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Encoding Motion Events in Mandarin Chinese

Jingxia Lin

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Encoding Motion Events in Mandarin Chinese
A cognitive functional study
by Jingxia Lin

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A cognitive functional study

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To my son Youheng
and our cat Maomao

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Abbreviations

1SG/PL	1st person singular/plural
2SG/PL	2nd person singular/plural
3SG/PL	3rd person singular/plural
ADV	Adverbial marker
BA	Object marker
CLF	Classifier
COMP	Complement marker
CONT	Continuous marker
COP	Copular
CRS	Currently relevant state marker
NAME	Person name
NEG	Negative marker
NOM	Nominalizer
ONOM	onomatopoeia
PASS	Passive marker
PAST	Past tense
PFV	Perfective
POT	Potential marker
PROG	Progressive marker
Q	Question marker
SFP	Sentence final particle
T	Topic marker

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CHAPTER 1

Introduction

Movement through space is one of the most basic human activities, but the many languages of the world do not express motion events in the same way. Hence, studies investigating the linguistic expressions of motion events can contribute to a better understanding of how form and meaning are related, or of how language and cognition are related. This book explores the encoding of motion events in Modern Mandarin Chinese (also *pǔtōnghuà* 'common language', hereafter "Chinese"), with a particular focus on the distributions of verbal morphemes that lexicalize motion information.

1.1 The notion of motion event in this study

In this study, a motion event refers to an event in which an object moves and changes its location with respect to another object. As illustrated in (1), the cat moved with respect to the kitchen, changing its location from the outside of the kitchen to the inside.

(1) *The cat ran into the kitchen.*

Such an event is termed as a "translational motion event" by Talmy (2000: 35, cf. Bohnemeyer et al. 2007). Talmy (2000: 25) identifies four "internal" components of a motion event:

(2) Figure: the moving object
Ground: the reference object with respect to which the figure moves
Motion: the presence of motion
Path: the course/route along which the figure moves with respect to the ground

For instance, (1), repeated in (3), describes an event in which the "figure" (the cat) carries out its "motion" (running) along a "path" (into) with respect to the "ground" (the kitchen).

(3) *The cat ran into the kitchen.*
Figure Motion Path Ground

In addition to the internal components, a motion event can also have an "external" co-event (Talmy 2000: 26). One important and widely-discussed co-event is the manner of motion, that is, how a figure moves. For instance, the verb *ran* in (1) specifies that the motion was carried out in a manner of running.

According to Talmy (2000: 27–28), translational motion events are classified into three types depending on the agentivity of the figure. The first type is the agentive motion, in which the movement of a figure is caused by some explicit external cause and the figure has no control over its motion, like *the keg* in (4), which was caused to move by *I*.

(4) *I slid the keg into the storeroom.* (Talmy 2000: 28, (5f))

The second type is the nonagentive motion, in which the motion of a figure occurs without an obvious cause, and the figure has no control over its motion, such as *the rock* in (5).

(5) *The rock slid down the hill.* (Talmy 2000: 28, (5c))

The third type is the self-agentive motion, in which a figure has control over its motion. (6) describes such an event.

(6) *I ran down the stairs.* (Talmy 2000: 28, 5(h))

This study focuses mainly on motion expressions that describe self-agentive motion and nonagentive motion. Agentive motion will only be mentioned when necessary because it is structurally different from the other two types in both English and Chinese. For instance, in expressions describing agentive motion, the figure is usually expressed as the object, like *the keg* in (4), whereas the figure in expressions of self-agentive and nonagentive motion is usually expressed as the subject, like *the rock* in (5) and *I* in (6).

Note that besides translational motion events, Talmy also treats the situation in which an object is located with respect to another object as a type of motion, as in *The pencil lay on the table* (Talmy 2000: 26, (26)). As such motion does not involve movement in space, it will not be discussed in detail in this study. Translational motion events are also distinguished from "self-contained motion events" such as rotation, oscillation, dilation, and wiggle in that the former involve the motion of the entire figure from one point to another in space, whereas in the latter, the figure remains in its basic location in space (Talmy 2000: 35–36). Such self-contained motion is not treated as a motion event in this study either.

1.2 Research questions and major proposals

Ever since Talmy's (1975, 1985, 2000) pioneering cross-linguistic study of the relationship between meaning (semantics) and linguistic representation (syntax, or surface expression), motion verbs and motion expressions have intrigued a substantial number of studies in various languages. Of these studies, the question that has received the most amount of attention is probably whether the path (and ground) information of a motion event is characteristically encoded in the main verb or in the satellite (nonverbal elements such as particles or verb affixes). Consequently, languages have been classified into three major categories, namely, verb-framed, satellite-framed, and equipollently-framed (see studies such as Talmy 1985, 2000; Choi and Bowerman 1991; Ameka and Essegbey 2001; Slobin 2004; Zlatev and Yangklang 2004; Nakazawa 2006; Filipović 2007, among many others, cf. Beavers et al. 2010; Croft et al. 2010). Verb-framed languages (e.g., Spanish, Turkish, Japanese) tend to use verbs for encoding path information, satellite-framed languages (e.g., English, Russian, German) tend to express path information via satellites to the verbs (e.g., affixes and particles), and equipollently-framed languages tend to express path and manner by equivalent grammatical forms (e.g., both manner and path are expressed in verbs, or in non-verbs). For Standard Mandarin Chinese and Chinese dialects, the typology of event integration has been extensively discussed (see studies such as Talmy 2000, 2009; Lamarre 2003, 2008; Tai 2003; Peyraube 2006; Ma 2008; Chen and Guo 2009; Shi and Wu 2014; Yiu 2014; Shi 2015, among others) and it is generally agreed upon that Modern Mandarin Chinese is primarily a satellite-framed language.

However, unlike most previous studies of Chinese motion events, this book pays particular attention to the lexicalization patterns, specifically the meanings that can be lexicalized in the verbal morphemes of Chinese, and whether these verbal morphemes are distributed in relation to what they lexicalize when encoding motion events. Before I introduce the research questions and major proposals of this study, it is worth noting that this study adopts the term "motion morpheme" to refer to any verbal morpheme lexicalizing motion information in Chinese, including both free and bound morphemes. While the term "motion verb" is mainly used for the verbs of motion in other languages, when it is used for Chinese, it only refers to free motion morphemes, that is, morphemes that can stand alone as verbs. There are two major reasons for this study to adopt the relatively more neutral term "motion morpheme". First, the boundaries between a free morpheme (a motion verb) and a bound morpheme are sometimes not clear-cut. Second, previous studies, especially studies on the typology of event integration (e.g., Tai 2003; Lamarre 2003; Talmy 2000; 2009, among others), take different viewpoints with respect to the grammatical status of some motion morphemes in Chinese. For example, for

motion expressions consisting of a manner-of-motion morpheme and a path morpheme, e.g., 飞过英吉利海峡 *fēi-guò yīngjílìhǎixiá* fly-pass English-channel 'pass the English Channel by flying', Talmy (2000, 2009) points out that the first morpheme (i.e. the manner-of-motion morpheme 飞 *fēi* 'fly') is the main verb (i.e. a free morpheme), whereas Tai (2003) argues that 过 *guò* 'pass' is the center of predication in the verb compound 飞过 *fēi-guò* fly-pass, i.e. the main verb and the free morpheme. Because it is not the focus of this study to clearly distinguish between free and bound morphemes, or between main verbs and verbal complements, this study adopts the relatively more neutral term of "motion morphemes".

In terms of glossing, the verbal meanings of these motion morphemes are provided. For instance, 飞回 *fēi-huí* and 跑进 *pǎo-jìn* are glossed as fly-return and run-enter respectively, rather than fly-back and run-into as in some previous studies. In those studies, 飞 *fēi* and 跑 *pǎo* are treated differently from 回 *huí* and 进 *jìn* with regard to their grammatical status, i.e. 飞 *fēi* and 跑 *pǎo* as main verbs and glossed as 'fly' and 'run' respectively, whereas 回 *huí* and 进 *jìn* as verbal complements and glossed as 'back' and 'into' respectively.

1.2.1 Research questions

Where the relationship between the semantic element and the surface element is concerned, Talmy (1975, 1985, 2000) proposes that there is no one-to-one correspondence between the meaning and its surface form. He identifies three major lexicalization patterns of motion verbs (roots): verbs conflating motion and manner/cause (e.g., *roll*), verbs conflating motion and path (e.g., *descend*), and verbs conflating motion and figure (e.g., *rain*). In studies of self-agentive and nonagentive motion events, Talmy's three-way classification is often simplified into a two-way classification, that is, manner-conflation verbs and path-conflation verbs. Cause-conflation verbs and figure-conflation verbs are seldom discussed because the former is typically used in agentive motion events, and the latter is very rare or exists as a common pattern only in very few languages. Therefore, in the majority of studies on motion events, manner-conflating verbs and path-conflating verbs are the most widely discussed, and are often referred to as "manner-of-motion verbs" (or "manner verbs" in short) and "path verbs" respectively. Talmy's classification has been extensively adopted in the subsequent studies, but there are also some studies that argue for the existence of a third lexicalization pattern, that is, verbs that conflate motion, manner, and path (see studies such as Slobin 2004; Zlatev and Yangklang 2004, among others).

Nonetheless, one common issue in previous studies is that the definitions of "manner" and "path" are unclear. Additionally, there is a lack of systematic criteria or

tests to determine the motion information that a particular motion verb lexicalizes. Therefore, the categorization of motion verbs in these previous studies is mainly based on the linguists' intuitions, resulting in inconsistent classifications among these studies. For instance, the motion morpheme 掉 *diào* 'fall' in Chinese is analyzed as a manner-of-motion morpheme in Chen and Guo (2009), a path morpheme in Lamarre (2008), and a morpheme denoting both manner and path in Hsiao (2009).

In addition, Chinese allows two or more verbal morphemes to co-occur in a motion construction, and therefore, motion events in Chinese are also commonly expressed through multimorphemic expressions. For instance, both the motion expressions in (7) consist of two motion morphemes: 滚 *gǔn* 'roll' and 落 *luò* 'fall' in (7a) and 落 *luò* 'fall' and 进 *jìn* 'enter' in (7b).

(7) a. 石块继续滚落，有时互相撞在一起。
shíkuài jìxù ***gǔn-luò***, *yǒushí hùxiāng zhuàng-zài*
stone continue roll-fall sometimes each.other hit-at
yīqǐ (BCC)
together
'The stones continue rolling down, sometimes hitting at each other.'

b. 忽然一块石子落进了水里。
hūrán yī kuài shízi ***luò-jìn-le*** *shuǐ-lǐ* (BCC)
suddenly one CLF pebble fall-enter-PFV water-inside
'Suddenly, a pebble fell into the water.'[1]

However, the generalization of the relative word orders of these co-occurring motion morphemes seems to be a challenging task. For instance, 落 *luò* 'fall' must follow 滚 *gǔn* 'roll' in (7a) but must precede 进 *jìn* 'enter' in (7b). Although it is very common in Chinese where a manner-of-motion morpheme (滚 *gǔn* 'roll') occurs before a path morpheme (落 *luò* 'fall'), it is intriguing to find out why the path morpheme 落 *luò* 'fall' must occur before the other path morpheme 进 *jìn* 'enter' when the two co-occur.

Even more intriguing is how the morphemes are sometimes allowed to occur in two different orders. That is, the position of the first and second morphemes can be reversed and still remain acceptable in Chinese, as illustrated by the

1. There are two major types of 了 – *le* in Chinese: the one occurring after (or suffixed to) a verb functions as a perfective marker, whereas the one in a sentence or clause final position signals a "currently relevant state" (Li and Thompson 1981: 240). A detailed discussion of 了 – *le* can be found in Li and Thompson (1981) and Huang and Shi (2016), among others. This book adopts the following convention for the glossing of 了 – *le*: all instances of 了 – *le* at clause or sentence final are glossed as CRS (i.e. currently relevant state), and all other 了 – *le* that occur immediately after a verb are glossed as PFV (i.e. perfective marker). The CRS 了 – *le* is treated as an independent word, whereas the PFV 了 – *le* is a suffix and connected to its preceding verb by a hyphen.

manner-of-motion morpheme 流 *liú* 'flow' and the path morpheme 回 *huí* 'return' in (8). Such examples also suggest that it is not always true that a manner-of-motion morpheme must precede a path morpheme.

(8) a. 被净化后的水再流回河里。
bèi jìnghuà hòu de shuǐ zài ***liú-huí*** *hé-lǐ*
PASS purify after NOM water again flow-return river-inside (BCC)
'The purified water then flows back into the river.'

b. 有助于血流快速地往心脏回流。
yǒuzhùyú xuè-liú kuàisù de wǎng xīnzàng ***huí-liú***
helpful.to blood-flow fast ADV toward heart return-flow (BCC)
'[It] helps the blood flow back toward the heart quickly.'

(9) shows examples consisting of path morphemes only, i.e. 落 *luò* 'fall' and 回 *huí* 'return', and these two morphemes are also found in two possible word orders. Thus, it is interesting to explore whether there are any linguistic differences, be it syntactic, semantic, or even beyond, between the two acceptable orders.

(9) a. 闷响过后，周围的碎石土渣重新落回地面。
mēn-xiǎng guòhòu, zhōuwéi de suìshí tǔzhā chóngxīn
dull-sound after surrounding NOM gravel dust again
luò-huí *dìmiàn* (BCC)
fall-return ground
'After a dull sound, the surrounding gravel and dust fell back to the ground'

b. 这时候，爆炸的声响早已停止，浓烟也在渐渐散去，尘埃也开始回落。
zhè shíhòu, bàozhà de shēngxiǎng zǎoyǐ tíngzhǐ,
this time explosion NOM sound already stop
nóngyān yě zài jiànjiàn sàn-qù, chén'āi yě
heavy.smoke also PROG gradually scatter-thither dust also
kāishǐ ***huí-luò*** (BCC)
start return-fall
'At this moment, the sounds of the explosion had long ceased, the heavy smoke was gradually dispersing, and dust began to settle.'

Therefore, the following major questions about encoding motion events in Chinese arise: what meaning components can a motion morpheme lexicalize? How to identify their lexicalized meanings? Is the ordering of motion morphemes generalizable when these morphemes co-occur in one motion expression? If yes, what motivates the generalization?

1.2.2 Major proposals

To answer the above questions, this study takes a cognitive functional perspective and adopts a scale-structure-based analysis (or scalar analysis, Hay et al. 1999; Kennedy 2001; Rappaport Hovav 2008; Rappaport Hovav and Levin 2010, among others) of Chinese motion morphemes. In the following, I list the major proposals about Chinese motion morphemes and the motion construction; these proposals will be justified in the different chapters of the book.[2]

(10) a. Chinese motion morphemes exhibit a tendency toward "manner/result (path) complementarity" (Rappaport Hovav and Levin 2010) in that a motion morpheme typically either lexicalizes manner-of-motion information or path information. In other words, Chinese tends not to adopt the lexicalization pattern where a motion morpheme conflates motion, manner, and path at the same time.

b. The traditional two-way classification of motion morphemes into manner-of-motion morphemes and path morphemes (Talmy 1975, 1985, 2000), while being the basic components of motion events conceptually, can be expanded into a four-way classification based on the scale lexicalized by the motion morphemes, with three of the four types being a further classification of path morphemes. The meaning components of the four types of motion morphemes can be identified using a set of independent tests proposed in this study. Furthermore, the four-way classification and the tests not only apply to free motion morphemes, but also to bound motion morphemes.

c. The four types of scale-based motion morphemes form a Motion Morpheme Hierarchy that can be used to predict the order of co-occurring motion morphemes in Chinese motion constructions.

d. The Motion Morpheme Hierarchy can be accounted for by a semantic and conceptual constraint, which I term as the "Scalar Iconicity Constraint". This constraint specifies that each morpheme is more specific in terms of the scale information it lexicalizes than the morpheme it follows. The constraint is cognitively motivated by iconicity in the sense that the order of language elements reflects the order in physical experience or the order of knowledge (Greenberg 1966; Haiman 1980, among others). It is worth noting that the Scalar Iconicity Constraint proposed in this study can not only account for the ordering of morphemes that denote sub-events occurring in a sequential order, but also account for those denoting simultaneous sub-events.

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2. Some of the research questions of this book have been explored in Lin (2011), Lin and Peck (2011), Lin (2015a, 2015b). This book presents a significant revision and expansion of these studies.

There are three major contributions arising from this study. First, this work is the first of its kind to classify Chinese motion morphemes in a finer-grained way based on their lexicalized scale structure, to provide a series of independent semantic, syntactic, or pragmatic tests to determine the categorization of each Chinese motion morpheme, and to generalize the ordering of co-occurring Chinese motion morphemes based on what they lexicalize. Hence, this study enriches the literature on motion and motion events and furthers our understanding of the nature of motion events. Second, the scale-based analysis provides new insights into the relationship between the semantic components and syntactic distributions of Chinese motion morphemes, or in other words, a new type of iconicity that cognitively motivates the structure in Chinese. Third, not only can the scalar approach and the major proposals of this work shed light on the studies of motion constructions in other languages, the approach and proposals are also extensible to studies beyond motion (verbs), including providing a more consistent account for the distributions and behaviors of verbs in general, adjectives, preposition phrases, and the relative word orders of larger elements such as adjuncts in Chinese.

1.3 Overview of the book

This book consists of six chapters. Chapter 1 is an introduction to the book. It outlines the background, the major research questions and proposals of this study, as well as the sources of the Chinese data used in the study.

Based on an exhaustive survey of motion morphemes and motion expressions in a corpus comprised of Chinese novels, Chapter 2 first provides a comprehensive description of how motion events are encoded in Chinese and a list of motion morphemes that constitute motion expressions. It also points out that there is a need for a more satisfactory explanation when it comes to the classification and ordering of Chinese motion morphemes.

Chapter 3 reviews and notes that previous studies on "manner" and "path" are inconsistent due to a lack of clear definitions and systematic tests. This study proposes a set of compatibility tests to identify the manner and path meaning components of motion morphemes in Chinese. Furthermore, this chapter also reviews previous studies on verbs encoding both manner and path information and illustrates with examples that Chinese motion morphemes exhibit a tendency of manner/result (path) complementarity.

