. *letto*   >   *lettino*   (concrete noun)
   'bed'   'little bed'

b. *idea*   >   *ideuzza*   (abstract noun)
   'idea'   'little idea'

c. *giocare*   >   *giocherellare*   (intransitive verb)
   'to play'   'to play around'

d. *mangiare*   >   *mangiucchiare*   (transitive verb)
   'to eat'   'to nibble'

The properties (5), (6) are shared with derivational morphology whereas (9), (10) with inflectional morphology. Having the properties (7), (8), evaluative suffixes cannot be grouped either with derivational or inflectional. Thus, Scalise (op. cit.) posits evaluative morphology as a separate level of subcomponent, between derivational and inflectional levels of morphology.

However, Scalise's proposal was principally based on Italian evaluative suffixes in the framework of level-order morphology (Siegel 1974; Allen 1978; i.a.: cf. Kiparsky 1982), and there are counterexamples for each of the above properties (5)–(10) when we look outside of Italian (Stump 1993; Beard 1995; Bauer 1997; Grandi & Körtvélyessy, op. cit.; i.a.).[2] In addition, evaluative expressions are cross-linguistically not limited to affixation or even to morphology, manifesting at various linguistic levels, by a variety of means: sound symbolism, tonal variation, reduplication, compounding, suppletion, gender shift, root internal modification, syntactic modification, or grammatical displacement (Haas 1972; Štekauer 2015; Grandi & Körtvélyessy op. cit.; and the references cited therein).

Another important aspect of evaluatives that has been a topic of discussion is about their elusive, multifarious, sometimes seemingly chaotic meanings. Advocating a new area of morphopragmatics, Dressler and Merlini-Barbaresi (1994) argue that in order to capture such varied meanings of evaluatives, a pragmatic variable must be incorporated in the description of their meanings. Evaluative word-formation contributes systematic, autonomous pragmatic meaning changes to the speech act in a given context. Two features are proposed for

---

2. The prevailing view is that the distinction between inflection and derivation, on which level-order morphology is based, is not an absolute or categorial dichotomy but rather relative and gradient on a continuum (Beard 1982; Halle & Mohanan 1985; i.a.).

the pragmatic variables in evaluatives: fictiveness and non-seriousness. (Merlini Barbaresi 2015; i.a.)

Placing CHILD as the historically and semantically prior sense of the diminutive, Jurafsky (1993) proposes a structured polysemy model for the semantics of diminutives, based on the radial category of Lakoff (1987). From the central core sense of CHILD, varied senses of diminutives are derived in a unidirectional graph with links representing mechanisms of semantic shifts in four types: metaphor, inference, generalization (or bleaching), and lambda-abstraction. Laying LITTLE as the prior sense to CHILD, Prieto (2005) modifies Jurafsky's model of the diminutive, and proposes a separate model of structured polysemy for augmentatives.

Grandi (2002) educes two perspectives, quantitative and qualitative, for linguistic evaluation; the former is objective and verifiable description of the referent whereas the latter is subjective and interpretive assessment from the speaker's perception in a given context. Grandi (ibid.: 31ff.) casts these two perspectives onto two axes of size and of feeling, abstracting Wierzbicka's (1996) semantic primitives onto two scales, BIG – SMALL and GOOD – BAD, respectively, and arranges the semantic functions of evaluatives as can be tabulated as below:

(11)

	Quantitative	*Qualitative*
+	BIG (AUG)	GOOD (AML)
	augmentation	*intensification*
		endearment
		prototypicality
−	SMALL (DIM)	BAD (PJR)
	diminution	*attenuation*
		contempt
		approximation

Not all, in fact not many, languages have distinct expressions for all four types of semantic values, and the two perspectives, quantitative and qualitative, are often conflated, sometimes with the polarity of one axis inverted. Thus, augmentatives and diminutives can shift into pejorative as well as ameliorative values. Consequently, evaluatives often have manifold meanings. For example, the Italian suffix *-ino* can express diminution (12a), endearment (12b), contempt (12c), or singulative (12d):

(12) a. *libro*   >   *librino*   (Grandi & Körtvélyessy, op. cit., 5f.)
          'book'   'booklet'
      b. *marito*   >   *maritino*
          'husband'   'dear husband'

c.   *dottore*   >   *dottorino*
    'doctor'   'untrustworthy doctor, quack'
d.   *zucchero*   >   *zuccherino*
    'sugar'   'sugar lump'

Diminutives are the most prevalent forms of evaluatives, and it is not cross-linguistically common that qualitatives, i.e., amelioratives and pejoratives, are formally distinct from quantitatives.

Körtvélyessy (op. cit.) puts forward an alternative model where evaluatives are founded in the supercategory of the QUANTITY continuum from augmentatives to diminutives, anchored in four onomasiological cognitive categories: SUBSTANCE (material objects, including human beings), ACTION (actions, states, including process), QUALITY (properties, features, characteristics), and CIRCUMSTANCE (location, time, manner of action, cause of action, etc.), typically expressed on nouns, verbs, adjectives, and adverbs, respectively. By recognizing ACTION as a domain of evaluatives, aspectuality and actionality fall under the subject of evaluatives, such as pluractionality, frequentativity, iterativity, distributiveness, conation, etc. (Tovena 2015). These quantitative evaluatives can shift metaphorically to qualitative evaluatives, such as pejoratives, amelioratives, hypocoristics, etc. When the evaluatives are put into use, they can acquire various additional shades of emotive coloring, such as admiration, contempt, etc.

Körtvélyessy (op. cit.) also devotes a whole chapter to the significance of sound-symbolic phonetic iconicity in evaluative morphology, but its nature is argued to be areal rather than universal (cf. Bauer 1996).

3.   Mimetics in Japanese

3.1   Lexicological status

Based on their etymological origins, traditional grammar of Japanese recognizes at least three strains of vocabulary: (13) *Yamato kotoba* or *wago*, native Japanese vocabulary, inherited from Old Japanese; (14) *kango*, Sino-Japanese vocabulary, borrowing from Chinese or coined from Chinese roots; and (15) *gairaigo*, foreign loanwords, borrowing from languages other than Chinese, mostly from the European languages, with increasing neologisms from English, in particular.

In addition, modern theoretical phonology identifies the mimetics in Japanese as another strain of the vocabulary, and these four strains of the vocabulary are taken to constitute strata/levels in the level ordering of lexical phonology (Kiparsky, op. cit.), each of which is subject to a different set of morphophonological rules and/or constraints (McCawley 1968; Itô & Mester 1995; i.a.).

Although it is natural that each etymological strain of the vocabulary embodies its respective lexical stratum, the mimetics is not an etymological strain. Thus, we find mimetics in native (16a), Sino-Japanese (16b), as well as foreign-loan roots (16c), such as the following:[3]

(16) a. *sizu~sizu*
          'a quiet, soft, slow, graceful manner'
      b. *hyou~hyou*
          'easy-going, aloof, standoffish, undemonstrative'
      c. *zigu~zagu*
          'zig-zag'

That is, the mimetics constitute a "file" that cross-cuts the other three strata of the Japanese lexicon.[4]

3.2   Morphophonology of mimetics

Lexically, Japanese mimetic "roots" can form verbs and adverbs, as well as adjectives and nouns.[5] Morphophonologically, mimetic "roots" can be either

---

3. It may be controversial whether or not reduplicated Sino-Japanese roots such as *hyou~hyou*, *dou~dou*, *ran~ran*, etc. can be taken as mimetics. Other than reduplication, their unreduplicated roots do not usually tolerate the morphophonological modifications characteristic of the mimetics surveyed in Section 3.2., and many of non-reduplicated roots have lost their currencies in the present-day colloquial style. Yet, reduplicated Sino-Japanese roots clad a strong air of mimetics with some rhetorical or metaphorical extensions from their unreduplicated roots.

For instance, *hyou* etymologically means 'gust' or 'flutter,' and when followed by the particle *to*, it can be used adverbially, meaning 'indifferent,' and when reduplicated, it is further extended to convey some meaning of 'easy-going, aloof, standoffish, undemonstrative' (16b).

Dou, in *dou~dou*, means 'a palace, a temple, a shrine, a chamber,' in isolation that appears in an obsolete set phrase *dou ni nobor-i, situ ni ir-a-zu*, the literal meaning of which is something like 'one has visited the palace, but not entered its backroom,' translated from part of a verse [*Ancient Times* 11:15] in *the Analects of Confucius*, which is intended to mean 'one has culminated, but not attained the quintessence.' It was later syncopated and altered into an affirmative idiom *dou ni ir-u* that literally means 'to enter the palace,' signifying 'masterly, adept, quintessential, consummate.' Clipped to the first word *dou* alone and reduplicated, *dou~dou* is taken to convey 'state, grandness, dignity, bravery, confidence, pride,' whose backdrop is almost completely opaque for average speakers of Japanese. We may regard these Sino-Japanese roots as "quasi-mimetics," in the sense of Akita (op. cit.).

4. As noted in fn.2, the level ordering in morphophonology has been questioned.

5. We adopt the term "root" for the precategorial seminal core of mimetic words in the sense of Hamano (op. cit., 18ff.) though we describe them in terms of morae, instead of syllables that Hamano employs. It is also sometimes referred to as "base" in the literature.

monomoraic or bimoraic. However, monomoraic roots cannot appear alone themselves. There are suffixes that turn them into minimal prosodic words (Poser 1990; Itô & Mester 1995; i.a.). The moraic glottal stop /-Q/ is a suffix that geminates and assimilates to the following voiceless obstruent, signaling a sudden stop, burst, or the single occurrence, of an action; whereas the moraic nasal /-N/ is another suffix that "produces a sense of prolonged resonance or that of rhythmicity" (Shibatani 1990: 155f.). These suffixes have some connotations of aspectuality (Akita, op. cit.) or of actionality, and such connotations may well be regarded as of evaluatives, as summarized at the end of Section 2 (Körtvélyessy op. cit.; Tovena op. cit.; i.a.).

Diphthongization and lengthening (or gemination) of the vowel of the monomoraic roots are other means of enhancing them toward minimal words, with all their concomitant semantic modifications.

Diphthongization in monomoraic roots are limited to /ai, oi, ui/, and since /ai/ occurs only as in *wai*(~*wai*) 'clamorously' (Hamano op. cit., 94ff.), /-i/ may well be considered as another suffix (Kadooka 2007). It connotes a swift change in direction, or a casual onset, of motion. Again, it is closely related to aspectuality or actionality.

On the other hand, lengthening of all five vowels /aa, ii, uu, ee, oo/ are found for monomoraic roots, and it is futile to posit a suffixal morpheme of five distinct allomorphs that match the vowel of the selecting roots. Vowel lengthening (or gemination) may be considered as reduplication of the vowel, and as reduplication generally does, it symbolizes intensity, as well as extension or exertion. The connotation of intensity by reduplication is typical of evaluatives.

Suffixation with a moraic consonant /-Q/ or /-N/ can take place after suffixation with the diphthongizing /-i/ or vowel reduplication as in *gu-i-Q* 'jerkingly' or *gu-u-N* 'forcefully.' The particle *to* is obligatory to further support the suffixed or vowel-reduplicated monomoraic roots.[6] In colloquial style, mimetics less than four morae cannot stand as minimal words. Stacking of the same types of suffixes is evocative of evaluative morphology (6), (8).

Reduplication of the entire roots is another strategy for expanding monomoraic roots toward minimal words, and yet they still require the support by the particle *to*. Simple reduplication sounds archaic and is usually limited to literary style.

---

6. Even though *to*, following the mimetics functioning adverbially, is usually taken to be a quotative particle, or a complementizer in the literature, it may as well be a conjugated form of the fossil copula *taru*. The adverbial form (*renyoo-kei*) of *taru* is also *to*, and unlike the modern copula *da*, the fossil copula *taru* is defective in that it conjugates only for the attributive form (*rentai-kei*) *taru* and the imperative form (*meirei-kei*) *tare*, other than the adverbial form *to*. The modern copula *da* does not conjugate into the imperative form. For the obligatoriness/optionality of *to*, the interested reader is referred to Akita (op. cit.), Nasu (2002), i.a., and the references cited therein.

(17) a. *Kankyaku wa **ka~ka** to   oowarai si-ta.*
          audience TOP roaring QUOT guffaw do-PST
          'The audience guffawed *roaringly*.'

    b. *Sono otoko wa **sa~sa** to   tatisat-ta.*
          that man   TOP nimble QUOT leave-PST
          'That man left *nimbly*.'

In colloquial style, reduplicated monomoraic roots usually take a moraic conso-
nantal suffix /-Q/ or /-N/, as in *gu~gu-Q* or *gu~gu-N*, or with the diphthongizing
suffix /-i/ or vowel-reduplication as in *gu~gu-i* or *gu~gu-u,* and further suffixed
with a moraic consonantal suffix /-Q/ or /-N/, as in *gu~gu-i-Q* or *gu~gu-u-N.*

   The moraic consonants /Q/ and /N/ can also appear in the middle of reduplica-
tion. These may well be derived as partial reduplication of suffixed monomoraic
roots.[7]

(18) a. *Kare wa kane o   **pa-Q~pa** to   tukat-ta.*
          he   TOP money ACC cursorily   QUOT use-PST
          'He spent his money *cursorily*.'

    b. *Kankyaku wa **ya-N~ya**   no kassai o   okut-ta.*
          audience   TOP tumultuous COP applause ACC send-PST
          'The audience gave a *tumultuous* applause.'

Or they may be analyzed by apocope of the final moraic consonant after total
reduplication, as total reduplication of suffixed or of vowel-reduplicated monomo-
raic roots are widespread.

   When monomoraic roots are reduplicated, they naturally end up in bimoraic
$(C_1)V_1 \sim (C_1)V_1$, but they are different from the bimoraic roots $(C_1)V_1(C_2)V_2$, in
that either the consonants, the vowels, or both are distinct in the first and the sec-
ond mora in the bimoraic roots.

   The bimoraic roots can also take the moraic consonantal suffix /-Q/ or /-N/,
just as the monomoraic roots do, carrying the same nuance of unidirectional
forcefulness and reverberation, respectively.

(19) a. *Kare wa nani o   iw-are-te   mo   **biku**   to   mo*
          he   TOP what ACC say-PASS-GER though startling QUOT even
          si-nakat-ta.
          do-NEG-PST
          'No matter what was said, he didn't budge an inch.'

---

7. Although Hamano (op. cit., 84f.) asserts, "No form with /N/ can be reduplicated this way"
in contrast to "a handful of forms with /Q/," we find (18b) perfectly natural, perhaps only one
possible.

b. *Kare wa zyuusei ni **biku-(u/*i)-Q/N** to   si-ta.*
    he   TOP gunshot at startling   QUOT do-PST
    'He *startlingly* flinched at a gun shot.'

The root final vowel of the bimoraic roots can be reduplicated before suffixation with /-Q/ or /-N/, but cannot be suffixed with diphthongizing /-i/ as in monomoraic roots. Instead, there is another suffix /-ri/, which occurs exclusively with bimoraic roots (Kuroda 1965; McCawley 1968; Hamano op. cit.; i.a.).

(20) *Kare wa zyuusei ni **biku-ri** to   se   o   kowabar-ase-ta.*
     he   TOP gunshot at startling QUOT back ACC stiffen-CAUS-PST
     'He *startlingly* stiffened his back at a gun shot.'

Kadooka (op. cit.) suggests that this suffix /-ri/ may be a variant of the diphthongizing /-i/ for the monomoraic roots. Nevertheless, they do not seem to share the same semantic effects. The bimoraic-only /-ri/ connotes a gradual slowing stop or an end-point of the phenomenon depicted whereas the monomoraic-only /-i/ produces semantic effects of "spinning change of direction, casualness, ease, deftness" of motion.[8] Yet, /-ri/ also has some connotations of actionality or aspectuality, and hence of evaluatives.

The bimoraic roots suffixed with /-ri/ may yield the so-called "emphatic" mimetics when a moraic consonant is epenthesized between the two morae, as in *bi<Q>ku-ri*. The <N> is epenthesized if the following consonant is voiced, other than /r/.[9]

(21) *Heya no ondo   ga   **zi<N>wa-ri** (to) agat-ta.*
     room GEN temperature NOM gradual   QUOT rise-PST
     'The room temperature rose *seepingly*.'

These two epenthetic moraic consonants <Q> and <N> must be distinguished from the homophonous moraic consonants that are suffixes, as the former two do not carry the characteristic meaning of the latters: unidirectional forcefulness and reverberation, respectively. Furthermore, the former two are archiphonemic, showing complementary phonotactic distribution (<Q> before voiceless obstruents and <N> before voiced consonants) whereas the latter two are not; both suffixal moraic consonants can appear before the particle *to*, a voiceless obstruent.

---

8. Martin (1952, 68f.) surmises that the suffix /-ri/ may have been derived from the verbalizing suffix /-r/ and the infinitive ending /-i/.

9. The epenthesized moraic consonant <N> does not appear before /d/ or /r/ although they are voiced. The exclusion of <N> before /d/ seems accidental, as Hamano (op. cit., 139f.) notes, as there are very few mimetics with /d/ as the onset consonant of their second mora. See Section 5. The exclusion before /r/ is limited to mimetics. See Section 6.

These are what Martin (op. cit., 68ff.) has called "intensive infixes," which are not limited to mimetics: *o<N>naji* (*onaji*) 'same, identical' (adjective), *to<N>bi* (*tobi*) 'kite bird' (common noun), *ni<Q>pon* (*nihon*) 'Japan' (proper noun) (ibid.: 70f.), in a light verb compound *saki<N>zuru* (*saki* 'ahead' + *suru* 'do') 'to advance' (ibid.: 51f.), and in adjectival ending *-ku<Q>te* (*-kute*) (ibid.: 58f.), e.g. *aka-ku<Q>te* (*aka-kute*) 'being red.'

Naturally, the intensive infixes may appear in mimetics without /-ri/, typically in what Akita (op. cit.) calls "fossil" mimetics, such as *ha<Q>si (to)* 'whacking, firmly,' *mu<N>zu (to)* 'roughly, violently, wildly,' *su<Q>ku (to)* 'abruptly erect,' and *za<N>bu (to)* 'splashing, buffeting' (Yamaguchi 2002; Akita op. cit.; i.a.).

An intensive infix can also appear in bimoraic roots affixed with a moraic consonantal suffix /-Q/ or /-N/ (Akita ibid.: 111f., fn.5).

(22) a. *Kare wa mizu o   go<Q>ku-N to   nomikon-da.*
          he   TOP water ACC gulping   QUOT swallow-PST
          'He gulped the water down.'
      b. *Keeki ga   hu<N>wa-Q to   yak-e-ta.*
          cake NOM puffy   QUOT bake-PASS-PST
          'A cake was baked *puffy.*'

In reduplicated bimoraic roots, intensive infixes can appear in the first reduplicant alone, or in both the first and the second ones.[10]

(23) a. *Kare wa ku<Q>ta~kuta ni   tukare-ta.*
          he   TOP weary   COP be.tired-PST
          'He is *totally* worn out.'
      b. *Kare wa ku<Q>ta~ku<Q>ta ni   tukare-ta.*
          he   TOP weary   COP be.tired-PST
          'He is *utterly* exhausted.'

As we have surveyed in the previous section, intensification is a kind of augmentation (11), and hence reduplication of vowels or of roots as well as the intensive infixes fall under evaluatives, which can be combined with one another as well as with other aspectuality/actionality suffixes /-Q/, /-N/, /-i/, /-ri/. They all can be further combined with the subphonemic autosegmental evaluatives of voicing and palatalization as we argue in the next section.

In determining categorial status of mimetics, the importance of accent patterns has been pointed out in the literature (Hamano op. cit.; Nasu op. cit.; Akita op. cit.; i.a. and the references cited therein). In general, the accentedness iconically

---

10. For some reason, the intensive infix cannot be epenthesized to the second reduplicant alone as in **kuta~ku<Q>ta (ni)*. We leave this interesting problem for future research.

reflects dynamicity whereas the accentlessness stativity; thus, verbal and adverbial mimetics tend to be accented while adjectival and nominal ones unaccented.[11] Although accents can be lexically specified on the roots, they are ultimately determined in the prosodic structures of their actual instantiations of inflected words.

3.3   Positional phonesthemes of segmental phonemes

Hamano (op. cit.) has conducted a comprehensive survey on positional phonesthemes of segmental phonemes in Japanese mimetics. In monomoraic roots, the onset consonant, if any, indicates a type of movement; the place of articulation denoting the surface structure on contact, and the manner of articulation representing the manner of movement (ibid.: 78ff.). Voicing expresses the quality of surface, and palatalization adds some connotation of energy or childishness (ibid.: 106ff.). The vowels signal the size and shape of movement, and its length reflects the length of movement (ibid.: 127ff.).

In bimoraic roots of the form $(C_1)V_1(C_2)V_2$, the onset consonant C_1, if any, of the first mora indicates the tactile nature of the object, and the vowel V_1 of the first mora expresses the first shape of the movement/object. The onset consonant C_2, if any, of the second mora signifies a type of the movement, and the vowel V_2 of the second mora symbolizes the shape and size of the movement/object (ibid.: 132ff., 224ff.).

Strikingly, C_1 of bimoraic roots parallels the onset consonant of monomoraic roots in voicing; voiceless consonants connote "light/small/fine" while voiced "heavy/large/coarse." Hamano (ibid.: 106f., 127f., 163ff., 225f., 238ff.) associates palatalization with some meaning of "childishness, immaturity, instability, unreliability, uncoordinated movement, incoherency, diversity, excessive energy, noisiness, lack of elegance, and cheapness."

Akita (op. cit.) notes the significance of the phonesthemic generalizations in terms of subphonemic features, rather than of segmental phonemes, but he does not go beyond Hamano's observations, to treating voicing and palatalization as morphemes or "constructions" in terms of construction grammar upon which his study is based. Mester and Itô (op. cit.) do recognize the voicing and palatalization in mimetics as "autosegmental morphemes," but remain silent on what kind of morphemes they are, whether derivational, inflectional, or something else.

We submit that voicing is augmentative and palatalization is diminutive in Japanese, both of which are respective autosegmental morphemes that Mester and Itô (op. cit.) identify, found predominantly in mimetics.

---

11. Poser (1984a) observes that verb nominalization involves an accent shift, as pointed out by a reviewer. The different accent patterns in mimetics can be thought of a result of similar suprasegmental derivational processes of categorial changes.

4.   Palatalization as diminutive

Hamano (op. cit., 229ff.) makes the phonotactic generalizations of palatalization in Japanese mimetics, which can be restated as follows (cf. Mester & Itô op. cit., 269ff.):

(24) Palatalization is permitted only once in the same root.

    a.   *pota~pota*   *pot^{y}a~pot^{y}a*   **p^{y}ot^{y}a~p^{y}ot^{y}a*
        'dripping'   'sloshing'

    b.   *toko~toko*   *t^{y}oko~t^{y}oko*   **t^{y}ok^{y}o~t^{y}ok^{y}o*
        'trotting'   'toddling'

(25) Palatalization of non-coronals is restricted to C_1.

    a.   *poko~poko*   *p^{y}oko~p^{y}oko*   **pok^{y}o~pok^{y}o*
        'burbling'   'springing'

    b.   *hoko~hoko*   *h^{y}oko~h^{y}oko*   **hok^{y}o~hok^{y}o*
        'warmly'   'bobbing'

(26) Palatalization occurs on the right most coronal.[12]

    a.   *hena~hena*   *hen^{y}a~hen^{y}a*   **h^{y}ena~h^{y}ena*
        'limp'   'wilting'

    b.   *kasa~kasa*   *kas^{y}a~kas^{y}a*   **k^{y}asa~k^{y}asa*
        'rustling'   'ruffling'

    c.   *tapu~tapu*   *t^{y}apu~t^{y}apu*   **tap^{y}u~tap^{y}u*
        'flabby'   'splashing'

    d.   *noko~noko*   *n^{y}oko~n^{y}oko*   **nok^{y}o~nok^{y}o*
        'nonchalantly'   'innocently'

    e.   *dosa~dosa*   *dos^{y}a~dos^{y}a*   **d^{y}osa~d^{y}osa*
        'thumping'   'lashing'

    f.   *noso~noso*   *nos^{y}o~nos^{y}o*   **n^{y}oso~n^{y}oso*
        'lumbering'   'blundering'

(27) Palatalization never appears on /r/.

    a.   *turu~turu*   *t^{y}uru~t^{y}uru*   **tur^{y}u~tur^{y}u*
        'slippery'   'slurping'

    b.   *noro~noro*   *n^{y}oro~n^{y}oro*   **nor^{y}o~nor^{y}o*
        'sluggish'   'slithering'

---

12. The only exception being *k^{y}oto~k^{y}oto* 'to look around indeterminately,' alongside of the well-behaved *kot^{y}o~kot^{y}o* 'tickling' (Hamano ibid, 231f.).

The impossibility of palatalizing /r/ in mimetics is notable in that palatalized /r/ can appear in all positions in non-mimetics, and /r/ is also peculiar with regard to its absence from the initial consonant of native mimetics.[13]

Arguing for the underspecification of the place feature for /r/, which is the only liquid consonant in Japanese, Mester and Itô (op. cit.) propose that the palatal prosody is an autosegmental morpheme that maps lexically to a coronal consonant from right to left in the mimetic roots. The liquid /r/ is lexically underspecified for the place feature so that it never hosts the palatal prosody. If the mimetic roots do not contain any coronal consonants, the palatal prosody docks on to the left-most consonant C_1 by default. They further suggest that the palatal prosody can be thought of the [– anterior] feature on the Coronal node in the feature geometry.

If the palatal prosody is a "morpheme" as Mester and Itô (op. cit.) claim, what is its meaning or function? In this regard, Hamano's (op. cit., 240f.) characteriza-tion is indicative enough; "The semantic continuum of palatalization stems from the foremost association of palatalization of alveolar stops and fricatives with 'childishness' or 'immaturity.'"[14] She further adds that palatalization is a universal characteristic of early stages of language acquisition and pervasive in "motherese" or "baby talk" (28), reflected in the non-mimetic vocabulary that are associated with childhood activities, childish movement, and endearment (29).

(28) a. *kusai   >   kusʸai   >   kutʸai*
          'stinky'
      b. *samui   >   sʸamui   >   tʸamui*
          'cold'

(29) a. *osʸama*
          'preconciousness'
      b. *otʸame*
          'playfulness
      c. *zʸareru*
          'to frisk'
      d. *aka-tʸan*
          'baby'

Mester and Itô (op. cit., 268f., fn.21) also take note of the alternation from /s/ to /tʸ/ in motherese (28) and of the hypocoristic *-tʸan* found in (29d), the latter of

---

13. The absence of /r/ holds only for native mimetics, and we find examples, such as Sino-Japanese *ran~ran* 'glaring' and foreign loan *rabu~rabu* 'lovey-dovey.' See Section 3.1. and fn.3.

14. Hamano (ibid.: 192ff.) holds that the meaning of the full segment /y/ as C_2 is the same as palatalization.

which is likely to be derived from *-san*, the informal/colloquial form of *-sama* 'Mr./Mrs./Ms./Miss,' and dialectally attested as *-sʸan*.[15]

Recall that sound symbolism is one of the various ways to express linguistic evaluation (Körtvélyessy op. cit.) and Jurafsky (op. cit.) takes CHILD as the core sense of the diminutive (Section 2).

It is also often observed in the studies of sound symbolism and phonetic iconicity that diminutives are often associated with front high vowels and/or palatal consonants in some languages (Ultan 1978; Nieuwenhuis 1985; i.a.). For example, in Cree, an Algonquian language, diminutives involves palatalization of /t/ to [c], which may optionally be further accompanied by diminutive suffixation (Pentland 1975: 241f.).

(30) *atihk*   >   *acihk*   >   *acihk-ošiš*
       'caribou'   'little caribou'   little.caribou-DIM

In his study of linear (non-)sequentiality of phonological elements, Ladd (2014) introduces the concept of "modulation" for categorical modification of propositional meanings to signal simultaneous indexical meanings in the sense of Abercrombie (1967), Silverstein (2006), i.a. By way of illustration, Ladd (op. cit., 101ff.) takes up ablaut morphology and ideophones, bringing out Japanese mimetics for the latter. Referring to voicing, gemination, and palatalization in Japanese mimetics, he conjectures (ibid.: 104f.), "They are actually rather similar to the mostly indexical meanings typically expressed by **diminutive** affixes in languages that have them …" [emphasis added: TT]. Despite the vague allusion to voicing and gemination together, it can be inferred that Ladd intends that palatalization is similar to diminutives.

Incidentally, there are potential mimetics (31), (32) that do not have their palatalized counterparts (Mester & Itô op. cit., 269f.), as well as palatalized mimetics (33), (34) that do not have their non-palatalized sources (Hamano op. cit., 239ff.; Mester & Itô ibid.).

(31) a. *paku~paku*
          'scarfingly eat'
      b. * *pʸaku~pʸaku*

(32) a. *kura~kura*
          'dizzy'
      b. * *kʸura~kʸura*

(33) a. * *muna~muna*
      b. *munʸa~munʸa*
          'mumbling'

---

15. For Japanese hypocoristic formation, see Sasaki (1977), Poser (1984a, b).

(34)   a.   *$uza{\sim}uza$*
     b. $uz^ya{\sim}uz^ya$
        'swarming'

It is not unnatural that some potential mimetics do not have palatalized counterparts, as Grandi (2015, 78ff.) states, "… evaluative formation displays gaps: not all base words that are semantically compatible with evaluative formation give rise to actual evaluative forms." Neither is it unnatural that a lexical root, mimetic or not, happens to have a palatalized segment underlyingly insofar as its phonotactics are respected.

For the cases like (33), (34), we take the palatalized segment to be underlyingly specified in the lexicon, not derived from any non-palatalized sources. These are the same as the cases of the so-called *diminutiva tantum*, exemplified below from Dutch with discernible diminutive suffixes *-je*, *-kje*, *-tje*, but no source words (Oosterhoff 2015: 18f.; Grandi ibid.: 79f.).

(35)   a.   *meisje*
        'young girl'
     b.   *sprookje*
        'fairly tale'
     c.   *dutje*
        'nap'

Taking stock, we would claim that palatalization in Japanese mimetics is the autosegmental diminutive.

5.   Voicing as augmentative

Where there are voicing contrasts, viz., on obstruents /p, t, k, s/ vs. /b, d, g, z/, the voicing of the onset obstruents in monomoraic roots and of C_1 in bimoraic roots connotes some meanings of "heaviness/largeness/coarseness/thickness" (Hamano op. cit., 106ff., 163f.), "cursoriness" or "incompleteness" (ibid.: 110f.), "massiveness" (ibid.: 163f.), "unpleasantness" (ibid.: 168f.), "suspicion, cheerlessness, complaints" (ibid.: 170f.), "forcefulness/powerfulness" (ibid.: 169f.), or "density" (ibid.: 172f.). Hamano (ibid.: 169f.) further makes the following remark:

> The assessment of "powerfulness," however, in many cases is subjective. Depending upon the speaker's subjective assessment, an identical movement may be described as "forceful/heavy" or …

This very "speaker's subjective assessment" is the hallmark of evaluatives. Gathering her descriptions of connotations, we contend that the voicing in mimetics is the

augmentative, another autosegmental morpheme that Mester and Itô (op. cit., 284ff.) identify.

For the voicing contrasts, Hamano (op. cit., 172ff.) observes a significant difference between C_1 and C_2 in bimoraic roots. For C_2, /p/ scarcely appears whereas /b/ is by far more frequent than any other voiced obstruents, viz., /d, g, z/, which are markedly less frequent than their voiceless counterparts, /t, k, s/. Hamano (op. cit., 176f.) speculates that /p/ in C_2 neutralized intervocalically as /b/, and hypothesizes that those with /d, g, z/ for C_2 are "either neologism or results of sporadic sound change."

In Hamano's (ibid.: 173ff.) near-exhaustive listing of a few dozen bimoraic mimetics that have /d, g, z/ for C_2, most of them lack their voiceless counterparts, and many of them are either what Akita (op. cit.) calls "fossilized mimetics" or "quasi-mimetics," traceable to their non-mimetic origin.

In addition, Hamano (ibid.: 172f.) observes that in a handful of cases where there is a voicing contrast for C_2, its semantic contrast is not of C_1 or of the onset obstruents of monomoraic roots, i.e., voiceless "light/small/fine" vs. voiced "heavy/large/coarse/thick."

(36) a. *gusu~gusu*
          'sniffling'
      b. *guzu~guzu*
          'dawdling, grumbling'

(37) a. *moku~moku*
          'smoke-belching'
      b. *mogu~mogu*
          'munching, mumbling'

Between 'sniffling' and 'dawdling, grumbling' in (36), or between 'smoke-belching' and 'munching, mumbling' in (37), no semantic similarity or hypernymic sense can be distilled. The only exception that Hamano (ibid.: 172f) notes is the following pair, where some hypernymic 'skulking motion' can be hinted at.

(38) a. *moso~moso*
          'creeping'
      b. *mozo~mozo*
          'crawling'

There are also exceptional cases that do not have the voicing contrast for C_1. Hamano (ibid.: 165f.) finds the following three patterns:

(39) a. sV_1yV_2 *soyo~soyo*
                            'breezing'
          $^*zV_1y\,V_2$ **zoyo~zoyo*

b. $^*tV_1tV_2$ $^*tota$-Q
    dV_1tV_2 $dota$-Q
                    'thudding'

c. $^*tV_1sV_2$ $^*tosi$-N
    dV_1sV_2 $dosi$-N
                    'thumping'

Just as in the cases of the orphaned palatalization (31)–(34), we argue that the voiced obstruents are underlyingly specified as they are, just as nasals or glides are voiced without contrasting with voiceless ones.

This leads us to formulate a generalization that the autosegmental augmentative voicing docks on to the left-most voiceless obstruents in mimetic roots when applicable, which Mester and Itô (op. cit., 285f.) implement as left-to-right mapping.

Importantly, this autosegmental augmentative voicing is distinct from *rendaku* 'sequential voicing,' which Itô and Mester (1986) analyze also with an autosegmental morpheme of a subphonemic [voice] feature, just as in the augmentative voicing. The difference is that the sequential voicing is inhibited if the second member of the compound contains a voiced obstruent, a constraint known as Lyman's Law (Lyman, 1894).[16] We find the voicing contrasts in mimetics that have a voiced obstruent for C_2 as in the following:

(40) a. *keba~keba*
           'gaudy'
      b. *geba~geba*
           'lurid'

(41) a. *saba~saba*
           'unembellished'
      b. *zaba~zaba*
           'careless, indifferent'

(42) a. *tʸobo~tʸobo*
           'dripping'
      b. *dʸobo~dʸobo*
           'dribbling

---

16. For the detailed autosegmental analysis in terms of OCP, see Itô & Mester (1986). For various promotional as well as inhibitive factors for sequential voicing, and its irregularity and exceptions to Lyman's Law, see Vance and Irwin (2016) and the references cited therein.

Furthermore, sequential voicing can take place in mimetics when reduplicated, without inducing the associated augmentative meaning as in the following:[17]

(43) a. *si<ɴ>mi-ri*
          'quietly, sadly'
      b. *simi~zimi*
          'heartily, serenely'

(44) a. *ho<ɴ>no-ri*
          'faintly, slightly'
      b. *hono~**b**ono*
          'heartwarmingly, dimly'

Hamano (op. cit., 243ff.) cites Suzuki (1962), who reports that the same voicing contrasts as mimetics can be found in a limited set of non-mimetic vocabulary as in the following:

(45) a. *kara*
          'husk, hull, shell, slough'
      b. *gara*
          'junks, bones for broth stocks'

(46) a. *sur*-u
          'to rub'
      b. *zur*-u
          'to slip, slide, slant, deviate'

(47) a. *hure*-ru
          'to swing, sway'
      b. *bure*-ru
          'to shake/jitter, chop (idea)'

Suzuki (op. cit.) claims that the voicing contrasts have "expressive values," and the voicing adds a "connotative meaning" as the speaker's "emotive evaluation" to the "denotatum" of the "denotative meaning" shared with the voiceless counterparts.[18]

We also find the following oppositions in kinship terms.

(48) a. *titi*
          'father'

---

17. Modulo, the intensification induced by reduplication, which is related with augmentation. See (11) and the discussion in Section 6.

18. Suzuki (ibid.: 28ff.) also discusses the opposition between /n/ and /d/, where /d/ has a pejorative or emphatic connotation, such as in *nora-neko* 'stray cat' vs. *dora-neko* 'bossy alley cat,' or *nok-u* vs. *dok-u* 'to get out of the way, make room.'

b.   *didi*
     'grandfather/old man'

(49) a.   *haha*
           'mother'
      b.   *baba*
           'grandmother/old woman'

These cases further supports our claim that the voicing is an augmentative, which can also be found outside of mimetics to a limited extent.

6.   Evaluative morphology in Japanese mimetics

At the outset, the square opposition was introduced where plain mimetics (1) can be voiced (2), palatalized (3), or both (4). In our terms, a plain mimetic can be augmented, diminutivized, or both. Although the simultaneous application of both augmentation and diminution may seem contradictory, it is not logically impossible. In English, for example, a *cigar-ette* is a fossil diminutive of a *cigar*, and we find a large or long cigarette, but still it is not a cigar. Similarly in Yupik, an Eskimo-Aleut language, we find the following kind of pairs (Mithun, 1999, 43f.):

(50) a.   *yug-pag-cuar*
           person-big-little
           'little giant'
      b.   *yug-cuar-pag*
           person-little-big
           'big midget'

As both the augmentative and the diminutive are segmental suffixes in Yupik, they cannot be realized simultaneously and the difference of their order produces a meaning contrast. In fact, recursive application of evaluatives of the same type is not uncommon, which sets apart evaluative morphology from either derivational or inflectional morphology (6), (8), and it is not too much a stretch to find recursive application of the different types of evaluatives.

    In Japanese mimetics, voicing and palatalization are the autosegmental augmentative "prefix" (left-to-right mapping) and diminutive "suffix" (right-to-left mapping), respectively, which can in principle apply to the same roots simultaneously without competing for the temporal order, and hence without any meaning contrast as Yupik segmental suffixes display.

    While augmented or diminutivized mimetics can be, and often are reduplicated as we have seen, reduplication itself is a way to iconically express linguistic

evaluation of intensification, which is associated with, or can be said of, a kind of augmentation (11).[19] That is, the same or different types of evaluatives can be combined in different modes. Although reduplication is quite productive in mimetics, it is less so in non-mimetic vocabulary in Japanese.

The intensive infixes, the moraic consonants <Q> and <N> we have seen in Section 3.2., are also evaluatives in that they add intensification as their name designates, and they can be combined with the autosegmental augmentative voicing or diminutive palatalization as well.

(51) a. *pata-ri*
          'flippingly'
      b. *pa<Q>ta-ri*
          'floppingly'
      c. *bata-ri*
          'collapsingly'
      d. *ba<Q>ta-ri*
          'droppingly'

(52) a. *hena~hena*
          'limp'
      b. *he<N>na~hena*
          'drainedly'
      c. *hen^ya~hen^ya*
          'wilting'
      d. *he<N>n^ya~hen^ya*
          'anemicly'

Unlike reduplication, the intensive infixes are fairly productive in non-mimetics and in varieties of categories as well, and unlike the suffixal moraic consonants /-Q/ and /-N/, they are archiphonemic, showing complementary phonotactic distribution as we have noted in Section 3.2.

Davis and Ueda (2002) offer a mora epenthesis analysis for the intensive infix in terms of optimality theory.[20] They take the intensive infix to be an autosegmental floating mora without any segmental specifications that needs to be anchored to the left edge, viz., atheoretically the first mora of the roots. Their constraint

---

19. Yet, semantically, intensification can be of either positive or negative, and when diminution is intensified, it conveys the "smallness" to a greater degree, as in English expression *very small* can be thought of *very* intensifying the "smallness."

20. They employ the term "mora augmentation," more familiar in the literature than our "mora epenthesis." We use the latter term to avoid the confusion with "augmentation" in the sense of evaluatives here.

ranking realizes the epenthesized mora as the coda of the first mora, $<Q>$ before voiceless obstruents or $<N>$ before voiced consonants other than /r/. Other higher-ranking constraints prevent the epenthesized mora from manifesting itself by lengthening or diphthongizing the preceding vowel.[21]

While lengthening (reduplication) of the root final vowel in monomoraic mimetics may also be amenable to the epenthesis analysis of a floating mora of an underspecified segment, its diphthongization in /-i/ in monomoraic roots seems better to be analyzed as a suffix, together with the bimoraic suffix /-ri/, as well as moraic consonantal suffixes /-Q/ and /-N/ as we have discussed. They all carry some nuance of actionality or aspectuality, absent without them (Hamano, op. cit.; Akita, op. cit.; i.a.). These mimetic suffixes are also of evaluatives, as actionality or aspectuality are subject to linguistic evaluation as we have broached in Section 2 (Körtvélyessy, op. cit.; Tovena, op. cit.; i.a.), and mimetics themselves are ultimately evaluatives, as sound-symbolic phonetic iconicity is one mode of linguistic evaluation.

7.   Concluding remarks

We have submitted a view that the voicing and palatalization in Japanese mimetics are the augmentative and diminutive autosegmental morphemes, respectively. Many African languages have evaluatives with tonal changes, which are also autosegmental, and tones are by definition suprasegmental whereas voicing and palatalization are subsegmental. Accentuation is an important device for categorial derivation in Japanese mimetics as well as non-mimetics, and it is also a matter of suprasegmental. Mora epenthesis is yet another suprasegmental. Together with reduplication and morphological templates, what we have been referring to as autosegmental, following Mester and Itô (op. cit.), may be brought under the umbrella term of non-concatenative morphology as a reviewer suggests, but the augmentative voicing and diminutive palatalization differ from other non-concatenative morphology, in that they involve subphonemic features, i.e., subsegmental. Sound-symbolic phonetic iconicity recognizes affinities between voicing and augmentation, and between palatalization and diminution in not a few languages, and they may as well be analyzed in terms of subphonemic non-concatenative morphology, instead of usual ablaut morphology.

---

21. Davis & Ueda (op. cit.) also offer a unified account of the dialectally possible $<N>$ before /r/ in non-mimetics, and of idiolectally possible V_1 lengthening before /r/ in mimetics, such as *ka<N>ra-i* (*kara-i*) 'spicy' and *hu-u-ra-ri* (*hura-ri*) 'swaying', respectively.

Acknowledgments

References

Abercrombie, D. 1967. *Elements of General Phonetics*. Edinburgh: EUP.

Akita, K. 2009. A Grammar of Sound-Symbolic Words in Japanese: Theoretical Approaches to Iconic and Lexical Properties of Mimetics. PhD dissertation, Kobe University.

Allen, M. R. 1978. Morphological Investigations. PhD dissertation, University of Connecticut, Storrs.

Beard, R. 1982. The plural as lexical derivation. *Glossa* 16: 133–148.

Beard, R. 1995. *Lexeme-Morpheme Base Morphology: A General Theory of Inflection and Word Formation*. New York NY: SUNY Press.

Bauer, L. 1996. No phonetic iconicity in evaluative morphology. *Studia Linguistica* 50: 189–206. https://doi.org/10.1111/j.1467-9582.1996.tb00349.x

Bauer, L. 1997. Evaluative morphology: In search of universals. *Studies in Language* 21: 533–575. https://doi.org/10.1075/sl.21.3.04bau

Davis, S. & Ueda, I. 2002. Mora augmentation processes in Japanese. *Journal of Japanese Linguistics* 18: 1–23.

Dressler, W. U. & Merlini-Barbaresi, L. M. 1994. *Morphopragmatics: Diminutives and Intensifiers in Italian, German and Other Languages*. Berlin: Mouton de Gruyter. https://doi.org/10.1515/9783110877052

Grandi, N. 2002. *Morphologie in contatto. Le construzioni valutative nelle lingue del Mediterraneo*. Milan: Franco Angeli.

Grandi, N. 2015. The place of evaluation within morphology. In Grandi & Körtvélyessy (eds.), 74–90

Grandi, N. & Körtvélyessy, L. (eds.), 2015. *Edinburgh Handbook of Evaluative Morphology*. Edinburgh: EUP.

Haas, M. 1972. The expression of the diminutive. In *Linguistics in Honor of. G. L. Trager*, E. M. Smith (ed.), 148–152. The Hague: Mouton.

Halle, M. & Mohanan, K. P. 1985. Segmental phonology of modern English. *Linguistic Inquiry* 16: 57–116.

Hamano, S. S. 1986. The Sound-Symbolic System of Japanese. PhD dissertation, University of Florida.

Itô, J. & Mester, A. R. 1986. The phonology of voicing in Japanese. *Linguistic Inquiry* 17: 49–73.

Itô, J. & Mester, A. R. 1995. Japanese phonology. In *The Handbook of Phonological Theory*, John A. Goldsmith (ed.) 817–838. Oxford: Blackwell.

Jurafsky, D. 1993. Universals in the semantics of the diminutive. *Proceedings of the Nineteenth Annual Meeting of the Berkeley Linguistics Society: General Session and Parasession on Semantic Typology and Semantic Universals*, 423–436.

Kadooka, K.-I. 2007. *Nihongo Onomatope-goi-ni okeru Keitaiteki/On'inteki Taikeisei-ni tuite* (On morphological and phonological systematicity in Japanese onomatopoeic vocabularies). Tokyo: Kurosio.

Kiparsky, P. 1982. From cyclic to lexical phonology. In *The Structure of Phonological Representations*, Vol. I, H. van der Hulst & N. Smith (eds.), 131–175. Dordrecht: Foris.

Körtvélyessy, L. 2015. *Evaluative Morphology from a Cross-Linguistic Perspective*. Newcastle upon Tyne: Cambridge Scholars.

Körtvélyessy, L. & Stekauer, P. (eds.), 2011. *Diminutives and Augmentatives in the Languages of the World: Lexis 6. E-Journal in English Lexicology*. <http://screcherche.univ-lyon3.fr/lexis>

Kuroda, S.-Y. 1965. Generative Grammatical Studies in the Japanese Language. PhD dissertation, MIT.

Ladd, R. D. 2014. *Simultaneous Structure in Phonology*. Oxford: OUP. https://doi.org/10.1093/acprof:oso/9780199670970.001.0001

Lakoff, G. 1987. *Women, Fire, and Dangerous Things*. Chicago IL: University of Chicago Press. https://doi.org/10.7208/chicago/9780226471013.001.0001

Lyman, B. S. 1894. *The Change from Surd to Sonant in Japanese Compounds*. Philadelphia PA: Oriental Club of Philadelphia.

Martin, S. E. 1952. Morphophonemics of standard colloquial Japanese. *Language* 28: 7–115. https://doi.org/10.2307/522176

McCawley, J. D. 1968. *The Phonological Component of a Grammar of Japanese*. The Hague: Mouton.

Merlini Barbaresi, L. 2015. Evaluative morphology and pragmatics. In Grandi & Körtvélyessy (eds.), 32–42.

Mester, A. R. & Itô, J. 1989. Feature predictability and underspecification: Palatal prosody in Japanese mimetics. *Language* 65: 258–293. https://doi.org/10.2307/415333

Mithun, M. 1999. *The Native Languages of North America*. Cambridge: CUP.

Moravcsik, E. A. 1978. Reduplicative constructions. In *Universals of Human Language*, Vol. 3: Word Structure, J. H. Greenberg, C. A. Ferguson & E. A. Moravcsik (eds.), 297–334. Stanford CA: Stanford University Press.

Nasu, A. 2002. Nihongo Onomatope no Go-Keisei to Inritu-Koozoo (Word formation and prosodic structures of Japanese onomatopoeia). PhD dissertation, University of Tsukuba.

Nieuwenhuis, P. 1985. Diminutives. PhD dissertation, University of Edinburgh.

Oosterhoff, J. 2015. *Modern Dutch Grammar: A Practical Guide*. New York NY: Routledge.

Pentland, D. H. 1975. Diminutive consonant symbolism in Algonquian. In *Papers of the Sixth Algonquian Conference, 1974*, W. Cowan (ed.), 237–252. Ottawa: National Museum of Canada.

Poser, W. J. 1984a. The Phonetics and Phonology of Tone and Intonation in Japanese. PhD dissertation, MIT.

Poser, W. J. 1984b. Hypocoristic formation in Japanese. *Proceedings of the Third West Coast Conference on Formal Linguistics*, 218–229.

Poser, W. J. 1990. Evidence for foot structure in Japanese. *Language* 66: 78–105. https://doi.org/10.1353/lan.1990.0031

Prieto, V. M. 2005. Spanish Evaluative Morphology: Pragmatic, Sociolinguistic, and Semantic Issues. PhD dissertation, University of Florida.

Rubino, C. 2005. Reduplication: Form, function, and distribution. In *Studies on Reduplication*, Bernhard Hurch & Veronika Mattes (eds.), 11–29. Berlin: Mouton de Gruyter. https://doi.org/10.1515/9783110911466.11

Sasaki, H. 1977. Aishoogo Keisei no Onseiteki Tokuchoo (Phonetic properties of hypocoristics formation). *Onsei Gakkai Kaihoo* 156: 22–24.

Scalise, S. 1984. *Generative Morphology*. Dordrecht: Foris.

Shibatani, M. 1990. *The Languages of Japan*. Cambridge: CUP.

Siegel, D. C. 1974. Topics in English Morphology. PhD dissertation, MIT.

Silverstein, M. 2006. Pragmatic indexing. In *Encyclopedia of Language and Linguistics*, Vol. VI, K. Brown (ed.) 14–17. Oxford: Elsevier. https://doi.org/10.1016/B0-08-044854-2/00381-3

Stump, G. T. 1993. How peculiar is evaluative morphology. *Journal of Linguistics* 29: 1–36. https://doi.org/10.1017/S0022226700000037

Štekauer, P. 2015. Word-formation processes in evaluative morphology. In Grandi & Körtvélyessy (eds.), 43–60.

Suzuki, T. 1962. On-in Kootai to Igi Bunka no Kankei ni Tsuite – Iwayuru Sei-Daku-On no Tairitsu wo Chuushinn to Site – (Associative and dissociative function of some morpho-phonemic contrasts in present-day Japanese). *Gengo Kenkyuu* 42: 23–30.

Tovena, L. M. 2015. Evaluative morphology and aspect/actionality. In Grandi & Körtvélyessy (eds.), 108–120.

Tsujimura, N. 1996. *An Introduction to Japanese Linguistics*. Oxford: Blackwell.

Ultan, R. 1978. Size-sound symbolism. In *Universals of Human Language*, Vol. 2: Phonology, J. H. Greenberg, C. A. Ferguson & E. A. Moravcsik (eds.), 525–568. Stanford CA: Stanford University Press.

Vance, T. J. & Irwin, M. (eds.), 2016. *Sequential Voicing in Japanese: Papers from the NINJAL Rendaku Project* [Studies in Language Companion Series 176]. Amsterdam: John Benjamins.

Wierzbicka, A. 1996. *Semantics: Primes and Universals*. Oxford: OUP.

Yamaguchi, N. 2002. *Inu wa "Biyo" to Naite Ita: Nihongo wa Giongo/Gitaigo ga Omosiroi* (Dogs used to bark "Biyo": In Japanese, it is mimetics that are interesting). Tokyo: Kobunsha.

PART II

Interfaces

On the distribution of the discourse particles *-yo* in Korean and *-ne* in Japanese

Changguk Yim and Yoshihito Dobashi
Chung-Ang University / Niigata University

The purpose of this paper is to provide a preliminary comparative study of the discourse particles *-yo* in Korean and *-ne* in Japanese, both of which show up fairly ubiquitously in sentence-medial positions. They appear to have very similar distributions, but a closer look at them reveals that they are systematically different. Elaborating on Yim and Dobashi's (2015, 2016) prosodic analysis of *-yo* in Korean, we give a novel account of the distributional differences between *-yo* and *-ne*. We propose that *-yo* and *-ne* are attached to a phonological phrase and a prosodic word, respectively, in the course of syntax-phonology mapping that proceeds derivationally, and that they are realized as intonational phrases as a result of this derivational procedure.

Keywords: syntax-phonology interface, prosodic domains, sentence-medial discourse particles, Korean, Japanese

1. Introduction

The discourse particles *-yo* in Korean and *-ne* in Japanese show an apparently similar phenomenon of sentence-medial attachment. As for the Korean particle, sentence-final *-yo* conveys politeness to the addressee at the end of a sentence (glossed as "POL(ite)") whereas sentence-medial *-yo* has been analyzed as having discourse functions such as hedges, pause fillers, softeners, and amplification of topicality (Lee & Park 1991 and references therein). As for the Japanese *-ne*, it is used to "soften a statement and invite confirmation on part of the hearer" (Martin 1987).[1]

---

1. In addition to *-ne*, particles such as *-sa* and *-yo* are also used sentence-medially in Japanese. The particle *-sa* is "vigorous and ego-assertive" and Japanese "*-yo* is sometimes used like *-sa* and *-ne* to punctuate phrases within a sentence" in country dialects, according to Martin (1987: 918–919). See also Uyeno 1971 for the meaning and function of these particles.

What is interesting for those particles in both languages is that they optionally attach to any, or all, sentence-medial material in any combination.[2]

(1) a.   Ce-A-ka(-yo)   ecey(-yo)   kkaphey-eyse(-yo) Celin-ul(-yo)
          Ce-A-NOM(-yo) yesterday(-yo) café-at(-yo)   Celin-ACC(-yo)
          mannasse-yo.
          met.C-POL
          'Ce-A met Celin at the café yesterday.'   [Korean]
     b.   Taro-ga(-ne)   kinoo(-ne)   kafe-de(-ne) Jiro-o(-ne)   mita-yo.
          Taro-NOM-(ne) yesterday(-ne) café-at(-ne) Jiro-ACC(-ne) saw-INS
          'Taro saw Jiro at the café yesterday.'   [Japanese]

In addition to the optionality and ubiquity, the two particles are similar in the following respects: (i) they are usually used in casual speech, (ii) they are followed by a pause, and (iii) the attachment is not specific either to grammatical categories or to grammatical functions, so that they can attach to various syntactic categories and grammatical functions. Moreover, the sentence-final particle *-yo* is obligatory in Korean and the one in Japanese is strongly preferred when the sentence-medial attachment occurs.

To our knowledge, no comparative research of this attachment phenomenon has been conducted in the generative literature. The purpose of this chapter is to provide a preliminary comparative study of attachment of the discourse particles. We show that the similarity is only apparent and the distribution of *-yo* in Korean is more restricted than that of *-ne* in Japanese. We argue that these differences receive a principled account in terms of prosody.

2.   Basic data

In addition to the similarities between *-yo* in Korean and *-ne* in Japanese pointed out in Section 1, there is another important similarity: Although they may occur fairly freely, these particles are not allowed everywhere. They may not intervene between a noun and a Case particle as in (2), nor can they appear between a verb and a negation.

---

2. We gloss these sentence-medial particles simply as '-yo' and '-ne' since their meaning and function are not entirely clear. We gloss the sentence-final particle *-yo* in Japanese as "-INS(istence)" because it is "an insistent 'indeed', used in asserting a claim, advocating a course of action, or emphasizing a warning" (Martin 1987: 918).

(2) a.   Sonnim(*-yo)-i wasse-yo.   [K]
          guest(-yo)-NOM came.C-POL
          'A guest has come.'

     b.   Kyaku(*-ne)-ga kita-yo.   [J]
          guest(-ne)-NOM came.C-INS
          'A guest has come.'

(3) a.   Ku-ka   hakkyo-ey kaci(*-yo) moshaysse-yo   [K]
          He-NOM school-to go(*-yo)   not.did-POL
          'He couldn't go to school.'

     b.   Taro-wa sushi-o   tabe(*-ne)-nai-yo.   [J]
          Taro-TOP sushi-ACC eat(-ne)-not-INS
          'Taro doesn't eat sushi.'

As is well-known, traditional Japanese grammarians posit a linguistic unit called *bunsetsu* (literally, 'a part of a sentence'), which is defined as a unit consisting of one content word and zero or more function word(s) that follow(s) it, and it is said that *bunsetsu* can be detected by checking if *-ne* or other similar particles can attach to it (see Hashimoto 1934).[3] Since this detection procedure would appear to be applicable to the Korean particle *-yo* in (1)–(3), one might wonder if something like *ecel/bunsetsu* could account for the distribution of *-yo* in Korean as well as *-ne* in Japanese. However, as we will see directly, the distribution of *-yo* in Korean presents intriguing complexities that cannot be handled with the notion of *ecel/bunsetsu*.

First of all, it is known that an accusative Case particle can be omitted in Korean and Japanese, especially in colloquial speech.

(4) a.   Phica(-lul) sikhyesse.   [K]
          pizza-ACC ordered.C
          '(Someone) ordered a pizza.'

     b.   Piza(-o)   tanonda.   [J]
          pizza-ACC ordered
          '(Someone) ordered a pizza.'

When the Case particle is omitted, Korean disallows *-yo* on the object while Japanese allows *-ne*.

---

3. The notion of *bunsetsu* is also introduced in junior high school education. Korean also has the traditional term, *ecel*, similar to *bunsetsu* in Japanese. Basically, *ecel* is a unit in writing that consists of content words like nouns and verbs, and nominal particles and verbal suffixes.

(5)   a.   *Phica-yo sikhyesse-yo.[4]   [K]
            pizza-yo ordered.c-POL
            '(Someone) ordered a pizza.'

      b.   Piza-ne tanonda-yo.   [J]
           pizza-ne ordered-INS
           '(Someone) ordered a pizza.'

In (5a), *phica* in Korean cannot host *-yo* while it may be considered to be an *ecel/
bunsetsu*.

   Next, adverbial expressions can usually host *-yo/-ne* in both languages (e.g.,
see (1) where 'yesterday' and 'at café' can host the particle in both languages), but a
certain group of adverbs in Korean resists the particle, unlike Japanese.[5]

(6)   a.   Ikes-ul tangcang(*-yo)   chelihasey-yo.   [K]
           this-ACC immediately(*-yo) handle.c-POL
           'Have this done immediately.'   (Yim 2012:(6a))

      b.   Kore-o sugu(-ne)   yar-inasai-yo.   [J]
           this-ACC immediately(-ne) do-IMP-INS
           'Have this done immediately.'

Again, the adverb 'immediately' may count as an *ecel/bunsetsu*, but it resists the
particle in Korean.

   Third, demonstratives such as 'this' and 'that' disallow the particle in Korean
while they allow the particle in Japanese.

(7)   a.   Chel-i(-yo)   i(*-yo)/ceo(*-yo)   cip-ey(-yo)   sala-yo.
           Chel-NOM (-yo) this(*-yo)/that(*-yo) house-in(-yo) live-POL
           'Chel lives in this/that house.'   [K]

      b.   Taro-wa(-ne) kono-ne/ano-ne ie-ni(-ne)   sundeiru-yo.
           Taro-TOP(-ne) this-ne/that-ne   house-in(-ne) live-INS
           'Taro lives in this/that house.'   [J]

Once again, these demonstratives count as *ecel/bunsetsu*, but the particles in ques-
tion can attach to them in Japanese while they cannot in Korean.

---

4. This sentence can be improved when the Case-dropped object is interpreted as a discourse-
old topic. See Yim & Dobashi 2016 for more details.

5. See Yim & Dobashi 2016 for different behaviors between adverbials with respect to *-yo* at-
tachment. Yim and Dobashi argue that there are two different types of adverbial expressions:
one that can host *-yo* and one that cannot. The former is a pure adjunct that is phonologically
phrased on its own while the latter is in fact a kind of bare NP adverb that is always phrased
with the following verb.

So far we have presented some differences between Korean and Japanese. The distribution of the Korean particle seems to be narrower, and cannot be accounted for by the notion of *ecel/bunsetsu*.

3.   An analysis

In this section, we will give a prosodic account for the difference that the Korean and Japanese particles exhibit. We adopt a fairly standard view of the prosodic hierarchy, where each prosodic constituent is properly contained in a superordinate prosodic constituent as follows (Selkirk 1984; Nespor & Vogel 1986):

(8) $_\iota($ $)_\iota($) Intonational Phrase
        $_\varphi($ $)_\varphi($ $)_\varphi($) Phonological Phrase
        $_\omega($ $)_\omega()_\omega()_\omega()_\omega()_\omega()_\omega()$ Prosodic Word

Each constituent demarcates the domain of phonological rules. For example, Intonational Phrase requires a pause at its end, both in Korean and Japanese; Phonological Phrase is the domain of voicing in Korean (Cho 1990, among others) and that of downstep in Japanese (McCawley 1968); Prosodic Word is the domain of tensification in Korean (Kim 1990) and that of pitch accent realization in Japanese (McCawley 1968).[6]

Yim and Dobashi (2015, 2016) argue that the distribution of Korean *-yo* can be best analyzed in terms of prosodic domains. They point out that the distribution of *-yo* presents a puzzling discrepancy in prosodic domains. On the one hand, *-yo* marks the right edge of an Intonational Phrase (ι). As mentioned in Section 1, *-yo* is always followed by a pause. Moreover, *-yo* exhibits characteristics of an ι-boundary such as an HL% boundary tone and syllable-final lengthening, as Kim and Yim's (2014) experimental study shows. On the other hand, the distribution of *-yo* suggests that it is attached to the right edge of a Phonological Phrase (φ). Thus in (1a), each of the adverbial expressions, the overtly Case marked subject and object, and the verbal complex constitutes a φ in the absence of *-yo* and each of these can thus host *-yo*. Yim and Dobashi argue that this discrepancy can be resolved by adopting a derivational architecture of the phonological component (cf. Pak 2008; Dobashi 2013), where prosodic hierarchy is built in a bottom-up fashion from the φ-level to the ι-level. They show that *-yo* is attached at the φ-level, and that the φ to which *-yo* is attached turns into an ι later in the derivation. Specifically, they pro-

---

6. For recent development of the prosodic hierarchy theory, see Ishihara 2015 and the references cited therein.

pose the following prosodic constraint on *-yo* attachment that applies throughout the prosodic derivation:

(9)   *-yo* appears at the edge of a prosodic phrase π.

Here "a prosodic phrase π" refers to either φ or ι. Note that (9) does not need to specify the direction (right/left) of the edge since *-yo* is a suffix and it never appears at the left edge.

Given these, let us consider how the sentence in (10) below is derived. The derivation is illustrated in (11).

(10)   Sonnim-i-yo   phica-lul-yo sikhyesse-yo.   [K]
guest-NOM-yo pizza-ACC   ordered.C-POL
'A guest ordered a pizza.'

(11)   φ-formation: $_φ$(sonnim-i-yo) $_φ$(phica-lul-yo) $_φ$(sikhyesse-yo)
                                                                        ↓

Apply (9):   √
                                                                        ↓

ι-formation: $_ι$($_φ$(sonnim-i-yo)) $_ι$($_φ$(phica-lul-yo)) $_ι$($_φ$(sikhyesse-yo))
                                                                        ↓

Apply (9):   √

First, the default φ-phrasing is defined by cyclic Spell-Out.[7] Second, (9) is applied to see if each occurrence of *-yo* is at the edge of a φ. Third, the ι-formation applies. Note that (9) requires that *-yo* be at the edge of an ι, too. So each of the *-yo*'s needs to be followed by an ι-boundary in the resulting ι-phrasing. This way, we can resolve the prosodic discrepancy mentioned above, accounting for the fact that *-yo* appears to occur at the right edge of a φ while it actually corresponds to the right edge of an ι.

This prosodic approach gives a straightforward account of the Korean data in (2)–(7). (2a) and (3a) are ruled out because *-yo* is not on the edge of any prosodic phrase. (5a) is ruled out because the Case-dropped NP constitutes a φ with the following verb in Korean so that there is no φ-boundary between the NP and

---

7. Yim and Dobashi (2016) adopt Dobashi's (2003, 2009) φ-formation mechanism where φ is defined in terms of cyclic Spell-Out (see also Fuß 2008 and Kratzer & Selkirk 2007). Although we do not go into the details of the mechanism in this paper, it should be noted that the basic syntactic structure in (ia) is mapped to the φ-phrasing in (ib).

(i) a. [$_{CP}$ [$_{TP}$ Subj [$_{vP}$ [$_{VP}$ Obj V] v] T] C]
b. $_φ$(Subj) $_φ$(Obj) $_φ$(V-v-T-C)

the verb, failing to meet (9).[8] The adverb in (6a), which Yim and Dobashi (2016) identify as a bare-NP adverb, also constitutes a φ with the following verb so that it cannot host -*yo*. (For the specific analysis of φ-formation of the Case-dropped NP and the adverbs, see Yim & Dobashi 2016). (7a) is excluded since the demonstrative and the noun that follows it forms a single φ, which is indicated by the fact that the onset of the noun 'house' undergoes Obstruent Voicing in the presence of a preceding vowel (Cho 1990: 48).[9]

> (12)   ce /c/ip →   ce [j]ip   'that house'

Given that there is no φ-boundary between the demonstrative and the noun, -*yo* cannot attach to the demonstrative due to (9).

Thus far we have presented the gist of Yim and Dobashi's prosodic approach to -*yo* in Korean. Note that the notion of *bunsetsu*, which we have referred to in the previous section, can be recast in terms of Prosodic Word (ω) (see Poser 1984).[10] Since Selkirk's (1984) influential work on the syntax-phonology relation, it has been assumed that function words are invisible to the prosodic domain formation (see also Truckenbrodt 1995). Given that they are invisible, function words need to be dependent on their neighboring content words in order to be appropriately parsed in the phonological component of grammar (see Sato and Dobashi 2016 for related discussion). We assume that function words such as Case particles and affixal verbal elements are morphologically suffixed to content words, and these

---

8. Kim (1997: 242) observes that Stop Nasalization, which is sensitive to φ-boundary, applies across Case-dropped NP and the verb in North Kyungsang Korean:

> (i)   pap meŋ-nen-ta → pa**m** meŋ-nen-ta
>   rice eat-PRS-IND
>   'eat rice'

That is, the Case-dropped NP and the verb belong to a single φ.

9. A reviewer observes that (i) below might sound much better than (7a), indicating that monosyllabic function words such as *i*- 'this' in (7) do not constitute their own φ, unlike *ilen*- 'this, such' in (i), where it can be followed by -*yo*:

> (i)   ??Chel-i(-yo)   ilen-yo cip-ey(-yo)   sala-yo.   [K]
>   Chel-NOM(-yo) this-yo house-in(-yo) live-POL
>   'Chel lives in this/ house.'

Although the acceptability of (i) is not crystal clear (at least to our ears) and seems to be also affected by information structure, we take (i) to be consistent with our prosodic approach in that prosodic factors such as syllable counts, as well as information structure, play an important role in accounting for the distribution of the particles in question.

10. Poser calls it a phonological word, which is equivalent to our Prosodic Word.

amalgamated units constitute ω's which serve as inputs to the φ-formation. Given this, we suggest that prosodic derivation starts with the ω-formation, and then the φ's are formed by combining the ω's, and the ι's are in turn formed by combining φ's. Under these considerations, we suggest the following constraint on the *-ne* attachment in Japanese, which is very similar to (9).

(13)   *-ne* appears at the edge of a prosodic phrase π.

Let us now consider how (14) below is derived. The derivation is illustrated in (15).

(14)   Taro-ga-ne   piza-o-ne   tanonda-yo.   [J]
       Taro-NOM-ne pizza-ACC-yo ordered-INS
       'Taro ordered a pizza.'

(15)   ω-formation: $_\omega$(Taro-ga-ne) $_\omega$(piza-o-ne) $_\omega$(tanonda-yo)
                                                           ↓
       Apply (13):   √
                                                           ↓
       φ-formation: $_\varphi$($_\omega$(Taro-ga-ne)) $_\varphi$($_\omega$(piza-o-ne)) $_\varphi$($_\omega$(tanonda-yo))
                                                           ↓
       Apply (13):   √
                                                           ↓
       ι-formation: $_\iota$($_\varphi$($_\omega$(Taro-ga-ne))) $_\iota$($_\varphi$($_\omega$(piza-o-ne))) $_\iota$($_\varphi$($_\omega$(tanonda-yo)))
                                                           ↓
       Apply (13):   √

Throughout the prosodic derivation in (15), *-ne* is always at the edge of each prosodic domain. This explains why *-ne* appears to attach to a *bunsetsu* or ω while it also corresponds to the edge of an ι, where it is followed by a pause, which is one of the typical characteristics of ι.

Building on these analyses of Korean *-yo* and Japanese *-ne*, we suggest that the difference between them can be accounted for straightforwardly by assuming the following:[11]

(16)   a.   *-yo* is introduced after φ-formation in Korean.
       b.   *-ne* is introduced after ω-formation in Japanese.

---

11. A reviewer suggested that (16) can be better rephrased as (i):

(i)   a.   *-Yo* in Korean selects φ.
      b.   *-Ne* in Japanese selects ω.

This selection-based approach will reduce the difference of the two particles to their lexical properties, and make (16) redundant. We would like to investigate the nature of this new concept of prosodic selection for future research.

Furthermore, (9) and (13) can be generalized into the following constraint:

(17)   A sentence-medial discourse particle appears at the edge of a prosodic phrase π.

Given (16) and (17), let us see for illustration how the contrast in (5) is accounted for, where a Case-dropped DP does not allow the attachment in Korean while it does in Japanese. Note that we assume that the sentence-final *-yo* in both languages is introduced in syntax (perhaps occupying a left-peripheral functional head. Cf. Yim 2012):

(18)

	[Korean]		[Japanese]	
Syntax:	pizza-ø	ordered-yo	pizza-ø	ordered-yo
	↓		↓	
ω-formation:	$_\omega$(pizza-ø)	$_\omega$(ordered-yo)	$_\omega$(pizza-ø)	$_\omega$(ordered-yo)
	↓		↓	
-ne attachment:	$_\omega$(pizza-ø)	$_\omega$(ordered-yo)	$_\omega$(pizza-ø-**ne**)	$_\omega$(ordered-yo)
	↓		↓	
Apply (17):	N/A		√	
	↓		↓	
φ-formation:	$_\varphi$($_\omega$(pizza-ø)	$_\omega$(ordered-yo))	$_\varphi$($_\omega$(pizza-ø-**ne**))	$_\varphi$($_\omega$(ordered-yo))
	↓		↓	
-yo attachment:	$_\varphi$($_\omega$(pizza-ø-**yo**)	$_\omega$(ordered-yo))	$_\varphi$($_\omega$(pizza-ø-**ne**))	$_\varphi$($_\omega$(ordered-yo))
	↓		↓	
Apply (17):	*		√	
			↓	
ι-formation:			$_\iota$($_\varphi$($_\omega$(pizza-ø-**ne**)))	$_\iota$($_\varphi$($_\omega$(ordered-yo)))

First, ω's are formed in both languages. (16a) does not allow the attachment of *-yo* after ω-formation in Korean, so (17) is not applicable at this stage. By contrast, (16b) allows the attachment of *-ne* in Japanese at this stage. Since its attachment site is on the edge of ω, (17) is satisfied and the prosodic derivation goes on to the next stage of φ-formation. After φ-formation, (16a) would allow the insertion of *-yo* in Korean. However, there is no φ-boundary after the Case-dropped DP, which is φ-phrased with the following verb. That is, the attachment to the Case-dropped DP results in the violation of (17). By contrast in Japanese, even if the Case-dropped DP is φ-phrased with the following verb, the particle *-ne* that has already been introduced at the ω-formation requires a φ-boundary to be created, due to (17). This boundary in turn becomes an ι-boundary at the ι-formation, satisfying (17) again. That is, *-ne* can attach to a Case-dropped DP in Japanese since its attachment takes place before the φ-formation while *-yo* cannot in Korean since its attachment applies after φ-formation and violates (17).

So far, we have shown how the contrast between Korean and Japanese can be captured in terms of prosodic derivation.

4. Consequences

In this section, we discuss some empirical and theoretical consequences of the proposed analysis.

It is widely observed in many languages that information structure affects φ-phrasing as well as ι-phrasing (see, e.g., Frascarelli 2000). Thus a topicalized phrase tends to form its own ι, and a focused phrase either creates or deletes a prosodic boundary right before or after it. By contrast, information structure does not seem to affect ω-formation, as far as we know. Then, the present analysis makes an interesting prediction: Information structure affects the distribution of *-yo* in Korean while it does not affect the distribution of *-ne* in Japanese.

A focused word is φ-phrased with the following word in Korean and Japanese (see Cho 1990; Kim 1997; and Ishihara 2005, 2007). Then, we predict that *-yo* cannot attach to a focused word in Korean while *-ne* can in Japanese. This prediction is borne out. *Wh*-phrases cannot host the particle in Korean while they can in Japanese.

(19) a. Nwu-ka(*-yo) wasse-yo?   [K]
    who-NOM(-yo) came.C-POL
    'Who has come?'
   b. Dare-ga(-ne) kita-no?[12]   [J]
    who-NOM(-ne) came-Q
    'Who has come?'

Another case where information structure affects prosodic phrasing is topic. Kang (1992) observes that a topic phrase in Korean forms an ι. Given the hierarchic nature of prosodic domains, it should be the case that the right edge of an ι coincides with that of a φ. It is then predicted that a phrase that cannot host *-yo* in an unmarked case will be able to host it if it is interpreted as a topic. Recall that a Case-dropped DP cannot host *-yo* as we have observed in (5a). It is, however,

---

12. (19b) might sound a little degraded perhaps due to the lack of *-yo* at the end of the sentence, which cannot co-occur with *-no*. If we embed the *wh*-question and put *-yo* at the end of the matrix clause, the sentence sounds perfect.

  (i) Dare-ga(-ne) kita-noka(-ne) shitteiru-yo.
    who-NOM(-ne) came-Q(-ne) know-INS
    '(I) know who came.'

expected that such a DP can host -*yo* when it is interpreted as a topic. Consider the following Korean examples (Yoon 2013).

(20) a. Minswu-nun onul an wasse-yo.
          Minsu-TOP   today not came.C-POL
      b. Minswu-nun-yo onul an wasse-yo.
          Minsu-TOP-yo   today not came.C-POL
      c. Minswu-yo onul an wasse-yo.
          Minsu-yo   today not came.C-POL
          'Minsu didn't come today.'

Here, Minsu is understood as a topic, and it can host -*yo* whether it has a topic marker (as in (20b)) or not (as in (20c)). And Japanese shows the same pattern.

(21) a. Taro-wa kyoo konakatta-yo.
          Taro-TOP today came.not-INS
      b. Taro-wa-ne kyoo konakatta-yo.
          Taro-TOP-ne today came.not-INS
      c. Taro-ne kyoo konakatta-yo.
          Taro-ne today came.not-INS
          'Taro didn't come today.'

Here, Taro is interpreted as a topic and it can host -*ne* whether it has a topic marker or not.

So far we have seen some empirical consequences. Let us next consider theoretical consequences. Jun (1998), among others, argues that the prosodic domains should be defined solely in terms of phonetic facts, without recourse to any syntactic information. Note that the proposed attachment of the particles needs to refer to the abstract prosodic domains that are not manifested on the surface level. Thus, -*yo* targets an abstract φ in the course of prosodic derivation but the φ is actually manifested as an ɩ, followed by a pause. That is, the present analysis argues for the syntax-phonology mapping architecture where those abstract domains are created without recourse to phonetic cues on the surface.

Finally, it should be emphasized that, as we have pointed out in the previous section, the present analysis is an attempt to reduce language variation to the externalization process (Chomsky 2015). Given that narrow syntax is universal, it is expected that the source of parametric variation is found in the phonological component (see Tokizaki and Dobashi 2013 for relevant discussion). Although some aspects of the proposed parameter in (16) are still not clear as briefly discussed in footnote 11, we believe that prosodic approaches to parametric variation have important consequences for the study of parameters and grammatical architecture.

5.   Conclusion

In this chapter, we have developed a preliminary comparative study of the sentence-medial attachment of the discourse markers in Korean and Japanese. We have shown that the apparently similar particles *-yo* in Korean and *-ne* in Japanese have different distributional properties, which are accounted for in terms of prosody. We have argued that *-ne* is attached after the ω-formation while *-yo* is attached after the φ-formation within the derivational architecture of the prosodic hierarchy, and these particles need to be at the edge of prosodic domains throughout the derivation.

Acknowledgments

References

Cho, Y. Y. 1990. Syntax and phrasing in Korean. In *The Phonology-syntax Connection*, S. Inkelas & D. Zec (eds), 47–62. Chicago IL: University of Chicago Press.

Chomsky, N. 2015. Problems of projections: Extensions. In *Structures, Strategies and Beyond: Studies in Honour of Adriana Belletti* [Linguistik Aktuell/Linguistics Today 223], E. Di Domenico, C. Hamann & S. Matteini (eds), 3–16. Amsterdam: John Benjamins. https://doi.org/10.1075/la.223.01cho

Dobashi, Y. 2003. Phonological Phrasing and Syntactic Derivation. PhD dissertation, Cornell University.

Dobashi, Y. 2009. Multiple spell-out, assembly problem, and syntax-phonology mapping. In *Phonological Domains: Universals and Deviations*, J. Grijzenhout & B. Kabak (eds), 195–220. Berlin: Mouton de Gruyter. https://doi.org/10.1515/9783110219234.2.195

Dobashi, Y. 2013. Autonomy of prosody and prosodic domain formation: A derivational approach. *Linguistic Analysis* 38(3–4): 331–335.

Fuß, E. 2008. Word Order and Language Change: On the Interface between Syntax and Morphology. Habilitationsschrift, Johann-Wolfgang- Goethe Universität.

Frascarelli, M. 2000. *The Syntax-Phonology Interface in Focus and Topic Constructions in Italian*. Dordrecht, Kluwer.

Halle, M. & Marantz, A. 1993. Distributed morphology and the pieces of inflection. In *The View from Building 20. Essays in Linguistics in Honor of Sylvain Bromberger*, K. Hale & S. J. Keyser (eds), 53–109. Cambridge MA: The MIT Press.

Hashimoto, S. 1934. *Kokugoho yosetsu* (The outlines of Japanese grammar). Tokyo: Meiji Shoin.

Ishihara, S. 2005. Prosody-scope match and mismatch in Tokyo Japanese *wh*-questions. *English Linguistics* 22(2): 347–379. https://doi.org/10.9793/elsj1984.22.347

Ishihara, S. 2007. Major phrase, focus intonation and multiple spell-out (MaP, FI, MSO). *The Linguistic Review* 24(2–3): 137–167.

Ishihara, S. 2015. Syntax-phonology interface. In *Handbook of Japanese Phonetics and Phonology*, H. Kubozono (ed.), 569–618. Berlin: Walter de Gruyter.

Jun, S- A. 1998. The accentual phrase in the Korean prosodic hierarchy. *Phonology* 15: 189–226. https://doi.org/10.1017/S0952675798003571

Kang, O. 1992. Korean Prosodic Phonology. PhD dissertation, University of Washington.

Kim, C- T. 1983. {yo} chengca contaypepey tayhaye (On address-honorification of -*yo*). *Kalamwunhwa* 2: 129–167.

Kim, H. Y. 1990. Voicing and Tensification in Korean: A Multi-face Approach. PhD dissertation, University of Illinois at Urbana-Champaign.

Kim, N- J. 1997. Tone, Segments, and Their Interaction in North Kyungsang Korean: A Correspondence Theoretic Account. PhD dissertation, Ohio State University.

Kim, M. & Yim, C. 2014. Mwuncwung/mwunmal '-yo'ey tayhan umsengcek thukseng Yenkwu (Phonetic characteristics of sentence medial vs. sentence final '-yo' in Korean). *Language Information* 18: 27–50.

Kratzer, A. & Selkirk, E. 2007. Phase theory and prosodic spellout: The case of verbs. *The Linguistic Review* 24(2–3): 93–135.