In Chapter 4, this study proposes a four-way classification of Chinese motion morphemes based on the kind of scale information they lexicalize. In the domain of motion, a scale can refer to the path that is composed of contiguous points ordered between the starting point and the reference point and these ordered points

indicate measurement values on the dimension of distance (Rappaport Hovav and Levin 2010, among others). According to whether a motion morpheme lexicalizes a scale, whether the scale has an inherent endpoint, and whether the scale is composed of only two points (the beginning and ending points) or multiple points (the beginning and ending points and many points in between them), motion morphemes can be classified into four types: nonscalar change motion morphemes (e.g., 滚 *gǔn* 'roll'), open scale motion morphemes (e.g., 落 *luò* 'fall'), multi-point closed scale motion morphemes (e.g., 回 *huí* 'return'), and two-point closed scale motion morphemes (e.g., 进 *jìn* 'enter'). It is important to note that of the four types, the first, that is the nonscalar change motion morphemes, is equivalent to manner-of-motion morphemes, and the other three present a further classification, and thus a finer-grained classification of path morphemes as proposed by Talmy (1975, 1985, 2000). Furthermore, this chapter proposes a set of independent semantic, syntactic, or pragmatic tests to determine which scalar category each motion morpheme belongs into. This chapter also shows that the proposed classification and tests are applicable to bound motion morphemes, i.e. motion morphemes such as 入 *-rù* 'enter' and 至 *-zhì* 'arrive' that are no longer verbs in Modern Chinese. Finally, there are several motion morphemes that do not always behave like other morphemes lexicalizing the same type of scale; these morphemes are discussed in depth in this chapter.

Chapter 5 formulates a hierarchy consisting of the four scalar types of motion morphemes to predict the order of motion morphemes that co-occur in a Chinese motion expression. The hierarchy is then verified by a corpus-based investigation. In addition, this chapter presents motion expressions that the hierarchy does not predict as well as motion expressions that are predicted by the hierarchy but rarely found in Chinese and shows that the predicting power of the hierarchy is not challenged by these examples. More importantly, this chapter extends the discussion to what the ordering hierarchy tells us about the encoding of motion events in Chinese, as well as why certain morphemes can or cannot occur together. Specifically, the ordering of Chinese motion morphemes conforms to the "Scalar Iconicity Constraint": the morpheme which is more specific about the scale in a motion event must precede the morpheme that is less specific. The constraint is conceptually motivated in that the morpheme order is iconic to the order in reality or the order of knowledge.

The last chapter of the book, Chapter 6, first summarizes the major proposals of this study and points out the future directions for scale-based studies of motion events. It then moves beyond motion (verbs) and discusses, using case studies, how the scalar approach and major proposals of this study can be successfully applied to a more unified analysis of the distributions and behaviors of Chinese verbs in general, Chinese adjectives, preposition phrases, and the word order of Chinese adjuncts.

1.4 Sources of Chinese data

The Modern Chinese data used in this study come from seven major sources. The first is the BLCU Chinese Corpus ("the BCC corpus" in short) developed by the Beijing Language and Culture University Corpus Center (Xun et al. 2016). The BCC corpus for Chinese language has around 15 billion Chinese characters, spread across several subcopora (assorted, literature, newswire, microblog, technology, classical Chinese, and student writing). The corpus is available online at http://bcc.blcu.edu.cn/. When not explicitly specified, the data from the corpus is either extracted from the BCC (assorted) (one billion Chinese characters) or BCC (literature) (three billion Chinese characters). While the study is primarily based on modern written texts, modern spoken Chinese is also occasionally used when investigating the behaviors of some motion morphemes. The Media Language Corpus (MLC, http://ling.cuc.edu.cn/RawPub/) is adopted as the primary source of spoken Chinese. The corpus was developed by the National Broadcast Media Language Resources Monitoring and Research Center in the Communication University of China. It consists of 200 million Chinese characters transcribed from radio and TV programs broadcasted between 2008 and 2013. In addition, examples from Google searches are also used when necessary. The searches in the BCC corpus, the MLC Corpus, and Google were conducted over three periods: May – September 2015, September – November 2017, and March – June 2018. In order to carry out an exhaustive investigation of the types of motion morphemes and motion expressions used in Chinese, as well as to verify the major proposals of this book from a quantitative perspective, this study also built a small-scale corpus (about 164,000 Chinese characters) consisting of selected chapters from five contemporary Chinese novels (see Chapter 2 for more information), providing a fourth source of data for the study. Examples from previous studies are also cited when necessary. Because the format of these examples in the original literature may differ from that of this book, for consistency, this book presents these examples in the same way as the other examples of this study. For instance, Chinese characters are added in this book if the original examples were given only in Chinese pinyin and some glossings from the original examples were changed, following the conventions adopted in this book. While this study highly values natural language data for linguistic research, some examples of this book are provided by the author as a native speaker of Chinese. Such examples are mainly used for the convenience of discussion or for the tests of the scalar features of motion morphemes. All these examples have been verified with other native speakers for acceptability. Finally, while this study primarily focuses on the encoding of motion events in Modern Mandarin Chinese, relevant data from earlier stages of Chinese is occasionally referred to. This study follows Wang (1980) on the periodization of Chinese, as given in Table 1.1.

Table 1.1 Major periods of the Chinese language (Wang 1980: 43)

Periods	Years
1. Old Chinese	Period prior to third century
2. Middle Chinese	Fourth to twelfth centuries CE
3. Early Modern Chinese	Thirteen to early twentieth centuries CE
4. Modern Chinese	Early twentieth century (1919) to present

CHAPTER 2

Encoding motion in Chinese

This chapter will first introduce the ways different motion morphemes combine to form motion verbs in Chinese. It will then provide a detailed description of how motion events are encoded in Chinese, by using natural language data to show the types and token frequencies of motion morphemes and motion expressions. This chapter will also review previous studies on the analysis of motion expressions in Chinese and suggest that a more unified account is necessary for the classification and ordering of Chinese motion morphemes.

2.1 Word formation of Chinese motion verbs

Following from studies in construction grammar (e.g., Fillmore et al. 1988; Fried and Östman 2004), "motion construction" in this study is used as an abstract or representational term for motion expressions that are typically headed by motion verbs and describe self-agentive or nonagentive events where a figure moves in space with reference to a ground. Like the motion constructions in many other languages (e.g., Talmy 2000; Slobin 2004; Beavers et al. 2010, among others), the motion construction in Chinese can be realized in different ways depending on how the information (manner, path, figure, ground, etc.) of motion events is expressed. Take the association between motion verbs that head the motion construction and the manner/path information as an example. All the sentences given in (1) are examples of the motion construction for translational motion events, but they differ in specific forms and meanings. Both (1a) and (1b) consist of only one verbal motion morpheme: the verbal motion morpheme 走 *zǒu* 'walk' in (1a) expresses the manner of motion, and whole sequence has no information about the path (direction) of motion; on the other hand, the verbal motion morpheme 进 *jìn* 'enter' in (1b) expresses the path of motion, and the whole expression does not specify information about the manner of motion. (1c) differs from (1a) and (1b) in that it consists of two co-occurring verbal motion morphemes, 走 *zǒu* 'walk' and 进 *jìn* 'enter', which express manner and path respectively. There are also cases where the manner or path information is expressed by non-verbal elements: in (1d), while the manner information is encoded in the verbal motion morpheme 走 *zǒu* 'walk', the direction is realized via the adjunct PP 向前 *xiàng qián* toward front 'forward'; in (1e), the verbal motion morpheme 进

jìn 'enter' encodes the path information, but the manner is realized by the adverbial *mànman* 'slowly'. Sometimes, neither the manner nor the path is expressed by a verbal motion morpheme: as illustrated in (1f), neither 坐 *zuò* 'sit' nor 在 *zài* 'at' expresses translational motion, but the sentence implies that the figure moved to the ground (the chair next to Xiaohong) and sat there.

(1) a. 两个女孩在路上走。
*liǎng gè nǚhái zài lù-shàng **zǒu*** (BCC)
two CLF girl at road-on walk
'Two girls are walking on the street.'

b. 他们进了房间。
*tāmen **jìn**-le fángjiān* (BCC)
3PL enter-PFV room
'They entered the room.'

c. 大家走进会客室。
*dàjiā **zǒu-jìn** huì-kè-shì* (BCC)
everyone walk-enter meet-guest-room
'Everyone walked into the meeting room.'

d. 他们让我转身，向前走。
*tāmen ràng wǒ zhuǎn-shēn, xiàng qián **zǒu*** (BCC)
3PL ask 1SG turn-body toward front walk
'They asked me to turn around and walk forward.'

e. 两人慢慢进了洞。
*liǎng rén mànman **jìn**-le dòng* (BCC)
two person slowly enter-PFV cave
'The two entered the cave slowly.'

f. 筱红的身边正好有个空椅子，卫东就坐在了筱红的身边。
Xiǎohóng de shēn-biān zhènghǎo yǒu gè kōng yǐzi,
NAME NOM body-side just.right have CLF empty chair
*Wèidōng jiù **zuò-zài**-le Xiǎohóng de shēn-biān* (BCC)
NAME then sit-at-PFV NAME NOM body-side
'There happened to be an empty chair besides Xiaohong; Weidong then sat down beside Xiaohong'

However, motion expressions like (1f) are not highly frequently found in Chinese, and the understanding of the construction as a translational motion is more likely to be contextually-dependent (Tham 2013, cf. Chen and Guo 2009; also see more discussion of the meanings lexicalized in a motion morpheme or understood from context in Chapter 3). This study will primarily focus on the motion expressions consisting of at least one verbal motion morpheme, e.g., (1a–e). Furthermore, different verbal motion morphemes may form motion verbs in different ways in Chinese. The rest of this section will first introduce the formation.

A motion event can be expressed in a motion expression with only one verbal morpheme as in (1a–b), or with two or more verbal morphemes as in (1c). While the verbal motion morphemes 走 *zǒu* 'walk' and 进 *jìn* 'enter' in (1a–c) are free morphemes, i.e. morphemes that can independently take a part-of-speech slot (Packard, 2000, 2016), a motion verb may sometimes consist of bound verbal morphemes, that is, a motion morpheme that typically cannot be used alone as an independent word in Modern Mandarin Chinese, e.g., 入 *-rù* 'in' in (2).

(2) a. 一个老妇人走入厅里。
*yí gè lǎo-fùrén **zǒu-rù** tīng-lǐ* (BCC)
one CLF old-lady walk-in hall-inside
'An old lady walked into the hall.'

b. *一个老妇人入厅里。
yí gè lǎo-fùrén **rù tīng-lǐ*
one CLF old-lady enter hall-inside
(intended) 'An old lady entered the hall.'

Many studies have discussed the notions of "word/compound/phrase" and "free/bound morpheme" (cf. Chao 1968; Li and Thompson 1981; Packard 2000, 2016, among others). This study mainly follows Packard (2000, 2016) in order to provide a relatively more systematic and comprehensive account of the formation of motion verbs in Chinese. In addition to words that contain only one morpheme (i.e. simple words), Packard (2000, 2016) proposes that words can be made from more than one morpheme via three ways: composition, compounding, and derivation. A word formed via the process of composition consists of at least one bound root, where a root refers to a contentful morpheme; a word formed by compounding consists of free roots only, i.e. a word made from words; and a word formed by derivation contains at least a derivational affix. Derivation is not closely relevant to this study as motion verbs typically do not involve affixes.

Building upon Packard (2000, 2016), this study proposes that there are five major types of motion verbs that may head a motion construction in Chinese. The five types are classified mainly according to the number of and the morphological (free or bound) status of verbal motion morphemes that constitute the verbs. As illustrated in Figure 2.1, depending on whether the motion verbs have only one or multiple motion morphemes, motion verbs are firstly classified into two types: monomorphemic verbs and multimorphemic verbs. Then, the multimorphemic verbs are further classified into three major types according to how the morphemes combine with each other: idioms, verbs by composition, and verbs by compounding. Finally, verbs by compounding are further classified into two types according to how closely the verbal motion morphemes are compounded with each other. I will introduce each of these five types with examples.

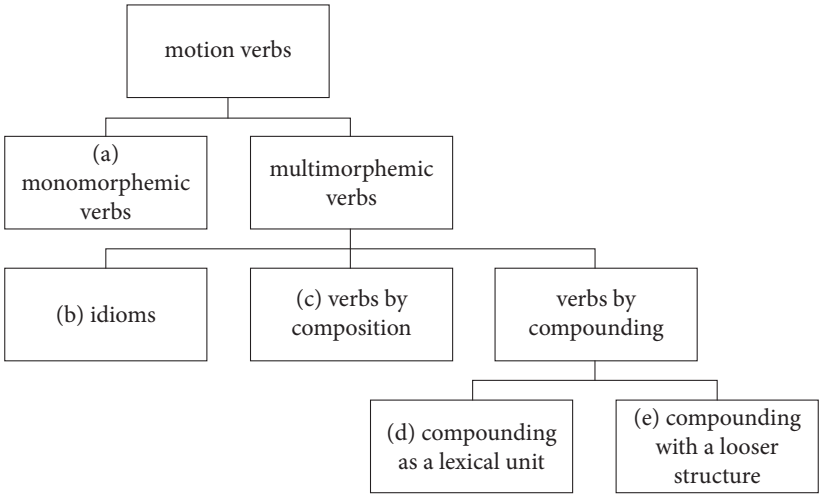

Figure 2.1 The formation of motion verbs in Chinese

a. Monomorphemic verbs

As a word is the smallest linguistic unit that can independently occupy a part-of-speech slot (Packard, 2000, 2016), the verbal morphemes such as 走 *zǒu* 'walk' and 进 *jìn* 'enter' in (1a–b) are the only motion verbs used in the motion expressions and both are monomorphemic words. In terms of syllables, most monomorphemic motion verbs are monosyllabic (e.g., 走 *zǒu* 'walk' and 进 *jìn* 'enter'), but examples with more than one syllable are also found in Chinese, e.g., 徘徊 *páihuái* 'roam' and 匍匐 *púfú* 'crawl'.

Verbal morphemes such as 走 *zǒu* 'walk' and 进 *jìn* 'enter' that can occur as the only motion morpheme in a motion expression are typically free morphemes. However, there are also cases where a bound morpheme is used as a free morpheme under certain circumstances, especially in a specific or highly conventionalized context or a more formal style (Packard 2016: 75). For instance, although 奔 *bēn* 'dash' is typically a bound morpheme and has to combine with another morpheme to form a word, it can occasionally function as a free morpheme. As illustrated in (3), 奔 *bēn* 'dash' behaves as a motion verb when it occurs as the only verbal morpheme in a motion expression, or is immediately suffixed by the perfective marker 了 *le* when co-occurring with other motion morphemes.

(3) a. 行人匆匆忙忙往家奔。

xíngrén cōngcōngmángmáng wǎng jiā ***bēn*** (BCC)

pedestrian hurriedly toward house dash

'The pedestrians dashed hurriedly toward their homes.'

b. 两个黑衣大汉应手奔了过来
liǎng gè hēi-yī dà-hàn yìngshǒu ***bēn****-le guò-lái*
two CLF black-clothes big-guy skillful dash-PFV cross-hither
'Two big men in black dashed over skillfully.' (BCC)

Note that in both examples of (3), the language is more formal or literary in style. It should be also noted that there are very few cases where a bound morpheme is used as a free morpheme, at least for motion morphemes. There are only four such instances in 100 randomly selected motion expressions that contain 奔 *bēn* 'dash' in BCC (assorted). The corresponding free motion morpheme 跑 *pǎo* 'run' can also combine with other morphemes to form new words, but in 100 randomly selected motion expressions from the same corpus, there are 35 instances where 跑 *pǎo* 'run' either occurs alone or is suffixed by aspectual markers, which is about nine times more frequent than 奔 *bēn* 'dash'.

In the investigation of the Novel Corpus that will be introduced later, 奔 *bēn* 'dash' is the only bound morpheme that is occasionally used as a free morpheme. For easier reference and statistical description, this study treats 奔 *bēn* 'dash' as a bound morpheme in general, and counts it as a free motion morpheme only when it clearly behaves like a free morpheme. The Novel Corpus has a total of three instances of 奔 *bēn* 'dash' functioning as a free morpheme, compared with 14 other instances where it combines with other morphemes (e.g., 奔驰 *bēnchí* dash-dash 'run quickly').

b. Idioms
Motion verbs with more than one morpheme can be further subdivided into three groups. The first group consists of idioms or fixed expressions that denote translational motion, e.g., 蜂拥而下 *fēng-yōng-ér-xià* bee-crowd-and-descend. from '[a crowd] swarm down like bees' and 跑来跑去 *pǎo-lái-pǎo-qù* run-hither-run-thither 'run back and forth'. These expressions are unanalyzable lexical items and usually consist of four syllables.

c. Verbs by composition
The second group of multimorphemic motion verbs are verbs formed via composition, that is, these verbs consist of at least one bound root (Packard 2000, 2016). 返回 *fǎn-huí* return-return 'return', 跑入 *pǎo-rù* run-enter 'run into', and 翱翔 *áo-xiáng* fly-fly 'soar' are three examples of motion verbs formed by composition, in the bound-free, free-bound, and bound-bound structures respectively.

d. Verbs by compounding: as a lexical unit
The third group of multimorphemic motion verbs is formed via compounding, that is, using free morphemes only (Packard 2000, 2016). This group can be further divided into two major sub-groups depending on how closely the constituent morphemes are compounded with each other: compounds as a

lexical unit and compounds with a looser structure. I will introduce the first sub-group here and the second in the next paragraph (e). In the first sub-group, i.e. compounds as a lexical unit, the morphemes that form the verbs are closely compounded and the whole compound behaves mostly like a single word. For instance, the two morphemes in 回流 *huí-liú* return-flow 'flow backward' and 飞跑 *fēi-pǎo* fly-run 'run like flying' cannot be separated by another morpheme, as in *回得流 *huí-de-liú* or *飞着跑 *fēi-zhe-pǎo*. Furthermore, where meanings are concerned, a large number of verbal compounds as a lexical unit cannot be simply analyzed as a combination of the meanings lexicalized by the constituent morphemes. For instance, even though both 飞 *fēi* 'fly' and 跑 *pǎo* 'run' are free morphemes, when they form the compound 飞跑 *fēi-pǎo* fly-run 'run as fast as flying', 飞 *fēi* 'fly' is used in a metaphorical sense and it modifies the other morpheme 跑 *pǎo* 'run'. Similarly, while both 出 *chū* 'exit' and 门 *mén* 'door' are free morphemes, when they form the compound 出门 *chū-mén* exit-door 'go out', the compound is not understood as the combination of the two morphemes, i.e. 'exit the door'; instead, it conveys the meaning of 'leaving (a place)'.

e. Verbs by compounding: with a looser structure

The second sub-group of multimorphemic motion verbs formed by compounding, on the contrary, has a looser structure when compared with the first sub-group introduced in (d). 流回 *liú-húi* flow-return 'flow back' and 跑进来 *pǎo-jìn-lái* run-enter-hither 'run into' are two rather typical examples. Structurally, these compounds allow for the insertion of potential markers, e.g., 流得回 *liú-de-húi* flow-POT-return 'be able to flow back' and 跑不进来 *pǎo-bu-jìn-lái* run-POT-enter-hither 'not be able to run into'. Furthermore, these compounds very often allow the insertion of aspectual markers, especially when the final motion morpheme is the deictic 来 *lái* 'hither' or 去 *qù* 'thither', e.g., 跑了进来 *pǎo-le-jìn-lái* run-PFV-enter-hither 'ran into'). Where the meanings are concerned, these compounds usually express literal meanings, i.e. the meaning of a compound is the sum of the meanings of the constituent morphemes. The compounds of this sub-group are widely recognized as directional verbal compounds, a type of resultative verbal compounds (Li and Thompson 1981, among many others). However, this study suggests that not all of such verbal compounds can be treated as the so-called directional or resultative verbal compounds because these terms typically only refer to compounds with two constituents (or three if the third one is 来 *lái* 'hither' /去 *qù* 'thither'), as in 流回 *liú-húi* flow-return 'flow back' and 跑进来 *pǎo-jìn-lái* run-enter-hither 'run into'. There are still cases, though much less in occurrence frequencies, where a compound is composed of more than two non-deictic verbal motion

morphemes. For instance, 滑落到 slip-fall-arrive 'slip onto (a place)' and 滚落回去 *gǔn-luò-huí-qù* roll-fall-return-thither 'roll down back (to a place)' describe translational motion events, but are typically not classified as examples of directional or resultative verbal compounds, leading to them being overlooked in literature. Unlike previous studies, this study will include all verbal compounds in this sub-group and aim to provide a more comprehensive and unified account for them, especially in terms of inherent meaning, structural relations, and the relative word orders of the constituent motion morphemes. In terms of their lexical status, the verbal compounds of this sub-group are not typical lexical units (cf. Chao 1968; Li and Thompson 1981), as they are structurally looser than the other types of verbal compounds. For easier reference, this study will use "multi-morpheme compound verb (MCV in short)" as a general term for motion verbs that consists of such motion morphemes.

Accordingly, the motion construction headed by such motion verbs are called "multi-morpheme compound verb construction (MCVC in short)". Note that in addition to the manner or path information about the motion specified by the verb, a motion construction may also specify information about the figure, the ground, etc. For instance, all three motion expressions in (4) are headed by the MCV 跑进来 *páo-jìn-lái* run-enter-hither and all specify the figure, but (4b) also specifies the ground by having the ground NP 家 *jiā* 'house' occurring between 跑进 *páo-jìn* run-enter and 来 *lái* 'hither', and (4c) specifies the perfective aspect information by suffixing the perfective marker 了 *le* to 跑 *páo* 'run'.

(4) a. 今天我在洗澡，女儿突然跑进来。
jīntiān wǒ zài xǐzǎo, nǚér tūrán ***páo-jìn-lái***
today 1SG PROG take.bath daughter suddenly run-enter-hither
'I was taking a bath today; my daughter ran in suddenly.'
(https://bbs.pcbaby.com.cn/topic-1249884.html)

b. 跑进家来的松鼠
páo-jìn *jiā* ***lái*** *de sōngshǔ*
run-enter house hither NOM squirrel
'the quirrel that ran into the house'
(www.aaaxk.com/YW6A/45207.html)

c. 女儿突然跑了进来。
nǚér tūrán ***páo****-le-****jìn-lái***
daughter suddenly run-PFV-enter-hither
'The daughter ran in suddenly.' (http://zqb.cyol.com/html/2012-05/02/nw.D110000zgqnb_20120502_8-09.htm)

2.2 Motion verbs and motion morphemes: A corpus survey

This section aims to provide a description of the motion expressions and the distributions of motion morphemes in Chinese via a close examination of selected natural Chinese data.

2.2.1 The corpus data

In order to collect all possible types of motion expressions that may occur in Chinese, this study constructed a small-scale corpus consisting of selected chapters from five contemporary novels (see Table 2.1 for the selected novels). Different numbers of chapters from each novel were selected in order to keep the sizes of the texts surveyed relatively balanced among the five. For convenience, this study adopts the term "the Novel Corpus" to refer to the data in Table 2.1.

Table 2.1 The Novel Corpus

Chinese title	English title	Abbreviation	Author	Year	Selection analyzed	Number of characters
Dìqiú de Hóng Piāodài	*The Earth's Red Flying Ribbon*	*Hóng*	Wei Wei	1988	First 6 chapters	34,108
Kōngzhōng Xiǎojiě	*Flight Attendant*	*Xiǎojiě*	Wang Shuo	1985	Entire novel	29,185
Tàiyáng Chūshì	*The Sun was Born*	*Tàiyáng*	Chi Li	1992	Entire novel	35,433
Láng Túténg	*Wolf Totem*	*Láng*	Jiang Rong	2004	First 3 chapters	29,739
Xiǎo Shídài 1.0	*Tiny Times 1.0*	*Xiǎoshídài*	Guo Jingming	2008	First 4 chapters	35,265
					Total	163,730

All five novels used in the Novel Corpus have great popular appeal in China. *Hóng* is a legacy of Chinese revolutionary literature, and its language is highly accessible to workers and soldiers. *Tàiyáng* and *Xiǎojiě* are based on the lives of urbanites in two large cities in China, Wuhan and Beijing, and the language is thus closer to that of urbanites. *Xiǎoshídài* is a youth novel popular particularly among Mainland China's teenagers, and is thus representative of youth language. *Láng* contains extensive description of nomadic life in Northern China, so the motion events in the novel include not only the motion of human but also that of animals such as wolves, horses, dogs, and sheep. Given their differences in content and style, these five novels present a reasonable diversity for the purpose of this study.

2.2.2 The motion verbs

A total of 1,174 motion expressions with verbal motion morphemes are found in the Novel Corpus. Table 2.2 presents the token frequencies of the motion verbs that occur in these motion expressions.

As shown in Table 2.2, all of the formation types for motion verbs, as introduced in Section 2.1, can be found in the data, and the frequencies of each type vary: monomorphemic motion verbs and MCVs (verbal compounds with a looser structure) are the most frequently used ones, followed by compositional motion verbs, whereas compounds as a lexical unit and idioms are among the least frequent. (5) lists a few examples of each type.

Compared with previous corpus-based studies, this study will discuss in-depth a larger range of motion morphemes and motion expressions in Chinese. For instance, Chen and Guo (2009) focus on motion morphemes that are monomorphemic and monosyllabic, i.e., those belonging to the type in (5a). Hsiao (2009) studies both monomorphemic and multimorphemic verbs (5a–d), but the MCVs, i.e. the compounds with a looser structure in (5e), are excluded from the discussion because they are not considered to be lexical items. Furthermore, while Hsiao (2009) provides an in-depth and comprehensive discussion of verbs that lexicalize manner information, those lexicalizing path information are left uninvestigated. Unlike these two studies, this study mainly focuses on the monomorphemic morphemes (5a), both manner and path, and the MCVs that are formed by these morphemes (5e). As shown in Table 2.2, monomorphemic verbs and MCVs take 40.6% and 39.9% respectively of the motion expressions with verbal motion morphemes in the Novel Corpus, so the study of these two types of motion expressions will contribute to a more comprehensive understanding of motion expressions in Chinese.

Table 2.2 Token frequencies of motion verbs in the Novel Corpus

Novel	(a) Monomorphemic motion verb	Multimorphemic motion verb				Total
		(b) Idiom	(c) Verb by composition	Compound		
				(d) as a lexical unit	(e) with a looser structure (MCV)	
Hóng	102	1	45	14	118	280 (23.9%)
Láng	111	14	49	11	94	279 (23.8%)
Tàiyáng	98	3	12	4	45	162 (13.8%)
Xiǎojiě	105	7	24	6	113	255 (21.7%)
Xiǎoshídài	61	7	23	8	99	198 (16.9%)
Total	477 (40.6%)	32 (2.7%)	153 (13%)	43 (3.6%)	469 (39.9%)	1,174 (100%)

(5) a. Monomorphemic verbs: 跑 *pǎo* 'run', 飞 *fēi* 'fly', 到 *dào* 'arrive', 回 *huí* 'return';
b. Idioms: 你追我赶 *nǐ-zhuī-wǒ-gǎn* 2SG-chase-1SG-rush 'chase each other', 一跃而起 *yī-yuè-ér-qǐ* one-jump-then-rise 'jump up suddenly', 从天而降 *cóng-tiān-ér-jiàng* from-sky-then-descend 'arrive suddenly and unexpectedly'
c. Verbs by composition: 飞翔 *fēi-xiáng* fly-fly 'fly', 追逐 *zhuī-zhú* chase-chase 'chase', 进入 *jìn-rù* enter-enter 'enter';
d. Compounding as a lexical unit: 冲刺 *chōng-cì* rush-stab 'sprint', 出门 *chū-mén* exit-door 'go out', 南下 *nán-xià* south-descend.from 'move to the south';
e. Compounding with a looser structure (MCVs): 走上来 *zǒu-shàng-lái* walk-ascend.to-hither 'walk up towards the deictic center', 跳出 *tiào-chū* jump-exit 'jump out', 跑进 *pǎo-jìn* run-enter 'run into'

2.2.3 The motion morphemes

In this section, we further examine the motion morphemes that can either occur alone in a motion construction or occur together in MCVCs (motion constructions headed by multi-morpheme compound verbs). As introduced in Section 2.1, such motion morphemes are typically free roots that can stand alone as a motion verb in Modern Chinese. Table 2.3 presents the type and token frequencies of the motion morphemes based on the investigation of the Novel Corpus.

The majority of the motion morphemes in Table 2.3 are considered to be typical free morphemes, e.g., 走$_1$ *zǒu*$_1$ 'walk' and 跑 *pǎo* 'run'. As pointed out in Section 2.1, 奔 *bēn* 'dash' is rarely used as a free morpheme and is thus treated as a bound morpheme in general, but there are three cases where it does behave like a free morpheme. So, it is treated as a motion verb and listed in Table 2.3 for these three cases, and treated as a bound motion morpheme for the other cases where it occurs (See Chapter 4 for *bēn* 'dash' as a bound motion morpheme).

It is important to note that, as shown in Table 2.3, the most frequently occurring motion morphemes are 来 *lái* and 去 *qù*, which are glossed as 'come, hither' and 'go, thither', respectively. In the rest of this study, I will gloss 来 *lái* /去 *qù* as 'hither/thither' when they occur as the last motion morpheme in a motion expression with multiple motion morphemes, and 'come/go' when they occur in other positions. It should also be pointed out that this study glosses 上 *shàng* /下 *xià* as 'ascend to/descend from' respectively, instead of 'ascend' and 'descend' in most previous studies. Explanations will be provided in Chapter 4 when these motion morphemes are discussed in more detail. Also note that there are three polysemous motion morphemes under different circumstances: 上 *shàng* 'ascend to, go', 走 *zǒu* 'walk,

leave', and 跑 *pǎo* 'run, leave, move for certain purposes'.[3] For easier reference, this study lists each meaning separately in Table 2.3.

When compared to previous studies like Chen and Guo (2009: 1757), more motion morphemes have been identified using the Novel Corpus compiled by this study. This study finds 74 free motion morphemes (70 forms, with three forms being polysemous), whereas Chen and Guo (2009) identify 53 manner and path morphemes based on their corpus investigation. Most of the morphemes in Chen and Guo (2009) also appear in Table 2.3. However, a few morphemes (e.g., 踢 *tī* 'kick' and 拖 *tuō* 'drag') in the list of Chen and Guo (2009) do not lexicalize translational motion or only lexicalize agentive motion, and thus are excluded from this study. On the other hand, there are also studies that have identified more motion morphemes than the current one. For instance, Hsiao (2009) identifies 85 monomorphemic free morphemes. However, because a full list of these morphemes is not available in Hsiao (2009), it is unclear as to what morphemes are not found in this study and what kinds of motion these morphemes lexicalize. In Chapters 3 and 4, I will further analyze the meaning components of the motion morphemes in Table 2.3 and provide a finer-grained classification for them.

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3. When 跑 *pǎo* is used in its most prototypical sense, that is, when it describes a motion event of running, a figure moves faster than walking by quickly moving the legs such that at least one leg is off the ground in each step. However, there are also three instances in the Novel Corpus where 跑 *pǎo* is unspecific about how the legs are moved and only refers to the generic movement of a figure. An example is given in (i), where the figure, Zhao Shengtian, went to different administrative departments in different parts of Wuhan City for the certificates required for the birth of his child. Rather than running, 跑 *pǎo* in this example refers to moving in order to get something done.

(i) 孩子没出世，赵胜天已经在武汉市跑了几圈了。
háizi méi chūshì, zhàoshèngtiān yǐjīng zài Wǔhàn shì ***pǎo****-le jǐ*
child NEG born NAME already at Wuhan city run-PFV several
quān le (*Tàiyáng*)
circle CRS
'Before the child was born, Zhao Shengtian has went a few times around Wuhan City.'

Also note that 开 *kāi* is polysemous too as a motion morpheme. It can refer to (a) drive (a vehicle) or (b) away from a ground. However, the second meaning is only available when 开 *kāi* follows another morpheme, e.g., 跑开 *pǎo-kāi* run-away 'run away'. In other words, 开 *kāi* does not describe motion in a direction of 'away' when it is a free morpheme. Therefore, the second meaning of 开 *kāi* is not included in Table 2.3. See more in Chapter 4 where 开 *kāi* is listed as a bound motion morpheme when expressing the meaning of 'away'.

Table 2.3 Type and token frequencies of free motion morphemes in the Novel Corpus

No.	Motion morpheme	Freq.
1	来 *lái* 'come, hither'	229
2	去 *qù* 'go, thither'	175
3	走$_1$ *zǒu*$_1$ 'walk'	161
4	到 *dào* 'arrive'	146
5	回 *huí* 'return'	95
6	过 *guò* 'cross'	86
7	出 *chū* 'exit'	84
8	进 *jìn* 'enter'	78
9	跑$_1$ *pǎo*$_1$ 'run'	66
10	上$_1$ *shàng*$_1$ 'ascend to'	45
11	冲 *chōng* 'rush'	43
12	下 *xià* 'descend from'	33
13	走$_2$ *zǒu*$_2$ 'leave'	21
14	赶 *gǎn* 'rush'	20
15	飞 *fēi* 'fly'	15
16	追 *zhuī* 'chase'	15
17	掉 *diào* 'fall'	13
18	上$_2$ *shàng*$_2$ 'go'	12
19	跳 *tiào* 'jump'	12
20	爬 *pá* 'crawl/climb'	10
21	逃 *táo* 'escape'	10
22	开 *kāi* 'drive'	8
23	踏 *tà* 'step'	8
24	渡 *dù* 'ferry'	7
25	绕 *rào* 'move around'	6
26	跟 *gēn* 'follow'	6
27	跨 *kuà* 'stride'	6
28	落 *luò* 'fall'	6
29	升 *shēng* 'ascend'	6
30	驶 *shǐ* 'drive'	6
31	撤 *chè* 'recede'	5
32	流 *liú* 'flow'	5
33	跑$_2$ *pǎo*$_2$ 'escape'	5
34	退 *tuì* 'recede'	5
35	逛 *guàng* 'stroll'	4
36	骑 *qí* 'ride'	4
37	陷 *xiàn* 'sink'	4
38	涌 *yǒng* 'gush'	4

Table 2.3 (*continued*)

No.	Motion morpheme	Freq.
39	奔 *bēn* 'dash'	3
40	穿 *chuān* 'pass through'	3
41	闯 *chuǎng* 'rush'	3
42	登 *dēng* 'climb'	3
43	滚 *gǔn* 'roll'	3
44	跑$_3$ *pǎo*$_3$ 'move for certain purpose'	3
45	踩 *cǎi* 'trample'	2
46	窜 *cuàn* 'flee'	2
47	灌 *guàn* 'pour'	2
48	滑 *huá* 'slide'	2
49	迈 *mài* 'stride'	2
50	喷 *pēn* 'spray'	2
51	漂 *piāo* 'float'	2
52	扑 *pū* 'throw oneself to'	2
53	散 *sàn* 'scatter'	2
54	渗 *shèn* 'seep through'	2
55	钻 *zuān* 'duck; dig'	2
56	蹦 *bèng* 'jump'	1
57	沉 *chén* 'sink'	1
58	传 *chuán* 'transmit'	1
59	蹿 *cuān* 'leap'	1
60	颠 *diān* 'turn over'	1
61	遁 *dùn* 'escape'	1
62	翻 *fān* 'overturn'	1
63	赴 *fù* 'go'	1
64	拐 *guǎi* 'turn on a road'	1
65	遛 *liù* 'stroll'	1
66	溜 *liū* 'slide; sneak'	1
67	掠 *lüè* 'snatch'	1
68	漫 *màn* 'overflow'	1
69	攀 *pān* 'climb'	1
70	飘 *piāo* 'drift'	1
71	洒 *sǎ* 'spill'	1
72	射 *shè* 'shoot'	1
73	摔 *shuāi* 'fall'	1
74	坠 *zhuì* 'fall'	1

2.3 The motion construction consisting of multiple motion morphemes

In Chinese, multiple motion morphemes can occur together if they are semantically compatible. Semantic compatibility in this study refers to the compatibility of different components (e.g., manner and path) of a motion event denoted by different motion morphemes, that is, whether the kind of motion denoted by these motion morphemes can be realized in the real world. For instance, a figure usually can enter a region in a running manner, so the morpheme denoting the manner of running 跑 *pǎo* 'run' and the morpheme denoting the direction of entering 进 *jìn* 'enter' are compatible and thus can occur together, as in 跑进房间 *pǎo-jìn fángjiān* run-enter room 'run into the room'. Similarly, 跑 *pǎo* 'run' denotes motion along a physical path (e.g., street, field), and 上 *shàng* 'ascend to' /下 *xià* 'descend from' specifies motion either along a path or through the air, so 跑 *pǎo* 'run 'and 上 *shàng* 'ascend to' /下 *xià* 'descend from' can occur together, as in 跑上山顶 *pǎo-shàng shāndǐng* run-ascend.to summit 'run up to the summit'. In contrast, 飞 *fēi* 'fly' typically denotes motion through air, so it cannot co-occur with 跑 *pǎo* 'run' to denote a motion that is both flying and running at the same time.