Lee, C. & Park, S. 1991. -'Yo' ssuimuy kwucowa kinung (The structure and function of the mid-sentential -*yo* construction). *Linguistic Journal of Korea* 16: 361–389.

Martin, S. E. 1987. *A Reference Grammar of Japanese*. Tokyo: Charles E. Tuttle.

McCawley, J. D. 1968. *The Phonological Component of a Grammar of Japanese*. The Hague: Mouton.

Nespor, M. & Vogel, I. 1986. *Prosodic phonology*. Dordrecht: Foris.

Pak, M. 2008. The Postsyntactic Derivation and its Phonological Reflexes. PhD dissertation, University of Pennsylvania.

Poser, W. J. 1984. The Phonetics and Phonology of Tone and Intonation in Japanese. PhD dissertation, MIT.

Sato, Y. & Dobashi, Y. 2016. Prosodic phrasing and the *that*-trace effect. *Linguistic Inquiry* 47(2): 333–349.

Selkirk, E. 1984. *Phonology and Syntax: The Relation between Sound and Structure*. Cambridge MA: The MIT Press.

Tokizaki, H. & Dobashi, Y. 2013. Introduction to universal syntax and parametric phonology. *Linguistic Analysis* 38(3–4): 147–151.

Truckenbrodt, H. 1995. Phonological Phrases: Their Relation to Syntax, Focus, and Prominence. PhD dissertation, MIT.

Uyeno, T. Y. 1971. A Study of Japanese Modality – A Performative Analysis of Sentence Particles. PhD dissertation, The University of Michigan.

Yim, C. 2012. Fragment answers containing -*yo* in Korean: New evidence for the PF deletion theory of ellipsis. *Linguistic Inquiry* 43(3): 514–518. https://doi.org/10.1162/LING_a_00101

Yim, C. 2016. The unembeddable allocutive marker -*yo* in Korean and the syntax-pragmatics interface. *Studies in Generative Grammar* 26(4): 395–406.

Yim, C., & Dobashi, Y. 2015. A derivational approach to prosodic -*yo* attachment in Korean. *Proceedings of the 9th Workshop on Altaic Formal Linguistics, MIT Working Papers in Linguistics 76*, 35–46.

Yim, C. & Dobashi, Y. 2016. A prosodic account of -*yo* attachment in Korean. *Journal of East Asian Linguistics* 25(3): 213–241.

Yoon, S. 2013. Interactive nature of the Korean honorific marker -*yo*. In *Studies in Korean Linguistics and Language Pedagogy: Festschrift for Ho-min Sohn*, S- O. Sohn, S. Cho & S- H. You (eds), 206–221. Seoul: Korea University Press.

Wh-indefinites in East Asian languages

Jiwon Yun

Stony Brook University

This paper investigates the syntactic and semantic behaviors of *wh*-indefinites in Chinese, Japanese and Korean when they receive an existential reading, and identifies the source of such a reading in the three languages. The observation is that Japanese and Korean pattern together in terms of the behavior of their complex *wh*-indefinites, while Chinese and Korean show apparently different behaviors regarding their bare *wh*-indefinites. However, a closer scrutiny suggests that bare *wh*-indefinites in Korean and Chinese share more commonalities than has been reported in the literature in that they both can have an apparently exceptional wide scope reading when they are interpreted as indicating a specific referent.

Keywords: *wh*-words, interrogative, indefinite, scope

1. Introduction

It is well known that *wh*-interrogative words in Chinese, Japanese, and Korean (henceforth CJK) can be used to build non-interrogative expressions. For example, all the sentences in (1)–(3) express the same meaning 'I don't need anything', in which the negative polarity item (NPI) 'anything' is expressed by a phrase containing the *wh*-word 'what'.

(1) Chinese
   Shenme dou bu yao.
   what all NEG need

(2) Japanese
   Nani-mo iranai.
   what-also need.NEG

(3) Korean
   Mwues-to philyochi anhta.
   what-also need NEG

In addition to the NPI reading as shown in the above example, *wh*-words in CJK can be used for existential or universal quantificational readings, or a free choice item (FCI) reading as well. Table 1 presents various expressions based on the *wh*-word 'who' in CJK, illustrating the versatility of *wh*-words in those languages.

Table 1. Expressions based on the *wh*-word 'who' in CJK

	Interrogative 'who'	Existential 'someone'	Universal 'everyone'	NPI 'anyone'	FCI 'anyone'
Chinese	*shei*	*shei*	*shei dou*	*shei dou*	*shei dou*
Japanese	*dare*	*dare-ka*	*dare-mo*	*dare-mo*	*dare-demo*
Korean	*nwukwu*	*nwukwu(−nka)*	*nwukwu-na*	*nwukwu-to*	*nwukwu-lato*

The non-interrogative uses of interrogative words in CJK have long received attention in the East Asian linguistics literature (e.g. Chinese: Huang 1982; Cheng 1991; Li 1992; Lin 1998; Aldridge 2007; Dong 2009; Japanese: Kuroda 1965; Nishigauchi 1990; Watanabe 1992; Shimoyama 2006; Yatsushiro 2009; Kinuhata & Whitman 2011; Korean: Chang 1973; Chung 1996; Jang 1999; Kim 2000; Yi 2000; Ha 2004; Yoon 2005; Comparative studies: Suh 1989; Aoun & Li 1993; Tsai 1994). In this paper, I will discuss the indefinite use of *wh*-expressions in CJK languages (henceforth *wh*-indefinites), focusing on the case where they have *existential* quantificational force. The indefinite use of *wh*-words exhibits an interesting typological pattern because the three languages all differ in the possible forms of *wh*-indefinites. Chinese allows the bare form of *wh*-words to be used as indefinites (e.g. the word *shei* 'who' can also mean 'someone') but Japanese requires *wh*-words to combine with a bound morpheme to receive an indefinite reading (e.g. the word *dare* 'who' needs the indefinite marker *-ka* to mean 'someone'), whereas Korean allows both types of *wh*-indefinites (e.g. *nwukwu* 'who' can mean 'someone' by itself or by combining with the explicit marker *-nka*). The syntactic and semantic behaviors of the different types of *wh*-indefinites in the three languages are even more puzzling, since Japanese and Korean pattern together in terms of the behavior of their CWIs, while Chinese and Korean BWIs show apparently different behaviors as we will see later in the paper.

This paper aims at achieving two goals. The first goal is to investigate *wh*-indefinites in all three languages closely and provide a systematic comparison between them. The second goal is to find an account for why Chinese and Korean differ in the behaviors of their BWIs. The paper is organized as follows. Section 2 presents data in Chinese and Japanese and demonstrates how they match with the cross-linguistic typological generalization, and reviews previous analyses for *wh*-indefinites to explain the different behaviors of Chinese and Japanese. Section 3 fo-

cuses on Korean data which seems to make an apparent exception to the typology, and presents an analysis for that. Section 4 concludes the paper.

2.   *Wh*-indefinites in Chinese and Japanese

2.1   Data

The indefinite use of *wh*-interrogatives must be marked by a particle *-ka* in Japanese, whereas no such marker is required in Chinese. In other words, Chinese has the bare form of *wh*-indefinites (BWIs henceforth), while Japanese has a complex form of *wh*-indefinites (CWIs henceforth). *Wh*-indefinites in Chinese and Japanese differ not only in their forms, but also in their syntactic and semantic properties: Chinese *wh*-indefinites occur in more restricted environments than Japanese *wh*-indefinites. In fact, the limited distribution of BWIs, compared to CWIs, has been noted cross-linguistically (e.g. German, Dutch, Classical Greek, Russian: see Haspelmath 1997 and Bruening 2007 for typological surveys). The following enumerates some common distinctions between BWIs and CWIs in the world's languages and shows how Chinese BWIs and Japanese CWIs fit into the cross-linguistic pattern.

First, BWIs cannot appear at the beginning of the sentence, while CWIs can (Cheng 1991; Haspelmath 1997; Aldridge 2007). For example, the only available reading of the Chinese sentence in (4) is an interrogative reading 'who came?' and it cannot have an indefinite reading. On the other hand, CWIs can appear at the beginning of the sentence as in the Japanese example (5).

(4)   ***Shei*** *lai*   *le*
      who   come PERF
      '*Someone came.'

(5)   ***Dare-ka-ga***   *kita*
      who-EX-NOM   come.PAST
      'Someone came.'

Second, BWIs cannot be moved out of the base position, whereas CWIs and regular indefinites can (Postma 1994). Although topicalization is a quite common process in Chinese (Ramsey 1987), a BWI cannot move by topicalization as shown in (6). On the other hand, a CWI in Japanese can be freely moved out of its base position, as shown in (7).[1]

---

1. A reviewer remarks that the comparison should be based on the same type of movement operation and raises a question about the acceptability of topicalizaed Japanese CWIs. The topic

(6) a.   *Wo xiang mai **shenme   dongxi.***
          I   want buy **what   thing**
          'I want to buy something.'

     b.   ***Shenme   dongxi** wo xiang mai.*
          what   thing   I   want buy
          '*I want to buy something.'

(7) a.   *Watashi-wa **nani-ka-o**   kai-tai.*
          I-TOP   **what-EX-ACC** buy-want
          'I want to buy something.'

     b.   ***Nani-ka-o**   watashi-wa kai-tai.*
          what-EX-ACC I-TOP   buy-want
          'I want to buy something.'

Third, BWIs do not take wide scope in general (Li 1992; Bruening 2007). For example, they cannot take scope over negation. The Chinese example in (8) can only mean that he did not eat anything, and cannot mean that there is a certain thing that he did not eat. However, such a wide scope reading is possible with CWIs, as in the Japanese example (9).[2]

(8) *Ta mei chi **shenme.***
     he NEG eat **what**
     'He didn't eat anything.'

(9) *Kare-wa **nani-ka**-o   tabe-nakatta.*
     he-TOP   **what-EX** -ACC eat-NEG.PAST.DECL
     'He didn't eat something.'

Fourth, BWIs cannot escape scope islands, while CWIs and regular indefinites can. As is well known, certain constructions do not allow quantifiers in them to take scope outside of them (Ross 1967). The sentence in (10) only means that May will be happy in case everyone comes to the party, and it cannot mean that for everyone, May will be happy if that person comes to the party. This illustrates that an *if*-clause creates a scope island because the quantificational expression *everyone* cannot take scope over *if*. However, the sentence in (11) can mean either May will be happy if someone (whoever it is) comes to the party or there is a specific person

---

marker *-wa* after a CWI indeed sounds odd if it appears out of blue, but it does not seem impossible when an appropriate context is given. The judgments I elicited from Japanese speakers suggest that a topicalized CWI is acceptable if it is contrastive, followed by a focused item.

2. In (9), a wide scope reading of the indefinite is in fact strongly preferred. As we will see later, this supports the choice function analysis of CWIs (cf. Kratzer 1998).

such that May will be happy if that person comes to the party. This illustrates that indefinite expressions such as *someone* can escape scope islands.

(10)   If everyone comes to the party, May will be happy. (if > every, *every > if)

(11)   If someone comes to the party, May will be happy. (if > some, some > if)

When it comes to *wh*-indefinites, only CWIs are known to escape scope islands. The following examples illustrate that the BWI *shenme ren* 'someone' in Chinese cannot be interpreted outside of the *if*-clause, while the CWI *dare-ka* 'someone' in Japanese can take scope over the *if*-clause.

(12)   *Yaoshi **shenme ren**   lai,   Mei hui hen gaoxing.*
         if   **what   person** come Mei will very happy
         'If someone comes, Mei will be very happy.' (if > some, *some > if).

(13)   ***Dare-ka**-ga   ki-tara Mei-wa sugoku yorokobu-daroo.*
         who-EX -NOM come-if Mei-TOP very   happy-will
         'If someone comes, Mei will be very happy.' (if > some, some > if).

2.2   Interim analysis

The syntactic and semantic restrictions of BWIs illustrated so far, compared to CWIs, are cross-linguistically observed among the languages that have *wh*-indefinites. This has led a number of researchers of individual languages to the same conclusion that bare *wh*-words require a certain licensor to receive an indefinite reading. Those researchers have regarded a BWI as an *e*-type variable that is bound by existential closure at VP (e.g. Cheng 1991 for Chinese; Postma 1994 for German and Dutch; cf. Heim 1982; Diesing 1992), or as an alternative set that should be bound by a certain lexical licensor such as a modal expression (e.g. Yanovich 2005 for Russian, Cheng 1991; Dong 2009 for Mandarin Chinese; cf. Hamblin 1973).[3] All of these analyses commonly assume that bare *wh*-words cannot be interpreted as an indefinite if they are not licensed properly, in which case the sentence is interpreted as either a *wh*-question or simply an ill-formed sentence.

Under this line of analysis, all the restrictions on BWIs mentioned in Section 2.1 are explained naturally. Syntactically, BWIs must be located lower than their licensor; thus they cannot move over their licensor and also cannot appear at the beginning of the sentence. Semantically, BWIs must be interpreted in the scope of their licensor, thus their scope configuration should be restricted. Note

---

3. The second type of BWI licensors seem to be determined by the lexicon rather than by the semantic properties because they do not form any stable natural class, even within a single language (Yanovich 2005).

that according to this analysis, some of the restrictions of BWIs should not be as strict as previously described. First, not all movements of BWIs should be illegal; movement to a position lower than the licensor should be possible. Second, a long-distance scope reading should be available as long as it is interpreted within the scope of the licensor. For instance, modal expressions such as *haoxiang* 'it seems' can license BWIs in Chinese while universal quantifiers cannot, thus a scope configuration such as [seem > some > all] is possible for the Chinese sentence in (14) with the BWI *shenme*:

(14) *Haoxiang tamen dou chiguo shenme.*
      seem   they all ate   **what**
      'It seems they all ate something.'

When it comes to CWIs, it would be natural to conclude that they have the same semantic representations as regular indefinites since those two kinds of indefinites pattern together. The semantics of regular indefinites that are *not* morphologically related to *wh*-words also has been a subject of controversy, especially because of their relatively free scope configurations compared to canonical quantificational expressions as illustrated in the contrast between (10) and (11). A number of researchers have attempted to explain the semantics of regular indefinites, and some relatively well-known analyses include the Choice Function Analysis (Reinhart 1997; Winter 1997; Kratzer 1998) and the Singleton Domain Analysis (Schwarzschild 2002). In the Choice Function Analysis, an indefinite introduces a choice function variable to the semantic representation of the sentence, which is existentially closed at some level (Reinhart 1997; Winter 1997) or remains free but its value is determined by the context (Kratzer 1998). In the Singleton Domain Analysis, indefinites that seem to take wider scope than other quantifiers are actually 'singleton indefinites' whose domain of quantification is contextually delimited to a singleton set.

Some previous studies on *wh*-indefinites have adopted the Choice Function Analysis (e.g. Ha 2004 for Korean, Yanovich 2005 for Russian, Yatsushiro 2009 for Japanese) for the semantic representation of CWIs, suggesting that the additional morphology after the *wh*-word in CWIs is an explicit choice function marker. The details of their analyses vary according to which specific choice function analysis was adopted. In this paper, I adopt the choice function analysis of Kratzer (1998) to analyze CWIs since it correctly predicts the relative scope configuration of negation and CWIs. According to Kratzer, a choice function indefinite necessarily takes the widest scope since it is not bound by a local existential operator but contextually determined, and an apparent narrow scope reading becomes available when the choice function is parameterized with an implicit argument against the other scope-bearing quantificational expression. For example, the Japanese CWI

nani-ka in the sentence (15a) indicates a choice function variable that takes the set of entities and returns one of the entities, as shown in the formula (15b). Since this function variable is free and its value is determined by the context, its default reading is the widest scope one. However, it can appear to take narrow scope if it is parameterized with an implicit argument against the other scope bearing expression 'everyone' as illustrated in the formula (15c). Since such parameterization is impossible for negation, choice function indefinites cannot be interpreted in the scope of negation. Indeed, (16) only allows a wide scope reading of the CWI.

(15)   a.   *Minna-ga*   ***nani-ka-o***   *tabe-ta.*
             everyone-NOM **what-EX** -ACC eat-DECL
             'Everyone ate something.'

       b. $\forall x[person(x) \wedge eat(f(thing))]$ (some > every)
       c. $\forall x[person(x) \wedge eat(f(x,thing))]$ (every > some)

(16)   a.   *Ken-wa* ***nani-ka-o***   *tabe-nakatta.*
             Ken-TOP **what-EX** -ACC eat-NEG.PAST.DECL
             'Ken didn't eat something.'

       b. $\neg[eat(Ken, f(thing))]$ (some > not)

3.   *Wh*-indefinites in Korean

3.1   Data

While Chinese and Japanese have only one type of *wh*-indefinite (i.e., BWIs and CWIs, respectively), Korean allows both types of *wh*-indefinites, since the indefinite marker -(*i*)*nka* is optional. The puzzling fact is that in Korean, none of the restrictions on BWIs that are observed in the case of Chinese hold, and BWIs and CWIs simply seem to pattern together. First, both BWIs and CWIs can appear at the beginning of the sentence.

(17)   a.   ***Nwuka***   *wass-ta.*
             who.NOM come.PAST-DECL
             'Someone came.'

       b.   ***Nwukwu-nka-ka*** *wass-ta.*
             who-EX -NOM   come.PAST-DECL
             'Someone came.'

Second, both BWIs and CWIs can be moved to the beginning of the sentence. In both examples shown below, the object *wh*-indefinite is scrambled over the subject.

(18) a. ***Nwukwu-lul Yuna-ka   kkok manna-ko sipheha-n-ta.***
          who-ACC   Yuna-NOM really meet-want-PRES-DECL
          'Yuna really wants to see someone.'
      b. ***Nwukwu-nka-lul Yuna-ka   kkok manna-ko sipheha-n-ta.***
          who-EX -ACC   Yuna-NOM really meet-want-PRES-DECL
          'Yuna really wants to see someone.'

Third, both BWIs and CWIs can take wide scope. For example, the *wh*-indefinite can take scope over negation in both examples below.[4]

(19) a. *Minho-ka   mwe-l   an kacyewa-ss-ta.*
          Minho-NOM **what**-ACC NEG bring-PAST-DECL
          'Minho didn't bring something.'
      b. *Minho-ka   mwe-nka-lul an kacyewa-ss-ta.*
          Minho-NOM **what- EX** -ACC NEG bring-PAST-DECL
          'Minho didn't bring something.'

Fourth, both BWIs and CWIs can escape scope islands. The *wh*-indefinite can be interpreted outside of the *if*-clause in both examples below.

(20) a. ***Nwu-ka   o-myen Yuna-ka   cham cohaha-l ke-ta.***
          who-NOM come-if Yuna-NOM very happy-will-DECL
          'If someone comes, Yuna will be very happy.'
      b. ***Nwukwu-nka-ka o-myen Yuna-ka   cham cohaha-l ke-ta.***
          who-EX -NOM   come-if Yuna-NOM very happy-will-DECL
          'If someone comes, Yuna will be very happy.'

3.2   Proposal

The above examples seem to suggest that BWIs and CWIs pattern together in Korean. Thus, one might argue that the two types of *wh*-indefinites have an identical semantic representation in Korean. Indeed, it has often been argued that Korean BWIs are merely a contracted form of the corresponding CWIs (Suh 1989; Chung 1996; Jang 1999, among others).

However, the distribution of BWIs and CWIs are not exactly the same in Korean. A BWI in fact can appear in contexts where a typical non-restricted

---

4. Ha (2004) argues that only CWIs can take wide scope over negation, other quantifiers, or *if*-clauses in Korean, providing examples that he claims to illustrate the impossibility of wide-scope BWIs. However, nearly every native Korean speaker I have consulted, including myself, did accept those examples with wide-scope BWIs. Furthermore, a perception experiment in Yun (2012) shows that a wide scope reading of BWIs is even preferred over a narrow scope reading when they receive prosodic prominence.

indefinite expression or a CWI cannot appear. For instance, the BWI *nwukwu* can occur in an exceptive phrase X-*pakkey eps-* 'nobody but X' (21), as a subject of the copular verb (22), or as an answer to the question 'who are you talking about?' (23).

(21) a. *Ilen cis-ul   hal salam-un   nwukwu-pakkey epsta.*
　　　 such thing-ACC do person-TOP **who**-FOC　　　 not.exist
　　　 'No one but **you-know-who** would do such a thing.'

　　 b. **Ilen cis-ul   hal salam-un   nwukwu-nka-pakkey epsta.*
　　　 such thing-ACC do person-TOP **who**- EX -FOC　　　 not.exist
　　　 '* No one but **someone** would do such a thing.'

(22) a. *Pemin-un   nwukwu-lako somwun-i   ta na-ss-ta.*
　　　 criminal-TOP **who**-be.that   rumor-NOM all spread-PAST-DECL
　　　 'The rumor spread that the criminal is **you-know-who**.'

　　 b. **Pemin-un   nwukwu-nka-lako somwun-i   ta na-ss-ta.*
　　　 criminal-TOP **who**- EX -be.that   rumor-NOM all spread-PAST-DECL
　　　 '*The rumor spread that the criminal is **someone**.'

(23) A: *Cikum nwukwu yaykiha-nun ke-ya?*
　　　 now   who   talk-PROG-Q
　　　 'Who are you talking about?'

　　 B: a. *Nwukwu isscahna.*
　　　　 who   you.know
　　　 'I'm talking about **you-know-who**.'

　　　 b. ** Nwukwu-nka isscahna.*
　　　　 who-EX   you.know
　　　 '*I'm talking about **someone**, you know.'

When a BWI is used in those contexts, the speaker refers to a specific person and presupposes the listener also knows that person, but does not want to (or cannot) mention the person's name explicitly for some reason. Note that CWIs or regular non-restricted indefinites cannot be used in this way, as shown by the unacceptability of the corresponding sentences with CWIs or their English translation with a regular indefinite *someone*. Based on these observations, we can conjecture that the seemingly exceptional scope reading of Korean BWIs is possible because they allow a referential reading.[5] Note that although referential expressions do not

---

5. A reviewer raises a question on the choice of the term "referential" instead of "specific". Although a specific expression usually receives a wide scope reading, specificity *per se* is independent of scope relations and a narrow-scope specific reading is possible (Enc 1991). On the other hand, a referential reading is only compatible with the widest scope reading, which provides the adequate description of the exceptional scope behaviors of Korean BWIs as discussed in this paper.

take scope, their interpretation is truth-conditionally compatible with the widest scope reading of indefinites. In other words, bare *wh*-words in Korean do have restrictions in their scope configuration when they bear existential quantificational force, but when they receive a referential reading, they can be seen as having an exceptionally wide scope reading. This approach is in line with the view that attributes the exceptional wide scope reading of certain genuine indefinites to their ambiguity between a quantificational reading and a referential reading (cf. Fodor & Sag 1982; Kratzer 1998).

The referential analysis of wide scope BWIs is further supported by the observation that the occurrence of BWIs is in fact not entirely free in Korean. Since a referential reading is only compatible with the widest scope reading, the analysis predicts that if a bare *wh*-word receives an indefinite-like reading in the position where typical BWIs cannot appear, it must take the widest scope. The following examples show that this prediction is borne out.

First, BWIs cannot be interpreted in the scope of other quantifiers when they escape syntactic islands. Consider the sentences in (24), in which three different readings are available in theory depending on the relative scope configuration of the *wh*-indefinite: i) the narrowest scope [many > if > **some**] (i.e. many people show an allergic reaction if they apply anything on their face; in other words, many people are simply sensitive), ii) an intermediate scope [*many > **some** > if] (i.e. many people show an allergic reaction to a certain thing if they apply it to their face: John is allergic to the chemical X, Bill is allergic to the chemical Y, etc.), and iii) the widest scope [**some** > many > if] (i.e. there is a certain thing such that many people show an allergic reaction if they apply it on their face; e.g. the chemical X is a common allergen for many people). These three possible readings are all available for the CWI in (24b), but the BWI does not allow an intermediate scope reading (24a). This is because the BWI must be referential to be interpreted out of the *if*-clause, and then it should demonstrate the widest scope reading, not an intermediate one.

(24) a. *Manhun salamtul-i   elkwul-ey* **mwe**-*l   palu-myen alleyluki-lul*
          many   people-NOM face-LOC **what**-ACC apply-if   allergy-ACC
          ilukhinta.
          occur
          'Many people show an allergic reaction if they apply something to the face.'

  b. *Manhun salamtul-i   elkwul-ey* **mwe-nka**-*lul palu-myen alleyluki-lul*
      many   people-NOM face-LOC **what-EX** -ACC apply-if   allergy-ACC
      ilukhinta.
      occur
      'Many people show an allergic reaction if they apply something to the
      face.'

Second, BWIs necessarily receive a wide scope reading when they are scrambled.
In the previous scrambled examples, repeated below, the sentence with the BWI
only has a wide scope reading that Yuna wants to see a specific person (25a), while
the one with the CWI allows a narrow scope reading (25b).

(25) a. *Nwukwu-lul Yuna-ka   kkok manna-ko sipheha-n-ta.*
          who-ACC   Yuna-NOM really meet-want-PRES-DECL
          'Yuna really wants to see someone.'
      b. *Nwukwu-nka-lul Yuna-ka   kkok manna-ko sipheha-n-ta.*
          who-EX -ACC   Yuna-NOM really meet-want-PRES-DECL
          'Yuna really wants to see someone.'

This observation might be difficult to disentangle from a general wide-scope pref-
erence in the scrambled position, as a wide scope reading is strongly preferred
even in the sentence with a CWI in (25b). However, it becomes clearer when we
consider an appropriate context that forces a narrow scope reading of an indefi-
nite. Suppose that there is a dispute in some area and every country dispatched
someone to mediate. The most natural reading is that each country dispatched
different people. In such a case, BWIs cannot appear in the scrambled position
(26a), while CWIs can (26b).

(26) a. ** Nwukwu-lul   motun nala-ka   phakyenhay-ss-ta.*
          who-ACC   all   country-NOM dispatch-PAST-DECL
          'Every country dispatched someone.'
      b. *Nwukwu-nka-lul motun nala-ka   phakyenhay-ss-ta.*
          who-EX -ACC   all   country-NOM dispatch-PAST-DECL
          'Every country dispatched someone.'

3.3   Evidence from other languages

To summarize the proposal, BWIs in Korean are apparently exceptional, not be-
cause they are completely different from BWIs in other languages, but because they
have an additional (i.e. referential) reading. A question then arises: is Korean the
only language whose BWIs are ambiguous? Are there any other languages in which

a non-quantificational usage of BWIs is found? As an answer to this question, this section introduces the so-called placeholder usage of bare *wh*-words.

Ganenkov et al. (2010) report that in certain Northeast Caucasian languages such as Udi and Agul, *wh*-pronouns can be used as placeholders, i.e., "hesitation markers whose use is motivated by production difficulties on the side of the speaker." In such a case, the speaker knows that there exists a specific expression that is appropriate for the utterance but cannot recall it in the moment, so she replaces the expression with a *wh*-pronoun. The target expression can appear after the *wh*-placeholder if the speaker successfully recalls it in the end as in (27), but not necessarily, as in (28).[6]

(27) Agul   (Ganenkov et al. 2010)
      Na-s   *aʁ-a-a*   *zun,*
      who-DAT say-IPF-PRS I
      me we   jazna   q'ulban-a-s = na...
      DEM your:SG brother_in_law Qurban-O-DAT = ADD
      'Then I tell [WHOM], your brother-in-law Qurban and ...'

(28) Udi   (Ganenkov et al. 2010)
      Bur = e = q-sa   lül-in-aχun tːe **he** *cːoroj-e-s-a.*
      begin = 3SG = ST-PRS pipe-O-ABL DEM **what** flow-LV-INF-DAT
      'This [WHAT] begins to flow from the pipe.'

Cheung (2015) discusses a placeholder usage of *wh*-expressions in Chinese, in which the exact reference is not uttered due to a momentary retrieval problem (29) or to avoid direct mentioning of the reference for some pragmatic reasons (30). In particular, he notices that the placeholder *wh*-words do not require any licensor, while BWIs in Chinese are known to require an appropriate licensor as we have seen earlier.[7]

(29) Cantonese   (Cheung 2015)
      Hoizoek   **me** *la*!
      switch.on what SP
      'Switch on [WHAT]!' (what = router).

---

6. IPF: imperfective stem, ADD: additive particle, ST: detached part of verbal stem, O: oblique, ABL: ablative, LV: light verb, INF: infinitive.

7. The Udi and Mandarin examples introduced here involve a demonstrative, which leaves a question whether a bare *wh*-word without a demonstrative in these languages can actually serve as placeholders. Cheung (2015) reports that in Mandarin the acceptability of placeholders indeed becomes lower if they do not include a demonstrative, but does not completely rule out the placeholder use of bare *wh*-words.

(30) Mandarin   (Cheung 2015)
      *Na ge **shei** yijing   you   nanyou   le.*
      DEM CL who already have boyfriend SP
      'That [WHO] has already got a boyfriend.'

The 'placeholder usage' of *wh*-words provides evidence that the non-interroga-tive bare *wh*-words are not limited to the homogeneous function (i.e. existential quantification) in many languages. Note that a referential reading is naturally de-rived when such a *wh*-word replaces a proper noun, which suggests that Korean and Chinese may have the common source of the exceptional reading of BWIs. Finding more instances of non-canonical usage of bare *wh*-words in other lan-guages is a worthy case for future research.

4.   Conclusion

This paper has investigated the differences and similarities in the syntactic and semantic properties of *wh*-indefinites in Chinese, Japanese, and Korean. The bare form of *wh*-indefinites (BWIs) in Chinese is more restricted in its use compared to the complex form of *wh*-indefinites (CWIs) in Japanese, which is in line with cross-linguistic typological generalization on BWIs and CWIs. Korean seems to make an exception to this typological generalization because its BWIs seem to be-have in the same way as CWIs at first glance. However, I have shown that Korean BWIs and CWIs are in fact systematically different and that the apparent overlaps between them are due to the possibility of a referential reading of BWIs in Korean. This is comparable with the placeholder use of *wh*-words in Chinese, which allows a broader range of non-interrogative readings of bare *wh*-words in Chinese.

References

Aldridge, E. 2007. *Wh*-indefinites and their relation to *wh*-in-situ. *Proceedings of the Annual Meeting of the Chicago Linguistics Society* 43: 139–153.
Aoun, J., & Li, A. 1993. On some differences between Chinese and Japanese *wh*-elements. *Linguistic Inquiry* 20: 265–272.
Bruening, B. 2007. *Wh*-in-situ does not correlate with *wh*-indefinites or question particles. *Linguistic Inquiry* 38: 139–166. https://doi.org/10.1162/ling.2007.38.1.139
Chang, S. -J. 1973. A generative study of discourse: pragmatic aspects of Korean with reference to English. *Ehak yenkwu* (Language research) 9.2 (supplement).
Cheng, L. L-S. C. 1991. On the Typology of Wh-questions. PhD dissertation. MIT.
Cheung, L. Y-L. 2015. Uttering the unutterable with *wh*-placeholders. *Journal of East Asian Linguistics* 24: 271–308. https://doi.org/10.1007/s10831-014-9130-x

Chung, D. -H. 1996. On the Representation and Licensing of Q and Q-dependency. PhD dissertation, University of Southern California.

Diesing, M. 1992. *Indefinites*. Cambridge MA: The MIT Press.

Dong, H. 2009. Issues in the Semantics of Mandarin Questions. PhD dissertation, Cornell University.

Enç, M. 1991. The semantics of specificity. *Linguistic Inquiry* 22: 1–25.

Fodor, J. D. & Sag, I. A. 1982. Referential and quantificational indefinites. *Linguistics and Philosophy* 5: 355–398. https://doi.org/10.1007/BF00351459

Ganenkov, D., Lander, Y. & Maisak, T. (2010). From interrogatives to placeholders in Udi and Agul spontaneous narratives. In *Fillers in Discourse and Grammar* [Typological Studies in Language 93], N. Amiridze, B. Davis, M. Maclagan, H. Kitano (eds.), 95–118. Amsterdam: John Benjamins.

Ha, S. 2004. The existential reading of *wh*-words and their scope relations. *Proceedings of the Annual Meeting of the Chicago Linguistics Society* 40: 83–95.

Haspelmath, M. 1997. *Indefinite Pronouns*. Oxford: OUP.

Heim, I. 1982. The Semantics of Definite and Indefinite Noun Phrases. PhD dissertation. University of Massachusetts, Amherst.

Huang, C. -T. J. 1982. Logical Relations in Chinese and the Theory of Grammar. PhD dissertation. MIT.

Jang, Y. 1999. Two types of question and existential quantification. *Linguistics* 37: 847–869. https://doi.org/10.1515/ling.37.5.847

Kim, A. -R. 2000. A Derivational Quantification of "Wh-phrase". PhD dissertation. Indiana University.

Kinuhata, T. & Whitman, J. 2011. Genesis of indefinite pronouns in Japanese and Korean. *Japanese/Korean Linguistics* 18: 88–100.

Kratzer, A. 1998. Scope or pseudoscope? Are there wide-scope indefinites? In *Events and Grammar*, S. Rothstein (ed.), 163–196. Dordrecht: Kluwer. https://doi.org/10.1007/978-94-011-3969-4_8

Kuroda, S. -Y. 1965. Generative Grammatical Studies in the Japanese Language. PhD dissertation, MIT.

Li, Y. -H. A. 1992. Indefinite *Wh* in Mandarin Chinese. *Journal of East Asian Linguistics* 1: 125–155. https://doi.org/10.1007/BF00130234

Lin, J. -W. 1998. On existential polarity *wh*-phrases in Chinese. *Journal of East Asian Linguistics* 7: 219–255. https://doi.org/10.1023/A:1008284513325

Nishigauchi, T. 1990. *Quantification in the Theory of Grammar Dordrecht*: Kluwer Academic Publishers.

Postma, G. 1994. The indefinite reading of WH. In *Linguistics in the Netherlands* 1994, R. Bok-Bennema & C. Cremers (eds.), 187–198. Amsterdam: John Benjamins.

Ramsey, R. 1987. *The Languages of China*. Princeton NJ: Princeton University Press.

Reinhart, T. 1997. Quantifier scope: How labor is divided between QR and choice functions. *Linguistics and Philosophy* 20: 335–397. https://doi.org/10.1023/A:1005349801431

Ross, J. R. 1967. Constraints on Variables in Syntax. PhD dissertation, MIT.

Shimoyama, J. 2006. Indeterminate phrase quantification in Japanese. *Natural Language Semantics* 14: 139–173. https://doi.org/10.1007/s11050-006-0001-5

Schwarzschild, R. 2002. Singleton indefinites. *Journal of Semantics* 19: 289–314. https://doi.org/10.1093/jos/19.3.289

Suh, C. -S. 1989. Interrogatives and indefinite words in Korean: With reference to Japanese. *Harvard Studies in Korean Linguistics* 3: 329–340.

Tsai, W. -T. D. 1994. On Economizing the Theory of A-bar Dependencies. PhD dissertation, MIT.

Watanabe, A. 1992. *Wh*-in-situ, subjacency and chain formation. *MIT Working Papers in Linguistics II*. Cambridge MA: MIT.

Winter, Y. 1997. Choice functions and the scopal semantics of indefinites. *Linguistics and Philosophy* 20: 399–467. https://doi.org/10.1023/A:1005354323136

Yanovich, I. 2005. *Choice-functional series of indefinites and Hamblin semantics*. Paper presented at the SALT XV, Ithaca NY.

Yatsushiro, K. 2009. The distribution of quantificational suffixes in Japanese. *Natural Language Semantics* 17: 141–173. https://doi.org/10.1007/s11050-009-9044-8

Yi, S. -W. 2000. On the indefinite expression of "interrogative pronoun+(*i*)+−*nka*" (in Korean). *Hankwukehak* (Korean linguistics) 36: 191–219.

Yoon, J. -M. 2005. Two historical changes in *wh*-constructions in Korean and their implications. *Studies in Generative Grammar* 15: 457–487.

Yun, J. 2012. The deterministic prosody of indeterminates. In *Proceedings of the 29th West Coast Conference on Formal Linguistics*, J. Choi, E. A. Hogue, J. Punske, D. Tat, J. Schertz & A. Trueman (eds.), 285–293. Somerville MA: Cascadilla Press.

PART III

Diachrony

CHAPTER 8

Resultative and termination

A unified analysis of Middle Chinese VP-YI

Edith Aldridge and Barbara Meisterernst
University of Washington & Humboldt University Berlin

This paper proposes an account of the reanalysis of the Chinese morpheme 已 *yǐ* from an intransitive verb meaning 'end, terminate' into a functional category marking completive aspect. We posit that this grammaticalization was triggered by the loss of aspectual affixes, prompting YI to be reinterpreted from a lexical verb to a secondary predicate supplying the endpoint to an event expressed by a preceding predicate. The use of YI as a secondary predicate was made possible in part by changes in Chinese VP structure which allowed an endpoint-denoting secondary predicate to occupy a VP-internal position in this period.

Keywords: aspect, grammaticalization, Middle Chinese, resultative, telicity

1. Introduction

Early Chinese translations of Buddhist texts reveal numerous cases of intransitive verbs 已 *yǐ*, 竟 *jìng*, 畢 *bì*, or 訖 *qì* originally meaning 'terminate' or 'finish' appearing in final position in a modifying subordinate clause to indicate completion of the event expressed by that clause. These subordinate clauses are followed by the main clause, which expresses an action following sequentially after the completion of the event expressed by the clause containing 已 *yǐ*, 竟 *jìng*, 畢 *bì*, or 訖 *qì*.

(1) a. 王　升　車　　已, 群　臣　　　跪　賀
　　　wáng shēng chē　yǐ, qún chén　　guì　hè
　　　king mount carriage YI, all   ministers kneel bless
　　　'After the king mounted the carriage, all ministers knelt down and gave
　　　their blessings.'

　　　　　　　　　　　(*Zhongben qi jing* 2nd–3rd c.) (*Taishō* 4, no.196, p. 153b)

b. 佛　　坐 飯 **竟**,　行 澡 水 **畢**,　為 說 經　法。
fó　　zuò fàn jìng,　xíng zǎo shuǐ bì,　wèi shuō jīng fǎ
Buddha sit eat finish, go wash water finish, for say sutra dharma
'After the Buddha had sat down and finished his meal, and after he had washed himself, he explained the sutra and the dharma (to them).'
　　　　　　(*Zhongben qi jing*, 2nd–3rd c.) (*Taishō* 4, no.196, p. 162a)

These aspectual verbs grammaticalized from lexical verbs and continued to be used as such in the same period. The verbal use is clear in the following examples from the fact that they are negated.

(2) a. 女　　舞　　未　　**竟**,　忽然　　不　見,
nǚ　　wǔ　　wèi　jìng, hūrán　　bù xiàn
woman dance NEG~asp~ finish, suddenly NEG visible
'The woman had not stopped dancing yet when she suddenly became invisible.' 　(*Zhongben qi jing*, 2nd–3rd c.) (*Taishō* 4, no.196, p. 149b)

b. 數　　譖　　不 **已**,　王　頗　惑　　之.
shuò　zèn　bù yǐ, wáng pō huò　zhī
several slander NEG finish, king quite confuse OBJ
'The various slandering had not stopped, and the king found it quite confusing.' 　(*Zhongben qi jing*, 2nd–3rd c.) (*Taishō* 4, no.196, p. 157c)

Among these verbs of completion, 已 *yǐ* was by far the one most commonly used as an aspectual marker. The goal of this paper is to propose an analysis of how YI was reanalyzed from a verb to an aspectual marker signaling the completion of an event. Before presenting our analysis, we first summarize other approaches which have been put forth in the literature.

Because of the predominant occurrence of aspectual YI in Buddhist texts, Cheung (1977) has speculated that this usage might be a borrowing from Sanskrit. Specifically, the Chinese verb YI was co-opted in order to translate the Sanskrit gerundial suffix *–tvā*. Cheung further suggests that this accounts for the clause-final position, since Sanskrit is a verb-final language, and the suffix follows the verb stem.

In contrast, Mei (1999) proposes that the aspectual use of YI was a native Chinese development, identifying several early examples in very Early Middle Chinese of the 1st century BCE, before the introduction of Buddhism to China.

(3) a. 鑽　中　已, 又　灼　龜　首
zuān zhōng yǐ, yòu zhuó guī　shǒu
bore center YI, again burn tortoise head
'After boring through the center (of the shell), then they burned the tortoise head.' 　　(*Shiji*: 128; 3240, 100 BCE; from Mei 1999: 289)

b.
飯 已,	盡	懷	其	餘	肉	持	去,	衣
fàn yǐ,	*jìn*	*huái*	*qí*	*yú*	*ròu*	*chí*	*qù,*	*yī*
eat finish,	completely	hold.in.bosom	POSS	rest	meat	take	leave,	dress

盡　　汗
jìn　　*wū*
completely dirty

'After eating, they took all their remaining meat with them (in their bosom) and left, and their clothes became completely soiled.'

(*Shiji*: 126; 3205; from Mei 1999: 289)

Jiang (2001, 2007) revises Mei's (1999) proposal by arguing that the native development was limited to YI which occurred with atelic events, particularly with durative verbs. The function of YI was to supply the endpoint to the event. This can be seen in Mei's examples in (3). In (3b), for instance, the function of YI is to indicate the end of the eating event.

In addition to this, Jiang proposes that a second function of YI was innovated under Sanskrit influence. This YI occurred with telic predicates, both accomplishments and achievements and signaled specifically that the endpoint of the event had been reached. This is illustrated in the following unaccusative examples. These are achievement predicates, which are both punctual and telic.

(4) a.
然 於後 世,	事	究竟	已, 言談	斐粲
rán yú hòu shì,	*shì*	*jiùjìng*	*yǐ, yántán*	*fěicàn*
so in later generation,	affair	thoroughly.	realize YI, utterance	brilliant

'So in later generations, after these things had been thoroughly comprehended, words and utterance became brilliant, …'

(*Zheng fahua jing*, 3rd century) (*Taishō* 9, no.263, p. 88a)

b.
佛	滅度	已, 受	持	經卷.
fó	*mièdù,*	*yǐ, shòu*	*chí*	*jīngjuàn*
Buddha	reach.extinction YI,	receive	hold	scripture

'… and after the Buddha has reached his extinction, they will receive and hold on to the scriptures.'

(*Zheng fahua jing*, 3rd c.) (*Taishō* 9, no.263, p. 101a)

This paper traces the origin of both types of YI and develops the proposal of Meisterernst (2011: 38) that the function of YI expressing either endpoint or completion of the event had its origin in the verb YI 'terminate'. It is true that early examples of VP-YI predominantly involve atelic predicates, with YI signaling termination rather than completion, but we argue that this is due to the following two factors. First, the original meaning of verbal YI was 'stop' or 'terminate' and did not entail completion of an event. Secondly, until the end of the Late Archaic period, the language retained a trace of the derivational affixes employed in Archaic

Chinese to derive telic from atelic verbs. YI did not occur with verbs that were marked as telic while the function of the morphology was still transparent.

We propose the following historical development for aspectual YI. First, with the loss of the aspectual morphology at the end of Archaic Chinese, the verb YI was reanalyzed as a secondary predicate in the VP in order to mark the endpoint of an event. The VP-internal position of YI suggests a close connection with lexical aspect, i.e. aktionsart, rather than grammatical aspect like perfectivity. We further propose that the reanalysis was facilitated by changes in Chinese VP structure which permitted an endpoint denoting secondary predicate to appear within the VP in Early Middle Chinese. As an endpoint denoting secondary predicate, YI most naturally occurred with activity predicates and served to supply the endpoint for the event.

Regarding the later use of YI to signal the realization of a telic event, we propose that this was not a borrowing from Sanskrit but rather a natural extension of the use of the endpoint denoting YI. The loss of the aspectual morphology had the concomitant result of neutralizing the formal distinction between telic and atelic verbs in Chinese, which may in turn be the origin of the well-known lack of inherently telic verbs in Modern Mandarin today, as noted by Tai (1984), Sybesma (1997), and others. In Middle Chinese, once telic verbs were no longer distinguished from atelic verbs, the endpoint denoting secondary predicate YI could co-occur with both types of predicate to supply the endpoint in the case of activities or indicate that the natural endpoint of the event had been reached in the case of achievements and accomplishments. These two functions of YI are essentially parallel, respectively, to the 'endpoint' and 'realization' functions proposed by Sybesma (1997, 1999) for the Modern Mandarin aspectual marker *le* 了 .

In sum, our proposal sides with Mei (1999) in claiming that the function of YI as an aspectual marker was a wholly indigenous Chinese development.[1] However, we go beyond Mei (1999) in providing an analysis of the diachronic development of the (multiple) aspectual functions of YI from the verbal YI. We additionally provide an explanation for why a VP internal aspectual marker emerged precisely in the beginning of the Middle Chinese period, as this was the time in the history of Chinese when the morphological aspectual distinctions had been lost and a position in the VP had been innovated for hosting resultative secondary predicates.

---

1. This has also been claimed in Meisterernst (2011) and later, independently in Wei (2015).

2.   Aspect in Late Archaic Chinese

In this section, we provide a brief overview of the impact that the loss of Late Archaic Chinese aspectual morphology had on changes in the aspectual system. Traditional proposals connect the aspectual morphology to grammatical aspect. However, Meisterernst (2015b) claims that this morphology concerns lexical aspect, aktionsart, rather than grammatical aspect. Aktionsart features, i.e. telicity features, are VP internal and aktionsart formation belongs to derivational morphology (Kiefer 2010: 145).[2] Derivational morphology adds semantic features to the verb such as ingressivity, terminativity, iterativity, etc. (Kiefer ibidem). Some of these functions have also been proposed for several of the Archaic Chinese affixes reconstructed by Sagart (1999), among others.

The following two morphemes are relevant in the present discussion: a) a former prefix that caused voicing of the following consonant resulting in a voiceless – voiced alternation of the root initial; and b) the suffix *-s. This suffix (OC *-s, *-h) which developed into the falling tone (qùshēng) (Haudricourt 1954; Downer 1959; Sagart 1999, and many others) has been connected diachronically to the Tibeto-Burman suffix -s (Schuessler 2007: 42, Huang Kunyao 1992, Jin Lixin 2006, and others). The -s suffix was the most productive affix in Classical Tibetan and it had aspectual functions related to perfective and perfect readings. Thus Tibeto-Burman aspectual morphology provides supporting evidence for the hypothesis that the [+/− voice] alternation and the suffix *-s also had aspectual functions in Archaic Chinese. Unger (1983), Huang Kunyao (1992), and Jin Lixin (2006) propose that these morphemes served to distinguish the imperfective and perfective aspects. Two arguments specifically challenge this hypothesis: (a) the morphological marking in Archaic Chinese is not mandatory,[3] though the categories imperfective and perfective which refer to grammatical aspect are mandatory (for instance in Russian); and (b) grammatical aspect is hosted in an Outer Aspect Phrase above vP, but the verb in Archaic Chinese did not move out of vP.[4] Accordingly, the

---

2. It has been proposed that derivational morphology is characteristic of the Tibeto-Burman languages (LaPolla 2003: 22). The Sinitic languages are a member of the Tibeto-Burman / Sino-Tibetan language family and a morphological system affecting verbal categories similar to that of other languages of this group has also been reconstructed for Pre-Archaic Chinese (before 11th c. BCE).

3. The constraints on the employment of the verbal morphology in pre-Archaic Chinese have not been figured out yet.

4. One piece of evidence for this is the fact that object wh-phrases move to a position preceding the verb but below vP-external material like the aspectual adverb jiang. Aldridge's (2010) analyses object wh-movement as targeting the outer edge of vP.

aspectual morphology has to be VP internal. Both facts argue for an analysis of the verbal morphology as being hosted by the Inner Aspect Phrase (Travis 2010) in which the telicity features, i.e. the lexical aspect, of the verb are checked.

The development of the suffix *-*s* has been discussed under the label 'derivation by tone change: 'four tones, different meanings' (*sì shēng bié yì*) (Mei 1980; Sagart 1999: 131, and many others). It is the most widely accepted aspectual derivation and refers to an alternation between any tone and the falling tone. This process is the 'youngest' morphological layer and continued to be transparent, if not fully productive, in Archaic Chinese (Schuessler 2007: 38). Haudricourt (1954) proposes that the falling tone developed from a former derivational suffix *-*s*, which became *-h* and further resulted in the falling tone.[5] Jin (2006: 325) distinguishes two different functions of this suffix: a transitivizating function and a deverbalizing function. Only the latter one is at issue in this discussion. Jin claims that the aspectual function is the basic function of this suffix; the deverbalizing function can be derived from the change from imperfective to perfective reading (Jin 2005, 2006). The derived form in the falling tone could function as an adjective or a noun, resulting in deverbal adjectives and nominals (Jin 2005: 2, 2006: 323f). The derivation by tone change and its aspectual function are represented by the verb *zhì* 治 in (6). This verb has two different readings in Archaic Chinese, one with and one without the suffix *-*s*: **r-de / *r-de-s* (reconstruction by by Jin (2006).[6]

(5)   The different readings of (*chí/*) *zhì* 治 in Archaic Chinese: **r-de /*r-de-s*.

(Jin 2006)

In (6a), the causative verb (*chí*)/ *zhì* 治 (*r-de*) 'put in order, govern' refers to the process part of an accomplishment; no endpoint is provided (Meisterernst 2016). In (6b) the verb (*r-de-s*) is unaccusative. It refers to a telic situation, i.e. to the resultant state of 'govern' 'be governed = in good order'. Telicity in the sense of an endpoint is added to the verb by the suffix *-*s*. This results in an achievement reading.

_____

i.   我   將   何   求?
    Wǒ jiāng hé   qiú?
    1   will what ask.for
    'What will I ask for?'

See also Meisterernst (2016) on the position of *jiang* in the outer aspect phrase.

5. Eight different functions of the falling tone derivations have been listed by Downer (1959); these have been reduced to two basic functions of the underlying suffix *-*s* in Jin (2006: 317, 321, 325f).

6. The originally voiced initial of this word in the level tone (without the suffix) should have resulted in a Modern Chinese reading *chí*. However, in Modern Chinese only the reading *zhì* survives.

(6) a. 政　　以　治　　民，　刑　　以　正　邪.
    Zhèng　*yǐ*　*chí (*r-de)*　*mín,*　*xíng*　*yǐ*　*zhèng*　*xié*
    government conj regulate　people, punishment conj correct bad
    'The government is necessary in order to correct the people, the
    punishments are necessary to correct the bad.'

                             (*Zuozhuan, Yin* 11, 5th–4th c. BCE)

    b. 使　為　　左師　以　聽政，　　　　　　於是　　　宋
        Shǐ　*wéi*　*zuǒshī*　*yǐ*　*tīngzhèng,*　　*yúshì*　*Sòng*
        cause become *zuoshi* con manage.government, thereupon Song
        治.
        zhì (*r-de-s)
        ordered
        'He made him *Zuoshi* and let him manage the government, and
        thereupon Song became well ordered.'

                             (*Zuozhuan, Xi* 9, 5th–4th c. BCE)

The other less frequent morphological alternation with aspectual function is the alternation of a voiceless with a voiced initial consonant (Karlgren 1933; Chou 1962; Wang 1958; Norman 1988; Mei 1988, 1991, 2015; Jin 2006; Hong & Yang 2010; and others). Pulleyblank (1973), Baxter (1992), and Baxter and Sagart (1999) reconstruct an earlier sonorant consonantal prefix for (Pre-)Archaic Chinese as the source of the voicing alternation.[7] Jin (2006) connects the [−voice] transitive variant to the imperfective aspect and the [+voice] unaccusative variant to the perfective aspect.[8] This alternation is represented by the verb *bài* 敗 in the examples in (8). Jin (2006: 83f) reconstructs the different Archaic Chinese readings for this verb as *plad-s / *blad-s.[9]

(7) The different readings of *bài* 敗: *plad-s / *blad-s.　　　　Jin (2006: 83f)

In (8a) the verb is the causative accomplishment verb 'destroy / defeat', and no endpoint is provided. The unaccusative variant in (8b), with the meaning 'destroyed / defeated', explicitly refers to the endpoint and the resultant state of the telic event. In (8b) the [+ voice] feature, which most likely developed from a Pre-Archaic sonorant prefix, adds telicity, i.e. an endpoint to the verb, similar to the *-s suffix in the example above. The derived verb expresses an achievement and the resultant state.

---

7. They date the voicing alternation to Middle Chinese. The origin of the voicing alternation is more controversial than that of the *-s suffix (Mei 2015).

8. Schuessler (2007) distinguishes between exoactive and endopassive variants.

9. Because *bài* 敗 has a falling tone reading, the different reconstructions are not reflected in Modern Chinese.

(8) a. 惠 公 之 季 年， 敗 宋 師 于 黃.
    Huì gōng zhī jì nián, bài (*plad-s) Sòng shī yú Huáng
    Hui gong GEN last year, defeat   Song army at Huang
    'In the last year of duke Hui he defeated an army of Song in Huang.'
                      (*Zuozhuan* Yin 1, 5th–4th c. BCE)

   b. 王 卒 亂， 鄭 師 合 以 攻 之，王 卒
    Wáng zú luàn, Zhèng shī hé yǐ gōng zhī, wáng zú
    king soldier chaotic, Zheng army unite CON attack OBJ, kind soldier
    大敗.
    dà bài (*blad-s)
    great defeated
    'The king's soldiers were in chaos; the army of Zheng united in order to
    attack them and the king's soldiers were devastatingly defeated.'
                  (*Zuozhuan,* Huan 5, 5th-4th c. BCE)

The alternation between (causative) accomplishment and (unaccusative) achievement readings of the same verbs in the preceding examples demonstrates the close relation of the aspectual morphology to the aktionsart features of the verb. The affixes explicitly mark the verbs as telic in adding an endpoint to the process part of the respective affix-less verb. The affixed (unaccusative) variant refers to a resultant state. The affix-less variant marks the process part of a causative event, i.e. an accomplishment, and no endpoint is provided. This close relation between the archaic morphology and telicity features, i.e. the aktionsart of the verb, suggests an analysis as telicity markers located in an Inner Aspect Phrase, which hosts the aktionsart features of the verb (Travis 2010).

These morphological affixes were certainly not productive any longer in Late Archaic Chinese, but the aspectual distinctions expressed by them still might have been transparent for the speaker of the time. This hypothesis can be supported by the fact that verbs with a transparent morphological distinction such as those discussed above only very infrequently combine with one of the adverbs *jì* 既 and *yǐ* 已 of Late Archaic and Early Middle Chinese (Meisterernst 2015b). These two adverbs are confined to preverbal position and they express perfectivity. Meisterernst (2016) proposes that they are located in the specifier of the Outer Aspect Phrase, because they show a close connection with the telicity features of the verb.[10] When they appear with activity verbs such as *shí* 食 'eat' and *yán* 言 'speak', as in the following examples, they provide an endpoint to the situation. Verbs such as *shí* 食

---

10. This means that the adverbs only modify verbs that provide an endpoint they can focus on, i.e. they are confined to stage level predicates. With state verbs that cannot provide a final endpoint, the adverbial modification induces an inchoative reading. With activity verbs, an endpoint is added to the activity.

and the Early Middle Chinese synonym of *yán* 言, *shuō* 說, are the first to appear with endpoint denoting secondary predicate YI in the Western Han and Early Buddhist literature (see also Wei 2015).

(9) a. 吾 既 言 之 矣, 敢 不 勉 乎!
    wú jì yán zhī yǐ, gǎn bù miǎn hū
    1 JI say OBJ SFP, dare NEG make.effort SFP
    'After I said that, could I dare not to make the utmost effort!'
                                 (*Zuozhuan, Ai* 11.1.10, 5th–4th c. BCE)

   b. 既 食, 而 後 食 之.
    jì shí, ér hòu sì zhī
    JI eat, CONJ afterwards feed OBJ
    'After they had eaten, they let him eat.'
                                (*Zuozhuan, Xiang* 24.8.3, 5th–4th c. BCE)

From the end of the Late Archaic period, the aspectual adverbs *jì* 既 and *yǐ* 已 can freely appear with not only atelic but also with telic achievement verbs, such as the verb *zhì* 治 'govern', as in Example (6b),[11] but the ratio of instances of the verb *zhì* 治 'govern' modified by an aspectual adverb is still low (less than 1%) in this period. In (10a), the unaccusative verb *zhì* 治 is modified by the perfective adverb *yǐ* 已 (in a succession of other predicates). In (10b), *yǐ* 已 modifies a transitive predicate headed by *zhì (chí)* 治.

(10) a. 問 之 曰: 『吾 城 郭 已 治, 守 備
    Wèn zhī yuē: wú chéng guō yǐ zhì (r-de-s), shǒu bèi
    ask OBJ say: 1 wall outer-wall YI regulated, defence arrange YI
    已 具, 錢 粟 已 足, 甲 兵 有 餘,
    yǐ jù, qián sù yǐ zú, jiǎ bīng yǒu yú,
    ready, money grain YI sufficient, armour weapon have surplus,
    '… asked him: "My walls are already in good order, my defence arrangements are already ready, money and cereals are sufficient, the armours and weapons are numerous,"' (*Han Fei Zi* 10.6.16, 3rd c. BCE)

   b. 季子 曰: 『堯 固 已 治 天下 矣,
    Jì zǐ yuē Yáo gù yǐ (chí (r-de))/ zhì (r-de-s) tiānxià yǐ
    Jizi say: Yao certainly YI regulate empire SFP
    'Jizi said: "Yao had certainly already regulated the empire."'
                              (*Lüshi chunqiu* 25.3.2.1, 3rd c. BCE)

---

11. A comprehensive analysis of these adverbs has been presented in Wei (2015) and Meisterernst (2015a, 2016). Wei provides a statistical overview of the historical distribution between the two adverbs in the Late Archaic literature. Wei also proposes that the distinction between the two adverbs might be due to a dialectal difference.

The morphological distinctions probably began to lose their transparency around the end of the Late Archaic period. We propose in the next section that this provided the trigger for the development of YI as a secondary predicate in the VP expressing termination and completion in Middle Chinese.

3. Evolution of YI from verb to secondary predicate

In this section, we trace the development of YI from a verb to an endpoint denoting secondary predicate. We propose that this reanalysis took place after the loss of derivational affixes distinguishing telic from atelic verbs. The reanalysis was in turn facilitated by the emerging possibility of VP-internal secondary predicates.

3.1 Late Archaic Chinese YI

In Late Archaic Chinese of the 5th to 3rd centuries BCE, YI was used as a verb, adverb, and sentence final particle. As a verb, it generally meant 'terminate, end'. The following examples are from a 5th century BCE text.

(11) a. 旦　　而　戰,　見 星 未　　已.
　　　dàn　　ér　zhàn, jiàn xīng wèi　yǐ
　　　morning CONJ fight, see　star　NEG$_{asp}$ stop
　　　'(They) began to fight in the morning and had not yet stopped when the
　　　stars appeared.'　　　　　　　　　(*Zuozhuan, Cheng* 16, 5th-4th c. BCE)

　　b. 始　　　吾有 虞　　　於 子, 今 則 已　矣.
　　　shǐ　　　wú yǒu yú　　　yú zǐ, jīn zé yǐ　yǐ
　　　beginning 1　have aspiration PREP 2　now then finish SFP
　　　'In the beginning, I had high aspirations for you. But now that is over.'
　　　　　　　　　　　　　　　　　　(*Zuozhuan, Zhao* 6, 5th–4th c. BCE)

YI was also used as an adverbial meaning 'already'.

(12) a. 門　已 閉　矣.
　　　mén yǐ bì　yǐ
　　　door YI close SFP
　　　'The door was already closed.'　　(*Zuozhuan, Ai* 15.5.6, 5th-4th c. BCE)

　　b. 諸侯　　求　盟,　已　　在　此 矣.
　　　zhūhóu　　qiú　méng,　yǐ　　zài　cǐ yǐ
　　　feudal.lord search alliance, already be.in this SFP
　　　'The feudal lords are calling for an alliance and are already here.'
　　　　　　　　　　　　　　　　　　(*Zuozhuan, Zhao* 13, 5th-4th c. BCE)

The third use of YI in LAC was as a clause final particle. YI follows a stative VP and adds emphasis. Note that the aspectual YI is not descended directly from the clause final particle YI. First, the clause-final particle use is lost by the end of the Archaic period. Secondly, the clause-final particle occurred only with stative predicates, while aspectual YI accompanied dynamic predicates.

(13) a. 去　　富子,則　群　公子　可　謀　　　　也　已.
         qù   Fù zǐ, zé   qún gōngzǐ kě móu   yě yǐ
         remove Fu zi, then all   prince can plotted.against SFP SFP
         'Once Fuzi is out of the way, then all the other princes can be plotted
         against.'   (*Zuozhuan, Zhuang* 23, 5th–4th c. BCE)

      b. 今　老　矣,　無　　　能　為　也　已.
         jīn lǎo yǐ, wú   néng wéi yě yǐ
         now old SFP, not.have can do SFP SFP
         'Now I am old; there is nothing I can do.'
                                              (*Zuozhuan, Xi* 30, 5th-4th c. BCE)

Throughout the LAC period, YI continues to be used as a verb and also as an adverb. (14a) shows that it appears with an unaccusative predicate. In (14b), it combines with a transitive predicate.

(14) a. 號　　　令　已　定,　　　守　　備　　　已　具.
         hào   lìng yǐ dìng,   shǒu bèi   yǐ jù
         command order YI determined, defense preparation YI ready
         'The commands and orders had already been determined and the
         defense arrangements were already prepared.'
                                              (*Han Fei Zi* 10.6.20, 3rd c. BCE)

      b. 晉　已　取　　虢,　還,　反　　滅　　虞.
         Jìn yǐ qǔ Guó, huán, fǎn   miè   Yú
         Jin YI take Guo, return, return destroy YU
         'After Jin had taken Guo, they returned, and returning they
         destroyed Yu.'   (*Han Fei Zi* 21.11.5, 3rd c. BCE)

However, it is unlikely that adverbial YI was the historical origin of aspectual YI, given the structural unlikelihood of a preverbal adverb being reanalyzed as a VP-internal secondary predicate. We therefore propose with Mei (1999), Jiang (2001, 2007), and Meisterernst (2011) that the origin of aspectual YI was the verbal YI and offer the following analysis of how the reanalysis took place.

We propose that the input to the reanalysis was a structural ambiguity of the following type, in which YI could be understood as either a verb or an aspect marker, depending on the interpretation of the preceding constituent. Like many words in Late Archaic Chinese, 飯 *fàn* 'eat/meal' in (15a) was ambiguous between

a verb and a noun. Likewise, 會盟 *hùiméng,* in (15b) could mean 'covenant' in addition to 'convene'.

(15) a. 飯 已, 盡 懷 其 餘 肉 持 去, 衣
    fàn yǐ, *jìn*   *huái*   *qí* *yú ròu chí qù,* *yī*
    eat finish, completely hold.in.bosom POSS rest meat take leave, dress
    盡 汗
    jìn   *wū*
    completely dirty
    'After eating/after the meal had finished, they took all their remaining meat with them (in their bosom) and left, and their clothes became completely soiled.'   (*Shiji*: 126; 3205; from Mei 1999: 289)

   b. 會盟 已, 飲, 而 衛 鞅 伏 甲 士 而
    huì méng   *yǐ, yǐn,* *ér* *Wèi Yǎng fú jiǎ* *shì* *ér*
    make.a.covenant YI, drink, CONJ Wei Yang hide armor officer CONJ
    襲 虜 魏 公子 卬,
    xí   *lǔ*   *Wèi gōngzǐ Áng*
    attack imprison Wei prince Ang
    'After they had concluded the covenant, they drank, and Wei Yang hid armored men in ambush and attacked and imprisoned the prince of Wei, Ang.'   (*Shiji*: 68; 2233)

If the constituent preceding YI is parsed as a noun, then YI must be understood as a verb taking this constituent as its argument, base generated as the internal argument of YI in VP and then moving to [Spec, TP] subject position. This is shown in (16a). However, the preceding constituent could also be understood as a verb, which forced YI to assume a different function. We propose that YI in this case functioned as a secondary predicate within VP specifying the endpoint for the event, as shown in (16b). This analysis of aspectual YI thus is parallel to Sybesma's (1997, 1999) account of the Modern Mandarin aspectual marker *le* 了.

(16) a. [$_{TP}$ *fàn* [$_{vP}$ [$_{VP}$ *yǐ* < *fàn*>]]]
      meal   YI
    'After the meal had finished, ….'

   b. [$_{TP}$ *pro* [$_{vP}$ [$_{VP}$ *fàn* [$_{XP}$ *yǐ*]]]]
             eat   YI
    'After they finished eating, ….'

This reanalysis of YI as an aspectual secondary predicate was also aided by the loss of the aspectual morphology. Specifically, the loss of the aspectual morphology led to the existence of verbs unmarked for lexical aspect. Thus, if *fàn* in (15a) was parsed as a verb, there would have been no morphological marking indicating

telicity. Given that the lexical meaning of YI as a verb was 'end, terminate', it is reasonable to imagine that this YI could be interpreted as a telicity marker supplying an endpoint to the preceding atelic verb. (15a, b) thus become structurally ambiguous as a consequence of these two ambiguities: the categorical status of the preceding constituent and the loss of aspectual morphology on lexical verbs. This allowed YI to be co-opted to fulfill the aspectual function.

A welcome consequence of this analysis is that it might suggest an account for the fact that aspectual YI only occurs in subordinate, typically nonfinite, adverbial clauses, because the requisite ambiguity is obtained very easily in this context. Realization of an endpoint in Archaic and Early Middle Chinese, if expressed at all, required the perfective sentence final particle *yǐ* 矣. A similar effect obtains in a subordinate clause in sequence with another clause expressing an event which follows it and depends on completion of the first event. In this case, the endpoint of the first event must have been realized in order for the second event to take place. In the Late Archaic and Early Middle Chinese periods, such subordinate clauses were typically marked by the aspectual adverbial 既 *jì*.

(17) a. 秦　始　皇　　　既　并　天　下　而　帝,　　　或　　　曰:
      Qín Shǐ huáng jì bìng tiānxià ér   dì,   huò   yuē
      Qin First Emperor JI unify empire CONJ emperor, someone say
      'After the First Emperor of Qin had unified the empire and become
      emperor, someone said: …'   (*Shǐjì*: 28; 1366)

   b. 桓　　公　與　莊　　　公　既　盟　　　　　　於　壇上　　　曹　沫
      Huán gōng yǔ Zhuāng gōng jì méng   yú Tánshàng, Cáo Mò
      Huan duke and Zhuang duke JI make.covenant at Tanshang, Cao Mo
      執　匕首　劫　　齊桓　公
      chí bǐshǒu jié   Qí Huán gōng
      hold dagger assault Qi Huan duke
      'After duke Huan and duke Zhuang had concluded the convenant, Cao
      Mo took a dagger and assaulted Duke Huan of Qi.'   (*Shiji*: 86; 2515)

We assume that the existence of this type of clause facilitated the interpretation of YI as expressing an endpoint when combined with another predicate, and it is precisely this structural context in which aspectual YI is used throughout the Middle Chinese period.

3.2   Structural reanalysis

In the previous subsection, we proposed that the reanalysis of verbal YI to aspectual YI took place with the loss of aspectual affixes on verbs. YI was clearly not a bound morpheme, however, as it followed all other VP internal material. We

proposed above that YI was a resultative secondary predicate (following Sybesma's 1997, 1999 analysis of *le* 了) supplying an endpoint to an atelic event. In this sub-section, we present evidence that the VP in Early Middle Chinese could in fact house a resultative secondary predicate.

In the Late Archaic period, VP internal endpoint denoting constituents were essentially limited to PPs expressing goal arguments or destinations.

(18)   a.   雍　子發　命　於軍　曰:
            Yōng zǐ fā　mìng yú jūn　yuē
            Yong zi issue order to army say
            'Yongzi issued an order to the army saying:'
                                                        (*Zuozhuan, Xiang* 26.10.15, 5th–4th c. BCE)

       b.   請　王　縞　素　辟　舍　於郊，　遣　使　於齊，
            qǐng wáng gǎo　sù　pì　shè　yú jiāo,　qiǎn shì　yú Qí
            ask king plain silk avoid house at suburb, send envoy to Qi
            'I beg the king to dress in plain silk and to avoid his dwellings and move to the suburbs, and to send an envoy to Qi.'
                                                        (*Lüshi chunqiu* 20.6.4., 3rd c. BCE)

However, it is unattested in the Archaic period for a verb to function as a resulta-tive secondary predicate. In other words, the Modern Mandarin verb-resultative compounds like in (19a) are a much later development in the language. As shown in (19a), the second verb is always intransitive. The possibility of a secondary pred-icate expressing a resultant state, as in (19b), did not emerge until the 5th century. The word order found in Modern Mandarin VV compounds did not make its ap-pearance until the 6th century.

(19)   a.   張三騎累了兩匹馬.
            *Zhāngsān **qí-lèi**-le　liǎng pí mǎ.*
            Zhangsan ride-tired-ASP two CL horse
            'Zhangsan rode two horses tired.'   (Cheng & Huang 1994: 188)

       b.   今　當　打　汝　前　兩　齒　折.
            *Jīn dāng　**dǎ** rǔ qián liǎng chǐ　**zhé**.*
            now should hit you front two tooth break
            'Now I should break two of your front teeth.'
                                                        (*Xianyujing*, 5th c.)(*Taishō* 4, no. 202, p. 429a)

       c.   主人　欲　打死　之.
            Zhǔrén yù　dǎ sǐ　zhī.
            master want hit die OBJ
            'The master wanted to strike him dead.'
                                                        (*Guang Gujin Wuxingji*, Guangji 91)

What can be found in Early Middle Chinese is coordinated transitive verbs sharing an object, as noted by Wang (1958), Ohta (1958), Shimura (1984), Mei (1991), Cao (1999), Jiang (1999), and Liang (2005), as in (20a). If the second verb was intransitive, then there could be no object and the shared argument was the subject, as in (20b). Since the second verb must be transitive when followed by an object, it cannot be analyzed as a secondary predicate denoting a result state.

(20) a. 子嬰 遂 刺 殺 高 於齋　宮.
　　　　Zǐyīng suì　cì　shā Gāo yú zhāi　gōng.
　　　　Ziying then stab kill Gao in cleanse palace
　　　　'Ziying then stabbed and killed (Zhao) Gao in the room for ritual
　　　　cleansing.'　　　　　　　　　　　(*Shiji*: 6, 275, 100 BCE)

　　　 b. 百日 而 餓 死.
　　　　Bǎi rì　ér　è　sǐ
　　　　100day CONJ starve die
　　　　'After one hundred days, (he) starved and died.'　(*Shiji*: 79; 2411)

The Late Archaic source for this construction further suggests that the correct analysis is coordination, because it requires an overt coordination marker, specifically the subordinating conjunction 而 *ér*. Full VPs could be coordinated, as in (21a). If the two VPs shared an object, this object appeared in the second conjunct, as in (21b). This coordination marker was lost during Middle Chinese, so it does not appear between the adjacent verbs in the examples in (20).

(21) a. 是 何 異　　於 刺 人　而　殺 之?
　　　　Shì hé　yì　　yú　cì rén　ér　shā zhī?
　　　　this how different from stab person CONJ kill OBJ
　　　　'How is it different from stabbing and killing people?'
　　　　　　　　　　　　　　　　　　　(*Mencius*, 1A.3, 4th c. BCE)

　　　 b. 豹　　 自 後 擊 而 殺 之.
　　　　Bào　zì　hòu jī　ér　shā zhī.
　　　　leopard from back strike CONJ kill OBJ
　　　　'A leopard struck and killed him from the back.'
　　　　　　　　　　　　　　　(*Zuozhuan*, *Xiang* 23.3.16, 5th-4th c. BCE)

The preceding discussion makes it unlikely that resultative secondary predicates were permitted to appear within VP. However, as Cao (1999) points out, there are a few cases in later Han period texts in which the second in a sequence of verbs is not a lexical verb selecting an argument but rather a functional category contributing aspectual information to the event structure. The example he provides is the verb *dé* 得 'obtain'. As a verb in the Late Archaic period, *dé* could be used in sequence with another verb with a similar meaning of 'obtain' or 'capture', as in

(22a). Cao analyzes these as cases of coordination. But examples emerge in later Han period texts in which *dé* no longer means 'obtain' but rather only signals that the action expressed by the first verb was successfully completed and realized. He points out further that the object in (22b) cannot be analyzed as the object of *dé*, because the sun did not come into the possession of the subject Yao.

(22) a. 孟孫　獵　得麑,　使　秦　西巴持　之　歸
       Mèngsūn liè　dé ní,　shǐ　Qín Xībā chí　zhī guī
       Mengsun hunt get fawn, send Qin Xiba hold OBJ return
       'Mengsun hunted and caught a fawn and he sent Qin Xiba to get it and
       return with it.'   (*Han Fei Zi* 22.22.3, 3rd c. BCE; cited by Cao 1999: 21)

   b. 堯　射　得 之, 猶　不　能　傷　日
       Yáo shè　dé zhī, yóu bù　néng shāng rì
       Yao shoot get OBJ, but NEG can   hurt   sun
       'Yao shot it, but he could not hurt the sun.'
                                  (*Lunheng* 19.1.4, 1st c. CE; cited by Cao 1999: 21)

Examples like (22b) involving *dé* are difficult to find in the *Shiji*, but there is some indication that VV sequences did not all involve object sharing between coordinated VPs even in this text. In other words, it is possible to find a few cases in which the second verb functions only as a secondary predicate within the VP projected by the first verb. One such example is the unaccusative verb *dìng* 定. In LAC, *dìng* had both an unaccusative and causative use meaning 'settle' or 'decide upon'.

(23) a. 王　未　　能　定　鄭　　而　　歸.
       wáng wèi　　néng dìng Zhèng ér　　guī
       king NEG$_{asp}$ can   settle Zheng CONJ return
       'The king was not able yet to settle Zheng and returned.'
                                  (*Zuozhuan, Xiang* 9.8.4, 5th–4th c. BCE)

   b. 君　　既　定　　矣, 又　　　何　求?
       Jūn　jì　dìng　yǐ, yòu　　hé　qiú
       Prince JI   establish SFP, furthermore what seak
       'Since my prince is already settled, what else would I wish for?'
                                  (*Zuozhuan, Dìng* 5.7.5, 5th-4th c. BCE)

In the *Shiji*, there are examples in which *dìng* follows another verb, but it does not seem to share the argument with that verb, as *dìng* did not have the sense of 'settle' when referring to situating the body in a sitting position.

(24) a. 荊　軻坐　定,　太子避　席　頓　　　首　曰:
       Jīng Kē zuò dìng, tàizǐ bì　xí　dùn　　shǒu yuē
       Jing Ke sit   settle, heir get.off mat knock.ground head say
       'When Jing Ke had sat down, the heir got off his mat, knocked his head
       to the ground and said:'   (*Shiji*: 86; 2531, 100 BCE)

b. 田　光　　坐 定,　左右　　無　　　人,　太子 避　　席　而
    Tián Guāng zuò dìng　zuǒyòu　wú　　rén, tàizǐ bì　xí　ér
    Tian Guang sit　settle, entourage not.have man, heir　get.off mat CONJ
    請　曰:
    qǐng yuē
    ask　say
    'When Tian Guang had sat down, no one of the entourage was around,
    and the heir got off his mat and asked:'　　　　　　　　(*Shiji*: 86; 2530)

Another reason to doubt the existence of argument sharing in (24) is the fact that
there are no examples of argument sharing between *dìng* and *zuò* in a Late Archaic
text. The only example in which *dìng* heads a VP coordinated with *zuò* that we
found does not involve argument sharing.

(25) 大　　王　　安　　坐 定　氣,　劍　　事　　已 畢　　奏　　　矣.
      Dà　　wáng ān　zuò dìng　qì,　jiàn　shì　yǐ bì　zòu　　yǐ
      Great king　calm sit　settle spirit, sword affair YI　finish achieve SFP
      'The great king may sit calmly and settle his spirit; the affair of the sword has
      already been finished.'　　　　　　　　(*Zhuangzi* 30.2.10, 4th–3rd c. BCE)

We suggest here that, although there were no true resultative secondary predicates
in Early Middle Chinese, there were some cases in which the second verb in a
sequence was not a lexical verb but rather functioned to indicate that the event
had come to successful completion. We propose that this was also the function of
YI in this period.

4.   Extension of aspectual YI as a native development

In the preceding section, we proposed that aspectual YI was reanalyzed from the
verb YI expressing termination of an event. The reanalysis took place in Early
Middle Chinese. The trigger for the grammaticalization was the loss of aspectual
morphology which marked telic verbs. YI served as a secondary predicate to mark
the endpoint of an event. This is the YI which Jiang (2001, 2007) assumes to be a
native Chinese development. Regarding the second use of YI, which Jiang claims
is a borrowing from Sanskrit, we propose in this section that this function is also
a native development, the result of extension of the endpoint denoting second-
ary predicate into an aspect marker signaling that the endpoint of an event has in
fact been realized.

    As mentioned briefly in Section 1, Jiang (2001, 2007) proposes that there were
two related YI, but they had separate origins. The YI expressing endpoint was a
native development, grammaticalizing from the verb YI meaning 'terminate'. This

YI occurred with atelic events and supplied an endpoint to the event. The second function of YI was innovated under Sanskrit influence. This second YI occurred with telic predicates and signaled that the event had been accomplished. YI1 and YI2 are shown in (26a) and (26b), respectively.

(26)   a.   飲   已 復   吐.
          yǐn   *yǐ fù*   *tǔ*
          drink YI again spit
          'He drank, but spit it out again.'

                                    (*Fobenxing Jijing*, 6th c.) (*Taishō* 3, no.190, p. 777a)

     b.   至   已 長   跪.
          zhì   *yǐ zhǎng guì*
          arrive YI ruler kneel. down
          'After he had arrived, the ruler knelt down.'

                                    (*Fobenxing Jijing*, 6th c.)(*Taishō* 3, no.190, p. 706c)

He proposes that YI1 and YI2 were used to translate the Sanskrit gerundive participle which was used to signal that one event was completed and then followed by a second event. The embedded clause projected by the gerund typically had the same subject as the main clause expressing the subsequent event. The primary diagnostic distinguishing the two types of YI is that only YI2 could occur with an achievement predicate.

    However, in our view, there is no need to assume that YI2 could not have developed directly from YI without foreign influence. Once the morphology distinguishing telic from atelic verbs had been lost in Chinese, so was the constraint that an endpoint denoting secondary predicate could only occur with an atelic predicate. As we showed in Section 2, an aspectual adverb occurred with an atelic predicate in the early part of the Late Archaic period in order to signal the completion of the event, as in (27a). But by the end of the Late Archaic period, with the loss of aspectual morphological distinctions, these adverbs could be used with achievement verbs, where their function was to signal that the natural endpoint implied by the predicate was in fact reached, as in (27b). Given our proposal that the reanalysis of YI followed in the wake of the loss of aspectual morphological distinctions, it is natural to assume that YI served the same functions as these adverbs, providing an endpoint in the case of an activity or signaling completion in the case of achievements and accomplishments.

(27)   a.   既 食, 而   後   食 之.
          jì shí, ér   *hòu*   *sì*   *zhī*
          JI eat, CONJ afterwards feed OBJ
          'After they had eaten, they let him eat.'