As Table 2.2 shows, 39.9% of motion expressions consist of more than one free motion morpheme (i.e. MCVCs). Table 2.4 presents the frequencies of these motion expressions with different number of motion morphemes.

Table 2.4 Type and token frequencies of MCVCs in the novel corpus

MCVC	Frequency	Motion morphemes
with two motion morphemes	362 (77.2%)	走进 *zǒu-jìn* walk-enter
with three motion morphemes	106 (22.6%)	滑落到 *huá-luò-dào* slip-fall-arrive
with four motion morphemes	1 (0.2%)	跳爬过来 *tiào-pá-guò-lái* jump-crawl-cross-hither
Total	469 (100%)	

As Table 2.4 suggests, even though Chinese allows for the co-occurrence of multiple verbal motion morphemes, most MCVCs consist of only two motion morphemes, followed by three motion morphemes. The data investigated only finds one MCVC with four motion morphemes, and there is no MCVC with more than four morphemes.

2.3.1 The motion construction consisting of two motion morphemes

In a motion expression with two motion morphemes, the expression can be made up of a manner-of-motion morpheme and a path morpheme, as 走 *zǒu* 'walk' and 进 *jìn* 'enter' in (6a), or two path morphemes, as 回 *huí* 'return' and 到 *dào* 'arrive' in (6b).

(6) a. 很多人走进客舱。
*hěnduō rén **zǒu-jìn** kè-cāng* (*Xiǎojiě*)
many people walk-enter guest-cabin
'Many people walked into the cabin.'

b. 他回到家里，一句话不说。
*tā **huí-dào** jiā-lǐ, yī jù huà bù shuō* (*Hóng*)
3SG return-arrive home-inside one CLF word NEG say
'He returned home and didn't say any word.'

Two manner-of-motion morphemes specifying different manners of motion usually do not co-occur because a motion event in a particular manner normally cannot be realized in another manner at the same time (i.e. semantic incompatibility), as in (7).

(7) *他跑跳。
*tā **pǎo-tiào***
3SG run-jump
(intended) 'He jumped in a running manner/He ran in a jumping manner.'

When two manner-of-motion morphemes co-occur, the collocation usually falls into one of two situations: (a) when the first morpheme loses its literal meaning and functions as a modifier of the second morpheme, and (b) when the two morphemes are synonymous. As illustrated in (8a), the first morpheme 飞 *fēi* 'fly' does not specify a flying event but is a modifier of the morpheme 跑 *pǎo* 'run', indicating that the moving objects are running at a very fast speed as if they are flying. Whereas in (8b), both 漂 *piāo* 'float' and 浮 *fú* 'float' describe motion on the surface of a liquid, and are thus synonymous. Such combinations are treated as compounds as a lexical unit in this study (see Section 2.1).

(8) a. 他在草地上飞跑。
*tā zài cǎo-dì-shàng **fēi-pǎo*** (BCC)
3SG at grass-field-on fly-run
'He was sprinting on the field.'

b. 漂浮着油渍的水面
***piāo-fú**-zhe yóuzì de shuǐ-miàn* (*Xiǎojiě*)
float-float-CONT grease REL water-surface
'The water on which the grease was floating.'

2.3.2 The motion construction consisting of three motion morphemes

Motion expressions consisting of three motion morphemes are also commonly found in Chinese. As illustrated in (9), 滑 *huá* 'slip', *luò* 'fall', and 到 *dào* 'arrive' can occur together.

(9) 生怕她滑落到地上。
shēngpà tā ***huá-luò-dào*** *dì-shàng* (*Tàiyáng*)
fear 3SG slip-fall-arrive ground-on
'Feared that she will slip and fall on the ground.'

More frequently, a three-morpheme motion construction ends with a deictic morpheme 来 *lái* 'hither' /去 *qù* 'thither', as in (10). Among the 106 instances found in the data (see Table 2.4), 105 of them fall into this category.

(10) a. 顾源则从D教学楼走出来。
Gùyuán zé cóng D jiàoxué-lóu ***zǒu-chū-lái*** (*Xiǎoshídài*)
NAME then from NAME teaching-building walk-exit-hither
'Gu Yuan then walked out of Teaching Block D.'
b. 她一阵风似地跑出去。
tā yī zhèn fēng shìde ***pǎo-chū-qù*** (*Xiǎojiě*)
3SG one CLF wind like run-exit-thither
'She ran out like a gust of wind.'

Furthermore, when a ground NP is not explicitly expressed in the motion expression, 来 *lái* 'hither' /去 *qù* 'thither' occurs immediately after a motion morpheme, as in (10); when a ground NP is expressed, 来 *lái* 'hither' /去 *qù* 'thither' needs to occur after the NP, as in (11). Chapters 4 will discuss in more detail the properties and distribution of 来 *lái* 'hither' /去 *qù* 'thither'.

(11) a. 赵胜天追出门来。
ZhàoShèngtiān ***zhuī-chū*** *mén* ***lái*** (*Tàiyáng*)
NAME chase-exit door hither
'Zhao Shengtian chased (after someone) through the door.'
b. 许多居民都逃到山上去了。
xǔduō jūmín dōu ***táo-dào*** *shān-shàng* ***qù*** *le* (*Hóng*)
many resident all escape-arrive mountain-on thither CRS
'Many residents escaped into the mountains.'

2.3.3 The motion construction consisting of more than three motion morphemes

Only one example consisting of four motion morphemes is found in the Novel Corpus, that is, 跳爬过来 *tiào-pá-guò-lái* jump-crawl-cross-hither 'came jumping and crawling' in (12). Further discussions of this example will be given in Chapter 5.

(12) 巴勒和几条大狗，一见到活黄羊，猎性大发，杀心顿起，拼命地跳爬过来，但爬到狼群止步的地方，也再不敢往前迈一步。
BāLè hé jǐ tiáo dà gǒu, yī jiàn-dào huó huángyáng,
NAME and few CLF big dog one look-arrive live gazelle
liè-xìng-dà-fā shā-xīn-dùn-qǐ pīnmìng de
hunt-instinct-big-trigger kill-heart-sudden-rise desperate ADV
tiào-pá-guò-lái *dàn pá-dào láng-qún zhǐbù de dìfāng*
jump-crawl-cross-hither but crawl-arrive wolf-pack stop REL place
yě zài bù gǎn wǎng qián mài yī bù (*Láng*)
also again NEG dare toward front step one CLF
'Bale and a few other big dogs were triggered by the sight of live gazelles and began pouncing and springing towards the gazelles; but as they approached where the wolf pack had stopped, the dogs did not dare move an inch forward.'

However, more examples of four-morpheme motion expressions can be found in larger corpora. (13) presents three examples from Google search and BCC. Similar to the three-morpheme motion expressions introduced in Section 2.1.2, most of these expressions end with 来 *lái* 'hither' /去 *qù* 'thither', as in (13b–c).

(13) a. 等树老了，树叶飘落回到根部。
děng shù lǎo le, shù-yè ***piāo-luò-huí-dào*** *gēnbù*
wait tree old CRS tree-leaf drift-fall-return-arrive root
'When the tree becomes old, the leaves will drift and fall back to the root.'
(https://zhidao.baidu.com/question/364005776.html)

b. 巨石又自动地滚落回去。
jù-shí yòu zìdòng de ***gǔn-luò-huí-qù*** (BCC)
giant-rock again automatic ADV roll-fall-return-thither
'The boulder rolled down back on its own again.'

c. 李芒也走回到树下来。
LǐMáng yě ***zǒu-huí-dào*** *shù-xià* ***lái*** (BCC)
NAME also walk-return-arrive tree-under hither
'Li Mang also walked back under the tree (toward the deictic center).'

Motion expressions consisting of more than four motion morphemes are not found in the corpus of this study, although it might be possible that such expressions are occasionally found in Chinese.

Note that there are cases in which more than four motion morphemes are used together in a sentence. For instance, (14a) is found in the BCC where five motion morphemes occur together, and (14b) is an example from Liu et al. (2015) where six motion morphemes are used.

(14) a. 我默默地从雪橇里跳出来走进教堂。
wǒ mòmò de cóng xuěqiāo-lǐ ***tiào-chū-lái*** ***zǒu-jìn***
1SG quiet ADV from sled-inside jump-exit-hither walk-enter
jiàotáng (BCC)
chapel
'I quietly jumped out from the sled and walked into the chapel.'

b. 树叶飞落下来到河里去。
shù-yè ***fēi-luò-xià-lái-dào*** *hé-lǐ* ***qù***
tree-leaf fly-fall-descend.from-hither-arrive river-inside thither
'The leaf flew down from the tree and into the river.'
(Liu et al. 2015: 539)

However, this study does not treat the five or six morphemes in (14) as single motion expression. Rather, they form two motion expressions: 跳出来 *tiào-chū-lái* jump-exit-hither 'jump out (toward the deictic center)' and 走进教堂 *zǒu-jìn jiàotáng* walk-enter church 'walk into the church' in (14a), and 飞落下来 *fēi-luò-xià-lái* fly-fall-descend.from-hither 'dropped down' and 到河里去 *dào hé-lǐ qù* arrive-river-inside-thither 'into the river' in (14b). In both (14a) and (14b), the two motion expressions describe two consecutive motion events. This can be evidenced by the fact that the two expressions can be expressed separately. Take (14a) as an example. The two expressions can be separated by a pause or a connective, as in (15a) and (15b) respectively.

(15) a. 我默默地从雪橇里跳出来, 走进教堂。
wǒ mòmò de cóng xuěqiāo-lǐ ***tiào-chū-lái***, ***zǒu-jìn***
1SG quiet ADV from sled-inside jump-exit-hither walk-enter
jiàotáng (BCC)
chapel
'I quietly jumped out from the sled and walked into the chapel.'

b. 我默默地从雪橇里跳出来, 然后走进教堂。
wǒ mòmò de cóng xuěqiāo-lǐ ***tiào-chū-lái***, *ránhòu*
1SG quiet ADV from sled-inside jump-exit-hither then
zǒu-jìn *jiàotáng* (BCC)
walk-enter chapel
'I quietly jumped out from the sled, then walked into the chapel.'

However, a typical MCVC, e.g., 跳出来 *tiào-chū-lái* jump-exit-hither 'jump out' or 走进教堂 *zǒu-jìn jiàotáng* walk-enter chapel 'walk into the chapel', does not allow the insertion of a pause or connective, as in (16) and (17).

(16) a. *我默默地从雪橇里跳，出来。
*wǒ mòmò de cóng xuěqiāo-lǐ **tiào**, **chū-lái***
1SG quiet ADV from sled-inside jump exit-hither
(intended) 'I quietly jumped from inside the sled (to) come out.'

b. *我默默地从雪橇里跳, 然后出来。
*wǒ mòmò de cóng xuěqiāo-lǐ **tiào**, ránhòu **chū-lái***
1SG quiet ADV from sled-inside jump then exit-hither
(intended) 'I quietly jumped from inside the sled; then came out.'

(17) a. *我走，进教堂。
*wǒ **zǒu**, **jìn** jiàotáng*
1SG walk enter chapel
(intended) 'I walked into the chapel.'

b. *我走，然后进教堂。
*wǒ **zǒu**, ránhòu **jìn** jiàotáng*
1SG walk then enter chapel
(intended) 'I walked, then entered the chapel.'

In summary, the corpus investigation shows that MCVCs in Chinese are typically composed of two to four motion morphemes, with two motion morphemes being the most common.

2.4 The ordering issue of Chinese motion morphemes

As illustrated with a few examples in Chapter 1, the relative order of motion morphemes in the Chinese multi-morpheme compound verb construction (MCVC) seems difficult to predict. This section introduces some previous studies for explanations on the order of motion morphemes. It shows that a more comprehensive or unified account of the various types of MCVCs in Chinese is still necessary. Furthermore, this section examines previous studies of the classification of Chinese motion morphemes and demonstrates that a more consistent and fine-grained classification is still in need so as to provide a general basis for explaining the order of motion morphemes.

2.4.1 The motion construction as a type of resultative verbal compound

Resultative verbal compounds (RVCs) are compounds consisting of two elements in which the second one "signals some result of the action or process conveyed by the first element" (Li and Thompson 1981: 54–55). Li and Thompson (1981) propose that there are four types of RVCs: cause, achievement, direction, and phase, as in (18a–d) respectively (cf. Chao 1968; Lu 1977; Xiao and McEnery 2004; Sun 2006).

(18) a. Cause RVC
我把茶杯打破了。
wǒ bǎ chá-bēi ***dǎ-pò*** *le* (Li and Thompson 1981: 55, (68))
1SG BA tea-cup hit-break CRS
'I broke the tea cup by hitting at it.'

b. Achievement RVC
我把那个字写清楚了。
wǒ bǎ nà gè zì ***xiě-qīngchu*** *le*
1SG BA that CLF character write-clear CRS
'I wrote that character clearly.' (Li and Thompson 1981: 55, (70))

c. Direction RVC
她/他跳过那条河了。
tā ***tiào-guò*** *nà tiáo hé le*
3SG jump-cross that CLF river CRS
'S/he jumped over the river.' (Li and Thompson 1981: 60, (88))

d. Phase RVC
她/他的钱用完了。
tā de qián ***yòng-wán*** *le* (Li and Thompson 1981: 56, (74)
3SG NOM money use-finish CRS
'Her/his money is all used up.'

Like Li and Thompson (1981), many studies (Hashimoto 1964; Thompson 1973; Ross 1990; Xiao and McEnery 2004; Hsiao 2009; Tham 2015, among others) treat the Chinese motion construction with two or three immediately adjacent motion morphemes as a type of RVC. (18c) is an example with two motion morphemes, 跳 *tiào* 'jump' and 过 *guò* 'cross'. For the motion construction with three immediately adjacent motion morphemes, the last morpheme is typically a deictic motion morpheme 来 *lái* 'hither' or 去 *qù* 'thither', e.g., 跳过来 *tiào-guò-lái* jump-cross-hither 'jump over here' in (19).

(19) 杨熙桐和林仁生也跳过来了。
Yángxītóng hé línrénshēng yě ***tiào-guò-lái*** *le* (BCC)
NAME and NAME also jump-cross-hither CRS
'Yang Xitong and Lin Rensheng also jumped over here.'

In the construction with three motion morphemes, the combination of the second and the third motion morphemes, e.g., 过来 *guò-lái* cross-hither in (19), is treated as the second element in an RVC, i.e. the complement to the first motion morpheme, e.g., 跳 *tiào* 'jump' in (19). The two-morpheme complement is usually called a "compound directional complement" (Chao 1968: 461), or "复合趋向补语 *fùhé qūxiàng bǔyǔ* (complex directional complement)" (Liu 1998: 1).

Li and Thompson (1981), among others, point out that directional RVCs differ from other types of RVCs in that they allow elements other than the potential infixes 得 *de* (positive potential marker) and 不 *bù* (negative potential marker) to occur between the elements that form the RVCs. As illustrated in (20), the continuous marker 着 *-zhe* can be inserted between 跳 *tiào* 'jump' and 过 *guò* 'cross' in (20a) and 跳 *tiào* 'jump' and 过来 *guò-lái* cross-hither in (20b), whereas it cannot be inserted into other types of RVCs, e.g., the Cause RVC as shown in (20c).

(20) a. 她跳着过那条河了。(Direction RVC)
tā ***tiào-zhe*** ***guò*** *nà* *tiáo* *hé* *le*
3SG jump-CONT cross that CLF river CRS
'She went over the river jumping.'

b. 她跳着过来了。(Direction RVC)
tā ***tiào-zhe*** *guò-lái* *le*
3SG jump-CONT cross-hither CRS
'She crossed over (towards the deictic center) jumping.'

c. *我把茶杯打着破了。(Cause RVC)
wǒ* *bǎ* *chá-bēi* ***dǎ-zhe* *pò* *le*
1SG BA tea-cup hit-CONT break CRS
(intended) 'I broke the tea cup by hitting at it.'

Nonetheless, motion expressions in (18c) and (19) are treated as RVCs in that the second element in the expressions "signals the direction in which the subject moves as the result of the displacement [the first morpheme]" (Li and Thompson 1981: 58). In this sense, 过 *guò* 'cross' in (18c) and 过来 *guò-lái* cross-hither in (19), as the second elements of RVCs, indicate the direction toward which the subject is moving as a result of jumping.

In contrast, Lu (1977) defines RVCs more narrowly, distinguishing directional verbal compounds ("DVC") from RVCs. According to Lu (1977: 282), RVCs exhibit three features: (a) the second verb indicates a result brought about by the action/process denoted in the first verb; (b) the result does not exist before the action/process takes place; (c) the object undergoes a change of state after the action/process. Lu's DVCs are verb-verb expressions in which the first verb indicates the manner of motion and the second verb indicates the direction of motion. In other words, the two verbs in a DVC are not necessarily in a cause-result relationship. In

addition, he argues that unlike an RVC in which the result denoted in the second verb does not exist before the action/process takes place, the actions denoted in the two verbs in a DVC can co-exist. For instance, according to Lu, the cat in (21) is moving in some manner (i.e. running), and at the same time, it is moving in some direction (i.e. toward the deictic center). Therefore, Lu points out that the elements in a DVC are in a "manner-direction" relationship.

(21) 小猫跑来了。
*xiǎo māo **pǎo-lái** le* (Lu 1977: 291, (36a))
small cat run-hither CRS
'The small cat ran over (in a direction toward the deictic center).'

However, neither the RVC account nor Lu's DVC analysis can account for all possible types of the motion construction in Chinese. According to the RVC account, both the second elements in (22), i.e. 落 *luò* 'fall' in (22a) and 进 *jìn* 'enter' in (22b), are understood as results of the action 滚 *gǔn* 'roll'.

(22) a. 石块继续滚落，有时互相撞在一起。
*shíkuài jìxù **gǔn-luò**, yǒushí hùxiāng zhuàng-zài*
stone continue roll-fall sometimes each.other hit-at
yīqǐ (BCC)
together
'The stones continue rolling down, sometimes hitting at each other.'
b. 那块条石滚进了岩下的水涧。
*nà kuài tiáoshí **gǔn-jìn**-le yán-xià de*
that CLF square.stone roll-enter-PFV cliff-under NOM
shuǐ-jiàn (BCC)
water-stream
'That square stone rolled into the stream under the cliff.'