                                      (*Zuozhuan, Xiang* 24.8.3, 5th-4th c. BCE)

b.　季　子曰: 堯　固　　已治　　天下　矣,
Jì　zǐ yuē: Yáo gù　　yǐ chí/zhì　tiānxià yǐ
Jizi say:　Yao certainly YI regulate empire SFP
'Jizi said: "Yao had certainly already regulated the empire."'
(*Lüshi chunqiu* 25.3.2.1, 3rd c. BCE)

These are precisely the two functions proposed by Sybesma (1997, 1999) to account for Modern Mandarin *le* 了. LE in (28a) is analyzed as expressing the endpoint of the event, in agreement with Chao (1968), Lü (1991), and many others, who analyze LE as expressing completion. Chao (1968: 446) terms LE a phase complement, which expresses a phase of the action (in this case completion) rather than the resultant state. Sybesma (1999: 72) treats phase complement LE as a 'neutral telic marker'. LE in (28b), however, must be treated differently. This is because the main verb is followed by a resultative secondary predicate expressing not only telicity but also specifying the resultant state of the object in this event. Consequently, LE itself cannot be expressing the endpoint of the event. Sybesma analyzes LE in (28b) as communicating that the endpoint has actually been realized. He terms this LE 'realization LE'.

(28)　a.　他賣了他的幾頭豬.
　　　　Tā mài-le tā-de jǐ-tóu　　zhū.
　　　　he sell-LE he-DE several-CL pig
　　　　'He sold those few pigs of his.'　　　　(Sybesma 1999: 68)
　　b.　張三擦乾了玻璃.
　　　　Zhāngsān　cā-gān-le　　bōli.
　　　　Zhang San wipe-dry-LE glass
　　　　'Zhang San has wiped the glass dry.'　　(Sybesma 1999: 69)

Sybesma analyzes both types of LE as small clause predicates. Endpoint LE heads a result denoting small clause YP, while realization LE is a higher functional head X whose function is to indicate that the event expressed by the lower small clause has been realized. When LE co-occurs with a resultative secondary predicate, the resultative occupies the endpoint denoting position Y, while LE is in the position for realization X.

(29)　　　　　VP　　　　　(Sybesma 1999:75)

　　　　V　　　XP

　　　　　　YP　　　X　　(realization)
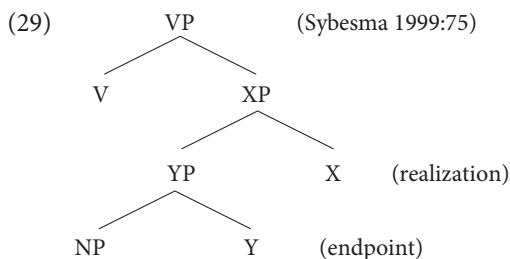
　　NP　　　　Y　　(endpoint)

Our proposal for YI is that it first functioned as the endpoint denoting secondary predicate, Sybesma's Y. This use of YI is particularly common in Early Middle Chinese translations of Buddhist texts. In the following example, YI follows an atelic predicate and provides an endpoint for the event.

(30) 供養　　已, 皆 白 佛　　言:
      gòngyǎng yǐ, jiē bái fó   yán
      sacrifice YI, all say Buddha say
      'when the sacrifices were over, they all said to the Buddha …'
                              (*Daoxing bore jing*, 2nd c.) (*Taishō* 8, no.224, p. 439b)

YI later came to take on the realization function (Sybesma's X), a use which becomes more common in subsequent centuries but can also be seen in Early Middle Chinese. We analyze this as a case of grammaticalization resulting from upward movement in the syntactic structure along the lines of Roberts and Roussou (2003). The following are examples of achievement predicates.

(31) a. 既受　　已, 復　持 反　　遺 薩陀波倫 菩薩,　　　即
          jì shòu   yǐ, fù   chí fǎn   wèi Sàtuóbōlún púsà,   jí
          JI accept YI, again hold return send Satuobolun bodhisattva, then
          自　　言:
          zì   yán
          himself say
          'After he had accepted them, he held on to them and sent them in return
          to the Satuobolun bodhisattva and said to himself:'
                              (*Daoxing bore jing*, 2nd c.) (*Taishō* 8, no.224, p. 476a)
      b. 佛　　滅度　　　已, 受　持　經卷.
          fó   mièdù   yǐ, shòu chí jíngjuàn
          Buddha reach.extinction YI, receive hold sutra
          'After the Buddha has reached extinction, we will receive and hold the
          sutras.'   (*Zheng fahua jing*, 3rd c.) (*Taishō* 9, no.263, p. 101a12)

The occurrence of YI with an achievement predicate is fully expected on our analysis.[12] The loss of derivational morphology creating telic verbs naturally led to the consequence which obtains in Modern Mandarin today, i.e. that there are no inherently telic verbs, as proposed by Tai (1984), Sybesma (1997), and others. Consequently, it is not surprising that YI occurred with achievement predicates, not in order to supply the endpoint but simply to indicate that the natural end-

---

12. Wei (2015) also provides some arguments against Jiang's hypothesis with regard to the development of YI2. According to Wei, the fact that examples with YI are in general not very frequent explains why there are only very few examples with telic verbs in this combination. He does not exclude the possibility that the structure has its origin in dialectal variants of Chinese.

point of this type of event had been achieved. Thus, Sybesma's (1999) endpoint and realization positions can be viewed as a single functional category, the semantic difference between them resulting merely from the aspectual properties of the predicate YI occurred with.

5.   Conclusion

In this paper, we have proposed an analysis of how the verb YI meaning 'terminate' came to be used as an aspectual marker signaling the end or completion of an event in Early Middle Chinese. We proposed that the trigger for this reanalysis was the loss of (Pre-)Archaic Chinese morphological affixes, which eliminated the formal distinction between telic and atelic verbs. YI was consequently reinterpreted as a secondary predicate in VP in order to supply an endpoint or to signal that the natural endpoint of an event had be realized. We further argued that the reanalysis of YI as a secondary predicate was made possible by changes in VP structure in Early Middle Chinese, which enabled the appearance of aspectual secondary predicates in the VP.

References

Aldridge, E. 2010. Clause-internal *wh*-movement in Archaic Chinese. *Journal of East Asian Linguistics* 19(1): 1–36. https://doi.org/10.1007/s10831-009-9054-z

Baxter, W. H. 1992. *A Handbook of Old Chinese Phonology*. Berlin: De Gruyter. https://doi.org/10.1515/9783110857085

Cao, G. 1999. Shilun Hanyu dongtai zhuci de xingcheng guocheng (On the formation of aspectual particles in Chinese). In *Linguistic Essays in Honor of Mei Tsu-lin: Studies in Chinese Historical Syntax*, A. Peyraube & C. Sun (eds.), 19–32. Paris: Center de Recherches Linguistiques sur l'Asie Orientale.

Chao, Y. R. 1968. *A Grammar of Spoken Chinese*. Berkeley CA: University of California Press.

Cheng, L. L. -S. & C. -T. J. Huang. 1994. On the argument structure of resultative compounds. In *In Honor of William S-Y. Wang: Interdisciplinary Studies on Language and Language Change*, M. Y. Chen & O. J. L. Tzeng (eds.), 187–221. Taipei: Pyramid Press.

Cheung, S. Hong-nin. 1977. Perfective particles in the 'Bian-wen' language. *Journal of Chinese Linguistics* 5: 55–74.

Chou, F.. 1962. *Zhongguo gudai yufa: Gouci bian* (Historical grammar of Ancient Chinese: Morphology). Taipei: Academia Sinica Institute of History and Philology.

Downer, G. 1959. Derivation by tone-change in Classical Chinese. *Bulletin of the School of African and Oriental Studies* 22: 258–290. https://doi.org/10.1017/S0041977X00068701

Haudricourt, A. G. 1954. Comment reconstruire le chinois archaïque. *Word* 10(2–3): 351–364. https://doi.org/10.1080/00437956.1954.11659532

Hong, B. & Yang, Z. 2010. Xian Qin Hanyu 'jian' lei dongci de qingzhuo jiaoti ji qi laiyuan (On the voicing alternation in 'jian' type verbs in pre-Qin Chinese). *Minzu Yuwen* 2010(1): 22–28.

Huang K. 1992. *Jingdian shiwen dongci yidu xin tan* (New discussion of the different readings of verbs in the Jingdian shiwen). Taiwan: Xuesheng shuju.

Jiang, S. 1999. Hanyu dongjieshi chansheng de shidai (The dating of the emergence of the verb-resultative construction in Chinese). *Hanxue Yanjiu* 6.

Shaoyu, Jiang 蒋绍愚. 2001. 'Shishuo xinyu', 'Qi min yaoshu', Luoyang qielan ji', Xianyu jing', Baiyu jing' zhong de "yi", "jing", "qi", "bi" 《世说新语》'齐民要术';'洛阳伽蓝记';'贤愚经';'百喻经',中的"已","竟","讫", "毕" *Yuyan yanjiu* 1(42): 73–78.

Jiang Shaoyu. 2007. Yuyan jiechu de yige anli – zai tan V (0) yi. (A case of language contact – another discussion of V (O) yǐ) *Yuyanxue luncong* 36.

Jin Lixin. 2005. Han Zang yu de wangchengti houzhui *-s. *Minzu yuwen* 2: 1–6.

Jin Lixin. 2006. *Shanggu Hanyu xingtai yanjiu* (Research on Old Chinese morphology). Hefei: Huangshan shushe.

Karlgren, B. 1933. Word families in Chinese. *Bulletin of the Museum of Far Eastern Antiquities* 5: 9–120.

Kiefer, F. 2010. Areal-typological aspects of word-formation: The case of aktionsart-formation in German, Hungarian, Slavic, Baltic, Romani and Yiddish. In *Variation and Change in Morphology selected papers from the 13th International Morphology Meeting, Vienna, February 2008*, [Current Issues in Linguistic Theory 310] F. Rainer, W. U. Dressler, D. Kastovsky, H. C. Luschützky (eds.), 129–148. Amsterdam: John Benjamins. https://doi.org/10.1075/cilt.310.07kie

LaPolla, R. J. 2003. Morphosyntax: An Overview. In *The Sino-Tibetan Languages*, G. Thurgood & R. LaPolla (eds.), 22–41. London: Routledge.

Liang, Y. 2005. Xihan jieguo buyu de fazhan (Development of the resultative complement construction in the Western Han period). *Guhanyu Yanjiu* 66: 34–40.

Lü, S. 1991 [1980] *Xiandai Hanyu babai ci* (Eight hundred words in Modern Chinese). Beijing: Commercial Press.

Mei, T. 1980. Si sheng bie yi zhong de shijian cengci. *Zhongguo Yuwen* 6: 427–443.

Mei, T. 1988. Neibu nigou Hanyu san li [Three examples of internal reconstruction in Chinese]. *Zhongguo Yuwen* 204(3): 169–181.

Mei, T. 1991. Cong Handai de 'dong-sha', 'dong-si' lai kan dongbu jiegou de fazhan (A look at the development of the verb-resultative construction from 'V-kill' and 'V-die' in the Han period). *Yuyanxue Luncong* 16: 112–136.

Mei, T. 1999. Xian Qin Liang Han de yizhong wancheng mao jushi (One type of perfective aspect construction in the Pre-Qin and Han periods). *Zhongguo Yuwen* 4.

Mei, T. 2015. Proto-Sino-Tibetan morphology and its modern Chinese correlates. In *Oxford Handbook of Chinese Linguistics*, W. S. -Y. Wang & C. Sun (eds.), 57–66. Oxford: OUP.

Meisterernst, B. 2011. Aspectual structures in Buddhist Chinese texts. In Hànwèn Fódiǎn yǔyén xué 漢文佛典語言學, 58–99. Taiwan: Fagu Fojiao xue yuan.

Meisterernst, B. 2015a. *Tense and Aspect in Han Period Chinese: A Linguistic Study of the Shǐjì*[Trends in Modern Linguistics 274]. Berlin: DeGruyter.

Meisterernst, B. 2015b. New issues in Chinese grammar: The morpho-syntax of the aspectual system in Late Archaic Chinese. In Minzu dianji wenzi yanjiu 民俗典籍文字研究 (Studies on folklore, classics and Chinese character), Vol. 15. Beijing: Shangwu yinshu guan.

Meisterernst, B. 2016. The syntax of aspecto-temporal adverbs from Late Archaic to Early Medieval Chinese. *Journal of East Asian Linguistics* 25(2): 143–181. doi: https://doi.org/10.1007/s10831-015-9140-3.

Norman, J. 1988. *Chinese*. Cambridge: CUP.

Ohta, T. 1958. *Chugokugo rekishi bunpo*(Historical grammar of Chinese). Tokyo: Konan Shoin.

Pulleyblank, E. G. 1973. Some new hypotheses concerning word families in Chinese. *Journal of Chinese Linguistics* 1: 111–124.

Pulleyblank, E. G. 1991. *Lexicon of Reconstructed Pronunciation in Early Middle Chinese, Late Middle Chinese and Early Mandarin*. Vancouver: UBC Press.

Roberts, I. & Roussou, A. 2003. *Syntactic Change: A Minimalist Approach to Grammaticalization*. Cambridge: CUP. https://doi.org/10.1017/CBO9780511486326

Sagart, Laurent. 1999. *The Roots of Old Chinese*[Current Issues in Linguistic Theory 184]. Amsterdam: John Benjamins. https://doi.org/10.1075/cilt.184

Schuessler, Axel. 2007. *ABC Etymological Dictionary of Old Chinese*. Honolulu HI: University of Hawai'i Press.

Shimura, Ryoji. 1984. *Chugoku chusei gohoushi kenkyu*(Middle Chinese grammar). Tokyo: Santosha.

Sybesma, Rint. 1997. Why Chinese verb-Le is a resultative predicate. *Journal of East Asian Linguistics* 6(3): 215–261. https://doi.org/10.1023/A:1008238319773

Sybesma, Rint. 1999. *The Mandarin VP*. Dordrecht: Kluwer. https://doi.org/10.1007/978-94-015-9163-8

Tai, J. H-Y. 1984. Verbs and times in Chinese: Vendler's four categories. In *Papers from the Parasession on Lexical Semantics*, D. Testen, V. Mishra, J. Drogo (eds.), 289–296. Chicago IL: Chicago Linguistic Society.

Travis, L. deMena. 2010. *Inner Aspect*. Dordrecht: Springer. https://doi.org/10.1007/978-90-481-8550-4

Unger, U. 1983. Hao ku Nr. 20 (unpublished).

Wang, Li. 1958 [2004]. *Hanyu shigao*. Beijing: Zhonghua Shuju.

Wei Pei-chüan. 2015. Gu Hanyu shiti biaoji de yuxu leixing yu yanbian (Word order patterns of temporal and aspectual markers in Classical Chinese and their development). *Language and Linguistics* 16(2): 213–247.

Whitman, John. 2008. The classification of constituent order generalizations and diachronic explanation. In *Linguistic Universals and Language Change*, Jeff Good (ed.), 233–252. Oxford: OUP. https://doi.org/10.1093/acprof:oso/9780199298495.003.0010

Zhou, Xuan. 1996. The interaction of the Mandarin aspectual particles *guo*, *le*, and *zhe*. Paper presented at *Chicago Linguistic Society 32*.

Differential argument marking and object movement in Old Japanese

A typological perspective

Yuko Yanagida
University of Tsukuba

This paper discusses object movement and its diachronic source in what Yanagida and Whitman (2009) (Y&W) label *nominalized* clauses in Old Japanese (OJ; 8 century). When the subject is marked by genitive *ga*, the ancestor of Modern Japanese nominative, the object necessarily moves over the subject, resulting in OSV. Y&W argue that OJ *ga* is licensed by agentive *v* and that OSV word order is a property of active alignment. From both theoretical and typological perspectives, this paper argues that case marking and word order variations in OJ are best analyzed as instances of the typologically well attested phenomenon of Differential Argument Marking (DAM). It is shown that object movement is a widely attested subtype of DAM. This paper proposes that the so-called *Subject-in-Situ Generalization* (SSG) (Alexiadou and Anagnostopoulou 2001) provides a unified analysis of object movement across languages.

Keywords: alignment, word order, genitive, active, nominalization, nominal hierarchy

1.   Introduction

The typological literature assumes that languages can be classified in terms of three types of alignment. In nominative/accusative languages, transitive subjects (A) are marked in the same way as intransitive subjects (S): nominative case, but differently from transitive O; accusative. In ergative/absolutive languages, S is marked in the same way as O; absolutive, but different from transitive subjects (A); ergative. Active languages are often classified as a subtype of ergative languages with split intransitivity. Intransitive predicates are split into active and inactive; agentive subjects are marked by active case, but non-agentive subjects are predominantly marked zero in the same way as transitive objects.

Yanagida and Whitman (2009) (henceforth Y&W) argue that OJ displays active alignment in *nominalized clause* types, including the adnominal clauses (1–3) and a variety of embedded clauses.[1]

(1) [***saywopimye no kwo ga*** *pire* Ø *puri-si*]   *yama*   (MYS 868)
     Sayohime   GEN child AGT scarf   wave-PST.ADN mountain
     'the mountain where Sayohime waved her cloth'

(2) [***wagimokwo ga*** *swode mo   sipoponi naki-si*]   SO
     my.wife   AGT sleeves even drenched cry-PST.ADN FOC
     [*o*]*mopayu*   (MYS 4357)
     long.for
     'I long for my wife, who cries so that even her sleeves were sopping.'

(3) [*aki no   nwo ni **tuyu** Ø op-ye-ru*]   *pagwi*   *wo*
     fall GEN field LOC dew   cover-STAT-ADN bush.clover ACC
     ta-wora-zu-te
     hand-break-not-GER
     'without breaking off the dew-laden bush clover in the fall meadow'
                                                                 (MYS 4318)

Genitive *ga*, the ancestor of Modern Japanese (henceforth, ModJ) nominative case, marks the agent subjects of transitives (1) and active intransitives (2). The patient subjects of inactive intransitive verbs (3), however, behave like the objects of transitive verbs (1) in that they are *zero*-marked morphologically.

Transitive nominalized clauses display another important property. As described in detail by Yanagida (2006), when the direct object is marked with *wo*, it precedes the *ga*-marked external argument, as shown in (4):

(4) ***yama***   ***di***   ***wo kimi ga*** *kwoye-maku*   (MYS 4225)
     mountain road OBJ you   AGT cross-NMLZ
     'You cross over the mountain road.'

Movement of *wo*-marked objects is not an instance of scrambling but *obligatory movement* to the left of *ga*-marked subjects. The canonical [S *ga* O (*w*)*o* V] word order of ModJ is not found in OJ syntax. (see Yanagida 2006 for a potential counterexample in the MYS corpus.) Note, however, that unlike *ga*, the other OJ genitive *no* has no such restriction. The subject moves over the subject, resulting in the canonical SOV word order.

---

1. OJ data in this study are taken from the *Man'yōshū* (MYS, compiled in mid-8th century), the earliest written record of OJ, comprising 4516 long (*chōka*) and short (*tanka*) poems. The data is taken from electronic text "*Man'yōshū Search System*" (Yamaguchi University, Japan) as well as the Oxford Corpus of Old Japanese (University of Oxford).

(5) **ipye pito no**   *idura to*   **ware wo** *topa-ba ikani ipa-mu*   (MYS 3689)
  family   GEN where COMP I   OBJ ask-if   how say-MOD.ADN
  'If your family should ask me where (you are now), how should I reply to them?'

From a typological standpoint, Y&W (2009) argue that the OSV order in (4) is a property of active alignment. *Ga* is an inherent active case associated with a particular θ role: Agent, assigned by *v*. Transitive *v* assigns no accusative case.[2]

Another characteristic of active alignment in OJ is that subject NPs and their predicates are inclined to bear particular selectional relations. First/second person pronouns associated with protypical agents predominantly occur with active predicates that express volition and control. In contrast, non-human and inanimate NPs are not transitivity prototype; they occur with inactive predicates which express no volition. The subjects of transitive and active intransitive verbs are marked by either *ga* or *no*, depending on their position in the nominal hierarchy (Silverstein 1976),[3] but never marked by *zero*. The subjects of inactive intransitve verbs are marked by *no* or *zero*, depending on whether they have specific interpretations. This is schematically illustrated in Figure 1 (see Yanagida (2018)).

1.	Nominal Hierarchy:	1st/2nd person > Human NPs > non-human NPs
2.	Agency:	Active ⟷ inactive
		ga *no* *zero*
3.	Specificity:	Specific ⟷ non-specific
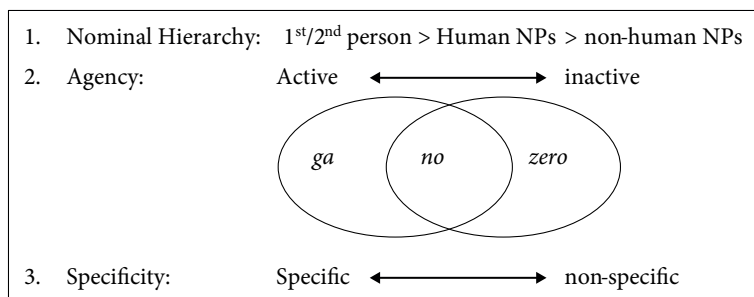
Figure 1. Three-way distinct marking on the subject in nominalized clauses

The idea that active case is an inherent case follows from the nature of ergative case proposed by many scholars (Woolford 1997, 2009; Legate 2002, 2008; Aldridge

---

2. The basic view adopted by Y&W (2009) is that of Woolford (1997) regarding the distinction between lexical and inherent case: lexical case is idiosyncratic, associated with particular lexical items, while inherent case is associated with particular thematic roles or argument positions, such as the position of external arguments. As is well-known, genitive/active syncretism is cross-linguistically very common. The OJ genitive *ga* is homophonous with active case.

3. Dixon (1979) interprets the nominal hierarchy to "roughly indicate the overall *agency potential* of any given NP" (1979: 86–87), and observes that a number of languages have split case marking exactly on this principle.

2004, 2008; Anand & Nevins 2006, among many others).[4] Legate (2008) proposes that while ergative is assigned to the external argument in the specifier position of [+ transitive] *v*, active is assigned to the external argument in the specifier of agentive *v*, as represented in (6).

(6)

```
                        vP
              ┌──────────┴──────────┐
         external                  v′
         argument          ┌────────┴────────┐
                           v                 VP
                                      ┌───────┴───────┐
                                      V         internal argument
```
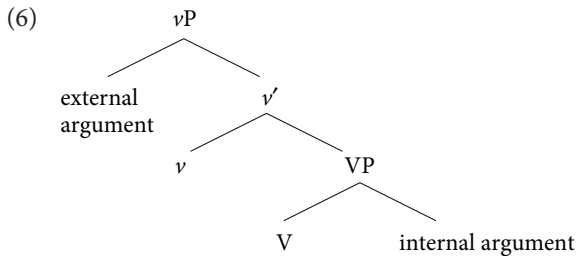
Some recent researchers, however, argue against the inherent case analysis of ergative, suggesting that ergative case is instead structural case. Baker (2014) argues that ergative case in Shipibo is structural case rather than inherent. Baker adopts a *dependent case* approach to ergative case, following the basic idea proposed by Marantz (1991). Rezac, Albizu, Etxepare (2014) claim that Basque ergative is structural, based on ergative-to-absolutive in so-called defective T contexts, such as raising and ECM constructions.

This paper revises important aspects of Y&W's (2009) analysis of active alignment in OJ. First, from a typological perspective, alignment in OJ is better characterized as a case of *Differential Subject Marking* (DSM) (de Hoop & de Swart 2009). Second, the distinctive object movement in nominalized clauses is a consequence of Alexiadou and Anagnostopoulou's (2001)*Subject-in-Situ Generalization* (SSG), analyzed as a general condition on structural case, which prohibits more than one argument with structural case from remaining inside *v*P. The SSG account of object movement suggests that OJ *ga* is in fact a structural case, not an inherent case as proposed by Y&W (2009).

This paper is organized as follows: Section 2 overviews the analysis of nominative-genitive conversion in ModJ, focusing on the issue of the transitivity restriction. This section provides a theoretical basis for the analysis of word order and case marking in OJ. In Section 3 we will discuss two types of nominalizations in OJ and compare them with other languages, proposing that the SSG provides a unified account for alignment and word order variations across languages. Section 4 will provide diachronic explanations for the source of object movement.

---

4. The descriptive generalization that supports the view that ergative is an inherent case comes from the fact that derived subjects are never ergative. There is no language that promotes an object to ergative in the passive. Ergative subjects in some instances occur in non-finite clauses while structural nominative subjects cannot.

2. Background

Nominative-genitive conversion in Modern Japanese (ModJ) has received much attention in the generative literature since Harada's (1971, 1976) work. A genitive subject is possible in a relative clause modifying the nominal head (7) and a complement headed by *koto* 'fact' (8).

Modern Japanese (ModJ)

(7) [*kinoo   John no/ga   kat-ta*] *hon*
    yesterday John GEN/NOM buy-PST book
    'the book John bought yesterday'

(8) *Taroo wa* [*kinoo   John no/ga   ki-ta   koto*] *o   sira-nai*
    Taroo TOP   yesterday John GEN/NOM come-PST that   ACC know-not
    'Taroo does not know that John came yesterday.'

A main issue concerning genitive subject constructions in ModJ is how to account for the so-called *transitivity restriction*, which prohibits direct objects from occurring in the structures that have the genitive subject. If the subject is in the nominative form, there is no such restriction. This is illustrated in (9–11).

(9) [*Taroo **ga**   hon   o   kari-ta*]   *hito*
    Taroo NOM book ACC borrow-PST person
    'the man from whom Taroo borrowed a book'

(10) *[*Taroo **no**   hon   o   kari-ta*]   *hito*
    Taroo GEN book ACC borrow-PST person
    'the man from whom Taroo borrowed a book'

(11) *[*hon o~i~   Taroo **no**   t~i~ kari-ta*]   *hito*
    book ACC Taroo GEN   borrow-PST man

As shown in (10–11), genitive is not licensed when the accusative object appears in the same clause. Scrambling of the object (11) does not improve the grammaticality. Watanabe (1996) observes that genitive is licensed in the context where a gapped object involves a *wh*-operator. Example (12) is cited from Watanabe (1996: 395).

(12) *John wa* [*Mary no   yon-da   yori*] *takusan no   hon   o   yonda*
    John TOP   Mary GEN read-PST than many   GEN book ACC read
    'John read more books than Mary did.'

Watanabe assumes that the comparative deletion clause in (12) involves a null *wh*-operator in parallel to the relative clause (7). Given that comparative deletion clauses have no nominal head, Watanabe proposes that genitive is licensed not by the nominal head, but by *subjunctive* C under *wh*-agreement. To account for the

transitivity restriction, Watanabe assumes early minimalism and claims that the genitive subject in Japanese remains in the external argument position within VP in overt syntax. The subject moves to Spec AgrsP to check the case feature at LF. This movement leads to a minimality violation, given that the object also moves to AgroP to check its case feature at LF. A minimality violation, however, does not arise when the object undergoes A′ movement in overt syntax. (For a technical detail, see Watanabe 1996: 389).

Alexiadou and Anagnostopoulou (2001) (A&A) assume with Watanabe (1996) that the genitive subject in Japanese remains in the base external argument position: Spec, *v*P. A&A propose that the transitivity restriction is subsumed under a more general theory of structural Case, formulated as the subject-in-situ generalization (SSG), stated in (13).[5]

(13)   *The Subject-in-Situ Generalization* (SSG)
        By Spell-out, *v*P can contain only one argument with an unchecked Case
        feature.   (Alexiadou & Anagnostopoulou 2001)

The SSG predicts that more than one DP argument must not be in the position in which they are merged. When the subject remains in Spec, *v*P, the object must move out of *v*P. Any construction in which both the subject and the object remain in *v*P-internal position is unacceptable.[6] A&A (2001) provide data from a variety of languages such as French, Arabic, English, Icelandic and Greek, and propose that the SSG is a universal principle on structural case features that holds across languages.

Note that unlike Japanese, genitive subjects in Turkish nominalizations display no transitivity restriction; the genitive subject precedes the accusative object in (14).

(14)   Turkish   (Turkic; Kornfilt 2003)
        [*(Bir)ari-nin* bugün *cocug-u*   sok-tug –un]-u   duy-du-m
         a bee-GEN   today child-ACC sting-F.NOM-3SG-ACC hear-PST-1SG
        'I heard that the bee/a bee [+ specific] stung the child today.'

---

5. As shown by A&A, stylistic inversion (SI) in French behaves exactly in parallel to the genitive subject construction in Japanese. SI is disallowed when the VP contains a direct object. On the other hand, when the direct object itself is *wh*-extracted, SI becomes possible again.

6. A&A (2001: 211) crucially assume that the operation Move is required when case features are checked. In other words, when the accusative case feature is checked by *v*, the object necessarily undergoes object shift to Spec, *v*P. This departs from Chomsky's mimimalist view (2001) that a structural case feature is a reflex of agreement and is assigned a value under a probe-goal relation. In this paper, I do not go into the theoretical details of the SSG.

Miyagawa (2011) assumes with A&A that the transitivity restriction is subsumed under the SSG and offers an analysis of the typological difference between Japanese and Turkish. According to Miyagawa, genitive subject constructions in Turkish differ from those in Japanese with respect to the clausal height where genitive occurs. The genitive subject in Turkish is C-licensed and moves to Spec, TP to check the EPP feature on T. This is because the clause that contains a genitive subject is a full CP. The genitive subject in Japanese, on the other hand, is D-licensed; the genitive fails to move to Spec TP because clausal T in Japanese is *defective*, without C, lacking an EPP feature.

Given that the SSG is responsible for a variety of the constructions which involve a full clausal CP, defectiveness in the sense of Miyagawa is not the only possible reason why subjects remain in situ. A crucial difference between Japanese and Turkish is that while genitive case in Japanese has no semantic effects, Turkish has differential subject marking (DSM), associated with specific/non-specific distinction. While subjects marked by genitive are interpreted as specific, those in nominative (that is *zero*-marked) are interpreted as non-specific (Kornfilt 2003, 2009). Turkish has differential object marking (DOM) as well.[7] Accusative case marks all definite NPs. It also marks indefinite NPs which presuppose the existence of a set of individuals (Enç 1991). As observed by Kornfilt (2003), when the subject is marked nominative and the object is marked accusative, the object must move over the subject, resulting in OSV order. Consider (15–16), cited by Kornfilt (2003).

> Turkish (Turkic; Kornfilt 2003)

(15) [***cocug-u*** *bugün (**bir**)ari* ∅ *sok-tug-un*]-*u*   *duy-du-m*
　 child-ACC today a bee 　sting-F.NOM-3SG-ACC hear-PST-1SG
　 'I heard that today bees/a bee [-specific] stung the child.'

(16) *[(***bir**)ari* ∅ ***cocug-u*** *bugün sok-tug-un*]-*u*   *duy-du-m*
　 a bee 　child-ACC today sting-F.NOM-3SG-ACC hear-PST-1SG
　 'I heard that today bees/a bee [-specific] stung the child.'

The contrast given in (15–16) is accounted for straightforwardly by the SSG. In (14) the subject marked by genitive moves to Spec, TP, and thus preceding the accusative object. The nominative subject, however, remains in situ and it is the accusative object that moves out of *v*P (Kornfilt 2003). A question now arises: if the genitive subject constructions in Turkish have a full CP structure, as proposed

---

7. DOM is independent of alignment. It is highly regular phenomenon in languages where it occurs and is often associated with the Animate/Inanimate or Specific/Non-Specific distinctions. Spanish, Romanian, Turkish, Persian and Hindi are frequently mentioned representative cases of DOM (Aissen 2003).

by Miyagawa (2011), how is the EPP on T satisfied in (15)? I explore an alternative approach as outlined by A&A (2001). That is, the EPP is a [+ D] feature in T, and this feature is checked in two different ways: It can be checked by a Spec-Head relation (17a) by moving a subject to Spec TP, or can be satisfied by head movement of $v_{[+ \text{NML}]}$ to T (17b). Given that the nominal feature on v raises to check the D feature on T, the subject need not move to Spec, TP. For present purposes, I propose that nominalization types are determined by the base position in which the nominal feature originates within the extended projection (C, T, v) of VP.

(17) a. C-typeNominalization   b. v-typeNominalization
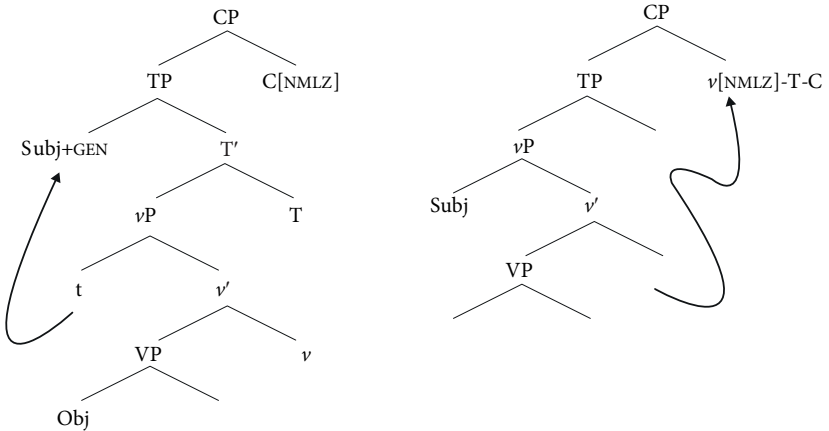
Nominalization associated with genitive in Turkish is a C-type nominalization. It displays no transitivity restriction as shown in (14). The genitive subject moves to Spec TP and the object remains within vP. In contrast, nominalization associated with genitive in Japanese is v-type nominalization. The subject remains in Spec, vP and the nominal feature in v raises to T to check the EPP feaure. The SSG forces the object to move out of vP.

Given the mechanism proposed in this section, the following sections discuss two types of nominalization structures in OJ. Nominalization associated with OJ *no* is a C-type nominalization, exactly in parallel to Turkish. In contrast, nominalization associated with OJ *ga* is a v-type nominalization which patterns like non-accusative alignment (see Figure 1). I will argue that the SSG provides a unified account for complex word order patterns associated with the two types of nominalization structures.

3.   Object movement

3.1   Differential Object Marking

Within the past few decades, various proposals have been made about *wo*-marked objects and zero-marked objects of OJ (Motohashi 1989; Miyagawa 1989, 2012; Yanagida 2006; Kinsui 1993, 2011; Frellesvig, Horn & Yanagida 2015). Motohashi (1989) observes that *wo* in OJ appears with definite/referential nouns, while non-referential indefinite nouns are morphologically unmarked. Examples (18)–(19) show this contrast.

(18) *sigeyama   no   tanipye ni   opuru yamabuki **wo** …*
      wooden.mountain GEN valley   LOC grow   yellow.rose OBJ
      pikiuwete   (MYS 4185)
      transplant
      'transplant the yellow-roses that grow about the valley of the wooden mountain …'

(19) *pitomoto no   nadesikwo   Ø uwe-si   sono kokoro*   (MYS 4070)
      one   GEN fringed pink   plant-PST that heart
      'the heart that planted a flowering pink'

Y&W (2009) argue that the contrast between *wo*-marked objects and zero-marked objects is attributable to specificity, not to definiteness, since *wh* pronouns can be marked by *wo*. The following two examples are taken from Y&W (2009).

(20) *sipo pwina-ba tamamo kari tum-ye   ipye   no   imwo ga pamaduto*
      tide recede-if seaweed cut gather-IMP house GEN wife   AGT shore.gift
      *kop-aba **nani wo** simyesa-mu?*   (MYS 360)
      want-if   what OBJ proffer-MOD.ADN
      'If the tide has gone out, cut and gather the precious seaweed! If my wife at home asks for gifts from the shore, which (other) shall I offer her?'

(21) *maki no itatwo wo osi   piraki siweya ide kone noti pa   **nani** Ø*
      wood GEN door   OBJ push open damn out come after TOP what
      se-mu?   (MYS 2519)
      do-MOD.ADN
      'Pushing open the door (I say) "Come out, dammit!" Then what will (I) do?'

In (20), the set of items that the speaker might offer his wife is defined as *pamadutwo* 'gifts from the shore'. In this case *nani wo* 'what/which Obj' picks out specific items from that set. In (21), in contrast, the bare *wh* pronoun is non-specific; the universe of things the speaker might do is completely undefined in previous discourse. Frellesvig, Horn & Yanagida (2015) extend Y&W's (2009) view and

argue that the two classes of objects fit into a pattern of differential object marking (DOM) in parallel to DOM in Turkish.

3.2   Word order

As discussed extensively in Yanagida (2006, 2007), and Y&W (2009), OJ has a distinctive word order restriction. The object marked by *wo* precedes the subject marked by *ga*, as shown in (22). Given that the basic word order in Japanese is SOV, the *wo*-marked objects in (22) move over the subject, resulting in OSV order. The object movement differs crucially from scrambling in that it is an instance of obligatory movement since Mod J canonical order [Subject *ga* Object *wo* V] is not found in the OJ corpus (Yanagida 2006).

(22)   [OSV order]
   a.   *pana   tatibana **wo** wotomyera **ga**   tama nuku   made* (MYS 4166)
        orange blossom OBJ maidens   AGT bead thread.ADN CONJ
        'The maidens thread the orange blossoms on their beads …'
   b.   *kusaka no   yama   **wo** yupugure ni   **waga** kwoye*
        Kusaka GEN mountain OBJ twilight   LOC I.AGT cross
        kure-ba   (MYS 1428)
        come-CONJ
        'when I come crossing Kusaka Mountain in the twilight'

In contrast, the objects that follow the subject are without exception zero-marked non-branching noun heads that appear immediately adjacent to the verb. This is exemplified in (23).

(23)   [SOV order]
   a.   [*Saywopimye no   kwo ga   **pire** Ø puri-si*]   *yama no*
         Sayohime   GEN child AGT scarf   wave-PST.ADN hill   GEN
        na   (MYS 868)
        name
        'the name of the hill where Sayohime waved a scarf'
   b.   *kanasiki kwo-ro   ga   **ninwo** Ø posa-ru   kamo* (MYS 3351)
        sad   child-DIM AGT cloth   hang.out-ADN Q
        'The sad child has hung out a piece of cloth.'   (Eastern Old Japanese)

Yanagida (2007) and Y&W (2009) argue that the *zero*-marked nouns, such as *pire* 'scarf' and *ninwo* 'cloth' (23a)–(b), are syntactically incorporated into the verb.[8] As

---

8. ModJ does not have noun incorporation in the strict sense. The patterns of incorporation discussed by Kageyama (1980) such as *kosi o kakeru* vs. *kosikakeru*, *tema o toru* vs. *temadoru* are not productive. These expressions are possibly analyzable as lexical compounds.

demonstrated extensively by Baker (1988), noun incorporation, which is widely observed in non-accusative languages, is a detransitiving process on a par with antipassives in that both involve a shift in valency, creating a derived intransitive. Incorporated objects need not be assigned structural accusative case. That is, OJ patterns like syntactically ergative languages in that the subject marked by *ga* is licensed by agentive *v*, and remains in Spec *v*P; the object is not assigned structural accusative within *v*P. There are two mechanisms to satisfy the case filter: object movement and noun incorporation. In Section 3.4, I will explore the possibility that object movement is independent of alignment, but rather it is uniformly accounted for by the universal principle of case, stated as the SSG (13).

3.3   Topicalization

Another important discovery with respect to the word order restriction in OJ is made by Nomura (1993), who observes that in so-called *Kakari-musubi* constructions in OJ, *wh*/focus phrases marked by *kakari* particle, such as XP *ka/ya/zo*, necessarily precede the subject marked by *ga/no*, while this restriction was lost in Early Middle Japanese (800–1200).

(24)   *iduku yu   **ka** imo **ga**   irikite   ime   ni   miye-turu*   (MYS 3117)
       where from Q   wife AGT come.in dream LOC appear-ASP.ADN
       'From where did my wife come and appear in my dream?'

(25)   *patuse   no   kapa pa   ura   na-mi   **ka** pune **no***
       Hatsuse GEN river TOP shore not-because Q   boat   GEN
       yori-ko-nu   (MYS 3225)
       come.near-not
       'Is it because Hatsuse River has no shore that no boat comes near?'

Assuming the word order restriction observed by Nomura, Watanabe (2002) argues that wh/focus phrases in OJ move overtly to FocP within CP layer. Following Rizzi's (1997) split C system, Watanabe suggests that examples like (24)–(25) have the structure in (26) (Watanabe 2002: 183).

(26) $[_{TopP}$ (DP = pa) $[_{FocP}$ DP = ka $[_{IP}$ DP = no/ga $[_{VP}$ …]]]]

Yanagida (2007: 183) provides the quantitative data for OSV order in OJ. Out of 65 tokens of OSV, 12 occur with a focus/*wh*-phrase. In 10 out of 12 tokens, *wo*-marked objects appear to the left of the focus phrase; that is, TopP in (26). Given that the focus/*wh*-phrase moves to FocP, *wo*-marked objects move to TopP within CP layer. This is illustrated in (27).

(27) $[_{\text{TopP}} \text{DP}_i = \text{wo} \; [_{\text{FocP}} \text{Wh/Focus} = \text{ka} \; [_{\text{TP}} \; [_{v\text{P}} \; t_i \; [_{v\text{P}} \; \text{DP} = \text{ga} \ldots t_i \ldots v_{\text{NMLZ}}]]]]$

    a. *aki   yama   **wo** ikani **ka** kimi ga   pitori kwoyu*
       autumn mountain OBJ how Q   you AGT alone cross
       ramu   (MYS 106)
       MOD.ADN
       'How do you cross the autumn mountain alone?'

    b. *ware **wo** yami ni **ya** imo ga   kwopi-tutu   aru*
       I   OBJ dark in Q   wife AGT longing.for-CONT be
       ramu?   (MYS 3669)
       MOD.ADN
       'Would my wife be longing for me in the dark?'

    c. *waga te   **wo** koyopi **mo** **ka** tono no wakugo **ga**   torite*
       my   hand OBJ tonight also Q lord GEN young   AGT take
       nageka-mu   (MYS 3459)
       mourn-MOD.ADN
       'Will the young lord take my hand and mourn tonight as well?'

Y&W (2009) propose that *wo*-marked objects move to AspectP above *v*P with the feature [± transitive]. Here I simply assume that they first undergo Object Shift (OS) to the outer edge of *v*P, where they receive a language-specific interpretation (i.e. specificity/definiteness) (cf. Chomsky 2001). *Wo*-marked objects then move further to the left peripheral position within the domain of CP.

    Note importantly that *wo*-marked objects can remain inside *v*P, when the subject is marked by *no*, as shown in (28) (Yanagida 2006).

(28) a. *parusame **no** yokuredo   ware **wo** nurasu*   (MYS 1697)
        spring rain GEN avoid-though I   OBJ drench
        'The spring rain, however hard I may shun it, drenches me.'

    b. *pito   **no** topona **wo** tatu   beki-mono ka*   (MYS 2772)
        people GEN rumor OBJ spread should   Q
        'Should people spread rumors?'

    c. *ipyebito **no**   idura-to   ware **wo** topa-ba ikani ipamu?*   (MYS 3689)
        family GEN where-COMP I   OBJ ask-if   how say
        'If your family should ask me where you are now, what should I reply to them?'

    d. *misagwo wiru su   ni   wiru pune **no** yupu-sipo   **wo** matu ramu*
        osprey be   nest LOC be   ship GEN evening-tide OBJ wait MOD
        ywori pa   ware koso masare.   (MYS 2831)
        than TOP I   FOC more
        'I am waiting more than a ship that is driven against the seashore where some ospreys are feeding, waiting for the evening tide to flow.'

Since, as observed by Nomura (1993), *no*-marked subjects necessarily follow a focus/*wh*-phrase, as shown in (25), it follows that (29) have the structure in which the *no*-marked subject moves to Spec, TP.

(29) [$_{FocP}$ Wh/Foc [$_{TP}$ Subject = no [$_{vP}$ Object = wo V]]]
   a. *soko mo* ***ka** pito   **no***   *wa* **wo** *koto nasa-mu*
       that FOC Q people GEN I   OBJ say do-MOD.ADN
       'People say this and that of me.'   (MYS 512, 1329,1376)
   b. *nani si*   ***kamo** wago opokimi **no** … kimi ga   asamiya* **wo**
       how FOC Q   my   princess GEN lord GEN Asamiya OBJ
       wasure-tamapu-ya?
       forget-Hon-Q
       'How could my Princess forget the lord Asamiya?'   (MYS 196)

To summarize, the above observations reveal that OJ has strict word order restrictions. The two types of subjects, one marked by *ga* and the other marked by *no*, appear in different structural positions, licensed by *v* and C respectively. The word order inside nominalized clauses follows from the SSG. Since subjects marked by *ga* remain in Spec, *v*P, the SSG forces the object to be externalized, resulting in OSV.

3.4   Object movement in nominal based split languages

Although OSV dominant word order is extremely rare cosslinguistically, the typological literature suggests that there is a strong correlation between OSV and ergative alignment. Hasplemath et al. (2016) identify four OSV languages in their typological database. Wik Ngathana, Tobati, Nadëb Kxoe. Whitman (2008) points out that the OSV status of Tobati is disputed, but that the other two, Nadëb and Wik Ngathana, are idenitifed in the literature as ergative. Furthermore, Northwest Iranian Vafsi is a split ergative language. Haig (2008:188) observes that the accusative pattern of Vafsi displays SOV order, and the ergative pattern OSV. In this section, we discuss two attested languages with object movement: Dyribal (Australian) and Kuikuro (Carib).

Dixon (1994:130) observes that in Dyirbal, the ergative pattern has OSV (30–31), whereas the nominative pattern has SOV (32). Dyirbal is a nominal based split ergative language: while common nouns display an ergative-absolutive pattern, pronouns a nominative-accusative pattern.

   Dyirbal (Australian; Dixon 1994)
(30) *ngana-na nguma-nggu bura-n*
      we-ACC   father-ERG   see-NONFUT
      'Father saw us.'

(31) *yabu   nguma-nggu bura-n*
      mother(ABS) father-ERG   see-NONFUT
      'Father saw mother.'

(32) *ngana   nguma   bura-n*
      we(NOM) father(ABS) see-NONFUT
      'we saw father.'

Dixon (1972:137) observes that "in Dyirbal, every sentence must contain a topic NP." The object is a topic in a clause with an ergative subject, and the subject is a topic when it is nominative.[9] This is represented in (33).

(33) a. Subject is topic. S_i = Abs $[_{vP} t_i$ V]   (intransitive)
      b. Object is topic. O_i = Abs/Acc $[_{vP}$ S = Erg t_i V] (transitive)

A widely observed feature of syntactically ergative languages, such as Dyirbal, is that the subjects of intransitive verbs (S) and the objects of transitive verbs (O) move to the subject position (Spec, TP), associated with the same absolutive case and licensing mechanism (Bittner & Hale 1996; Manning 1996, among many others). Object movement, however, is not the property of absolutive DP. As we see in Dyirbal (30–31), the object moves to a clause initial position, regardless of whether it is absolutive (unmarked) or accusative (case marked).

   Object movement is also widely found in Cariban languages like Kuikúro and Panare, as discussed extensively by Franchetto (1990) and Gildea (1998, 2000). Cariban languages manifest ergativity in case/agreement marking and word order. Kuikuro, for example, displays OVS/SV word order, as shown in (34–35). The subject of the transitive verb takes ergative *-heke* (34), while the subject of the intransitive verb is marked *zero* (35).

(34) Kuikúro
      [O   V   ] Aux A
       *Kuk-aki-sa Ø ta-laigo leha karaiha-**heke***
       Inc-word-Rel hear-Fut Asp non-indian-Erg
      'The non-indian will hear our words.'

(35) [S   V   ]
       tolonkgugu itsuN-tagü
       little.bird(s) noise-ASP
      'The bird(s) is/are singing.'

---

9. The status of absolutive has been called into question, and it has been argued that it should be treated to be the same as nominative (cf. Bittner & Hale 1996; Legate 2008 among many others)

Carib languages have a construction labelled the "AV ergative" system by Gildea (1998: 190–196, 2000: 85–88), originally referred to as "De-ergative" by Franchetto (1990). (Below I use the term de-ergative for this construction.) In this system, the object surfaces outside the *v*P containing the external argument and the verb. The agent does not take the ergative case *heke*, but instead the deergative prefix ñ- is attached to the verb, as shown in (36).

(36) **The Kuikúro De-ergative construction**   (Franchetto 1990: 413)

$[_{vP}$ A   V]   O
Ku-ñ-api-rái   *iŋéle*
1/2-DERG-hit-INT he
'We shall hit him.'

Like Dyirbal, the de-ergative pattern in Carib can also be characterized as involving movement of the object, but not of the absolutive DP. Gildea (2000: 98) cites constituency tests showing that O in this construction is external to the verbal projection containing A and the verb. According to Franchetto (1990), the de-ergative pattern as in (36) is sensitive to the nominal hierarchy and is obligatory in cleft constructions, relative clauses, and content questions in which the direct object is questioned. This pattern is obligatory for transitive intentional mood verbs in which the subject is first person singular or inclusive; however, if the transitive subject is first person exclusive or second person there is alternation between an ergative and a deergative pattern. Finally, when the transitive subject is third person, de-ergativization may not occur. The basic properties of this structure are exactly parallel to the active property and OSV word order of nominalized clauses in OJ.

3.5   Parametrization

Ergative/active patterns are typlogically diverse. The complexties of syntactic behavior makes it difficult to find a single coherent syntactic implementation of languages of this type. I hypothesize that the DSM languages with object movement discussed in 3.4 share the following properties common to nominalization associated with *ga* in OJ:

(37) a.   The realization of case is sensitive to the nominal hierarchy.
     b.   The subjects of transitive verbs remain in Spec *v*P.
     c.   DSM is associated with nominalized *v*.[10]

---

10. Gildea (1998, 2000) argues that alignment and word order patterns in Carib languages are historically derived from distinct types of nominalization (see Section 2). The historical origin of the alignment pattern in Dyirbal is unknown. Bittner and Hale (1996), however, indicate that verbs in ergative languages like Dyirbal have noun properties, which fail to assign accusative

An interesting theoretical question arises: What is the motivation for the object to move outside vP in these languages? A plausible hypothesis is that object movement in non-accusative languages is accounted for by the SSG. The object is externalized because the agenitive subject remains in Spec vP. Perhaps the strongest challenge to the application of the SSG to non-accusative languages is that the SSG is meant to be the condition for arguments with structural case. A&A (2001) indicate that PP arguments with inherent case are exempt from the SSG. If all ergative (or active) case is inherent, as is widely assumed, the SSG would be inapplicable to ergative languages. I propose that object movement in the DSM languages discussed above provides evidence that ergative (active) case is an abstract case, rather than an inherent case, and hence it is subject to the SSG.[11]

As we discussed in Section 2, the SSG provides another diagnostic for parametrization, in terms of the position to which the nominal feature originates within the extended projection (v or C) of VP. Nominalization associated with genitive in Turkish is a C-type nominalization, while nominalization associated with genitive in ModJ is v-type nominalization. Now, including non-accusative languages, parametrization of the height of the nominal feature is represented in Table 1.

Table 1. The typology of nominalizations

Clause type	Accusative ⟵				⟶ Non-accusative	
	Turkish	OJ	ModJ	OJ	Carib	Dyirbal
		no	*no*	*ga*		
The position of the nominal feature	C	C	v	v	v	v

Nominalization associated with genitive *no* in OJ is a C-type nominalization in parallel to Turkish. It displays no transitivity restriction. The genitive subject given in (28) moves to Spec TP and the object that follows it remains within vP in parallel to Turkish. Nominalization associated with OJ *ga*, on the other hand, is a v-type nominalization in parallel to ModJ *no*. The subject remains in Spec, vP and the nominal feature in v raises to T to check the EPP feaure. The accusative object is prevented from occuring inside vP. The SSG forces the object to be externalized to the CP domain, resulting in OSV word order as in (22). Note importantly, that

---

case to the object. This forces the object to move to Spec IP to avoid a violation of the case filter, resulting in OSV in Dyirbal.

11. Note the proposal here does not claim that all ergative/active languages respond to the SSG by moving the internal argument out of vP. Rather this may be a point of typological variation related to the origin of ergative case (see Section 2). In languages like Hindi, ergative (active) subject may be an inherent case in line with previous analyses (cf. Anad &Nevin 2006; Woolford 2009).

object movement in OJ is an instance of A′ movement to the CP layer. ModJ has no *wh*/focus movement to the domain of CP found in OJ. The scrambling of an object does not suffice to avoid an SSG violation, as shown in (11). Table 1 shows that the history of nominalization has undergone a curious fluctuation in Japanese: what used to be a C-type nominalization licensing genitive *no* on subjects in OJ came to be a *v*-type nominalization, and *v*-type nominalization with *ga* came to be a main clause with nominative-accusative alignment in ModJ.

So far, we have focused on the synchronic explanations for case marking and OSV order in nominalized clauses. The following final section sets out to explore the diachronic origins of OSV.

4.   A historical origin for OSV word order

The phenomenon of ergativity has been analyzed in the literature from both synchronic and dichronic perspectives. It has been widely accepted that variable alignment patterns are related to the historical origins of ergative case. The ergative case in languages like Hindi is a reanalyzed instrumental or dative case that was innovated after the reinterpretation of passive/participle constructions. Ergative case may originate from genitive through reanalysis of possessive constructions. A number of linguists have proposed that nominalization structures are a diachronic source for variation in alignment and word order, particularly for languages that show syncretism of agent and genitive marking, like OJ. This approach has come to be known as the *nominalist hypothesis* (cf. Kaufman 2007, 2009).[12] Y&W (2009) and Yanagida (2012) suggest that there are close parallels between Gildea's (1998, 2000) reconstruction of Carib de-ergative patterns, as shown in Kuikúro (36) and the historical sources of the OSV pattern in OJ. Gildea (1998, 2000) claims that alignment and word order variations in Carib languages are byproducts of historical change from different types of biclausal nominalization reanalayzed as monoclausal main structures. He attempts to reconstruct the source of de-ergative pattern (38) in Panare, as object nominalization, selected by the matrix copula (39).

---

12. Examples of sources for non-accusative alignment from nominalizations proposed in the literature include Mayan (Bricker 1981), Austronesian (Starosta et al. 1982, Kaufman 2007, 2009; Aldridge 2017), and Cariban (Gildea 1998, 2000), among others). The starting point for such 'nominalist' accounts of non-accusative alignment in the case of OJ comes from Miyagawa's (1989) synchronic treatment of adnominal clauses in OJ.

(38)   The Panare De-ergative construction   (Gildea 2000: 86)

[A   V   ]   O

yu-noh   *pɨ* **nɨ-a'kama-pitɨ-hpë**   *mën*

I-grandmother dead **DeErg**-FOC-tell-ITER-PST it

'My late grandmother told it over and over.'

(39)   a.   **Source:**   [$_{\text{NP}}$ POSS   *n*-V-Nmlzer]   Copula   S

         ↓   ↓   ↓   ↓

b.   **Result:**   [$_{\text{VP}}$ A   **DeErg**-V-T/A]   Auxiliary   O

(38) at the stage of (39a) would have the meaning 'this is what my late grandmother told me'. This biclausal source structure containing the copula is reanalyzed as monoclausal (39b): the nominalization is reanalyzed as a verbal projection (VP) containing the external argument (A) and the verb in its base position. The copula is reanalyzed as an auxiliary, and the original subject as the object (O). Gildea's account shows how reanalysis of a nominalization structure can result in a cross-linguistically marked structure.

Y&W (2009) and Yanagida (2012) argue for the diachronic development of OSV in nominalized clauses, applying Gildea's (1998, 2000) nominalist hypothesis to alignment and word order in OJ. In the rest of this section, I propose some revisions of our original claims regarding the origin of OSV patterns.

Harris and Campbell (1995) (H&C) argue that focus constructions universally develop out of biclausal cleft constructions. H&C (1995: 161), following Akiba (1978), analyze the origin of *kakari* focus constructions in OJ as clefts. They cited Example (40) from Akiba (1978). (Akiba's transcription of OJ as been modified.)

(40)   a.   **tapi no pikari so kokoda teri-taru**   (MYS 230)

torch GEN fire   FOC brightly shine-PERF.ADN

'It is the torch fire that is brightly shining.'

b.   *kokoda teri-taru (pa)*   *tapi no pikari so*

brightly shine-PERF.ADN (TOP) torch GEN fire   FOC

'What is brightly shining is the torch fire.'

Ohno (1964) originally proposed that the pattern illustrated in (40a) developed from (40b) by simple inversion of the subject and the predicate (see also Ohno 1993). Given that the *kakari* focus particle in clause final position is identical to clause medial position, H&C, following Akiba, suggest that *kakari* particles originated as a verb functioning as the copula 'be'. Thus, as Akiba's glosses suggest, the original construction was a cleft.

While *kakari-musubi* focus constructions may have their origins in a cleft structure, the OSV pattern cannot be analyzed as clefts, because as discussed in Section 3.3, the object always appear in the position preceding the focused

constituent. A plausible hypothesis is that the source of OSV structure is an instance of what H&C call *anti-clefts* (H&C 1995: 165). H&C suggest that anti-clefts in the diaclect of Laz (Kartvelian) have the structure in which the subordinate clause contains the topicalized element and the copula, as illustrated in (41). Laz (Kartvelian; H&C 1995: 165)

(41) *mazura-pe-na   en, va uc'umess*
      second-PL.NOM-COMP it.be NEG he.speak.to.them
      'Lit. The others that are, he does not speak to [them].'
      'As for the others, he does not speak to them.'

According to H&C, the anti-cleft structure differs from clefts in two respects. First, the highlighted element is a topic rather than focus. Second, in anti-clefts, the copula appears not in the main clause but in the subordinate clause. H&C suggest that the topic construction in the Xopian dialect of Laz (Kartvelian) in (42) has developed out of an anti-cleft construction: the biclausal structure is reanalyzed as a single clause and the copula was reanalyzed as the topic marker *nay*.

(42) Xopian   (Laz; Kartvelian; H&C 1995: 166)
      *ia   patisaik-**nay** badis   uc'veen*
      that ruler-TOP   old.man he.speak.him
      'As for that ruler, he apparently says to the old man.'

Turning now back to OJ, it is well-known that *wo* has multiple functions. It can mark various phrases other than the objects of transitive clauses. In (43)*wo* markes the adjunct phrase rather than the object in the clause initial topic position.

(43) a. ***udi gapa wo** pune Ø watase wo   to ywobape domo* … (MYS 1138)
          Uji river TOP boat   send EXCL that call   though
          'Though I call to send the boat at the Uji River …'
      b. ***yworu no ime ni wo** tugite   miye   koso*…(MYS 807, 3108)
          night GEN dream LOC TOP continuously appear EXCL
          '(you) will appear in a dream in the darkness of the night.'

Wo has a clause final function (44) below, just like *kakari* focus paricles. Tokieda (1954:204) claims that accusative *wo* evolved from this clause-final exclamatory/emphatic particle *wo*.

(44) a. *yami   no yo   pa kurusiki mono **wo***   (MYS 1378)
          darkness GEN night TOP painful thing EXCL
          '(Lit.) The darkness of night is something painful.'
      b. *kimi ga koto matu ware **wo***   (MYS 2782)
          you GEN word wait I   EXCL
          'Who is waiting for your word is me!'

Y&W (2009) explore the possiblity that the source of *wo* is the existential verb *wor-* 'exist, sit' and *wi-* 'be at, sit'.[13] The sentence-final *wo* may be analyzed as a truncated copula.

Interestingly, as pointed out by Stephen Horn (personal communication), the particle *wo* is cognate with *wo* 'yes', used to show agreement.

(45) *ina mo* **wo** *mo, posiki manimani yurusu beki …*   (MYS 3796)
no FOC yes FOC want as-like   forgive MOD
'(whether I said) yes or no, do as I like, you may forgive me.'

The fact that the copula is cognate with *yes* is not rare crossliguistically. For example, the copular verb *shì* 'to be' in Mandarin, which is believed to originate in pronoun is to emphasize a particular element of the sentence. The copular verb *shi* is also used to give affirmative answers to yes/no questions: *Zhangsan lai ma* 'Will Zhangsan come?' *Shi* 'yes',, in parallel to (45) in OJ.

These cross-linguistic observations make it plausible to hypothesize that *wo* originates as copula. The following is a possible scenario for the development of *wo* as accusative.

(46) Source Structure > Monoclausal
Source Stage I: [NP   *wo*$_{[Cop]}$]   [POSS V$_{NMLZ}$]
                              ↓   ↓   ↓   ↓
Monoclausal Stage II: [O   *wo*$_{[Topic]}$]   [S$_A$ V]
Monoclausal Stage III: [O   *wo*$_{[ACC]}$]   [S$_A$ V]

The source structure is what H&C labelled as anticleft containing the copula *wo*, which appears in the subordinate clause. In stage II, the subordinate clause is re-analyzed as topic predicated of a main nominalized clause containing an agentive subject. In stage III, the topic phrase is reanalyzed as the accusative object of a monoclausal transitive sentence. The historical change from Stage I to II involves the process of clausal simplification outlined by H&C in that biclausal structure is reanalyzed as monoclausal structure. The historical change of *wo* is now shown in (47).

(47) copula > topic   > accusative case

From a crosslinguistic point of view, the reanalysis of copula as accusative case, as shown in (47) is not particular to Japanese. König (2008:278) argues that

---

13. Diachronically, copulas may originate from verbs expressing location, position, stance or existence. The Bambara copula *bɛ* is homonymous with the verb 'to live'. The Basque copula *izan* is homonymous with the verb 'to exist'. In Kawaiisu, the positional predicates *kari* 'to sit', *wini* 'to stand' and *hari-* 'to lie' are often used in the sense of copula 'be' (see Pustet 2003).

accusative case in Khoe languages has evolved in the similar diachronic process as OJ. Examples (48)–(49) are cited by König (2008:278).

(48)   Khwe   (Khoe, Khoisan)
     yì   á
     tree COP
     'It is a tree.'

(49)   *yì   á   tí   múùn-á-té*
     Tree OBJ 1SG see-I-PRES
     'I see a tree.'

König (2008) argues that the object marker in Khwe languages has its origin in a copula, and that the copula synchronically functions both as a focus marker and as an object marker, which is similar to the analysis proposed here to OJ *wo* except that an earlier form of OJ accusative *wo* serves as a topic rather than focus.

5.   Conclusion

Y&W (2009) argue that nominalizations in Japanese at its oldest attested stage (8th century) show active alignment. This paper proposes that case marking and word order patterns are best analyzed as typologically well attested DSM. DSM parallels DOM exactly with respect to semantic distinctions licensed at different syntactic positions. I propose that the marked [O *wo* S *ga* V pattern] of transitive nominalized clauses identified by Yanagida (2006) and Y&W (2009) is synchronically an instance of topicalization in which the object moves to the domain of CP, resulting from the SSG proposed by A&A (2001). This paper has proposed that the SSG provides a unified account for object movement in ergative languages, and that it also serves as a diagnostic for nominalization type across languages.

Abbreviations

ABS	absolutive	INC	inclusive
ACC	accusative	INT	intentional
ADN	adnominal	ITER	iterative
AGT	agent	LOC	locative
ASP	aspect	MOD	modal
COMP	complementizer	NEG	negative
CONJ	conjunctive	NMLZ	nominalizer
COP	copula	NOM	nominative

DERG	de-ergative	NONFUT	non-future
DIM	diminutive	OBJ	object marker
ERG	ergative	PERF	perfective
EXCL	exclamative	PL	plural
F	female	PRES	present
FOC	focus marker	PST	past
FUT	future	Q	question particle
GEN	genitive	REL	relator (possession suffix)
GER	gerund	STAT	stative
HON	honorific	SG	singular
IMP	imperative	TOP	topic

References

Aissen, J. 2003. Differential object marking: Iconicity vs. economy. *Natural Language & Linguistic Theory* 21: 435–448. https://doi.org/10.1023/A:1024109008573

Akiba, K. 1978. A Historical Study of Old Japanese Syntax. PhD dissertation, UCLA.

Aldridge, E. 2004. Ergativity and Word Order in Austronesian Languages. PhD dissertation, Cornell University.

Aldridge, E. 2008. Generative approaches to ergativity. *Language and Linguistics Compass: Syntax and Morphology* 2(5): 966–995. https://doi.org/10.1111/j.1749-818X.2008.00075.x

Aldridge, E. 2017. Intransitivity and the development of ergative alignment. In *The Oxford handbook of ergativity*, J. Coon, D. Massam & L. Travis (eds.), 501–529. Oxford: OUP.

Alexiadou, A. & Anagnostopoulou, E. 2001. The subject-in-situ generalization and the role of case in driving computations. *Linguistic Inquiry* 32(2): 193–231.
https://doi.org/10.1162/00243890152001753

Anand, P. & Nevins, A. 2006. The locus of ergative case assignment: Evidence from scope. In *Ergativity: Emerging Issues*, A. Johns, D. Massam & J. Ndayiragije (eds.), 3–25. Dordrecht: Springer. https://doi.org/10.1007/1-4020-4188-8_1

Baker, M. C. 1988. *Incorporation*. Chicago IL: The University of Chicago Press.

Baker, M. C. 2014. On dependent ergative case (in Shipibo) and its derivation by phase. *Linguistic Inquiry* 45: 341–379. https://doi.org/10.1162/LING_a_00159

Bittner, M. & Hale K. 1996. The structural determination of case and agreement. *Linguistic Inquiry* 27: 1–68.

Bricker, V. 1981. The source of the ergative split in Yukatek Maya. *Journal of Mayan Linguistics* 2(2): 83–127.

Chomky, N. 1981. *Lectures in Government and Binding* [Studies in Generative Grammar 9]. Dordrecht: Foris.

Chomksy, N. 2001. Minimalist inquiries: The framework. In *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, R. Martin, D. Michaels & J. Uriagereka (eds.), 89–156. Cambridge MA: The MIT Press.

de Hoop H. & de Swart P. 2009. *Differential Subject Marking. Studies in Natural Language and Linguistic Theory*. Dordrecht: Springer. https://doi.org/10.1007/978-1-4020-6497-5

Dixon, R.M.W. 1972. *The Dyirbal language of North Queensland*. Cambridge: Cambridge University Press

Dixon, R. M. W. 1979. Ergativity. *Language* 55: 59–138. https://doi.org/10.2307/412519

Dixon, R. M. W. 1994. *Ergativity*. Cambridge: CUP. https://doi.org/10.1017/CBO9780511611896

Dryer, M. S. & Haspelmath, M. (eds.), 2013. *The World Atlas of Language Structures Online*. Leipzig: Max Planck Institute for Evolutionary Anthropology. <http://wals.info> (28 September 2016).

Enç, M. 1991. The semantics of specificity. *Linguistic Inquiry* 22:1–25.

Franchetto, B. 1990. Ergativity and nominality in Kuikúro and other Carib languages. In *Amazonian Linguistics: Studies in Lowland South American Languages*, D. L. Payne (ed.), 407–428. Austin TX: University of Texas Press.

Frellesvig, B., Horn, S., & Yanagida, Y. 2015. Differential object marking: A corpus based study. In *Historical Linguistics 2013: Selected Papers from the 21st International Conference on Historical Linguistics, Oslo, 5–9 August 2013* [Current Issues in Linguistic Theory 334], T. T. D. Haug (ed.), 195–211. Amsterdam: John Benjamins.
https://doi.org/10.1075/cilt.334.11fre

Gildea, S. 1998. *On Reconstructing Grammar*. Oxford: OUP.

Gildea, S. 2000. On the genesis of the verb phrase in Cariban languages. In *Reconstructing Grammar: Comparative Linguistics and Grammaticalization* [Typological Studies in Language 43], S. Gildea (ed.), 65–106. Amsterdam: John Benjamins.
https://doi.org/10.1075/tsl.43.04gil

Haig, G. 2008. *Alignment Change in Iranian languages: A Construction Grammar Approach*. Berlin: Mouton de Gruyer. https://doi.org/10.1515/9783110198614

Harada, S. 1971. *Ga-no* conversion and idiolectal variations in Japanese. *Gengo Kenkyu* 60: 25–38.

Harada, S. 1976. *Ga-no* conversion revisited: A reply to Shibatani. *Gengo Kenkyu* 70: 23–38.

Harris, A. & Campbell, L. 1995. *Historical Syntax in Cross-linguistic Perspective*. Cambridge: CUP. https://doi.org/10.1017/CBO9780511620553

Johns, A. 1992. Deriving ergativity. *Linguistic Inquiry* 23(1): 57–87.

Kageyama, T. 1980. *Goi no kozo* (The structure of lexicon). Tokyo: Shohakusha.

Kaufman, D. 2007. Austronesian typology and the nominalist hypothesis. The nominalist hypothesis in Austronesian. Paper given at ZAS Berlin, August 14, 2007

Kaufman, D. 2009. Austronesian nominalism and its consequences: A Tagalog case study. *Theoretical Linguistics* 35(1): 1–49. https://doi.org/10.1515/THLI.2009.001

Kinsui, S. 1993. Kotengo no wo ni tsuite (On the particle wo in premodern Japanese). In *Nihongo no kaku o megutte* (Perspectives on case in Japanese), Y. Nitta (ed.), 191–224. Tokyo: Kurosio.

Kinsui, S. 2011. Togoron (Syntax) In *Bunposhi* (The history of grammar), S. Kinsui, Y. Takayama, T. Kinuhata & T. Okazaki (eds.), 77–166. Tokyo: Iwanami Shoten.

Kornfilt, J. 2003. Subject case in Turkish nominalized clauses. In *Syntactic Structures and Morphological Information*, U. Junghanns & L. Szusich (eds.), 130–214. Berlin: Mouton de Gruyter. https://doi.org/10.1515/9783110904758.129

Kornfilt, J. 2009. DOM and two types of DSM in Turkish. In *Differential Subject Marking*, H. de Hoop & P. de Swart (eds.), 79–111. Dordrecht: Springer.
https://doi.org/10.1007/978-1-4020-6497-5_5

König, C. 2008. *Case in Africa*. Oxford: OUP.

Legate, J. 2002. Warlpiri: Theoretical Implications. PhD dissertation, MIT.

Legate, J. 2008. Morphological and abstract case. *Linguistic Inquiry* 39(1): 55–101.
https://doi.org/10.1162/ling.2008.39.1.55

Manning, C. 1996. *Ergativity: Argument structure and grammatical relations*. Stanford:CSLI Publications.

Marantz A. 1991. Case and licensing. *Paper presented at the 8th Eastern States Conference on Linguistics*. University of Maryland, Baltimore.

Miyagawa, S. 1989. *Structure and Case Marking in Japanese* [Syntax and Semantics 22]. New York NY: Academic Press.

Miyagawa, S. 2011. Genitive subjects in Altaic and specification of phase. *Lingua* 121: 1265–1282.
https://doi.org/10.1016/j.lingua.2011.01.009

Miyagawa, S. 2012. *Case, Argument Structure and Word Order*, New York NY: Routledge.

Motohashi, T. 1989. Case Theory and the History of the Japanese Language. PhD dissertation, University of Arizona.

Nomura, T. 1993. Jôdaigo no *no* to *ga* ni tsuite (On the particles *no* and *ga* in Old Japanese). *Kokugo Kokubun* 62: 1–17.

Ohno, S. (1964). Kakarimusubi no kigen ha donna koto ka [What is the origin of Kakari-Musubi]. Kokubungaku: Kaishaku to Kansho 29–11, 96–102.

Ohno, S. 1993. *Kakari-Musubi no kenkyu* (A study of Kakari-Musubi). Tokyo: Iwanami.

Pustet, R. 2003. *Copulas: Universals in the Categorization of the Lexicon*. Oxford: OUP.
https://doi.org/10.1093/acprof:oso/9780199258505.001.0001

Rezac, M., Albizu P., & Etxepare, R. 2014. The structural ergative of Basque and the theory of Case. *Natural Language &Linguistic Theory* 32: 1273–1330.
https://doi.org/10.1007/s11049-014-9239-7

Rizzi, L. 1997. *The fine structure of the left periphery. In Elements of Grammar*, L. Haegeman (ed.), 281-337. Dordrecht:Kluwer.

Silverstein, M. 1976. Hierarchy of features and ergativity. In *Grammatical categories in Australian Languages*, R. M. W. Dixon (ed.), 112–171. Canberra: Australian Institute of Aborignal Studies.

Starosta, S., Pawley, A. & Reid, L. 1982. The evolution of focus in Austronesian. In *Papers from the Third International Conference on Austronesian Linguistics*, Vol. 2: *Tracking the Travelers* [Pacific Linguistics C-75], A. Halim, L. Carrington & S. Wurm (eds.), 145–170. Canberra: Australian National University.

Tokieda, M. 1954. *Nihon bunpo bungo hen* (Old Japanese grammar). Tokyo: Iwanami Shoten.

Watanabe, A. 1996. Nominative-genitive conversion and agreement in Japanese: A cross-linguistic perspective. *Journal of East Asian Linguistics* 5: 373–410.
https://doi.org/10.1007/BF00132699

Watanabe, A. 2002. Loss of overt wh-movement in Old Japanese. In *Syntactic Effects of Morphological Change*, D. Lightfoot (ed.), 179–195. Oxford: OUP.
https://doi.org/10.1093/acprof:oso/9780199250691.003.0010

Whitman, J. 2008. The classification of constituent order generalizations and diachronic explanation. In *Language Universals and Language Change*, J. Good (ed.), 233–252. Oxford: OUP.

Woolford, E. 1997. Four-way case systems: Ergative, nominative, objective, and accusative. *Natural Language and Linguistic Theory* 15: 181–227.
https://doi.org/10.1023/A:1005796113097

Woolford, E. 2009. Differential subject marking at argument structure, syntax and PF. In *Differential Subject Marking*, H. de Hoop & P. de Swart (eds.), 17–40. Dordrecht: Springer. https://doi.org/10.1007/978-1-4020-6497-5_2

Yanagida, Y. 2006. Word order and clause structure in early Old Japanese. *Journal of East Asian Linguistics* 15: 37–68. https://doi.org/10.1007/s10831-005-2165-2

Yanagida, Y. 2007. Jôdaigo no nôkakusei ni tsuite (On ergativity in Old Japanese). In N. Hasegawa (ed.), *Nihongo no shubun genshô* (Main clause phenomena in Japanese), 147–188. Tokyo: Hituzi Shobo.

Yanagida, Y. 2012. The syntactic reconstruction of alignment and word order: The case of Old Japanese. In *Historical Linguistics 2009*, A. van Kemenade & N. de Haas (eds.), 107–127. Amsterdam: John Benjamins.

Yanagida, Y. 2018 Differential subject marking and its demise in the history of Japanese. In *Diachrony of Differential Argument Marking*, I. Seržant & A. Witzlack-Makarevich (eds.), 403–425. Berlin: Language Science Press.

Yanagida, Y. & Whitman J. 2009. Alignment and word order in Old Japanese. *Journal of East Asian Linguistics* 18: 101–144. https://doi.org/10.1007/s10831-009-9043-2

Possessive nominal phrases in Lamaholot

Kunio Nishiyama

Ibaraki University

This paper analyzes the synchrony and diachrony of possessive noun phrases in Lamaholot (Austronesian). On the assumption that the clause architecture and the nominal architecture are parallel, the loss of verb movement at the clausal level (Aldridge 2010) is argued to be equivalent to the loss of movement of NP at the nominal level. This captures the possessor – possessed order in languages in eastern Indonesia (including Lamaholot), as opposed to the possessed – possessor order in western Indonesia. Lamaholot also has the possessed – possessor order, and this involves focus movement of NP. The complementary distribution of a genitive pronoun and a nominal suffix is accounted for by contextual allomorphy. As driving force of word order change, an internal factor (within Austronesian) and an external factor (contact with Papuan languages) are suggested.

Keywords: Austronesian, Lamaholot, possessives, word order, focus, allomorphy, language contact, Papuan languages

1.   Introduction: The Austronesian word order

Word order is one of the most frequently discussed features in the typological literature. In the diachronic literature as well, word order often becomes an issue, as most typically exemplified by numerous works on the change of word order in English from SOV to SVO. In the Austronesian languages, which consist of some 1,200 languages and whose historical development is relatively well understood (cf. Tryon 1995; Blust 2009 and (4) below), the word order change is from verb-initial (i.e., VSO or VOS) to SVO:

(1) a.   wada biq-un huluma na   Ape ka   laqi   (Seediq)
          PAST give-TR treat   ERG A.   ABS child
          'Ape gave the child a treat.'

b. Ali mem-beli buku pada Nuri   (Malay/Indonesian)
   A. Act-buy   book for   N.
   'Ali bought a book for Nuri.'   (Aldridge 2010: 169)

Seediq in (1a) is a Formosan language spoken in Taiwan, the homeland of the Austronesian languages. Formosan languages are generally agreed to preserve the grammatical features of Proto-Austronesian, and the verb-initial order is one such feature. The same verb-initial word order is also observed in the languages in the Philippines. In contrast, the Austronesian languages of Indonesia, with the exception of those of Sulawesi, the word order is generally SVO, as illustrated in Malay/Indonesian in (1b).

In the nominal domain, word order variation is observed between the languages of western Indonesia and those of eastern Indonesia:

(2) a. oto guru   (Malay/Indonesian)
        car teacher
        'teacher's car'
    b. guru   oto-nən   (Lamaholot)
        teacher car-3SG
        'teacher's car'

Malay/Indonesian is spoken as a native language in western Indonesia, and the order is **head noun – possessor** as (2a). The same order is observed in the languages of Taiwan and the Philippines. Lamaholot is spoken in Flores in eastern Indonesia, and the order is reversed as **possessor – head noun** as (2b).

According to Himmelmann's (2005) survey of typological features of non-Oceanic Austronesian languages (i.e., the languages of Taiwan, the Philippines, Borneo, Indonesia and Madagascar), they are divided into *symmetrical voice languages* (western) and *preposed possessor languages* (eastern) (p. 175). 'Symmetrical voice' refers to a situation in which the so-called 'passives' (from the Indo-European perspective) occur frequently and have no marked status compared to 'actives', as typically illustrated by the renowned voice system in Tagalog. In 'preposed possessor languages', the possessors precede the head nouns. That is, the order of possessor – head noun is the defining feature of the languages of eastern Indonesia, which include Lamaholot.

The situation is summarized as follows:

(3)   *The Austronesian word order*
        conservative ⟵··· ··· ···⟶ innovative

Formosan and Philippine	western Indonesia	eastern Indonesia
verb-initial	SVO	
head noun – possessor		possessor – head noun

This table is to be considered in the context of the following family tree of Austronesian:

(4) *Subgrouping of Austronesian Languages*

(Based on Tryon (1995: 7), among others)

Proto-Austronesian

…Formosan languages… Mayalo-Polynesian (MP)

Western MP (Malay/Indonesian)   Central-Eastern MP

Central MP (Lamaholot)   Eastern MP

S.Halmahera- W.New Guinea   Oceanic
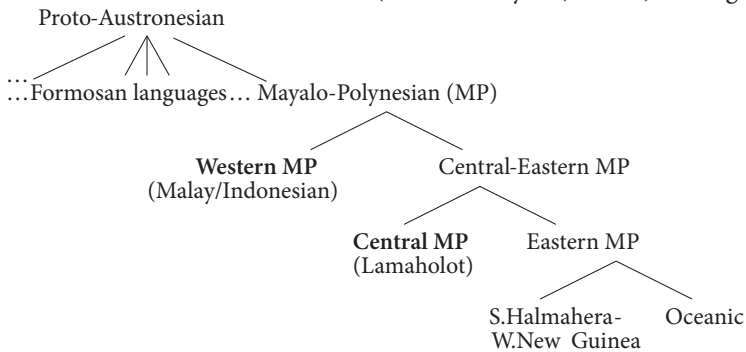
The family tree of the Austronesian languages is basically right-branching, and this means that the languages in the upper-left of the above chart (i.e., Formosan languages and Western Malayo-Polynesian) are close to the proto language and are thus more conservative. The languages of the Philippines and Malay/Indonesian are members of Western Malayo-Polynesian. In contrast, Lamaholot belongs to Central Malayo-Polynesian, which is considered to be more innovative.