However, in Chinese, the two "result" elements, 落 *luò* 'fall' and 进 *jìn* 'enter', can occur together too. In addition, when they occur together, 落 *luò* 'fall' must precede 进 *jìn* 'enter', as in (23). In other words, it cannot explain why 进 *jìn* 'enter' must be understood as the result of the action encoded in 落 *luò* 'fall', but not vice versa, given that both 落 *luò* 'fall' and 进 *jìn* 'enter' can be "results" in (22).

(23) a. 忽然一块石子落进了水里。
*hūrán yī kuài shízi **luò-jìn**-le shuǐ-lǐ* (BCC)
suddenly one CLF pebble fall-enter-PFV water-inside
'Suddenly, a pebble fell into the water.'
b. *忽然一块石子进落了水里。
*hūrán yī kuài shízi **jìn-luò**-le shuǐ-lǐ*
suddenly one CLF pebble enter-fall-PFV water-inside

Meanwhile, the sequences in (23a) do not give rise to a DVC either: rather than being in a "manner-direction" relationship proposed by Lu (1977) regarding DVCs, 落 *luò* 'fall' and 进 *jìn* 'enter' are in a "direction-direction" relationship because both 落 *luò* 'fall' and 进 *jìn* 'enter' specify directions of motion.

In addition, though not a frequent occurrence, Chinese motion expressions can consist of more than two motion morphemes. For instance, as introduced above, (9) consists of three motion morphemes, 滑 *huá* 'slide', 落 *luò* 'fall', and 到 *dào* 'arrive', whereas each of the three examples in (13) has four motion morphemes, e.g., 飘 *piāo* 'drift', 落 *luò* 'fall', 回 *huí* 'return', and 到 *dào* 'arrive' in (13a). However, neither the RVC nor the DVC account can cover the relationships and order of the motion morphemes in these expressions, because both accounts are mainly concerned with expressions with only two morphemes, or three-morpheme expressions where the third morpheme is the deictic motion morpheme 来 *lái* 'hither' /去 *qù* 'thither'.

2.4.2 Temporal sequence and word order

Some previous studies such as Tai (1985, 1987, 1989, 2011) and Li (1993) relate the order of syntactic units to the temporal sequence of the states/actions denoted by these units, a type of iconicity proposed in Haiman (1980). Tai (1985: 50) proposes the Principle of Temporal Sequence where "the relative word order between two syntactic units is determined by the temporal order of the states which they represent in the conceptual world." For instance, (24) describes a situation in which the subject arrives at a place by taking a bus.

(24) 他坐公共汽车到这儿。
tā zuò gōnggòngqìchē dào zhèr (Tai 1985: 54, (19))
3SG sit bus arrive here
'He came by bus.'

Because the subject took the bus before he arrived at the place, the phrase expressing 'riding the bus' precedes the phrase of 'arriving here' (Tai 1985). In contrast, (25) describes a situation in which the subject arrived at a place and then took a bus from the place, so the phrase expressing arriving at the place precedes the phrase expressing riding the bus (Tai 1985).

(25) 他到这儿坐公共汽车。
tā dào zhèr zuò gōnggòngqìchē (Tai 1985: 54, (20))
3SG arrive here sit bus
'He came here to ride in a bus.'

Tai (1985: 53) claims that the Principle of Temporal Sequence is a general syntactic constraint in Chinese and is "independently motivated by the word order

phenomena in conjoined sentences and predicates, serial verb phrases, and verb compounds in Chinese."

In a similar sense, Li (1993) proposes a "Temporal Iconicity Condition" that the linear order of verbal constituents must obey:

(26) *Temporal Iconicity Condition: Let A and B be two subevents activities, states, changes of states, etc.) and let A' and B' be two verbal constituents denoting A and B, respectively; then the temporal relation between A and B must be directly reflected in the surface linear order of A' and B' unless A' is an argument of B' or vice versa.* (Li 1993: 499)

Li (1993) also argues that the Temporal Iconicity Condition is universal and independent of morphological requirements. Two examples are given in (27). Both 累哭 *lèi-kū* tired-weep 'weep as a result of fatigue' and 哭累 *kū-lèi* weep-tired 'tired as a result of crying' are understood as resultative compounds, but the relative order of 哭 *kū* 'weep' and 累 *lèi* 'tired' is determined by the temporal order in the real world: 累哭 *lèi-kū* tired-weep describes a situation in which the subject was tired and then wept because of being tired, whereas 哭累 *kū-lèi* weep-tired describes a situation where the subject wept and then became tired because of weeping (Li 1993).

(27) a. 优优累哭了。
Yōuyōu ***lèi-kū*** *le* (Li 1993: 499, (35))
NAME tired-weep CRS
'Youyou was so tired she wept.'

b. 优优哭累了。
Yōuyōu ***kū-lèi*** *le* (Li 1993: 499, (36))
NAME weep-tired CRS
'Youyou wept for so long that she became tired.'

Both Tai's (1985, 1987, 1989, 2011) Principle of Temporal Sequence and Li's (1993) Temporal Iconicity Condition suggest that in a Chinese motion expression, the motion morpheme that denotes temporally-later motion follows the morpheme that denotes temporally-earlier motion. The proposal is consistent with the iconicity of sequence proposed in Haiman (1980: 533), that is, "events are described in the order of their occrrence", and "iconicity" refers to the more general motivation that "the structure of language directly reflects some aspect of the structure of reality" (Haiman 1980: 515).

As shown in (24–25) and (27) as well as the other examples in Tai's and Li's studies, it is indeed true that when there are temporal differences between two states/actions, the constituent denoting the earlier state/action must occur first in Chinese. However, in a Chinese motion expression, two motion morphemes may be used to denote two different components of a motion event and these components

can happen concurrently in the real world. For instance, the cat in (21) is moving in a certain manner and direction at the same time (Lu 1977). Also, the motion denoted by 上 *shàng* 'ascend to' in (28) does not necessarily occur temporally later than the action denoted by 跑 *pǎo* 'run', especially if the figure was standing at the lower end of the stairs before he started running up them. The simultaneity between the motion denoted by 跑 *pǎo* 'run' and 上 *shàng* 'ascend to' can be evidenced by the suffixation of the continuous marker 着 *zhe* to 跑 *pǎo* 'run' in (28b): according to Tai (2011: 74), the sub-events denoted by a serial verb construction with 着 *zhe* must be overlapping (i.e. simultaneous) in terms of temporal relation.

(28) a. 他跑上楼梯。
tā ***pǎo-shàng*** *lóutī* (BCC)
3SG run-ascend.to stairs
'He went up the stairs running.'

b. 于是，他跑着上了楼梯，比门房还快
yúshì, tā pǎo-zhe shàng-le lóutī, bǐ ménfáng hái
then 1SG run-CONT ascend.to-PFV stairs comp concierge even
kuài (BCC)
fast
'So, he went up the stairs running, even faster than the concierge.'

However, even though the actions denoted by 跑 *pǎo* 'run' and 上 *shàng* 'ascend to' can occur simultaneously, only 跑 *pǎo* 'run' can precede 上 *shàng* 'ascend to', but not vice versa, as in (29). Therefore, the temporal iconicity account is unable to explain the word order in such instances.

(29) *他上跑楼梯。
tā ***shàng-pǎo*** *lóutī*
3SG ascend.to-run stairs
(intended) 'He went up the stairs running.'

Tai (2011) has also observed that Principle of Temporal Sequence cannot account for serial verb constructions that contain the continuous marker 着 *zhe*. Therefore, he resorts to using a structural principle in Chinese for an explanation, i.e. the principle of "modifier-before-modified" as proposed in studies such as Chappell (1994). Specifically, the syntactic unit suffixed with 着 *zhe* (e.g., 跑着 *pǎo-zhe* run-CONT in (28b)) functions as a manner adverbial, and thus is required to occur before the main syntactic unit (e.g., 上 *shàng* 'ascend to' in (28b)). While it is true that the Principle of Temporal Sequence, in combination with the structural principle of "modifier-before-modified", accounts for the word order of almost all Chinese motion expressions, it is still worthwhile to explore the possibility of other types of iconicity for a more unified and streamlined account.

2.4.3 Classification of motion morphemes and word order

As introduced in Chapter 1, motion verbs can be classified into two major types in Talmy's (1975, 1985, 2000) framework: (a) manner-of-motion verbs that lexicalize how a motion event takes place (e.g., *walk, run, fly*), and (b) path verbs that lexicalize the direction in which a motion event takes place (e.g., *descend, come, return*). Talmy's two-way classification of motion verbs has been widely adopted for Chinese motion morphemes (Talmy 1985, 2000, 2009; Chu 2004; Lamarre 2003, 2008; Chen and Guo 2009, among others). For instance, 走 *zǒu* 'walk', and 跑 *pǎo* 'run' are manner-of-motion morphemes, whereas 回 *huí* 'return' and 进 *jìn* 'enter' are path morphemes (Chen and Guo 2009).

In addition to the two-way classification, some studies (e.g., Zlatev and Yangklang 2004; Slobin 2004, among others) propose that there are motion morphemes that specify both manner and path information. Different languages can be found with such motion verbs, including Chinese. For instance, Ma (2008: 29) argues that motion morphemes such as 走 *zǒu* 'rush', 降 *jiàng* 'descend', 逃 *táo* 'escape', 升 *shēng* 'ascend to', 坠 *zhuì* 'fall', 落 *luò* 'fall', and 登 *dēng* 'climb' in Old Chinese (771BCE–220CE) have both manner and path meanings because they can take ground NPs directly as complements and describe directed motion events with respect to these grounds. Hsiao (2009) and Shi (2015) also argue for a third classification, as there are motion morphemes with both manner and path meanings in Modern Chinese. For example, Hsiao (2009: 91, 65) points out that 沉 *chén* 'sink' not only expresses a downward direction, but also a medium of motion (i.e. water), whereas 掉 *diào* 'fall' expresses not only a downward direction, but also a force of motion (i.e. the force of gravity which causes the motion). I will further review and discuss the linguistic reliability of these classifications in Chapter 3. In this section, I first show that the two/three-way classification cannot provide a comprehensive account for the ordering of Chinese motion morphemes.

It is true that Talmy's two-way classification of motion morphemes into manner and path can be used to predict the order of morphemes in many motion expressions consisting of a manner-of-motion and a path morpheme. For instance, in (22a–b), the manner-of-motion morpheme 滚 *gǔn* 'roll' precedes the path morphemes 落 *luò* 'fall' and 进 *jìn* 'enter'. However, the classification is not sufficiently fine-grained to account for all types of motion morphemes. For instance, it cannot explain why a particular path morpheme (e.g. 落 *luò* 'fall') must precede the other path morpheme (e.g. 进 *jìn* 'enter'), as in (23). Furthermore, the proposal of the three-way classification cannot account for the word orders of 落 *luò* 'fall' and 进 *jìn* 'enter' either, because according to the studies of Hsiao (2009) and Shi (2015), neither of these two morphemes lexicalize manner information and path information simultaneously.

Liu et al. (2015) is one of the very few studies that provide a finer-grained classification of Chinese motion morphemes and discuss in-depth the ordering issue of the motion morphemes. The study first identifies five prototypical semantic components that Mandarin motion morphemes lexicalize, as summarized in (30). Among them, Route, Direction, and Endpoint are the components of Path.

(30) a. Manner: the way that the motion is carried out;
b. Route: the contour along which the motion is carried out;
c. Direction: the spatial orientation of the Path;
d. Endpoint: the projected final point of the Path;
e. Deictic: further specification of the speaker-oriented perspective with regard to the motion

According to Liu et al. (2015), a motion morpheme lexicalizes at least one semantic component proposed in (30). The authors observe ten different types of motion morphemes, each with a different combination of these five components, as in (31).

(31) a. Manner: 飞 *fēi* 'fly', 跑 *pǎo* 'run', 走 *zǒu* 'walk';
b. Manner + Route: 流 *liú* 'flow', 溯 *sù* 'go against water current', 逛 *guàng* 'stroll';
c. Manner + Route + Direction: 攀 *pān* 'climb', 登 *dēng* 'climb', 涌 *yǒng* 'gush';
d. Route: 移 *yí* 'move', 过 *guò* 'cross', 越 *yuè* 'cross';
e. Route + Direction: 落 *luò* 'fall', 退 *tuì* 'recede', 升 *shēng* 'ascend', 降 *jiàng* 'descend';
f. Route + Direction + Endpoint: 回 *huí* 'return', 返 *fǎn* 'return', 归 *guī* 'return';
g. Direction: 起 *qǐ* 'rise';
h. Direction + Endpoint: 进 *jìn* 'enter', 出 *chū* 'exit', 上 *shàng* 'ascend to', 下 *xià* 'descend from';
i. Endpoint: 到 *dào* 'arrive', 至 *zhì* 'arrive', 入 *rù* 'arrive';
j. Deictic: 来 *lái* 'hither', 去 *qù* 'thither'

The authors then propose the Proto-motion Event Schema ("PMS") that linearizes the five semantic components for expressing motion events, as in (32).

(32) Manner → Route → Direction → Endpoint → (Loc-NP) → Deictic

Specifically, if multiple motion morphemes co-occur in a sequence, the word order of these morphemes follows the PMS in terms of the semantic components they lexicalize. For instance, as illustrated in Figure 2.2 with the example 球滚落进到洞里来 *qiú gǔn-luò-jìn-dào dònglǐ lái* ball roll-fall-enter-arrive hole-inside hither 'The ball rolled and fell into the hole (toward the deictic center)', the first morpheme 滚 *gǔn* 'roll' encodes Manner, and the following 落 *luò* 'fall' encodes Route

and Direction, 进 *jìn* 'enter' encodes Direction and Endpoint, 到 *dào* 'arrive at; to' encodes an Endpoint, and finally the Deictic 来 *lái* 'hither'.[4]

Manner → Route → Direction → Endpoint → (Loc-NP) → Deictic
[滚 *gǔn* 'roll']
[….. 落 *luò* 'fall' …]
[…. 进 *jìn* 'enter' ….]
[到 *dào* 'arrive']
[来 *lái* 'hither']

Figure 2.2 An example illustrating PMS (Liu et al. 2015: 522)

However, the proposal by Liu et al. (2015) still needs to be refined, as some of the meaning components cannot be effectively identified by the proposed criteria. Take Route as an example. Liu et al. (2015) point out that Route entails a locational change, so a Route-encoding morpheme is not compatible with the adverbial 在原地 *zài yuándì* at same.spot 'at the same spot' or other adverbials of similar meanings. Furthermore, the study argues that the Route component entails "a course over space and time", so a Route-encoding morpheme is compatible with 到一半 *dào yībàn* arrive half 'to the middle point', as "it profiles a progressional course that ends at a middle point instead of the final point" (Liu et al. 2015: 525). However, both tests are untenable. First, while it is true that a motion morpheme lexicalizing Route information is not compatible with 在原地 *zài yuándì* at same.spot 'at the same spot', the incompatibility is actually a feature of all path morphemes because they all entail displacement in space. For instance, although 进 *jìn* 'enter' and 出 *chū* 'exit' do not encode Route as seen in (31), they are not compatible with the adverbial like Route morphemes are not, as in (33).

(33) *在原地进/出教室
**zài yuándì jìn/chū jiàoshì*
at same-spot enter/exit classroom
(intended) 'enter/exit the classroom while staying at the same spot'.

Second, the compatibility test with 到一半 *dào yībàn* arrive half 'to the middle point' cannot effectively identify Route either. Like the first test, in addition to Route-encoding morphemes, most morphemes denoting durative motion, including

4. Note that the four motion morphemes, 滚 *gǔn* 'roll', 落 *luò* 'fall', 进 *jìn* 'enter', and 到 *dào* 'arrive', rarely occur together in one motion expression in Chinese. A Google search of "滚落进到" (*gǔn-luò-jìn-dào*) only retrieved one example. Also note that the figure presented in Liu et al. (2015: 522, Figure 9) marks 滚 *gǔn* 'roll' as a morpheme lexicalizing both Manner and Route, but this could be a typo because 滚 *gǔn* 'roll' is treated as a Manner only morpheme in their study (Liu et al. 2015: 506, 526, 540).

manner-of-motion morphemes, are compatible with 到一半 *dào yībàn* arrive half 'to the middle point' if given a supportive context, e.g., 跑 *pǎo* 'run' in (34).

(34) 我正跑向来处，跑到一半，小丫头出现了。
wǒ zhèng pǎo xiàng lái-chù, pǎo dào yībàn, xiǎo yātou
1SG PROG run toward come-place run arrive half little girl
chūxiàn le (BCC)
appear CRS
'I was running to the place where I came from. When I was halfway through the run, the little girl showed up.'

The compatibility holds because the context suggests the beginning and ending points of the path of a motion event, which enables the motion along the path to be measurable. On the contrary, when there is no supportive context that indicates the path of motion, motion morphemes without an inherent endpoint are not allowed to co-occur with 到一半 *dào yībàn* arrive half 'to the middle point', as in (35).

(35) 他在街上漫无目的地跑着，*但跑到一半停下了。
*tā zài jiē-shàng màn-wú-mù-dì de pǎo-zhe, *dàn **pǎo**-dào*
3SG at street-on aimless ADV run-CONT but run-arrive
yībàn tíngxià le
half stop CRS
(intended) 'He ran aimlessly on the streets but stopped halfway.'

Another issue with Liu et al. (2015) is that while the study attempts to provide a specific and comprehensive description of motion events and proposes five meaning components of motion as well as ten types of motion morphemes, the proposal can hardly be applied to domains other than motion, including the distributions and behaviors of verbs in general, adjectives, etc.

2.5 Summary

This chapter first summarized the formation of motion verbs in Chinese. It further investigated how Chinese expresses motion events based on a corpus survey. This chapter also introduced MCVCs, motion expressions consisting of more than one verbal motion morpheme and argued that further studies is necessary to account for the distribution of the constituent motion morphemes. The further studies will require a finer-grained classification of motion morphemes and a generalization of how different classes of motion morphemes are ordered. These issues will be explored in the next three chapters.

CHAPTER 3

"Manner vs. path" or "manner + path"?