Returning to the table in (3), of the three areas in question, the Formosan and Philippine languages are the most conservative with the order of verb-initial and head noun – possessor, and those of eastern Indonesia are the most innovative with the order of SVO and possessor – head noun. The language of western Indonesia comes in between with the mixed order of conservative head noun – possessor and innovative SVO.

The purpose of this paper is to analyze the structure and derivation of possessive nominal phrases in Lamaholot, with special focus on the mechanism behind the word order change in the Austronesian context from head noun – possessor to possessor – head noun. It also discusses some intricate synchronic features specific to Lamaholot. All the Lamaholot data are from Nishiyama & Kelen (2007).

This paper is organized as follows. Section 2 is a brief introduction to the Lamaholot language and lays out the basic assumptions in this paper regarding the clausal and nominal architectures. Section 3 presents the structure and derivation of prenominal possessor nominal phrases. I extend Aldridge's (2010) analysis of word order change at the clausal level in the Austronesian languages to the nominal domain. Specifically, like Aldridge's analysis, according to which the SVO order is obtained with the loss of verb raising, I claim that the possessor – head noun order is obtained with the loss of NP raising. In addition to prenominal

possessors, *post*nominal possessors are also possible in Lamaholot noun phrases, and Section 4 is concerned with this construction. I argue that focus movement and contextual allomorphs are involved in this construction. Section 5 provides more discussion on the diachrony of this word order change in noun phrases, with specific focus on the role of language contact. Section 6 concludes.

2.   The Lamaholot language and its clausal and nominal architectures

Lamaholot is spoken by 150,000~200,000 people on the eastern tip of Flores, on all of Solor, Adonara, Lembata (except the Kedang area) and in enclaves on the northern coast of Pantar, northwest Alor, and surrounding islands. According to one survey, Lamaholot has 33 dialects, and this paper is on the Lewoingu dialect (alternatively called Lewolaga). In terms of subgrouping, Lamaholot belongs to Central Malayo-Polynesian (Blust 1993), as we saw in (4). It should also be noted that Central Malayo-Polynesian languages are spoken in the areas in proximity to Papuan languages. This feature will be crucial in the discussion of the role of languages contact in Section 5.

The basic word order of Lamaholot at the clause level is SVO (with prepositions):[1]

(5) a. tite   bu'a wata pe lango
         we.INCL eat   rice in house
         'We eat rice in the house.'
     b. kame   hope ue   nein mio
         we.EXCL buy   ptato for   you.PL
         We buy potatoes for you.'

The pronominal system of Lamaholot is as follows:

(6) *The pronominal system of Lamaholot*

	nominative/accusative	genitive	suffix
1SG	go	go'en	-kən
2SG	mo	mo'en	-ko/-no
3SG	(ro)na	na'en	V-na/N-nən
1PL.EXCL	kame	kame'en	-kən
1PL.INCL	tite	tite'en	-te
2PL	mio	mion	-ke/-ne
3PL	ra	ra'en	-ka

---

1. The orthography for Lamaholot is generally phonetically transparent. I use the apostrophe for the glottal stop and the IPA symbol for schwa.

There are three paradigms of nominative/accusative, genitive, and suffix relevant in this paper.[2] Nominative/accusative pronouns are free pronouns that emerge in the argument position (i.e., the subject or the object). Genitive pronouns are used in postnominal possessive constructions, discussed in Section 4. Suffixes attach to either a verb or a noun, and are analyzed as agreement markers in Section 3. *-ko/-no* for second person singular and *-ke/-ne* for second person plural are free variants. *V-na/N-nən* for third person singular indicate that *-na* is used for a verb and *-nən* is used for a noun; all other forms of suffixes are used for both verbs and nouns.

Next I lay out the theoretical assumptions regarding the clausal and nominal architectures that I adopt for Lamaholot. Clauses and nominals have parallel structures and thus subjects and possessors are parallel (cf. Abney 1987, among others). Specifically, nominal phrases are structured as (7a), parallel to the clausal architecture as (7b).

(7) a. (DP tree: DP → D′ → D, nP; nP → possessor, n′; n′ → n, NP) b. (TP tree: TP → T′ → T, vP; vP → subject, v′; v′ → v, VP)
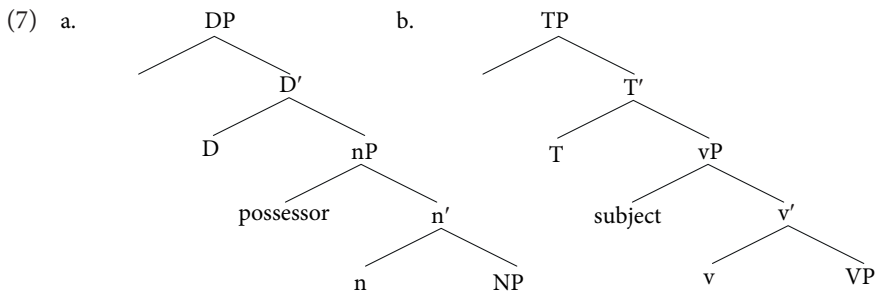
Just like the subject is introduced in the Spec of vP, the possessor is introduced in the Spec of nP. (cf. Alexiadou 2005). Some researchers use NumP as a functional projection between DP and NP. I adopt the label of nP to feature the parallelism with the clausal architecture, but the exact label is not crucial, nor is whether NumP and nP can be reduced to one projection.[3]

---

2. I abstract away from prefixes, which are restricted to a limited set of vocabularies and are not observed in noun phrases.

3. The nominal structure in (7a) is head-initial because the clause structure in Lamaholot is head-initial, as we saw in (5), which is reflected in (7b). But this does not predict the position of the determiner, which is at the end of DP:

i.   wata yang go biho me'en
      rice that I   cook the
      'the rice that I cooked'

However, the determiner-at-the-end requirement also holds in Malay/Indonesian. Thus, the question of why determiners emerge at the end of DP is not intrinsic to the Lamaholot nominal structure but touches upon the more general issues of the Austronesian nominal structure.

3.   Prenominal possessors

This section analyzes prenominal possessors in Lamaholot. The key feature of the analysis is that the order of possessor – head noun reflects a syntactic change in the nominal domain that is parallel to the syntactic change in the clausal domain as proposed by Aldridge (2010).

Aldridge argues that verb-initial order as in (1a) is obtained by verb raising.[4] In this analysis, innovative SVO order as in (1b) emerges when a language loses verb raising.

Pursuing the basic assumption in this paper to maximize the parallelism between the clausal and nominal structures, I propose that the possessor – head noun order is obtained by the loss of noun raising. By 'noun raising', I do not mean head movement of N, i.e., N-raising. N-raising is originally proposed by Cinque (1994), but is later rejected by Cinque (2010) himself. Besides, this analysis is supposed to capture the N–A order, while our concern here is the N–Poss order. Instead, I argue that the conservative head noun – possessor order is obtained by movement of NP to Spec DP as in (8a), which is absent for innovative possessor – head noun order as in (8b):

One way to derive the D-final order with (7a) is to move nP to the Spec of DP. Alternatively, as suggested by a reviewer, the nominal structure of Lamaholot is head-final. In the following discussions, what is crucial is that the Spec of nP is on the left side if n', and whether n precedes or follows NP is largely immaterial. Although my analyses assume the head-initial structure, I believe that they can also be implemented within the head-final structure as well.

4. Technically, this is an oversimplification, for her analysis is more elaborated. For the present purposes it suffices to note that the analysis says that the verb-initial order is obtained from the initial SVO order when a phrase containing a verb moves across the subject.

(8) a.

```
             DP
          ／    ＼
        NP       D′
              ／    ＼
            D        nP
                  ／    ＼
            possessor    n′
                       ／  ＼
                      n     t_NP
```

(Malay/Indonesian)

b.

```
             DP
           ／   ＼
               D′
            ／    ＼
          D        nP
                ／    ＼
          possessor    n′
                     ／  ＼
                    n     NP
```

(Lamaholot)
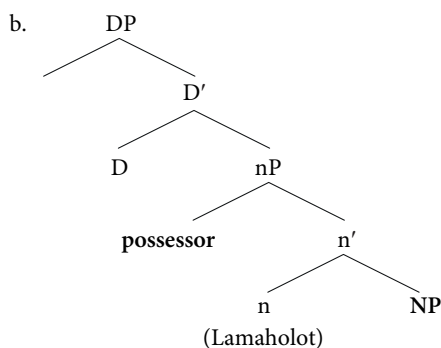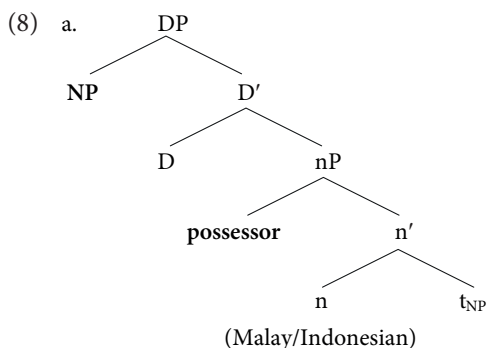
One piece of evidence for movement of NP in Malay/Indonesian comes from the order of modifying adjectives with respect to the possessor and the head noun, which is N – A – Poss:

(9) teh panas saya   (Malay/Indonesian)
     tea hot   1sɢ
     'my hot tea'   (Dardjowidjojo 1978: 67)

On the assumption that adjectives are right-adjoined to a noun phrase, the above order is obtained when the noun phrase *teh panas* moves across the possessor *saya*. See Simpson (2005) for a related discussion on NP raising in Southeast Asian languages. I leave open the theoretical motivation for NP-raising in (8a). But in Section 5 I discuss the historical background behind the loss of movement of NP in (8b).

The suffix on the head noun in Lamaholot is analyzed as agreement with the possessor. Thus, when the possessor is plural, the head noun has a plural marker:

(10) Bala no'on Lepang lango-ka
      B.   and   L.   house-3ᴩʟ
      'Bala and Lepang's house'

As mentioned in (6), the person markings on the head nouns are basically identical to the agreement marker on verbs. Compare the agreement marker on verbs in (11)[5] with the possessive suffixes on the head noun in (12):

(11) a. ia'-ke
          'live-2PL'
      b. ia'-kən
          'live-1SG'
      c. ia'-ko
          'live-2SG'

(12) a. lango-ke
          'your (PL) house'
      b. bapa'-kən
          'my father'
      c. bapa'-ko
          'your (SG) father'

Note that the agreement markers are the same for verbs and nouns. This confirms our assumption that clauses and noun phrases have parallel structures. The same argument based on agreement has been observed based on Hungarian since Szabolcsi (1983/1984).

Theoretically, agreement is analyzed as the realization of the phi-features of the agreement trigger copied onto the agreement host (cf. Distributed Morphology, Halle & Marantz 1993). For verbal agreement, the trigger is the subject, and the host is v. For nominal agreement, the trigger is the possessor, and the host is n. The latter is depicted as follows:

(13)

---
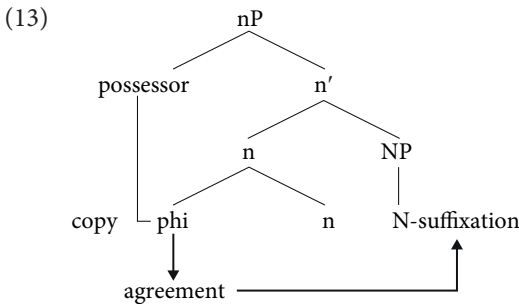
5. Not all verbs show agreement: there are some 40 verbs that show agreement with a suffix. Such verbs are by and large intransitive verbs, and suffixes are often optional but are preferred or obligatory depending on the verb, the pronoun in the subject, or contexts. *ia'* 'live' in (11) is an agreeing verb, but the verbs in (5) are not, and this is why no agreement marker is present in (5).

The realized agreement marker is a suffix, and thus is ultimately attached to the head noun.[6] I assume that when there is no overt possessor, there is a null possessor in the Spec of nP as the trigger of agreement.

For some speakers, nominal suffixes are not morphologically productive. When they do not use nominal suffixes, genitive pronouns are used instead. Genitive pronouns in Lamaholot are derived by attaching -ʻ*en* to a free pronoun.

(14)   a.   lango na'en
            house his/her
            'his/her house'
       b.   oto mo'en
            car your
            'your (sg) car'
       c.   mata go'en
            eye   my
            'my eye'

Thus, Lamaholot has two ways to express possession, namely by a suffix and by a genitive pronoun. Interestingly, when a genitive pronoun is used, the full NP possessor is *post*nominal. This is where the data become complicated and we move into the realm that is particular to the synchronic grammar of Lamaholot. We discuss this in the next section.

4.   Postnominal possessors, focus movement, and contextual allomorphy

In the last section we discussed the prenominal possessor construction, where the possessor precedes the head noun, which is suffixed with an agreement marker. This section analyzes the *post*nominal possessor construction. Here, the order is head noun – possessor – genitive pronoun as (15a), and the order is strict (15b):

(15)   a.   lango guru   na'en
            house teacher his/her
            'teacher's house'

---

6. This is analogous to English tense morphemes /z/ and /d/: although T precedes VP in English, the tense markers are suffixed onto a verb. One might think that the derivation would be simpler if the phi-features are copied directly onto the head noun. There are two reasons why I do not adopt this analysis. One is that the Spec-Head relation as in (13) is more local, and locality is required in agreement. The other is that feature copying onto n can naturally be extended to the postnominal possessive construction discussed in the next section.

b. *lango na'en   guru
   house his/her teacher
   'teacher's house'

Compared with prenominal possessors, postnominal possessors are less produc-
tive syntactically, and have marked information structure. I analyze (15a) as de-
rived from focus movement of the head noun to a nominal-initial position:

(16)
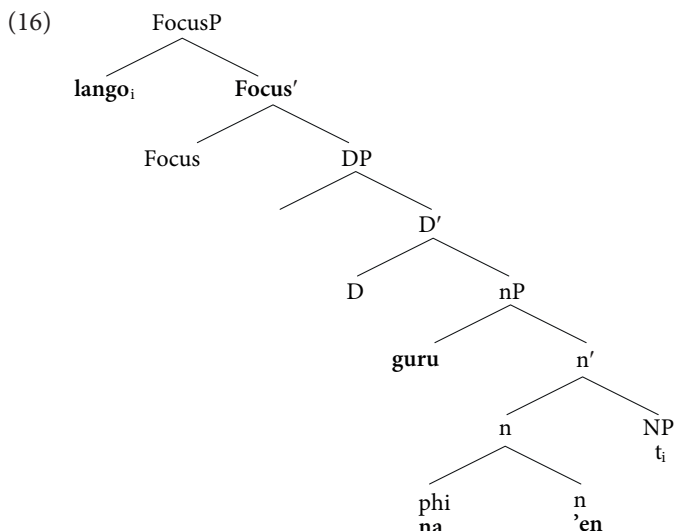
In the following I elaborate the structure and the derivation of the postnominal
possessive construction above.

In (16), the movement of the head noun *lango* is a case of focus movement,
with Spec FocusP as the landing site. To motivate the relevance of focus in this
movement, we need to look into some aspects of the information structure in
Lamaholot noun phrases. (17) illustrates the usage of possessive nominals with
respect to whether the information is new or old:

(17) a.   go təngə Bala lango-nən hala'. go təngə **Lado** lango-nən.
          I see B. house-3SG not I see L.   house-3SG
          'I didn't see Bala's house. I saw *Lado's* house.'
     b.   go təngə Bala lango-nən hala'. go niko təngə **oto** (?Bala) na'en
          I see B. house-3SG not I only see car B.   his
          'I didn't see Bala's house. I only saw his (Bala's) *car*.'

(17a) and (17b) share the same the introducing part ('I didn't see Bala's house'). As
the translations indicate, in (17a) Lado is new information, and in (17b), 'car' is. In
both cases, the new information is ordered first. That is, regarding the order of the

possessor and the head noun, whichever comes first gets focus. In (17b), *oto* is in focus. Perhaps *Lado* in (17a) is also in focus.

In the introducing part in (17a) and (17b), the order is *Bala lango-nən.* This indicates that the possessor – possessed order is an unmarked order. This is reflected in (8b), the structure for *Bala lango-nən*, in which there is no FocusP.

In (16), the focus movement is phrasal movement to Spec rather than head movement. This is evidenced by the following, where the noun moves with a modifying adjective.

(18) təma   wu'un Bala na'en
       friend new   B.   his
       'Bala's new friend'

Here, the purported moved element is *təma wu'un* 'new friend,' a modified noun phrase.

Let us move to the genitive pronouns, which are segmented as a nominative/accusative pronoun plus *-'en* (e.g., *na-'en*). I analyze the pronoun part and the suffix part as contextual allomorphs of the phi-features and n, respectively, specified for the context in which the complement NP is phonologically empty.[7] This is implemented in terms of vocabulary insertion rules of Distributed Morphology as follows:

(19)

```
                   n′ /nP
                  /      \
                 n        NP
                / \
    [phi-features]  n
```

(20) a. [phi-features] ⟷ /suffix/ / ___ NP (overt)
     b. [phi-features] ⟷ /pronoun/ / ___ [$_{NP}$ Ø]

(21) a. n ⟷ Ø / ___ NP (overt)
     b. n ⟷ /'en/ / ___ [$_{NP}$ Ø]

As in the case of ordinary agreement depicted in (13), the phi-features of the possessor are copied onto n, deriving the structure in (19). When the complement NP is overt, the phi-features are realized as a suffix (20a) and n as zero (21a), and this is what happens in ordinary agreement (followed by the suffixation of the suffix onto the head noun). In contrast, focus movement as in (16) makes the comple-

_____

7. I am grateful to Edith Aldridge for suggesting this line of analysis.

ment NP empty, and when this happens, the phi-features are realized as a pronoun (20b) and n as -ʾen. (21.), deriving a genitive pronoun.[8]

The genitive suffix -ʾen has a morphological constraint to the effect that only a pronoun, not a full NP, can host it:

(22) *lango guru-ʾen
       house teacher-POSS
       'teacher's house'

It is just the opposite of English -'s, which attaches to a full NP and not to a pronoun. The vocabulary insertion rules in (20b) and (21b) captures this effect by specifying the same contextual feature (namely the empty NP complement) for the pronoun and -ʾen.[9]

---

8. For expository purposes I formulate the rules in (20) that are limited to the nominal domain. If we extend the scope of the rules to the pronouns in the argument position (i.e., the subject and the object), the rules are revised as follows:

(i) a.   [phi-features] ⟷ /suffix/ / [$_n$ ___] NP (overt)
     b.   [phi-features] ⟷ /pronoun/

Here, the pronoun are obtained by the elsewhere rule. The suffix is specified to appear within n followed by an overt NP complement. When the phi-features appear within n but the NP complement is empty, the required contextual features for the suffix are not met, and the phi-features obey the default rule, deriving a pronoun in the case of postnominal possessive construction.

Furthermore, if we are to differentiate between nominal suffixes and verbal suffixes, further specifications are necessary:

(ii) a.   [phi-features] ⟷ /nominal suffix/ / [$_n$ ___] NP (overt)
     b.   [phi-features] ⟷ /verbal suffix/ / [$_v$ ___]

Recall from the table in (6) that for third person singular, the nominal suffix and verbal suffix are different (-nən vs. -na). I leave open the issue of whether identical non-third person singular verbal and nominal suffixes should be treated uniformly, and if so, how the vocabulary insertion rules can be collapsed.

9. Based on dialectal evidence, Nishiyama and Kelen (2007: 15f) argue that the *e* part of -ʾen is historically a part of the pronoun, and that the original possessive part is -n. This situation is observed in the second person plural pronoun (*mio* (free pronoun) ➔ *mion* (genitive pronoun)), the only form in the pronominal paradigm that does not involve -ʾen in deriving the genitive form. (But I assume that -ʾen is one morpheme in the synchronic grammar of the Lamaholot dialect in question.)

The head label n is primarily meant to be parallel to v in that it licenses the possessor. However, it can also be interpreted as the nominalizer in the sense of Marantz (1997). Thus, Nagaya (2011: 111ff) shows that the nasal part -n is a nominalizer in (another dialect of) Lamaholot.

The vocabulary insertion rules in (20) say that the pronouns and suffixes are allomorphs, and this captures the complementary distribution of possessive pronouns and nominal suffixes:

(23)   a.   lango-nən
            house-3SG
            'his/her house'

     b.   lango na'en
            house his/her
            'his/her house'

     c.   *lango-nən na'en
             house-3SG his/her
            'his/her house'

Note that a possessive pronoun and a nominal suffix cannot co-occur (23c). This is a natural consequence of the analysis according to which -*nən* and *na*- are allomorphs that realize the same phi-feature.

The point of this section is that, although movement of NP is generally lost in Lamaholot as in (8), it is still observed for focus. Edith Aldridge (p.c.) points out that an equivalent to NP focus fronting as in (16) can be found at the clausal level in Malay/Indonesian. Alongside the SVO order, the VOS order is also possible, with the effect of focus:

(24)   Mem-bayar tukang becak   satu rupuah bapak saya
       Act-pay   worker pedicab one rupiah father my
       'My father paid the pedicab driver one rupiah.'   (Chung 2008: 1557)

Note that this sentence involves movement of a phrase containing a verb. In Aldridge's (2010) analysis, which is adopted in this paper, Malay/Indonesian has lost verb raising that is observed in the verb-initial languages. But (24) shows the movement is still observed for focus.

5.   Diachrony and the role of language contact

Returning to the key feature of the proposed analysis, recall from (8), repeated below, that the possessor – head noun order is obtained when the head noun ceases to move:

(25) a.

(Malay/Indonesian)

b.

(Lamaholot)
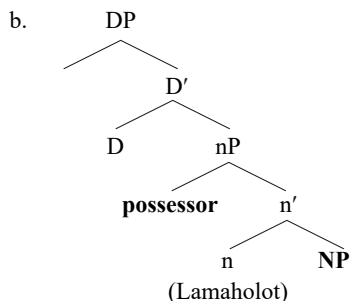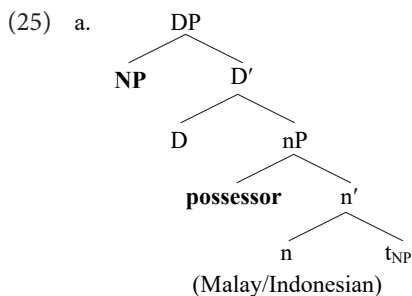
Following Klamer (2002), Donohue (2005, 2007), and Klamer et al. (2008), this section suggests that this change of word order is (at least partially) induced by contact with the Papuan languages, which have prenominal possessors. In particular, Klamer (2002) notes that the similarities between languages of eastern Indonesia and Papuan languages are not limited to word order but other typological features such as pervasiveness of head-marking (agreement). See also Nishiyama (2011).

In terms of typological features, languages in eastern Indonesia are peculiar among the whole Austronesian family in that the possessors are prenominal. In fact, postnominal possessors are not limited to "conservative" Western Malayo-Polynesian in (4). In "innovative" Oceanic languages as well, possessors are generally postnominal, according to Lynch, Ross and Crowley (2002: 41). Crucially in the present context, they also note that there are exceptions to this generalization: the possessor is prenominal in a number of western Melanesian languages, especially those with SOV clause order. SOV clause order is quite rare in Austronesian languages, and there is no doubt that such languages are heavily influenced by Papuan languages, which are overwhelmingly verb-final.

In the proposed diachrony in (25), movement of NP, which reverses the order of possessor–NP, is lost in Lamaholot. In Section 3, a parallelism between clauses and nominals was featured: V-initial > SVO is obtained by the loss of verb movement, as proposed by Aldridge (2010). Thus, a question arises which is the driving

force of the historical change in question, the clause-nominal parallelism (internal factor) or language contact (external factor).

I conjecture that both factors play a role. Thus, the loss of verb raising is not sufficient for the loss of NP raising; witness the situation of Malay/Indonesian, where verb raising is lost (resulting in SVO), but NP raising is still active as in (25a). In the literature of language contact, it is often claimed that language change can happen with or without language contact, but language contact can facilitate a change, functioning as a catalyst (cf. Heine & Kuteva 2005). If this applies to the Lamaholot case, the internal factor (the loss of verb raising) was facilitated by the external factor (contact with the Papuan languages), and they worked hand in hand to achieve the change in question, namely the loss of NP raising, resulting in the possessor – head noun order as in (25b).

Aldridge (2010: 178) also entertains the catalyst view of language contact that played a role in the Austronesian word order change from verb-initial to SVO. Specifically, she argues that Donohue's (2005) view, according to which Austronesian innovated SVO through contact with subject-initial substrate languages, is not necessarily incompatible with her analysis of the emergence of SVO in Austronesian. Relating the Austronesian innovation of prenominal possessors with the Austronesian innovation of SVO from the perspective of language contact complicates the issue, and thus is beyond the scope of this paper, but I offer a brief speculation below.

The scenarios for the Austronesian innovation of prenominal possessors diverge depending on how languages in eastern Indonesia innovated SVO. There can be two hypotheses:

(26) a. Languages of eastern Indonesia inherited SVO from those of western
          Indonesia.
      b. Languages in eastern Indonesia and those of western Indonesia
          innovated SVO independently, both (partially) through contact with
          subject-initial substrate languages.

According to the family tree of Austronesian in (4), languages in western Indonesia (Western Malayo-Polynesian) is closer to the proto-language than those of eastern Indonesia (Central Malayo-Polynesian). This means that migration of the Austronesian-speaking people, which started from Taiwan some 5,000 years ago, expanded to western Indonesia earlier than eastern Indonesia. The question is what kind of language the Austronesian were speaking when they migrated to eastern Indonesia. (26a) says it was already SVO. The major point of this paper is that the loss of movement of NP in eastern Indonesia, which yields prenominal possessors, is parallel to the loss of verb raising in western Indonesia, which yields SVO. This scenario is readily compatible with the hypothesis in (26a).

In contrast, Donohue (2005: 532) finds the scenario of (26a) unlikely and endorses (26b). (26b) says that when the Austronesian moved to eastern Indonesia, their language was still verb-initial. If (26b) is correct, the innovation of SVO in western Indonesia and that in eastern Indonesia are not genetically related. Still, one can say that languages in eastern Indonesia imitated the change that their ancestor languages (i.e., those in western Indonesia) underwent, and this may well be attributed to the common features in the languages in the two areas. In this sense, the internal Austronesian factor mentioned above can still be relevant.

Regarding the nominal domain, the contact languages did not affect the N–Poss order in western Indonesia, and the reason is rather straightforward. Although we do not know exactly what language(s) the languages in west Indonesia had contact with, judging from contemporary languages in Southeast Asia, we can safely assume that the hypothesized contact language had the N–Poss order. Below are examples of Thai and Cambodian:

(27) a. mee   phom   (Thai)
          mother I
          'my mother'   (Hudak 1990: 770)
      b. laan əwpuk   (Cambodian)
          car   father
          'father's car'   (Campbell 1995: 104)

The same N–Poss order is also observed in Vietnamese (Nguyen 1990: 784) and Burmese (Campbell 1995: 100). Therefore, it is not surprising that the Austronesian languages in western Indonesia maintained its original N–Poss order under Donohue's contact scenario.

The situation is different for the Austronesian languages in eastern Indonesia, for which the contact languages are Papuan languages with the Poss–N order. In fact, some Austronesian languages in eastern Indonesia are *still* in contact with Papuan languages. Let us compare Lamaholot with the neighboring language Alorese, the only Austronesian language spoken in the Papuan-dominant islands of Alor and Pantar. Alorese was earlier believed to be a dialect of Lamaholot, but Klamer (2011) shows that it is a language of its own. Unlike Lamaholot, Alorese has no nominal suffixes, but like Lamaholot, the order is Poss–N (ibid: 52; see also Klamer 2012: 81, forthcoming: 10), and this seems to be only possible order:

(28) a. ni uma   (Alorese)
          3SG house
          'his house'
      b. bapa John ni   uma   (Alorese)
          father John 3SG house
          'Father John's house'

This word order resembles that of neighboring Papuan languages:

(29) yivar ga-manak   (Teiwa)
     dog   3SG-master
     'the dog's master'   (Klamer 2010: 189)

Thus, the Papuan influence seems stronger in Alorese, eradicating the original Austronesian N–Poss order. Lamaholot, in contrast, shows mixed features of Austronesian and Papuan, yielding complex characteristics.

   Above I discussed two hypotheses regarding the origin of SVO in languages in eastern Indonesia. Whichever of (26) is correct, the ultimate contact factor for SVO is the subject-initial order of the substrate languages. In this account, whether the substrate languages are head-initial (SVO) or head-final (SOV) is largely irrelevant: it is the fact that the subject comes first that is crucial. But Lamaholot also has a feature that points to the relevance of the head-final nature of the substrate languages: With the exception of object fronting for focus, Lamaholot obeys the strict VO order, but some auxiliaries can be placed either before or after VP:[10]

(30) a. go **bisa** biho wata
         I   can cook rice
         'I can cook rice.'
     b. go biho wata **bisa**
         I   cook rice can
         'I can cook rice.'

This shows that contact with Papuan languages has partial effect at the sentence level in Lamaholot as well.

6.   Conclusion

This paper has analyzed the synchrony and diachrony of possessive nominal phrases in Lamaholot. The main proposal is that prenominal possessors emerge when movement of NP is lost, and this is parallel to the change at the clausal level, where verb raising is lost. In addition, the influence of Papuan languages is suggested as an external factor of this change in word order. As observed by Klamer (2002), the Papuan influence is observed in other domains of grammar, and for Lamaholot, rich agreement (cf. Nishiyama 2011) and VP-final auxiliaries are the two other features that strongly suggest the Papuan influence. By extending the

---

10. The word order in (30b) is a counterexample to *the Final-over-Final Constraint (FOFC)* of Biberauer, Holmberg and Roberts (2014), which prohibits the order of V-O-Aux.

scope of research to such domains in the future, I hope to have more understandings of the roots of grammatical features of Lamaholot, in particular the role of language-internal (Austronesian) factors and external (contact) factors.

Acknowledgment

References

Abney, S. 1987. The English Noun Phrase in its Sentential Aspect. PhD dissertation, MIT.

Aldridge, E. 2010. Directionality in word order change in Austronesian languages. In *Continuity and Change in Grammar*, [Linguistik Aktuell/Linguistics Today 159] A. Breitbarth, C. Lucas, S. Watts & D. Willis (eds.), 169–180. Amsterdam: John Benjamins. https://doi.org/10.1075/la.159.08ald

Alexiadou, A. 2005. Possessors and (in)definiteness. *Lingua* 115: 787–819. https://doi.org/10.1016/j.lingua.2004.01.005

Biberauer, T., Holmberg, A. & Roberts, I. 2014. A syntactic universal and its consequences. *Linguistic Inquiry* 45: 169–225. https://doi.org/10.1162/LING_a_00153

Blust, R. 1993. Central and Central-Eastern Malayo-Polynesian. *Oceanic Linguistics* 32: 241–293. https://doi.org/10.2307/3623195

Blust, R. (2009). *The Austronesian languages*. Pacific Linguistics, The Australian National University.

Campbell, G. L. 1995. *Compendium of the World's Languages*. London: Routledge. https://doi.org/10.4324/9780203159064

Chung, S. 2008. Indonesian clause structure from an Austronesian perspective. *Lingua* 118(10): 1554–1582. https://doi.org/10.1016/j.lingua.2007.08.002

Cinque, G. 1994. On the evidence for partial N movement in the Romance DP. In *Paths Towards Universal Grammar*: Studies in Honor of Richard S. *Kayne*, G. Cinque, J. Koster, J. -Y. Pollock, L. Rizzi & R. Zanuttini (eds.), 85–110. Washington DC: Georgetown University Press.

Cinque, G. 2010. *The Syntax of Adjectives: A Comparative Study*. Cambridge MA: The MIT Press. https://doi.org/10.7551/mitpress/9780262014168.001.0001

Dardjowidjojo, S. 1978. *Sentence Patterns of Indonesian*. Honolulu HI: The University of Hawaii Press.

Donohue, M. 2005. Word order in New Guinea: dispelling a myth. *Oceanic Linguistics* 44(2): 527–536. https://doi.org/10.1353/ol.2005.0033

Donohue, M. 2007. Word order in Austronesian from north to south and west to east. *Linguistic Typology* 11(2): 349–391. https://doi.org/10.1515/LINGTY.2007.026

Halle, M. & Marantz, A. 1993. Distributed Morphology and the pieces of inflection. In *The View from Building 20*. Essays in Linguistics in Honor of Sylvain Bromberger, K. Hale & S. J. Keyser (eds.), 111–176. Cambridge MA: The MIT Press.

Heine, B. & Kuteva, T. 2005. *Language Contact and Grammatical Change*. Cambridge: CUP. https://doi.org/10.1017/CBO9780511614132

Himmelmann, N. P. 2005. The Austronesian languages of Asia and Madagascar: Typological characteristics. In *The Austronesian languages of Asia and Madagascar*, K. A. Adelaar & N. Himmelmann (eds.), 110–181. London: Routledge/Curzon.

Hudak, T. J. 1990. Thai. In *The World's Major Languages*, B. Comrie (ed.) 757–775. Oxford: OUP.

Klamer, M. 1998. *A Grammar of Kambera*. Berlin: Mouton. https://doi.org/10.1515/9783110805536

Klamer, M. 2002. Typical features of Austronesian languages in central/eastern Indonesia. *Oceanic Linguistics* 41: 363–383. https://doi.org/10.1353/ol.2002.0007

Klamer, M. 2010. *A Grammar of Teiwa*. Berlin: Mouton. https://doi.org/10.1515/9783110226072

Klamer, M. 2011. *A Short Grammar of Alorese* (Austronesian). Munich: Lincom.

Klamer, M. 2012. Papuan-Austronesian language contact: Alorese from an areal perspective. In *Melanesian Languages on the Edge of Asia: Challenges for the 21st century* [Language Documentation & Conservation. Special Publication No. 5], N. Evans & M. Klamer (eds.), 72–108. <http://nflrc.hawaii.edu/ldc/sp05>

Klamer, M. Forthcoming From Lamaholot to Alorese: Simplification without shift. In *Austronesian Undressed: How and Why Languages Become Isolating*, D. Gil, J. McWhorter & S. Paauw (eds.).

Klamer, M., Reesink, G. & van Staden, M. 2008. East Nusantara as a linguistic area. In *From Linguistic Areas to Areal Linguistics*, [Studies in Language Companion Series 90] P. Muysken (ed.), 95–149. Amsterdam: John Benjamins. https://doi.org/10.1075/slcs.90.03kla

Lynch, J., Ross, M. & Crowley, T. 2002. Typological overview. In *The Oceanic Languages*, J. Lynch, M. Ross & T. Crowley (eds.), 34–53. London: Routledge/Curzon.

Marantz, A. 1997. No escape from syntax: Don't try morphological analysis in the privacy of your lexicon., In *Proceedings of the 21st Annual Penn Linguistic Colloquium University of Pennsylvania Working Papers in Linguistics* 4(2): 201–225.

Nagaya, N. 2011. The Lamaholot Language of Eastern Indonesia. PhD dissertation, Rice University.

Nguyen, D. -H. 1990. Vietnamese. In *The World's Major Languages*, B. Comrie (ed.), 777–796. Oxford: OUP.

Nishiyama, K. & Kelen, H. 2007. *A Grammar of Lamaholot, Eastern Indonesia: The Morphology and Syntax of the Lewoingu Dialect*. Munich: Lincom.

Nishiyama, K. 2011. Conjunctive agreement in Lamaholot. *Journal of Linguistics* 47: 381–405. https://doi.org/10.1017/S0022226710000356

Tryon, D. T. (ed.). 1995. *Comparative Austronesian Dictionary, Part I: Fascicle 1*. Berlin: Mouton de Gruyter. https://doi.org/10.1515/9783110884012

Szabolcsi, A. 1983/84. The possessor that ran away from home. *The Linguistic Review* 3: 89–102. https://doi.org/10.1515/tlir.1983.3.1.89

Simpson, A. 2005. Classifiers and DP structure in Southeast Asia. *The Oxford Handbook of Comparative Syntax*. In R. S. Kayne & G. Cinque (eds.), 806–838. Oxford: OUP.

Psycholinguistics

An experimental study of children's comprehension of lexical and productive causatives in Japanese

Kyoko Yamakoshi,[1] Kaori Miura,[2] Hanako Jorinbo,[1]
Kayoko Angata[1] and Kaori Yamasaki[1]
[1]Ochanomizu University / [2]Kyushu Sangyo University

This article experimentally investigates children's comprehension of causative constructions in Japanese and compares the acquisition of lexical and productive causatives in Japanese. The results of our experiments show that children correctly comprehend direct causative meanings of lexical causative verbs quite early, but that they often misinterpret indirect causative meanings of productive causatives, which suggests that the acquisition of indirect causative meanings of productive causatives is delayed. We suggest the delay of the acquisition of productive causatives is due to children's misplacement of the causative morpheme *sase* in the structure of productive causatives, which is compatible with the analysis of children's natural speech data in Murasugi and Hashimoto (2004) and Murasugi, Hashimoto and Fuji (2007).

Keywords: first language acquisition, lexical causatives, sociative causatives, productive causatives, direct/indirect causative meanings, the question-after-story task, the truth value judgment task, the picture selection task, mono-clausal/bi-clausal structures, blocking effects

1. Introduction

This paper investigates children's comprehension of lexical and productive causatives in Japanese. We report the results of two experiments and show that the acquisition of the indirect causative meaning of productive causatives is delayed compared to the direct causative meaning of lexical causatives.

Before going into the details of the experiments, let us review the meanings and structures of lexical and productive causatives. In Japanese, it has been noted

that there are two kinds of causatives called lexical causatives and productive causatives (Inoue 1976; Kuno 1973; Miyagawa 1980, 1984, 1989, 2012; Shibatani 1973, 1976; Shibatani & Chung 2001; Shibatani & Pardeshi 2002; Harley 1995, 2008, a.o.). Examples of a lexical causative verb and a productive causative verb are shown in (1) and (2):

(1) Lexical causative
     Otokonoko-ga neko-o tukue-kara or-osi-ta.
     Boy-NOM   cat-ACC desk-from get.down-TRANS-PAST
     'The boy took the cat down from the desk.'

(2) Productive causative
     Sensei-ga   otokonoko-ni butai-kara or-i-sase-ta.
     Teacher-NOM boy-DAT   stage-from get.down-INTRANS-CAUSE-PAST
     'The teacher had the boy come down from the stage.'

(1) is an example of the lexical causative verb *or-os-u* 'get.down-TRANS-PRESENT.' The corresponding intransitive verb is *or-i-ru* 'get.down-INTRANS-PRESENT.' In Japanese, it is often the case that lexical causatives have morphologically-related intransitive counterparts. The forms of intransitive and lexical causative pairs are various and irregular, such as *ag-ar-u* 'rise-INTRANS-PRESENT' and *ag-e-ru* 'rise-TRANS-PRESENT,' *tao-re-ru* 'fall.down-INTRANS-PRESENT' and *tao-s-u* 'fall.down-TRANS-PRESENT,' and so on. According to Jacobsen (1992), there are 16 different classes of lexical causatives.

The lexical causatives are typically associated with direct causation (Shibatani & Pardeshi 2002: 89–90). According to Shibatani and Pardeshi (2001), "the term 'direct causation' can be used in reference to a situation where an agentive causer and a patient causee are involved", and "the causer typically has to bring about the caused event by physically manipulating the causee" (p. 112). In (1), the agentive causer *otokonoko* 'the boy' physically took the patient causee *neko* 'the cat' and put it down off the desk.

The productive causative in (2) is *or-i-sase-ta* 'get.down-INTRANS-CAUSE-PAST,' in which the causative morpheme *sase* is attached to the intransitive verb *or-i-ta* 'get.down-INTRANS-PAST.' In (2), *otokonoko* 'the boy' has the dative marker *ni*, but the use of the accusative case marker *o* is also possible. We deal with the distinction between *ni*-causatives and *o*-causatives later.

Productive causatives are typically associated with indirect causation (Shibatani & Pardeshi 2002: 89–90). According to Shibatani and Chung (2001), "the term 'indirect causation' can be used in reference to a situation involving an agentive causer and an agentive causee", and "the causer typically gives an oral instruction to the causee, who acts accordingly" (p. 112). In (2), we can imagine

a situation in which the agentive causer *sensei* 'the teacher' gave an oral instruction to the agentive causee *otokonoko* 'the boy,' who consequently came down from the stage.

In addition to the direct and indirect causation exemplified above, Shibatani and Chung (2001) and Shibatani and Pardeshi (2002) propose a third category of causative situation called sociative causation in Japanese and Korean. Sociative causation represents a "causative situation that is intermediate between direct and indirect causative situations," and it "depicts situations in which the causer agent participates in or attends to the activity of the causee agent in a more direct way than in indirect causative situations" (Shibatani & Chung 2001: 114). An example of sociative causation is given in (3):

(3)   Hahaoya-ga kodomo-o asob-ase-te   i-ru.[1]
      mother-NOM child-ACC play-CAUSE-CONJ be-PRES
      'Mother is making the child play.'

<div align="right">(Shibatani & Chung 2001: 115)</div>

In (3), Shibatani and Chung (2001) explain that "it is most likely that the mother is also playing with the child" (p. 115). The mother, the causer agent, participates in the activity of the child, the causee agent, in a more direct way than in an indirect causation situation.

In the case of productive causatives with the causative morpheme *sase*, the causee agent is marked with either the accusative case marker *o* or the dative case marker *ni*. Shibatani and Chung (2001: 117–118) point out that "the *o/ni* distinction in Japanese correlates significantly with sociative/ indirect causation" as shown below:

(4)   a.   Hahaoya-wa kodomo-o koen-de asob-ase-ta.   (sociative)
           mother-TOP child-ACC park-in play-CAUSE-PAST
           'Mother made the child play in the park.'
      b.   Hahaoya-wa kodomo-ni koen-de asob-ase-ta.   (indirect)
           mother-TOP child-DAT   park-in play-CAUSE-PAST
           'Mother had the child play in the park.'

(4a) is *o*-causative and correlates with sociative causation. That is, (4a) expresses that the mother participates in the activity of the child in a more direct way. On the other hand, (4b) is *ni*-causative and it correlates with an indirect causation situation.

---

1. In (3), the causative morpheme *sase* changes to *ase*. If verbs end in a consonant as in *asob*, the initial consonant of the causative morpheme *s* is dropped as in *asob-ase-ta* 'play-CAUSE-PAST' in Japanese.

Let us summarize the relation between the forms of causatives and Shibatani and Chung's (2001) classification of three types of causation below:

(5) Forms and meanings of causatives in Japanese
                            <Form>   <Meaning>

                  Lexical causatives   ⟶   Direct causation

                  Productive causatives   ⟶ Sociative causation   (*o*-causative)

                                      Indirect causation   (*ni*-causative)

In our experiment, we focus on lexical causatives which represent direct causation and productive causatives that show indirect causation (i.e. the *ni* –causative) underlined in (5), but we will also mention sociative causatives later.

This paper is organized as follows. In Section 2, we review three previous studies, Murasugi & Hashimoto (2004), Murasugi, Hashimoto & Fuji (2007) and Okabe (2008). In Section 3, we report the results of two experiments. In the first experiment, we examined children's comprehension of lexical and productive causatives whose roots are unaccusative verbs by using the question-after-story task (de Villiers & Roeper 1996). The results of the first experiment will show that children correctly comprehend the direct causative meanings of lexical causatives whose roots are unaccusative verbs earlier than the indirect causative meanings of productive causatives. Still, we thought that the task we used, i.e. the question-after-story task, was not sufficient enough to examine children's knowledge of direct and indirect causative meanings of lexical and productive causatives. Therefore, we conducted another experiment using a different type of lexical and productive causatives, whose roots are transitive verbs, not unaccusatives. In this experiment, we examined children's comprehension of lexical and productive causatives whose roots are transitive verbs. We also conducted further tasks, namely the picture selection task and the truth value judgment task. We give discussions in Section 4 and conclude in Section 5.

2.   Previous acquisition studies of causatives in Japanese

2.1   Murasugi & Hashimoto 2004 and Murasugi, Hashimoto & Fuji 2007

The acquisition of lexical and productive causatives in Japanese has been examined in several studies based on children's natural speech data (Murasugi &

Hashimoto 2004; Murasugi, Hashimoto & Fuji 2007 (MHF 2007) a.o.). Murasugi and Hashimoto (2004) and MHF (2007) have reported the following four developmental stages by examining the natural speech data of two children, Akkun and Sumihare (Noji 1974–1977).

In the first stage, before the children produced the correct causative forms, they avoided using causative verbs:

(6)   Kutyu   ha-i-te.   (Akkun 2;1 (2 years 1 month old))
      a pair of shoes put.on-REQUEST
      '(Please) put a pair of shoes on me.'   (MHF 2007: 643)

In (6), the correct form is the causative verb *hak-ase-te* 'put.on-CAUSE-REQUEST', but the child used the transitive verb *hak-u* and attached the particle *te* which represented a request.

In the second stage, Sumihare (Noji 1974–1977) in the CHILDES database (MacWhinney 2000) started using lexical causatives around the age of 2;5:

(7)   Seiji-kun   boku-ga ne nak-asi-tan   janai no   (Sumihare 2;7)
      Seiji(Name) I-NOM   INT cry-CAUSE-PAST not   INT
      'It is not me who made Seiji cry.'   (MHF 2007: 643)

In the third stage, the causative morpheme *sase* is observed in Akkun's speech around the age of 3;6:

(8)   Nomi-tatye-te.   (Akkun 3;7)
      drink-CAUSE-REQUEST
      'Please feed me (with miso soup).'
      (*-tatye* seems to correspond to *sase*.)   (MHF 2007: 633)

In (8), the correct form is *nom-ase-te* 'drink-CAUSE-REQUEST.' *Nom-ase* is analyzed by MHF as a lexical causative with the meaning of direct causation (analogous to 'feed'). This is a rare case in which the lexical causative form and the productive causative form are identical. We will return to the case in which a causative form is ambiguous between direct causation and indirect causation in Section 4.

In the final stage, Sumihare started using productive causatives extensively at around the age of 4;7, as shown in (9):

(9)   a.   Mou gohan tabe-sase-n   yo.   (Sumihare 4;9)
           more dish   eat-CAUSE-not INT
           '(I) won't let you eat dinner any more.'   (MHF 2007: 646)
      b.   Tuk-e-sase-te   age-tara funa-o kure-tan yo. Sumihare 5;3)
           attach-TRANS-CAUSE-TE let.do-as fish-ACC give-PAST INT
           'As (Sumihare/I) let (the people fishing) put a net trap (in the water),
           (they) gave me the fish.'   (MHF 2007: 646)

Therefore, Murasugi and Hashimoto (2004) and MHF (2007) report that the lexical causative verbs are used earlier, around the age of 2;5, and the productive causatives with the causative morpheme *sase* appear later, around the age of five.

It has been argued that lexical causatives have a mono-clausal structure and productive causatives have a bi-clausal structure (Kuroda 1965a, b; Kuno 1973; Shibatani 1973, 1976; Harley 1995, 2008; Murasugi, Hashimoto & Fuji 2007, a.o.) The structures of lexical causatives and productive causatives are shown as follows in MHF (2007: 626, 631, 632), following Matsumoto (2000):

(10)   a.   Lexical causatives   b.   Productive causatives
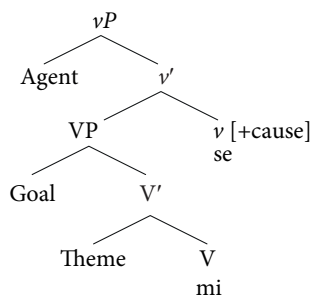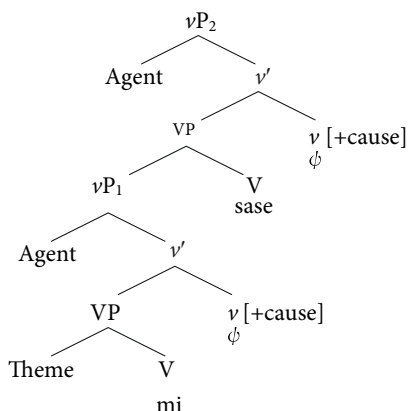
In the lexical causative structure in (10a), the stem *mi* 'see' appears in the lowest V, the transitive affix *se* in *mi-se* 'show' appears in v [+ cause], and the agent is in vP specifier. The structure in (10a) has a mono-clausal structure and it involves the direct causative meaning of lexical causatives, such as "the person A showed the person B something." In the productive causative structure in (10b), there are two vP layers. The causative morpheme *sase* is in the higher V and takes the lower v projection as its complement. The dative NP in $v\text{P}_1$ specifier becomes an agent of the verb *mi* 'see'. Since the lower $v\text{P}_1$ becomes an embedded clause and the upper $v\text{P}_2$ becomes the matrix clause, (10b) has a bi-clausal structure and involves the indirect causative meaning of productive causatives, such as "the person A made the person B see something."

In MHF (2007: 647), as we saw above, they observed the four developmental stages of causatives. In the first stage, the child could not use causative verbs and used unaccusative and transitive verbs to express causatives. In the second stage, the child used lexical causatives as productive causatives. In the third stage, the child started using the causative morpheme *sase*, but MHF pointed out that the child used V + *sase* for a direct causative meaning (e.g. *nomi-sase-te* 'Feed (me)' as

in (8)). In this stage, MHF suggested that children have not acquired the bi-clausal structure of productive causatives in (10b) and may locate the productive causative morpheme *sase* in *v* [+ cause] in the structure of lexical causatives in (10a), as shown in (11):

(11)   Children's misplacement of the causative morpheme *sase* in the structure of lexical causatives

```
                    vP
                 /      \
            Agent        v′
                      /      \
                    VP        v [+cause]
                  /    \         sase
              Goal      V′
                      /    \
                 Theme      V
                            mi
```
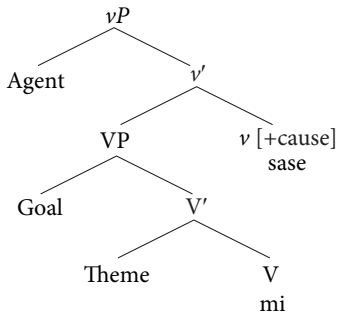
The observations of Murasugi and Hashimoto (2004) and MHF (2007) are based on two children's natural speech data. We will consider again the children's structure of productive causatives based on the results of our experiments in Section 4.

In the next subsection, we review Okabe (2008), which experimentally examined children's distinction between lexical and productive causatives.

2.2   Okabe (2008)

Okabe (2008) tested whether children could identify the subject of the embedded clause in productive causative constructions by conducting experiments using *zibun* 'self.'

Before testing productive causatives, Okabe tested whether the children interpreted the subject of an embedded clause as the antecedent of *zibun* 'self' in the embedded clause because *zibun* takes the subject (whether matrix or embedded) as its antecedent. The test sentence with the embedded clause in Okabe (2008: 62) is as follows:

(12)   Buta-wa [usagi-ga   zibun-no ringo-o   tabechat-ta] to it-ta.
        pig-TOP   rabbit-NOM self-GEN apple-ACC eat up-PAST C say-PAST
        'The pig said that the rabbit ate up self's apple.'

In (12), both of the subject in the matrix clause, i.e. the pig, and the subject of the embedded clause, i.e. the rabbit, can be antecedents of *zibun* 'self' in adult Japanese because *zibun* takes the subject (whether matrix or embedded) as its antecedent. If children interpret the embedded subject as an antecedent, then it shows that

children know the bi-clausal structure and that the antecedents of *zibun* can be either the matrix subjects or the embedded subjects.

Okabe tested 15 children aged from four to seven year old (One four-year-old, five five-year-olds, five six-year-olds, and four seven-year-olds). Ten of the children in total (10/15, 66.7%) and five of the six four- and five-year-olds accepted the embedded subject as an antecedent of *zibun* 'self.' This result shows that around the age of five, most children have knowledge of the bi-clausal structures and they can identify the status of the subject in embedded clauses.

Next, let us look at the results of productive causatives. According to Okabe's experiment, four-year-olds still seem to have problems with the bi-clausality of productive causatives. The test sentence in Okabe (2008: 84) is given in (13):

(13) Buta$_i$-ga kuma$_j$-ni zibun$_{i/j}$-no hon-o   mi-sase-ta.
      Pig-NOM bear-DAT self-GEN   book-ACC see-CAUSE-PAST
      'The pig made the bear look at the bear self(= pig/bear)'s book.'

When the verbs are productive causative verbs with *sase* as in (13), Okabe assumes that the productive causatives have a bi-clausal structure in adult Japanese, as we saw in MHF (2007). In (13), *zibun* in the embedded clauses can refer to either the matrix subject *pig* or the embedded subject *bear*. Okabe tested the children with (13) by using the truth value judgment task (Crain and Thornton 1998). In the story, the pig made the bear see either the pig's book or the bear's book. The children were tested individually and asked whether the test sentence including *zibun* 'self' matched the story or not.

According to Okabe's (2008) results, most four and five-year-olds did not accept the bear (i.e. the embedded subject) as an antecedent of *zibun* 'self.' The percentages of the acceptance were 22.2% for four-year-olds, 30.0% for five-year-olds, and 33.3% for six-year-olds (p. 87). These results suggest that many four- to six-year-olds in Okabe's experiment judged that the subject of the matrix clause, i.e. *the pig*, was the antecedent of *zibun* 'self.'[2]

To summarize so far, the results of Murasugi and Hashimoto (2004) and Murasugi, Hashimoto and Fuji (2007) based on children's natural speech data and the results of Okabe (2008)'s experiment with *zibun* 'self' suggest that Japanese

---

2. Okabe (2008: 110–115) conducted a follow-up experiment with *zibun* and concluded that even four-year-olds acquired the bi-clausal structure of the productive causatives. However, in her follow-up experiment, the conditions are presented differently from her experiment explained above. In the first experiment explained above, both the bear's book and the pig's book were included in the context, whereas in the follow-up experiment, only the bear's book was included in the context. It is not clear to us whether Okabe's follow-up results have indeed shown that the children have acquired the bi-clausal structure and the indirect meaning of productive causatives around the age of four.

children acquire lexical causatives earlier than productive causatives and they incorrectly interpret productive causatives as lexical causatives around the age of four. Later, around the age of six, children seem to acquire productive causatives with the productive causative morpheme *sase*.

As we saw above, the acquisition of lexical and productive causatives has not been experimentally examined in detail except for Okabe's (2008) experiments. Therefore, we conducted two experiments to examine children's comprehension of lexical and productive causatives. The next section explains the details and the results of the experiments.

3.   Experiments

3.1   Experiment 1

3.1.1   *Method*
In our experiments, we investigate whether Japanese children know the direct causative meanings of the lexical causatives and the indirect causative meanings of the productive causatives by examining children's distinction of the two types of causatives.

In Experiment 1, we used lexical causative verbs and productive causative verbs in which the causative morpheme *sase* is attached to unaccusative verbs. The lexical and productive verb pairs we used were: *or-osi-ta* 'get.down-TRANS-PAST' / *or-i-sase-ta* 'get.down-INTRANS-CAUSE-PAST', *koroga-si-ta* 'roll-TRANS-PAST' /*koroga-r-ase-ta* 'roll-INTRANS-CAUSE-PAST', and *tao-si-ta* 'fall.down-TRANS-PAST'/*tao-re-sase-ta* 'fall.down-INTRANS-CAUSE-PAST'. The corresponding unaccusative verbs are *or-i-ru* 'get.down-INTRANS-PRESENT', *koroga-r-u* 'roll-INTRANS-PRESENT', and *tao-re-ru* 'fall.down-INTRANS-PRESENT'. In each pair, the lexical causative verb expresses the direct causative meaning, and the productive causative verb expresses the indirect causative meaning. All the verbs were used with the past tense marker in the experiment.

The subjects were twelve children aged from 3;8–5;9 (3 years 8 months old to 5 years 9 months old)(two three-year-olds, six four-year-olds, four five-year-olds, mean=4;8). They were tested individually in a quiet room of daycare centers in Tokyo and Yokohama.

The method of the experiment was the question-after-story task. First, the experimenter acted out short stories with stuffed animals in front of a child. In a story, one animal played a role of the agent of lexical causatives and another animal played a role of the causer of the productive causatives. After that, the child was asked a test question involving either a lexical causative or a productive causative.

(e.g. *koroga-si-ta-no-wa dare kana?* 'Who is it that rolled (the animal)?') The child was expected to answer the name of the animal, such as 'the elephant', or point to the stuffed animal that performed the action. A sample story, a test question and the picture of the situation are shown below:

(14) Elephant   Oh, the cow is sleeping on my futon.
                   Cow, get out of my futon!
                   (The elephant rolled the cow out of the futon.)

      Cow   Ok, ok!

      Frog   Oh, the squirrel is sleeping on my futon.
                   Squirrel, move!

      Squirrel   Ok, ok!
                   (The squirrel rolled out of the futon by himself.)

Question
a. (Lexical causative)
    Koroga-si-ta-no-wa   dare kana?
    roll-TRANS-PAST-NM-TOP who Q
    'Who is it that rolled (the animal)?'
     (The correct answer: 'The elephant.')
b. (Productive causative)
    Koroga-r-ase-ta-no-wa   dare kana?
    roll-INTRANS-CAUSE-PAST-NM-TOP who Q
    'Who is it that made (the animal) roll?'
     (The correct answer: 'The frog.')
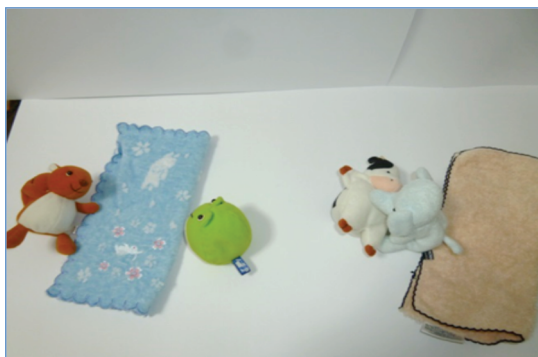
In the story shown above, the elephant directly rolled the cow out of the futon, which included the event of direct causation. On the other hand, the frog gave an order to get out of the futon to the squirrel, which included the event of indirect causation. We included the events of direct causation and indirect causation in all the stories in Experiment 1.

3.1.2   *Results of Experiment 1*

The correct response rates of children's comprehension of lexical causatives and productive causatives are shown in Table 1:

Table 1. Correct response rates of lexical and productive causatives

Lexical causatives	3-year-olds (N = 2)	4-year-olds (N = 6)	5-year-olds (N = 4)	Child Total (N = 12)	Adults (N = 10)
Or-osi-ta (get.down-TRANS-PAST)	100% (2/2)	100% (6/6)	75.0% (3/4)	91.7% (11/12)	90.0% (9/10)
Koroga-si-ta (roll-TRANS-PAST)	100% (2/2)	100% (6/6)	100% (4/4)	100% (12/12)	100% (10/10)
Tao-si-ta (fall.down-TRANS-PAST)	100% (2/2)	100% (3/3)	100% (3/3)	100% (8/8)	100% (10/10)
Total	100% (6/6)	100% (15/15)	90.9% (10/11)	96.9% (31/32)	96.7% (29/30)
Productive causatives					
Or-i-sase-ta (get.down-INTRANS-CAUSE-PAST)	0.0% (0/2)	16.7% (1/6)	25.0% (1/4)	16.7% (2/12)	80.0% (8/10)
Koroga-r-ase-ta (roll-INTRANS-CAUSE-PAST)	0.0% (0/2)	40.0% (2/5)	25.0% (1/4)	27.3% (3/11)	80.0% (8/10)
Tao-re-sase-ta (fall. down-INTRANS-CAUSE-PAST)	50.0% (1/2)	0.0% (0/4)	33.3% (1/3)	22.2% (2/9)	70.0% (7/10)
Total	16.7% (1/6)	20.0% (3/15)	27.3% (3/11)	21.9% (7/32)	76.7% (23/30)

As for the results of the adult control group, adults responded correctly for lexical causatives 96.7% of the time (29/30) and for productive causatives 76.7% of the time (23/30).[3]

With regard to the results of lexical causative tests, the children responded correctly 96.9% of the time (31/32) and there were no great differences between age groups. This shows that the children correctly interpreted the lexical causatives as direct causatives.

As for productive causatives, the overall correct response rate was only 21.9% (7/32). The performances of four-year-olds (20.0%) and five-year-olds (27.3%) were only slightly better than that of three-year-olds (16.7%). The low correct response rates for productive causatives seem to show that the children from three to five years old mostly gave the direct causative meanings to productive causatives.

When we look at the individual results, among the twelve children we tested, five children sometimes gave correct responses and they sometimes gave incorrect responses to the productive causatives (the ages of the five children are 3;11, 4;5, 4;6, 5;2, 5;9). Four children gave incorrect responses to all the productive causatives (4;4, 4;6, 4;6, 5;1). When they gave incorrect responses, it means that they gave direct causative meanings to the productive causatives. There were two children (4;6, 4;9), who gave the names of two animals, which may show that they allowed both direct and indirect causative meanings for the productive causatives. These individual results also show that the children around the age of six are still in the process of acquiring the indirect causative meanings of those productive causatives.

3.2   Experiment 2

In Experiment 2, we used ditransitive/lexical causative verbs, such as *wata-si-ta* 'pass-TRANS-PAST,' or *tob-asi-ta* 'fly-TRANS-PAST,' and productive causative verbs in which the causative morpheme *(s)ase* is attached to those ditransitive verbs, such

---

3. The percentage of adults' productive causatives is lower than that of lexical causatives (96.7% and 76.7%). Because the test questions were in the form of cleft sentences, such as 'Who is it that made (the animal) roll?' and involved a null pronoun without a case marker, it is possible to interpret the productive causative questions as *o*-causatives, i.e. sociative causatives, which have direct causative meanings. (See Section 1 in this paper and also Shibatani & Chung (2001), and Shibatani & Pardeshi (2002)). Although there is a large difference regarding productive causatives between the performance of children and adults (21.9% and 76.7%), some children may have interpreted the productive causative questions as *o*-causatives/sociative causatives having direct causative meanings. Because of this possibility, it may have been more appropriate to use another form of test questions than cleft sentences. We would like to leave this issue for the future research.

as *wata-s-ase-ta* 'pass-TRANS-CAUSE-PAST,' and *tob-as-ase-ta* 'fly-TRANS-CAUSE-PAST.' The subjects were 23 monolingual Japanese children from 4;0 to 6;10 (ten four-year-olds, six five-year-olds and seven six-year-olds, mean=5;4) and 15 adults as a control group. We used two methods in the same session consecutively, the picture selection task and the truth value judgment task.[4] We interviewed the subjects individually in a quiet room of daycare centers in Tokyo and Yokohama. The two tasks took about 15 minutes for each child. In the following subsections, we present each task and its results respectively.

3.2.1   *Picture selection task*

3.2.1.1   *Method.*   In the picture selection task, a child was shown two pictures and the experimenter gave the child brief descriptions of the two pictures. Then another experimenter, playing the role of Miffy, produced a test sentence which described one of the pictures. Then the child was asked to choose which picture Miffy meant. We asked children to tell us when they thought both pictures were acceptable for the test sentences, but there were no children who accepted both pictures for the test sentences. The picture selection task contained six test sentences (three lexical and three productive causatives). Sample pictures and sample test sentences are given below:

(15)   Sample pictures for the picture selection task
Experimenter: (Showing two pictures to the child and pointing to the right picture) 'The bear is saying, "Do (it), do (it)."' (Then, pointing to the left picture) 'As for this picture, (the bear) is not saying (it).'

---

4. We conducted Experiments 1 and 2 at different times and with different methods. In the question-after-story task with stuffed animals and props in Experiment 1, the subjects mostly gave us one answer (i.e. one animal's name) and we could not test whether other answers were possible. That is why we used the truth value judgment (TVJT) task and the picture selection task in Experiment 2. In the TVJT task, it was possible to examine whether children allowed multiple answers or not. In the picture selection task, it was also possible for children to say that both pictures were acceptable for the test sentences. In addition, we used the picture selection task because it was easier to show ditransitive situations in the pictures than with stuffed animals and props in front of children.
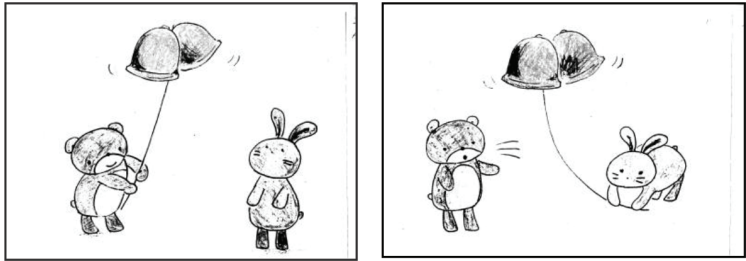
Test sentence A: Lexical causatives
Kumasan-ga kane-o   nar-asi-ta-yo.
Bear-NOM   bell-ACC ring-TRANS-PAST-PRT
'The bear rang the bell.'
Test sentence B: Productive causatives
Kumasan-ga kane-o   nar-as-ase-ta-yo.
Bear-NOM   bell-ACC ring-TRANS-CAUSE-PAST-PRT
'The bear made (the rabbit) ring the bell.'

In the test sentence B, we did not include the causee 'the rabbit' on purpose to make the test sentence B parallel to the test sentence A. Japanese adults interpret the test sentence B as an indirect causative with the causative morpheme *sase* even if the causee does not appear in the sentence. The verbs we used for the test sentences were: *nar-asi-ta* 'ring-TRANS-PAST' / *nar-as-ase-ta* 'ring-TRANS-CAUSE-PAST,' *tob-asi-ta* 'fly-TRANS-PAST' / *tob-as-ase-ta* 'fly-TRANS-CAUSE-PAST,' *wata-si-ta* 'pass-TRANS-PAST' / *wata-s-ase-ta* 'pass-TRANS-CAUSE-PAST,' and *ki-se-ta* 'put.on-TRANS-PAST' / *ki-sase-ta* 'put.on-CAUSE-PAST.'

3.2.1.2   *Results of the picture selection task.*   The correct response rates of the picture selection task are shown in Table 2 below:

Table 2. Correct response rates of the picture selection task

Lexical causatives	4-year-olds (N = 10)	5-year-olds (N = 6)	6-year-olds (N = 7)	Children Total (N = 23)	Adults (N = 15)
nar-asi-ta (ring-TRANS-PAST)	100% (10/10)	100% (6/6)	100% (7/7)	100% (23/23)	93.3% (14/15)
tob-asi-ta (fly-TRANS-PAST)	90.0% (9/10)	83.3% (5/6)	100% (7/7)	91.3% (21/23)	100% (15/15)
wata-si-ta (pass-TRANS-PAST)	100% (10/10)	100% (6/6)	100% (7/7)	100% (23/23)	100% (15/15)
ki-se-ta (put.on-PAST)	90.0% (9/10)	83.3% (5/6)	85.7% (6/7)	87.0% (20/23)	100% (15/15)
Total	95.0% (38/40)	91.7% (22/24)	96.4% (27/28)	94.6% (87/92)	98.3% (59/60)

Table 2. (*continued*)

Lexical causatives	4-year-olds (N = 10)	5-year-olds (N = 6)	6-year-olds (N = 7)	Children Total (N = 23)	Adults (N = 15)
Productive causatives					
nar-as-ase-ta (ring-TRANS-CAUSE-PAST)	40.0% (4/10)	50.0% (3/6)	71.4% (5/7)	52.2% (12/23)	93.3% (14/15)
tob-as-ase-ta (fly-TRANS-CAUSE-PAST)	20.0% (2/10)	66.7% (4/6)	57.1% (4/7)	43.5% (10/23)	93.3% (14/15)
wata-s-ase-ta (pass-TRANS-CAUSE-PAST)	30.0% (3/10)	50.0% (3/6)	57.1% (4/7)	43.5% (10/23)	93.3% (14/15)
ki-sase-ta (put.on-CAUSE-PAST)	10.0% (1/10)	16.7% (1/6)	28.6% (2/7)	17.4% (4/23)	86.7% (13/15)
Total	25.0% (10/40)	45.8% (11/24)	53.6% (15/28)	39.1% (36/92)	91.7% (55/60)

As for the results of the adult control group, adults responded correctly for lexical causatives 98.3% of the time (59/60) and for productive causatives 91.7% of the time (55/60).[5]

The children's correct response rates of lexical causatives were above 90% for all the age groups, which shows that the children correctly comprehended the direct causative meanings of the lexical causatives early by the age of four. In contrast, the correct response rates of productive causatives were 25.0% (four-year-olds), 45.8% (five-year-olds) and 53.6% (six-year-olds). We can observe the gradual development in the rates among the age groups, but the correct response rate of six-year-olds is still not high (53.6%).

Let us also look at the results of the productive causatives individually. Among the four verbs, the correct response rate of the verb *ki-sase-ta* 'put.on-CAUSE-PAST' was quite low, thus we focus on the performance of the other three verbs. Among

---

5. Adults' correct response rate of the productive causatives was a little lower (91.7%) than that of the lexical causatives (98.3%). Among 15 adults we tested, five adults selected the picture depicting the direct causative meanings for different productive causative verbs. Two adults preferred the direct causative meaning for *ki-sase-ta* 'put.on-CAUSE-PAST.' This result may show that some adults allow the direct causative meanings for some productive causative verbs. As one of the anonymous reviewers pointed out, it seems that adults' distinctions between the direct causative meanings of lexical causatives and the indirect causative meanings of productive causatives are more subtle than we expected for some productive verbs. We leave this issue for the future research.

23 children we tested, there were eight children who gave incorrect responses to all the productive causatives. Those children gave direct causative meanings for the productive causatives. Their ages were 4;2, 4;4, 4;7, 4;9, 4;11, 5;8, 6;2, 6;10. There were eight children who gave correct responses to all the productive causatives (4;9, 4;11, 5;1, 5;11, 6;4, 6;9, 6;9, 6;9). We also found six children who sometimes gave correct responses and sometimes gave incorrect responses to the three productive causative verbs (4;0, 4;7, 5;0, 5;2, 5;3, 6;2). These individual results show that children's performances differ individually, and the acquisition of the indirect causative meanings of productive causatives seems to take time for some children.

These results of the picture selection task show that children acquire the direct causative meaning of lexical causatives early by the age of four, but the acquisition of the indirect causative meaning of the productive causatives is still ongoing for some children between the ages of four to six.

3.2.2   *Truth value judgment task*

3.2.2.1   *Method.* In the truth value judgment task, the experimenter acted out a story with stuffed animals in front of a child. Another experimenter playing the role of Miffy listened to the story with the child. At the end of the story, Miffy gave the child the test sentence which described the story. The child was asked to give Miffy a candy if the child thought what Miffy said matched the story. The child was asked to give Miffy a plastic corn which would make Miffy smarter if the child thought what Miffy said did not match the story. Among six five-year-olds, one five-year-old did not want to continue the task, thus we tested five five-year-olds.

A sample story and a test sentence are shown in (16):

(16)   Sample story and a test sentence:
        Experimenter: The sheep and the monkey were taking a walk, and they found a box. (The sheep says,) 'Oh this is a big box... What is in it?' (The monkey says,) 'Can you open it?' (The sheep says,) 'I can't open it. Monkey, open it!' (The monkey says,) 'Ok. Oof, oof... Oh, there are marbles!!'
        Miffy: Osarusan-ga   hako-o   ak-e-sase-ta-yo.
              Monkey-NOM box-ACC open-TRANS-CAUSE-PAST-PRT
        'The monkey made (the sheep) open the box.'   (Mismatched condition)

We included four test sentences with two lexical and two productive causatives. The test sentences involved *ak-e-ta* 'open-TRANS-PAST' / *ak-e-sase-ta* 'open-TRANS-CAUSE-PAST' in a mismatched condition and *mawa-si-ta* 'roll-TRANS-PAST' / *mawa-s-ase-ta* 'roll-TRANS-CAUSE-PAST' in matched conditions.

3.2.2.2 *Results of the truth value judgment task.* The results of the truth value judgment task are quite similar to the results of the picture selection task. The correct response rates in each age group are shown in Table 3:

Table 3. Correct response rates of the truth value judgment task

Lexical causatives	T/F	4-year-olds (N = 10)	5-year-olds (N = 5)	6-year-olds (N = 7)	Child Total (N = 22)	Adults (N = 15)
mawa-si-ta(roll-TRANS-PAST)	T	90.0% (9/10)	100% (5/5)	100% (7/7)	95.5% (21/22)	100% (15/15)
ak-e-ta(open-TRANS-PAST)	F	90.0% (9/10)	100% (5/5)	100% (7/7)	95.5% (21/22)	100% (15/15)
Total		90.0% (18/20)	100% (10/10)	100% (14/14)	95.5% (42/44)	100% (30/30)
Productive causatives						
mawa-s-ase-ta(roll-TRANS-CAUSE-PAST)	T	20.0% (2/10)	60.0% (3/5)	71.4% (5/7)	45.5% (10/22)	93.3% (14/15)
ak-e-sase-ta(open-TRANS-CAUSE-PAST)	F	40.0% (4/10)	20.0% (1/5)	42.9% (3/7)	36.4% (8/22)	100% (15/15)
Total		30.0% (6/20)	40.0% (4/10)	57.1% (8/14)	40.9% (18/44)	96.7% (29/30)

Concerning the results of the adult control group, adults responded correctly for lexical causatives 100% of the time (30/30) and for productive causatives 96.7% of the time (29/30).

The children's correct response rates of lexical causatives were above 90% for all the age groups. However, the correct response rates of productive causatives were 30.0% (four-year-olds), 40.0% (five-year-olds) and 57.1% (six-year-olds). As we saw in the results of the picture selection task in the previous section, there was also a gradual development in the correct response rates of the productive causatives among age groups. The percentages show that the children sometimes gave the indirect causative meanings to productive causatives, but they sometimes gave the direct causative meanings as well. The correct response rate of six-year-olds is still not high (57.1%), which shows that the acquisition of the indirect meaning of productive causatives takes time and six-year-olds are still in the process of acquiring the indirect meaning of productive causatives.

The individual results show that ten children gave incorrect responses to all the productive causatives (4;2, 4;4, 4;6, 4;7, 4;9, 4;11, 5;1, 5;3, 6;2, 6;10). Those children gave direct causative meanings to the productive causatives. Six children gave correct responses to all the productive causatives (4;0, 4;11, 5;11, 6;4, 6;9, 6;9).

There were six children who sometimes gave correct responses and sometimes gave incorrect responses to the productive causatives (4;7, 4;9, 5;2, 5;8, 6;2, 6;9).

These results show that the children acquire the direct causative meaning of lexical causatives early by the age of four, but there are individual differences in the acquisition of the indirect causative meaning of productive causatives and its acquisition takes time for most of the children.

4. Discussion

In Experiment 1, we examined the acquisition of direct causative meanings of lexical causatives and indirect causative meanings of productive causatives containing the causative morpheme *sase* attached to the unaccusative verbs using the question-after-story task. In Experiment 1, the results show that the direct causative meaning of lexical causatives is acquired quite early, around the age of three, whereas the indirect causative meaning of productive causatives has not acquired completely at the age of five.

In Experiment 2, we examined direct causative meanings of ditransitive/lexical causative verbs and indirect causative meanings of productive causative verbs using the picture selection task and the truth value judgment task. Similar to the results of Experiment 1, we found that the direct causative meanings of ditransitive/lexical causative verbs are acquired earlier than the indirect causative meanings of productive causatives. According to the results, the direct causative meanings of the ditransitive/lexical causative verbs are acquired by the age of four, but the indirect causative meanings of the productive causatives with *sase* have not been acquired completely even at the age of six. It seemed that some of the children sometimes gave the direct causative meanings and sometimes gave the indirect causative meanings to productive causatives.

As we have seen in Section 2, Murasugi, Hashimoto and Fuji (MHF) (2007) among others assume the mono-clausal structure for lexical causatives and the biclausal structure of productive causatives as shown below:

(17) a. Lexical causatives   b. Productive causatives

```
          vP                                      vP₂
        /    \                                  /     \
    Agent    v'                             Agent     v'
           /    \                                    /    \
         VP    v [+cause]                          VP    v [+cause]
        /  \      se                              /  \       φ
     Goal   V'                                  vP₁   V
           /  \                                /  \   sase
        Theme  V                           Agent   v'
               mi                                 /   \
                                                VP   v [+cause]
                                               /  \      φ
                                            Theme  V
                                                   mi
```
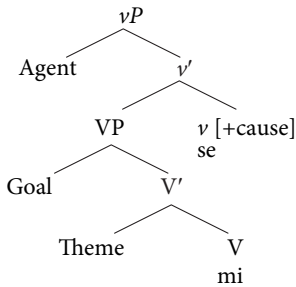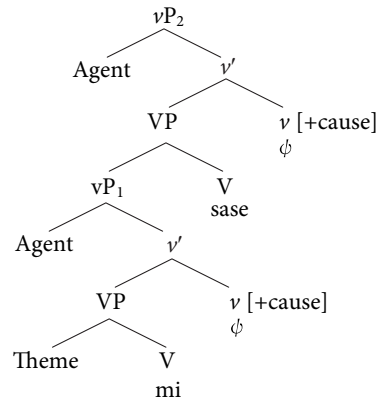
Based on children's natural speech data, as we have seen in 2.1, MHF (2007) suggested that the children may have put the causative *sase* morpheme in *v* [+ cause] in the lexical causative structure in (17a). When the children around the age of four gave direct causative meanings to productive causatives in our experiments, it is possible that they have put the causative morpheme *sase* mistakenly in *v* [+ cause] in the mono-clausal structure, and they may not have constructed the bi-clausal structure of productive causatives as in (17b), as suggested in MHF (2007).

However, as we saw in both Experiment 1 and 2, there are about one third of children who sometimes gave direct causative meanings and sometimes gave indirect causative meanings to the productive causative verbs with the causative morpheme *sase*. These results suggest that children were occasionally able to make bi-clausal structures for productive causative verbs with the causative morpheme *sase*. Therefore, we suggest that those children did not always make a mono-clausal structure and locate *sase* in the head *v* of the lower *v*P; rather, the same children sometimes located *sase* in the V of the upper VP in the structure of (17b) when they gave indirect causative meanings to productive causative verbs and they built up the bi-clausal structures in those cases.

To summarize, the results of our experiments have shown that Japanese children acquire the direct causative meanings of lexical causatives earlier than the indirect causative meanings of productive causatives, and some children give either

the direct causative meanings or the indirect causative meanings to productive causatives even at the age of six.

Finally, we would like to discuss the blocking effect between lexical causatives and productive causatives proposed by Miyagawa (1980, 1984, 1989, 2012):[6]

(18)   Blocking: A V-*sase* that does not have a lexical-causative counterpart may function as a lexical causative (as well as an analytical causative).

<div align="right">(Miyagawa 2012: 199)</div>

For example, according to Miyagawa (2012: 199), the unaccusative verb *tao-re* 'fall.down-INTRANS' in Japanese has the lexical causative counterpart *tao-s* 'fall. down-TRANS.' This lexical causative *tao-s* blocks the *V-sase* verb *tao-re-sase* 'fall. down-INTRANS-CAUSE' from having the direct causative meaning of a lexical causative. In contrast, the verb *aw* 'match' does not have a lexical causative counterpart. Therefore, the *V-sase* verb *aw-(s)ase* 'match-CAUSE' is not blocked to have the direct causative meaning of a lexical causative, in addition to the indirect causative meaning of a productive causative. Although there are studies (e.g. Embick & Marantz 2008) which cast doubt on the presence of the blocking principle, we hypothesize that the principle is necessary in the course of first language acquisition and that it is endowed innately to children as one of the acquisition principles.