As briefly introduced in Chapter 2, while Talmy's (1975, 1985, 2000) influential two-way classification of motion verbs into manner-of-motion verbs and path verbs has been supported by many studies, a third type of motion verbs has since been proposed by several studies, that is, the "manner + path" verbs such as *phloo1* 'pop out' in Thai (Zlatev and Yangklang 2004) and *tırmanmak* 'climb' in Turkish (Slobin 2004). Nonetheless, one issue with these previous classifications of motion verbs is a lack of systematic criteria or tests to identify which type a particular motion verb falls into, or in other words, what motion information that each motion verb lexicalizes. Instead, the motion verbs have been largely classified based on intuition. This is also true for the analysis of Chinese motion morphemes. While there is in general no disagreement in identifying prototypical manner-of-motion morphemes (e.g., 流 *liú* 'flow', 飞 *fēi* 'fly') and path morphemes (e.g., 进 *jìn* 'enter', 回 *huí* 'return') in Chinese, some less prototypical motion morphemes are classified differently by different linguists. For example, 掉 *diào* 'fall' is a manner-of-motion morpheme according to Chen and Guo (2009), a path morpheme in Lamarre (2008), and a morpheme with both manner and path information in Hsiao (2009).

The intuition-based semantic groupings of motion verbs may be attributed to the fact that the concepts of "manner-of-motion" and "path" have been used in vague and broad senses, despite the large number of studies that discuss the typology of motion events. This is especially so for the "manner-of-motion verbs" – although they are generally referred to as the ways in which a motion event takes place, few studies explain exactly what "ways" (or the meaning components) are counted as "manner". This chapter proposes two tests to distinguish Chinese motion morphemes that lexicalize manner information from those that lexicalize path information and argues that Chinese motion morphemes tend to show a manner/result complementarity.

3.1 The notions of "manner" and "path" in previous studies

There has been a significant number of studies on motion and motion events in different languages. This section mainly reviews the major ones regarding the notions of manner and path.

Talmy (1975, 1985, 2000)

According to Talmy (2000: 152, also 1975, 1985), "manner refers to a subsidiary action or state that a Patient manifests concurrently with its main action or state." However, the wide range of information covered by this definition makes it too vague to identify manner-of-motion verbs from a language, let alone a comparison between languages (Hsiao 2009). On the other hand, path in a translocational motion event is referred to as the path followed by the figure object with respect to the ground object (Talmy 2000: 25). Talmy (2000: 53–56) proposes three main components for a path complex: (a) vector: "the basic types of arrival, traversal, and departure that a Figural schema can execute with respect to a Ground schema"; (b) conformation: "a geometric complex that relates the fundamental Ground schema within a Motion-aspect formula to the schema for a full Ground object"; (c) deictic: "two notions 'toward the speaker' and 'in a direction other than toward the speaker'". However, Talmy is unspecific about how these components can be represented by languages; furthermore, as will be shown in the following chapters, information such as whether a path has an endpoint plays a significant role in linguistic representation, but such information is not extensively discussed. A large number of studies have adopted Talmy's (1975, 1985, 2000) framework and divided motion verbs into either the manner-of-motion group or the path group. However, due to the lack of a clear-cut definition or test, the same motion verb is sometimes categorized into different groups. An instance is the Chinese motion morpheme 掉 *diào* 'fall' as mentioned at the beginning of this chapter. Another similar example is 钻 *zuān* 'squeeze': it is a manner-of-motion morpheme according to Chen and Guo (2009), but a path morpheme in Lamarre (2008).

Slobin (1997, 2000, 2003, 2004, 2006, among others)

Slobin and his collaborators' studies on motion events primarily focus on manner information. In one of his earlier studies, Slobin (1997) proposes that a language has two tiers of lexicons with respect to the encoding of manner information. The first tier includes the common basic motion verbs, and these verbs are in general more unspecific about manner component. Verbs in the second tier denote more "expressive/ exceptional" information, e.g., *dash, swoop*, etc. He points out that all languages have first-tier lexicons, whereas the satellite-framed languages, i.e. languages that primarily express path information in the satellites to main verbs, have more second-tier motion verbs. However, drawing a boundary between the two tiers in a language is not easy, if not impossible, across languages.

Being aware of the lack of a clear definition, Slobin (2004: 255) points out that manner-of-motion verbs are "an ill-defined set of dimensions that modulate

motion, including motor pattern, rate, rhythm, posture, affect, and evaluative factors". Slobin (2000, 2003, 2004, 2006) attempts to decompose manner. For instance, Slobin (2006: 62) states that "'manner' is a cover term for a number of dimensions, including motor pattern (e.g., *hop, jump, skip*), and is often combined with rate of motion (e.g., *walk, run, sprint*) or force dynamics (e.g., *step, tread, tramp*) or attitude (e.g., *amble, saunter, stroll*), and sometimes encodes instrument (e.g., *sled, ski, skateboard*), and so forth".[5] This definition, as Slobin (2006: 62) himself notes, is still not a clear one. However, attempts are continuously being made to understand the components of manner. For instance, more recently, Slobin et al. (2014) carried out experiments to elicit linguistic expressions of the manners (e.g., rate, effort, posture, and motor patterns of legs and feet) of walking and running that take place in natural circumstances. The experiments find that when there are additional descriptions of motion outside a motion verb, the descriptive elements serve to augment information if the motion verb itself encodes some manner information; but if the verb does not denote manner information, then the elements function to complement motion information for the verb. However, a further study is still necessary to effectively identify the meaning components in motion verbs.

Chu (2004, 2009)

Based on Talmy's framework, Chu's (2004) study focuses on the typological characteristics of the conceptualization and linguistic representation of motion in Modern Mandarin Chinese.

Chu (2004: 144–145, 2009) argues that path is more fundamental than the notion of movement in motion events. Unlike Talmy (2000) who proposes three main components for path complex (i.e. vector, conformation, and deictic), Chu proposes three additional components of path; they are direction, dimension, and perspective (where perspective takes deictic as one of its subcategories). Direction refers to the "tropism of the motion of the figure in space" (Chu 2004: 155) and has four subcategories: vertical, facing, returning, and verging. Dimension is concerned with the spatial extent property of the ground, which also has four subcategories, i.e. zero-dimensional point, one-dimensional line, two-dimensional plane, and three-dimensions (volume). Perspective involves the speaker's conceptualization of the relation among the figure, ground, and the speaker, and has two basic subcategories: anchorage and region of attention. As for the linguistic realization of the path notion, Chu (2004, 2009)

5. In earlier preliminary studies, Slobin (2000, 2003) attempts to decompose manner into seven semantic categories: (1) rapid motion (e.g., *bolt, burst*); (2) leisurely motion (*drift, loiter*); (3) smooth motion (*brush, glide*); (4) obstructed motion (*stumble, trip*); (5) furtive motion (*crawl, creep*); (6) manners of walking (*march, plod*); (7) manners of jumping (*jump, hop*).

proposes that Chinese can express path via complement verbs, prepositions, and main verbs. For instance, the complement verb 进 *jìn* 'enter' encodes information of vector (arrival), conformation (inside), dimension (volume), and perspective (region of attention). However, like Talmy (1975, 1985, 2000), Chu (2004, 2009) does not discuss in-depth whether other conceptual information about path (e.g., length and boundedness) could be associated with their linguistic representations.

Chu (2004: 195) also recognizes that "manner" is a complex notion, which leads to the uncertainty of the scope of manner-of-motion verbs. One example that Chu (2009) provides is a comparison between two motion events, 'moving by using a car' and 'moving by using a stick'. Even though both motion events involve a tool, only the former is realized as a motion verb in English, i.e. *drive*. Chu (2004: 197) hypothesizes that the conflation difference might be attributed to social factors and the relative frequency of the two situations, and thus cross-linguistically, it is expected to have a significant amount of variation with regard to the conflation of manner and motion. Take English and Chinese as examples. In English, *hop* describes the motion 'jump on one foot', but Chinese does not have a verb equivalent to this. Rather, Chinese has to use an adverbial in addition to the verb of jumping to express the same meaning, e.g., 单脚跳 *dān jiǎo tiào* one foot jump or 用一只脚跳 *yòng yī zhī jiǎo tiào* use one CLF foot jump. However, Chu (2004: 201–203) does not provide a detailed discussion of manner, and instead only lists ten types of manner-of-motion verbs that are frequently used in Chinese, as in (1).

(1) Frequently used manner-of-motion verbs in Chinese (Chu 2004: 201–203)
   a. motion on foot: 走 *zǒu* 'walk', 跑 *pǎo* 'run', 冲 *chōng* 'rush', 奔 *bēn* 'rush', 逛 *guàng* 'stroll', 溜达 *liūda* 'stroll', 蹦 *bèng* 'leap', 跳 *tiào* 'jump', 跨 *kuà* 'bestraddle';
   b. medium of motion: 飞 *fēi* 'fly', 游 *yóu* 'swim', 走 *zǒu* 'walk', 爬 *pá* 'crawl/climb';
   c. vehicle of motion: 划(船) *huá (chuán)* 'row (a boat)', 开(车) *kāi (chē)* 'drive (a car)', 骑(马) *qí (mǎ)* 'ride (a horse)';
   d. speed of motion: 走 *zǒu* 'wall', 跑 *pǎo* 'run', 冲 *chōng* 'rush', 奔驰 *bēn-chí* 'run quickly', 飞奔 *fēi-bēn* 'gallop';
   e. motion by losing control: 跌 *diē* 'fall', 摔 *shuāi* 'fall', 倒 *dǎo* 'fall/collapse';
   f. self-contained motion in translocational motion: 滚 *gǔn* 'roll', 转 *zhuàn* 'rotate', 弹 *tán* 'bounce';
   g. motion of liquid: 滴 *dī* 'drop', 漏 *lòu* 'leak', 涌 *yǒng* 'gush', 流 *liú* 'flow', 溅 *jiàn* 'splash', 喷射 *pēn-shè* 'spray';
   h. motion of sound: (声音) 传 *(shēngyīn) chuán* '(sound etc.) transmit'
   i. motion of light: 照 *zhào* 'shine', 照射 *zhào-shè* 'irradiate';
   j. motion of abstract things: 流传 *liú-chuán* '(information etc.) spread', 传 *chuán* 'transmit';

In summary, Chu (2004, 2009) maps the conceptualization of motion and the linguistic representation in Chinese, but does so mainly by intuition, with no clearly-specified linguistic criteria. Particularly, the grouping of manner-of-motion verbs lacks a set of consistent or unified diagnostics, and the same motion verb can thus be classified in different groups. For instance, 走 *zǒu* 'walk' is found in three groups: (1a) motion on foot, (1b) medium of motion, and (1d) speed of motion.

Hsiao (2009)

Hsiao (2009) is one of the first comparative studies focusing on the manner-of-motion verbs in English and Modern Mandarin Chinese. It is also among the first to analyze the meaning components of manner-of-motion verbs and provide tests for identifying these components. Furthermore, the study gives a detailed introduction to the forms of motion verbs in Chinese, including monosyllabic and monomorphemic motion verbs in Chinese such as 走 *zǒu* 'walk' and 进 *jìn* 'enter', disyllabic monomorphemic motion verbs such as 徘徊 *páihuái* 'waver; linger', and multimorphemic words such as 活蹦乱跳 *huó-bèng-luàn-tiào* live-hop-disorderly-jump 'skip; frolic'.

Primarily based on Slobin's (2003, 2004) dimensions of manner, Hsiao (2009) proposes that in addition to motion, the notion of "manner of motion" consists of a set of conceptual components, including force, rate, contact, medium, path, and motor program, though not all of these components are lexically specified in each individual manner-of-motion verb. Hsiao (2009: 132) also proposes a set of semantic criteria to determine whether a motion verb is a manner-of-motion verb. According to Hsiao (2009), a manner-of-motion verb must meet all of the following three criteria: (a) it entails translocation in which the whole figure changes from one location to another; (b) it does not lexicalize any direction; (c) it lexicalizes any of the manner dimensions (e.g., force, rate, contact, medium, path, and motor program).

Hsiao (2009: 50–51) further classifies manner-of-motion verbs into two types: (a) event-centered manner if the manner properties denoted by the verb are to modify the motion event; and (b) figure-centered manner if the properties denoted by the verb are exhibited by the figure during motion. The former includes properties such as RATE (e.g., fast, slow), PATH (e.g., shape of path), CONTACT (e.g., non-smooth/smooth continuous contact), MEDIUM (e.g., land, air, water where the motion takes place), and FORCE (e.g., internally self-propelled motion, externally vehicle-helped motion). For instance, *swim* specifies the MEDIUM (i.e. water) and *walk* specifies the FORCE (i.e. self-propelled), though these two verbs are unspecific about other manner information. On the other hand, a verb of figure-centered manner lexicalizes information about the figure during motion. For instance, *strut* and *sashay* express figure's attitude and notable body movement during the motion, respectively.

In contrast to the wide range of manner dimensions, the concept of path is much more restricted in Hsiao (2009). According to Hsiao (2009: 53), path verbs lexicalize both motion and direction, so any non-path information is identified as MANNER information. In other words, verbs that lexicalize only direction and motion are categorized as path verbs. In this sense, *ascend*, *arrive*, and *exit* in English and 进 *jìn* 'enter' and 出 *chū* 'exit' in Mandarin Chinese are some examples of path verbs, but verbs such as 沉 *chén* 'sink' and its synonyms are not path verbs because in addition to direction and motion, they lexicalize other information. For example, 沉 *chén* 'sink' also lexicalizes the medium of motion, i.e. liquid, in addition to path, and thus belongs to the third type of motion verbs, i.e. verbs lexicalizing both manner and path (Hsiao 2009).

Hsiao (2009: 37–39) is also among the first to propose syntactic and semantic tests to identify the manner component lexicalized in motion verbs, i.e. the "adverb compatibility test". Assuming that the meaning of a verb constrains the kind of adverbials that can modify the verb, one can identify the meaning component of a motion verb by examining the compatibility of the verb with different kinds of adverbials. For example, *zoom* is compatible with the adverb *quickly* but not *slowly*; this suggests that the verb lexicalizes a speed of motion faster than average.

However, there are two issues with Hsiao's (2009) tests. First, except for the test of the speed component, the study does not provide any information for testing other manner components and thus, it is left unclear as to what adverbs have been used in the tests and whether or not these tests are reliable. Second, the adverb compatibility test can be misleading in some cases. Take the test for speed as an example. 跑 *pǎo* 'run' is compatible with the adverbial 慢慢 *mànman* 'slowly', as in (2). According to Hsiao's tests, this would suggest that the verb 跑 *pǎo* 'run' lexicalizes a slow speed. However, 跑 *pǎo* 'run' is usually understood as a kind of motion with a speed faster than walking ("rapid motion on foot", Hsiao 2009: 90). When 跑 *pǎo* 'run' is modified by 慢慢 *mànman* 'slowly', the motion is understood as running at a speed slower than that of normal running but is still faster than walking or the average speed of motion by animate agents.

(2) 马儿马儿慢慢跑。
mǎ-ér mǎ-ér màn-man ***pǎo*** (BCC)
horse horse slow-slow run
'O horses, run slowly.'

3.2 "Manner + path" motion verbs

In addition to Talmy's two-way classification of motion verbs, scholars such as Zlatev and Yangklang (2004) and Slobin (2004) argue that there is a third type of motion verbs: verbs that encode both manner and path information, i.e. "manner + path" verbs. For easier reference, this study calls such verbs "MP verbs" following from Zlatev and Yangklang (2004). MP verbs are not only found in English, but also in other languages such as Thai, Turkish, and Italian according to different studies. Chinese, too, is claimed to have MP verbs (e.g., Hsiao 2009; Shi 2015). This section reviews the MP verbs in literature.

3.2.1 MP verbs across languages

According to Zlatev and Yangklang (2004), Thai has a type of motion verbs which lexicalizes both manner and path, e.g., *tok1* 'fall', *nii4* 'escape', *phloo1* 'pop out', and *laj2* 'chase'. For instance, *laj2* 'chase' expresses motion in the direction of a moving object, and also information related to manner, such as purposive action, high speed, etc. In addition to Thai, MP verbs have been claimed to exist in other languages, e.g., English (Özçalışkan and Slobin 2000; Hsiao 2009: 53–54; 65; Beavers and Koontz-Garboden 2012; 2017), Turkish (Slobin 2004), Spanish (Fábregas 2007), and Italian (Folli and Ramchand 2005). For instance, Slobin (2004: 230) points out that the 'climb' verb in Turkish, as well as the equivalent 'climb' verbs in other verb-framed languages, lexicalizes both manner and path because it is used only for "upward motion in a grasping manner". Hsiao (2009: 65) argues that in English, verbs such as *fall*, *plunge*, and *dive* lexicalize both a directed path and "additional FORCE or a specification of the MOTOR PROGRAM or MEDIUM involved", whereas verbs such as *soar*, *scram*, and *slip (away)* encode a fast speed and the source of path. Folli and Ramchand (2005) state that some Italian manner-of-motion verbs, e.g., *correre* 'run', *rimbalzare* 'bounce', and *volare* 'fly', encode the endpoint of a motion event. (3) lists more examples of MP verbs collected from previous studies.

(3) Examples of MP verbs collected from previous studies
   a. English: *drop, fall, sink, stumble, plunge, drip, slip, dive, scale, skedaddle, soar, scram, slip (away), hurtle (off), slink (off), pace, pop (in), collide, crash, bump, etc*. (Hsiao 2009)
   b. Italian: correre 'run', rotolare 'roll', rimbalzare 'bounce', scivolare 'glide, slide', gattonare 'crawl', saltare ' jump', volare 'fly', saltellare 'hop' (Folli and Ramchand 2005: 97)

c. Spanish: *arrastrarse* 'crawl/creep', *caminar* 'walk', ?*cojear* 'limp', *conducir* 'drive', *correr* 'run', *deslizarse* 'slip/slid', ?*gatear* 'crawl', *nadar* 'swim', *navegar* 'sail', *remar* 'row', *resbalar* 'slide', *rodar* 'roll', *saltar* 'jump', *volar* 'fly' (Fábregas 2007, cited from Levin et al. 2009: 14)

d. Thai: *tok1* 'fall', *nii4* 'escape', *laj2* 'chase', *phloo1* 'pop out', *lom3* 'fall, collapse', etc. (Zlatev and Yangklang 2004: 178)

e. Turkish: *tırmanmak* 'climb' (Slobin 2004: 230)

3.2.2 MP verbs in Chinese

A few studies of Chinese motion events, e.g., Hsiao (2009), Shi (2014), Ma (2008), propose that some Chinese motion verbs also lexicalize both manner and path information. Hsiao (2009: 90; 101–102) points out that 升 *shēng* 'rise', 掉 *diào* 'fall', 沉 *chén* 'sink', 倒 *dǎo* 'stumble', and 陨 *yǔn* 'fall from the sky' are MP verbs; Shi (2015: 71; 180) argues that 跨 *kuà* 'bestraddle', 越 *yuè* 'climb', 渡 *dù* 'cross', and 登 *dēng* 'scale' in Modern Chinese encode both manner and path. However, both studies do not list these MP verbs as an individual lexicalization pattern: Hsiao (2009) places MP verbs into the category of figure-centered manner verbs, whereas Shi (2015) categorizes them as manner-of-motion verbs. In addition to Modern Chinese, Ma (2008: 221) points out that verbs such as 奔 *bēn* 'rush', 走 *zǒu* 'rush', 逃 *táo* 'escape', 亡 *wáng* 'rush', 趋 *qū* 'hurry', and 赴 *fù* 'attend' in Old Chinese are MP verbs, but these verbs are now used mainly as manner-of-motion morphemes in Modern Chinese because they lost path information along the development of Chinese, during which satellite elements such as directional complements started to appear after them to specify direction of motion.