In Experiment 1, we have used productive causatives in which the causative morpheme *sase* is attached to unaccusative verbs. Those productive causatives have lexical causative counterparts, such as *or-i-sase* 'get.down-INTRANS-CAUSE' and *or-os* 'get.down-TRANS.' Thus, for Japanese adults, those productive causatives with *sase* do not have direct causative meanings, according to the blocking principle. However, the children in our experiment sometimes interpreted productive causatives as having direct causative meanings of lexical causatives, and we could not find clear blocking effects in the responses of the children from three to six years of age.

Although we could not find clear blocking effects in our results, the blocking principle is one of the acquisition principles which is part of the Language Acquisition Device, and the principle seems to be working not only in causatives but also in other phenomena of languages as an acquisition principle in the course of first language acquisition. Other studies concerning the acquisition of irregular past tense verbs (e.g. Brown (1973), Kuczaj (1977)) report that a certain amount

---

6. As one of the anonymous reviewers pointed out to us, some researchers such as Embick and Marantz (2008: 3) propose that there is no need to implement blocking as a mechanism in grammar and a single set of mechanisms responsible for affixation in syntactic structures based on Distributed Morphology is all that is required. Whether it is necessary to implement blocking as part of the grammatical system or not is beyond the scope of this paper, and here we would like to assume blocking as one of acquisition principles that children are innately endowed with.

of time is required for children to acquire the knowledge that the forms such as *goed* are incorrect because they are blocked by the presence of irregular forms such as *went*. Therefore, we would like to argue that the acquisition of the indirect causative meanings of productive causatives is delayed and children sometimes give direct causative meanings to productive causatives because of the misplacement of the position of the causative morpheme *sase* in the structure of productive causatives.

5.   Conclusion

In this study, we reported the results of two experiments examining the comprehension of lexical causatives and productive causatives in Japanese. The results of our experiments show that the direct causative meanings of lexical causative verbs are acquired earlier than the indirect causative meanings of productive causative verbs. These results are compatible with what has been observed in the previous studies based on children's natural speech data (Murasugi & Hashimoto 2004; Murasugi, Hashimoto & Fuji 2007).

We have suggested that children sometimes misinterpret productive causatives as having direct causative meanings because of the misplacement of the causative morpheme *sase*. We have pointed out that children may use the monoclausal structure not only for lexical causatives but also for productive causatives, and thus children may give direct causative meanings for productive causatives. We would like to investigate why there is a delay in the acquisition of the indirect causative meaning of productive causatives more in our future research.

Acknowledgement

the teachers and children at Zoshigaya daycare center in Tokyo and Kukku Kodomono Ie Okurayama Daycare center in Yokohama for helping us greatly with our experiments. All remaining errors are our own.

References

Brown, R. 1973. *A First Language: The Early Stage*. Cambridge, MA: Harvard University Press. https://doi.org/10.4159/harvard.9780674732469

Crain, S. & Thornton, R. 1998. *Investigations in Universal Grammar*. Cambridge, MA: The MIT Press.

De Villiers, J. & Roeper, T. 1996. Questions after stories: On supplying context and eliminating it as a variable. In *Methods for Assessing Children's Syntax*, D. McDaniel, C. McKee & H. S. Cairns (eds), 163–187. Cambridge, MA: The MIT Press.

Embick, D. & A., Marantz (2008) Architecture and blocking. *Linguistic Inquiry* 39: 1–53.

Harley, H. 1995. Subjects, Events and Licensing. PhD dissertation, MIT.

Harley, H. 2008. On the causative construction. In *The Oxford Handbook of Japanese Linguistics*, S. Miyagawa & M. Saito (eds), 22–53. Oxford: Blackwell.

Inoue, K. 1976. *Henkei Bunpoo to Nihongo*. Tokyo: Taishukan.

Jacobsen, W. 1992. *The Transitive Structure of Events in Japanese*. Tokyo: Kuroshio.

Kuczaj, S. 1977. The acquisition of regular and irregular past tense forms. *Journal of Verbal Learning and Verbal Behavior* 16(5): 589–600. https://doi.org/10.1016/S0022-5371(77)80021-2

Kuno, S. 1973. *The Structure of the Japanese Language*. Cambridge, MA: The MIT Press.

Kuroda, S. -Y. 1965a. Generative Grammatical Studies in the Japanese Language. PhD dissertation, MIT.

Kuroda, S. -Y. 1965b. Causative forms in Japanese. *Foundations of Language* 1: 30–50.

Matsumoto, Y. 2000. On the crosslinguistic parameterization of causative predicates: Implications from Japanese and other languages. In *Argument Realization*, M. Butt & T. H. King (eds), 135–169. Stanford, CA: CSLI.

MacWhinney, B. 2000. *The CHILDES Project: Tools for Analyzing Talk*, 3rd ed. Mahwah NJ: Lawrence Erlbaum Associates.

Miyagawa, S. 1980. Complex Verbs and the Lexicon. PhD dissertation, University of Arizona, Tucson.

Miyagawa, S. 1984. Blocking and Japanese causatives. *Lingua* 64: 177–207. https://doi.org/10.1016/0024-3841(84)90016-0

Miyagawa, S. 1989. *Structure and Case Marking in Japanese*. New York, NY: Academic Press.

Miyagawa, S. 2012. Blocking and causatives revisited: Unexpected competition across derivations. In *Case, Argument Structure, and Word Order*, 195–216. Oxford: Routledge.

Murasugi, K. & Hashimoto, T. 2004. Three pieces of acquisition evidence for the *v*-VP frame. *Nanzan Linguistics* 1: 1–19.

Murasugi, K., Hashimoto, T. & Fuji, C. 2007. VP-shell analysis for the acquisition of Japanese intransitives verbs, transitive verbs, and causatives. *Linguistics* 45: 615–651. https://doi.org/10.1515/LING.2007.019

Noji, J. 1974–1977. *Youji no Gengoseikatsu no Jittai I-IV* (Language use in childhood). Tokyo: Bunka Hyoron Shuppan.

Okabe, R. 2008. Child Causatives: Acquisition of Bi-clausal Structures in Japanese. PhD dissertation, UCLA.

Shibatani, M. 1973. Semantics of Japanese causativization. *Foundations of Language* 9: 327–373.

Shibatani, M. 1976. The grammar of causative constructions: A conspectus. In *The Grammar of Causative Constructions*, [Syntax and Semantics 6] M. Shibatani (ed.), 1–142. New York, NY: Academic Press.

Shibatani, M. & Chung, S. Y. 2001. Japanese and Korean causatives revisited. *Kobe Papers in Linguistics* 3: 112–135, Kobe University.

Shibatani, M. & Pardeshi, P. 2002. The causative continuum. In *The Grammar of Causation and Interpersonal Manipulation*, M. Shibatani (ed.), 85–126. Amsterdam: John Benjamins. https://doi.org/10.1075/tsl.48.07shi

CHAPTER 12

Parsing Chinese relative clauses with structural and non-structural cues

Zhong Chen and John Hale

Rochester Institute of Technology / University of Georgia

This paper presents a word-by-word computational model of incremental processing difficulty in human sentence comprehension. In particular, it discusses the processing of Chinese relative clauses guided by both structural preferences and frequencies of non-structural features like animacy. The information-theoretic metric Entropy Reduction (Hale, 2003, 2006) mirrors the disambiguation effort which readers spend on each word and links theories of parsing to observed measurements in reading experiments, including the so-called animacy effect in psycholinguistic studies (Wu, Kaiser & Anderson 2012).

Keywords: relative clause, animacy, sentence processing, minimalist grammar, Entropy Reduction, computational modeling, information theory, Chinese

1. Introduction

When people read or listen incrementally, the human parser employs information that helps us to make predictions and shape expectations about the rest of the sentence (Hale 2001; Levy 2008). The information that each new word carries may be structural, e.g. grammatical category, hierarchical phrase structure, or syntactic movement, or it may be non-structural, which encompasses lexical semantics and information structure. The interaction between structural and non-structural cues has long been central to the sentence processing research.

The animacy of noun phrases is one of the cross-linguistically applicable non-structural cues in interpreting a sentence. Contrastively, many other cues, such as agreement (or the verb morphology) could only be applied to languages like English, Italian and German, but not to Chinese, which does not have clear inflectional markings. More broadly, typical patterns of animate versus inanimate noun phrases have been viewed as a factor that impacts sentence comprehension (e.g. English: Traxler, Morris & Seely 2002; Traxler, Williams, Blozis &

Morris 2005; Dutch: Mak, Vonk & Schriefers 2002, 2006; Chinese: Wu, Kaiser & Anderson 2012).

In this work, we present the inclusion of animacy in a word-by-word computational model of processing difficulty. In particular, we discuss Chinese relative clause (RC) comprehension that involves both formal grammar fragments and non-structural features like animacy. The theoretical predictions made by our model correctly derive several reported animacy effects in the psycholinguistic literature.

The rest of this paper is organized as follows. Section 2 introduces the idea of complexity metric Entropy Reduction. Section 3 surveys previous experimental studies on the processing of Chinese RCs. We focus on various temporary ambiguities and their impacts in the experiment design. In addition, we discuss the animacy effect in Chinese RC processing reported by Wu et al. (2012). Section 4 presents the modeling procedure and predictions. By comparing the predictions and the experimental data, we show that it is possible to incorporate frequency distribution information of non-structural cues in a computational model of human sentence processing. Importantly, this kind of modeling also provides us nontrivial and linguistic-plausible accounts for comprehension difficulty patterns.

2.   Uncertainty reduction in sentence processing

A growing body of work in the field of psycholinguistics suggests that it is possible to predict incremental comprehension difficulties using information-theoretic notions (Hale 2001, 2003, 2006; Levy 2008). For instance, Entropy Reduction (ER) is a complexity metric that quantifies the cognitive effort expended on a word. It allows for the possibility of parallel parsing. The uncertainty that the ER deals with reflects the ambiguity between multiple parses, including expectations about as-yet-unheard words. As new words come in, given what one has already read, the probability of grammatical alternatives fluctuates. The idea of ER is that decreased uncertainty about the whole sentence, including probabilistic expectations, correlates with observed processing difficulty. Such processing difficulty reflects the amount of information that a word supplies about the overall disambiguation task in which the reader is engaged. Recent work has shown a relationship between Entropy Reduction and the processing time, either in self-paced reading (Frank 2013; Linzen & Jaeger 2016) or in eye-tracking (Lowder et al. 2018).

The average uncertainty of specified alternatives can be quantified using the fundamental information-theoretic notion, Entropy, as formulated below in definition (a). In a language-processing scenario, the random variable X in (1) might take values that are derivations on a probabilistic grammar G. We could further

specify *X* to reflect derivations proceeding from various categories, e.g., *NP*, *VP*, *S* etc. Since rewriting grammars always have a start symbol, e.g. *S*, the expression $H_G(S)$ reflects the average uncertainty of guessing any derivation that the grammar *G* generates.

a. $H(X) = -\sum_{x \in X} p(x) \log_2 p(x)$

This entropy notation extends naturally to express conditioning events. If $w_1 w_{2...} w_i$ is the initial substring of a sentence generated by *G*, the conditional entropy $H_G(S|w_1 w_{2...} w_i)$ will be the uncertainty about just those derivations that have $w_1 w_{2...} w_i$ as a prefix.[1] By abbreviating $H_G(S|w_1 w_{2...} w_i)$ with H_i, the cognitive load *ER(i)* reflects the difference between conditional entropies before and after w_i, a particular word in a particular position in a sentence.

b. $ER(i) = \begin{cases} H_{i-1} - H_i & \text{when this difference is positive} \\ 0 & \text{otherwise} \end{cases}$

The above formula (b) defines the ER complexity metric. It says that cognitive work is predicted whenever uncertainty about the sentence's structure, as generated by the grammar *G*, goes down after reading in a new word.

Intuitively, disambiguation occurs when the uncertainty about the rest of the sentence decreases. In such a situation, readers' "beliefs" in various syntactic alternatives take on a more concentrated probability distribution (Jurafsky 1996). The disambiguation work spent on this change is exactly the entropy reduction. By contrast when beliefs about syntactic alternatives become more disorganized, e.g. there exist many equiprobable syntactic expectations, then disambiguation work has not been done and the parser has gotten more confused. The background assumption of ER is that human sentence comprehension is making progress towards a peaked, disambiguated parser state and that the disambiguation efforts made during this process can be quantified by the reductions of structural uncertainty conveyed by words.

The ER proposal is not to be confused with another widely-applied complexity metric, *Surprisal* (Hale 2001; Levy 2008), which is the conditional expectation of the log-ratio between forward probabilities of string prefixes before and after a word.[2]

---

1. Conditional entropies can be calculated using standard techniques from computational linguistics such as chart parsing (Bar-Hillel, Perles & Shamir 1964; Nederhof & Satta 2008). See Chapter 13 of Jurafsky & Martin (2008) for more details.

2. Hale (2016) reviews both information-theoretical complexity metrics and their implementations in human sentence processing.

Surprisal and ER have different properties. For instance, entropy reductions are additive whereas surprisals are not.[3] ER has had rather better success in modeling sentence-medial ambiguities, such as those found in English object relatives. Surprisal has not led, as yet, too much insight into these effects (Levy 2008: 1164). Recent works have used ER to model the processing asymmetry found in English relative clauses (Chen 2014; Chen & Hale submitted). More specifically, subject relative clauses were processed faster than object relative clauses both at the noun phrase and the verb within the relative clause, a result that is consistent with the eye-tracking data in Staub (2010).

As Sections 3 and 4 go on to show, the ER can provide a detailed account of ambiguity resolution in prenominal relativized structures like Chinese RCs, even when the animacy of noun phrases is taken into consideration.

3.   Chinese relative clauses

The target language, Chinese, is structurally different from languages like English in which relative clauses start with the head noun phrase. Chinese relatives are prenominal. In other words, the head noun phrase follows an RC. Languages with these kinds of head-final RCs have drawn considerable attention in recent discussions in the literature, mostly because they present a challenge to previous theories proposed primarily for the processing of post-nominal RCs, in particular, English RCs. As a result, we must carefully examine the predictions of Chinese RC comprehension difficulty made by different classes of sentence processing theory. In particular, we focus on two leading ideas in recent years: working-memory based accounts such as the Dependency Locality Theory (Gibson 1998, 2000) and those based on probabilistic grammars, including Entropy Reduction and Surprisal. Despite conflicting reports in the literature, the most recent evidence decisively disconfirms a working-memory account of Chinese RC processing. The modeling results we report in this paper instead support the idea that processing decisions made during Chinese RC comprehension are derived by readers' expectations. In addition, these expectations are formed based on both structural and non-structural information. Evidence for the expectation-based theories came from the Subject Advantage observed in "disambiguated" RCs as well as the facilitation of noun phrase animacy in Chinese RC processing. Entropy Reduction, as an expectation-based metric, is able to predict processing difficulties found in

---

3. Blachman (1968) clarifies the difference between Surprisal and ER on a mathematical level. In his notation, "I" is the formal quantity that leads to ER and "J" is the quantity leading to Surprisal. For more details, see Appendix 3 in Yun et al. (2015).

Chinese RCs, including the effect of head noun animacy. The modeling results are consistent with both recent experimental reports and other modeling efforts.

Section 3.1 serves as a basic introduction to Chinese RCs, with an emphasis on temporary ambiguities involved in the comprehension process. Section 3.2 provides a comprehensive literature review of Chinese RC processing issues. It addresses the failure to find a Subject Advantage that was characteristic of early work on Chinese RC processing. However, the puzzling picture becomes much clearer once temporary ambiguities are taken out (Jäger et al. 2015). This section also introduces recent studies on the role of noun phrase animacy in Chinese RC processing (Wu 2009; Wu et al. 2012), an effect that is comparable to English RCs (Traxler et al. 2002). By applying the complexity metric Entropy Reduction to derive a processing difficulty pattern, the predictions are consistent with the Subject-Object asymmetry that has been observed experimentally with "disambiguated" stimuli. They also faithfully mirror the head noun animacy effect reported by Wu et al. (2012).

3.1   Ambiguities in Chinese relative clauses

The most distinctive feature of Chinese relatives is that they are prenominal. Consider the examples in (1) from F. Hsiao & Gibson (2003). In both examples, the noun phrase *guanyuan* "official" is relativized to the right end of the relative clause instead of its left-end. Those two example sentences also highlight the empty category (or gap) which the head noun phrase left in the RC after relativization. Head-final RCs distinguish themselves from their head-initial counterparts because the distance (both linear and structural) between the empty category and head noun is longer in subject relatives than in object relatives. As the next section shows in detail, the reversed filler-gap distance between subject relatives and object relatives poses a challenge to theories of RC processing based on the working-memory burden. On the contrary, expectation-based proposals such as Surprisal and Entropy Reduction are not necessarily affected by this word order difference: readers still have a stronger expectation for SRs than for ORs, as attested by the higher frequency of SRs in Chinese corpora.

(1)   a.   Chinese Subject-modifying Subject Relative Clause
      [e_i *Yaoqing fuhao de*] *guanyuan$_i$ xinhuaibugui*
         invite   tycoon DE official   have.bad.intentions
      'The official who invited the tycoon has bad intentions.'
      b.   Chinese Subject-modifying Object Relative Clause
      [*Fuhao   yaoqing e_i de*] *guanyuan$_i$ xinhuaibugui*
         tycoon invite   DE official   have.bad.intentions
      'The official who the tycoon invited has bad intentions.'

Gibson and Wu (2013) argue that temporary ambiguities could confound the comprehension of Chinese RCs. Because RCs precede their head noun phrases in Chinese, readers have few clues to identify the left-boundary of an RC. In fact, there exist a number of sentence-medial temporary ambiguities that could mislead the comprehension of RCs. For example, in an SR such as (1a), the sentence-initial words *Yaoqing fuhao* "invite tycoon" can be parsed as a main clause with a dropped subject (or subject *pro*), meaning "someone invited the tycoon". This ambiguity is strong because subject *pro*-drop is highly acceptable in Chinese (Huang 1989). *Pro*-drop is particularly felicitous when a preceding context is presented. The beginning of a Chinese SR can also be a sentential subject with the main clause predicate, such as Example (2) below.

(2) *Yaoqing fuhao bu changjian*
     invite   tycoon not common
     'It is not common to invite a tycoon.'

At the next word, the relativizer *de*, both ambiguities still exist because *de* can also be part of a possessive structure, as in *fuhao de mishu* "tycoon's secretary". Therefore, in the most typical Chinese SR structure, such as (1a), alternative parses competing with the RC are sometimes only resolved semantically when reaching the main predicate. Example (3) highlights this temporary ambiguity between SR and a sentential subject with subject *pro*-drop. The sentence only becomes unambiguous at the main predicate, i.e., *xinhuaibugui* "have bad intentions" in (3a) and *buchangjian* "uncommon" in (3b).

(3) a. Subject relative clause
         [e_i *Yaoqing fuhao de*] *mishu$_i$ xinhuaibugui*
             invite   tycoon DE secretary have.bad.intentions
         'The secretary who invited the tycoon has bad intentions.'
     b. Sentential subject with subject *pro*-drop
         pro Yaoqing *fuhao de mishu   buchangjian*
             invite   tycoon DE secretary uncommon
         'Inviting the tycoon's secretary is uncommon.'

Chinese object-extracted RCs, as in (1b), start with the RC subject *fuhao* "tycoon" followed by the RC verb *yaoqing* "invite". However, since the canonical word order in Chinese is Subject-Verb-Object, this Noun + Verb sequence can also be interpreted as the beginning of a canonical main clause, which would be a complete sentence if a direct object were to follow the transitive verb, as in (4) below.

(4) *Fuhao   yaoqing pengyou*
     tycoon invite   friend
     'The tycoon has invited friends.'

This main clause analysis becomes impossible upon reaching the next word, namely the relativizer *de*. Similarly, the sentential subject reading also exists as in (5), although corpus studies have shown that object-*pro* drop is rare in Chinese.

(5) *Fuhao yaoqing bu changjian*
tycoon invite   not common
'It is not common that the tycoon invited someone.'

Note that there is no ambiguity caused by possessive structures in Chinese ORs since *de* follows the RC verb instead a noun phrase. The possessor noun phrase in Chinese cannot be omitted.

Structural ambiguities also exist when RCs modify the main object. Since Chinese RCs are all prenominal, in object-modifying SRs (6a), the verb and object combination within the RC, i.e. *yaoqing fuhao* "invite tycoon", could be analyzed as the subject of a sentential complement. However, whether this parse is possible depends on the choice of the main verb. If a main verb can take sentential complements, such as *tingshuo* "hear" or *zhidao* "know", the complement clause reading would be allowed.

Another classic example examined previously is the main clause illusion in object-modifying ORs. The RC subject (*fuhao* "tycoon" in (6b)) can be interpreted as the direct object of the preceding main clause verb (*daibule* "arrested"). Therefore, the main clause subject (*jingcha* "police"), the main clause verb and the RC subject could be read as a canonical transitive main clause ("The police arrested the tycoon"). This reading becomes impossible upon reaching the RC verb (*yaoqing*). It has been argued that this local ambiguity leads to a garden-path effect of structural re-analysis at the RC verb (C-J. C. Lin & Bever 2011; Z. Chen, Grove & Hale 2012; Gibson & Wu 2013).[4]

(6) a. Chinese object-modifying subject relative
Jingcha daibule [e_i *yaoqing fuhao de*] *guanyuan$_i$*
police arrested   invite   tycoon DE official
'The police arrested the official who had invited the tycoon.'
b. Chinese object-modifying object relative
Jingcha daibule [e_i *fuhao   yaoqing de*] *guanyuan$_i$*
Police arrested   tycoon invite   DE official
'The police arrested the official who the tycoon had invited.'

Lastly but importantly, Chinese RCs can be headless. The ambiguity between two RCs either with an overt or a covert head noun phrase exist in all types of RCs. As shown in Example (7), both SRs and ORs can modify a covert matrix subject. In

---

4. See Mazuka & Itoh (1995) for a discussion of garden-path sentences in Japanese.

addition, a previous corpus study suggests that Chinese ORs are more likely to be headless than SRs (Z. Chen, Jäger & Hale 2012).

(7)   a.   Chinese headless SR
[*e~i~ Yaoqing fuhao   de*] *pro xinhuaibugui*
   invite   tycoon DE   have.bad.intentions
'Someone who invited the tycoon has bad intentions.'

   b.   Chinese headless OR
[*fuhao   yaoqing e~i~ de*] *pro* xinhuaibugui
   tycoon invite   DE   have.bad.intentions
'Someone who the tycoon invited has bad intentions.'

To summarize, the head-final feature of Chinese relativized structures, along with the SVO word order in Chinese, provides an environment for a variety of temporary ambiguities to co-exist with the RC parse in incremental sentence comprehension, especially when there is limited help from the context. Without a clear marker, such as the relative pronoun in English to indicate RC, readers could well integrate the initial part of the RC with other parts of the sentence. Indeed, previous conflicting results on this topic are likely due to local ambiguities in the experimental materials, as discussed by a number of authors (C-J. C. Lin & Bever 2006, 2011; Qiao, Shen & Forster 2012; Vasishth, Chen, Li & Guo 2013; Y. Hsiao, Li & MacDonald 2014). Reducing the impact of local ambiguities becomes necessary in experimental controls of Chinese RC comprehension.

3.2   Experimental studies of Chinese RC processing

Chinese is not the only language with prenominal relative clause structures. Other languages in this category, such as Japanese and Korean, also attest the Subject Advantage such that subject RCs are easier to process. The evidence is strong and comes from a wide variety of experimental methodologies, such as self-paced reading, eye-tracking, and ERP (Japanese: Miyamoto & Nakamura 2003; Ueno & Garnsey 2008; Korean: Kwon, Polinsky & Kluender 2006; Kwon, Lee, Gordon, Kluender & Polinsky 2010; Kwon, Kluender, Kutas & Polinsky 2013). Among different accounts for the processing ease of SRs in Japanese and Korean, the working-memory based theories fail to furnish a sound explanation. By contrast, models based on readers' structural expectations are able to account for the subject advantage in both languages (Yun, Whitman & Hale 2010; Yun, Chen, Hunter, Whitman & Hale 2015).

While the processing literature on Japanese and Korean is univocal about the Subject Advantage in those languages, the Chinese RC processing literature

is inconsistent.[5] F. Hsiao and Gibson (2003) were the first to test the processing of Chinese RCs and argued that Chinese ORs were actually easier to process as compared to SRs. This surprising result was different from findings in all other languages. The evidence for their claim came from a 2 × 2 self-paced reading experiment with different RC types (SRs vs ORs) and the number of embeddings (single vs double).

In singly-embedded RCs, ORs were read more slowly than SRs at the relative clause region, namely the RC verb and RC object in SRs and the RC subject and the RC verb in ORs. At the relativizer *de* and subsequent words including the head noun, no OR advantage was found. In doubly-embedded conditions, readers spent less time in ORs than SRs at the region containing two relative clauses up to the relativizer *de* of the outer RC. F. Hsiao and Gibson's result is particularly interesting not only because it was the first time that an Object Advantage was reported, but also because the authors interpreted this finding as evidence for a memory-based account, i.e., the Dependency Locality Theory (Gibson 2000). The DLT includes two processing difficulty metrics, namely the storage and integration costs. The storage cost assumes that the processing difficulty increases if more syntactic heads are predicted at a given word. The integration cost, on the other hand, is defined as a function of the number of new discourse referents (such as noun phrases) that intervene between the phrase that is currently being processed and the constituent(s) to which the dependency links. In the case of RCs, the integration cost metric reflects the number of new discourse referents between the head noun phrases and the empty category (or the RC verb) within the RC. In languages like English, the integration cost at the embedded verb is higher in ORs than in SRs. For languages with prenominal relative clauses like Chinese, Japanese, and Korean, the DLT predicts longer reading times in SRs, compared to ORs. This inverse pattern for prenominal RCs is predicted to occur at the head noun, where the filler-gap dependency is finally resolved.

The original F. Hsiao and Gibson (2003) study runs counter to subsequent experimental findings involving Chinese RCs, which found a subject preference. Among those results that support a universal subject preference, Lin and Bever present a series of self-paced reading studies which all provide counterevidence against Hsiao and Gibson (C-J. C. Lin & Bever 2006, 2011; C-J. C. Lin, 2008). For example, C-J. C. Lin and Bever (2006) considered the same types of RCs as F.

---

5. Carreiras, Duñabeitia, Vergara, de la Cruz-Pavía, and Laka (2010) have also reported that Basque also represents an exception to the universal subject-relative preference. However, the object-relative advantage found there could relate to the unique ergativity in Basque. See also for recent evidence supporting the Subject Advantage in ergative Mayan languages (Clemens et al. 2015).

Hsiao and Gibson, along with two other types in which the head noun occupies a matrix object position. These two types appear previously as Example (6). Figure 1 plots the reading time per word across four types of RCs and shows that SRs are read faster than ORs in Chinese in both subject-modifying and object-modifying conditions thus supporting the Subject Advantage, although the subject advantage was only statistically significant when the object of the main clause was modified by an RC. In a later study, Gibson and Wu (2013) challenged this result and argued the Subject Advantage observed on ambiguous Chinese RCs, as discussed in details previously in Section 3.1, reflected a methodological flaw. Lin and Bever's stimuli, while otherwise well-controlled, nevertheless allow for the main clause illusion in object-modifying ORs as exemplified in (6b). It is possible that the amplified subject advantage in object-modifying conditions relates to local ambiguities.
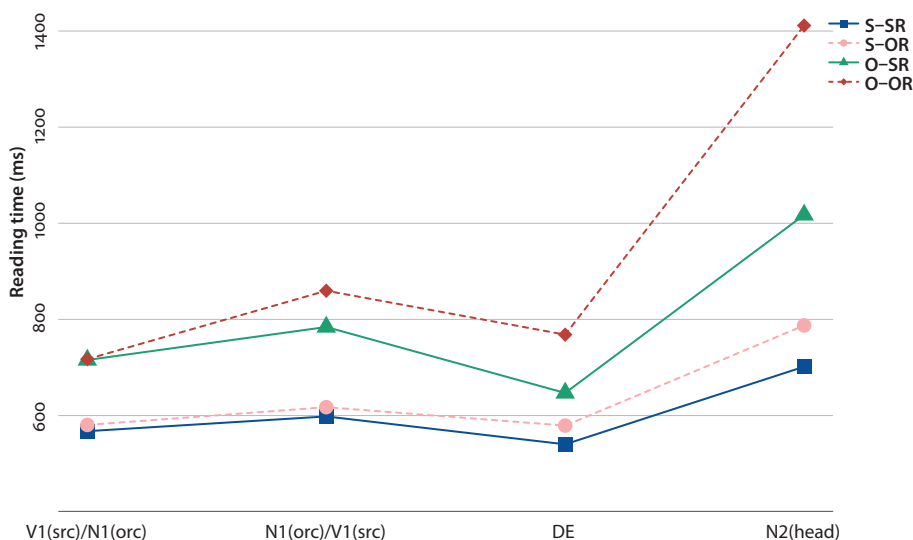
Figure 1. Reading times of each region in Chinese RCs (C-J. C. Lin & Bever 2006)

Other experimental studies have reported either an SR advantage (Wu 2009; Wu et al. 2012; Vasishth et al. 2013; Xu 2014; Jäger et al. 2015) or an OR advantage (Su, Lee, & Chung 2007; B. Chen, Ning, Bi & Dunlap 2008; Y. B. Lin & Garnsey 2011; Gibson & Wu 2013). Nevertheless, after the initial attempt by F. Hsiao and Gibson (2003), the weight of the evidence seems to suggest that Chinese is not as exceptional as first suggested. However, a final determination awaits further investigation, especially when temporary ambiguities could confound the processing effect of RCs, no matter whether it is a subject advantage or an object one.

One way to solve the problem of unwanted temporary ambiguity is to introduce a context preceding the critical sentence that promotes the expectation of an

upcoming RC. Gibson and Wu (2013) conducted such an experiment on subject-modifying singly embedded RCs.[6] In their design, the target sentences were similar to the experimental stimuli of F. Hsiao and Gibson (2003). In addition, those target sentences were preceded by a context which introduces the action described in the RC. The preceding context also asked a question eliciting either the agent or the patient of the action. The answer to this question needed to be the target sentence itself, i.e., either an SR or an OR. Gibson and Wu found an OR advantage at the relativizer *de* and this effect reached statistical significance at the next word, the head noun. This finding contradicts the null result in singly embedded RC conditions of F. Hsiao and Gibson (2003). Gibson and Wu interpreted this finding as evidence for the integration cost metric. However, ORs were not read slower at the RC region preceding the relativizer *de* where a significant effect was reported by the initial Hsiao and Gibson study.

Vasishth et al. (2013) cast doubts on whether the working memory-based DLT could correctly predict the processing difficulties in Chinese RCs after they found that the Object Advantage at the head noun in Gibson and Wu's paper was driven entirely by 13 extreme data points in the SR condition that exceeded 2,300 ms. In addition, Vasishth et al. were unable to replicate both the F. Hsiao and Gibson (2003) and the Gibson and Wu (2013) studies. In particular, different from Hsiao and Gibson's original finding, they instead reported the Subject Advantage using the same experimental materials and design. Vasishth et al. also attempted a replication using the items and fillers of the Gibson and Wu paper. Although ORs were found to be read slower than SRs, this Object Advantage effect started from and was only significant at the relativizer *de*, which cannot be explained by either DLT integration or storage cost metrics.

C-J. C. Lin (2014) investigated the puzzling results of Gibson and Wu (2013) from a different angle. He argued that the Object Advantage observed there might reflect a syntactic priming from the preceding context rather than a lower DLT integration cost in ORs. Indeed, a stronger Object Advantage was found when the thematic order in the preceding context was similar to the one of an OR. In other words, the familiarity of the thematic pattern facilitated the comprehension of ORs.

These conflicting results may be due, as Gibson and Wu originally suggested, to local ambiguities. If this is true, then what we are really seeing is garden-pathing that happens not to be present in head-initial RCs like English. Therefore, a

---

6. Gibson and Wu (2013) did not test object-modifying conditions perhaps because the main-clause illusion caused by the first three words (a Noun-Verb-Noun sequence) in object- modifying ORs cannot easily be eliminated even with a preceding context. See C-J. C. Lin and Bever (2011) for a detailed discussion on this garden-path ambiguity.

clean and precise experimental design needs to be in place to unveil the nature of Chinese RC processing. Unlike the biasing context provided in Gibson and Wu (2013), Jäger et al. (2015) used an experimental design where RC-initial substrings are disambiguated from matrix clauses. In such contexts, readers strongly anticipate a relative clause as opposed to other structures. The disambiguation is accomplished using extra words that help guide readers towards some RC interpretation while still leaving the specific gap site unspecified.

(8) a. "Disambiguated" Chinese Subject relative clause
  na-ge zuotian [e$_i$ yaoqing fuhao de] guanyuan$_i$ xinhuaibugui
  that-CL yesterday invite tycoon DE official have.bad.intentions
  'The official who invited the tycoon yesterday has bad intentions.'

 b. "Disambiguated" Chinese Object relative clause
  na-ge zuotian [fuhao yaoqing e$_i$ de] guanyuan$_i$ xinhuaibugui
  that-CL yesterday tycoon invite DE official have.bad.intentions
  'The official who the tycoon invited yesterday has bad intentions.'

In Examples (8a)–(8b), the demonstrative-classifier combination *na-ge* at the onset of the relative clause encourages readers to expect a noun phrase. However, the following word is a temporal phrase, such as *zuotian* "yesterday", which has to be attached to a verb phrase. This design therefore leads the reader to only foresee an upcoming RC-modified noun phrase by ruling out the *pro*-drop analysis. Jäger et al. (2015) tested these "disambiguated" RC stimuli in both self-paced reading and eye-tracking experiments. They reported that SRs were consistently read faster than ORs in the RC region (*Vt N* or *N Vt*, respectively) and at the head noun. A Subject Advantage was also found after the head noun, potentially a spillover effect from previous regions. This result can be explained by the expectation-based theories because readers would have higher expectation on a subject-extracted structure than an object-extracted one, as evidenced by the higher frequency of SRs in the corpus. Surprisal was used as a processing difficulty metric and derived the Subject Advantage observed in the experiments.

Head-final relativized structures provide us a great test case for memory-based theories, such as the DLT. Past results supporting the Subject Advantage have spoken against attributing the processing asymmetry only to the working-memory burden. The seeming controversies in previous Chinese literature could be the result of temporary ambiguities led by the combination of SVO word order and prenominal relativized structure. When recent studies, such as Jäger et al. (2015), carefully controlled the structural ambiguities, the Subject Advantage was found to be robust in Chinese as well.

3.3   The role of animacy in Chinese RC processing

Studies have shown that theories based on structural expectations could well explain the processing difference between Chinese SRs and ORs. But the subject-object asymmetry was not the only evidence for these expectation-based accounts. Wu and colleagues (Wu 2009; Wu, Kaiser & Andersen 2011; Wu et al. 2012) have conducted a series of experiments investigating how the frequency distribution of noun phrase animacy would impact the processing of Chinese RCs. The results indicate that animacy serves as an important cue for thematic role assignment and affects how ambiguities are resolved during RC processing, which is similar to those reported in other languages such as Dutch and English (Mak et al. 2002, 2006; Traxler et al. 2002, 2005)

Based on corpus analyses (Pu 2007; Wu 2009), observations in functional linguistics (Givón 1983; Croft 2003) and in cognitive psychology (Just & Carpenter 1992; Clifton et al. 2003; Gennari & MacDonald 2008, among others), Wu et al. (2012) suggested that a set of "Animacy Preference Constraints" could explain the patterns of RC structures with different animacy manipulations observed cross-linguistically, including Chinese.

(9)   Animacy Preference Constraints (Wu et al. 2012: 1495)
    i   Subjects tend to be animate;
    ii   Head nouns in object-extracted RCs tend to be inanimate;
    iii As a joint consequence of (i) and (ii), a contrastive animacy configuration tends to occur in object-extracted RCs with inanimate heads and in subject-modifying, subject-extracted RCs with animate heads.

With respect to the specific processing effects in Chinese RCs, Wu and colleagues found a facilitation effect of head noun animacy. SRs with animate heads and ORs with inanimate heads were easier to comprehend. They also reported the effect of animacy in embedded noun phrases (RC-objects in SRs and RC-subjects in ORs). This effect was marginal in SR conditions and was only seen at the third word after the head in OR conditions. Comparing SRs and ORs with two nouns that have contrastive animacy, the animacy effect of head nouns was also significant. Those experimental observations were consistent with Chinese corpus studies and further indicated a strong relationship between sentence processing patterns and comprehenders' expectations on structures and lexical semantics.

To conclude, we have reviewed previous works investigating how Chinese relativized structures are processed. A number of temporary ambiguities which coexist inside the RC prefix have led to conflicting experimental results. Removing the impact of syntactic alternatives with special experimental controls allows the Subject

Advantage to reemerge in Chinese RCs. Together with the animacy effect at the head noun, the processing of Chinese RCs provides additional evidence for expectation-based sentence processing theories. The next section describes how the expectation-based complexity metric ER derives Chinese RC processing patterns.

4.   Predicting the processing difficulty of Chinese RCs

This section reports modeling work on word-by-word Chinese relative clause comprehension. As a start point, we introduce how the Subject Advantage in "disambiguated" Chinese RCs (Jäger et al. 2015) is derived by the Entropy Reduction model[7] and extend the model to predict the noun phrase animacy effect in Chinese RCs. With a subcategorized grammar encoding the frequency distribution of animacy in argument and verb relations, the predictions mirror the self-paced reading times in (Wu et al. 2012) and are compatible with the predictions made by a connectionist model (Y. Hsiao & MacDonald 2013).

4.1   Chinese grammars

To calculate structural uncertainties at each word in a sentence, a weighted grammar is required. Different from modeling works using context-free analyses of Chinese RCs (Z. Chen, Grove & Hale 2012; Y. Hsiao & MacDonald 2013), the Minimalist Grammar (MG) formalism (Stabler 1997) allows us to analyze the filler-gap dependency as feature-driven movement. The grammar fragment used in this work supposes that, in relativization, an argument NP moves to become the head of an RC. Additionally, when the relativization is driven by an animate NP, processing is easier. Including syntactic categories that differentiate between [+animate] and [−animate] NPs allows a modeler to combine syntactic and non-syntactic cues in the same formal grammar.

Two Chinese MG fragments have been hand-prepared for the modeling work described in this section. The first grammar covers the "disambiguated" experimental conditions in Jäger et al. (2015). It allows the determiner-classifier ("Det Cl") combination attaching to a noun phrase. Clauses can also take a temporal phrase ("Time") as an adjunct. The second grammar is capable of describing sixteen types of Chinese RCs with various animacy manipulation. Eight of those are subject-modifying RCs used by Wu et al. (2012) as experimental conditions while the rest are object-modifying ones modeled in Y. Hsiao and MacDonald (2013). We introduce the details of those two grammars in order.

---

7. Yun et al. (2015) provides more modeling details in a step-by-step fashion.

Table 1 lists a sample of eight MG lexical items used in the first Chinese grammar. They are essential in constructing a Chinese relative clause, namely a sequence of "Vt Noun *de* Noun" as SRs or "Noun Vt *de* Noun" as ORs. As always, all grammars used in this work use abstract lexical items such as "Noun" or "Vt" so that entropy calculations based on them reflect only structural uncertainty, as opposed to word-choice uncertainty.

Table 1. Sample of MG lexical entries used to construct a Chinese relative clause

	Terminal	Syntactic feature	Note
1	Noun	headful, −case	noun
2	Noun	headful, −case, −wh	relativizable noun with -*wh* feature
3		= headful, Arg	relativizable noun is also an argument
4	Vt	Arg, + case, V	verb selecting an argument as object
5		= > V, = Arg, v	verb selecting an argument as subject
6		= v, + case, T, −f	tense with -*f* feature
7		= T, + wh, Crel	+*wh* feature hoisting noun phrase
8	de	= Crel, + f, F	+*f* feature moves RC to the left of relativizer *de*

The hand-prepared Chinese grammars in this work follow Aoun and Li (2003) in the sense that an NP rather than a DP is raised to the RC head position (c.f. Huang, Li, and Li 2009). In this way, the determiner and the classifier modifying the head noun can be outside of the RC. The MG focuses on the argument NP relativization. At this moment, they do not cover relativization involving resumptive pronouns or adjuncts. Both Chinese grammar fragments employ the promotion analysis of Kayne (1994) such that the RC head is moved directly from the position of the gap into RC head position. In a typical derivation, driven by the + *wh* feature on Line 7, *wh*-movement will raise an argument noun phrase headed by the lexical entry on Line 2 out of the CP (in this case, "C-RelP"). In addition, Line 8 of Table 1 follows Ou (2007) and treats the relativizer *de* as a LINKER (den Dikken & Singhapreecha 2004) to derive the correct word order for Chinese RCs.[8] The *f* feature of *de* moves a sentence (here "TP") to the Spec of a functional head (FP). In other words, the *f* feature licenses a kind of movement that puts RCs on the left hand side of the NP they modify.

Section 3.1 has highlighted a variety of local ambiguities in string prefixes that begin with a possible Chinese RC. In order to test whether the Subject Advantage also holds in Chinese RCs, Jäger et al. (2015) uses the sentence-initial determiner-classifier-adverb sequence to encourage an expectation for relative clause

---

8. *de* can also be treated as a modification marker according to Cheng and Sybesma (2005).
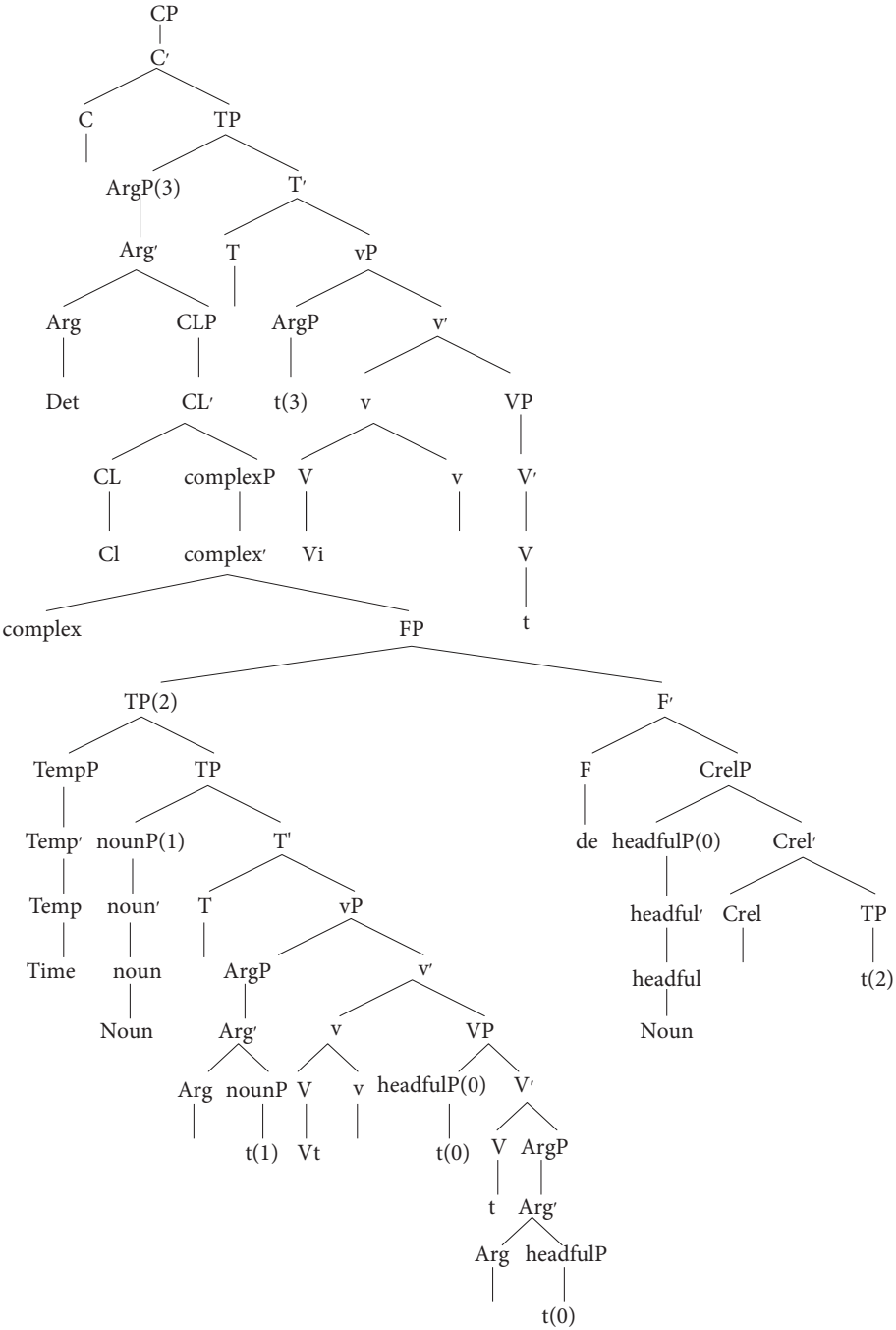
Figure 2. X-bar tree of "disambiguated" Chinese ORs in (8b)

structures (as opposed to main clause, or complement clause alternatives). The Chinese grammar in this modeling work covers those additional phrases. Figure 2 presents a derived X-bar tree of "disambiguated" Chinese ORs corresponding to Example (8b). It shows that the head noun "headfulP(0)" originates within the OR as the object. The relativization (i.e. *wh*-movement) of this noun phrase leaves a co-indexed trace "t(0)".

Modeling the role that the animacy cue plays in Chinese RC processing requires a subcategorized grammar. In particular, MG lexical items exemplified in Table 1 are differentiated according to their animacy status. In addition, the grammar also differentiates RCs by extraction-site, i.e. with either -SR or -OR diacritics. This is a case of grandparent annotation in the sense of Johnson (1998) which ensures that fine-grained probabilistic information can be captured in the grammar weighting stage. Using one category (e.g. -rel) instead of two categories -SR and -OR sometimes obscures this sort of distributional difference.

The MG fragment in Table 2 is enough to derive a Chinese OR with animate subject and inanimate object. Example (10) below provides such an example with Chinese words.

Table 2. Animacy-encoded MG fragment derives ORs with animate subject and inanimate object

	Terminal	Syntactic feature	Note
1	AniN	aniheadful, −case	animate noun
2	InaniN	inaniheadful, −case, −inaniwh	relativizable inanimate noun
3		= aniheadful, Arg-ani	animate argument
4		= inaniheadful, Arg-rel-inani	relativizable inanimate argument
5	Vt	Arg-rel-inani, + case, V-OR	OR verb selecting its inanimate object
6		= > V-OR, = Arg-ani, v-OR	OR verb selecting its animate subject
7		= v-OR, + case, T-OR, −f	tense with -*f* feature
8		= T-OR, + inaniwh, Crel-OR-inani	+ *inaniwh* feature hoisting inanimate noun
9	de	= Crel-OR-inani, + f, F-OR-inani	+ *f* feature keeping the RC head final

(10) [*Jizhe   raokai e*$_i$ *de*] *damen*$_i$ *huaile*
    reporter bypass   DE gate   broke
    'The gate which the reported bypassed was broken.'

For simplicity and consistency with experimental conditions in Wu et al. (2012), the animacy-encoded Chinese MG does not include lexical entries for "disambiguation" materials used in the first Chinese grammar, in particular the demonstrative prefix "Det" and "Cl". Compare the lexical entry on Table 1 Line 2 with its

counterpart on Line 2 of Table 2, the generic *wh*-feature in the "animacy grammar" is further specified (i.e. +aniwh and −inaniwh) depending on the animacy nature of the noun phrase. Line 5 of Table 2 suggests that a transitive predicate can be named as "V-OR" if it selects a relativizable inanimate noun phrase as its object. The noun phrase's −inaniwh feature is checked by the +inaniwh feature of OR tense and hence projects an inanimate OR (or OR with inanimate head, "Crel-OR-inani"), as shown on Line 8 in Table 2. A derived X-bar tree of the targeted OR structure is illustrated in Figure 3.

Creating the animacy annotated MG fragment above presents us an opportunity to model reading difficulties observed in three Chinese RC experiments
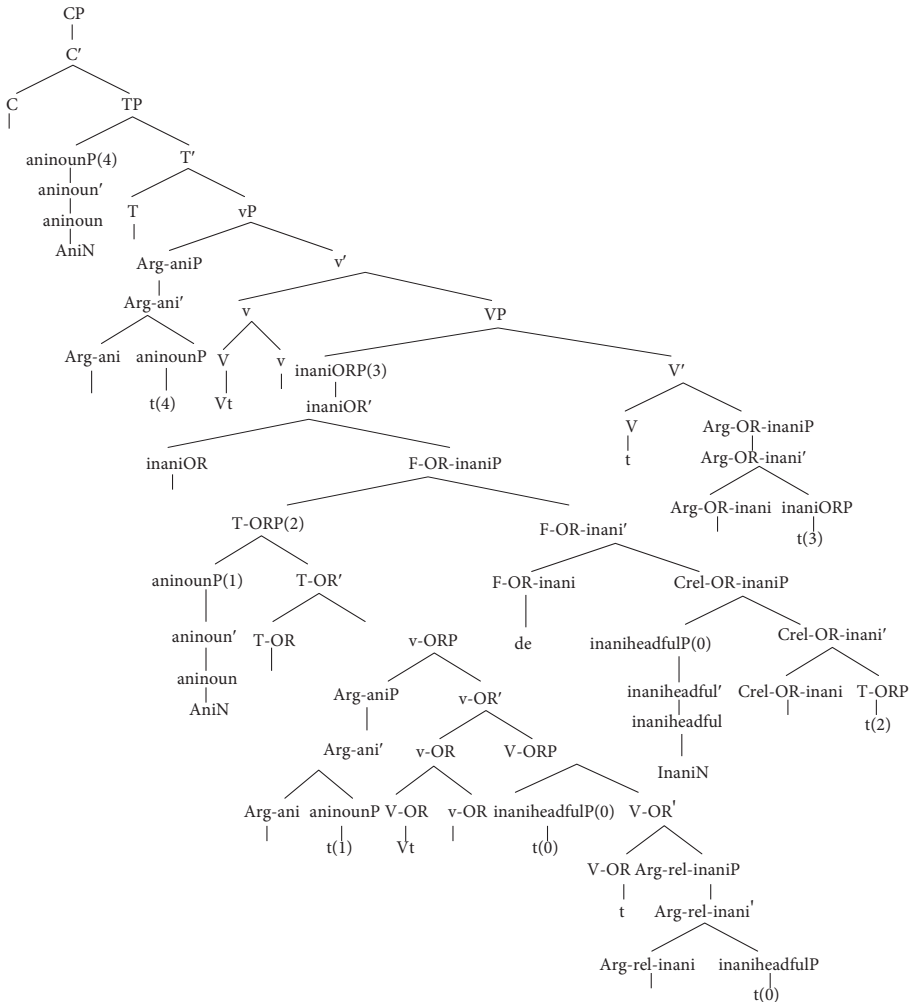
Figure 3. X-bar tree of a Chinese OR with inanimate head and animate RC subject

in Wu et al. (2012). Note that the grammar fragment we employed was hand-prepared, as compared to broad-coverage grammars generated by large natural language corpora (Boston et al. 2011; Demberg 2010; Demberg & Keller 2008). Since we are only dealing with a specific language structure, i.e. relative clauses, and related structural variants, we believe that it meets our needs.

To calculate the Entropy Reduction values word-by-word, grammars need to be weighed. We now explain how weights of crucial parameters in the grammar are obtained from a Chinese corpus.

4.2   Counting constructions in the Chinese treebank

The ER complexity metric derives processing difficulty, in part, from probabilities. This means we need to weight the prepared grammars with help from language resources. We obtain attestation counts from Chinese Treebank 7 (Xue et al. 2010) which contains 51,447 fully parsed sentences or 1,196,329 words. These yield the weights shown below in Table 3. Note that during the transformation from MG to MCFG, the grammar itself determines the parameterization by defining the set of rewrites that are "contested." These become choice points whose relative weights determine the probability of alternative subtrees of the derivation. This is done by adding up the products of attestation counts and rule applications (Chi, 1999). The "disambiguated" RCs shown in Examples (8a)–(8b) motivate a somewhat richer set of choice points in the formal grammar fragment, which obligates us to estimate weights for a longer list of parameters than those only covering "regular" RCs.

Table 3 reveals several key facts of Chinese RCs.[9] It shows that SRs are much more frequent than ORs in Chinese, similar to other languages including English and Italian. Interestingly, Chinese ORs are more likely to have a covert head than Chinese SRs. As expected, subject-*pro* is extremely frequent in Chinese while object-*pro* is rare (Huang et al. 2009). Subject *pro*-drop is also popular within the RC. An adequate grammar must allow for an OR's embedded subject to be omitted.

To properly weight the animacy-specified Chinese grammar, a more fine-grained investigation of noun phrases is necessary. Wu (2009) and Y. Hsiao and MacDonald (2013) hand-coded the animacy of the head noun and the embedded noun phrase in a subset of RCs taken from the Chinese Treebank. The Chinese

---

9. Among other things, Reali and Christiansen (2007) have shown that pronominal ORs could be read faster than pronominal SRs when the embedded pronoun is personal, a result that is facilitated by the frequency of the embedded clause. Although the grammar and the corpus counts in our work do not include relative clauses with pronouns as either subjects or objects, adding frequency distribution information about pronominal relatives will allow us to calculate ER values and compare those with the data in Reali and Christiansen (2007).

Table 3. Attestation counts from Chinese Treebank 7 are used to weight the grammar for "disambiguated" Chinese RCs

noun with a demonstrative modifier	2916
complex NP with a demonstrative modifier	345
noun in argument position	8133
complex NP in argument position	2316
possessive phrase in argument position	1866
headful SR	2281
headless SR	280
headful OR	830
headless OR	304
noun in subject position	3830
noun with a demonstrative modifier in subject position	167
pro in subject position	6385
noun in object position	3766
noun with a demonstrative modifier in object position	123
pro in object position	2
subject *pro* with transitive verb	5054
subject *pro* with intransitive verb	1331
subject NP with transitive verb	17250
subject NP with intransitive verb	4377
noun as OR subject	185
noun with a demonstrative modifier as OR	12
subject *pro* as OR subject	162
matrix modified by temporal adjunct	343
matrix not modified by temporal adjunct	16852
SR not modified by temporal adjunct	2532
OR not modified by temporal adjunct	1124
RC modified by temporal adjunct	39
relative clause	3695
complement clause	852

animacy modeling work in Chen (2014) adopts key corpus counts from CTB 7 reported by Y. Hsiao and MacDonald (2013) in order to compare ER values directly with results based on the first Chinese grammar using CTB 7 counts. Table 4 is adopted from Y. Hsiao and MacDonald (2013). It confirms that SRs are indeed more frequent than ORs in Chinese. In addition, head nouns and embedded nouns prefer to have contrastive animacy in both SRs and ORs. SRs tend to have more animate heads whereas OR heads are more likely to be inanimate. Those results are consistent with the corpus counts in Wu (2009).

Table 4. Tokens of Chinese RCs with various animacy patterns (Y. Hsiao & MacDonald, 2013)

Modification Type	RC Type	RC verb	Head NP	Embedded NP	Count
Subject-modifying	SR	Vt	+anim	+anim	61
			+anim	−anim	209
			−anim	+anim	68
			−anim	−anim	31
		Vi	+anim		14
			−anim		56
	OR	Vt	+anim	+anim	11
			+anim	−anim	0
			−anim	+anim	163
			−anim	−anim	23
Object-modifying	SR	Vt	+anim	+anim	30
			+anim	−anim	62
			−anim	+anim	27
			−anim	−anim	76
		Vi	+anim		34
			−anim		74
	OR	Vt	+anim	+anim	10
			+anim	−anim	0
			−anim	+anim	79
			−anim	−anim	23

Y. Hsiao and MacDonald (2013) have considered the animacy of nouns in both RCs and simple sentences. In order to best model reading difficulties observed in Wu et al. (2012), we also take into account several additional animacy patterns, in particular, the animacy of nouns in possessive structures as well as the relationship between head noun animacy and the type of matrix verb in subject-modifying conditions.

Table 5 Exemplifies how noun phrase animacy varies in Chinese "Noun *de* Noun" (N1 *de* N2) structures like possessives. Possessives are common in Chinese and can have the word *de* in between the possessor and the possessee. The sequence is also a substring of an SR potentially confounding RC processing. Therefore, it is possible that the animacy of nouns in "N1 *de* N2" structures also affects readers' expectations at the embedded noun and the head noun of SRs. In order to gather precise counts of noun animacy in possessives, a total of 732 possessives with only bare nouns are extracted from CTB 7, as compared to 1866 of those with noun phrases in Table 3. Among four types of "N1 *de* N2" structures with various animacy combinations, the one with two inanimate noun phrases is most frequent. The second noun phrase tends to be inanimate.

Table 5. Animacy pattern of Chinese "Noun de Noun" structures

Example	N1	N2	Count
fumu de pengyou parents DE friend 'a friend of parents'	+anim	+anim	10
renmin de ziyou parents DE freedom 'people's freedom'	+anim	−anim	182
dangdi de cunmin local DE villager 'the local villager'	−anim	+anim	45
yuyan de yishu language DE art 'the art of language'	−anim	−anim	495

Besides the animacy of "N1 *de* N2" structures, the present work also explores the relation between RC head animacy and the type of matrix verb, as required by the fine-grained Chinese MG fragment with animacy. Table 6 serves as a complement to the corpus counts of simple sentences with noun phrase arguments (see Table 2 of Y. Hsiao and MacDonald (2013)). It identifies the fact that an RC-modified head noun is more likely to be followed by an intransitive main verb rather than a transitive one.

Table 6. Animacy pattern of Chinese RC heads with different types of matrix verb

Matrix verb	RC Type	Head NP	Count
Vt	SR	+anim	66
		−anim	40
	OR	+anim	13
		−anim	8
Vi	SR	+anim	101
		−anim	101
	OR	+anim	20
		−anim	3

Using the corpus counts of various structures from Chinese Treebank 7, Chinese MG fragments are weighted. The probabilistic grammar reflects Chinese readers' expectation on how to construct a phrase or a sentence with both syntactic and non-syntactic knowledge such as the frequency distribution of noun phrase

animacy. We can subsequently calculate the readers' sentence-medial expectations, incorporating both syntactic and non-syntactic knowledge. The fluctuation of the uncertainty degrees, formalized by ER, mirrors the incremental reading difficulty at each word. Sections 4.3 below presents the Chinese modeling results.

4.3   Modeling results: The animacy effect in Chinese RC processing

In earlier works (Chen et al. 2012; Yun et al. 2015), we have modeled the Subject Advantage in Chinese RCs when competing temporary ambiguities are taken out. ER predictions are consistent with the reading time pattern observed in Jäger et al. (2015) at both the RC region and the head noun. In the present paper, we take the model of Chinese RC processing one step further with a focus on the animacy effect, which has been precisely described as a set of Animacy Preference Constraints in (9).

The animacy constraints above are generalized from corpus count observations (Pu 2007; Wu 2009), tested in reading experiments (Wu 2009; Wu et al. 2012), and recently modeled by a connectionist simple recurrent network (Y. Hsiao & MacDonald 2013). The modeling work reported in this section contributes to the ongoing investigation by integrating corpus counts, the "formalist" grammar and the complexity metric Entropy Reduction. The advantage of computational modeling like ours is to provide insights into how legitimate syntactic alternatives sharing the common prefix lead to different uncertainty levels when processing each word in the sentence. The animacy-encoded Chinese grammar further allows us to take non-syntactic information into account.

Table 7 presents ERs at both the RC region and the head noun in Chinese RCs with eight different animacy patterns. We calculate those predicted reading difficulties based on an animacy-encoded MG which specifies noun phrase animacy

Table 7. ER predictions of Chinese RCs with different animacy patterns

RC Type	Head NP	Embedded NP	ER (bits)	
			RC region	RC head
SR	+anim	+anim	2.27	1.45
	+anim	−anim	2.37	1.19
	−anim	+anim	2.27	1.47
	−anim	−anim	2.67	1.57
OR	+anim	+anim	2.35	1.46
	+anim	−anim	2.48	1.44
	−anim	+anim	2.35	1.28
	−anim	−anim	2.48	1.26

and is weighted by corpus counts in Tables 5 and 6 in addition to those in Y. Hsiao and MacDonald (2013). The animacy pattern of Chinese possessives and the interaction between head animacy and the type of matrix verb will partially account for the modeling results reported below. ER predicts that SRs with animate heads and ORs with inanimate heads (highlighted in red) are easier at the head noun than their counterparts. It also suggests an interaction between the head animacy and the animacy of embedded nouns in SRs, namely those with animate heads and inanimate RC objects are the easiest across four SR conditions. These results are consistent with what Wu et al. (2012) have reported. Next, we compare ER predictions and their experimental observation in details.

4.4   Discussions

As shown in Table 7, the comprehension difficulties predicted by ER largely mirror the reading time pattern observed in three experiments by Wu et al. (2012). They reported that in Chinese SRs, head nouns were read faster when they were animate (Experiment 1). In contrast, inanimate noun phrases were easier to process when they headed Chinese ORs (Experiment 2). If comparing SRs with their OR counterparts, SRs were read faster when the animacy configuration was not preferred, i.e. SR with an inanimate head and an animate embedded NP and OR with an animate head and inanimate embedded NP. SRs and ORs were equally difficult when the animacy configuration was preferred. In other words, the subject advantage is larger when a less-preferred animacy pattern is chosen. Our modeling is able to capture all those observations but one still wants to know what factors derive readers' behavior in Chinese RC comprehension.

Figure 4 details ER differences between the animate head and the inanimate head in SRs. This diagram shows parser states arising during the processing of an SR with an inanimate object. This corresponds to the second and the fourth line in the SR category in Table 7. These two constructions share a common initial substring, namely "Vt InaniN *de*". At this point, both conditions have the same level of uncertainty, 4.087 bits. After reading the next word, the syntactic alternatives for the SR prefix with animate head (the bottom left box) become more diversified. This leads to a smaller ER value of 1.19 bits such that less disambiguation work has been done. In contrast, when the SR head is inanimate, ER is larger, i.e., 1.57 bits, because the competition among possible remainders is weaker (the bottom right box). Looking into different alternatives in that box explains how the lower level of uncertainty with an inanimate head is calculated. The Chinese relativizer "de" can also occur in a "N1 *de* N2" structure. In addition, corpus counts in Table 5 reveal that structures with two inanimate noun phrases are very frequent. Consequently, the surface string of the most probable syntactic derivation given the prefix "Vt

InaniN *de* InaniN" is the string itself, a subject-dropped simple sentence with a possessive object. This is recorded as the top one in the bottom right box with a probability of 0.557. Since none of the probabilities of other alternatives are larger than 0.2, an SR with an inanimate head is less ambiguous.

SR de

entropy = 4.087

0.271	*Vt InaniN de*	*InaniN*
0.122	*Vt InaniN de*	*AniN Vi*
0.103	*Vt InaniN de*	*AniN Vt InaniN*
0.086	*Vt InaniN de*	*InaniN Vi*
0.080	*Vt InaniN de*	*Vt InaniN*
…	…	

ER=1.19   ER=1.57

head noun

entropy = 2.898

0.338	*Vt InaniN de AniN*	*Vi*
0.287	*Vt InaniN de AniN*	*Vt InaniN*
0.111	*Vt InaniN de AniN*	*Vt AniN*
0.090	*Vt InaniN de AniN*	
0.046	*Vt InaniN de AniN*	*Vt InaniN de InaniN*
…	…	

Animate

entropy = 2.521

0.557	*Vt InaniN de InaniN*	
0.176	*Vt InaniN de InaniN*	*Vi*
0.041	*Vt InaniN de InaniN*	*de AniN Vi*
0.039	*Vt InaniN de InaniN*	*Vt InaniN*
0.034	*Vt InaniN de InaniN*	*de AniN Vt InaniN*
…	…	

Inanimate

Figure 4. SR transitions at heads with different animacy

In addition to the animacy of Chinese possessives, this modeling work also explores the frequency distribution between head animacy and the main verb type. This issue in fact partly explains the animacy effect at the OR head. Figure 5 illustrates the reductions of uncertainty before and after two OR heads with different animacy. Different from the pattern predicted for SRs, integrating an inanimate head with the OR prefix is easier. From the same start point "AniN Vt *de*", the OR with inanimate head has a flatter distribution of syntactic alternatives, resulting in a higher uncertainty degree of 1.828 bits. This is because ORs with inanimate heads, rather than those with animate heads, are more likely to be subject of a transitive main verb, as attested in the Chinese Treebank (Table 3). Therefore,

OR de

entropy = 3.110

0.370	*AniN Vt de*	*InaniN Vi*
0.193	*AniN Vt de*	*Vt InaniN*
0.133	*AniN Vt de*	*InaniN Vt InaniN*
0.075	*AniN Vt de*	*Vt AniN*
0.052	*AniN Vt de*	*InaniN Vt AniN*
…	…	

ER=1.46   ER=1.28

head noun

entropy = 1.646

0.667	*AniN Vt de AniN*	*Vi*
0.185	*AniN Vt de AniN*	*Vt InaniN*
0.071	*AniN Vt de AniN*	*Vt AniN*
0.030	*AniN Vt de AniN*	*Vt InaniN de InaniN*
0.011	*AniN Vt de AniN*	*Vt AniN de InaniN*
…	…	

Animate

entropy = 1.828

0.606	*AniN Vt de InaniN*	*Vi*
0.218	*AniN Vt de InaniN*	*Vt InaniN*
0.084	*AniN Vt de InaniN*	*AniN*
0.035	*AniN Vt de InaniN*	*Vt InaniN de InaniN*
0.013	*AniN Vt de InaniN*	*Vt AniN de InaniN*
…	…	

Inanimate

Figure 5. OR transitions at heads with different animacy

the competition between "Vt" or "Vi" continuations is stronger in the inanimate condition, as exemplified by the top two candidates in the bottom right box.

Comparing the modeling results with the reading time data of Wu et al. (2012), ER accurately predicts the animacy effect at the head noun in both Chinese SRs and ORs. SRs with animate heads and ORs with inanimate heads are easier. We notice that another interesting observation in Wu et al. (2012) was that the effect of head noun animacy sometimes showed up early in the sentence, often before reaching the RC head. The modeling work in its current form is not able to predict the effect before the head noun simply because ER values are the same given the same prefix. The effect of the head noun can only be evaluated after knowing the animacy of it. The modeling described in this section also does not predict any animacy effect at the embedded noun. We think the reason may be due to how structures are derived by the MCFG with subcategorized features. For example, a pair of MCFG rules below describes how the OR embedded verb selects its relativizable object. The probability varies between choosing an inanimate object and an animate one. However, *wh* features with different animacy make the left-hand side of those rules different. Therefore, with the same 1.0 probability, those two rules in (11) are incomparable.

(11) 1.0 (: + case V-OR;: -case **-aniwh**) →
       (:: = Arg-rel-ani + case V-OR) (: Arg-rel-ani;: -case **-aniwh**)
       1.0 (: + case V-OR;: -case **-inaniwh**) →
       (:: = Arg-rel-inani + case V-OR) (: Arg-rel-inani;: -case **-inaniwh**)

This issue may be solved in the future by employing a more complicated probability model for Minimalist Grammars (Hunter & Dyer 2013).

5.   Conclusions

Experimental studies have shown that readers rely on both structural and non-structural information in interpreting a sentence word-by-word. Non-structural cues like the animacy of noun phrases play a role in parsing relative clauses. In this work, we implement a computational model which predicts reading difficulty patterns in Chinese relative clauses with different animacy manipulations. Our results based on the information-theoretic notion Entropy Reduction are consistent with experimental data in Wu et al. (2012). Lastly, our model provides detailed illustration of how different parses are maintained at each word during processing and therefore takes the discussion one step further by identifying additional accounts for the observed animacy effect, in addition to those proposed previously in the literature.

References

Aoun, J., & Li, A. Y. -H. 2003. *Essays on the representational and derivational nature of grammar: The diversity of wh-constructions*. Cambridge MA: The MIT Press.

Bar-Hillel, Y., Perles, M., & Shamir, E. 1964. On formal properties of simple phrase structure grammars. In *Language and Information: Selected Essays on their Theory and Application*, Y. Bar-Hillel (ed.), Ch. 9, 116–150. Reading MA: Addison-Wesley.

Blachman, N. 1968. The amount of information that y gives about X. *IEEE Transactions on Information Theory* IT-14(1): 27–31. https://doi.org/10.1109/TIT.1968.1054094

Boston, M., Hale, J., Vasishth, S., & Reinhold Kliegl. 2011. Parallel processing and sentence comprehension difficulty. *Language and Cognitive Processes* 26(3): 301–349.
https://doi.org/10.1080/01690965.2010.492228

Carreiras, M., Duñabeitia, J., Vergara, M. De La Cruz-Pavía, I. & Laka, I. (2010). Subject relative clauses are not universally easier to process: Evidence from Basque. *Cognition*, 115(1), 79–92. https://doi.org/10.1016/j.cognition.2009.11.012

Chen, B., Ning, A., Bi, H., & Dunlap, S. (2008). Chinese subject-relative clauses are more difficult to process than the object-relative clauses. *Acta Psychologica* 129(1): 61–65.
https://doi.org/10.1016/j.actpsy.2008.04.005

Chen, Z. (2014). Animacy in sentence processing across languages: An information-theoretic prospective. PhD dissertation, Cornell University.

Chen, Z, & Hale, J. Submitted. Structural and non-structural uncertainties in expectation-based sentence comprehension.

Chen, Z., Grove, K., & Hale, J. 2012. Structural expectations in Chinese relative clause comprehension. In *Proceedings of the 29th West Coast Conference on Formal Linguistics (WCCFL-29)*, J. Choi, E. A. Hogue, J. Punske, D. Tat, J. Schertz, & A. Trueman (eds.), 29–37. Somerville MA: Cascadilla Proceedings Project.

Chen, Z., Jäger, L., & Hale, J. 2012. Uncertainty reduction as a predictor of reading difficulty in Chinese relative clauses. In *Proceedings of the 13th International Symposium on Chinese Languages and Linguistics (IsCLL-13)* Y. -O. Biq & L. Chen (eds.), 245–261. Taipei, Taiwan.

Cheng, L. L. -S., & Sybesma, R. 2005. A Chinese relative. In *Organizing Grammar: Studies in Honor of Henk van Riemsdijk*, H. C. Broekhuis, N. Huybregts, R. Kleinhenz, U. Kleinhenz & J. Koster (eds.), 69–76. Berlin: Mouton de Gruyter.

Chi, Z. 1999. Statistical properties of probabilistic context-free grammars. *Computational Linguistics* 25(1): 131–160

Clifton, C., Juhasz, B., Ashby, J., Traxler, M. J., Mohamed, M. T., Williams, R. S., & Rayner, K. 2003. The use of thematic role information in parsing: Syntactic processing autonomy revisited. *Journal of Memory and Language* 49: 317–334.
https://doi.org/10.1016/S0749-596X(03)00070-6

Clemens, L., Coon, J., Pedro, P., Morgan, A., Polinsky, M., Tandet, G. & Wagers, M. 2015. Ergativity and the complexity of extraction: A view from Mayan. *Natural Language & Linguistic Theory* 33(2): 417–467. https://doi.org/10.1007/s11049-014-9260-x

Croft, W. 2003. *Typology and Universals*. Cambridge: CUP.

Demberg, V. 2010. Broad-coverage Model of Prediction in Human Sentence Processing. PhD Dissertation, University of Edinburgh.

Demberg, V. & Keller, F. 2008. Data from eye-tracking corpora as evidence for theories of syntactic processing complexity. *Cognition* 109(2): 193–210.
https://doi.org/10.1016/j.cognition.2008.07.008

den Dikken, M. & Singhapreecha, P. 2004. Complex noun phrases and linkers. *Syntax* 7(1): 1–54. https://doi.org/10.1111/j.1368-0005.2004.00064.x

Frank, S. (2013) Uncertainty reduction as a measure of cognitive load in sentence comprehension. *Topics in Cognitive Science*, 5, 475–494. https://doi.org/10.1111/tops.12025

Gennari, S. P. & MacDonald, M. C. 2008. Semantic indeterminacy in object relative clauses. *Journal of Memory and Language* 58(2): 161–187. https://doi.org/10.1016/j.jml.2007.07.004

Gibson, E. 1998. Linguistic complexity: Locality of syntactic dependencies. *Cognition* 68: 1–76.
https://doi.org/10.1016/S0010-0277(98)00034-1

Gibson, E. 2000. Dependency locality theory: A distance-based theory of linguistic complexity. In *Image, Language, Brain: Papers from the First Mind Articulation Project Symposium*, A. Marantz, Y. Miyashita & W. O'Neil (eds.). Cambridge MA: The MIT Press.

Gibson, E. & Wu, H. -H. I. 2013. Processing Chinese relative clauses in context. *Language and Cognitive Processes* 28(1–2): 125–155. https://doi.org/10.1080/01690965.2010.536656

Givón, T. (ed.). 1983. *Topic Continuity in Discourse: A Quantitative Cross-Language Study* [Typological Studies in Language 3]. Amsterdam: John Benjamins.
https://doi.org/10.1075/tsl.3

Hale, J. (2001). A probabilistic Earley parser as a psycholinguistic model. In *Proceedings of the Second Meeting of the North American Chapter of the Association for Computational Linguistics on Language Technologies, Pittsburgh, Pennsylvania, June 1–7, 2007*. Stroudsburg PA: ACL.

Hale, J. 2003. The information conveyed by words in sentences. *Journal of Psycholinguistic Research* 32(2): 101–123. https://doi.org/10.1023/A:1022492123056

Hale, J. 2006. Uncertainty about the rest of the sentence. *Cognitive Science* 30(4): 643–672.
https://doi.org/10.1207/s15516709cog0000_64

Hale, J. 2016. Information-theoretical Complexity Metrics. *Language and Linguistics Compass* 10(9): 397–412.

Hsiao, F. & Gibson, E. 2003. Processing relative clauses in Chinese. *Cognition* 90: 3–27.
https://doi.org/10.1016/S0010-0277(03)00124-0

Hsiao, Y., Li, J. & MacDonald, M. 2014. Ambiguity affects Mandarin relative clause processing. Presented at The 27th Annual CUNY Conference on Human Sentence Processing, Columbus, OH, March 13–15.

Hsiao, Y. & MacDonald, M. C. 2013. Experience and generalization in a connectionist model of Mandarin Chinese relative clause processing. *Frontiers in Psychology* 4(767).

Huang, C. -T. J. 1989. Pro-drop in Chinese: A generalized control approach. In *The Null Subject Parameter*, O. Jaeggli & K. Safir (eds.), 185–214. Dordrecht: Reidel.
https://doi.org/10.1007/978-94-009-2540-3_6

Huang, C. -T. J, Li, A. Y. -H. & Li, Y. 2009. *The Syntax of Chinese*. Cambridge: CUP .
https://doi.org/10.1017/CBO9781139166935

Hunter, T., & Dyer, C. 2013. Distributions on minimalist grammar derivations. In *Proceedings of the 13th Meeting on the Mathematics of Language*, A. Kornai & M. Kuhlmann (eds.).

Jäger, L., Chen, Z., Li, Q., Lin, C. -J. C. & Vasishth, S. 2015. The subject relative advantage in Chinese: Evidence for expectation-based processing. *Journal of Memory and Language* 79–80: 97–120. https://doi.org/10.1016/j.jml.2014.10.005

Johnson, M. 1998. PCFG models of linguistic tree representations. *Computational Linguistics* 24: 613–632.

Jurafsky, D. 1996. A probabilistic model of lexical and syntactic access and disambiguation. *Cognitive Science* 20: 137–194. https://doi.org/10.1207/s15516709cog2002_1

Jurafsky, D. & Martin, J. 2008. *Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition*, 2d edn. New York NY: McGraw Hill.

Just, M. A. & Carpenter, P. A. 1992. A capacity theory of comprehension: Individual differences in working memory. *Psychological Review* 99: 122–149. https://doi.org/10.1037/0033-295X.99.1.122

Kayne, R. 1994. *The Antisymmetry of Syntax*. Cambridge MA: The MIT Press.

Kwon, N., Kluender, R., Kutas, M., & Polinsky, M. 2013. Subject/object processing asymmetries in Korean relative clauses: Evidence from ERP data. *Language* 89: 537–585. https://doi.org/10.1353/lan.2013.0044

Kwon, N., Lee, Y., Gordon, P. C., Kluender, R., & Polinsky, M. 2010. Cognitive and linguistic factors affecting subject/object asymmetry: An eye-tracking study of pre-nominal relative clauses in Korean. *Language* 86(3): 546–582. https://doi.org/10.1353/lan.2010.0006

Kwon, N., Polinsky, M. & Kluender, R. 2006. Subject preference in Korean. In *Proceedings of the 25th West Coast Conference on Formal Linguistics (WCCFL-25)*, D. Baumer, D. Montero & M. Scanlon (eds.), 1–14. Somerville MA: Cascadilla Proceedings Project.

Levy, R. 2008. Expectation-based syntactic comprehension. *Cognition* 106: 1126–1177. https://doi.org/10.1016/j.cognition.2007.05.006

Lin, C. -J. C. 2008. The processing foundation of head-final relative clauses. *Language and Linguistics* 9(4): 813–839.

Lin, C. -J. C. 2014. Effect of thematic order on the comprehension of Chinese relative clauses. *Lingua* 140: 180–206. https://doi.org/10.1016/j.lingua.2013.12.003

Lin, C. -J. C. & Bever, T. 2006. Subject preference in the processing of relative clauses in Chinese. In *Proceedings of the 25th West Coast Conference on Formal Linguistics*, D. Baumer, D. Montero & M. Scanlon (eds.), 254–260. Somerville MA: Cascadilla Proceedings Project.

Lin, C. -J. C., & Bever, T. 2011. Garden path and the comprehension of head-final relative clauses. In *Processing and Producing Head-final Structures*, Y. Hiroko, Y. Hirose & J. L. Packard (eds.), 277–297. Dordrecht: Springer.

Lin, Y. & Garnsey, S. 2011. Animacy and the resolution of temporary ambiguity in relative clause comprehension in Mandarin. In *Processing and Producing Head-final Structures*, Y. Hiroko, Y. Hirose & J. L. Packard (eds.), 241–276. Dordrecht: Springer.

Linzen, T. & Jaeger, F. 2016. Uncertainty and expectation in sentence processing: Evidence from subcategorization distributions. *Cognitive Science* 40(6): 1382–1411.

Lowder, M. W., Choi, W., Ferreira, F. & Henderson, J. M. (2018) Lexical predictability during natural reading: Effects of surprisal and entropy reduction. *Cognitive science*, 42: 1166–1183.

Mak, W., Vonk, W. & Schriefers, H. 2002. The influence of animacy on relative clauserProcessing. *Journal of Memory and Language* 47(1): 50–68. https://doi.org/10.1006/jmla.2001.2837

Mak, W., Vonk, W., & Schriefers, H. 2006. Animacy in processing relative clauses: The hikers that rocks crush. *Journal of Memory and Language* 54: 466–490. https://doi.org/10.1016/j.jml.2006.01.001

Mazuka, R. & Itoh, K. 1995. Can Japanese speakers be led down the garden path? In *Japanese Sentence Processing*, R. Mazuka & N. Nagai (eds.), 295–329. Mahwah NJ: Lawrence Erlbaum Associates.

Miyamoto, E. & Nakamura, M. 2003. Subject/object asymmetries in the processing of relative clauses in Japanese. In *The 22nd West Coast Conference on Formal Linguistics (WCCFL-22)*, G. Garding & M. Tsujimura (eds.), 342–355. Somerville MA: Cascadilla.