These studies suggest at least two issues with regards to MP verbs in Chinese. First, even though these studies argue for the existence of MP verbs in Chinese, the numbers of the MP verbs identified have been very low. For instance, both Hsiao (2009) and Shi (2015) only list no more than five verbs that belong to this category. Second, and more importantly, the MP verbs identified in these two studies are not the same verbs, as none of the MP verbs listed in Hsiao (2009) can be found in the list of MP verbs in Shi (2015). These issues naturally raise the following questions: do the Chinese MP verbs identified in previous studies really lexicalize both manner and path information? If yes, then why are there so few MP verbs in Chinese and is it then linguistically significant to group them into one verb category? Why are the verbs identified by various studies different? Lastly, is there any other alternative analysis of these so-called MP verbs in Chinese?

In the rest of this chapter, I first introduce tests that can be used to distinguish motion morphemes lexicalizing manner information from those lexicalizing path

information (Section 3.3), and then come back to verbs that are claimed to lexicalize both manner and path information.

3.3 An alternative approach to manner and path

Sections 3.1–3.2 have shown that as the definitions of manner and path are unclear, the same motion verb is sometimes categorized into different types by different studies. Furthermore, even though some studies argue for the existence of verbs that encode both manner and path information, these studies cannot agree on what verbs fall into this category. This current study proposes that rather than using an intuition-based grouping, manner and path meanings can be identified and distinguished with a set of tests. The rest of this section will introduce two tests for this purpose.

3.3.1 Distinguishing manner from path

The two tests introduced in this section are both compatibility tests. The first is concerned with a motion morpheme's compatibility with different manner expressions, and the second checks for a motion morpheme's compatibility with different resultative expressions.

Rappaport Hovav (2008) observes that a path verb differs from a manner-of-motion verb in that the former does not lexicalize information about manner-of-motion, and thus the motion along that kind of path can be realized in different manners. Therefore, a given path verb can potentially be modified by phrases expressing different manners of motion. For example, 退 *tuì* 'recede' and 回 *huí* 'return' encode a receding event and a returning event, respectively, but do not specify in what manner the events take place, so they can be modified by adverbial phrases expressing different manners in various dimensions, e.g., jumping or running in terms of motion pattern (mode of motion, or "motor program" in Hsiao 2009) (4) and fast or slow in terms of rate (5).

(4) a. 他跑/跳着退。
tā *pǎo/tiào-zhe* ***tuì***
3SG run/jump-CONT recede
'He receded by running/jumping.'

b. 他跑/跳着回学校。
tā *pǎo/tiào-zhe* ***huí*** *xuéxiào*
3SG run/jump-CONT return school
'He returned to school by running/jumping.'

(5) a. 敌人飞速/慢慢退了。
*dírén fēisù/mànman **tuì** le*
enemy quickly/slowly recede CRS
'The enemy receded quickly/slowly.'
b. 他飞速/慢慢回了学校。
*tā fēisù/mànman **huí**-le xuéxiào*
3SG quickly/slowly return school
'He returned to school quickly/slowly.'

In contrast, if a motion verb specifies a particular manner of motion, then the event denoted by the given verb cannot be carried out in a different manner of the same dimension; in other words, the morpheme should not be modifiable by adverbials expressing other manners of motion. For example, 走 *zǒu* 'walk', which specifies motion in the manner of walking, cannot be modified by adverbials expressing jumping or running, as illustrated in (6a); similarly, the compound 奔驰 *bēnchí* 'speed' expresses motion with a fast rate, thus a modifier expressing slow speed is not allowed, (6b).

(6) a. *他跳/跑着走。
tā tiào/pǎo-zhe **zǒu*
3SG jump/run-CONT walk
(intended) 'He walked by jumping/running.'
b. *动车在慢慢奔驰。
dòngchē zài màn-man **bēnchí*
train PROG slow-slow speeding
(intended) 'The high-speed train is speeding slowly.'

A similar compatibility test for manner-of-motion verbs can be found in Hsiao (2009), as introduced in Section 3.2. However, as introduced in Slobin (2000, 2003, 2004, 2006) and Hsiao (2009), as manner can have different dimensions such as speed, medium, and motor pattern (Slobin 2000, 2003, 2004, 2006; Hsiao 2009), the test should be exercised with caution. This means that the incompatibility only occurs when there is a conflict in the manners of the same dimension (cf. Rappaport Hovav 2008 and Hsiao 2009). In other words, a manner-of-motion verb can be compatible with a modifier that describes manner in a different dimension. For instance, 走 *zǒu* 'walk' in (6a) denotes a motor pattern of walking, so it does not allow the coexistence of another mode of translocation such as 跳 *tiào* 'jump' and 跑 *pǎo* 'run'. However, because 走 *zǒu* 'walk' does not specify the manner in the dimension of rate, it can be modified by adverbials denoting different speeds, as in (7).

(7) a. 想见你父亲的话就快点走。
*xiǎng jiàn nǐ fùqin dehuà jiù kuàidiǎn **zǒu*** (BCC)
want see your father if then faster walk
'Walk faster if you want to see your father.'

b. 慢点走，小心别摔交。
màndiǎn ***zǒu***, *xiǎoxīn bié shuāijiāo* (BCC)
slower walk careful NEG fall
'Walk slower, careful not to slip.'

In the second test, manner-of-motion verbs and path verbs can be differentiated from each other by testing their compatibility with a variety of resultative complements. A manner-of-motion verb can take a complement phrase that denotes a result state brought about by the motion (Rappaport Hovav 2008: 22, cf. Simpson 1983; Goldberg 1991; Tenny 1994; Levin and Rappaport Hovav 1995; Filip 2004, 2008). Furthermore, a manner-of-motion verb does not denote change in any particular path of motion, so the verb can take resultative phrases in various dimensions, including the path dimension. For instance, in addition to complements that express result information relevant to the path of motion, e.g., arriving at school in (8a), the manner-of-motion morpheme 跑 *pǎo* 'run' can also take complements in other dimensions, e.g., 'being tired' (8b) and 'losing shoes' (8c), because they can be understood as the results or outcomes of a running event. In other words, (8) shows that a manner-of-motion morpheme can co-occur with resultative phrases that are either related (8a) or not related (8b–c) to the path of motion.

(8) a. 他跑到学校了。
tā ***pǎo****-dào xuéxiào le*
3SG run-arrive school CRS
'He ran to the school.'
b. 他跑累了。
tā ***pǎo****-lèi le*
3SG run-tired CRS
'He ran, and as a result, he became tired.'
c. 他跑丢鞋子了。
tā ***pǎo****-diū xiézi le*
3SG run-lose shoe CRS
'He ran and as a result, he lost his shoes.'

In contrast, a path verb can only be followed by resultative phrases that are related to the path of the motion lexicalized by the verb; very often, these are phrases that specify an endpoint to the path (Rappaport Hovav 2008). For example, although 'being tired' (9b) and 'losing weapons' (9c) can happen in an event of returning to the outside of the pass, they are irrelevant to the path of the event, so the phrases expressing 'being tired' and 'losing weapons' are not allowed to follow 回 *huí* 'return'. In contrast, arriving at the outside of a pass reinforces the figure's returning to the endpoint of the path, so (9a) is acceptable.

(9) a. 敌人回到了关外。
dírén ***huí****-dào-le* *guān-wài*
enemy return-arrive-PFV pass-outside
'The enemy returned to the outside of the pass.'

b. *敌人回关外回累了。
dírén* *huí* *guān-wài* ***huí**-lèi* *le*
enemy return pass-outside return-be.tired CRS
(intended) 'The enemy returned to the outside of the pass and as a result, they became tired.'

c. *敌人回关外回丢了武器。
dírén* *huí* *guān-wài* ***huí**-diū-le* *wǔqì*
enemy return pass-outside return-lose-PFV weapon
(intended) 'The enemy returned to the outside of the pass and as a result, they lost their weapon.'

Using the two tests above, i.e. whether a motion verb is compatible with a variety of manner adverbials and resultative phrases, we can determine what kind of meaning, manner or path, is lexicalized in motion verbs.

3.3.2 Case studies

The rest of this section introduces case studies in which the tests are applied to three Chinese motion morphemes, including 掉 *diào* 'fall', which has been controversial in previous studies, and 沉 *chén* 'sink' and 逃 *táo* 'escape' which seem to encode both manner and path information. I will show that the basic meaning of 掉 *diào* 'fall' and 沉 *chén* 'sink' is path while the basic meaning of 逃 *táo* 'escape' is manner.

3.3.2.1 掉 diào *'fall'*

As mentioned earlier, 掉 *diào* 'fall' is a manner-of-motion morpheme according to Chen and Guo (2009), a path morpheme according to Lamarre (2008), and a morpheme with both manner and path information according to Hsiao (2009). If we apply the tests introduced in Section 3.3.1, we can determine that 掉 *diào* 'fall' is a path morpheme.

First, 掉 *diào* 'fall' can be modified by phrases expressing different manners of motion. As illustrated in (10), a falling event can take place in a tumbling manner (10a), at a slow speed (10b), purposefully (10c), or in a manner where the figure can be in control of her motion (10d).

(10) a. 手中的电筒翻滚着掉进了冰缝。
shǒu-zhōng *de* *diàntǒng* *fāngǔn-zhe* ***diào****-jìn-le* *bīng-fèng*
hand-inside NOM torchlight tumble-CONT fall-enter-PFV ice-gap
'The torchlight fell through the gap in the ice from (one's) hands.' (BCC)

b. 两行泪水却已在她的眼角慢慢掉了下来。
liǎng háng lèishuǐ què yǐ zài tā de yǎn-jiǎo
two CLF tears but already at 3SG NOM eye-corner
*màn-man **diào**-le-xià-lái* (BCC)
slow-slow fall-PFV-descend.from-hither
'But tears have already fell slowly from the corner of her eyes.'

c. 她是故意掉下楼梯。
*tā shì gùyì **diào**-xià lóutī* (BCC)
3SG COP purposely fall-descend.from stairs
'She fell down the stairs on purpose.'

d. 待反应过来时，她已经落的挺深了，连忙稳住心神，控制掉下的势头，想往上飞去。
dài fǎnyìng guò-lái shí, tā yǐjīng luò de tǐng shēn
wait react cross-hither time 3SG already fall COMP quite deep
*le, liánmáng wěn-zhù xīnshén, kòngzhì **diào**-xià de*
CRS quickly stable-stop mind control fall-desceond.to NOM
shìtóu, xiǎng wǎng shàng fēi-qù
momentum want toward up fly-thither
'When she became able to react, she had fallen quite deeply; she quickly calmed down, controlled her downward motion, and attempted to fly upwards.' (http://m.lwxiaoshuo.com/66/66750/14659620.html)

Second, 掉 *diào* 'fall' can be only followed by resultative phrases (or complements) related to the path of falling. For instance, 掉 *diào* 'fall' is followed by a resultative expression in (10) and all phrases specify the endpoint of the path of the event: the figure is moving 'into the ice crack' in (10a), 'down toward the deictic center' in (10b), 'down the stairs' in (10c), and 'down (to the ground)' in (10d). Apart from the phrases related to the path of motion, phrases expressing other types of results are also typically not allowed to follow 掉 *diào* 'fall'. For instance, when a truck falls off a bridge, its engine may be broken and it may lose its wheels, but these results are not related to the path of falling, and consquently, the phrases expressing these results are not compatible with 掉 *diào* 'fall', as illustrated in (11).

(11) a. *货车掉坏发动机了。
huòchē **diào-huài fādòngjī le*
truck fall-spoil engine CRS
(intended) 'The truck fell and as a result, its engine was broken.'

b. *货车掉丢轮子了。
huòchē **diào-diū lúnzi le*
truck fall-lose wheel CRS
(intended) 'The truck fell and as a result, it lost its wheels.'

To conclude, the compatibility tests of 掉 *diào* 'fall' with a variety of manner-of-motion and resultative expressions show that it is a path morpheme: 掉 *diào* 'fall' can be modified by different manners of motion and it can only take resultative phrases that are related to the path it lexicalizes.

3.3.2.2 沉 chén *'sink'*

沉 *chén* 'sink' is analyzed as a morpheme lexicalizing both manner and direction by Hsiao (2009) because it denotes downward motion (path) in a liquid-like medium (manner). For instance, (12) describes an event of 'sinking in water'.

(12) 船上的粮食和物资全部沉入水底。
*chuán-shàng de liángshi hé wùzī quánbù **chén**-rù*
ship-on NOM food and supplies all sink-enter
shuǐ-dǐ (BCC)
water-bottom
'All food and supplies on board sank into the bottom of water.'

However, it is better to analyze 沉 *chén* 'sink' as motion in the direction of gravity, because in all of its uses, the verb is associated with a downward direction, but not necessarily in a liquid medium. For instance, all three examples in (13) describe a downward motion event, but neither takes place in liquid.

(13) a. 太阳终于西沉了，一天又过了。
*tàiyáng zhōngyú xī **chén** le, yī tiān yòu guò le* (BCC)
sun finally west sink CRS one day again over CRS
'The sun has finally set, and the day was once again over.'

b. 如蜂箱摆放是前低后高，冷湿空气会沉到箱底。
rú fēngxiāng bǎifàng shì qián-dī-hòu-gāo, lěng-shī kōngqì
if skep place COP front-low-back-high cold-moist air
*huì **chén**-dào xiang-dǐ* (BCC)
will sink-arrive box-bottom
'If the front of the skep is raised higher than the back, the cold, moist air will sink to the bottom of the box.'

c. 何富伟伸个懒腰，整个人沉入皮椅里，仰望天花板上的日光灯
*Héfùwěi shēn gè lǎn-yāo, zhěng gè rén **chén**-rù*
NAME stretch CLF lazy-waist whole CLF body sink-enter
pí-yǐ-lǐ, yǎngwàng tiānhuābǎn-shàng de
leather-chair-inside look.up ceiling-on NOM
rìguāng-dēng (BCC)
fluorescent-lamp
'He Fuwei stretched himself, sank his whole body into the leather chair, and looked up at the fluorescent lamp on the ceiling.'

In the first 200 instances retrieved from a search for the nouns following 沉入 *chén-rù* sink-enter 'sink into' in BCC (assorted), only 131 (65.5%) describe motion in a liquid medium (e.g., 水中 *shuǐ-zhōng* water-inside 'in the water', 海底 *hǎidǐ* 'sea bottom', and 浴缸 *yugāng* 'bathtub'), whereas 12 (6%) describe motion without a liquid medium (e.g., 沙堆 *shāduī* 'sand piles', 地平线 *dìpíngxiàn* 'horizons', and 地面 *dìmiàn* 'ground') and 57 (28.5%) describe metaphorical motion (e.g., 梦乡 *mèngxiāng* 'dreams' and 深渊 *shēnyuān* 'abyss').

Furthermore, the compatibility tests of 沉 *chén* 'sink' also show that it behaves like a path morpheme instead of a manner morpheme or a MP morpheme. As mentioned earlier, a manner-of-motion verb is compatible with all kinds of results that could be brought about by the event denoted by the verb; in contrast, a path verb only allows resultative phrases that are related to the path of the event, and a path verb can occur with adverbials expressing different manners of motion. As illustrated in (14a), 沉 *chén* 'sink' allows a phrase that specifies the endpoint of the path of sinking; but, as in (14b), it does not take resultative phrases irrelevant to its path: although a fly may die in the process of sinking into water, its death is not related to the path of sinking.

(14) a. 船翻了，沉到海底。
*chuán fān le **chén**-dào hái-dǐ* (BCC)
ship overturn CRS sink-arrive sea-bottom
'The ship capsized and sank to the bottom of the sea.'

b. *苍蝇沉死了。
cāngying **chén-sǐ le*
fly sink-die CRS
(intended) 'The fly sank, and as a result, it died.'

In addition, 沉 *chén* 'sink' can co-occur with elements describing different manners. (15) comprises of a few examples showing that the motion denoted by 沉 *chén* 'sink' can be fast (15a), slow (15b), or in a lazy and swinging manner (15c).

(15) a. 它腿上和身上的羽毛湿了以后，很快就可以沉到水底。
tā tuǐ-shàng hé shēn-shàng de yǔmáo shī le yǐhòu, hěn
it thigh-on and body-on NOM feather wet CRS after very
*kuài jiù kěyǐ **chén**-dào shuǐ-dǐ* (BCC)
fast then can sink-arrive water-bottom
'It can sink to the bottom of the water after the feathers on its thighs and body are wet.'

b. 戒指……慢慢沉到清澈的水底。
*jièzhi…… màn-man **chén**-dào qīngchè de shuǐ-dǐ* (BCC)
ring slow-slow sink-arrive clear NOM water-bottom
'The ring sank slowly to the bottom of the water.'

c. [海豚] 懒洋洋地摇摆着沉入水中。
*[hǎitún] lǎnyángyáng de yáobǎi-zhe **chén**-rù shuǐ-zhōng*
[dolphin] lazily ADV shake-CONT sink-enter water-inside
'(The dolphins) sank into the water as they shook lazily.' (BCC)

Therefore, although 沉 *chén* 'sink' is frequently associated with downward motion through a liquid medium, given its distribution and the fact that only the downward direction can be found in all of its uses, 沉 *chén* 'sink' is better treated as a path morpheme rather than as a manner-of-motion morpheme or a morpheme lexicalizing both manner and path.