Nederhof, M. & Satta, G. 2008. Computing partition functions of PCFGs. *Research on Language and Computation* 6(2): 139–162. https://doi.org/10.1007/s11168-008-9052-8

Ou, T. -S. 2007. *Suo* relative clauses in Mandarin Chinese. *Language and Linguistics* 8(4): 913–937.

Pu, M. -M. (2007). The distribution of relative clauses in Chinese discourse. *Discourse Processes* 43(1): 25–53. https://doi.org/10.1080/01638530709336892

Qiao, X., Shen, L. & Forster, K. 2012. Relative clause processing in Mandarin: Evidence from the maze task. *Language and Cognitive Processes* 27(4): 611–630. https://doi.org/10.1080/01690965.2011.578394

Reali, F. & Christiansen, M. H. 2007. Processing of relative clauses is made easier by frequency of occurrence. *Journal of Memory and Language* 53: 1–23. https://doi.org/10.1016/j.jml.2006.08.014

Stabler, E. 1997 Derivational minimalism. In *Logical Aspects of Computational Linguistics*, C. Retoré (ed.), 68–95. Dordrecht: Springer. https://doi.org/10.1007/BFb0052152

Staub, A. 2010. Eye movements and processing difficulty in object relative clauses. *Cognition* 116(1): 71–86. https://doi.org/10.1016/j.cognition.2010.04.002

Su, Y., Lee, S., & Chung, Y. 2007. Asyntactic thematic role assignment by Mandarin aphasics: A test of the Trace-Deletion Hypothesis and the Double Dependency Hypothesis. *Brain and Language* 101(1): 1–18. https://doi.org/10.1016/j.bandl.2006.12.001

Traxler, M., Morris, R. & Seely, R. 2002. Processing subject and object relative clauses: Evidence from eye movements. *Journal of Memory and Language* 47(1): 69–90. https://doi.org/10.1006/jmla.2001.2836

Traxler, M., Williams, R., Blozis, S. & Morris, R. 2005. Working memory, animacy, and verb class in the processing of relative clauses. *Journal of Memory and Language* 53: 204–224. https://doi.org/10.1016/j.jml.2005.02.010

Ueno, M. & Garnsey, S. M. 2008. An ERP study of the processing of subject and object relative clauses in Japanese. *Language and Cognitive Processes* 23(5): 646–688. https://doi.org/10.1080/01690960701653501

Vasishth, S., Chen, Z., Li, Q. & Guo, G. -L. 2013. Processing Chinese relative clauses: Evidence for the subject-relative advantage. *PLoS One* 8(10)(e77006). https://doi.org/10.1371/journal.pone.0077006

Wu, F. 2009. Factors Affecting Relative Clause Processing in Mandarin: Corpus and Behavioral Evidence. Phd dissertation, University of Southern California.

Wu, F., Kaiser, E. & Andersen, E. 2011. Subject preference, head animacy and lexical cues: A corpus study of relative clauses in Chinese. In *Processing and Producing Head-final Structures*, Y. Hiroko, Y. Hirose & J. L. Packard (eds.), 173–193. Dordrecht: Springer.

Wu, F., Kaiser, E. & Andersen, E. 2012. Animacy effects in Chinese relative clause processing. *Language and Cognitive Processes* 27(10): 1489–1524. https://doi.org/10.1080/01690965.2011.614423

Xu, Y. 2014. Evidence of the accessibility hierarchy in relative clauses in Chinese as a second language. *Language and Linguistics* 15(3): 435–464. https://doi.org/10.1177/1606822X14520666

Xue, N., Jiang, Z., Zhong, X., Palmer, M., Xia, F., Chiou, F., & Chang, M. (2010). Chinese Treebank 7.0. Philadelphia PA: Linguistic Data Consortium.

Yun, J, Chen, Z., Hunter, T., Whitman, J. & Hale, J. 2015. Uncertainty in processing relative clauses across East Asian languages. *Journal of East Asian Linguistics* 24(2): 113–148. https://doi.org/10.1007/s10831-014-9126-6

Yun, J., Whitman, J., & Hale, J. T. 2010. Subject-object asymmetries in Korean sentence comprehension. In *Proceedings of the 32nd Annual Meeting of the Cognitive Science Society*. S. Ohlsson & R. Catrambone (eds.).

Phonology

The inexorable spread of ⟨ou⟩ in Romanized Japanese

Timothy J. Vance
Komatsu University

When the Japanese government adopted new guidelines for representing words in *kana* (basically moraic phonograms) in 1946, a few mismatches between spelling and modern Tokyo pronunciation remained. One was using ⟨う⟩ (*u*) as the default representation for the second half of the long vowel /oH/ (/H/ = length). In official romanization, /ou/ is ⟨ou⟩ and /oH/ is ⟨ō⟩, ⟨ô⟩, or ⟨oo⟩, but the most popular romanization for /oH/ is now ⟨ou⟩, partly because most computer users input Japanese text by typing romanization that matches *kana* spelling. This paper will propose that *kana* spelling, abetted by romanized input, might induce future speakers to adopt /ou/ as the underlying form in many words that, for now, still have /oH/.

Keywords: kana spelling reform, long vowels, romanization, spelling pronunciation, word processing

1. Kana

The modern Japanese writing system is universally recognized as the most complicated system still in use in the world today (Sampson 1985: 172–173; Sproat 2000: 154; Gnanadesikan 2009: 113). There is no need to go into all the details here, but it will be important to understand some of the spelling conventions in the two parallel quasi-syllabaries, *hiragana* 平仮名 and *katakana* 片仮名 (referred to collectively as *kana* 仮名). For most children in Japan, the first step on the path to literacy is learning *hiragana*. In material aimed at adults, native Japanese words and Sino-Japanese words are often written (at least partly) in Chinese characters (*kanji* 漢字), and loanwords from languages other than Chinese are usually written in *katakana*, but any Japanese word can be spelled entirely either in *hiragana* or in *katakana*. The headwords in a dictionary are normally displayed in *kana*, and the order of the entries is determined by their *kana* spellings.

2. Long vowels and vowel sequences

Modern Tokyo Japanese has five contrasting short vowels, which are almost always transcribed phonemically as /i e a o u/. There is also a full set of contrasts between short and long vowels, although none of these length contrasts has a very high functional load (Vance 2008b: 56–57).

Phonetically, short and long vowels are distinguished entirely by differences in duration, with no perceptible differences in vowel quality. The examples in (1) illustrate three of the five contrasts.[1]

(1) a. [kado] 角 'corner' [kaːdo] カード 'card'
     b. [biɾɯ] ビル 'building' [biːɾɯ] ビール 'beer'
     c. [kɯɾo] 黒 'black' [kɯːɾo] 空路 'air route'

There are two viable choices for a phonemic analysis of the long vowels. One possibility is to analyze a long vowel as two short vowels in a row: /ii ee aa oo uu/. This analysis corresponds to the way long vowels in native and Sino-Japanese words are typically spelled in *hiragana*. For example, *okāsan* お母さん 'mother' is spelled ⟨おかあさん⟩ (*o ka a sa n*). The other possibility is to analyze a long vowel as a short vowel followed by a lengthening phoneme. Although /R/ has probably been the most popular transcription for this phoneme among linguists writing in Japanese, I adopted /H/ in a recent textbook (Vance 2008b: 58), representing the five long vowels as /iH eH aH oH uH/. This lengthening-phoneme analysis corresponds to the way long vowels in loanwords are most often spelled in *katakana*, as in ⟨カード⟩ (*ka – do*) for *kādo* 'card' in (1a) and ⟨ビール⟩ (*bi – ru*) for *bīru* 'beer' (1b). Notice that the *katakana* length mark ⟨ー⟩ corresponds to the macrons in the romanizations.

Modern Tokyo Japanese also allows any sequence of two vowels in a row, although some of these sequences are rare or nonexistent unless the two vowels are on opposite sides of a morpheme boundary (Vance 2008b: 61–62). When the sequence consists of two vowels with the same quality, the vowels are in separate syllables. For example, *chīku* チーク 'teak' is pronounced [cçiːkɯ], with a long vowel, but *chiiku* 知育 'intellectual training' is pronounced [cçi*ikɯ], where [*] represents vowel rearticulation, i.e., a brief dip in intensity (Bloch 1950: 105–106; Martin 1952: 13).[2]

---

1. Throughout this paper, /u/ is transcribed phonetically as [ɯ], using the IPA symbol for a high back unrounded vowel, although the phonetic facts are more complicated that this transcription suggests (Vance 2008b: 54–56).

2. Although [*] is not an IPA symbol, Ladefoged and Maddieson (1996: 76–77) adopt it for transcribing vowel rearticulation in the Papuan language Gimi.

The double-vowel phonemic analysis of long vowels blurs the distinction between [Vː] (a long vowel) and [V*V] (two short vowels separated by vowel rearticulation), as pointed out many years ago by Kindaichi (1950). But this problem disappears if syllable boundaries are marked, as in /i.i/ vs. /ii/, and my position is that the vowel + length analysis and the double-vowel analysis are both reasonable and not mutually exclusive (Vance 2008b: 60–61).[3]

3.   *Kana* spelling reform

One of the many post-World War II reforms of the Japanese writing system was the adoption of so-called modern *kana* usage (*gendai-kana-zukai* 現代仮名遣い) in 1946.[4] The modern *kana* spellings of the long vowel /oH/ constitute one of the few instances in which the reform failed to achieve a consistent match between spelling and modern Tokyo pronunciation. In the system today, the most common *hiragana* spelling of /oH/ represents the length with the letter ⟨う⟩ (*u*), which by itself represents /u/, rather than with ⟨お⟩ (*o*), which by itself represents /o/. This peculiarity of *hiragana* spelling is an important part of the explanation for the spread of the romanization ⟨ou⟩ for /oH/.

The modern *kana* spelling system was reaffirmed, with a few small revisions, in a cabinet notification (*naikaku kokuji* 内閣告示) issued on July 1, 1986 (Bunka-chō 1986). The basic principle is that spelling should follow modern pronunciation, but there are some exceptions, and these are explicitly noted. The exceptions are attributed to respect for traditional spelling practices, and the spellings of /oH/ are the most problematic of these exceptions. The long vowels are mentioned individually (Bunka-chō 1986: 4), and the spelling of a syllable containing each long vowel other than /oH/ is described as $(C)V_1 + V_1$. As noted above in §2, this is how long vowels in native Japanese and Sino-Japanese words are most often spelled in *hiragana*, as in ⟨くうき⟩ (*ku u ki*) for /kuHki/ 空気 'air'. For /oH/, however, the default rule is to use a letter for (C)/o/ followed by the letter for /u/, i.e., ⟨う⟩. For example, /toHdai/ 灯台 'lighthouse' is spelled ⟨とうだい⟩ (*to u da i*). There were several different ways to spell /oH/ before the 1946 reform (in so-called historical

---

3. There is almost always a morpheme boundary (at least arguably) where vowel rearticulation appears, but a word meaning 'flame', written with the *kanji* ⟨炎⟩, is an interesting exception. Even though this word is synchronically monomorphemic, some Tokyo speakers have vowel rearticulation where there used to be a boundary, that is, some speakers treat it as /ho.no.o/, although others treat is as /ho.noH/ (Vance 2008b: 61–62).

4. Seeley (1991: 136–187) provides a historical account of the postwar reforms. Yoshida and Inokuchi (1962: 667–684) reproduce the complete text of the 1946 cabinet proclamation.

kana usage: *rekishi-teki kana-zukai* 歴史的仮名遣い), but (C)/o/ + /u/ was the most common. Thus, in the case of /oH/, the respect for traditional spelling practices produced a mismatch between spelling and modern Tokyo pronunciation in a very large number of words. To make matters worse, the vowel sequence /ou/ is possible and is spelled the same way. For example, /koHši/ 講師 'instructor' and /kouši/ 子牛 'calf' are both spelled ⟨こうし⟩ (*ko u shi*), and /hiroH/ 疲労 'fatigue' and /hirou/ 拾う 'pick up' are both spelled ⟨ひろう⟩ (*hi ro u*).

On the other hand, a few instances of /oH/ are spelled differently, that is, there are exceptions to the exception. There is a set of words in which /oH/ has to be spelled like other long vowels: (C)/o/ + /o/ rather than (C)/o/ + /u/. Thankfully, this set is fairly small. The 1986 cabinet notification gives a list (although not a complete list), and offers the following explanation: the long vowel /oH/ is spelled (C)/o/ + /o/ when the pre-reform spelling had ⟨を⟩ (*wo*) or ⟨ほ⟩ (*ho*) as the second letter (Bunka-chō 1986: 6). In the words of interest, these two letters both represented /wo/ at an earlier time in the history of the Japanese language, but /w/ was subsequently lost (Frellesvig 2010: 201–209, 387). In the case of morpheme-internal two-syllable sequences of the form (C)/owo/, the usual outcome in modern Tokyo Japanese is a single long syllable of the form (C)/oH/, not a two-syllable sequence of the form (C)/oo/. Some examples are given in (2) .

(2)   a.   /toH/ 塔 'tower': とう (*to u*)
      b.   /toH/ 十 'ten': とお (*to o*) [< とを (*to wo*)]
      c.   /oHi/ 王位 'kingship': おうい (*o u i*)
      d.   /oHi/ 多い 'numerous': おおい (*o o i*) [< おほい (*o ho i*)]

Except for a few people with specialized academic interests, no one educated after World War II knows the historical spellings of words containing /oH/, and present-day schoolchildren simply have to memorize the words in which /oH/ is spelled (C)/o/ + /o/. Not surprisingly, even well-educated adults sometimes make mistakes.[5]

Interestingly, as Seeley (1991: 143–144) recounts, the Japanese Ministry of Education had tried to impose new rules for *kana* spelling in elementary-school textbooks in 1900, and one of these rules was to use a line to represent vowel length, just as in modern *katakana* representations of loanwords (see §2 above).

---

5. My favorite example of a misspelling of /oH/ appears in a book with the title *Nihongo no seishohō* 日本語の正書法 'Japanese orthography' (Koizumi 1978: 244). A sentence beginning *sude ni nobeta tōri* 'as I have already said' somehow made it into print with /toHri/ 'way' spelled ⟨とうり⟩ (*to u ri*). When this word is used figuratively to mean 'way' rather than literally to mean 'street' or 'road', it is often written entirely in *hiragana*, but the correct *hiragana* spelling is ⟨とおり⟩ (*to o ri*). I owe this example to several students in a Japanese phonology course I taught in 2011 for the Summer M. A. Program in Japanese Pedagogy at Columbia University.

For example, /uNdoH/ 運動 'exercise' was to be spelled ⟨うんどー⟩ (*u n do –*).[6] This spelling technique could have eliminated all the confusion surrounding /oH/. Unfortunately, however, it was restricted to Sino-Japanese words, and historical spellings were retained for native Japanese words. Not surprisingly, this half-hearted reform was not well received, and the Ministry of Education rescinded the new *kana* spelling rules in 1908. It was not until 1946 that historical *kana* spellings were finally replaced for good, this time across the board, and as explained above, a consistent spelling for /oH/ was not adopted.

School teachers are still struggling with the inconsistency, and as Tanahashi (2012: 30–31) reports, it has led to the bizarre practice of replacing an author's original length mark ⟨ー⟩ with ⟨う⟩ (*u*) in stories reproduced in elementary-school textbooks. Writers often use ⟨ー⟩ in words otherwise spelled in *hiragana* to represent emphatic vowel lengthening as opposed to phonemic vowel length. For example, writing /sugoi/ 'amazing' as ⟨すごーい⟩ (*su go – i*) indicates that the lexically short second vowel /o/ has been elongated (by some indeterminate amount) to highlight the word. In textbooks for elementary-school children, however, the general principle is to avoid the length mark, and consequently, ⟨すごーい⟩ (*su go – i*) is "corrected" to ⟨すごうい⟩ (*su go u i*).

It has also become increasingly common in recent years to spell /oH/ in loanwords with *katakana* ⟨ウ⟩ (*u*) instead of the length mark. For example, when a Japanese translation of the novel *A Separate Peace* by the American author John Knowles appeared in 1972, his surname was rendered in *katakana* as ⟨ノールズ⟩ (*no – ru zu*), but when the American singer Beyoncé Knowles released her first album in Japan in 2003, her surname was rendered as ⟨ノウルズ⟩ (*no u ru zu*). Both spellings represent the same pronunciation: /noHruzu/. The loanword based on English *bowling* is pronounced /boHriNgu/ but is usually written ⟨ボウリング⟩ (*bo u ri n gu*), probably to distinguish it visually from the homophonous loanword based on English *boring* 'drilling holes', which is usually written ⟨ボーリング⟩ (*bo – ri n gu*).

4.   Disparity between /ou/ and /ei/

As mentioned in §2, any sequence of two vowels is phonotactically permissible in modern Tokyo Japanese, including /ou/. There is, however, an interesting disparity between /ei/ and /ou/ that deserves comment. In careful pronunciation, native speakers distinguish the vowel sequence [ei] from the long vowel [eː], and

---

6. The modern *kana* spelling of this word is the same as the historical spelling: ⟨うんどう⟩ (*u n do u*).

this distinction is reflected in *kana* spelling. For example, the Sino-Japanese word *seifu* (/seifu/) 政府 'government' is written ⟨せいふ⟩ (*se i fu*) in *hiragana*, and the recent loanword *sēfu* (/seHfu/) 'safe' is written ⟨セーフ⟩ (*se – fu*) in *katakana*. In the natural pronunciation that is typical of ordinary conversation, however, there is a strong tendency for /ei/ to be pronounced [eː], that is, just like /eH/. Thus, *seifu* 'government' and *sēfu* 'safe' are both likely to be pronounced [seːɸɯ]. In the case of /ou/, the two vowels are almost always on opposite sides of a morpheme boundary, as in *koushi* (/ko + uši/) 子牛 'calf' (cf. /ko/ 'child', /uši/ 'cow'). The pronunciation [oː] for /ou/ doubtless occurs in rapid speech, but it sounds sloppy in a way that [eː] for /ei/ does not. On the other hand, /eH/ cannot be pronounced as [ei], and it is not normal to pronounce /oH/ as [ou]. Of course, when the *kana* spelling of /oH/ uses a letter for /u/, it is possible to convey the spelling to a listener by pronouncing it unnaturally as [oɯ] (often with a glottal stop between the two vowels).

The American Christian missionary James Curtis Hepburn (1815–1911) published the first edition of his famous Japanese-English dictionary in 1867. The second edition appeared in 1872, and the third edition in 1886. Hepburn changed his romanization system with each new edition, and some of the changes show that he was uncertain about /ou/. For example, the entry for the verb *omou* 思う 'think' in the first edition has the romanization ⟨omō⟩, but Hepburn corrected it to ⟨omou⟩ partially in the second edition and completely in the third edition. The system he adopted for the third edition is essentially the system recommended by the Rōmaji-kai 羅馬字会 'Romanization Club' in 1885 (Yoshida & Inokuchi 1962: 289–303), and it is known today as Hepburn romanization (ヘボン式ローマ字 *Hebon-shiki-rōmaji*) (Seeley 1991: 139–140; Hachiya 2007: 384). The Rōmaji-kai instructions prescribed a macron for all long vowels, but the authors cautioned against using macrons in certain instances, and most of these were words that clearly contained a sequence of two short vowels rather than a single long vowel. For example, the instructions specified ⟨omou⟩ for *omou* 'think' (/omou/) and ⟨sukuu⟩ for *sukuu* 救う 'rescue' (/sukuu/), explicitly labeling ⟨omō⟩ and ⟨sukū⟩ as incorrect (Yoshida and Inokuchi 1962: 297).

Hepburn had nothing to say about the distinction between /eH/ and /ei/. In his first edition, the introduction explains that the macron in ⟨ā ī ō ū⟩ indicates vowel length, but there is no mention of the romanization ⟨ē⟩ (Hepburn 1867: ix), and there do not appear to be any headwords containing /eH/. In the later editions, he retained only ⟨ō ū⟩ and replaced ⟨ā ī⟩ with ⟨aa ii⟩, but there is still no mention of ⟨ē⟩ or ⟨ee⟩ in the front matter (Hepburn 1872: xii, 1886: xi).[7] The second edition, however, does list *nēsama* 姉様 'elder sister' as ⟨nē-sama⟩, with ⟨ē⟩ rather than ⟨ee⟩

---

7. In native and Sino-Japanese words, /oH/ and /uH/ are far more frequent than the other long vowels, and even Hepburn's third edition lists only a very few loanwords from languages other

for /eH/. On the other hand, for words that can be analyzed as containing /ei/, Hepburn consistently used ⟨ei⟩ in all three editions. The 1885 Rōmaji-kai recommendations explicitly specify ⟨ē⟩ for /eH/ (Yoshida and Inokuchi 1962:292), but no examples are provided. As for /ei/, the recommendations prescribe ⟨ei⟩ and caution that Sino-Japanese *gei* 芸 'artistic skill' and *zei* 税 'tax' must be written as ⟨gei⟩ and ⟨zei⟩, not as ⟨gē⟩ and ⟨zē⟩.

The 1986 reaffirmation of modern *kana* usage (see §3 above) maintains the corresponding *kana* spelling distinction between /eH/ and /ei/ but hints that there may not actually be a pronunciation distinction (Bunka-chō 1986: 7). Among the examples cited are Sino-Japanese *hei* 塀 'fence' and *eiga* 映画 'movie', and such words are to be spelled ⟨へい⟩ (*he i*) and ⟨えいが⟩ (*e i ga*), i.e., with ⟨い⟩ (*i*) rather than with ⟨え⟩ (*e*) for the second letter of the long syllable, regardless of whether they are pronounced with /eH/ or with /ei/. This caveat does not necessarily imply that there is no distinction between /eH/ and /ei/ in modern Tokyo, but it does show that the authors of the 1986 cabinet notification were aware that the distinction is blurred in most dialects.[8]

Three independent sources of evidence support the conclusion that most instances of *hiragana* (C)/o/ + /u/ represent the long vowel /oH/ and not the sequence /ou/. First, the difference between /ei/ spelled (C)/e/ + /i/ and /oH/ spelled (C)/o/ + /u/ comes out clearly in songs (Vance 2008b: 64–67). When a sequence of the form C/ei/ is assigned to two notes, it is sung as [(C)e]-[i], which makes sense if the phonemic analysis /ei/ is correct. There would be some explaining to do if the phonemic analysis were /eH/. Of course, since the *hiragana* spelling of the second mora is ⟨い⟩ (*i*), it is possible to argue that the singing pronunciation is a kind of letter-by-letter spelling pronunciation. However, the treatment of the long vowel /oH/ suggests that this spelling-pronunciation explanation is not correct. When a sequence of the form C/oH/ is assigned to two notes, it is sung as [(C)o]-[o], not [(C)o]-[u], even when the *hiragana* spelling of the second mora is ⟨う⟩ (*u*).

Second, /ei/ spelled (C)/e/ + /i/ and /oH/ spelled (C)/o/ + /u/ behave differently in speech errors. Speech errors that split the two moras of a long syllable are very frequent in Japanese (Kubozono 1989: 266; Kubozono & Honma 2002:58–59; Terao 2002: 96). If the /ei/ analysis is correct for cases that can be pronounced carefully as [ei], it should be possible for speech errors to split the second mora /i/ from the first mora. An attested example that seems to fit this description is intended /kaN.kei/ 関係 'relationship' mistakenly produced as /kai.keN/ (Kubozono

---

than Chinese. Consequently, the number of headwords affected by replacing ⟨ā ī⟩ with ⟨aa ii⟩ was quite small.

8. Hirayama (1998: 170) provides a map showing an isogloss, far to the west of Tokyo, between dialects that clearly maintain [ei] for /ei/ and those that do not.

1989: 252–255). This appears to be a transposition error: the second mora /N/ of the first syllable and the second mora /i/ of the second syllable have changed places. Now consider the word /kaN.koH/ 観光 'sightseeing', which is spelled ⟨かんこう⟩ (ka n ko u) in *hiragana*. If this word were phonemically /kaN.kou/, we would expect a speech error transposing /N/ and /u/ to be possible: /kaN.kou/→ /kau.koN/. No error of this kind is attested, however, and it strikes native speakers as impossible.[9]

Third, /ei/ spelled (C)/e/ + /i/ and /oH/ spelled (C)/o/ + /u/ are treated differently in braille. Japanese braille is *kana*-based in the sense that each braille letter corresponds to a letter in *hiragana* or *katakana*, although there is no *hiragana*-versus-*katakana* distinction. On the other hand, braille spelling deviates from conventional *kana* spelling in several interesting ways, including the representations of /oH/ (Nihon Tenji Toshokan 1996; Nakano 2011). For example, braille ⟨⠺⠺⟩ (e e) matches modern *hiragana* spelling for /eH/ 'yes', i.e., ⟨ええ⟩ (e e), and braille ⟨⠻⠃⠌⟩ (se i fu) matches modern *hiragana* spelling for /seifu/ 政府 'government', i.e., ⟨せいふ⟩ (se i fu), with /ei/ represented as (C)/e/ + /i/. For /eH/ in recent loanwords, braille uses a letter corresponding to the *katakana* length mark (ー), spelling /seHfu/ セーフ 'safe' as ⟨⠻⠒⠌⟩ (se – fu), with letters corresponding to *katakana* ⟨セーフ⟩ (se – fu).

For /oH/, braille uses letters for (C)/o/ + /o/ when that is the modern *kana* spelling (see §3), as in ⟨⠞⠃⠡⟩ (to o ka) for /toHka/ 十日 'ten days', which is written ⟨とおか⟩ (to o ka) in *hiragana*. Braille also matches *kana* spelling in the case of loanwords spelled with (C)/o/ + length in *katakana*, as in ⟨⠪⠒⠻⟩ (ko – chi) for /koHči/ コーチ 'coach', with letters corresponding to ⟨コーチ⟩ (ko – chi). For words with /oH/ spelled in *hiragana* as (C)/o/ + /u/, however, braille does not match the *hiragana*. For example, /koHči/ 耕地 'cultivated land' is written ⟨こうち⟩ (ko u chi) in *hiragana*, but the braille representation is ⟨⠪⠒⠻⟩ (ko – chi), with the letter corresponding to the length mark representing the second mora of the long vowel. Thus, the two homonyms /koHči/ 'coach' and /koHči/ 'cultivated land' are written identically. In short, /oH/ is spelled in braille as (C)/o/ + /o/ if the modern *kana* spelling is (C)/o/ + /o/ and as (C)/o/ + length otherwise.

---

9. To strengthen the claim that words like /kaN.koH/ 'sightseeing' have /oH/ and not /ou/, despite the *kana* spelling, it would be nice to be able to cite attested speech errors in which the second half of the long vowel and some other mora are transposed, as in /kaN.koH/→/kaH.koN/ or, on the double-vowel analysis of long vowels (see § 2), /kaN.koo/→/kao + koN/. Unfortunately, neither Kubozono (1989) nor Terao (2002) cites an example of this form.

5.   Romanization(s)

All of the evidence considered so far supports the conclusion that most instances of *hiragana* (C)/o/ + /u/ represent the long vowel /oH/ and not the sequence /ou/. Officially recognized romanization systems reflect this phonemic analysis. As noted above in §4, Hepburn romanization is named after the Hepburn of dictionary fame. A slightly modified version of the Hepburn system is widely used today in English-language publications about Japan.[10] This modified Hepburn system has also been used for the headwords in some important dictionaries (Katsumata 1954; Masuda 1974).

Kunrei romanization (訓令式ローマ字 *kunrei-shiki-rōmaji*) was promulgated by the Japanese government in an official directive (*kunrei*) issued by the cabinet in 1937 (Hachiya 2007: 384). This system is a slightly modified version of Japan-style romanization (日本式ローマ字 *Nihon-shiki-rōmaji*), which the physicist Tanakadate Aikitsu (1856–1952) proposed in 1881 (Seeley 1991: 140). The Hepburn and Kunrei systems differ in their representations of several of the consonants of modern Tōkyō Japanese, but their representations of vowels are essentially identical. Vowel length is traditionally marked with a macron ⟨¯⟩ in Hepburn romanization and with a circumflex ⟨ˆ⟩ in Kunrei romanization. Double vowel letters are permitted for long vowels when diacritics are problematic.[11] What is relevant for present purposes is that both systems consistently distinguish /oH/ from /ou/, as the examples in (3) show.

(3)   /koHši/ 講師 'instructor'   /kouši/ 子牛 'calf'
       hiragana: ⟨こうし⟩ (*ko u shi*) *hiragana*: ⟨こうし⟩ (*ko u shi*)
       Hepburn: ⟨kōshi⟩   Hepburn: ⟨koushi⟩
       Kunrei: ⟨kôsi⟩   Kunrei: ⟨kousi⟩

The JR railway companies use a version of the Hepburn system, with macrons marking long vowels, as in ⟨Tōkyō⟩ for /toHkyoH/ 東京 in Figure 1.

---

10. The most conspicuous modification involves the representation of the moraic nasal /N/, which is realized as [mː] immediately preceding a bilabial stop or nasal. In all three editions of his dictionary, Hepburn used ⟨m⟩ for /N/ before /p/, /b/, or /m/, which he romanized as ⟨p b m⟩. The Rōmaji-kai followed the same principle (Yoshida & Inokuchi 1962: 298). Modified Hepburn romanization always uses ⟨n⟩ for /N/, no matter what follows, as in ⟨shinpo⟩ for /šiNpo/ 進歩 'progress' (instead of ⟨shimpo⟩).

11. Users often resort to a hyphen or an apostrophe to distinguish a sequence of two identical short vowels (see §2) from a long vowel, as in ⟨Hiro'o⟩ or ⟨Hiro-o⟩ for the place name /hiroo/ 広尾 vs. ⟨hiroo⟩ for /hiroH/ 疲労 'fatigue'.

Figure 1. JR Station sign

The Ministry of Land, Infrastructure, Transport and Tourism also uses a version of the Hepburn system on road signs, but usually leaves vowel length unmarked, as in ⟨TOMEI⟩ for /toHmei/ 東名 (the name of the expressway connecting Tokyo and Nagoya) in Figure 2.
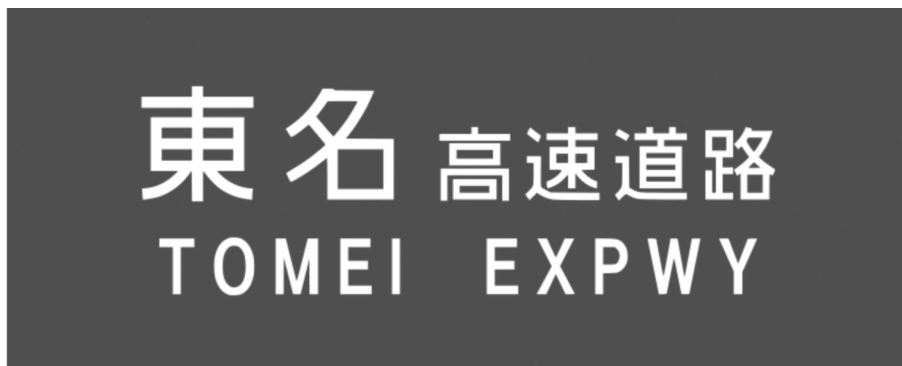
Figure 2. Expressway sign

The Ministry of Foreign Affairs is quite permissive when it comes to romanizing names on passports, but it does not allow diacritics. A passport holder's romanized name appears entirely in capital letters, and an applicant can choose ⟨O⟩, ⟨OO⟩, ⟨OU⟩, or ⟨OH⟩ (but not ⟨Ô⟩ or ⟨Ō⟩) for /oH/. As a result, the most common Japanese surname, /satoH/ 佐藤, which is spelled ⟨さとう⟩ (*sa to u*) in *hiragana*, can appear on passports as ⟨SATO⟩, ⟨SATOO⟩, ⟨SATOU⟩, or ⟨SATOH⟩. Romanizing /oH/ as ⟨OH⟩ is also popular among professional baseball players for the surnames on the backs of their uniform shirts.

This is not the place to go into the relative merits of the romanization systems for Japanese.[12] The important point here is that ordinary people are understandably

---

12. For discussion of the relationship between alternative romanizations and alternative phonemic analyses, see Vance (2008a, 2008b: 225–232).

confused by the lack of consistency, and it is easy to find examples of mixtures, as in ⟨Kichijyoji⟩ for the place name /kičiǰoHji/ 吉祥寺, which would be ⟨Kichijōji⟩ in Hepburn (with ⟨j⟩ for /ǰ/) and ⟨Kitizyôzi⟩ in Kunrei (with ⟨zy⟩ for /ǰ/).

6.   Word processing

In the 1980s, dedicated word processors rapidly replaced Japanese typewriters (amazing but hard-to-use contraptions). These word processors were inexpensive enough that millions of people who had never considered using a Japanese typewriter began producing documents mechanically rather than by hand. More recently, dedicated word processors have almost completely disappeared because personal computers, which are much more versatile, have taken over. The word-processing programs that were hard-wired into dedicated word processors have been converted into software.

Right from the start, there have been two basic input methods for Japanese text. One method uses a keyboard layout with a *kana* letter assigned to each key. Pushing a key causes a *hiragana* letter to appear on the screen. The other method uses the QWERTY keyboard layout and requires the user to type romanized Japanese. For example, when the user types ⓀⒶ, the *hiragana* letter ⟨か⟩ (*ka*) appears on the screen. Interestingly, this second method is far more popular. To make a word to appear in *kanji*, either partly or entirely, the user first inputs a string of *hiragana* letters and then pushes a conversion key (normally the space bar on a computer keyboard). The software responds by offering a possible representation. For example, if the user types Ⓤ Ⓜ Ⓘ, the *hiragana* letters ⟨うみ⟩ (*u mi*) appear on the screen. The first push of the conversion key will cause the *kanji* ⟨海⟩ to replace the two *hiragana* letters. The word *umi* 'sea', typically written with the *kanji* ⟨海⟩, is the most likely possibility here. A second push of the conversion key will cause another possibility to appear, since there are other words that match the same string of consonants and vowels (although they may differ in pitch accent). Additional pushes will bring up additional candidates. It may take several pushes, but eventually the *kanji* ⟨膿⟩ will appear. The word *umi* 'pus', typically written with the *kanji* ⟨膿⟩, is infrequent but not obscure or obsolete.

All Japanese word-processing programs will accept either Hepburn or Kunrei romanization. For example, to get ⟨ふじ⟩ (*fu ji*) to appear on the screen, the user can type Hepburn Ⓕ Ⓤ Ⓙ Ⓘ, Kunrei Ⓗ Ⓤ Ⓩ Ⓘ, or a mixture (Ⓕ Ⓤ Ⓩ Ⓘ or Ⓗ Ⓤ Ⓙ Ⓘ). To input a word with a long vowel, however, the user must use a romanization that matches the *kana* spelling. For example, to get the *kanji* ⟨党利⟩ for the word *tōri* 'party interests', the user must type Ⓣ Ⓞ Ⓤ Ⓡ Ⓘ, since this word is spelled ⟨とうり⟩ (*to u ri*) in *hiragana*. In contrast, to get the *kanji-kana*

mixture ⟨通り⟩, which is the usual way to represent *tōri* 'street', the user must type Ⓣ◎◎Ⓡ①, since this word is spelled ⟨とおり⟩ (*to o ri*) in *hiragana*.

As explained above in §3, ⟨う⟩ (*u*) is by far the most common way of representing the length of /oH/ in modern *kana* spelling. With the rapid spread of word processing, it is hardly surprising that ⟨ou⟩ has become the most popular way of romanizing /oH/ in Japan today, despite the fact that this spelling is allowed officially only as an exception on passports (see §5). Using ⟨ou⟩ for /oH/ instead of ⟨ô⟩ or ⟨ō⟩ is sometimes called *wāpuro-shiki* ワープロ式 'word-processor-style' romanization. Recall, however, that word processing requires ⟨oo⟩ for /oH/ when the word in question is one of those few that require *hiragana* ⟨お⟩ (*o*) to represent the length of /oH/, as in the case of *tōri* (/toHri/) 通り 'street': ⟨とおり⟩ (*to o ri*). A word-processor-style romanization of this word would presumably be ⟨toori⟩, and the allomorph /doHri/ that appears in street names like *Meiji-dōri* 明治通り would be ⟨doori⟩. Nonetheless, examples like the one in Figure 3 are not hard to find.

Figure 3. Dental clinic advertisement

The clinic advertised on the sign in Figure 3 is located on *Daigaku-dōri* 大学通り 'University Avenue', but /doHri/ is romanized as ⟨douri⟩. Another word that requires *hiragana* ⟨お⟩ (*o*) for the length of /oH/, which came up earlier in §4, is *tōka* 十日 'ten days; tenth day': ⟨とおか⟩ (*to o ka*). Nonetheless, the tourist information map in Figure 4 romanizes *tōka* in *Tōkamachi* 十日町 'Tenth-day Town' as ⟨touka⟩.

It is a misnomer to call these last two examples of ⟨ou⟩ word-processor-style romanizations. Typing Ⓓ◎Ⓤ Ⓡ① will produce ⟨どうり⟩ on the screen, which will not covert to ⟨通り⟩ 'street', and typing Ⓣ◎Ⓤ Ⓚ Ⓐ will produce ⟨とうか⟩, which will not covert to ⟨十日⟩ 'tenth day'.

The recent, virus-like spread of ⟨ou⟩ can be understood as the outcome of a struggle for consistency: ⟨ou⟩=/oH/. Recall, however, that the vowel sequence /ou/ also has to be romanized as ⟨ou⟩, so using ⟨ou⟩ for /oH/ does not actually achieve
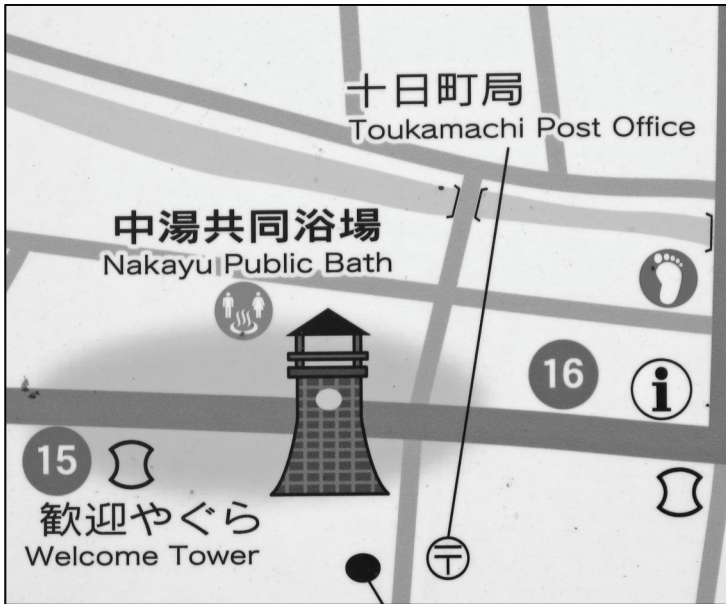
Figure 4. Tourist information map

consistency. Nonetheless, given the bewildering inconsistencies in romanization that confront people every day, it is only natural for them to be confused about how to represent /oH/ and /ou/.

7. The future

Given the overall complexity of the Japanese writing system, the inconsistent spelling of /oH/ in *kana* is no more than a trivial nuisance for native-speaking readers and writers of Japanese, and romanization (as opposed to QWERTY input) is such a marginal concern that it rarely draws any attention. What makes the case in question interesting to phonologists is its potential as a trigger for spelling pronunciation.

As noted above in §4, Sino-Japanese *seifu* 政府 'government' is written ⟨せいふ⟩ (*se i fu*) in *hiragana*, and the recent loanword *sēfu* 'safe' is written ⟨セーフ⟩ (*se – fu*) in *katakana*. It was also pointed out that *seifu* can be [seiɸɯ] in careful pronunciation but is typically [seːɸɯ], that is, the same as *sēfu*, which can only be [seːɸɯ]. It has been suggested that the careful pronunciation with [ei] of words like *seifu* is a spelling pronunciation, motivated by knowledge of the *kana* spelling (Vance 2008b: 65–66; Labrune 2012: 40). The difference between [ei] and [eː] is very small, of course, but even if a diphthong has a much larger difference than

[ei] does between its starting point and ending point, it is not at all unusual for it to change historically into a monophthong.

The reason so many modern Japanese words have *kana* spellings that imply /ei/ is presumably that they were pronounced with [ei] when the relevant spelling convention was adopted. It is easy to imagine that, after this spelling convention became entrenched, /ei/ came to be pronounced as [eː], resulting in a merger of /ei/ and /eH/. If this scenario is accurate, it implies that the modern Tōkyō distinction between /ei/ and /eH/ has been resurrected relatively recently. If so, spelling pronunciation is the obvious explanation for the resurrection.

Now consider the long vowel /oH/. *Hiragana* spellings with the length represented by ⟨う⟩ (*u*) are the overwhelming majority among native and Sino-Japanese words that contain /oH/ (§3), and the romanization ⟨ou⟩ for /oH/ is the most popular in everyday life (§6). At present, words with /oH/ cannot be pronounced with [ou], no matter how they are romanized or spelled in *kana* (§4). The word for 'elephant' is still /zoH/ 象, pronounced [dzoː], in Tōkyō today (§4), but is it possible that *kana* spelling, reinforced by unofficial romanization practice, could one day lead to to spelling pronunciations such as [dzou], implying /zou/? Only time will tell.

Acknowledgements

References

Bloch, Bernard. 1950. Studies in colloquial Japanese IV: Phonemics. *Language* 26: 86–125. https://doi.org/10.2307/410409
Bunka-chō. 1986. *Gendai kana-zukai (naikaku kokuji, naikaku kunrei)*. Tokyo: Bunka-chō.
Frellesvig, Bjarke. 2010. *A History of the Japanese Language*. Cambridge: CUP. https://doi.org/10.1017/CBO9780511778322
Gnanadesikan, Amalia E. 2009. *The Writing Revolution: Cuneiform to the Internet*. Chichester: Wiley-Blackwell.
Hachiya, Kiyoto. 2007. <<TAAL:su>>Rōmaji. In *Nihongo-gaku kenkyū jiten*, Y. Hida et al. (eds.), 383–385. Tōkyō: Meiji Shoin.

Hepburn, J. C. 1867. *A Japanese and English Dictionary with an English and Japanese Index*. Shanghai: American Presbyterian Mission Press.

Hepburn, J. C. 1872. *A Japanese-English and English-Japanese Dictionary*, 2nd edn. Shanghai: American Presbyterian Mission Press.

Hepburn, J. C. 1886. *A Japanese-English and English-Japanese Dictionary*, 3rd edn. Tokyo: Z. P. Maruya & Co. (Maruzen).

Hirayama, T. 1998. Zen-Nihon no hatsuon to akusento. In *Nihongo hatsuon akusento jiten*, NHK Hōsō Bunka Kenkyūjo (ed.), 123–173. Tokyo: Nihon Hōsō Shuppankai.

Katsumata, S. (ed.). 1954. *Kenkyusha's New Japanese-English Dictionary*, 3rd edn. Tokyo: Kenkyūsha.

Kindaichi, H. 1950. 'Gooku' to 'gōku': Hikionsetsu no teishō. *Kokugo to Kokubungaku* 27(1): 46–59.

Koizumi, T. 1978. *Nihongo no seishohō*. Tokyo: Taishūkan.

Kubozono, H. 1989. The mora and syllable structure in Japanese: Evidence from speech errors. *Language and Speech* 32: 249–278.

Kubozono, H. & Honma, T. 2002. *Onsetsu to mōra*. Tokyo: Kenkyūsha.

Labrune, L. 2012. *The Phonology of Japanese*. Oxford: OUP.
https://doi.org/10.1093/acprof:oso/9780199545834.001.0001

Ladefoged, P. & Maddieson, I. 1996. *The Sounds of the World's Languages*. Oxford: Blackwell.

Martin, S. E. 1952. *Morphophonemics of Standard Colloquial Japanese* [Language Dissertation No. 47]. Baltimore MD: Linguistic Society of America.

Masuda, K. (ed.). 1974. *Kenkyusha's New Japanese-English Dictionary*, 4th edn. Tokyo: Kenkyūsha.

Nakano, Maki. 2011. Kindai kana-zukai kaitei-shi kara mita 'tenji kana-zukai' ni tsuite. In *Nihongo Gakkai 2011-nendo Shunki Taikai Yokō-shū*, 91–98.

Nihon Tenji Toshokan (ed.). 1996. *Hajimete tenji o yomu anata e*. Tokyo: Enpawamento Kenkyūjo.

Rōmaji-kai (ed.). 1885. *Rōmaji nite Nihongo no kakikata*. Tokyo: Rōmaji-kai.

Sampson, G. 1985. *Writing Systems: A Linguistic Introduction*. London: Hutchinson.

Seeley, C. 1991. *A History of Writing in Japan*. Leiden: Brill.

Sproat, R. 2000. *A Computational Theory of Writing Systems*. Cambridge: CUP.

Tanahashi, H. 2012. Gakkō ni okeru hyōki no hi-nichijōsei. In *Nihongo moji, hyōki no muzukashisa to omoshirosa*, 27–34. Tokyo: Kokuritsu Kokugo Kenkūyjo.

Terao, Y. 2002. *Ii-machigai wa dōshite okoru?* Tokyo: Iwanami Shoten.

Vance, T. J. 2008a. Romanization and phonemicization of Japanese. In *Japanese/Korean Linguistics* 13, M. Endo Hudson, P. Sells & S.-A. Jun (eds.), 81–91. Stanford CA: CSLI.

Vance, T. J. 2008b. *The Sounds of Japanese*. Cambridge: CUP.

Vance, T. J. 2011. *Rendaku* in Sino-Japanese: Reduplication and coordination. In *Japanese/Korean Linguistics* 19, H. Sohn, H. M. Cook, W. O'Grady, L. Serafim & S. Y. Cheon (eds.), 465–479. Stanford CA: CSLI.

Yoshida, S. & Inokuchi, Y. (eds.). 1962. *Meiji ikō kokuji mondai shoan shūsei*. Tokyo: Fuzama Shobō.

Loanword accent of Kyungsang Korean

A moraic account

Haruo Kubozono

National Institute for Japanese Language and Linguistics

This paper reanalyzes loanword prosody of North and South Kyungsang Korean and proposes a mora-based accentual analysis as opposed to the traditional syllable-based tonal analyses. The new analysis is based on the following three observations. First, loanwords in both North and South Kyungsang Korean are invariably 'accented' in that they involve a sudden pitch fall at the surface output. Second, accent in Kyungsang Korean is fixed in a certain position of the word and does not change in phrases. Third, Kyungsang loanwords are generally accented on their *penultimate mora*: pitch falls between the penultimate and final moras in most loanwords, whether it is across syllables or within a syllable. Kyungsang Korean is thus a 'mora-counting language' as far as loanword prosody is concerned, just like many Japanese dialects.

Keywords: loanword accent, Kyungsang Korean, penultimate accent, Japanese, mora, mora-counting language, contour tone

1.   Introduction

Kyungsang (Gyeongsang) Korean is spoken in the southeastern part of Korea. This dialect is generally divided into two areas, North and South Kyungsang, which we call NK Korean and SK Korean in this paper. Both NK and SK Korean are known to use pitch contrastively in their native vocabulary (Hayata 1999; Fukui 2000; Kenstowicz & Sohn 2001, etc.). This is exemplified by the data of SK Korean in (1) (Lee 2005), where H and L given in parentheses stand for high and low tones, respectively.[1] In this respect, Kyungsang Korean is more similar to Tokyo and Osaka

---

Japanese than to Seoul Korean, the latter being generally classified as an 'accentless dialect', or a dialect with no fixed accent pattern specified at the word level.

(1)   a.   o.le.pi (HHL) 'elder brother'
       b.   maŋ.a.ci (LHL) 'foal, pony'
       c.   pu.k'u.lɯʌm (LHH) 'shyness'
       d.   a.ci.me (HLL) 'aunt'

In Kyungsang Korean, loanwords are supposed to exhibit more than one accent/tone pattern like the native words in (1), as we will see shortly. On the basis of an experimental analysis of originally collected accent data as well as a reanalysis of the data reported in the literature, this paper reanalyzes loanword prosody of NK and SK Korean and proposes a new analysis which is different from those proposed in the literature in several crucial ways. First, our analysis invokes not only the syllable but also the mora as a basic unit of description. Second, we propose a pitch accent analysis rather than a tonal analysis: we posit that only one position in a word is phonologically marked, whereas all syllables are specified with tones in the traditional analyses. We argue, moreover, that the location of accent is not marked in the lexicon per se but is derived by rule. This new analysis allows us to explain the crucial similarities and differences between NK and SK Korean on the one hand, and to capture some interesting similarities between Kyungsang Korean and Tokyo/Osaka Japanese, on the other.

This paper is organized as follows. The next section reviews previous studies of loanword prosody in Kyungsang Korean. Sections 3 and 4 are the main part of this paper where we will present our original data and analysis. In Section 4, specifically, we will propose a pitch accent (rather than a tonal) rule that puts an accent on the penultimate mora, or the second mora from the end of the word for Kyungsang loanwords. On the basis of this new generalization, Section 5 considers the similarities and differences between Kyungsang Korean and Tokyo/Osaka Japanese. Section 6 provides a summary of the paper as well as some remaining questions for future work.

2.   Previous studies

There are several substantial studies on the loanword accent/tone of both NK Korean (Kenstowicz & Sohn 2001; Kim 2006; Son 2007a) and SK Korean (Jun 2005; Lee 2005). Of these Lee (2005) is based on the largest corpus which contains 2,265 loanwords, mainly from English. As Lee (2005) also gives a detailed description of syllable structure and tonal patterns, we will focus on this work to review

the literature with additional reference to Kenstowicz and Sohn's (2001) analysis of NK Korean.

Lee (2005) established the following three tonal patterns for SK loanwords. The tonal patterns are schematically shown in parentheses, where σ_L and σ_H denote light (monomoraic) and heavy (bimoraic) syllables, respectively, whereas σ represents any syllable, light or heavy.

(2) a.   If the word begins with a heavy, i.e., bimoraic, syllable, its first two syllables are high-toned and the following syllables low-toned. $(\overline{\sigma_H \sigma} | \underline{\sigma \dots \sigma} \#)$

   b.   If the word begins with a light (monomoraic) syllable and ends in a heavy syllable, its initial syllable is low-toned and the remaining syllables high-toned. $(\underline{\sigma_L} | \overline{\sigma \dots \sigma_H} \#)$

   c.   If the word begins with and ends in a light syllable, its initial and final syllables are low-toned, with all other syllables high-toned. $(\underline{\sigma_L} | \overline{\sigma \dots \sigma} \underline{\sigma_L} \#)$

This is quite similar to the following generalization of NK Korean proposed by Kenstowicz & Sohn (2001) (henceforth, K&S 2001). K&S additionally claim that the 'penultimate' pattern in (3c) represents the default prosodic pattern of loanwords in NK Korean and is the most productive pattern in native nouns as well.

(3) a.   'Double-accent class'
      If the initial syllable of the output is heavy, then the initial two syllables are high and the remaining syllables are low. $(\overline{\sigma_H \sigma} | \underline{\sigma \dots \sigma} \#)$

   b.   'Final-accent class'
      If the initial syllable is light and the final syllable is heavy, only the final syllable is high. $(\underline{\sigma_L \sigma \dots} | \overline{\sigma_H} \#)$

   c.   'Penultimate-accent class'
      If the initial and the final syllables are both light, only the penultimate syllable is high. $(\underline{\sigma_L \sigma \dots} | \overline{\sigma} \underline{\sigma_L} \#)$

'Heavy syllables' in (2) and (3) basically refer to closed syllables, or syllables ending in a consonant.[2] Since vowel length is distinctive at least in word-initial position in the native vocabulary of Kyungsang Korean (Hayata 1999; Fukui 2000; K&S 2001),

---

2. Coda consonants contribute to weight in Kyungsang Korean just as they do in Japanese. The only exception to this is the first member of a geminate /l/, which does not count as one mora (K&S 2001; Jun 2005). Hence, the initial syllable of /kʰel.lin.tʌ/ 'calendar' as well as the second syllable of /pa.nil.la/ 'vanilla' counts as a light syllable.

word-initial heavy syllables can be open syllables with a long vowel. (2) and (3) are exemplified in (4), where trisyllabic loanwords are used for illustration.[3,4]

(4) a. sin.tɨ.lom 'syndrome', lep.so.ti 'rhapsody', ak.sen.tʰɨ 'accent'
   b. kʰɨ.lem.lin 'Kremlin', li.mu.cin 'limousine', pɨ.la.cil 'Brazil', kʰe.pi.net 'cabinet'
   c. ka.i.tɨ 'guide', o.len.cɨ 'orange'

As can be seen from (2) and (3), Lee's and K&S's generalizations presuppose certain correlations between syllable structure and surface tonal patterns. First, word-initial syllables take either high or low tone depending on whether they are heavy or light: initial heavy syllables take a high tone, whereas light syllables in the same position take a low tone. Second, a comparison between (2b)/(3b) and (2c)/(3c) reveals that word-final syllables tend to be high in pitch if they are heavy. Exceptions to this can be found in cases where both the initial and final syllables are heavy; in such cases, final syllables are assigned a low tone according to (2a)/(3a).

These two facts point to a general principle regarding the interaction between syllable structure and tone: heavy syllables tend to attract a high tone, whereas light syllables tend to take a low tone. This observation is shared by studies of loanword prosody of Kyungsang Korean (e.g., Jun 2005). In fact, K&S's analysis of NK Korean is only different from Lee's analysis of SK Korean in the description of (4b) and (partially) of (4c). K&S posit that NK Korean has a high tone only on the final syllable for (4b) and on the penultimate syllable in (4c). These differences are illustrated in (5).

(5) SK Korean   NK Korean
    LHH   LLH
    LHHH   LLLH
    LHHL   LLHL
    LHHHL   LLLHL

In general, NK Korean is different from SK Korean in having just one high-toned syllable in a word. This led K&S (2001) and others to propose for NK Korean what looks like a pitch accent analysis as in (3) rather than a tonal analysis as in (2). However, these analyses are basically identical in that they posit three distinct prosodic patterns–namely, those in (2a-c) and (3a-c)–for loanwords and they identify

---

3. Korean lacks a contrast between voiced and voiceless consonants, but has three types of voiceless stops (aspirated, tense and lax). In its loanword phonology, voiced consonants are generally borrowed as lax consonants and voiceless consonants as aspirated ones (Kang 2003).

4. /c/ denotes a voiceless affricate. /ɨ/ is a high vowel that is used as a default epenthetic vowel in loanwords.

high tones as accent, apparently using 'accent' and 'high tone/pitch' interchangeably. The latter point is symbolically shown by K&S's term 'doubled accent' in (3a), according to which two adjacent syllables are both accented in word-initial position, e.g., /sén.tál/ 'sandal', /án.tán.tʰe/ 'andante'. This definition of 'accent' is fundamentally different from the conventional definition of the term referring to the culminative phonological prominence at the lexical level, which is adopted in this paper. With this difference in mind, we will present our original data and analysis in the next section.

3. Experiment

3.1 Data collection

In order to confirm that the conventional description is correct, we collected original data from two groups of consultants, which we call primary and secondary groups here. The primary group consists of two female native speakers of SK Korean: one is in her twenties and from Pusan, whereas the other is in her late forties and from Chinju, a city about eighty kilometers to the west of Pusan. Both speakers lived in or near Kobe, Japan, at the time of recording in 2005–6.[5] The secondary group of consultants consists of ten speakers, four of whom are native speakers of NK Korean and the remaining six are from the SK area.[6] Both groups of consultants were tested individually.

As for the primary group, we asked the two consultants to pronounce a total of 757 loanwords,[7] once or twice in isolation and once or twice with the nominative marker /i/ or /ka/.[8] The 757 test words, which are mainly from English, vary in phonological length and syllable structure. They vary from one to six-syllable words, as illustrated in (6). Moreover, they vary in syllable structure, too, as illustrated with the trisyllabic words in (7). We controlled for syllable structure in order to confirm the reported effects of syllable structure on tonal patterns.

---

5. It is unlikely that their knowledge of Japanese influenced the accent patterns they produced since, as will be discussed later, the pitch patterns they produce for English loanwords are different from those observed for the same words in Japanese.

6. Three speakers of NK Korean are from Taegu, while the other is from Kyungju. Among the six SK Korean speakers, four are from Pusan, one from Masan, and one from Chinju.

7. I am grateful to Kwon Yeonjoo for her help in making this word list.

8. /i/ and /ka/ appear in a complementary fashion: /i/ is added to nouns ending in a consonant, whereas /ka/ is attached to nouns ending in a vowel.

(6)   pel 'bell', lʌn.tʌn 'London', hen.ti.kʰep 'handicap', pʰɨl.la.sɨ.tʰik 'plastic',
      kʰom.pi.ne.i.ʃʌn 'combination', en.tʰʌ.tʰe.in.mʌn.tʰɨ 'entertainment'

(7)   a. $\sigma_L\sigma_L\sigma_L$ pʰi.a.no   'piano'
      b. $\sigma_L\sigma_L\sigma_H$ pa.sɨ.kʰet   'basket'
      c. $\sigma_L\sigma_H\sigma_L$ a.mon.tɨ   'almond'
      d. $\sigma_L\sigma_H\sigma_H$ wʌ.siŋ.tʰʌn   'Washington'
      e. $\sigma_H\,\sigma_L\sigma_L$ an.tʰe.na   'antenna'
      f. $\sigma_H\sigma_L\sigma_H$ in.tʰʌ.net   'internet'
      g. $\sigma_H\sigma_H\sigma_L$ ak.sen.tʰɨ   'accent'
      h. $\sigma_H\sigma_H\sigma_H$ kʰʌn.pen.ʃʌn   'convention'

The secondary group of consultants was tested only with a fraction of the test word set. Their intuition was particularly helpful in interpreting the nature of pitch falls, which we discuss in Section 3.2.1 below.

3.2   Results

3.2.1   *Pitch fall*

The most striking fact that we discovered from our experiment is that *all* loanwords are pronounced with a pitch fall in both NK and SK Korean.[9] There was no exception to this rule whatsoever. This was true of all the 757 test words, all the consultants (both of primary and secondary groups), and of both types of test forms (with or without the nominative particle). The pitch fall was noticeable not only in the two types of words in (2a)/(3a) and (2c)/(3c), but also in those words belonging to (2b)/(3b). Namely, pitch does fall in words that have been described as ending in a high tone: it always falls *within* the final heavy syllable, e.g., within /cil/ in /pɨ.la.cil/ 'Brazil', within /cin/ in /li.mu.cin/ 'limousine', within /im/ in /ke.im/ 'game', etc. This can be confirmed both auditorily and acoustically.[10] Representative pitch forms of these words as produced by a speaker of SK Korean are given in Figure 1. NK Korean speakers show the same pattern with respect to the location of pitch fall as shown in Figure 2. In both figures, the relevant positions of pitch fall are indicated by arrows.

---

9. One may wonder if the observed pitch patterns were influenced by the stress patterns in the source language. This question can be answered negatively since the loanwords in our data showed a rather uniform accent pattern as described shortly below. This is true of the loanword data reported in the literature, too.

10. This pitch fall can be found in Lee's (2007) acoustic data, too, but the final syllable is recognized as bearing a high tone by Lee himself.
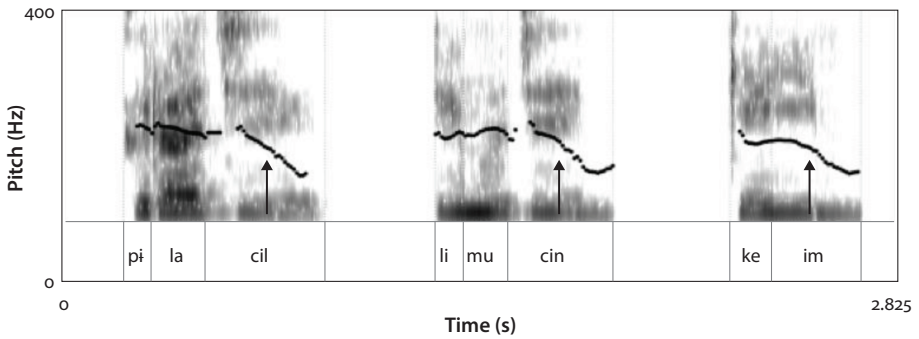
Figure 1 Typical F0 patterns of /pɨ.la.cil/ 'Brazil', /li.mu.cin/ 'limousine' and /ke.im/ 'game' produced by a SK speaker.
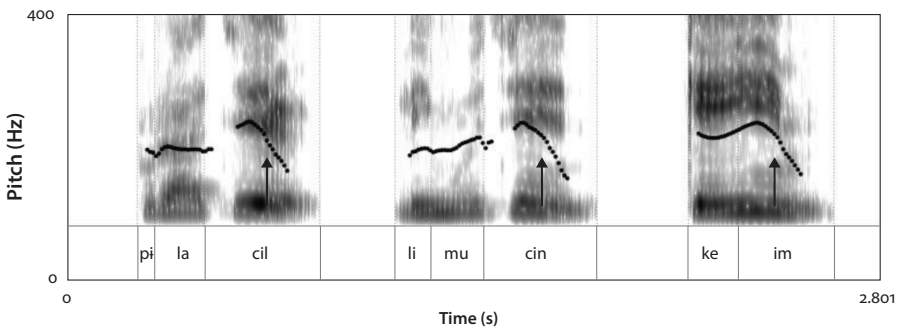
Figure 2 Typical F0 patterns of /pɨ.la.cil/ 'Brazil', /li.mu.cin/ 'limousine' and /ke.im/ 'game' produced by a NK speaker.

Given the pitch fall in final heavy syllables, one may naturally wonder if this might be a property of the phrase rather than the word. Namely, the pitch fall in question might be interpreted as a phrasal tone rather than a lexical one in the framework of autosegmental metrical theory of intonational phonology (Pierrehumbert & Beckman 1988, Ladd 1996). If it is a phrasal property, it should be given a different interpretation from the pitch fall observed in (2a)/(3a) and (2c)/(3c), which takes place at syllable boundaries. If it turns out to be a property of the word, on the other hand, it should phonologically be interpreted in the same way as the pitch fall in (2a)/(3a) and (2c)/(3c).

This question can be solved by checking how native speakers of Kyungsang Korean pronounce the test words in sentences and, in particular, whether the pitch fall in question persists when disyllabic or longer particles are attached to the words.[11] If the pitch fall is a lexical property, it should remain intact even when those particles follow within the same phrase. If, on the other hand, the pitch

---

11. I owe this suggestion to Sun-Ah Jun.
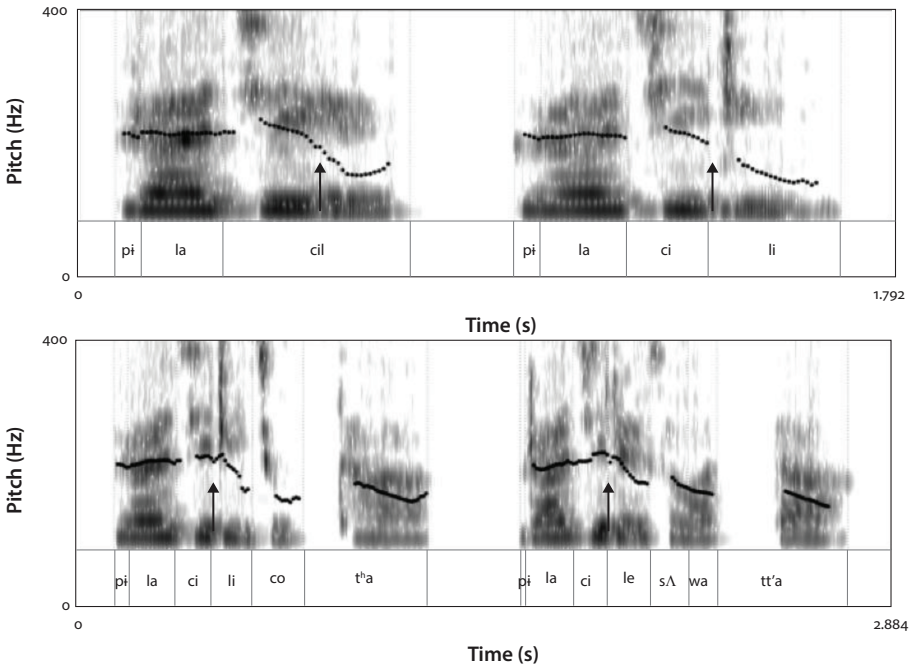
Figure 3 Typical F0 contours of /pɨ.la.cil/ 'Brazil', /pɨ.la.ci.li/ 'Brazil-NOM', /pɨ.la.ci.li co.tʰa/ '(I) like Brazil', and /pɨ.la.ci.le.sʌ wat.t'a/ '(I) came from Brazil', produced by a SK Korean speaker.

fall is a phrasal property, it should either disappear entirely or move towards the end of the phrase as the entire phrase becomes phonologically longer. We tested these points by asking our secondary group of consultants to pronounce relevant test words in the following phonological contexts: /-i/ (or /-ka/) is a nominative case marker, whereas /-esʌ/ and /-k'aci/ are postpositions meaning 'from' and 'to', respectively.

(8) a. NOUN-i/ka cotʰa 'I like (noun).'
     b. NOUN-esʌ watt'a 'I came from (noun).'
     c. NOUN-k'aci katt'a 'I went to (noun).'

This supplementary experiment has shown that the pitch fall in (2b)/(3b)-type words generally survives in the same position even if the words are put in sentences and/or if disyllabic or longer particles are attached to them. For example, pitch falls within the final heavy syllable /cil/ in (9a), between /ci/ and /li/ in (9b/c), between /ci/ and /lesʌ/ in (9d). In all these cases, the location of pitch fall is invariant: pitch falls immediately after /ci/.
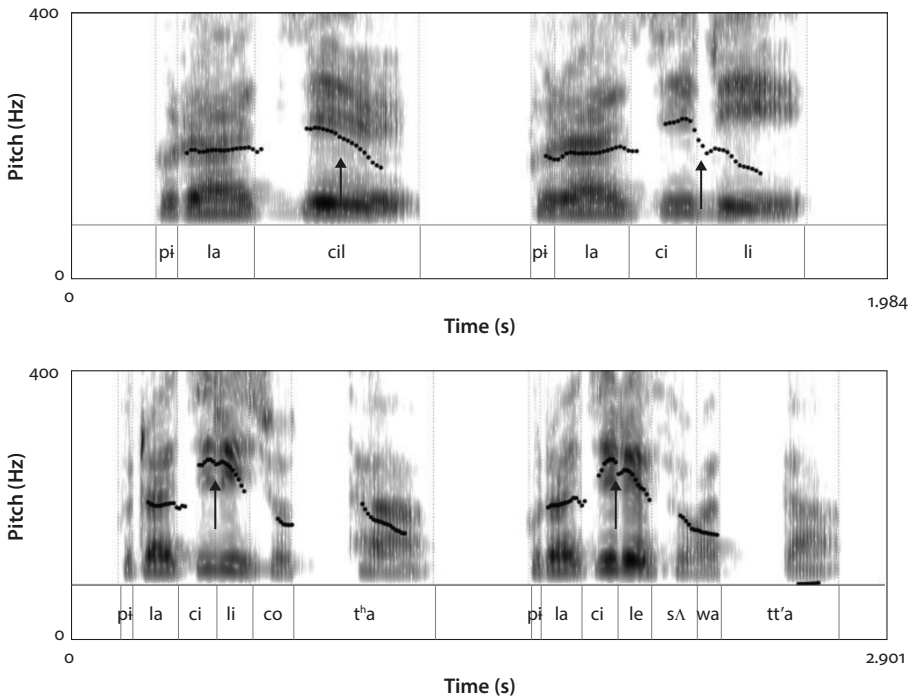
Figure 4 Typical F0 contours of /pɨ.la.cil/ 'Brazil', /pɨ.la.ci.li/ 'Brazil-NOM', /pɨ.la.ci.li co.tʰa/ '(I) like Brazil', and /pɨ.la.ci.le.sʌ wat.t'a/ '(I) came from Brazil', produced by a NK Korean speaker.

(9) a. pɨ.la.cil 'Brazil'
     b. pɨ.la.ci.li 'Brazil-NOM'
     c. pɨ.la.ci.li co.tʰa '(I) like Brazil.'
     d. pɨ.la.ci.le.sʌ wat.t'a '(I) came from Brazil.'

This can be confirmed acoustically, too, as can be seen from the pitch contours in Figure 3 which were produced by a SK Korean speaker. NK Korean exhibits basi-cally the same pattern with respect to the location of pitch fall, as shown in Figure 4.

3.2.2   *Pitch rise*

While the current study revealed a critical problem with the previous studies as re-gards the description of pitch fall, it did not find any serious problem with regard to pitch rise. Generally speaking, words begin with high pitch if they start with a heavy syllable, while they begin with relatively low pitch if their initial syllable is light. The latter is especially evident in NK Korean (e.g., Figure 2). In this respect, NK and SK Korean do not seem to differ very much. A major exception to this generalization can be found in disyllabic words consisting of two light syllables. Words of this

class begin with a high-pitched light syllable, which is followed by low pitch in the second syllable: in /ká.sɨ/ 'gas', for example, /ka/ is high and /sɨ/ is low (cf. (17d)).

4. Analysis

4.1 Penultimate accent rule

The data presented in Section 3.2.1 show that (2b)/(3b)-type words exhibit a pitch fall just as words of (2a)/(3a) and (2c)/(3c) types, and that the pitch fall in the final heavy syllables in (2b)/(3b)-type words occurs consistently in sentences. What these facts mean is that the pitch fall in question is a lexical property rather than a phrasal one, just like the pitch fall observed in (2a)/(3a) and (2c)/(3c) type words. Note in this connection that pitch fall within final heavy syllables in (2b)/(3b) is quite similar to and, in fact, indistinguishable from the pitch fall observed in accented heavy syllables in Tokyo Japanese, e.g., the pitch fall observed in the underlined syllables in words in (10).

(10) <u>kan</u> 'can', <u>kya</u>ppu 'cap', koo<u>hii</u> 'coffee', beru<u>gii</u> 'Belgium'

In Tokyo Japanese, these words are interpreted as having a lexical pitch accent on the relevant heavy syllables and are often represented as in (11a) or (11b) (McCawley 1968; Kubozono 1988; Shibatani 1990). This abstract accent is phonetically implemented as a sequence of high and low pitched moras, with the accented mora having high pitch and the following mora(s) low pitch.

(11) a. kán, kyáp.pu, koo.híi, be.ru.gíi[12]
      b. ka'n, kya'p.pu, koo.hi'i, be.ru.gi'i

Now we can apply this accentual analysis to the tonal patterns of Kyungsang Korean presented in the preceding sections. First, the words in (4b) can now be represented as in (12), where the vowels in the final heavy syllables are accented. More precisely, the accent is placed on the second mora from the end of the word.

(12) kʰɨ.lem.lín 'Kremlin', li.mu.cín 'limousine', pɨ.la.cíl 'Brazil', kʰe.pi.nét 'cabinet'

Similarly, our accentual analysis assigns an accent on the final mora of the penultimate syllable in (4a) and (4c) words.

(13) a. (=4a) lep.só.ti 'rhapsody', ak.seń.tʰɨ 'accent'
      b. (=4c) ka.í.tɨ 'guide', o.leń.ci 'orange'

---

12. The word for 'Belgium' admits a second–probably newer–accent pattern with an accent on the initial syllable, i.e., /bé.ru.gii/.

A comparison of (12) and (13) reveals that accent location is quite consistent: accent falls on the *penultimate mora* (exceptions will be discussed shortly below). This penultimate accent rule can be formulated as follows:

(14) Penultimate accent rule in Kyungsang Korean loanwords
      Accent falls on the penultimate mora, or the second mora from the end of
      the word.

This analysis is fundamentally different from those proposed in the literature in two ways. First, the rule we propose is an accent rule rather than a tonal rule: it specifies only one location in a word that is phonologically prominent rather than the overall tonal pattern at the surface, e.g., LHL. It is, therefore, more abstract than the previous analyses referring to the surface tone, including Lee's generalization described in (2). It is also different from K&S's (2001) generalization in (3) in that only one position in a word is phonologically marked. Since our new rule specifically marks the location of pitch fall, which we identify as a phonetic correlate of phonological accent, the 'double-accent pattern' in (3a) can be reinterpreted as a pattern involving an accent on the second syllable, or on the final mora of the second syllable, to be more precise.

Second, our generalization is based upon the *mora* rather than the *syllable*. All previous studies of south Kyungsang prosody analyze loanwords merely as a sequence of syllables to which a string of tones (high or low) is assigned. This is basically true in K&S's (2001) pseudo-accentual analysis of NK loanwords, too, where one or two *syllables* in a word are marked as 'accented'. Our analysis is crucially different from these analyses in positing the mora as a basic unit of description. This does not of course preclude the possibility of the syllable being another basic unit; on the contrary, the syllable as well as the mora is an indispensable phonological unit in Kyungsang Korean, as we will see in Section 5.

The mora-based generalization in (14) has a number of advantages over the syllable-based generalizations proposed in the literature. The most important is that it can distinguish between the two accent loci in a heavy syllable, i.e., the first and the second moras. This can be illustrated by the underlined syllables in (15): (15a) has an accent on the first mora of a heavy syllable, whereas (15b) bears an accent on the second mora (hyphens indicate mora boundaries within heavy syllables).[13] This distinction is not possible in syllable-based analyses since syl-

---

13. This is reminiscent of Hayes' (1995: 49) claim that heavy syllables can have an accentual contrast (between rising and falling prominence) in pitch accent languages, but not in stress (accent) languages, or the general discussion that stress-bearing units are syllables, whereas tone-bearing units are moras.

lables, both heavy and light, should have only one locus for accent and, hence, the two patterns in (15) cannot be generalized as shown in the parentheses.

(15) a. kʰe.cʰá-p (kʰe.cʰáp) 'ketchup'
      b. o.le-ń.ci (o.lén.ci) 'orange'

This distinction turns out to be crucial in our analysis since it allows us to generalize seemingly different prosodic patterns. For example, (15a) and (15b) have been classified by K&S (2001) as final accent and penultimate accent, respectively, as shown in the parentheses above. In our mora-based analysis, in contrast, they can be generalized as a pattern involving an accent on the penultimate mora, i.e., /kʰe.cʰá-p/ and /o.le-ń.ci/, thus being attributed to the penultimate rule in (14). In phonetic terms, the accent is realized as an abrupt pitch fall between the final two moras in both cases.

It must be emphasized here that the penultimate accent rule in question is very productive and admits only a certain class of exceptions. It admits no exception for monosyllabic words, since all words of this type are accented on their heavy syllables. Monosyllabic words not ending in a consonant are usually pronounced with a long vowel and are indeed pronounced with a falling pitch within this vowel. We can interpret this vowel as bimoraic and posit an accent on its first mora.

(16) a. kʰáa 'car', páa 'bar', tʰíi 'tea'
      b. kʰán 'can', pʰín 'pin', tʰén 'ten'

Similarly, disyllabic words admit no exception, either. They fall into the four classes in (17) according to their syllabic composition, but all of them display a pitch fall between the penultimate and final moras: the position of the relevant pitch fall is shown by a downward arrow. Specifically, pitch falls within the final heavy syllable in (17a) and (17b),[14] while it falls immediately before the final light syllable in (17c) and (17d).

In K&S (2001), (17a) and (17c) were classified as 'doubled accent', while (17b) and (17d) were classified as 'final accent' and 'penultimate accent', respectively. All these seemingly different patterns can be adequately generalized by the penultimate accent rule in (14).

---

14. This means that a falling 'contour tone' (Maddieson 1978) is permitted in Kyungsang Korean. This fact contrasts with the observation that word-initial heavy syllables begin with high pitch, which means that a rising contour tone is prohibited in the same language (see Section 5.2 for more details).

(17)

    a. $\sigma_H\sigma_H$ in.tʰʌn 'intern'

    b. $\sigma_L\sigma_H$ ke.ím 'game'

    c. $\sigma_H\sigma_L$ kol.pʰɨ 'golf'

    d. $\sigma_L\sigma_L$ ká.sɨ 'gas'

Finally, three-syllable or longer words admit a certain number of exceptions to the penultimate rule. Exceptions are restricted largely to (2a)/(3a)-type words, however. In trisyllabic words, exceptions are attested in words such as those in (18), where both the final and initial syllables are heavy. In these words, the final two moras usually have low pitch, which means that the antepenultimate mora is exceptionally accented. This accent pattern seems quite odd in view of the fact that the accent can dock on a light syllable flanked by heavy syllables.

(18)   sin.tɨ.lom 'syndrome'
         ʃam.pʰé.in 'champagne'
         in.tʰʌ.net 'internet'
         cen.tʰɨl.men 'gentleman'

Exceptions to (14) can also be found in longer words. Specifically, four-syllable or longer words of (2a)/(3a) type become exceptions to the penultimate rule since only the initial two syllables have high pitch. In accentual terms, these words attract an accent onto the antepenultimate syllable, as in (19a), or onto a syllable further to the left, as in (19b).

(19)   a.   kʰon.kʰɨ.li.tʰɨ 'concrete'
       b.   in.tʰʌ.ne.ʃʌ.nʌl 'international'

While the types of words given in (18) and (19) should be marked in the lexicon as to their accentual behavior, all other words follow the penultimate rule in (14). In fact, almost all words beginning with a light syllable can be explained by this rule. In our corpus of 757 words, about 80% of the whole data including those words that begin with a heavy syllable obey the rule. This ratio is quite high and is actually higher than the corresponding ratio of the famous antepenultimate accent rule in Japanese in (20) (McCawley 1968; Akinaga 1985), which accounts for about 70% of loanwords in Tokyo Japanese (Sibata 1994; Kubozono 2006a/b, 2011).

(20)   Loanword accent rule in Tokyo Japanese
       Accent falls on the syllable containing the antepenultimate mora, or the third mora from the end of the word.

4.2   Reanalysis of existing data

Given the rule in (14) and its high productivity, one may naturally wonder if it can account for the data reported in the previous studies of Kyungsang phonology. Two previous studies are particularly relevant for this purpose: Lee's (2005) data of SK Korean and Son's (2007a) data of NK Korean. Both studies give the frequency of each accent/tonal pattern for each syllable structure as well as for each phonological length. Lee (2005), for example, classifies his data of trisyllabic words as in Table 1, where 'percentage' means the percentage of words showing the 'main tone pattern' for each syllable composition.

Table 1. Lee's (2005) data for trisyllabic loanwords

Syllable composition	Main tone pattern	Percentage (%)
$\sigma_L \sigma_L \sigma_L$	LHL	412/446 (92.4%)
$\sigma_H \sigma_L \sigma_L$	HHL	71/75 (94.7%)
$\sigma_H \sigma_H \sigma_L$	HHL	23/25 (92.0%)
$\sigma_H \sigma_L \sigma_H$	HHL	20/26 (76.9%)
$\sigma_H \sigma_H \sigma_H$	HHL	13/14 (92.8%)
$\sigma_L \sigma_H \sigma_L$	LHL	124/126 (98.4%)
$\sigma_L \sigma_H \sigma_H$	LHH	33/36 (91.7%)
$\sigma_L \sigma_L \sigma_H$	LHH	246/269 (91.4%)

Of the three tonal patterns given in Table 1, LHH is now reinterpreted as LH$\widehat{\text{HL}}$, where $\widehat{\text{HL}}$ denotes a so-called 'contour tone' involving a pitch change within a syllable, or a pitch fall within the final syllable in this particular case.[15] The penultimate accent rule in (14) can account for most of the 'main tone patterns' in Table 1. For instance, it readily accounts for the main tone patterns in all the words ending in a light syllable, i.e., $\sigma_L \sigma_L \sigma_L$, $\sigma_H \sigma_L \sigma_L$, $\sigma_H \sigma_H \sigma_L$ and $\sigma_L \sigma_H \sigma_L$. In these words, pitch falls immediately before the final light syllable or, equivalently, before the final mora. The penultimate rule also explains the main tone patterns in words beginning with a light syllable and ending in a heavy syllable, i.e., $\sigma_L \sigma_H \sigma_H$ and $\sigma_L \sigma_L \sigma_H$. In these words, pitch falls within the final heavy syllable, or before the final mora on a mora-based account.

This leaves us with the two syllable compositions in Table 1, i.e., $\sigma_H \sigma_L \sigma_H$ and $\sigma_H \sigma_H \sigma_H$. While our rule predicts that words of these syllable structures will take

---

15. This interpretation has been confirmed by checking the pronunciations of DongMyung Lee and Hyang-Sook Sohn, whose previous analyses we reviewed in Section 2. Both of these phonologists produced a pitch fall within the final heavy syllables consistently.

HHHĹ, with a contour tone in the final syllable, they actually take the HHL tonal pattern in most cases.

Based on the actual number of words that Lee gives for each tonal pattern and for each syllable composition, we can recalculate his data to figure out the percentage of words that conform to the rule in (14). Results of this reanalysis are given in Table 2, where shaded numbers refer to those that conform to the penultimate accent rule. This reveals that this rule accounts for 89% of the data in Table 1, i.e., 909 out of 1017 words.

Table 2 Lee's (2005) data reanalyzed

Syllable composition	Main tone pattern	Percentage (%)
$\sigma_L\sigma_L\sigma_L$	LHL	412/446 (92.4%)
$\sigma_H\sigma_L\sigma_L$	HHL	71/75 (94.7%)
$\sigma_H\sigma_H\sigma_L$	HHL	23/25 (92%)
$\sigma_H\sigma_L\sigma_H$	HHL	20/26 (76.9%)
$\sigma_H\sigma_H\sigma_H$	HHL	13/14 (92.8%)
$\sigma_L\sigma_H\sigma_L$	LHL	124/126 (98.4%)
$\sigma_L\sigma_H\sigma_H$	LHHĹ	33/36 (91.7%)
$\sigma_L\sigma_L\sigma_H$	LHHĹ	246/269 (91.4%)

A similar reanalysis of the remaining SK Korean data in Lee (2005) and of the NK data in Son (2007a) provides the statistics in Table 3.

Table 3 Reanalysis of the previously reported data

	Lee (2005)	Son (2007a)
Disyllabic loans	95% (683/720)	85% (292/344)
Trisyllabic loans	89% (909/1017)	73% (384/526)
Four-syllable loans	90% (452/502)	80% (207/259)
Total	91% (2044/2239)	78% (883/1129)

As is clear from Table 3, the existing data are quite compatible with the penultimate rule in (14). In fact, this rule accounts for 91% of Lee's data for SK Korean and 78% of Son's data for NK Korean. These are extremely high ratios as compared with the ratio of the antepenultimate accent rule for loanwords in Tokyo Japanese, which is about 70%, as mentioned above. The results in Table 3 are compatible with a reinterpretation of K&S's (2001) data, too. The penultimate rule in (14) accounts not only for the 'final accent' pattern entirely but also for most (or all) instances exhibiting the 'penultimate accent' pattern and many instances showing the 'doubled accent' pattern.

All in all, the penultimate rule in (14) provides an adequate account for the data reported in the literature as well as the SK data originally reported by the present study. Note that this rule defines the location of pitch fall, which is computed basically independently of the location of pitch rise in our analysis.

4.3   Exceptions and variation

From the analysis presented in the previous sections, it can be said that (14) is a rather productive accent rule in both SK and NK loanwords, at least more productive than the antepenultimate rule responsible for the accent of loanwords in Tokyo Japanese. This said, it must also be repeated that the penultimate rule admits a certain class of exceptions. These exceptions mostly occur, as exemplified in (18) and (19) above, when the word begins with a heavy syllable and consists of three or more syllables. We assume that these words are exceptionally specified in the lexicon with respect to accent, while the accent of all words conforming to (14) is derived by rule.

A careful analysis reveals, however, that many of these exceptions admit a second accent pattern alongside the accent pattern predicted by (2a)/(3a). Interestingly enough, this second pattern coincides with the pattern predicted by the penultimate rule in most cases. Some examples are given in (21).[16]

(21)   sin.tɨ́.lom~sin.tɨ.lóm 'syndrome'
       kʰʌn.tí.ʃʌn~kʰʌn.ti.ʃʌ́n 'condition'
       hen.tɨ́.pʰon~hen.tɨ.pʰón 'cell phone'

The productivity of the penultimate rule will go up further if this type of accentual variation is taken into consideration. This reinforces our claim that the penultimate rule is indeed the default accent rule for loanwords in NK and SK Korean.

4.4   Summary

In the foregoing discussion, we proposed a new analysis of loanword prosody of North and South Kyungsang Korean on the basis of our own experiment as well as a reanalysis of the data reported in the literature. Specifically, we proposed a rule that places an accent on the penultimate mora as a general rule of loanword accent in Kyungsang Korean. Empirically, this proposal is based on the observation that pitch falls in every loanword including those ending in a heavy syllable, and that this pitch fall is a lexical property rather than a phrasal one.

---

16. Native speakers differ in the extent to which they admit this default accent pattern. Moreover, different speakers seem to admit the default pattern for different words.

From theoretical perspectives, our analysis is different from those proposed in the literature in several crucial ways. First, it assumes an accent rule rather than a tonal rule. Our new analysis is not concerned with surface tonal patterns such as HLL and LHL, but rather with a more abstract phonological representation from which these pitch patterns can be derived. This is reminiscent of the development in Japanese phonology some decades ago, whereby a surface-based tonal approach was replaced by an accent-based approach (Hattori 1973). The first is a static approach that exhaustively assigns a tone (high or low) to every mora, whereas the second is a more dynamic approach by which prosodic information is sparsely specified. These two approaches are illustrated with the loanword /banana/ 'banana' in (22).

(22)   a.   HLL
      b.   bánana

We claimed that the same development can be made in Kyungsang Korean phonology. This development can be exemplified as in (23), where the loanwords /kol.pʰɨ/ 'golf' and /an.tan.tʰe/ 'andante' are used for illustration.

(23)   a.   HL   HHL
      b.   kol̋.pʰɨ   an.tań.tʰe

The accentual representations as in (22b)/(23b) crucially differ from tonal representations as in (22a)/(23a) in the degree of lexical specification. In (22a)/(23a), all syllables constituting a word are specified with tones, whereas only one position in a word is phonologically marked in our analysis in (22b)/(23b). In connection with this, one may argue that our accentual representations in (23b) look very similar to the pseudo-accentual representations adopted by K&S (2001) and others for NK Korean. This is not the case, however, since we do not assume 'doubled accent' for words beginning with a heavy syllable. The pseudo-accentual analysis like K&S's represents the word /an.tan.tʰe/ 'andante' as /án.tán.tʰe/, which violates the basic function of the accent, or the notion of culminativity (Hyman 2006; Kubozono 2012). Our pitch accent analysis dispenses with this ad-hoc representation by assuming that only one position (mora) is phonologically marked as in (23b).

More crucially, our analysis posits the accentual representations in (22b)/(23b) as surface rather than underlying representations. In our analysis, most loanwords are unspecified in the lexicon but are given an accent as in (22b)/(23b) by accent rules–by the Japanese antepenultimate rule in (20) and the Kyungsang

penultimate rule in (14), respectively.[17] Exceptions to this must be exceptionally specified in the lexicon with respect to accent.

A second point in which our analysis crucially differs from those proposed in the literature concerns the distinction between pitch falls and pitch rises. These two tonal features were intermingled with each other in the previous studies of Kyungsang Korean, where only *pitch levels* (high or low) were the focus of description. We refute this static model of prosody in favor of a more dynamic model that describes *pitch changes* as phonologically relevant pitch features. We claim, more specifically, that pitch rises and falls are computed basically by independent mechanisms in loanwords: the location of pitch fall, which we assume is the phonetic correlate of the accent, can be defined independently of the location of pitch rise (Section 5.2). The only potential exception to this is the case where words begin with a heavy syllable. In this type of words, high pitch starts from the initial syllable, and the location of pitch fall is somewhat correlated with it.

A third noteworthy feature of our analysis lies in the claim that the loanword accent rule is sensitive to the mora. Against the traditional view that loanword prosody in Kyungsang Korean is computed by the syllable, we have proposed a mora-based generalization whereby accent is placed on the penultimate mora in most loanwords in both NK and SK Korean.[18]

5.   Comparison with Japanese

5.1   Pitch fall

Given the penultimate rule in (14), one will naturally notice its notable resemblance to the loanword accent rule in Tokyo (and Osaka) Japanese: the accent rule in Kyungsang Korean places an accent on the penultimate mora, whereas its Japanese counterpart chooses the antepenultimate mora as a default location of accent. These two rules crucially resemble each other in that both use the mora as the basic unit to measure phonological distances. In fact, the two rules primarily differ in the location of the default accent: penultimate vs. antepenultimate mora. In this sense, both the loanword accent rule in Kyungsang Korean and its coun-

---

17. This is equivalent to saying that most loanwords are specified in the lexicon with a floating accent (or anything equivalent to it) which is assigned to a certain mora by accent rule (Kubozono 2008).

18. Inkelas and Zec (1988) present similar arguments for Serbo-Croatian, demonstrating that pitch accent in this language becomes largely predictable once reference to the mora is made.

terpart in Tokyo/Osaka Japanese are mora-counting rather than syllable-counting rules.

This crucial similarity between Kyungsang Korean and Tokyo/Osaka Japanese can be revealed if and only if (i) an accentual rather than (surface) tonal analysis is adopted, and (ii) the location of accent is computed on the basis of the mora rather than the syllable.

Having pointed out the interesting similarity between Korean and Japanese, we must hasten to add that Kyungsang Korean is more moraic than Tokyo Japanese. This becomes evident when the loanword accent docks onto the second mora of a heavy syllable. In Tokyo Japanese, the second mora of a heavy syllable cannot bear an accent so that any accent placed on this mora moves one mora to the left, i.e., to the 'syllabic mora' of the same syllable. This is illustrated in (24).

(24) roń.don → rón.don 'London'
      pai.naṕ.pu.ru → pai.náp.pu.ru 'pineapple'
      reé.daa → rée.daa 'radar'
      saí.daa → sái.daa 'cider'

The antepenultimate rule formulated in (20) succeeds in capturing this fact by referring to the syllable as well as the mora. The fact that not every mora can be an accent bearer in Tokyo Japanese means that this is not a completely moraic language, as McCawley (1978) aptly called it a 'mora-counting, syllable language'.

While the loanword accent rule in Tokyo Japanese is thus syllable-based to some extent, its counterpart of Kyungsang Korean is fundamentally mora-based. This can be seen from cases where the penultimate mora of the word happens to be the second mora of a heavy syllable:

(25) koĺ.pʰɨ 'golf'
      ak.seń.tʰɨ 'accent'
      lo.meń.sɨ 'romance'

The words in (25) end in a sequence of heavy and light syllables. The penultimate rule in (14) assigns an accent on the second mora of the penultimate heavy syllable. Unlike the cases in Tokyo Japanese, the second mora of a heavy syllable can bear an accent in Kyungsang Korean. In other words, Kyungsang Korean does not show an accent shift as in (26), which would be comparable to the one in (24).

(26) koĺ.pʰɨ → *kól.pʰɨ
      ak.seń.tʰɨ → *ak.sén.tʰɨ
      lo.meń.sɨ → *lo.mén.sɨ

The contrast between (24) and (26) suggests that Kyungsang Korean is more moraic than Tokyo Japanese as far as loanword accent rules are concerned. In

Kyungsang Korean, accent falls on the penultimate mora, whether it is syllabic as in (17a,b,d) or non-syllabic as in (17c) and (25). This is an interesting insight since the prosodic systems of Kyungsang Korean and Tokyo Japanese have been characterized as syllable-based and mora-based, respectively, in the literature (see, for instance, K&S 2001 for Kyungsang Korean, and McCawley 1968 and 1978 for Tokyo Japanese).

5.2   Pitch rise

Up to this point, we have deferred the discussion of pitch rise, which is another pitch feature characterizing word accent patterns. Interestingly, Kyungsang Korean exhibits a striking similarity to Tokyo Japanese with respect to pitch rise, too. As mentioned in Sections 2 and 3.2.2, Kyungsang Korean generally displays high pitch on word-initial heavy syllables and low pitch on word-initial light syllables. This is an interesting feature commonly found in both NK and SK Korean, but more interestingly, the same feature is shared by Tokyo Japanese, too.

In Tokyo Japanese, words generally begin with low pitch as in (27a), unless they are initially accented as in (27b).

(27)   a.   ko.kó.ro   kokoro 'heart'

       b.   í.no.ti   i noti 'life'

However, this generalization does not hold in words whose initial syllable is heavy. In this case, the initial heavy syllable is usually high-pitched from the beginning (Hattori 1954; Haraguchi 1977).[19] This is illustrated in (28), where words beginning with a heavy syllable (28a) are compared with those beginning with a light syllable (28b) (/tookyoo/, /kankei/ and /yokohama/ are 'unaccented' words, or words involving no sudden pitch fall).

(28)   a.   kan.gá.ruu   kangaruu 'kangaroo'
             too.kyoo   tookyoo 'Tokyo'
             kan.kei   kankei 'relationship'
       b.   ka.me.rúun   kameruun 'Cameroon'
             yo.ko.ha.ma   yo kohama 'Yokohama'

---

19. Among heavy syllables, those with a moraic obstruent (or *sokuon*) are supposed to behave differently from other types of heavy syllables in starting with low pitch (Hattori 1954; Haraguchi 1977).

What is commonly observed in Kyungsang Korean and Tokyo Japanese is that words begin with high pitch if they begin with a heavy syllable although they would otherwise start with low pitch. This peculiar behavior shown by heavy syllables can be attributed to a general constraint prohibiting a 'contour tone', i.e., pitch change occurring within a syllable. In the case under consideration, contour tones involving a pitch rise are prohibited in word-initial position. This is not a peculiar constraint as it might first look because in tone languages, contour tones are generally disfavored and are permitted if and only if level tones are permitted (see, for example, Maddieson 1978 and Hyman 2007).

Note in this connection that both Kyungsang Korean and Tokyo Japanese display an interesting asymmetry in the distribution of 'contour tones': both systems prohibit rising contour tones, i.e., syllables involving a pitch rise, while they tolerate falling contour tones, or syllables involving a pitch fall. In fact, syllable-internal pitch fall is permitted quite freely in both Kyungsang Korean and Tokyo Japanese, as shown in (12), (16), (17a-b) and (24).

Having characterized the peculiar behavior of heavy syllables in this general way, one must hasten to add that NK and SK Korean often differ in the location of pitch rise. As noted by Lee (2007) and others, this difference emerges in words beginning with a light syllable. In SK Korean, the initial light syllable is usually followed by a high-pitched syllable, whereas pitch stays low right until the accented syllable/mora in NK Korean. This is illustrated words in (29), where syllables in bold bear an accent in our analysis.[20]

(29)		SK Korean	NK Korean
	$\sigma_L\sigma_H\boldsymbol{\sigma_H}$	LH**ĤL**	LL**ĤL**
	$\sigma_L\sigma_L\boldsymbol{\sigma_H}$	LH**ĤL**	LL**ĤL**
	$\sigma_L\boldsymbol{\sigma_H}\sigma_H\sigma_L$	LH**H**L	LL**H**L
	$\sigma_L\sigma_H\sigma_H\boldsymbol{\sigma_H}$	LHH**ĤL**	LLL**ĤL**
	$\sigma_L\sigma_L\boldsymbol{\sigma_H}\sigma_L$	LH**H**L	LL**H**L
	$\sigma_L\sigma_L\sigma_H\boldsymbol{\sigma_H}$	LHH**ĤL**	LLL**ĤL**
	$\sigma_L\sigma_L\boldsymbol{\sigma_L}\sigma_L$	LH**H**L	LL**H**L

This is reminiscent of the difference between Tokyo and Osaka/Kyoto Japanese with respect to the word (or phrase-) initial pitch rise. In Tokyo Japanese, the initial two moras must generally differ in pitch, as illustrated in (27) above: the second mora is high if the initial is low, and vice versa. In contrast, Osaka/Kyoto

---

20. Lee (2007) interprets this dialectal difference as a difference in tonal alignment. In SK Korean, pitch rises gradually from the beginning of the word to the peak syllable of the word, or to the accented syllable/mora in our terminology. In NK Korean, on the other hand, pitch must remain low until the peak syllable. This interpretation is compatible with my own auditory observations.

Japanese is free from such a restriction, so that initial two moras can be both high as in (30a) or low as in (30b):[21]

(30)   a. $\overline{\text{ki.mo.no}}$ 'clothes'

   $\overline{\text{mi.ya.ko}}$ 'capital city'

   b. $\underline{\text{u.sa.gi}}$ 'rabbit'

   $\underline{\text{ki.tu.ne}}$ 'fox'

A comparison with the Korean patterns in (29) and the Japanese patterns in (27)/(30) reveals that, as far as the word-initial pitch rise pattern is concerned, SK Korean is similar to Tokyo Japanese, while NK Korean somewhat resembles Osaka/Kyoto Japanese. In the first group, there is a strong interaction in pitch between the word-initial two syllables/moras, whereas no such interaction is observed in the second group.

6.   Conclusions and future agenda

6.1   Summary

In this paper, we presented a new analysis of loanword prosody of North and South Kyungsang Korean on the basis of our own experiment as well as a reanalysis of the data reported in the literature. Specifically, we proposed a rule that places an accent on the penultimate mora as a general rule of loanword accent in Kyungsang Korean. This new rule is superior to the previous syllable-based analyses both in simplicity and generality, as fully demonstrated in the preceding sections.

   Our new analysis has several more advantages over the previous analyses. For one thing, it enables us to understand both the similarities and differences between Kyungsang Korean and Japanese dialects. One notable similarity between the two languages is that they both have pitch accent systems rather than tonal ones, i.e., they are '(pitch) accent languages', not 'tone languages'. They are also similar in computing accent location in loanwords basically by the mora rather than by the syllable: both Kyungsang Korean and Tokyo/Osaka Japanese are 'mora-counting' languages. Moreover, pitch rises and falls are computed independently of each other in both languages.[22]

---

21. The examples in (30) are unaccented words, that is, words that involve no sudden pitch fall even when a particle is attached to them.

22. These similarities may hint a genetic relationship between the two languages, but this is an issue beyond the scope of this paper.

The present study has also revealed an interesting similarity between Kyungsang Korean and Tokyo Japanese as regards the interaction between syllable weight and pitch. Loanwords in both languages basically begin with low pitch, but they exceptionally begin with high pitch if their initial syllable is heavy, i.e., bimoraic. This exceptional behavior of initial heavy syllables is due to a ban on 'contour tones', or a general constraint militating against pitch change within a syllable. In both Kyungsang Korean and Japanese, this constraint specifically prohibits contour tones involving a pitch rise in word/phrase-initial position, while readily allowing those involving a pitch fall near the end of the word (Hyman 2007; Kubozono 2016). This interesting asymmetry between the two types of contour tones has also been revealed by the present study.

The present study has also uncovered some pivotal differences between the two languages. One remarkable difference concerns the default location of accent: *penultimate* mora in Kyungsang Korean vs. *antepenultimate* mora in Tokyo and Osaka/Kyoto Japanese. Another difference can be found about the status of the mora in Korean and Japanese. While both languages use the mora as the basic counting unit in accent assignment, Kyungsang Korean is more 'moraic' than Tokyo Japanese in that it allows loanword accent to fall even on the second, i.e., non-syllabic, mora of a heavy syllable, as in (25). As pointed out in Section 5.1, the second mora of a heavy syllable cannot bear an accent in Tokyo Japanese so that any accent placed on this mora moves one mora to the left, i.e., to the 'syllabic mora' of the same syllable. In Kyungsang Korean, in contrast, the penultimate mora can bear an accent in loanwords whether it is syllabic or non-syllabic.

Finally, it is worth referring to the crucial difference between NK and SK Korean. While both dialects of Kyungsang Korean share the penultimate accent rule for loanwords, they crucially differ with respect to the location of pitch rise. Specifically, pitch generally rises between the first two moras in loanwords in SK Korean (except in those that begin with a heavy syllable, as mentioned above), while it remains low up to the syllable containing the accented mora in loanwords in NK Korean. In fact, this is the most noticeable difference between the two Kyungsang dialects as far as loanword prosody is concerned. In this respect, SK Korean is similar to Tokyo Japanese, while NK Korean looks more like Osaka/Kyoto Japanese.

6.2.   Future agenda

At least four questions remain unsolved in this paper. One of them concerns the origin of the penultimate accent pattern shown by most loanwords in Kyungsang Korean. As mentioned in Section 1, native words in Kyungsang Korean show multiple accent patterns including the penultimate pattern. Given this, one may

naturally wonder why the penultimate accent pattern is predominant in loanwords or, in other words, where the penultimate accent rule of loanwords comes from. While this is an open question for future work, recent studies of Japanese accent give a certain hint. According to Kubozono (2006b, 2008, 2011, 2012), the antepenultimate (mora) accent pattern of loanwords in Tokyo Japanese and the penultimate (syllable) accent of loanwords in Kagoshima Japanese both come from the native phonology of the respective dialects. In Tokyo, for example, /ro.san.zé.ru.su/ 'Los Angeles' reflects the default pattern of *accented* native nouns such as /í.no.ti/ 'life' and /a.zá.ra.si/ 'harbor seal'. Similarly, in Kagoshima Japanese, /ro.san.ze.rú.su/ reflects the default pattern of *accented* native words such as /a.za.rá.si/ 'harbor seal' and /sa.ká.na/ 'fish'. In other words, the loanword accent rules do not come out of the blue or reflect any universal rule; rather, they come from the native phonology of the host languages.

From this analysis, it is possible to speculate that the penultimate (mora) accent in Kyungsang Korean loanwords probably represents the most productive accent pattern–or the default accent rule–of its native phonology. Namely, the penultimate rule of loanwords may be nothing but the native accent rule of Kyungsang Korean. It is worth referring in this connection to Chung (1991), cited in K&S (2001), who observes that native nouns longer than three syllables consistently have penultimate accent in NK Korean. Like other studies of NK Korean, Chung's analysis is based on the syllable rather than the mora and, moreover, fails to recognize a pitch fall in word-final heavy syllables. However, it is suggestive that the penultimate (mora) accent rule in Kyungsang loanwords comes from its native phonology. If carefully pursued, this line of analysis may well show that what seems to be a complex accent system of Kyungsang Korean can be decomposed into two parts, a rule-governed accent pattern and lexically marked accent patterns, similar to the seemingly complex system of Tokyo Japanese (Kubozono 2006a/b, 2008, 2011).

A second question that remains to be answered is how the obtained generalization of Kyungsang Korean can be extended to the loanword phonology of Korean in general. While the lexical accent of Korean dialects has attracted serious attention recently (see, for example, Son 2007b), these analyses are still based on the syllable, not the mora. A thorough work is necessary for each dialect to see if the accent of the dialect can be better reanalyzed in terms of mora. This new approach may allow us to uncover the similarities and differences among various dialects of the language.

Thirdly, we need to examine how epenthetic vowels behave in accent assignment. In Japanese, epenthetic vowels are known to exhibit peculiar behavior in loanword accentuation, often failing to serve as a docking site of accent (Kubozono 2001). It will be interesting to ask how epenthetic vowels and accent interact with

each other in Korean loanwords and, in particular, to what extent epenthetic vowels are responsible for the exceptions to the penultimate (mora) accent rule. K&S's (2001) analysis of epenthetic vowels in loanword accentuation will be worth serious attention in this respect.

Finally, the analysis presented in this paper should be reconsidered from a more theoretical viewpoint. It will be particularly interesting to ask how the penultimate mora accent in Kyungsang loanwords can be computed in the output-oriented constraint-based framework of Optimality Theory (Prince and Smolensky 1993/2004). A foot-based analysis, for example, will assume that Kyungsang Korean attracts accent to the final foot, whereas Tokyo Japanese attracts accent to a non-final foot. This will raise a new question of how the difference between the two languages can be accounted for.

Acknowledgments

References

Akinaga, K. 1985. Kyōtsūgo no akusento (Accent of standard Japanese). In *NHK Pronunciation and Accent Dictionary*, the appendix to NHK (Ed.). Tokyo: Nihon Hōsō Shuppan Kyōkai.

Chung, Y. H. 1991. The Lexical Tone System of North Kyungsang Korean. PhD dissertation, The Ohio State University.

Fukui, R. 2000. Kankokugo shohōgen-no akusento taikei-ni tsuite(On accent systems of Korean dialects). In *Kankokugo Akuento Ronsō*, (*Studies in Korean Accentology*) [ICHEL Linguistic Studies 3] R. Fukui (ed.), 1–20. Tokyo: University of Tokyo.

Haraguchi, S. 1977. *The Tonal Pattern of Japanese: An Autosegmental Theory of Tonology*. Tokyo: Kaitakusha.

Hattori, S. 1954. On'inron-kara mita kokugo-no akusento (Japanese accent considered from a phonological point of view). *Kokugo Kenkyū 2*. Reproduced in *Akusento* (Accent), M. Tokugawa (ed.), 37–65. Tokyo: Yūseido.

Hattori, S. 1973. Akusento towa nani ka? Sono benbetuteki tokuchō towa? (What is the prosodeme, and what are its distinctive features?). *Gengo no Kagaku* 4: 16–53.

Hayata, T. 1999. *Onchō-no Taiporojii*(Tonal Typology). Tokyo: Taishukan.

Hayes, B. 1995. *Metrical Stress Theory: Principles and Case Studies*. Chicago IL: The University of Chicago Press.

Hyman, L. M. 2006. Word-prosodic typology. *Phonology* 23: 225–257.
https://doi.org/10.1017/S0952675706000893

Hyman, L. M. 2007. Universals of tone rules: 30 years later. In *Tones and Tunes*, Vol. 1: *Typological Studies in Word and Sentence Prosody*, T. Riad & C. Gussenhoven (eds.), 1–34. Berlin: Mouton de Gruyter. https://doi.org/10.1515/9783110207569.1

Inkelas, S. & Zec, D. 1988. Serbo-Croatian pitch accent: The interaction of tone, stress, and intonation. *Language* 64: 227–248. https://doi.org/10.2307/415433

Jun, H.全鎬環. 2005. Factors affecting accentual patterns of loanwords in Pusan Korean. *Kyushu University Papers in Linguistics 25/26*.

Kang, Y. 2003. Perceptual similarity in loanword adaptation: English postvocalic word-final stops in Korean. *Phonology* 20: 219–273. https://doi.org/10.1017/S0952675703004524

Kenstowicz, M. & H. -S. Sohn孫亨淑. 2001. Accentual adaptation in North Kyungsang Korean. In *Ken Hale: A Life in Language*, M. Kenstowicz (ed.), 239–270. Cambridge MA: The MIT Press.

Kim, J.金丁仙. 2006. Double accent in loanwords of North Kyungsang Korean and variable syllable weight. Ms, Indiana University.

Kubozono, H. 1988. The Organization of Japanese Prosody. PhD dissertation, Edinburgh University. (Tokyo: Kurosio, 1993).

Kubozono, H. 2001. Epenthetic vowels and accent in Japanese: Facts and paradoxes. In *Issues in Japanese Phonology and Morphology*, J. van de Weijer & T. Nishihara (eds.), 113–142. Berlin: Mouton de Gruyter.

Kubozono, H. 2006a. *Akusento no Hōsoku* (Laws of Accent). Tokyo: Iwanami.

Kubozono, H. 2006b. Where does loanword prosody come from? A case study of Japanese loanword accent. *Lingua*, 116: 1140–1170. https://doi.org/10.1016/j.lingua.2005.06.010

Kubozono, H. 2008. Japanese accent. In *The Oxford Handbook of Japanese Linguistics*, S. Miyagawa & M. Saito (eds.), 165–191. Oxford: OUP.

Kubozono, H. 2011. Japanese pitch accent. In *The Blackwell Companion to Phonology*, Vol. 5, M. van Oostendorp, C. Ewen, E. Hume & K. Rice (eds.), 2879–2907. Malden MA: Wiley-Blackwell.

Kubozono, H. 2012. Varieties of pitch accent systems in Japanese. *Lingua* 122: 1395–1414. https://doi.org/10.1016/j.lingua.2012.08.001

Kubozono, H. 2016. Diversity of pitch accent systems in Koshikijima Japanese. *Gengo Kenkyu* 150: 1–31.

Ladd, D. R. 1996. *Intonational Phonology*. Cambridge: CUP.

Lee, D.李東明. 2005. Weight-sensitive tone patterns in loanwords of South Kyungsang Korean. Paper presented at Harvard ISOKL-2005.

Lee, D.李東明. 2007. The tonal structures of the location of the main accent of Kyungsang Korean words. Paper presented at Harvard ISOKL-2007.

Maddieson, I. 1978. Universals of tone. In *Universals of Human Language*, Vol. 2: Phonology, J. H. Greenberg (ed.) 335–365. Redwood City CA: Stanford University Press.

McCawley, J. D. 1968. *The Phonological Component of a Grammar of Japanese*. The Hague: Mouton.

McCawley, J. D. 1978. What is a tone language? In *Tone: A Linguistic Survey*, V. Fromkin (ed.), 113–131. New York NY: Academic Press.

Pierrehumbert, J. & Beckman, M. 1988. *Japanese Tone Structure*. Cambridge MA: The MIT Press.

Prince, A. & Smolensky, P. 1993. Optimality Theory: Constraint Interaction in Generative Grammar [Technical Report 2]. New Brunswick NJ: Rutgers Center for Cognitive Science, Rutgers University. (Oxford: Blackwell, 2004).

Shibatani, M. 1990. *The Languages of Japan*. Cambridge: CUP.

Sibata, T. 1994. Gairaigo ni okeru akusento kaku no ichi (On the location of accent in loanwords). In *Gendaigo Hōgen-no Kenkyū*, (Studies on Modern Japanese and its Dialects), Kiyoji Sato (ed.) 338–418. Tokyo: Meiji Shoin.

Son, J.孫在賢. 2007a. Kankokugo keishōdō hōgen no gairaigo akusento (Loanword accent of Kyungsang Korean dialects). *Proceedings of the 134th Meeting of the Linguistic Society of Japan*, 222–227.

Son, J.孫在賢. 2007b. Accent in Korean Dialects. PhD dissertation, University of Tokyo.

CHAPTER 15

The role of perceived similarity and contrast
English loanwords into Korean and Japanese

Hyun Kyung Hwang
RIKEN Center for Brain Science

This study explores a pattern of speech perception in Korean and Japanese with special attention to American English vowel /æ/. Two identification tests reveal that Korean speakers pay more attention to the second formant (F2) signaling the backness of a vowel, whereas Japanese speakers are more sensitive to the first formant (F1) signaling the height of a vowel. The distinct sensitivity to different acoustic cues in the languages discussed here is accounted for by two language-specific factors: Different L1 vowel systems and language-specific variations.

Keywords: perceived similarity, language-specificity, native phonology, language experience, Korean, Japanese

1.   Introduction

Loanword adaptation involves multiple factors, including speech perception, the phonological grammar of a recipient language, orthography, and other socio-linguistic factors. In particular, there is ample evidence for the role of perception in loanword phonology (Silverman 1992; Dupoux et al. 1999; Peperkamp and Dupoux 2003; Peperkamp 2005; Peperkamp et al. 2008). It is possible that auditory capacity and perceptual mapping are fundamentally language-universal. However, it is widely acknowledged that perception is constrained by language-specific experience (Kuhl et al. 1992; Best 1995; Flege 1995; Johnson 2004). Thus, the perception pattern of non-native sounds observed in loanword adaptation provides much insight into language-specific aspects of the native phonology of a recipient language. In exploring the influence of language-specificity on perception, it is important to compare directly languages bearing distinct sound systems.

This study is concerned with the adaptation of American English [æ] in Korean and Japanese. Neither the vowel inventories of Japanese nor Korean include /æ/. At the same time, this vowel is adapted in a different way in each language. Let

us consider the data in (1), where English [æ] takes on distinct forms in Korean and Japanese:

(1)   English   Korean   Japanese
       iPad   [ai pʰe̱dɨ]   [ai pa̱ddo]
       tab   [tʰe̱p̄]   [ta̱bu]
       gag   [ke̱gɨ]   [gja̱gu]

Commonly, /æ/ is adapted as /e/ in Korean[1], while it is generally adapted as /a/ in Japanese. Since it is extensively documented that Korean speakers fail to discriminate the English /ɛ/~/æ/ contrast (Flege et al. 1997; Ingram & Park 1997; Kim 2010; Tsukada et al. 2005; among others), this observed adaptation pattern in Korean seems to be attributable to the influence of perception. In contrast, the role of perceptual similarity in the Japanese loanword adaptation is questionable, given an apparent influence from orthography. However, it has been reported that Japanese speakers frequently misperceive /æ/ as /a/ (Ingram & Park 1997; Hisagi 2007; Strange et al. 2001). It will furthermore be shown that the perceptual mapping supports these distinct repair strategies in adopting the low front vowel [æ] in American English into Korean and Japanese.

This study investigates patterns of speech perception in Korean and Japanese. The distinct perception patterns in each language discussed here are accounted for by different L1 phonological systems and language-specific variations/sound change in progress.

Vowel inventory of Korean and Japanese. Standard Japanese has five short vowels. Figure 1 shows average values for the first formant (F1) and second formant (F2) of each short vowel (Vance 2008). While slight differences are observed between reading word lists and prose passages, /e/ and /a/ are well apart from each other both in F1 and F2 dimensions.

Turning to Korean, Standard Korean includes seven contrastive monophthongal vowels: /a, e, i, o, u, ɨ, ʌ/ (Ahn 1998; Kim 1999; Kang 2013). The vowel space of Korean is shown in Figure 2.

It should be noted that Korean previously exhibited an /e/-/ɛ/ contrast, and this is still reflected in the Korean writing system: /e/ by "ㅔ" and /ɛ/ by "ㅐ". A recent corpus study (Kang 2013) finds that the merger of /e/ and /ɛ/ is nearly completed via the raising of /ɛ/. As a result, both letters "ㅔ" and "ㅐ" are realized as /e/, and this symbol is used for the non-high front vowel in Korean throughout this paper. Still, Kang (2013) reports that older male speakers marginally retain

---

1. Some variations are observed in the adaptation of [æ] in Korean, probably due to the orthographic effects, or the way in which loanwords are introduced and borrowed into the language.
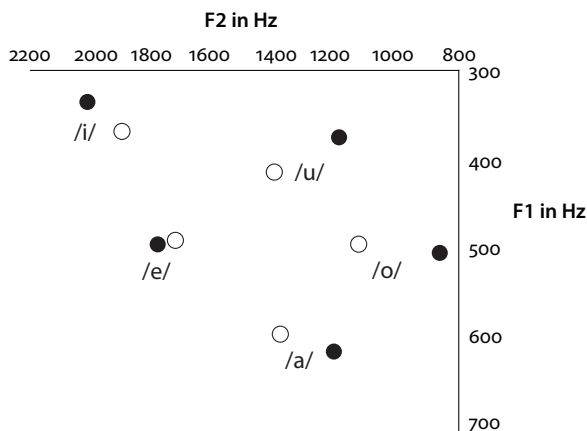
Figure 1. Average F1 and F2 of Japanese short vowels produced by Japanese speakers reading word lists (●) and prose passages (○) (Vance 2008)
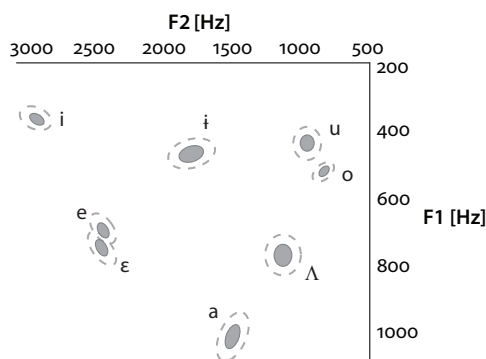
Figure 2. Korean vowel space in an /hV/ context: the center of each ellipse represents the mean F1/F2 frequency, while the solid and dashed ellipses represent one and two standard deviations, respectively (Mitsuya et al. 2010).

this vowel distinction, suggesting the possibility that younger speakers experience this contrast even if they do not distinguish the two vowels.

By comparing the vowel systems in Korean and Japanese, it seems that the vowel spaces of the non-high, non-back area are quite similar in terms of density and average F1 and F2 values. Thus we need first to consider if the divergent adaptation patterns of /æ/ between the two languages involve different perception patterns. In order to examine this question, I conducted identification tests with two different sets of stimuli, each discussed in the following sections.

2.   Experiment

2.1   Identification of non-native vowels using natural stimuli

2.1.1   *Method*

Material and recording. English nonsense words of the form CVs were created. All the items contained one of the three vowels /æ, ɛ, a/ preceded by either /h/ or /f/. Testing nonsense words allowed us to obviate the influence of existing loans or frequency effect. An onset was added to the vowels, as a CV syllable makes the possible responses less likely to be existing words than a simple V syllable. Note that a stop-V sequence results in more existing words compared to a fricative-V sequence. The onset fricatives, particularly /h/, were chosen in order to minimize possible effects of a consonant on the acoustic characteristics of a following vowel. Most of the possible responses for the CV combinations tested in the current study were nonce words both in Korean and Japanese.

One male speaker of American English read the list containing the six target items together with twelve fillers. The recording was made in a sound-attenuated booth at National Institute for Japanese Language and Linguistics. The mean formant frequencies of the speaker are presented in Figure 3.
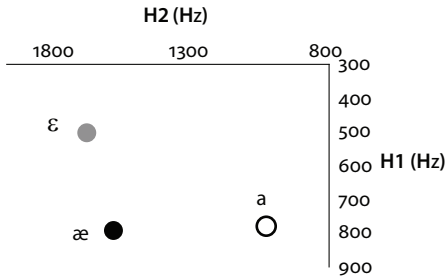
Figure 3. F1 and F2 of the three English vowels produced by the American English speaker

Participants and task. Thirty four standard Korean, and twenty eight standard Japanese monolingual speakers participated in a forced-choice vowel identification task. Participants ranged in age from 18 to 39 years at the time of the test. All were born and grew up in the respective linguistic target areas and had no history of speech or hearing impairment.

The target items and fillers were shuffled and presented in a random order. Participants were instructed to choose the closest sequences that they heard among given choices, after listening to each token three times. Choices were provided in Korean (*Hangul*) or Japanese orthography (*Katakana*).

2.1.2   *Results*

The mean percentages of /e/ perception are illustrated in Figure 4. In both languages, the control vowels /a/ and /ɛ/ are quite consistently mapped to /a/ and /e/, respectively; only one Korean speaker chose /e/ for English /a/ preceded by /h/, and three Japanese speakers chose /a/ for English /ɛ/ preceded by /f/. In contrast, the perception of /æ/ exhibits substantial differences between Korean and Japanese: for English vowel /æ/, Koreans speakers tend to perceive /e/ while Japanese speakers tend to perceive /a/, indicating that perception also supports the observed adaptation pattern in the languages discussed here. It should be noted that the non-/e/ responses for English /æ/ were /a/ without exception.
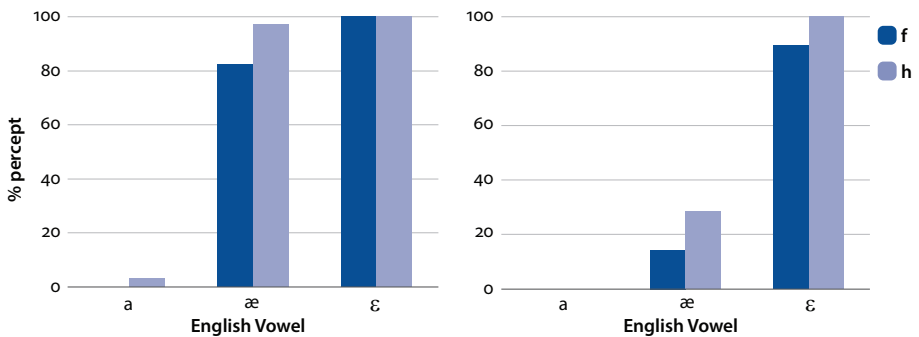
Figure 4. Percentages of /e/ responses for natural stimuli in Korean (left) and Japanese (right)

The vowel identification patterns discussed above seem to show that the vowel quality of /æ/ guides Korean and Japanese speakers to perceive different vowels. However, natural stimuli involve not only the vowel quality but also other perceptual cues, such as pitch or duration. In order to circumvent the problem of natural stimuli, another set of sounds was further tested.

2.2   Identification of synthesized stimuli

2.2.1   *Method*

Two sets of synthesized sounds for each onset consonant were created, by varying the F1 and F2 of the English vowel /æ/ as obtained in the recording session (i.e. an F1 continuum and F2 continuum respectively). In manipulating formant frequencies, the tool "source-filter synthesis using existing sounds" in Praat was used. Specifically, F1 of the vowel was lowered by 30 Hz steps (ranging from 800 Hz to 620 Hz), and F2 by 60 Hz steps (ranging from 1540 Hz to 1180 Hz), yielding 7 stimuli for each continuum. As a reference for the range of formant continua, the F1 and F2 values of [a] and [ɛ] recorded were used, which is given in Table 1.

Table 1. F1 and F2 of the original recording

	F1 (Hz)	F2 (Hz)
æ	787	1600
ɛ	641	1650
a	788	1176

It is worth noting that the duration of stimuli was carefully controlled, since it is widely acknowledged that duration can be a critical cue for vowel contrast. The duration of all the manipulated stimuli in this study was 125ms, which was the average duration of [a] and [ɛ] for the speaker.

The stimuli were presented to the same participants who identified the natural stimuli. The equivalent procedure of the previous task was performed for this set of stimuli.

2.2.2   Results

Figure 5 presents the percentages of /e/ responses in Korean. For the F1 continuum ([æ] to [ɛ]), no appreciable change of vowel perception is observed, indicating that the stimuli were invariably perceived as /e/. Sounds on the F2 continuum ([æ] to [a]), on the other hand, exhibit a gradual decrease of /e/ responses, suggesting that speakers are sensitive to the backness of a vowel, as signaled by F2. Interestingly, the two onset consonants yield fairly different perception patterns: the percentages of /e/ perception declines more rapidly with /f/ onset than with /h/ onset. This difference associated with onset consonants cannot be attributed to the influence of formant transition, since both F1 and F2 were manipulated to be constant throughout the entire vowel portion, thus bearing no transition from the preceding consonant. Rather it is conceivable that the formant structure of the original vowel [æ] contained in /h/ – F2 in particular – is responsible for the prevalent /e/ responses involving the /h/ onset. At the same time, these results suggest that Korean speakers are relatively insensitive to varying F1, and perceive /e/ as long as the F2 of a vowel is high enough to signal a front vowel. This consonant is less likely to affect the following vowel, but is itself quite heavily affected by the vowel, and furthermore, cues present in the consonant caused by the vowel seem to play some role in vowel identification.

Turning to Japanese, quite different responses are observed, as shown in Figure 6. Unlike Korean speakers, sounds on the F1 continuum ([æ] to [ɛ]) are negatively correlated with the percentage of /e/ responses, suggesting that Japanese speakers are sensitive to vowel height as signaled by F1. With respect to varying F2, no noticeable change in vowel perception was observed. The observed difference between Korean and Japanese is instructive because it reveals that the specific
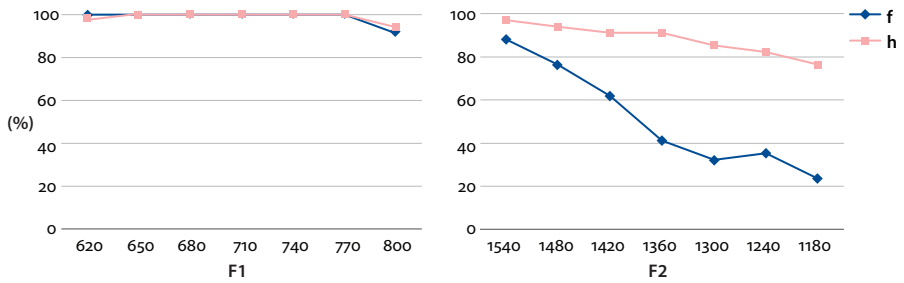
Figure 5. Percentages of /e/ responses for manipulated stimuli in Korean
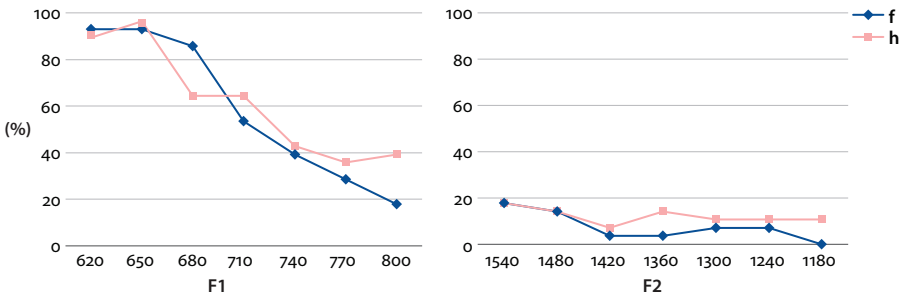
Figure 6. Percentages of /e/ responses for manipulated stimuli in Japanese

perceptual boundary between /e/ and /a/ differs across the languages, even though the average F1 and F2 frequencies of the vowels are comparable.

In summary, the results reveal that the perception pattern supports the adaptation patterns not only for Korean but for Japanese as well. Moreover, the results of synthetic stimuli show that Korean speakers perceive /e/ as long as F2 is high (signaling a front vowel) whereas Japanese speakers perceive /a/ as long as F1 is high (signaling a low vowel).

3.   Discussion

Korean speakers attend more to F2, whereas Japanese speakers attend more to F1 in identifying non-high, non-back vowels. Given the fact that the identical acoustic cues regarding vowel quality are equivalently available for use in both languages, and that the non-back, non-high parts of the vowel space are extremely similar in Japanese and Korean, it is not obvious why distinct perception patterns are observed in these languages.

However, it is widely accepted that perception is influenced by language-specificity (Kuhl et al. 1992; Best 1995; Flege 1995; Johnson 2004). In particular, two possible language-specific factors may have affected the divergent response

patterns observed here. One possibility involves the phonology/phonetics of L1. Specifically, differences in the constitution of the vowel inventory across the languages might have affected the perception pattern by directing native speakers' attention to different acoustic cues. This possibility implies that it is necessary to look beyond the merely lower front portion of the vowel spaces, and to the overall vowel system in order to understand the relevant perception patterns. If we consider the entire vowel system of the languages under investigation, it is clear that two more contrastive vowels are present in Korean: a high mid unrounded vowel /ɨ/ and mid back unrounded /ʌ/. It may be the case that the presence of high mid unrounded /ɨ/ vowel leads listeners to be sensitive to the backness of a vowel, in non-high vowels as well. Also, the mid back unrounded vowel /ʌ/ yields greater competition among vowels of mid height, i.e. /e, o, ʌ/. Unlike /o/, which is characterized by roundness, /e/ and /ʌ/ contrast only in backness, and this may result in speakers' enhanced attention to F2 in the identification mid vowels. In contrast, for Japanese speakers, perception of non-native sounds involving different F2 values may be more challenging than perceiving contrasts involving F1 differences, since the Japanese vowel inventory includes only /e/ and /o/ (which contrast not only in backness but also in roundness).

Still, the differences in L1 phonology/phonetics alone do not sufficiently account for the observation that Korean speakers are more insensitive to F1 than Japanese speakers. The other language-specific factor that may have contributed to these response patterns is the merger of /e/ and /ɛ/ in Korean. Recall that the merger of the two vowels has nearly reached completion, and only older speakers retain the contrast (Kang 2013). A recent corpus study (Yoon et al. 2015) reports the vowel contrast of older speakers in many varieties of Korean, including standard Korean. The vowel system of standard Korean that Yoon et al. (2015) present is shown in Figure 7. The study relied on spontaneous conversational speech collected in 2011, and the speaker was 81 years old at the time of recording. As illustrated in Figure 7, this speaker still retains the /e/-/ɛ/ distinction. It is not implausible to think that this distinction is simply recognized as greater phonetic variation by younger speakers who do not maintain this contrast, and that this
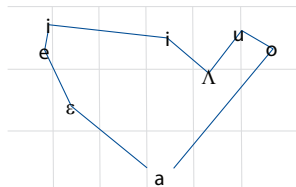
Figure 7. The vowel inventory of standard Korean produced by an older speaker (Yoon et al. 2015)

"variation" in F1 dimension might have contributed to the development of insensitivity with regard to varying F1.

Further investigation into other languages may provide yet more direct evidence as to whether the presence or absence of this contrast indeed influences sensitivity to specific acoustic cues, as seems indicated here in the Korean and Japanese cases.

4.   Conclusions

In this paper I have addressed distinct adaptation patterns in Korean and Japanese, focusing on American English vowel /æ/. Specifically, the role of perceptual similarity modified by language-specific contrasts in L1 phonology and phonetic details, was explored in accounting for observed adaptation patterns.

I have provided the data of an identification task where two sets of stimuli were tested: natural utterances of nonsense words and formant-manipulated stimuli. The results reveal that speakers of the languages investigated perceive the input vowel [æ] in distinct ways: while [æ] was perceived consistently as [e] by Korean speakers, it was identified as [a] by Japanese speakers. This result provides support for the role of perceived similarity in loanword adaptation. Furthermore, distinct sensitivity to different acoustic cues was found: Korean speakers tend to pay more attention to F2 (signaling the backness of a vowel), whereas Japanese speakers appear to be more sensitive to F1 (signaling the height of a vowel). By utilizing synthetic stimuli, it was shown that the perceptual boundary between /e/ and /a/ differs across the languages, even though the average F1 and F2 frequencies of the vowels are comparable between Korean and Japanese.

This paper has also discussed why Japanese and Korean speakers exhibit distinct sensitivity to identical acoustic cues even regarding the same relative vowel space (i.e. the non-high, non-back region). The distinct perception patterns are ascribed to language-specific experiences. By taking differences in L1 phonology, as well as phonetic variations into account, this study has highlighted the manner in which language specificity shapes different perceptual sensitivity.

Testing more varieties of dialects and languages as a recipient and also as a donor language is a promising direction for future research. Recently, a perception study demonstrated that Polish speakers exhibit distinct perception pattern of /æ/ in British English and American English (Szpyra-Kozłowska and Radomski, 2015). Incorporating more recipient languages having different phonetics and phonology would help us better understand how language-specific experiences constrain perception patterns of speakers in the adaptation of loanwords.

Acknowledgments

References

Ahn, S. 1998. *An Introduction to Korean Phonology*. Seoul: Hanshin.

Best, C. T. 1995. A direct realist perspective on cross-language speech perception. In *Speech Perception and Linguistic Experience: Theoretical and Methodological Issues in Cross-language Speech Research*, W. Strange (ed.), 167–200. Timonium MD: York Press.

Dupoux, E., Kakehi, K., Hirose, Y., Pallier, C. & Mehler, J. 1999. Epenthetic vowels in Japanese: A perceptual illusion? *Journal of Experimental Psychology-human Perception and Performance* 25(6): 1568–1578. https://doi.org/10.1037/0096-1523.25.6.1568

Flege, J. E. 1995. Second language speech learning: Theory, findings, and problems. In *Speech perception and Linguistic Experience: Theoretical and Methodological Issues in Cross-language Speech Research*, W. Strange (ed.), 233–277. Timonium MD: York Press.

Flege, J. E., Bohn, P. & Jang, S. 1997. Effects of experience on non-native speakers production and perception of English vowels. *Journal of Phonetics* 25, 437–470. https://doi.org/10.1006/jpho.1997.0052

Hisagi, M. 2007. Perception of Japanese Temporally-cued Phonetic Contrasts by Japanese and American English Listeners: Behavioral and Electrophysiological Measures. PhD dissertation, CUNY.

Ingram, J. C. L. & Park, S. -G. 1997. Cross-language vowel perception and production by Japanese and Korean learners of English. *Journal of Phonetics* 25: 343–370.

Johnson, K. 2004. Cross-linguistic perceptual differences emerge from the lexicon. In *Proceedings of the 2003 Texas Linguistics Society Conference: Coarticulation in Speech Production and Perception*, A. Agwuele, W. Warren & S. -H. Park (eds.) 26–41. Sommerville MA: Cascadilla Press.

Kang, Y. 2003. Perceptual similarity in loanword adaptation: English postvocalic word-final stops in Korean. *Phonology* 20: 219–273. https://doi.org/10.1017/S0952675703004524

Kang, Y. 2013. A corpus-based study of positional variation in Seoul Korean vowels. *Japanese/Korean Linguistics* 23.

Kuhl, P. K., Williams, K. A., Lacerda, F., Stevens, K. N. & Lindblom, B. 1992. Linguistic experiences alter phonetic perception in infants by 6 months of age. *Science* 255: 606–608. https://doi.org/10.1126/science.1736364

Kim, C. 1999. *Eoneo* (language). Seoul: Tapchulpansa.

Kim, J. 2010. Perception and production of English front vowels by Korean speakers. *Journal of Korean Society of Speech Sciences* 2(1): 51–58.

Mitsuya, T., MacDonald, E. N., Purcell, D. W. & Munhall, K. G. 2010. A cross-language study of compensatory response to formant-shifted feedback. Paper presented at The Second Language Studies – Acquisition, Learning, Education and Technology, Tokyo, Japan.

Peperkamp, S. 2005. A psycholinguistic theory of loanword adaptations. In *Proceedings of the 30th Annual Meeting of the Berkeley Linguistics Society*, M. Ettlinger, N. Fleischer & M. Park-Doob (eds.), 341–352. Berkeley CA: BLS.

Peperkamp, S. & Dupoux, E. 2003. Reinterpreting loanword adaptations: The role of perception. In *Proceedings of the 15th International Congress of Phonetic Sciences*, M. J. Solé, D. Recasens & J. Romero (eds.), 367–370. Adelaide: Causal Productions.

Peperkamp, S., Vedelin, I., & Nakamura, K. (2008). On the perceptual origin of loanword adaptations: Experimental evidence from Japanese. *Phonology* 25: 129–164. https://doi.org/10.1017/S0952675708001425

Silverman, D. 1992. Multiple scansions in loanword phonology: Evidence from Cantonese. *Phonology* 9: 289–328. https://doi.org/10.1017/S0952675700001627

Strange, W., Akahane-Yamada, R., Kubo, R., Trent, S. A., & Nishi, K. 2001. Effects of consonantal context on perceptual assimilation of American English vowels by Japanese listeners. *The Journal of the Acoustical Society of America* 109: 1691–1704. https://doi.org/10.1121/1.1353594

Szpyra-Kozłowska J. & Radomski, M. 2015. Perception versus spelling in loanword adaptation from English into Polish: The case of /æ/ and /ɪ/. Paper presented at *Approaches to Phonetics and Phonology*.

Tsukada, K., Birdsong, D., Bialystok, E., Mack, M., Sung, H. & Flege, J. 2005. A developmental study of English vowel production and perception by native Korean adults and children. *Journal of Phonetics* 33: 263–290.

Vance, T. 2008. *The Sounds of Japanese*. Cambridge: CUP.

Yoon, T., Kang, Y., Han, S., Maeng, H., Lee, J., & Kim, K. 2015. A corpus-based approach to dialectal variation in Korean vowels. *Proceedings of ICPhS 2015*.

The status of schwa in Indonesian

Evidence from a naturalistic corpus

Abigail C. Cohn and Ferdinan Okki Kurniawan
Cornell University

Cross-linguistically, the distribution of schwa is often different from other vowels. This is the case in Indonesian: While contrastive, schwa's distribution is more restricted than the other vowels and the realization of schwa is variable. Most prior work on schwa in Indonesian has focused on Standard Indonesian; however as a formal standard, there are many normative aspects of pronunciation potentially affecting observed patterns. To understand actual patterns of usage, we investigate schwa in Jakarta Indonesian, an emerging colloquial variety spoken in Indonesia's capital, based on a naturalistic spoken corpus. We conclude that observed patterns are due to optional deletion of underlying schwa conditioned by multiple factors including phonological and morphological structure, orthography, and stylistic factors.

Keywords: Indonesian, schwa, corpus phonology, vowel acoustics

1.   Introduction

The status of schwa cross-linguistically is a complex problem (Silverman 2011). Often its phonological distribution is more limited and phonetic realization more variable than for other vowels in a given language. "Schwa" is also used as a cover term for at least three sorts of entities: underlying vowels, phonologically inserted vowels, and phonetic transitions, arguably resulting from the interaction between gestural coordination and timing.

There have been conflicting claims about the status of schwa in (Standard) Indonesian. Indonesian is described as having a six-vowel system [i, u, e, a, o, ə] (Lapoliwa 1981). While schwa is contrastive as illustrated in (1a), the distribution of schwa is more restricted than that of the other vowels as illustrated in (1b) (as observed by Lapoliwa and discussed by Cohn, 1989 and Cohn & McCarthy, 1998). (Italicized forms are orthographic representations.)

(1)   Behavior of schwa in Indonesian

    a.   schwa in contrast

        gamelan [gaməlan] 'musical ensemble' ~ *jumla*h [dʒumla] 'total'

        berat [bərat]'heavy' ~ *barat* [barat] 'west'

    b.   restrictions on schwa: schwa cannot appear in a word final syllable[1]

        * ə (C) #

        berat [bərat] 'heavy'   but * [barət]

Additionally, the realization of schwa is variable as illustrated in (2).

(2)   *kelapa* [kəlapa] ~ [klapa] 'coconut'

    selalu [səlalu] ~ [slalu] 'always'

    sekolah [səkola] ~ [skola] 'school'

Historically there are at least two sources of schwa. As discussed below, underlying sources of schwa include vowels in stems and prefixes. Also, historically in native Malay words the maximal syllable was CVC and tautosyllabic clusters were unattested. In borrowings, such clusters were broken up by epenthesis.

Most prior work on schwa in Indonesian has focused on Standard Indonesian (SI). However, as a formal standard variety, the prescriptive norms are very different from colloquial patterns observed in more casual speech and the variable realization of schwa is clearly a casual speech phenomenon. To understand actual patterns of usage, we investigate schwa in Jakarta Indonesian (JI, a rapidly developing colloquial variety of Indonesian spoken in Jakarta, the capital of Indonesia), based on a naturalistic spoken corpus (Gil & Tadmor 2015).

In this paper we review earlier accounts of schwa in Indonesian (Section 3) considered in light of issues posed by the analysis of schwa cross-linguistically (Section 2). We also discuss the issue of Standard vs. Colloquial Indonesian (Section 4). We then turn to an investigation of schwa in Jakarta Indonesian, reporting on both corpus and experimental phonetic evidence (methodology in Section 5). As discussed in Section 6, our results suggest that observed patterns arise from optional deletion of underlying schwa, conditioned by a number of factors including sonority and morphological structure, levels of formality, and word history, as encoded in orthography. Furthermore, some expected conditioning factors, such as rate of speech, do not appear to play a role.

---

1. Schwa is found in word final syllables in borrowings from Javanese, cf. Standard Indonesian *malam* [malam] 'night' pronounced [maləm] in Jakarta Indonesian due to influence from Javanese.

2.   Schwa cross-linguistically

As noted above, the distribution and analysis of schwa cross-linguistically pose a number of issues. First in many languages there appear to be multiple sources of schwa. For example, as discussed by van Oostendorp (1998/2003) and Silverman (2011), schwa can be characterized as having three sources, underlying, reduced, or inserted. Second, schwa is often observed to be "defective" being more restricted in its distribution than other vowels. Third, schwa appears to be more variable in its realization than other vowels, both in the acoustic form of its realization and in terms of its presence or absence.

There are assumptions in both phonological and phonetic analysis that contribute to some of these issues. First is the use of a specific IPA symbol [ə] to represent "schwa". Unlike other phonetic symbols, which (in principle) are used independently from phonological analysis, schwa [ə] is not only used to represent a mid-central vowel (often shorter and more variable than other vowels in a particular language), but it is also used to represent a vowel that is phonologically "defective" in some way, that is, unstressed or prosodically inert. Thus in transcription of English, schwa [ə] and wedge [ʌ] are often both used to indicate a mid central vowel. (Compare *butt* transcribed as [bʌt], with *but* transcribed as [bʌt] if stressed and [bət] if unstressed.) Also at issue is the fact that most phonological descriptions and analyses of schwa are based on impressionistic transcription. There are limitations to how reliable impressionistic transcription is, which are likely to be exacerbated when analyzing a phonological segment type that is by definition short and variable.

Following basic tenets of generative phonology, a standard approach in phonology has been to apply a uniform account to multiple sources of schwa in a given language. Thus for example, in English, since many cases of surface schwa can be accounted for as derived from another vowel through vowel reduction, it has been argued that schwa need not be considered as an underlying phoneme in English (see Chomsky & Halle 1968, but see also Sainz 1992 for discussion). Following this view, the surface forms of *atom* [ˈæɾəm] and *atomic* [əˈtʰamɪk] would both be derived from underlying /ætam/. Non-alternating schwas such as *the* [ðə] would also be assumed to be derived from another underlying vowel. To better understand the patterning of schwa, it is important to separate analytic assumptions from empirical analysis.

Recent discussions of schwa in English and other languages have led to a more nuanced understanding of schwa. First it is agreed that there might well be multiple sources of schwa in a given language. For example, in English as shown in (3), there are underlying schwas (3a). Schwa is restricted in its distribution, occurring only in unstressed positions, including function words (3b). There are also schwas

resulting from vowel reduction (3c) and epenthesis (3d). Schwa is also optionally deleted (at least impressionistically, (3e)).

(3)   Different sources of schwa in English
    a.   underlying (non-alternating) schwas
        the [ðə]
        sofa [ˈsofə]
        Anna [ˈænə]
    b.   limited distribution, only in unstressed position
        content words: *support* [səˈpɹʊt], *sofa* [ˈsofə]
        function words: *the* [ðə], *a* [ə]
    c.   result of vowel reduction: V ~ ə
        Canada [ˈkænədə], *Canadian* [kəˈnediən]
        telephone [ˈtɛləˌfon], *telephony* [təˈlɛfəni]
    d.   epenthetic schwa: Ø ~ ə[2]
        in regular plurals: *dish, dishes* [dɪʃəz]
        in regular past tenses: *lift, lifted* [lɪftəd]
    e.   optional deletion: ə ~ Ø
        below [bəˈlo] reduced to [blo]
        support [səˈpɔɹt] reduced to [spɔɹt]

Phonetic studies of schwa have also led to a more complex picture. First these studies suggest that what is described as the presence or absence of schwa based on introspection and impressionistic transcription may be end points along a continuum (thus *below* and *blow* and *support* and *sport* may not be fully neutralized). Alternations described as deletion of schwa may actually be varying degrees of reduction. These complexities are highlighted in the discussion of schwa deletion in French, typically analyzed as being "present" or "absent". Bürki et al. (2011) show that what has been described as "deletion" of schwa in French is the endpoint of a continuum of shortening, which can be modeled as gestural overlap (see Browman & Goldstein 1992 for discussion of this approach). Bürki et al. also document extensive variation across listeners in their judgments of the presence or absence of schwa, which raises issues of the reliability of impressionistic judgments for these sorts of phenomena. At the same time, what have been described as phonological processes of schwa insertion or epenthesis may well result from gestural coordination, with excrescent schwa resulting from gestural "underlap" (see Warner et al. 2001 and Hall 2006, 2011, for recent discussion). Phonetic stud-

---

2. In some varieties of English there are two unstressed central vowels, one higher and one lower. The epenthetic vowel for some speakers is more appropriately transcribed as [ɨ] and is in contrast with [ə], e.g. *roses* [rozɨz] vs. *Rosa's* [rozəz].

ies are needed to determine whether schwa is categorically present or absent or whether its realization is gradient.

The realization of schwa is variable in two different dimensions. As just discussed there is temporal/spatial variation, which we refer to as *gradience*. There is also variability in the occurrence or non-occurrence of schwa, often modeled as "optionality" in the phonological literature, referred to as "gradient variation in frequency of occurrence of categorical events" by Ladd (2014: 88).[3] Corpus studies have contributed to our understanding of variable schwa, or what has often been described as optional deletion or insertion of schwa. This variability is well documented by Bürki et al. for French and also shown for English by Patterson, LoCasto & Connine (2003).

There are thus both substantive and methodological matters to keep in mind as we investigate the status of schwa in Indonesian. First, there may well be multiple sources of schwa, and indeed historic evidence from Indonesian suggests that this is the case. Second, "deletion" or "insertion" of schwa may be end points on a continuum of reduction or excrescence. Third, the realization of schwa may be variable, conditioned by grammatical as well as stylistic and other performance factors, whether through "optional insertion" or "optional deletion". To fully understand these patterns, we clearly need to look at phonetic data in addition to impressionistic transcription (which may provide some indication of listeners' perceptions) and we need to analyze naturalistic data. We turn next to previous accounts of schwa in (Standard) Indonesian.

3.   Accounts of schwa in (Standard) Indonesian

(Standard) Indonesian is widely described as having a six vowel system including the five vowels [i, u, e, a, o] and schwa [ə] (Lapoliwa 1981). While the distribution of schwa is more restricted than that of the other five vowels, it is generally agreed that schwa needs to be included as an underlying vowel at least in the native vocabulary (see Lapoliwa 1981: 31–35). As shown in (4), schwa is in contrast both with Ø (4a) and other vowels (4b).[4]

---

3. The relationship of these two dimensions of variation is not well understood. See Cohn (2006) and Ladd (2014) for recent discussion. Cohn (2006: 31–32) observes "It is not necessarily the case that temporal/spatial gradience and variability go hand in hand."

4. Note while the Indonesian orthography is phonemic and quite transparent, there is an indeterminacy between schwa, represented orthographically as < e > and the mid front vowel /e/ written as either < é > or < e >. Thus there is an ambiguity between, for example, *desa/désa* [desa] 'village' and *besar* [bəsar] 'big'.

(4) Evidence of contrast

a. schwa   vs.   Ø

   gamelan [gaməlan]   *jumlah* [dʑumla] 'total'
   'musical ensemble'

   emas [əmas] 'gold'   *mas* [mas] 'term of
                   address for young male'

b. schwa   vs.   V

   berat [bərat] 'heavy'   *barat* [barat] 'west'
   seni [səni] 'art'   *sini* [sini] 'here'
   semur [səmur] 'meat dish'   *sumur* [sumur] 'well'
   terang [təraŋ] 'light'   *térong* [teroŋ] 'eggplant'
   belum [bəlum] 'not yet'   *bélok* [beloʔ] 'turn'

If schwa were not treated as underlying, there would be no way to predict its presence in these forms.[5]

At the same time, schwa is clearly more restricted in its distribution. In native vocabulary it occurs in non-final syllables of roots and in prefixes (actually it is the only vowel occurring in prefixes with the exception of the prefix *di-* 'passive'), as illustrated in (5a) & (b). But it cannot occur word finally, whether in a root-final syllable or suffix, as schematized in (5c).

(5) Restrictions on schwa's distribution

a. schwa in native or well integrated roots
   kecil [kətɕil] 'small'
   kerja [kərdʑa] 'work'
   perempuan [pərəmpuan] 'woman'
   kelapa [kəlapa] 'coconut'

b. schwa in prefixes
   meng- [məŋ-] 'active'
     meng-atur [məŋatur] 'arrange'
     mem-bantu [məmbantu] 'help'
   ke- [kə-] 'ordinal'
     dua [dua] 'two', *ke-dua* [kədua] 'second'

c. schwa cannot appear in a word-final syllable[6]
   * ə (C) #
   berat [bərat] 'heavy'   but * [barət]
   makan-an [makanan] 'food' but * [makanən]

---

5. As discussed by Lapoliwa and further developed and analyzed by Cohn (1989), since stress placement is predictable, the placement of stress follows from the presence of schwa or another vowel, rather than the other way around.

6. Except as noted above in Javanese borrowings or pronunciations influenced by Javanese.

As discussed by Lapoliwa (1981), Cohn (1989), and others, at least in many varieties of Indonesian, schwa cannot bear stress. As illustrated in (6a) the usual locus of primary stress described for Standard Indonesian is penultimate. However, when a schwa occurs in the penultimate syllable, final stress is observed in disyllabic forms (6b) and antepenultimate stress is observed in trisyllabic or longer forms (6c).

(6)   Stress placement with schwa   (Cohn 1989)
    a.   penultimate stress
        bantu [ˈbantu] 'help'
        bicara [biˈt͡ʃara] 'speak'
    b.   final stress with schwa in the penult
        beri [bəˈri] 'give'
        kecil [kəˈt͡ʃil] 'small'
        kerja [kərˈd͡ʒa] 'work'
    c.   antepenultimate stress with schwa in the penult
        gamelan [ˈgaməlan] 'musical ensemble'
        ceritera [t͡ʃəˈritəra] 'story'

While Cohn (1989) suggests that schwa might be treated as epenthetic to account for its prosodic invisibility, as shown in (4), this is not tenable. Cohn and McCarthy (1998) show that schwa has a prosodic presence in limited circumstance (that is, in disyllables with schwa as the initial vowel), and propose an Optimality Theoretic account of schwa's restricted distribution. They conclude that schwa can be part of, but not the head of, a metrical foot and taken together with a restriction on weak final syllables, account for the observed patterns.

    There is less agreement about the treatment of schwas in historically borrowed forms. Malay, the closely related source language for Indonesian, served as a lingua franca for many centuries and as such has extensive borrowings from successive waves of languages the speakers of Malay came in contact with. Borrowings from languages with more complex syllable structure than the CVC syllable allowed in Malay were nativized either by epenthesis or simplification. Most relevant in this regard are extensive borrowings from Sanskrit, Arabic, and later Portuguese, Dutch, and English, as exemplified in (7).

(7)   Loan adaptations into Malay/Indonesian
    a.   loans from Sanskrit, Arabic
        bahasa [bahasa] 'language' from Sanskrit [bʰāṣā]
        seteru [sətəru]   'enemy'   from Sanskrit [satru]
        pikir [pikir]   'to think' from Arabic [fikr]
    b.   loans from Portuguese, Dutch, English
        geréja   [gəred͡ʒa]   'church' from Portuguese *igreja*
        perakték [pəraktek]   'practice'   (also written as *prakték*)

kelas   [kəlas] 'class'
keran   [kəran] 'faucet' from Dutch *kraan*
pelakat [pəlakat]   'placard'

Most previous analyses assume a uniform account of schwa. Lapoliwa (1981: 116–117) argues that all such epenthetic schwas should be treated as underlying (as indicated by the orthography), to avoid the need for both an epenthesis and deletion rule (the latter motivated by variable schwa deletion in fast speech). This seems to be well motivated for older borrowings that are fully integrated into the language (7a), forms that many speakers are not even aware are borrowings. It is less clear how more recent borrowings (7b) should be treated. Adisasmito (1993) argues that, while schwa is underlying in native vocabulary, it should be treated as epenthetic in borrowed vocabulary, to account for greater variability in pronunciation of these forms than in the native vocabulary.

Closely tied to this issue is the question of allowable syllable types in (Standard) Indonesian. As discussed by Lapoliwa (1981) and others, there is a strict canonical word structure in native vocabulary. Canonical syllables are maximally CVC. A very large majority of (content) roots are disyllabic, $C_1 V (C_2) C_3 V (C_4)$, with the only canonical clusters being heterosyllabic (and usually homorganic). However as discussed by Hardjadibrata (1978), Ikranagara (1980), Adisasmito (1993) and others, tautosyllabic clusters are observed in the spoken language as exemplified in (8).

(8)   Observed tautosyllabic clusters
      kelapa [kə.la.pa] ~ [kla.pa] 'coconut'
      perempuan [pə.rəm.pu.an] ~ [prəm.pu.an] 'woman
      seperti [sə.pər.ti] ~ [spər.ti] 'similar'
      selalu [sə.la.lu] ~ [sla.lu] 'always'
      sekarang [sə.ka.raŋ] ~ [ska.raŋ] 'now'
      berapa [bə.ra.pa] ~ [bra.pa] 'how much'
      berangkat [bə.raŋ.kat] ~ [braŋ.kat] 'leave'
      terus [tə.rus] ~ [trus] 'continue'
      belom [bə.lom] ~ [blom] 'not yet'

As discussed by Adisasmito, there are two patterns of deviation from canonical syllable structure. One allows tautosyllabic obstruent – liquid clusters; the other includes [s] + obstruent or [s] + obstruent + liquid clusters. The first case is a very well attested CC cluster pattern cross-linguistically which respects the sonority hierarchy and is attested in closely related, neighboring languages including Sundanese and Javanese. The second is often analyzed as [s] being extra-syllabic. Both patterns are widely attested in Dutch and English borrowings in Indonesian, some of which are very well nativized, others of which are less well integrated.

Adisasmito (1993) observes that speakers seem to vary in how strictly they observe the canonical syllable types and speakers may show variation based on style, rate of speech, and exposure to source language, as schematized in her diagram (45, p. 15), repeated here in Figure 1. She also suggests that the effect of formal vs. informal speech will go in the opposite direction for native vs. borrowed lexical items.

(45)   Diagram of [ə] occurrence in borrowed lexical items

most exposure to source language	least exposure to source language
fast speech	slow speech
formal speech	informal speech
schwa is not present	⟵⟶	schwa is present
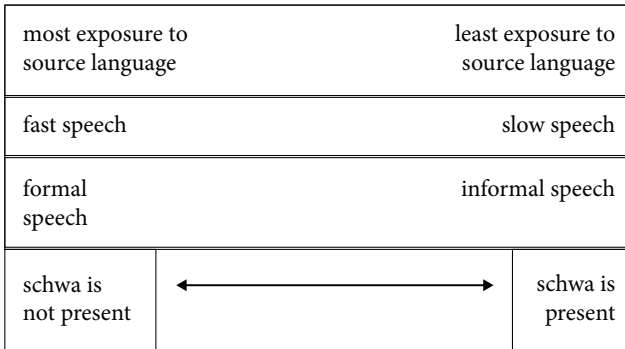
Figure 1. Factors conditioning presence or absence of schwa, reproduced from Adisasmito (1993 (45), p. 15 with author's permission).

There are thus many factors including both grammatical and stylistic ones that might be at play in determining observed patterns of realization of schwa in Indonesian.

As detailed below in Section 5.1, the prior literature leaves us with several unanswered questions about the status of schwa in Indonesian. As discussed above in Section 2, both naturalistic data and phonetic data are needed to tease apart the contributions of this complex set of grammatical and stylistic factors. Before turning to our methodology for the present study, we need to address the issue of Standard Indonesian as an object of study and its relationship to Colloquial Indonesian.

4.   Standard Indonesian vs. Colloquial Indonesian

Most prior work on schwa in Indonesian (and Indonesian phonology more generally) focuses on Standard Indonesian (SI). This is the variety of Indonesian that serves as the national language (as declared at the nation's founding in 1945, see Sneddon 2003 for discussion). It is the variety learned in school for most Indonesians (native speakers of hundreds of different local languages). Developed by the National Language Board, its use is constrained by normative expectations and H is thought of as a formal variety. To understand actual patterns of usage of

schwa, at least in part a casual speech phenomenon, and other phonological phenomena more generally, we need to study Colloquial Indonesian.

However, there is little agreement about how to define Colloquial Indonesian. This is in part because as a largely spoken variety, it has rarely been an object of study (though see Ewing 2005). This is also because colloquial varieties vary regionally and are strongly influenced by local languages and vernacular varieties of Malay. One of the most important local varieties of Colloquial Indonesian that is starting to get more attention is Jakarta Indonesian (JI). This is a rapidly emerging variety of Indonesian spoken in and around the capital of Jakarta, serving as the native language of the increasingly large population of speakers who has adopted Indonesian as their first language (in the tens of millions though no reliable figures are available, see Sneddon 2006: 3 for discussion). It also appears to be developing as a generalized variety in other urban areas across Indonesia. Thus it is an appropriate variety for phonological investigation and is in need of further documentation as a major emerging colloquial variety.[7] Here we join other scholars, building on a language documentation project carried out at the Max Planck Institute for Evolutionary Anthropology, Jakarta Field Station.

5.   Methodology

We now turn to the methodology for the current study, drawing on data from a naturalistic corpus, including audio files that can be used for acoustic analysis.

5.1   Research questions and factors

As discussed in Sections 2 and 3, there are a number of questions for us to consider.

(9) Questions about schwa in Indonesian
   a.   Is there evidence for both underlying and inserted schwas?
   b.   Are schwas (whether inserted or underlying) gradient in their realization?
   c.   What factors—phonological, morphological, lexical—condition presence or absence of schwa?
   d.   What is the source of variable schwas?
         Do these arise from optional deletion of underlying schwa or optional insertion of schwa?

---

7. Another interesting question, that we don't pursue here, is the relationship between Jakarta Indonesian and Betawi Malay, the variety of Malay spoken in and around Jakarta at the founding of Indonesia. See Kurniawan (forthcoming) for discussion.

Regarding variable schwa, we need to consider what factors condition variable realization, as detailed in (10).

(10)   What factors condition realization of variable schwa
  a.   Is variation observed between speakers (inter-speaker variation)? Are the differences due to different varieties of Indonesian or contact influences?
  b.   Is there variation within speakers (intra-speaker), suggesting stylistic variation?
  c.   Phonology: Do phonotactics, prosodic word structure, and/or sonority play a role?
  d.   Morphology: Are there differences based on location of schwas, as part of a monomorphemic word, part of lexically frozen affix, part of productive affix?
  e.   Lexical: Are the patterns of variability the same for native vocabulary or borrowing? Is recency and/or source of borrowing relevant? Does lexical (token) frequency affect observed patterns?
  f.   Orthography: Are patterns affected by whether schwa is represented orthographically?
  g.   Stylistic and performance factors: Does level of formality or rate of speech affect observed patterns?

With the data available to us, we can address all of the questions except lexical frequency (10e) and level of formality (10g). In the first case this is because the corpus is not large enough to make reliable determinations of token frequency and we do not currently have available to us independent token frequency counts for Jakarta Indonesian. In the second case, this is because the corpus is based on informal colloquial speech and doesn't include more formal registers. There are, however, isolated examples of careful speech in the corpus that we can consider.

5.2   Data: Jakarta Field Station Corpus

For the present study we analyze data from the MPI Jakarta field station corpus of Betawi-Jakarta Indonesian (Gil & Tadmor 2015). This corpus is based on recordings done in informal settings in Jakarta, with 28 hours of recorded speech with a total of 75,079 utterances transcribed by trained native linguists in ELAN (Max Planck Institute for Psycholinguistics) based on careful listening and imported into a relational database. The database is searchable by orthography, phonetic transcription, morphological structure, as well as by speaker.

We focus in this study on data from speakers clearly identified as speakers of Jakarta Indonesian, based on the available meta-data. We report here on speech

from two speakers, one female, one male, to investigate the questions and factors laid out in Section 5.1. Both speakers are educated speakers of Indonesian who grew up in Jakarta, speaking Indonesian as their first language.

5.3   Data: Phonological patterns investigated

We focus our attention on the presence or absence of schwas in word-initial syllables.[8] To do this we compare orthographic sequences of #CC to #CeC and also phonetic transcriptions of [#C$_1$C$_2$] to [#C$_1$əC$_2$]. As discussed above, schwa in Indonesian is represented orthographically by < e > . We compare the orthographic representation and the phonetic transcription of these forms. We also carried out acoustic analysis of relevant target items from the corpus, using Praat (Boersma and Weenick 2013). In the current analysis, we exclude *Cr* and *Cer* sequences because *Cer* is often realized as syllabic r.[9]

A sample of the patterns of words extracted from the corpus is shown in Table 1, where we compare, for example, #sk vs. #sək and #kl vs. #kəl in native roots, borrowings, and prefixed forms for both speakers (number of tokens found in parenthesis, not all tokens are usable in the analysis as some involve overlapping speech, background noise, errors, etc.).

Table 1. Sample of database results for two speakers, E = borrowing from English, P = borrowing from Portuguese, D = borrowing from Dutch, (# of tokens).

		Speaker 1	Speaker 2
native root	sk	skaraŋ (10)	skaraŋ (85)
	sək	səkaraŋ (47)	səkaraŋ (25), səkian(2)
borrowing	sk	N/A	skola [P] (28), skripsi [D] (2)
	sək	səkɔla [P] (18)	səkola [P] (7)
prefixed	sk	N/A	s-kali (14)
	sək	sə-kitar, sə-kaliʔ (8) sə-kali-an (6) sə-kəluwarga sə-kəlas (7) sə-kədar-ɲa	sə-kali (9) sə-ketemu-ɲa sə-katiʔ sə-kilo

---

8. Similar alternations also occur in non-initial syllables and we expect our findings will largely extend to these cases. The issue of schwa in final syllables is more complicated as no schwas occur syllable finally in the native vocabulary. There are of course schwas in borrowings; we leave the issue of nativization of such schwas as a future topic.

9. It is possible that < er > , taken to represent /ər/, is better analyzed as /ɼ/, especially in the verbal prefix *ber-*. We leave this question for future investigation.

Table 1. (*continued*)

		Speaker 1	Speaker 2
native root	**kl**	kliad-klied (2)	kluarga (19), kluar (20) kləŋər, klambu, kladi (2), kluh-an, klapa (10), klintʃĩ, kliŋkiŋ
	kəl	kəliliŋ (6), kəlapaʔ (2) kəluwarga (2) kəliniŋ-an	kəlabu kəlapa (2) kəlar
borrowing	**kl**	kləb [E], klas [D] (7)	klas [D] (2) klinik [D] (3)
	kəl	kəlas [D] (21) kəlar [D] (2)	kəlas [D]
prefixed	**kl**	N/A	k-lurah-an (2) k-liat-an (6), k-lempar
	kəl	kə-luar (6) kə-landʒutan-ɲa kə-lahir-an kə-lijat-an (2)	kə-lurah-an kə-lapar-an kə-lama-an (2) kə-lahir-an kə-ləbih-an

An important note is that despite the relatively large size of the corpus (for a fully transcribed and annotated corpus of an understudied language), the number of tokens available to us for the relevant comparisons is quite small. Thus our analysis is more qualitative than quantitative in nature. We turn now to the results.

6.   Results

First, we consider the answers to questions about realization of schwa in (9a), (b), & (c) in Section 6.1. Then we turn to the status of variable schwa (9d) and consider the various factors contributing to this variability listed in (10a–g) in Section 6.2.

6.1   Realization of schwa

Quite strikingly, based on acoustic analysis we find that schwa is either clearly present or absent, that is, there is no evidence that schwa is either excrescent or re-duced but not deleted. Also, both speakers readily produce clusters in both native forms and historical borrowings. Synchronically there is little evidence for schwa insertion in borrowed forms with illicit clusters.

Reliability of transcription

First we consider a methodological result, that is, the issue of how reliable (impressionistic) phonetic transcription is for judging the presence or absence of schwa. This can be addressed by comparing tokens of word forms transcribed with and without schwa along with their acoustic realizations. Unfortunately, the phonetic transcription is *not* a reliable indicator of the acoustic presence or absence of schwa. What we find is that if no schwa is transcribed, there is almost never one present in the acoustic realization. (There are a few cases, where no schwa is transcribed and a syllabic l was observed.) On the other hand, quite often when a schwa is transcribed, there is not actually one present acoustically. This is illustrated in Figure 2 in the spectrograms for two tokens of *sekarang* 'now', for each speaker, one transcribed with, one transcribed without schwa, where in neither case is there any acoustic evidence of a schwa.

a.i.
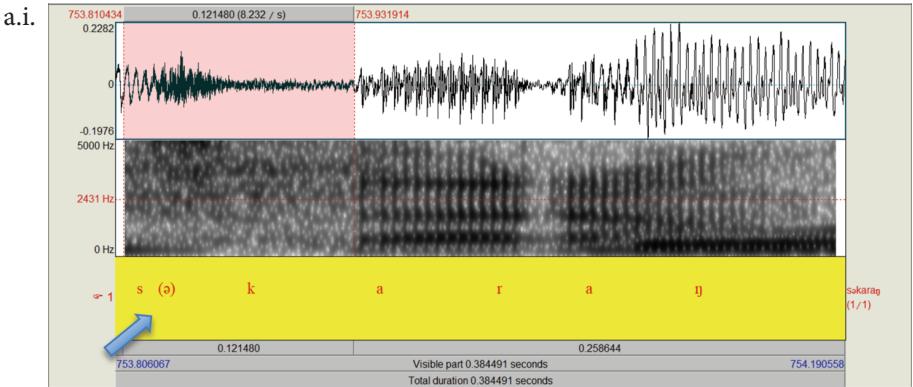
[səkaraŋ] coded with schwa, Speaker 1

a.ii.
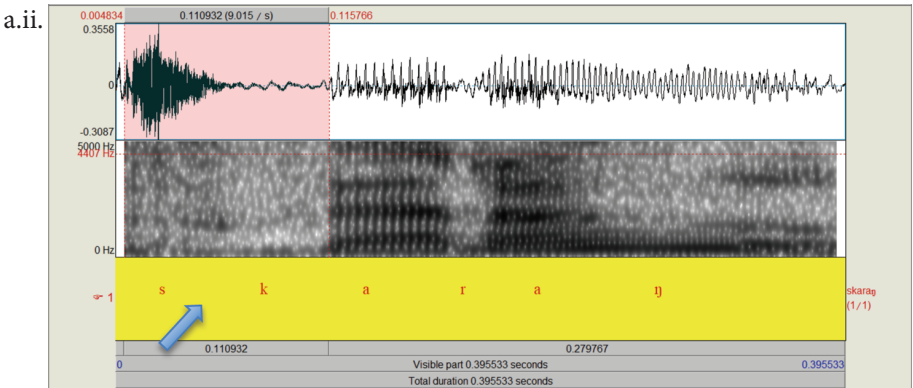
[skaraŋ] coded without schwa, Speaker 1
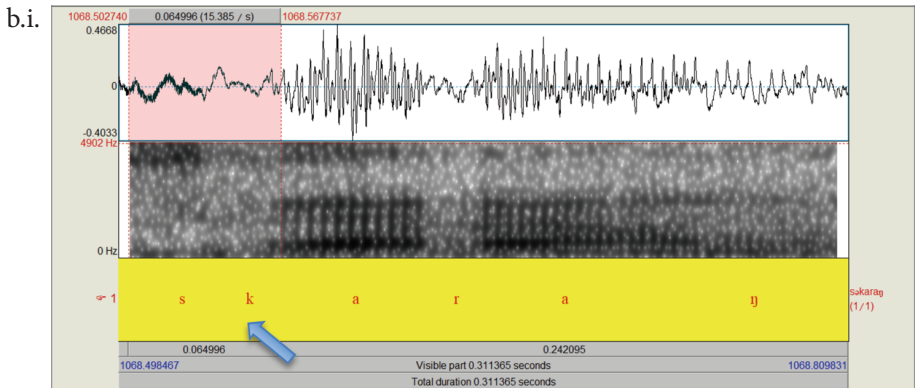
[səkaraŋ] coded with schwa, Speaker 2
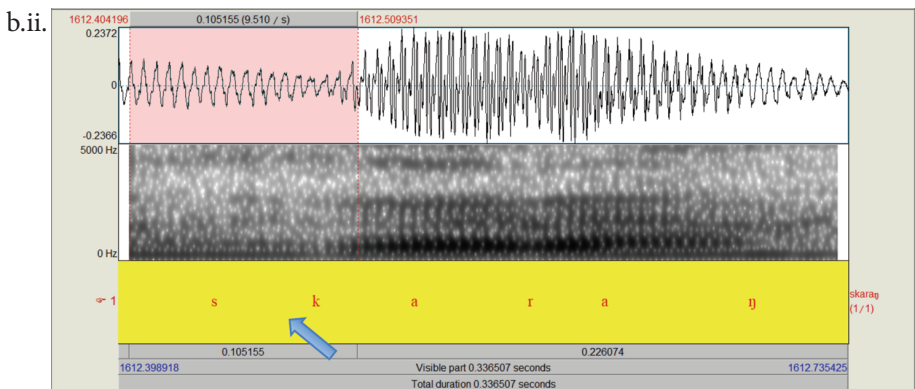
[skaraŋ] coded without schwa, Speaker 2

Figure 2 Spectrograms of *sekarang* 'now', transcribed with and without schwa, a. Speaker 1, i. [səkaraŋ], ii. [skaraŋ]; b. Speaker 2, i. [səkaraŋ], ii. [skaraŋ].

We believe that this is due to the influence of orthography, where these forms are written including < e > . Thus even well trained native transcribers might be biased. There could also be subtle spectral differences that transcribers are sensitive to. This could be tested with a perceptual study. This result means that we can use the phonetic transcription to search the corpus for relevant forms, but we *cannot* use the phonetic transcription as an accurate indicator of the presence or absence of schwa. This is a reminder of the issues posed by impressionistic transcription even when carefully done by trained linguists. To address this limitation, the results reported here are based on both the phonetic transcription and acoustic analysis.

Categorical or gradient realization

Next we find that in almost all cases schwa is either categorically present or absent. This is seen in the representative spectrograms shown in Figure 2 where schwa is categorically absent, as well as in the spectrograms in Figure 3 showing two tokens of *beli* 'buy' with and without schwa.

a.

[bəli] 'buy'

b.
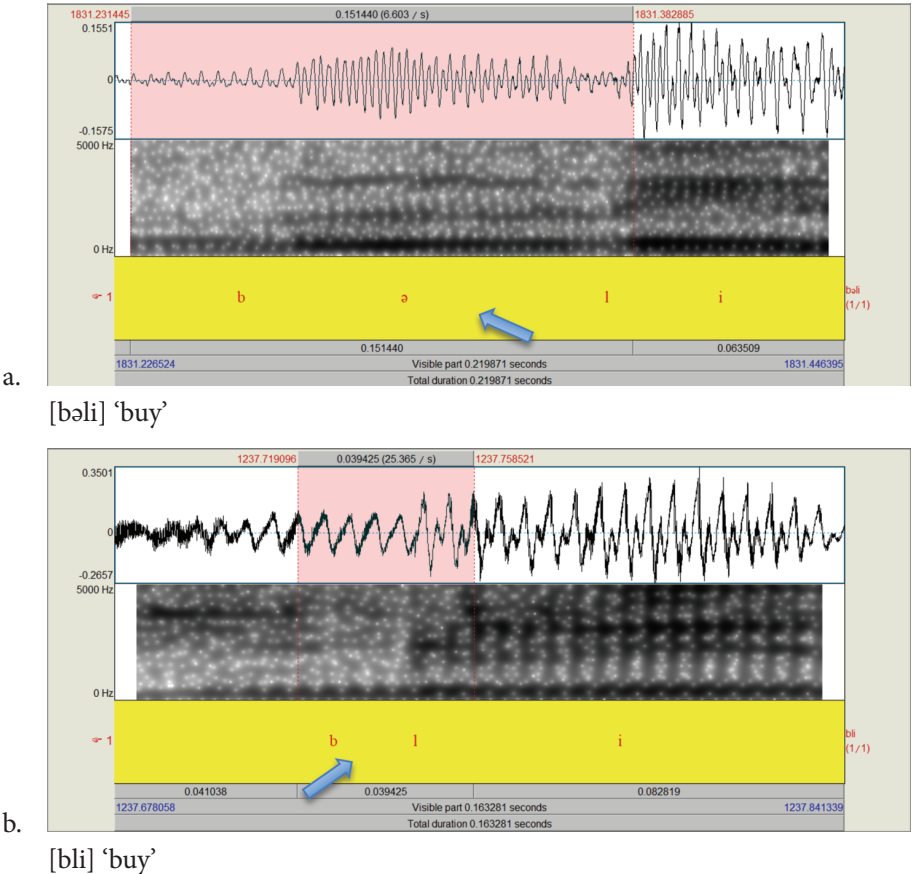
[bli] 'buy'

Figure 3. Spectrograms *beli* 'buy', a. [bəli], b. [bli], Speaker 1.

If the observed patterns were a result of gestural (re)alignment, whether excrescence or reduction, we would expect to see the duration values of schwa fall along a continuum, from zero to the longest tokens (in our data about 100 ms.) But this is not what we find. Most of the schwas are in the range of 35–80 ms, with only a few shorter tokens. What we observe is a bimodal distribution with one mode at zero (no schwa) and one mode at about 50 ms.[10] The latter values are roughly what we would expect based on schwa duration measurements cross-linguistically

---

10. The data are not sufficiently balanced to make a statistical analysis meaningful.

(e.g. Umeda 1975 finds schwa in unstressed function words in English to be in the 40–50 ms range). These durations are also comparable to duration for /i/ in the same corpus (also expected to be quite short as a high vowel) when it occurs in unstressed position (forms such as *bicara* [bi'cara] 'speak' *dikirim* [di'kirim] 'sent, passive') where [i] ranges from 43–72 ms.

This is both an interesting and useful result. This suggests that the presence or absence of schwa is indeed either a phonologically conditioned process or information encoded in the lexical representation, not a result of phonetic implementation. While as discussed below there is extensive variability for one speaker, there is not gradience that needs to be incorporated into the analysis. Based on lexical, phonological, or stylistic factors, schwa is present or absent.

Insertion and/or deletion?

As discussed further in Section 6.2, for Speaker 1, there are word forms where schwa is (almost) always absent, where it is (almost) always present, and then cases where we see extensive variability for the same word form. While prosodic word structure and morphological structure are relevant factors in determining observed patterns, we do *not* find different patterns between borrowings and native forms. This suggests a unified account of schwa in native and borrowed forms (such as proposed by Lapoliwa 1981), rather than an account such as Adisasmito (1993) proposing underlying schwas (optionally deleted) in native forms, but (optionally) inserted schwas in historically borrowed forms.

Furthermore both speakers in the present study readily produce tautosyllabic clusters, at least in word initial position. This suggests that synchronically, for at least some speakers, the restrictive canonic syllable type from Malay (C)V(C) is no longer applicable. This is likely to be the cumulative effect of extensive borrowings from neighboring languages, especially Javanese and Sundanese, with tautosyllabic obstruent-liquid clusters, as well as the massive borrowings from both Dutch and English. We do note that both of these speakers are proficient in English, which might also be a relevant factor.

What these results show is that, at least for some speakers, such clusters do not need to be broken up. This means that the original pressure for epenthesis is no longer operative and schwas in historically borrowed forms need to be part of the underlying representation. For such speakers, non-alternating schwas and variably realized schwas appear to be present underlyingly. Further support for this comes from the fact that more recent borrowings of such clusters never alternate and do not include < e > orthographically, as illustrated in (11).[11]

---

11. While there is some variation between the major dictionaries of Indonesian (e.g. Stevens & Schmidgall-Tellings 2004 as compared to Departemen Pendidikan Nasional, 2008, *KBBI*), in

(11)   *kelas* [kəlas] ~ [klas] 'class' but *blok* [blok] 'block'
                                          plastik [plastik] 'plastic'
         sekolah [skola] 'school'   but *skéma* [skema] 'scheme'

In other words, it is orthography, rather than word history, that is at least in part responsible for observed patterns. Since older borrowings are more likely to be written with schwa, the historical remnants of schwa insertion are seen in the orthography and the recency of the borrowing is thus indirectly and partially encoded in the orthography.

With these answers to questions about the realization of schwa, we turn now to the factors conditioning variability.

6.2   Factors affecting variability of schwa

As laid out in (10), there are a number of factors that might condition presence or absence of schwa. The first question is whether the variability is between speakers, or within speakers.

Inter vs. intra speaker variation?
The account of variability is quite different depending on if it is between speakers or within speakers (see, e.g. Coetze 2012 for review). If speakers have consistent patterns, but there are differences between speakers, then these differences can be attributed to their dialect background, contact influences, or just idiolectal differences. Adisasmito (1993) suggests this could be the case, with different speakers having more or less stringent requirements on syllables types resulting in three different varieties. Here we find interspeaker differences along these lines where Speaker 1 shows an interesting pattern of variation, while Speaker 2 lacks schwa in almost all of the forms written orthographically with schwa.

On the other hand, if individual speakers show variability, that is, different realizations of the same or similar word forms, which are not accounted for by phonological, morphological or lexical factors, these differences are likely due to stylistic variation, or performance factors (such as rate of speech). The speakers in the present study show similar patterns for cases where schwa is consistently deleted, but differ in their patterns of where schwa is produced.[12] However as we

---

general borrowing from Portuguese tend to be written with schwa and many borrowing from Dutch and English are not written with schwa.

12. We were surprised by the systematic absence of schwa for Speaker 2. Further studies of additional speakers are needed to understand how characteristic the patterns exhibited by the two speakers in the present study are.

will see in a moment, Speaker 1 also shows extensive *intra*-speaker variability that needs to be accounted for.

Phonological conditioning

Looking closely at the observed patterns for Speaker 1, as summarized in Table 2, we find that there are cases where (i) schwa is consistently present, (ii) others where it is consistently absent, and (iii) still others where for the same word form its presence or absence is variable. Despite what appears to be a high degree of variability, which group a word form falls into is systematically conditioned by the phonology. (We return below to the additional effect of morphological structure.) The two factors that account for this distribution are relative sonority of C_1 and C_2 and number of syllables.

Table 2. Presence, absence, or variable realization of schwa, conditioned by sonority and number of syllables, Speaker 1.

C_1 C_2 sonority	2 syllables[13]	3 syllables or more
stop-liquid s- liquid	iii. variable	ii. (almost) always absent
s- nasal s- voiceless stop	iii. variable	ii. (almost) always absent
obstruent- nasal obstruent- obstruent s- voiced stop sonorant-sonorant	i. (almost) always present	i. (almost) always present

First consider cases where schwa is almost always present (i) as illustrated in (12) and shown in the representative spectrograms in Figure 4 for *penting* 'important' and *ketemu* 'meet'. If C_1 is more sonorous than C_2, equal (obstruent-obstruent, except if C_1 is [s]), or close in sonority (obstruent-nasal), underlying schwa is rarely deleted (12a). Interestingly, s + voiced stop does not seem to be allowed, whereas s + voiceless stop is ok (12b). Also t-l and possibly d-l are not allowed, similar to the restriction observed in English (12c).

---

13. There are no monosyllabic words with schwa.

a.

[pəntiŋ] 'important'

b.
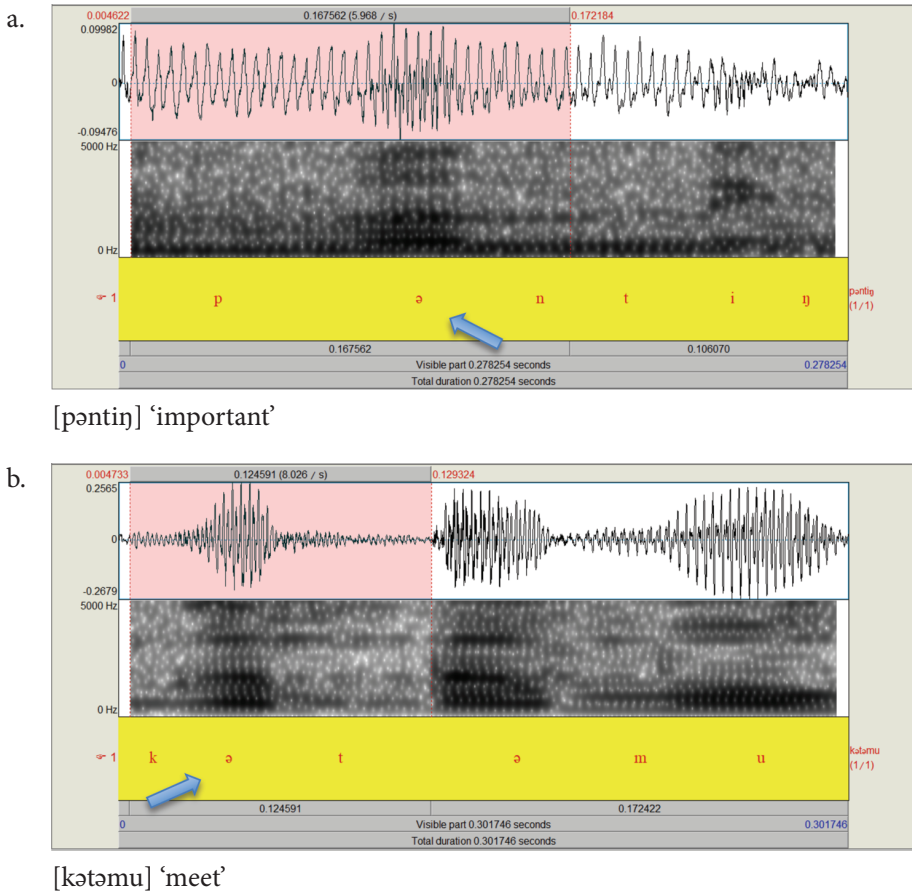
[kətəmu] 'meet'

Figure 4. Spectrograms a. *penting* 'important' b. *ketemu* 'meet' with clear schwa present, Speaker 1.

(12)   Schwa is almost always present

    a.   obstruent-nasal, obstruent-obstruent, sonorant-sonorant

        benar [bənar] 'true'

        penting [pəntiŋ] 'important'

        ketemu [kətəmu] 'meet'

        Melayu [məlaju] 'Malay'

    b.   s + voiced stop

        segar [səgar] 'fresh'

        segitu [səgitu] 'as much as that'

    c.   t + l, d + l

        telat [təlat] 'overdue'

        telor [təlor] 'egg'

It seems then that if there is not a minimum sonority rise between C_1 and C_2, schwa is not deleted (consistent with the sonority sequencing generalization, Clements, 1990).

On the other hand, as illustrated in (13) and as shown above in the spectrograms in Figure 2, in words of three syllables or more where C_1 and C_2 are obstruent – liquid sequences or [s] + voiceless stop or nasal, schwa is consistently deleted:

(13) Schwa is usually deleted
      kelapa [klapa] 'coconut'
      pelayan [plajan] 'servant'
      sekarang [skaraŋ] 'now'
      berapa [brapa] 'how much'
      belakang [blakaŋ] 'back'

Here it appears that if C_1 C_2 shows a minimum sonority rise, schwa is deleted. Deletion in these cases applies equally to native roots and borrowings (compare *sepulu* [spulu] 'ten' and *sepatu* [spatu] 'shoe', from Portuguese *sapato*). This supports the conclusion that for some speakers of JI as spoken contemporarily, initial tautosyllabic clusters are allowed, but minimum sonority distance is required. The allowable initial clusters are very similar to those observed in Dutch and English, where obstruent-liquid clusters are well-formed, but obstruent-nasal clusters are not.

The similarity in patterning of deletion observed for native roots and borrowings suggests that due to the influence of massive borrowings, the phonotactics of the modern language have changed. (To fully assess whether these patterns are internalized by speakers, it would be interesting to do a nonce form experiment.) With influence from extensive borrowing, allowable clusters have evolved from the phonotactics in native Malay vocabulary, that is, the phonotactic restrictions have become less stringent in the modern spoken language.

We now turn to the pattern seen in Table 2 in two syllable words. In the cases parallel to those where schwa is consistently deleted in words of three syllables or more, we see variability, that is, the same speaker may or may not delete schwa in the same word form, as illustrated in (14).

(14) Variable deletion in two syllable words (number of tokens in parentheses)
      beli   [bəli] (8)   [bli] (11) 'buy'
      belum [bəlum] (1) [blom] (30) 'not.yet'[14]
      kelas   [kəlas] (1)   [klas] (1) 'class'
      sepi   [səpi] (4)   [spi] (1) 'quite'

---

14. This forms varies between [blom] ~ [blum].

This variability was exemplified in the spectrograms for *beli* above in Figure 3.[15] As noted in Section 6.1, it is interesting that in these cases schwa is either present or absent, so while its realization is variable, it is not gradient.

What characterizes this word type is that if the schwa is deleted, these words become monosyllabic. As discussed by Cohn (2005), there is a strong preference in Indonesian for content words to be at least two syllables thereby meeting canonical word minimality (being a syllabic trochee). This suggests that word minimality is playing a role in blocking the deletion of schwa. Yet, it is not the case that schwa is never deleted in these forms. Rather, the variable deletion observed suggests that there is an interaction of the influence of word minimality disfavoring deletion with factors favoring deletion, including an allowable sonority profile, and perhaps factors such as high frequency words, informal speech, and rate of speech. Thus, while this subclass can be phonologically defined, the realization of schwa within this class is not phonologically conditioned.

In conclusion to this subsection, we see that for one speaker in the present study whether underlying schwas are consistently realized, consistently absent, or variably realized is conditioned by phonological factors including clusters with an acceptable sonority profile. In this regard the observed patterns and their account are very regular and lend themselves to a traditional phonological analysis, whether analyzed as violable constraint interactions, or phonological rules. However, we need to consider further the factors that condition the variable realization of schwa in disyllables with a schwa in the initial syllable where C_1 and C_2 could form an onset cluster.

We turn now to a brief consideration of morphological and lexical factors, and then stylistic and performance factors.

Morphological and lexical factors
A factor that appears to play some role in the retention of schwa in disyllabic forms as well as longer forms is morphological constituency. In addition to clearly monomorphemic forms and morphologically complex forms made up of roots with productive affixes, there are also affixed forms that have become lexically frozen. While the data in the corpus are somewhat limited in this regard, it seems that indeed if a form is transparently morphologically complex, schwa is less likely to be deleted. As illustrated in (15), we find that in productive prefixes and circumfixes schwa is present or variable (15a) as compared to very similar forms where the same phonological sequence is lexically frozen or part of a monomorphemic word (15b)

---

15. It should be noted that in some of the cases starting with /bəl/ including the prefix *bel-* but also in forms such as *Belanda* 'Dutch', the /l/ is syllabic. Further analysis is needed of syllabic l along with syllabic r.

where schwa is consistently deleted. This is also illustrated in the spectrograms in Figure 5, comparing *belajar* 'to study', with schwa to *belakang* 'back' without.

a.

bel-ajar [bəladʒ̃ar]   (with schwa)

b.

belakang [blakaŋ]   (without schwa)
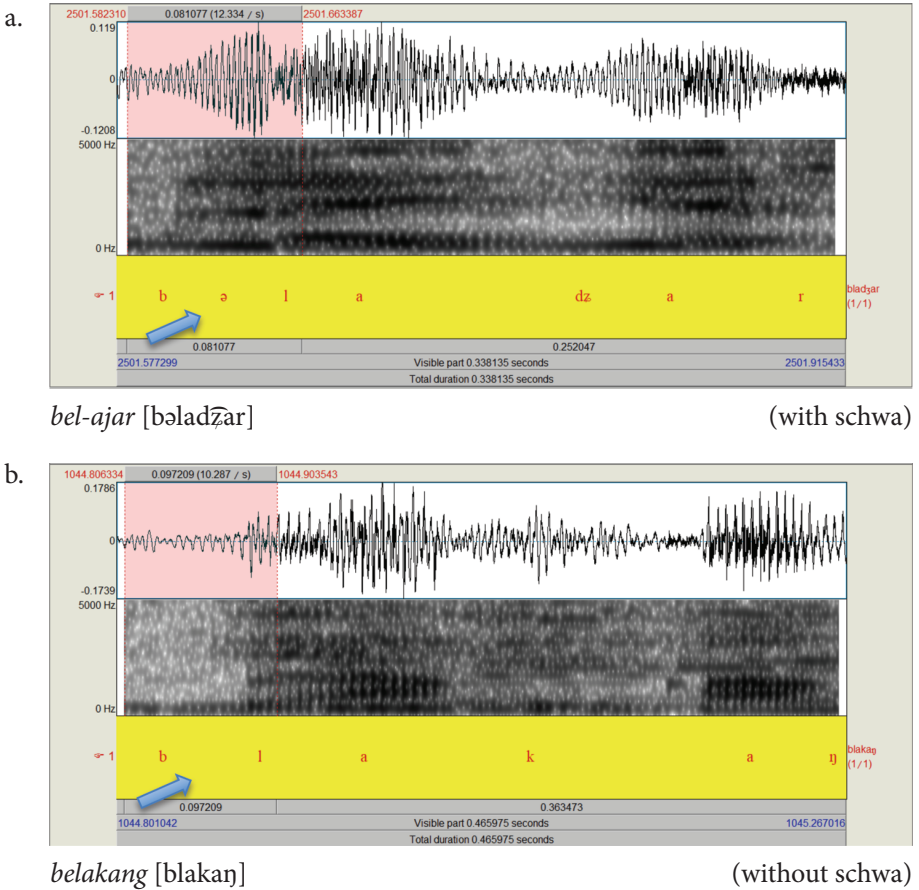
Figure 5. Spectrograms of a. *belajar* 'to study' with schwa, and b. *belakang* 'back' without schwa, Speaker 1.

(15) Effect of morphological constituency
  a. productive affixes
      bel-ajar [bəladʒ̃ar] ~ [bladʒ̃ar] 'study'   (variable)
      ke-lihat-an [kəliʲatan] 'visible'   (all have schwa)
  b. monomorphemic or lexically frozen
      belakang [blakaŋ] 'back'   (none have schwa)
      kelapa [klapa] 'coconut'   (none have schwa)
      keluarga [kluwarga] 'family'   (none have schwa)

This is also supported by a production study by Kurniawan (2015) on the realization of the active prefix in JI, realized as *N-* or *nge-* (cognate with *meng-* in SI).

Stylistic and lexical factors

As discussed in Section 3, Adisasmito (1993) suggests that speech style, rate of speech, and in the case of borrowed forms, degree of familiarity with source language, will influence likelihood of presence or absence of schwa. As discussed in our results, we do not find evidence for differing behavior between native forms and borrowings. Rather presence or absence of schwa has become codified in the orthographic representation. At the same time we do find intra-speaker variation, that is, cases where the same or similar word forms are pronounced with or without schwa. In these cases, we expect that token frequency, style, rate of speech, and linguistic background of the speaker might all come into play.

In terms of lexical effects, we would expect (token) frequency to be a factor, based on work on phonological reduction (e.g. Jurafsky et al. 2001: Bybee 2002). As noted above, we cannot systematically look at token frequency with this corpus; however, we expected that some variability would be observed where deletion would be more likely in very high frequency words. Consideration of a fuller range of styles or registers would be important in this regard. More variability might be found in a corpus including both formal and informal speech. On the other hand, if these results are found across styles, this would suggest lexical restructuring has or is taking place with some of these forms. It would be interesting to see if there is variability in orthography of these forms, possibly written with and without < e > .

While systematic differences between the two speakers were seen with Speaker 2 deleting schwa in cases that were present or variable for Speaker 1, both speakers have very similar linguistic backgrounds. Fuller investigation of the effect of linguistic background on realization of schwa could be undertaken by looking at additional speakers in the corpus.

For the cases where intra-speaker variability was seen, that is, for the disyllabic forms for Speaker 1, it seems very likely that stylistic and performance factors are at play, with greater likelihood of schwa deletion in more casual speech. As noted above, since the corpus consists of casual speech, we cannot test this hypothesis.

We might also expect rate of speech to be an effect. However, based on the forms we can compare with and without schwa, this does not seem to be the case. Interestingly, our findings are consistent with those of Patterson, LoCasto and Connine (2003), who looked at schwa deletion in English based on corpus data. This suggests that rate of speech is *not* a proxy for style or level of formality.

Thus while we agree with Adisasmito that stylistic factors are likely contributing factors, especially in those cases where there is variable realization of the same or very similar word forms, additional corpus data and/or production studies are needed to fully investigate these issues.

7.   Discussion and conclusions

Investigating naturalistic data from Jakarta Indonesian, a colloquial variety of Indonesian, leads us to a more nuanced analysis of schwa, offering an account for the complex behavior and conflicting claims in earlier accounts. Our study highlights the importance of naturalistic corpus data and phonetic analysis for fuller understanding of phonological patterns and has implications for a more complete understanding of a range of ways that weak or "defective" vowels might differ from "full" vowels across the languages of the world.

Overall, we find that the observed patterns of variation result from optional schwa deletion conditioned by phonological properties interacting with stylistic factors, rather than being a result of an active process of epenthesis, which historically was the account of schwa in borrowed forms. We suggest that synchronically schwas are encoded orthographically, with a greater tolerance for clusters (following minimal sonority distance) than historically allowed in Malay.

In the case of Jakarta Indonesian, schwa is either present or absent, that is, its realization is variable, but not gradient. Both inter- and intra-speaker variation was observed. The two speakers exhibited different patterns, so the study needs to be extended to additional speakers. For one speaker, the presence, absence, or variable realization was conditioned by sonority sequencing and word minimality, as well as morphological constituency. Variable realization of the same or very similar word forms is likely conditioned by stylistic factors as well as token frequency, but systematic study of these factors is beyond what can be investigated with present corpus.

Methodologically our study highlights the importance of naturalisitic data for doing phonological analysis, crucially including corresponding audio files and speaker metadata, augmenting, but not replacing traditional introspection and careful impressionistic observation.

Acknowledgment

References

Adisasmito, N. 1993. Syllable structure and the nature of schwa in Indonesian. *Studies in Linguistic Sciences* 23: 1–19.

Boersma, P. & Weenink, D. 2013. Praat: Doing phonetics by computer [Computer software]. <http://www.praat.org/>

Browman, C. & Goldstein, L. 1992. Articulatory phonology: An overview. *Phonetica* 49: 155–180. https://doi.org/10.1159/000261913

Bürki, A., Fougeron, C., Gendrot, C., & Frauenfelder, U. 2011. Phonetic reduction vs. phonological deletion of French schwa: Some methodological issues. *Journal of Phonetics* 39: 279–288. https://doi.org/10.1016/j.wocn.2010.07.003

Bybee, J. 2002. Word frequency and context of use in the lexical diffusion of phonetically conditioned sound change. *Language Variation and Change* 14: 261–290. https://doi.org/10.1017/S0954394502143018

Chomsky, N. & Halle, M. 1968. *The Sound Pattern of English*. New York NY: Harper and Row.

Clements, G. N. 1990. The role of the sonority cycle in core syllabification. In *Papers in Laboratory Phonology I*, J. Kingston & M. Beckman (eds.), 283–333. Cambridge: CUP. https://doi.org/10.1017/CBO9780511627736.017

Coetzee, A. W. 2012. Variation: Where laboratory and theoretical phonology meet. In *Oxford Handbook of Laboratory Phonology*, A. C. Cohn, C. Fougeron & M. K. Huffman (eds.), 62–75. Oxford: OUP.

Cohn, A. C. 1989. Stress in Indonesian and bracketing paradoxes. *Natural Language and Linguistic Theory* 7: 167–216. https://doi.org/10.1007/BF00138076

Cohn, A. C. 2005 Truncation in Indonesian: Evidence for violable minimal words and AnchorRight. In *Proceedings of NELS 34*, Vol. 1, K. Moulton & M. Wolf (eds.), 175–189. Amherst MA: GLSA.

Cohn, A. C. 2006. Is there gradient phonology? In *Gradience in Grammar: Generative Perspectives*, G. Fanselow, C. Fery, R. Vogel & M. Schlesewsky (eds.), 25–44. Oxford: OUP. https://doi.org/10.1093/acprof:oso/9780199274796.003.0002

Cohn, A. C. & McCarthy, J. J. 1998. Alignment and parallelism in Indonesian phonology. *Working Papers of the Cornell Phonetics Laboratory* 12, 53–137.

Departemen Pendidikan Nasional. 2008. *Kamus Besar Bahasa Indonesia (KBBI)*. Jakarta: Gramedia Pustaka Utama.

Ewing, M. C. 2005. Colloquial Indonesian. In *The Austronesian Languages of Asia and Madagascar*, K. A. Adelaar & N. Himmelman (eds.), 227–258. London: Routledge.

Gil, D. & Tadmor, U. 2015. *The MPI-EVA Betawi-Jakarta Database*. A joint project of the Department of Linguistics, Max Planck Institute for Evolutionary Anthropology and the Center for Language and Culture Studies, Atma Jaya Catholic University.

Hall, N. 2006. Cross-linguistic patterns of vowel intrusion. *Phonology* 23: 387–429. https://doi.org/10.1017/S0952675706000996

Hall, N. 2011. Vowel epenthesis. In *The Blackwell Companion to Phonology*, M. van Oostendorp, C. Ewen, E. Hume & K. Rice (eds.), 1576–1596. Malden MA: Wiley-Blackwell.

Hardjadibrata, R. 1978. Consonant clusters in Indonesian. In *Second International Conference on Austronesian Linguistics: Proceedings*. A. Wurm (Ed.), 165–180. Canberra: Australian National University.

Ikranagara, Kay. 1980. Melayu Betawi Grammar. *NUSA Linguistic Studies in Indonesian and Languages in Indonesia*, Vol. 9. Jakarta: Atma Jaya University.

Jurafsky, D., Bell, A., Gregory, M. & Raymond, W. 2001. Probabilistic relations between words: Evidence from reduction in lexical production. In *Frequency and the Emergence of Linguistic Structure* [Typological Studies in Language 45], J. Bybee & P. Hopper (eds.) 229–254. Amsterdam: John Benjamins. https://doi.org/10.1075/tsl.45.13jur

Kurniawan, F. 2015. Nasal assimilation in Jakarta Indonesian. *Austronesian Formal Linguistics Association (AFLA) 21 Conference Proceedings* 149–165. Canberra: Australia National University.

Kurniawan, F. Forthcoming. Phonological Variation in Jakarta Indonesian: An Emerging Variety of Indonesian. PhD dissertation, Cornell University.

Ladd. D. R. 2014. *Simultaneous Structure in Phonology*. Oxford: OUP. https://doi.org/10.1093/acprof:oso/9780199670970.001.0001

Lapoliwa, H. 1981. *A Generative Approach to the Phonology of Bahasa Indonesia*. Canberra: Department of Linguistics, Research School of Pacific Studies, Australia National University.

Max Planck Institute for Psycholinguistics, The Language Archive, Nijmegen, The Netherlands. ELAN. <http://tla.mpi.nl/tools/tla-tools/elan/>

Patterson, D., LoCasto, P. & Connine, C. 2003. Corpora analyses of frequency of schwa deletion in conversational American English. *Phonetica* 60: 45–69. https://doi.org/10.1159/000070453

Sainz, S. 1992. A Noncyclic Approach to the Lexical Phonology of English. PhD dissertation, Cornell University.

Silverman, D. 2011. Schwa. In *The Blackwell Companion to Phonology*, M. van Oostendorp, C. Ewen, E. Hume & K. Rice (eds.), 628–642. Oxford: Wiley-Blackwell.

Sneddon, J. N. 2003. *The Indonesian Language: Its History and Role in Modern Society*. Sydney NSW: UNSW Press.

Sneddon, J. N. 2006. *Colloquial Jakartan Indonesian*. Canberra: Pacific Linguistics.

Stevens, A. & Schmidgall-Tellings, A. E. 2004. *A Comprehensive Indonesian-English Dictionary*. Athens OH: Ohio University Press.

Umeda, N. 1975. Vowel duration in American English. *Journal of the Acoustical Society of America*, 58(2): 434–446. https://doi.org/10.1121/1.380688

van Oostendorp M. 1998/2003. Schwa in phonological theory. *Glot International* 3(5): 3–9. Reprinted in Cheng, L. & Sybesma, R. (eds.). 2014. *The Second Glot International State-of-the-Article Book: The Latest in Linguistics* [Studies in Generative Grammar 61], 431–461. Berlin: Mouton de Gruyter.

Warner, N., Jongman, A., Cutler, A. & Mücke, D. 2001. The phonological status of Dutch epenthetic schwa. *Phonology* 18: 387–420. https://doi.org/10.1017/S0952675701004213

Quantitative and qualitative restrictions on the distribution of lexical tones in Thai

A diachronic study

Pittayawat Pittayaporn
Chulalongkorn University

In present-day Thai, contour tones show a more restricted distribution in comparison with level tones that cannot be explained by syllable structure alone. This diachronic study argues that both quantitative and qualitative restrictions are responsible for the puzzling gaps and accounts for them by positing Optimality-Theoretic constraints. In addition, it analyzes the tonal distribution in the early 19th and 20th centuries based on data from published materials. Furthermore, it discusses sound changes and lexical changes that gave rise to the tonal distribution.

Keywords: contour-tone distribution, tonal change, Thai

1.   Introduction

It has long been noted that contour tones often show a more restricted distribution in comparison with level tones in the same language. This typological observation has played an important role in the theoretical discussion on phonological representation of lexical tones. While some phonologists attribute the pattern to syllable quantity (Dutcher & Paster 2008; Gordon 2001; Yip 1982; Zhang 2002, 2004), others explain it in terms of featural quality of the syllable coda (Morén & Zsiga 2006; Yip 1982). Often brought up in this discussion is the Bangkok dialect of Thai, which has altogether five contrastive tones but only allows three of them to occur in "checked" syllables, i.e. syllables ending in obstruents.

As pointed out by Gandour (1974), Yip (1982) and Morén & Zsiga (2006), the Thai tonal distribution is characterized by two puzzling restrictions related to syllable structure. First, Tone 1 is not allowed on checked syllables. This is surprising as it is a mid-level tone and has the least complex contour. Second, Tone 5 is

similarly banned from occurring on checked syllables but Tone 3 is not, as summarized in Table 1.[1]

Table 1. Tonal distribution in present-day Thai

	Tone 1	Tone 2	Tone 3	Tone 4	Tone 5
	[33]	[21]	[42]	[34]	[13]
CVV	+	+	+	+	+
CVS	+	+	+	+	+
CVVS	+	+	+	+	+
CVO	-	+	(+)	+	-
CVVO	-	+	+	(+)	-

S = sonorant; O = obstruent

This intriguing distribution is however an innovation, since the reconstruction of the 17th-century tonal system has only Tones 2 and 3 on checked syllables (Pittayaporn 2016), as summarized in Table 2. As previous studies have shown that the phonetic realizations of the lexical tones have changed quite markedly since the beginning of the 20th century (Anivan 1988; Pittayaporn 2007, 2018; Teeranon 2002, 2007; Teeranon & Rungrojsuwan 2009), the question is thus how the tonal distribution has transformed in the past few centuries.

Table 2. Tonal distribution in the 17th century (based on Pittayaporn 2016)

	Tone 1	Tone 2	Tone 3	Tone 4	Tone 5
	mid	high(1)	mid falling	high-mid	high(2)
CVV	+	+	+	+	+
CVS	+	+	+	+	+
CVVS	+	+	+	+	+
CVO	-	+	+	-	-
CVVO	-	+	+	-	-

In this paper, I describe changes in the Thai tonal distribution from the 17th century to the present. First, I will argue that both quantitative and qualitative restrictions are responsible for the puzzling distribution of lexical tones on checked

---

1. The phonetic realizations of the present-day Thai tones have been instrumentally studied by Morén & Zsiga (2006) and Thepboriruk (2010) among many others. Because experts (e.g. Bao 1999; Duanmu 1990; Xu 2004; Yip 1980) do not agree on the nature of tonal representation, this paper uses Chao's (1930) five-scale tone number instead of more abstract tonal features such as H, L, [+ upper], etc.

syllables, and propose Optimality-Theoretic constraints to account for the distributional gaps. Most importantly, I will describe the tonal systems of the early 19th and 20th centuries based on published grammars, dictionaries, and articles, and analyze them using the proposed constraints. Furthermore, I will discuss how the changes in tonal distribution in Thai arose.

2.　Quantity and quality in distributional restrictions of tones

Cross-linguistically, different types of syllables are endowed with different degrees of tone-bearing ability. Typological surveys by Gordon (2001) and Zhang (2002, 2004) both reveal that the set of tones allowed on checked syllables is a subset of those found on non-checked syllables. Moreover, they also show that contour tones typically have more restricted distributions than their level counterparts. The tonal distribution of present-day Thai in Table 1 is largely consistent with the findings, showing a few gaps that cannot be explained simply in terms of checked and non-checked syllables.

The distribution of Tone 3 [42] and Tone 4 [34] are of crucial relevance. Although the two tones are permissible on checked syllables, they are attested with different robustness in CVO and CVVO. In particular, Tone 3 [42] is found on a large set of CVVO syllables but only occurs on rare instances of CVO, e.g. /rɛt³/ 'rhinoceros', /kʰlak³/ 'densely', /fɛp³/ 'to deflate', /sɛp³/ 'spicy' and /lɤk³ lak³/ 'bewildered'. In contrast, Tone 4 [34] is amply attested in CVO but is surprisingly limited in CVVO. Although most cases of CVVO with Tone 4 [34] are English and Chinese loanwords, e.g. /sɔːt⁴/ 'sauce', /yiːt⁴/ 'yeast', /piːp⁴/ 'bucket', /coːk⁴/ 'congee' etc., and onomatopoeia, e.g. /ciək⁴/ 'sound made by monkey', /cɔːk⁴/ 'sound of a hungry stomach', many are common nouns and verbs, e.g. /luːk³ ʔɔːt⁴/ 'tadpole', /luːk³ ciəp⁴/ 'chick', and /kriːt⁴/ 'to scream'.

Previous accounts of these generalizations explain the distribution in terms of quantitative or qualitative restrictions. The first view holds that the tonal restrictions are quantitative in nature. Duanmu (1990: 113–114, 126) proposes that contour tones, being composed of two level tones, are allowed only on syllables with two voiced moraic segments. Similarly, Gordon (2001) explains the restrictions against contour tones on checked syllables phonetically in terms of duration of the sonorous portion of the rime. Formally, he proposes that contour tones are licensed only by rimes containing two sonorants.

These accounts, however, predict that CVVO syllables allow the same set of tones as CVV syllables, which is not borne out in Thai. As Zhang (2002, 2004) points out, these accounts also fail to explain why rising tones have more restricted distribution than falling tones. He thus proposes *Contour(x_1)-C$_{\text{contour}}(y_1)$ family

of constraints, which allows different contours to show different distributions.[2] Unlike other authors, he argues that the contour-bearing ability of the syllable is determined directly by sonorous rime duration (Zhang, 2002: 23–27). If applied to present-day Thai, two positional markedness constraints *Contour(LH)-$C_{contour}$(CVVO) and *Contour(LH)-$C_{contour}$(CVO) must be evoked. While the former bans rising contour on CVVO and syllables with shorter sonorous rime duration, the latter prohibits a falling contour on CVO syllables.

While these constraints nicely capture the distribution of Tone 3 [42] and Tone 5 [13], they cannot account for why Tone 1 [33], which is the least complex of the five tones, has identical distribution as Tone 5[13], which is the most complex. Furthermore, they do not explain why Tone 4 [34] is firmly attested in CVO but found in CVVO only in relatively new words and onomatopoeia. If sonorous rime duration is the only determining factor, CVVO should always be tone-friendlier than CVO.

In contrast to the first view, the second holds that certain tones are banned from CVO and CVVO syllables because they are not compatible with the feature specification of the final stop. Most widely-cited is the work by Morén & Zsiga (2006) who adopt the moraic representations of the syllable types in Figure 1.

Assuming that the second mora in CVVO is shared by the nucleus and the coda, they argue that Tone 1 [33] and Tone 5 [13] are not allowed in CVO and CVVO because they are incompatible with the feature [+ constricted glottis] of the final stop. Formally, they propose a markedness constraint C.G. Coda -> L, which requires [+ C.G.] to be associated with low tone. In the same fashion, Ruangjaroon (2006) attributes the gap to the feature [-spread glottis], and proposes two markedness constraints*[v́][−S.G.] and *[v̄][−S.G.] to rule out Tone 1 [33] and Tone 5 [13] on checked syllables.

At first glance, Morén and Zsiga (2006) and Ruangjaroon (2006) seem to capture the ban of Tone 1 [33] and Tone 5 [13] on checked syllables. However, a closer look reveals that the two analyses would work if only all CVO with Tone 3 [42] and all CVVO with Tone 4 [34] were excluded. The proposed constraints cannot rule out Tones 1 [33] and 5 [13] in CVVO without also ruling out Tone 4 [34]. Moreover, the assumption that all CVVO syllables with Tone 4 [34] are not properly part of the Thai lexicon is clearly not tenable. First of all, the Thai National Corpus (Aroonmanakun 2007) reveals that a large set of CVVO with

---

2. He quantifies the contour-bearing ability in terms of $C_{contour}$, which he defines as a weighted sum of duration and sonority (Zhang 2002: 29–44). Whether phonology makes direct reference to phonetics, or relates to it through abstract structural representation is beyond the scope of this paper.

Tone 4 [34] occurs with high token frequency (Zipf > 3),[3] e.g. /kɛːt⁴/ 'gas' (Zipf = 4.16), /meːt⁴/ 'meter' (Zipf = 4.99), /coːk⁴/ 'congee' (Zipf = 3.82), /kriːt⁴/ 'to scream' (Zipf = 4.54), etc., indicating that they are part of the ordinary Thai vocabulary. Furthermore, many of these words were included in the first edition of the Royal Institute Dictionary published in 1950, e.g. /kaːt⁴/ 'kerosene', /meːt⁴/ 'meter', /ciːt⁴/ 'very small', /kraciəp⁴/ 'okra', /kiəʔ⁴/ 'wooden clog', suggesting that they have long been incorporated into the Thai lexicon.

In addition to the two opposing views, the third view proposes that both quantitative and qualitative restrictions are responsible for the distributional gaps. In particular, Yip (1982) explains that contour tones are missing on CVC in Thai because the short vowel is the only moraic segment in this type of syllable. However, she proposes that Tone 5, which she analyzes as [LH], is not allowed on CVO and CVVO syllables because it is not compatible with the feature [+ glottal] in Thai final stops. However, this analysis fails to explain why Tone 1 [33] is also banned in CVO and CVVO.

Because all previous accounts fail to adequately capture the true distribution of tones in present-day Thai, I propose an alternative analysis using OT-style constraint interaction. Assuming Prince and Smolensky's (2004) view of faithfulness, an output candidate violates faithfulness constraints when its underlying and surface tones do not match. However, it is unknown if any faithfulness constraint is violated, given the lack of morphophonemic alternation in Thai. The surface distribution of tones is crucially determined by ranking of markedness constraints. Specifically, systematic gaps are ones that are barred by markedness constraints that are ranked above the set of relevant faithfulness constraints. Similar to Yip, I account for the distributional gaps in terms of both quantitative and qualitative restrictions.

The crucial set of constraints that capture the quantitative restrictions include Rise≥μμ, and Fall≥μμ as formulated in (1). Positing separate constraints for rising and falling tones is phonetically motivated as a number of instrumental studies, e.g. Zhang (2002); Xu (2004), show that rising contours take longer than falling contours to be fully realized.

(1)   Rise≥μμ
       A rising contour must be supported by at least two moras.
       Fall≥μμ
       A falling contour must be supported by at least two moras.

---

3. The Zipf score is a standardized measure of word frequency proposed by van Heuven et al. (2014). Words that have a Zipf value higher than 3.0 are considered high-frequency words.

Central to these constraints is the concept of support, which must be interpreted in relation to the moraic representation in Figure 1. Because tones can only be realized on voiced segments, only moras belonging in the sonorous part of the rime can bear tone. While both moras in CVS can support tones, only one has the tone-bearing ability in CVO. Similarly, only one and a half moras in CVVO can bear tone because the second mora is shared with the voiceless obstruents.
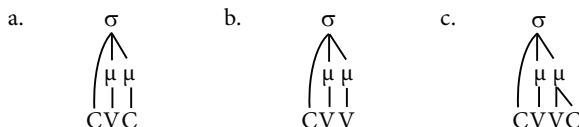
Figure 1. The moraic representations of CVC, CVV and CVVC

In addition to these general quantity-related constraints, I propose another set of more specific constraints that militate against contour tones with relatively great pitch excursion. As formulated in (2), the markedness constraints STEEP RISE≥µµ and STEEP FALL≥µµ specifically penalize tonal contours that move two or more levels in Chao's 5-level scales, e.g. [42], [31], [35], [24]. Note that RISE≥µµ and FALL≥µµ are more general than STEEP RISE≥µµ and STEEP FALL≥µµ, respectively, in the sense that any candidate that violates STEEP RISE≥µµ and STEEP FALL≥µµ also violates RISE≥µµ, and FALL≥µµ, cf. Pāṇini's Theorem (Prince & Smolensky 2004: 97–99, 130–132).

(2)   STEEP RISE≥µµ
       A steep rising contour must be supported by at least two moras.
       STEEP FALL≥µµ
       A steep falling contour must be supported by at least two moras.

As for the qualitative restriction, *MID LEVEL[+C.G.] is posited on the basis of phonetic studies on consonant-tone interaction. Although a number of studies have examined the effect of the coda on the vowel, they do not agree on whether glottalization raises or lowers fundamental frequency (Haudricourt 1954; Hombert et al. 1979; Hyman 1976; Kingston 2001; Maddieson 1976, 1977). What is clear is that the mid-level contour is hard to sustain in front of a glottalized coda. A constraint banning a mid-level tone followed by a [+ constricted glottis] coda, as formulated in (3), is thus phonetically motivated.

(3)   *MID LEVEL[+C.G.]
       A mid-level tone must not be followed by a [+ constricted glottis] coda.

The complete lack of Tone 1 [33] and Tone 5 [13] can be accounted for by ranking STEEP RISE≥µµ and *MID LEVEL[+C.G.] over faithfulness constraints. Because the voiceless coda cannot bear tone, CVO has only one mora that can license tones.

Similarly, CVVO is endowed with only one mora and a half because the second mora is shared by the voiceless coda. Tone 5 [13] on CVVO thus violates STEEP RISE≥μμ, which requires two moras for rising contours. In contrast, Tone 2 [21], Tone 3 [42] and Tone 4 [34] are permissible in both CVO and CVVO, even though they do not have two moras that are linked to voiced segments. This indicates that FALL≥μμ, RISE≥μμ, and STEEP FALL≥μμ are ranked below faithfulness constraints. Crucially, any syllable-tone combination violating the markedness constraints and that are ranked above faithfulness are eliminated, as seen in Table 3.

Table 3. Tones on CVO and CVVO in present-day Thai

		STEEP RISE≥μμ	*MID LEVEL [+C.G.]	FAITH	FALL≥μμ	RISE≥μμ	STEEP FALL≥μμ
Tone 1[33]	✗ CVO		*				
	✗ CVVO		*				
Tone 2[21]	✓ CVO				*		
	✓ CVVO				*		
Tone 3[42]	✓ CVO				*		*
	✓ CVVO				*		*
Tone 4[34]	✓ CVO					*	
	✓ CVVO					*	
Tone 5[13]	✗ CVO	*				*	
	✗ CVVO	*				*	

This ranking shows that the bans on Tone 1 [33] and Tone 5 [13] are due to the quality-based constraint *MID LEVEL[+C.G.] and the quantity-based constraint STEEP RISE≥μμ respectively. It prohibits Tone 1 [33] and Tone 5 [13] but also correctly allows Tone 2 [21] and Tone 4 [34] in CVO and CVVO. Note that the constraint ranking does not address how underlying [33] and [13] would be realized in the output. In any case, there is no morphophonemic alternation in the language that would indicate that checked syllables with Tone 1 [33] and Tone 5 [13] in the input exist.

3.   Tonal distribution in the early 19th century

The tonal system of the early 19th century is documented in early grammars, students' manuals, and dictionaries written by westerners. *Brief grammatical notices of the Siamese language* by Jones (1842) and *Grammar of the Thai or Siamese*

language by Low (1828) are the earliest grammars of Thai written in English but their description of tones is not very systematic and quite difficult to interpret. The best sources of information on the tonal system of the early 19th century are *Grammatica Linguae Thai* by Pallegoix (1850), and *Dictionarium Linguae Thai* also by Pallegoix (1854). While the former gives explicit descriptions of the five lexical tones, the latter provides the lexicographical materials that allow us to state the distribution of each tone. In addition, a revised version of Pallegoix's dictionary, titled *Dictionnaire Siamois-Francais-Anglais* (Pallegoix & Vey 1896), was published at the end of the 19th century and agrees with the original version except for the pronunciation of a handful of words.

According to Pallegoix (1850: 29–36), the Thai language at the time had five lexical tones, which he recorded using musical notation, as shown in Figure 2. However, this description of Tone 2 is at variance with Jones (1842: 14), who states that it is more "depressed" than Tone 1. It is thus not clear if Tone 2 was in fact a mid-high tone that fell slightly before rising moderately as described by Pallegoix, or a low level tone as described by Jones. Perhaps, the discrepancy points to variation between a more conservative and a more innovative variant of the tone. This analysis assumes Pallegoix's conservative realization [323].
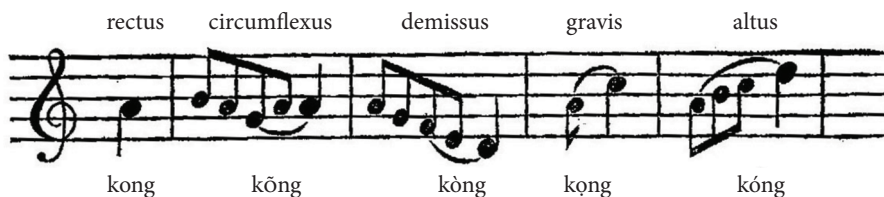
Figure 2. Thai tones in the early 19th century as recorded in Pallegoix (1850, p. 31). (Rectus = Tone 1 [33], Circumflexus = Tone 2 [323], Demissus = Tone 3 [31], Gravis = Tone 4 [34], Altus = Tone 5 [35])

With respect to tonal distribution, a different subset of tones was allowed on checked syllables in early 19th-century in comparison to present-day Thai. Based on data from Pallegoix (1854), Tone 1 [33] was commonly found on CVO syllables, contrasting with Tone 4 [34], which was only attested in a few words, e.g. /kak^4/ 'shirt without sleeves', /hak^4/ 'insolent', /hat^4/ 'arduous'. Moreover, neither Tone 3 [31] in CVO nor Tone 4 [34] in CVVO was found in the dictionary. Table 4 summarizes the phonetic characteristics and distributions of the lexical tones in the early 19th century. Note that CVO syllables that Pallegoix (1850: 31) described as having "tonum rectum", i.e. Tone 1, are said to be "high" in Jones (1842: 14). This suggests that Tone 1 on CVO syllables was perceptibly higher in pitch than the same tone on CVV, CVS, and CVVS syllables.

Table 4. Realization and distribution of lexical tones in the early 19th century

	Tone 1 [33]	Tone 2 [323]	Tone 3 [31]	Tone 4 [34]	Tone 5 [35]
CVV	+	+	+	+	+
CVS	+	+	+	+	+
CVVS	+	+	+	+	+
CVO	+	+	-	(+)	-
CVVO	-	+	+	-	-

Compared to the constraint ranking in present-day Thai, the distributional gaps of tones in CVO and CVVO seem to have been more permissive. In particular, the early 19th century system allowed [323], [31], and [33] tones on checked syllables, suggesting that RISE≥μμ, STEEP FALL≥μμ, and *MID LEVEL[+c.g.] were ranked below faithfulness constraints. However, the ranking predicts that Tone 3 [31] should be possible in CVO, and Tone 1 [33] and Tone 4 [34] in CVVO, but these combinations are in fact not attested in the data, as summarized in Table 5.

Table 5. Tones in CVO and CVVO in the early 19th century

		STEEP RISE ≥μμ	FAITH	*MID LEVEL [+c.g.]	FALL≥μμ	RISE≥μμ	STEEP FALL≥μμ
Tone 1[33]	✔ CVO			*			
	? CVVO			*			
Tone 2[323]	✔ CVO				*	*	
	✔ CVVO				*	*	
Tone 3[31]	? CVO				*		*
	✔ CVVO				*		*
Tone 4[34]	✔ CVO					*	
	? CVVO					*	
Tone 5[35]	✘ CVO	*				*	
	✘ CVVO	*				*	

One explanation is that the gaps were in fact accidental ones. In other words, the phonological system at the time did not ban these tone-syllable combinations, but the lexicon simply had not acquired such words. This speculation is possible given that the 17th-century tonal system of Thai as reconstructed by Pittayaporn (2016) allowed only Tone 2 and Tone 3 on checked syllables. The CVOs with Tone 1 and Tone 4 had been introduced into the system only later. Recall that CVO with Tone

4 [34] was very rare in the early 19th century and that CVVO with Tone 4 [34] entered the language just a few decades later. As for CVO with Tone 3, its absence must have been due to the diachronic tonal reduction that turned Tone 3 into Tone 1 in CVO (see discussion in Section 5).

4. Tonal distribution in the early 20th century

The last decade of the 19th century and the first half of the 20th century saw an increase in publication of resources on the Thai language, including *Siamese-English dictionary* by Michell (1892), *Elements of Siamese grammar* by Frankfurter (1990), *Elementary hand-book of the Siamese language* by Cartwright (1906), *Siamese-English dictionary* by Cartwright (1907), and *Student's manual of the Siamese language* also by Cartwright (1915).

Most importantly, it was in the early 20th century when the Thai tones started to be described in modern phonetic terms. Phonetic studies of Thai tones in this period include notes by Cartwright (1907: 16–18), Jones (field note cited in Henderson (1976)) and Taylor (1920). However, the most prominent is the oldest instrumental study conducted in 1908 by Bradley (1911, 1916) on his own speech.[4] Unlike later studies, the measurements were made by calculating the frequency values based on wavelengths recorded using the Rousselot apparatus. The values were then transformed into values on a musical scale and plotted on the vertical axis against time on the horizontal axis as shown in Figure 3. Note that Tone 4 was a high falling tone [42] rather than a high level tone like in the early 19th century (Pittayaporn 2007, 2018; Teeranon 2002).

With respect to tonal distribution, the main difference between the language of the early 20th century and the early 19th century is that Tone 1 was no longer allowed on CVO syllables in the early 20th century. The pitch contour considered to be an allophone of Tone 1 in the previous century had become a high level tone and was analyzed as an allophone of Tone 4 [42] by the majority of authors such as Taylor (1920), Cartwright (1906: 38–44), Cartwright (1915: 54–60), McFarland (1944: x–xv), and Jones (field note cited in Henderson (1976)). This view is not inconsistent with Bradley (1911, 1916) and McFarland (1900: vi–viii),

---

4. Though an American citizen, he was most likely a native speaker of Thai. As a son of American missionaries in Siam, he was born in Bangkok and spent his childhood there. His family settled in an old Thai Christian community and was attended to by at least one Thai servant. He also spent a number of years on an evangelical mission in Thailand starting in his late twenties. In addition, he is the author of a number of research papers on the Thai language during his professorship at UC Berkeley (Griswold & na Nagara 1971; Lord 1968; Michuthon 2004).
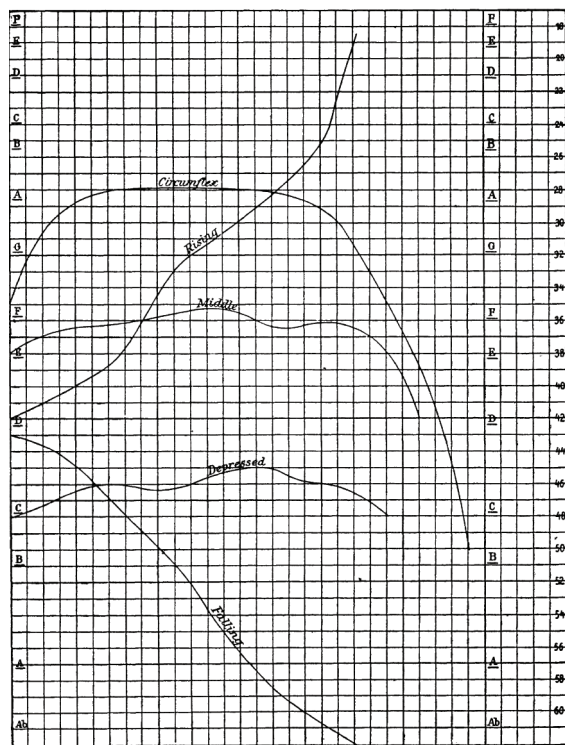
Figure 3. Thai tones in the early 20th century (from Bradley 1911: 286)

who considered the pitch contour to be a "sixth tone". Only Frankfurter (1990), who adopted Pallegoix's tradition, still treated it as Tone 1. The change means that Tone 4 [42] was now commonly attested on CVO syllables but in a reduced form [44]. In addition, McFarland (1900, 1944) also listed a few English loanwords of the shape CVVO that carried Tone 4 [42] such as /cʰɔːk⁴/ 'chalk', /suə³ kʰoːt⁴/, and /muək² kɛːp⁴/.⁵ This means new CVVO with Tone 4 [42] was starting to fill in the gap. Table 6 summarizes the phonetic characteristics and distributions of the lexical tones in the early 20th century.

Comparing the early 19th century and the present-day, the contour shapes of the 20th century were clearly intermediate between the two stages. While Tone 3 [31] and Tone 5 [35] were conservative, Tone 2 [22] had already transformed into the low level tone found today. However, with respect to the tonal distribution, the language of the early 20th century was almost identical to the present-day language. The only difference is that Tone 3 [31] was still unattested on CVO

---

5. McFarland (1900) described these words as carrying his sixth tone, which we consider an allophone of Tone 4.

Table 6. Realization and distribution of lexical tones in the early 20th century

	Tone 1	Tone 2	Tone 3	Tone 4	Tone 5
	[33]	[22]	[31]	[42]/[44]	[35]
CVV	+	+	+	+	+
CVS	+	+	+	+	+
CVVS	+	+	+	+	+
CVO	-	+	-	+	-
CVVO	-	+	+	(+)	-

Table 7. Tones in CVO and CVVO in the early 20th century

			STEEP RISE ≥µµ	*MID LEVEL [+C.G.]	FAITH	FALL≥µµ	RISE≥µµ	STEEP FALL≥µµ
Tone 1[33]	✗	CVO		*				
	✗	CVVO		*				
Tone 2[22]	✓	CVO						
	✓	CVVO						
Tone 3[31]	?	CVO				*		*
	✓	CVVO				*		*
Tone 4[42]	✓	CVO				*		*
	✓	CVVO				*		*
Tone 5[35]	✗	CVO	*				*	
	✗	CVVO	*				*	

Tone 4 in CVO was attested but was phonetically reduced to a high level tone [44].

syllables. This accidental gap seems to have persisted relatively long because CVO syllables entering Thai from English were only assigned either Tone 2 [22] or Tone 4 [44]. This lack of borrowed CVO with Tone 3 left the gap unfilled. As shown in Table 7, the constraint ranking in this period is identical to that of present-day Thai in Table 3.

5.   Explaining the distributional changes

The investigation of Thai lexical tones at different stages allows us to see that their distribution has changed considerably since the 17th century during which period only Tone 2 and Tone 3 were allowed in CVO and CVVO (Pittayaporn 2016).

These changes did not occur randomly but were closely tied to other changes in the language. As a conclusion, I show how the distributional changes arose during the period from the 17th century to the present.

The first distributional change that occurred is the disappearance of Tone 3 in CVO. In the 17th century, CVO could only occur with either Tone 2 or Tone 3. However, a diachronic change occurred that turned all instances of Tone 3 in CVO to Tone 1. Phonetically speaking, the change can be explained in terms of the reduction of the falling contour due to the relatively short voiced portion of the rime. More specifically, the pitch fall of Tone 3, which is reconstructed as a mid falling tone was truncated. The resulting mid-level contour was thus reanalyzed as Tone 1. This means that the sound change was not motivated by constraint re-ranking, and did not affect the ranking of FALL≥μμ, and STEEP FALL≥μμ.

The second change is the introduction of CVO syllables with Tone 4, which was taking place at the beginning of the 19th century. Strictly speaking, this change is in fact not a phonological change because it did not involve constraint re-ranking. Although Tone 4 in CVO did not exist in the 17th century, the fact that loanwords and onomatopoeia such as /kak^4/ 'shirt without sleeves', /hak^4/ 'insolent', and /hat^4/ 'arduous' were entering the language in the early 19th century, as recorded in *Dictionarium Linguae Thai* (Pallegoix 1854), suggests that Thai did not systematically ban a high slightly rising tone in CVO. Therefore, the appearance of CVO with Tone 4 [34] is best characterized as a lexical change that filled in accidental gaps that existed previously.

The third change is the banning of Tone 1 in CVO, which occurred by the end of the 19th century. Due to this change, Tone 1 [33] was no longer permitted in CVO in the early 20th century. The mid-level contour that had occurred in CVO had also shifted to the high pitch range and become re-analyzed as an allophone of Tone 4 [42]. Formally speaking, the banning of Tone 1 [33] indicates that the quality-based markedness *MID LEVEL[+C.G.] had been promoted to dominate faithfulness constraints (see Table 7). This re-ranking means that the mid-level contour was no longer allowed on any checked syllables in the early 20th century. Unfortunately, it is not clear whether the phonetic change triggered the constraint re-ranking, or the other way round.

The fourth change was a lexical one. It involves the appearance of CVVO syllables with Tone 4, which was taking place toward the end of the 19th century. According to the constraint ranking proposed for the early 19th century, Tone 4 was not banned from occurring in CVVO. However, the combination did not appear in the sources until the turn of the 20th century as attested by new words in *Siamese-English Dictionary* (Cartwright 1907) and *Thai-English dictionary* (McFarland 1944) such as /kraciəp^4/ 'okra', /c^{h}ɔːk^4/ 'chalk', and /kaːt^4/ 'gas'.

The last change is also lexical in nature. It is the only noticeable distributional change from the early 20th century and present-day. It involves filling the gap that was left by the change of Tone 3 in CVO to Tone 1. While some of the new CVOs with Tone 3 are results of the sporadic shortening of /ɛː/ and /ɔː/ that started at the turn of the 20th century, e.g. /rɛt³/ 'rhinoceros', /fɛp³/ 'to deflate', /sɛp³/ 'spicy', and /cʰɤt³/ 'to raise', others are either expressives, e.g. /kʰlak³/ 'densely', /lɤk³ lak³/ 'bewildered', or onomatopoeia, e.g. /cak³/ 'sound of heavy rain', /hɛk³/ 'sound of panting'.

6.   Conclusion

The distribution of Thai tones on checked syllables has changed markedly over the past few centuries. In particular, the distributional gaps that occurred in each stage of the language are best viewed as results of interactions between quantitative and qualitative restrictions. A comparison among four historical stages shows that changes in tonal distribution can be formally accounted for in terms of OT constraints re-ranking. Not surprisingly, the five distributional changes that have occurred since the 17th century were either phonological or lexical in nature. While the phonological ones can be explained as consequences of sound changes, the lexical ones simply involve filling in the accidental gaps created by the changing distributional restrictions.

References

Anivan, S. 1988. Evolution of Bangkok tones. Paper presented at the The International Symposium on Language and Linguistics, Bangkok, Thailand.

Aroonmanakun, W. 2007. Creating the Thai National Corpus. *Manusaya: Journal Humanities*, Special Issue 13: 4–17.

Bao, Z. 1999. *The Structure of Tone*. Oxford: OUP.

Bradley, C. B. 1911. Graphic analysis of the tone-accents in the Siamese language. *Journal of the American Oriental Society* 31(3): 282–289. https://doi.org/10.2307/3087645

Bradley, C. B. 1916. On plotting the inflections of the voice. *University of California Publications in American Archeology and Ethnology* 12(5): 195–218.

Cartwright, B. O. 1906. *An Elementary Hand-book of the Siamese Language*. Bangkok: The American Presbyterian Mission Press.

Cartwright, B. O. 1907. *A Siamese-English Dictionary*. Bangkok: The American Presbytarian MIssion Press.

Cartwright, B. O. 1915. *Student's Manual of the Siamese Language*. Bangkok: American Presbyterian Mission Press.

Chao, Y. -R. 1930. A system of tone-letters. *Le Maître Phonétique* 45: 24–27.

Duanmu, S. 1990. A Formal Study of Syllable, Tone, Stress, and Domain in Chinese Languages. PhD dissertation, MIT.

Dutcher, K. & Paster, M. 2008. Contour tone distribution in Luganda. In *Proceedings of the 27th West Coast Conference on Formal Linguistics*, N. Abner & J. Bishop (eds.), 123–131. Somerville MA: Cascadilla Proceedings Project.

Frankfurter, O. 1990. *Elements of Siamese Grammar with A ppendices*. Bangkok: American Presbyterian Mission Press.

Gandour, J. 1975. 1974. On the representation of tone in Siamese. *UCLA Working Papers in Phonetics* 27: 118–146.

Gordon, M. 2001. A typology of contour tone restriction. *Studies in Language* 25(3): 423–462. https://doi.org/10.1075/sl.25.3.03gor

Griswold, A. B. & na Nagara, P. 1971. The inscription of King Rama Gamheng of Sukhodaya (1292 A.D.). *Journal of the Siam Society*, 59(1): 179–228.

Haudricourt, A. -G. 1954. De l'origine des tons en vietnamien. *Journal Asiatique* 242: 69–82.

Henderson, E. J. A. 1976. Thai phonetics sixty years ago: Gleanings from the unpublished notes of Daniel Jones. In *Tai Linguistics in Honor of Fang-Kuei Li*, T. W. Gething, J. G. Harris & P. Kullavanijaya (eds.), 162–170. Bangkok: Chulalongkorn University Press.

Hombert, J. -M.., Ohala, J. J. & Ewan, W. G. 1979. Phonetic explanations for the development of tones. *Language* 55(1): 37–58. https://doi.org/10.2307/412518

Hyman, L. M. 1976. On some controversial questions in the study of consonant types and tones. *UCLA Working Papers in Phonetics* 33: 90–98.

Jones, J. T. 1842. *Brief Grammatical Notices of the Siamese Language: With an Appendix*. Bangkok: The Mission Press.

Kingston, J. 2001. Tonogenesis. In *The Blackwell Companion to Phonology*, Vol. 9, M. van Oostendorp, C. J. Ewen, E. Hume & K. Rice (eds.), 2304–2333. Malden MA: Wiley-Blackwell.

Lord, D. 1968. *Mo Bradley and Thailand*. Grand Rapids MI: Eerdmans.

Low, C. J. 1828. *A Grammar of the Thai or Siamese Language*. Calcutta: Baptist Mission Press.

Maddieson, I. 1976. A further note on tone and consonants. *UCLA Working Papers in Phonetics* 33: 131–159.

Maddieson, I. 1977. Tone effects on consonants. *UCLA Working Papers in Phonetics* 36: 91–110.

McFarland, G. B. 1900. *English-Siamese Pronouncing Handbook* Bangkok: American Presbyterian Mission Press.

McFarland, G. B. 1944. *Thai-English Dictionary*. Stanford CA: Stanford University Press.

Michell, E. B. 1892. *A Siamese-English Dictionary*. Bangkok.

Michuthon, U. 2004. Mo Bratl kap kan prakat satsana nai Siam (Bradley and mission in Siam). *Silpa Watthanatham* [Art and culture] 25(9): 87–95.

Morén, B. & Zsiga, E. 2006. The lexical and post-lexical phonology of Thai tones. *Natural Language and Linguistic Theory* 24(1): 113–178. https://doi.org/10.1007/s11049-004-5454-y

Pallegoix, J. -B. 1850. *Grammatica linguae Thai*. Bangkok: Typographia Collegii Assumptionis B.M.V..

Pallegoix, J. -B. 1854. *Dictionarium linguae Thai: Sive Siamensis interpretatione Latina, Gallica et Anglica*. Parisiis: Jussu Imperatoris Impressum.

Pallegoix, J. -B. & Vey, J. -L. 1896. *Dictionnaire Siamois Français Anglais*. Bangkok: Imprimerie de la Mission Catholique.

Pittayaporn, P. 2007. Directionality of tone change. In *Proceedings of the 16th International Congress of Phonetic Sciences, Saarbrücken, Germany, 6–10 August 2007* J. Trouvain & W. J. Barry (eds.), 1421–1424. Saarbrücken, Germany.

Pittayaporn, P. 2016. *Chindamani* and reconstruction of Thai tones in the 17th century. *Diachronica* 33(2): 187–219.

Pittayaporn, P. 2018. Phonetic and systemic biases in tonal contour changes in Bangkok Thai. In *Tonal change and neutralization*, H. Kubozono & M. Giriko (eds.), 249–278. Berlin: De Gruyter.

Prince, A., & Smolensky, P. 2004. *Optimality Theory: Constraint Interaction in Generative Grammar*. Malden MA: Blackwell. https://doi.org/10.1002/9780470759400

Ruangjaroon, S. 2006. Consonant-tone interaction in Thai: An OT analysis. *Taiwan Journal of Linguistics* 4(2): 1–66.

Taylor, L. F. 1920. On the tones of certain languages of Burma. *Bulletin of the School of Oriental Studies, University of London* 1(4): 91–106. https://doi.org/10.1017/S0041977X00101685

Teeranon, P. 2002. Thai tones in the reigns of King Rama VI and King Rama IX. *Journal of Language and Linguistics* 21(1): 32–46.

Teeranon, P. 2007. The change of the Standard Thai high tone: An acoustic study and a perceptual experiment. *SKASE Journal of Theoretical Linguistics* 4(3): 1–16.

Teeranon, P. & Rungrojsuwan, R. 2009. Change in the Standard Thai High Tone: An Acoustic Study. *Manusya: Journal of Humanities*, Special Issue 17: 34–44.

Thepboriruk, K. 2010. Bangkok Thai tones revisited. *Journal of the Southeast Asian Linguistics Society* 3(1): 86–105.

van Heuven, W. J. B., Mandera, P., Keuleers, E., & Brysbaert, M. (2014). Subtlex-UK: A new and improved word frequency database for British English. *Quarterly Journal of Experimental Psychology* 67: 1176–1190.

Xu, Y. 2004. Understanding tone from the perspective of production and perception. *Language and Linguistics* 5: 757–797.

Yip, M. 1980. The Tonal Phonology of Chinese PhD dissertation, MIT.

Yip, M. 1982. Against a segmental analysis of Zahao and Thai: A laryngeal tier proposal. *Linguistic Analysis* 9: 79–94.

Zhang, J. 2002. *The Effects of Duration and Sonority on Contour Tone Distribution*. London: Routledge.

Zhang, J. 2004. Contour tone licensing and contour tone representation. *Language and Linguistics* 5(4): 925–968.

Subject index

Dedicated to John B. Whitman, this collection of seventeen articles provides a forum for cutting-edge theoretical research on a wide range of linguistic phenomena in a wide variety of Asian languages, including Japanese, Korean, Chinese, Austronesian, Indo-Aryan, and Thai. Ranging from syntax and morphology to semantics, acquisition, processing and phonology, from synchronic and/or diachronic perspectives, this collection reflects the breadth of the honoree's research interests, which span multiple research subfields in numerous Asian languages.

"It has become increasingly clear that to understand a phenomenon in one language often requires a close look at similar phenomena across a variety of languages, and not just across the synchronic space but also the diachronic as well. John Whitman's life work embodies precisely this message. The range of languages he has investigated is immense, and the enormous scholarship that went into this investigation gives his work a quality of unparalleled depth and breadth. The broad range of languages represented in this volume and the variety of fields they represent directly reflect the enthusiasm, dedication, and curiosity that John himself brings to the study of linguistics."

Shigeru Miyagawa, *Massachusetts Institute of Technology*

"A fitting testament to John Whitman's range of interests and influence, this book will be of interest to theoretical linguists as well as scholars of East Asian and South Asian languages."

Peter Sells, *University of York*

ISBN 978 90 272 0172 0

9 789027 201720

John Benjamins Publishing Company