3.3.2.3 逃 táo '*escape*'

逃 *táo* 'escape' is classified as a manner-of-motion morpheme in both Hsiao (2009: 90) and Chen and Guo (2009: 1757). According to Hsiao (2009: 95), 逃 *táo* 'escape' encodes a kind of motion in which the figure runs away quickly. In addition, 逃 *táo* 'escape' is mainly defined as 逃跑 *táo-pǎo* escape-run in *Xiàndài Hànyǔ Cídiǎn (The Contemporary Chinese Dictionary*, 5th Edition, 2012), that is, 'to leave from the unfavorable situation or object'. The other dictionary, *Hànyǔ Dà Cídiǎn* (*Comprehensive Chinese Word Dictionary*, 1994), provides a richer explanation, that is, 'to quickly or quietly leave in order to escape from unfavorable situation or object'. The descriptions in Hsiao (2009) and the two dictionaries suggest four meaning components in 逃 *táo* 'escape': (a) direction, i.e. to move away or leave; (b) purpose (figure-related), i.e. to get rid of unfavorable situation or object; (c) speed, i.e. to be quick in motion; (d) noise, i.e. to be quiet in motion. These four meaning components together suggest that 逃 *táo* 'escape' is an MP morpheme. However, this study proposes that the basic meaning of 逃 *táo* 'escape' is better analyzed as "motion in order to get rid of unfavorable situation or object", which is a feature of the figure-centered event in the sense of Hsiao (2009). In other words, 逃 *táo*' 'escape' is a manner-of-motion morpheme with figure information, whereas the other meanings of 逃 *táo* 'escape', i.e. moving away, or moving in a fast or quiet manner, are often associated with the lexicalized meaning of the morpheme, and thus can drop out sometimes.

The motion denoted by 逃 *táo* 'escape' is usually carried out at a fast rate and/or in a quiet manner because the figure usually needs to be fast and/or quiet to move away from an unfavorable situation or object. However, the property of being fast and/or quiet is not lexicalized in all uses of 逃 *táo* 'escape'. As illustrated in (16a), the crow escapes in a slow and relaxed (慢悠悠 *mànyōuyōu* 'leisurely') manner as its potential "unfavorable object" Bai Hao has already been unconscious and become a non-immediate danger; similarly, in (16b), the escaping can be very slow and noisy when a mouse is digging a hole to escape.

(16) a. 白浩啊的一声"惨叫"，双眼一翻，晕倒在地；乌鸦则"嘎"的 一声飞去，踢了一下白浩脸蛋，慢悠悠逃向远方。
Báihào ā de yī shēng cǎn-jiào, shuāng-yǎn yī
NAME ONOM NOM one CLF horrible-scream both-eyes one
fān, yūn-dǎo zài dì, wūyā zé gā de yī shēng
turn faint-fall at floor crow then ONOM NOM one CLF
fēi-qù, tī-le yī xià Báihào liǎndàn, mànyōuyōu
fly-thither kick-PFV one CLF NAME face leisurely
***táo**-xiàng yuǎn-fāng*
escape-toward far-direction
'Bai Hao let out a miserable scream and fainted on the ground; the crows then flew towards his face, kicked it and escaped leisurely into the distance.'
(http://www.qb5200.com/xiaoshuo/56/56528/5307228.html)

b. 于是老鼠会顺着泥土的缝隙，挖洞慢慢慢慢逃了出来跑到海边。
yúshì lǎoshǔ huì shun-zhe nítǔ de fèngxì, wā dòng
therefore mouse will follow-CONT soil NOM gap dig hole
*màn-man màn-man **táo**-le chū-lái pǎo-dào hǎi-biān*
slow-slow slow-slow escape-PFV exit-hither run-arrive sea-side
'Therefore, the mouse will escape to the seaside by following the gaps in the soil and burrowing through the earth.' (BCC)

Furthermore, in order to get rid of an unfavorable situation or object, a figure usually needs to leave an unfavorable place, and thus, 逃 *táo* 'escape' is very often associated with a direction away from the place, but this does not apply to all cases. In (17), the direction of escape can be away from the village (the unfavorable place) or toward the village.

(17) 付强不向着村子外面逃去，反而向着村子逃回来。
*Fùqiáng bù xiàngzhe cūnzi wàimiàn **táo**-qù, fǎnér*
NAME NEG toward village outside escape-thither instead
*xiàngzhe cūnzi **táo**-huí-lái*
toward village escape-return-hither
'Instead of escaping away from the village, Fu Qiang escaped back into the village.' (http://www.zhaoxiaoshuo.com/view/003/888/3888924.html)

More importantly, 逃 *táo* 'escape' as a manner-of-motion morpheme can be further evidenced by the compatibility tests. As in (18), 逃 *táo* 'escape' can take various resultative complements like other manner-of-motion morphemes, whereas typical path morphemes usually can only take path-related complements.

(18) a. 把我带走吧，我逃累了。
*bǎ wǒ dài-zǒu ba, wǒ **táo**-lèi le* (BCC)
BA 1SG bring-leave T 1SG escape-tired CRS
'Bring me away; I am tired of escaping.'

b. 一个小孩子已在暗中逃远了。
*yí gè xiǎo háizi yǐ zài àn-zhōng **táo**-yuǎn le* (BCC)
one CLF small child already in dark-inside escape-far CRS
'A small child has already escaped far in the dark.'

c. 营地的火堆仍在，人却逃光了。
*yíngdì de huǒduī réng zài, rén què **táo**-guāng le* (BCC)
camp NOM fire still at people but escape-empty CRS
'The fire at the camp is still burning, but the people have escaped.'

On the other hand, 逃 *táo* 'escape' is usually not found to occur with adverbials or adjuncts that express purposes other than "getting rid of unfavorable situation or object". For instance, 逃 *táo* 'escape' in (19a) is natural with a purpose to 躲避战火 *duǒbì zhànhuǒ* hide war 'hiding from the war', as war is typically an unfavorable situation. But as in (19b), it becomes unnatural if the purpose of 逃 *táo* 'escape' is to 平息战火 *píngxī zhànhuǒ* clam war 'stop the war', because for such a purpose, it is not necessary for the figure to move in the manner of escaping. In other words, such a purpose is semantically incompatible with the purpose that is lexicalized in 逃 *táo* 'escape'.

(19) a. 30多万人逃到邻国躲避战火。
*30 duō wàn rén **táo**-dào lín-guó*
30 over ten.thousand people escape-arrive neighbouring-country
duǒbì zhànhuǒ (BCC)
hide war
'Over 30 thousand people escaped to the neighbouring countries to hide from the war.'

b. ??逃到邻国平息战火。
***táo**-dào lín-guó píngxī zhànhuǒ*
escape-arrive neighbouring-country calm war
(intended) 'escape to the neighbouring country to stop the war'.

3.4 "Manner + path" motion verbs revisited

Section 3.3 introduced two compatibility tests to identify what motion information is encoded in a motion verb. This section further discusses the so-called MP verbs that lexicalize both manner and path and argues that Chinese exhibits the tendency of manner/result (path) complementarity.

3.4.1 The manner/result (path) complementarity

Concerning what meaning component is possible and impossible in a verb, Levin and Rappaport Hovav (1991, 1995, 2013, 2014) and Rappaport Hovav and Levin (2010) propose that there is "manner/result complementarity", which means that a verb either lexicalizes a manner or a result in each instance of use, but not both simultaneously. For example, the authors point out that although the verb *wipe* is usually associated with an intention to clean the surface, the verb does not lexicalize a result (i.e., clean) because a wiping event is not necessarily associated with a result of being clean, as in (20).

(20) *I wiped the table, but none of the fingerprints came off.*
(Rappaport Hovav and Levin 2010: 22, (46))

In the domain of motion, path denotes a directed change of location and thus is a type of result (Levin and Rappaport Hovav 1992; Rappaport Hovav and Levin 2010). Rappaport Hovav and Levin (2010) argue that motion verbs also conform to the constraint of manner/result complementarity, that is, motion verbs may entail manner and path meanings, but they do not have both meanings at the same time or in one use. The manner/result complementarity hypothesis aligns with Talmy's (1985, 2000) dichotomous classification in which a motion verb is in general either a manner-of-motion verb or a path verb. An example of motion verbs that Levin and Rappaport Hovav (2013) analyze in detail is *climb* (see analysis of other verbs such as *cut* in Levin and Rappaport Hovav 2013 and *clean* in Levin and Rappaport Hovav 2014). According to them, *climb* has been recognized as a verb with both manner and path meanings in several previous studies (e.g., Fillmore 1982: 32; Jackendoff 1985; Slobin 2004, cf. Kiparsky 1997: 490): it expresses a clambering manner and an upward direction. (21) is an example in which *climb* seems to have both the meanings of manner and direction.

(21) *Kelly climbed the tree.* (Levin and Rappaport Hovav 2013: 58, (15))

However, Levin and Rappaport Hovav argue that the basic meaning of *climb* is only the manner of motion. Furthermore, citing Geuder and Weisgerber (2008), Levin and Rappaport Hovav (2013: 59) claim that the manner lexicalized in *climb* is not clambering, but "force exertion against gravity". According to them, in a climbing event, animate climbers with limbs often clamber, whereas other climbers, e.g., animals without limbs such as snails or inanimate objects such as trains and planes, may climb in other ways, but all of them are actions displaying an exertion of a force against gravity. Therefore, *climb* is understood to lexicalize manner in all sentences in (22), even if not all moving objects clamber while they climb.

(22) a. *John climbed down the mountain.*
(Levin and Rappaport Hovav 2013: 58, (16a))
b. *Kelly climbed through the gap in the hedge.*
(Levin and Rappaport Hovav 2013: 58, (17a))
c. *The plane/elevator climbed.* (Levin and Rappaport Hovav 2013: 58, (18a))

Note that the sentence in (21) does not contain explicitly expressed information about direction, but the direction of climb is understood as being upward. Levin and Rappaport Hovav (2013) argue that even in this case, *climb* still only lexicalizes manner because the path, i.e. the upward direction, is closely associated with the properties of the entity that its object denotes. Levin and Rappaport Hovav (2013: 62) point out that trees are "perceived as projecting upward from the ground, so they are typically encountered as something to ascend"; that is, rather than the verb *climb*, the upward direction in (21) comes from the way in which an agent typically interacts with a tree. The authors also point out that *climb* is not always associated with an upward direction when it takes a ground NP directly as its object; as illustrated in (23), the figure is understood to climb in a downward direction although there is no explicitly expressed information about direction:

(23) *'Bring the Governor's reply straight back,' shouted Master Mace as Mungo* ***climbed*** *the rope ladder into the ship's rowing boat.* (J. Riordan and B. K. McCalla, *Rebel Cargo*, Frances Lincoln, London, 2007, p. 149; cited from Levin and Rappaport Hovav 2013: 63, (28))

Therefore, Levin and Rappaport Hovav (2013) argue that the direction associated with the climbing event is understood from the context in which *climb* is used rather than from the meaning that *climb* lexicalizes.

Meanwhile, the authors also observe cases in which *climb* lexicalizes an upward direction, e.g., when the subjects are abstract themes entities such as temperature and prices. They point out that in these cases, *climb* indeed lexicalizes an upward direction, but at the same time, the manner meaning of *climb* is no longer available; in this sense, *climb* behaves like a path verb such as *rise*, as in (24).

(24) *The prices/temperature climbed/rose.*
(Levin and Rappaport Hovav 2013: 66, (37))

Levin and Rappaport Hovav (2013) conclude that the basic meaning of *climb* is the manner, but *climb* may also express a directional meaning, and the two meanings show manner/path complementarity in that only one of the meanings is available in each use of *climb*. For these reasons, we have to carefully analyze the meaning lexicalized in a motion verb and distinguish it from meanings that are understood from context.

Counterexamples against the manner/result complementarity, particularly those involving manner-of-motion verbs that occur in certain structures, can be found in several studies (e.g., Özçalışkan and Slobin 2000; Slobin 2004; Zlatev and Yangklang 2004; Fábregas 2007; Folli and Ramchand 2005; Goldberg 2010; Beavers and Koontz-Garboden 2012, 2017; Mateu and Acedo-Matellán 2012, among others). Beavers and Koontz-Garboden (2017) also provide a detailed analysis of the English verb *climb*. However, unlike Levin and Rappaport Hovav (2013), the study proposes that *climb* can occur in three different structures: (a) as an intransitive verb and may co-occur with a directional particle or PP, as in (22a); (b) as a transitive verb and co-occurs with a directional particle or PP, as in (23); (c) as a transitive verb without co-occurring with directional particle or PP, as in (21). More importantly, even though *climb* denotes manner information (i.e. resistance to gravity following Levin and Rappaport Hovav 2013) in all three structures, it also denotes an upward direction in the third structure.

In addition to examples such as *climb* in the sequence "*climb* + location NP" (21), some motion verbs that are often classified as manner-of-motion verbs are found to co-occur with a non-directional ground PP and the whole sequence generates a directional interpretation (Folli and Ramchand 2005; Fábregas 2007; Nikitina 2008, among others). For instance, in the English example in (25a), the sequence "*slide* + *in* PP" describes a directional event, even though neither the motion verb *slide* nor the *in* PP is directional; similarly, in the Italian example in (25b), the motion is understood to be directional even though neither the motion verb *correre* 'run' nor the *in* 'in' PP describes direction.

(25) a. *Roberta Landis put her hand on the husband's arm as he* ***slid in*** *the driver's seat beside her.* (Nikitina 2008: 181, (7b))

b. *Gianni è corso in spiaggia.*
John COP run-PAST in beach
'John ran to the beach.' (Folli and Ramchand 2005: 96, (31a))

While some studies (e.g., Fábregas 2007; Folli and Ramchand 2005) treat verbs that have distributions similar to *slide* and *correre* 'run' in (25) as MP verbs, Levin et al. (2009) argue that the directional understanding does not arise from the meanings of the manner-of-motion verbs, but is facilitated by contextual-pragmatic factors, e.g., aspect, properties of the ground and path, and the nature of the manner. They point out that not all manner-of-motion verbs can occur equally well with locative PPs and have a directional interpretation. For instance, previous studies (e.g., Nikitina 2008) have observed that the verbs that are most likely to allow directional interpretation are those involving a figure's change of location in some direction, e.g., running and walking, whereas verbs that typically do not allow a directional

interpretation are those that do not involve a figure's displacement, e.g., dancing and spinning. In addition, a directional understanding is likely to arise when the verb is inherently punctual and the ground is a location with well-defined boundaries (e.g., room, rather than forests).

Levin et al. (2009) further argue that manner-of-motion verbs cannot be divided based on their ability to co-occur with locative prepositions to form a sequence with a directional interpretation, because such a division cannot explain why sometimes, a verb that is typically not allowed to have a directional interpretation with a location preposition is found to do so, e.g., *wander* in (26). Therefore, they propose the pragmatic account, that is, although *wander* usually denotes aimless motion, when given an appropriate context, it can occur with *in* PP with a directional interpretation:

(26) … *my 2 year old daughter had* ***wandered in*** *the room drawn in by the sounds of battle.* (www.audioholics.com/reviews/receivers/pioneer-vsx-818v/listening-conclusion, cited from Levin et al. 2009: 16, (60))

To summarize, this section introduces that some manner-of-motion verbs can occur in certain structures and have a directional understanding, even though no directional element is present in these structures. Two explanations have been proposed in the literature. One proposes that the manner-of-motion verbs actually lexicalize both manner and path information rather than manner only, and thus these verbs are the counterexamples to the manner/result complementarity. The other proposes that the interpretation of directional motion arises from the context rather than from the verbs, which thus does not challenge the manner/result complementarity. In the next section, I will point out that in Chinese, manner-of-motion morphemes can also occur in similar structures, i.e. "manner-of-motion morpheme + ground NP" and "manner-of-motion morpheme + non-directional preposition + ground NP", and that these structures can have a directional interpretation. This study argues that Chinese motion morphemes tend to follow the manner/result complementarity.

3.4.2 The Chinese "manner + path" morphemes re-examined

Ma (2008) claims that in earlier stages of Chinese, some motion morphemes lexicalize both manner and path because they can take a ground NP directly as an object and describe a directed motion event. For instance, 奔 *bēn* 'dash' and 逃 *táo* 'escape' in (27) are immediately followed by the ground NPs 山 *shān* 'mountain' and 楚 *Chǔ* 'State of Chu', respectively.

(27) a. 白公奔山而缢。
Báigōng ***bēn*** *shān* *ér* *yì*
NAME dash mountain then hang
'Lord Bai rushed to the mountain and then hanged himself.'
(Old Chinese, *Zuǒzhuàn*, cited from Ma 2008: 29)

b. 伍子胥逃楚而之吴。
Wǔzǐxū ***táo*** *Chǔ* *ér* *zhī* *Wú*
NAME escape Chu then arrive Wu
'Wu Zixu escaped from the State of Chu and then arrived at the State of Wu.' (Old Chinese, *Zhànguócè*, cited from Ma 2008: 29)

In addition, although there is no explicit morpheme specifying the direction of motion, both the sentences in (27) have a 'to' directional interpretation: to the mountain in (27a) and to the State of Chu in (27b). Therefore, Ma claims that 奔 *bēn* 'dash' and 逃 *táo* 'escape' are morphemes lexicalizing both manner and path meanings, and the directed motion interpretation of these two sentences comes from these two verbs.

However, a more careful analysis is necessary to identify whether these motion morphemes indeed lexicalize both manner and path. A related issue is whether the ground NP is an argument of these morphemes or an argument of directional prepositions that are omitted in the texts. In other words, it may not be that these motion morphemes take a ground NP as their object and describe directed motion with respect to the locations, but rather, there are hidden directional prepositions that introduce the ground NPs and contribute to the direction interpretation. According to Lin (2013b), the directional preposition 于 *yú* 'to' in Old and Middle Chinese is often used or omitted for different reasons. There are instances when a ground NP is introduced by the preposition 于 *yú* 'to' before it follows morphemes like 奔 *bēn* 'dash' and 逃 *táo* 'escape'. For example, the two sentences in (28) are from texts composed in the same period as the sentences in (27), but both the ground NPs in (28) following 奔 *bēn* 'dash' and 逃 *táo* 'escape' are introduced by the preposition 于 *yú* 'to' instead of the two morphemes.

(28) a. 昭公师败，奔于齐。
Zhāo gōng shī bài, ***bēn yú*** *Qí* (Old Chinese, *Shǐjì*)
NAME lord army fail dash to Qi
'Lord Zhao's army failed [in the battle]; he rushed to the State of Qi.'

b. 且举大事者，孰不逃？桓公之难，管仲逃于鲁。
qiě jǔ dà shì zhě, shú bù táo? Huán gōng zhī
PART do big thing person who NEG escape NAME lord POSS
nàn, Guǎnzhòng ***táo yú*** *Lǔ* (Old Chinese, *Zhànguócè*)
difficulty NAME escape to Lu
'[As to] people who are conducting great undertakings, who has not run away? When Lord Huan was in a difficulty, Guanzhong escaped to the State of Lu.'

Therefore, it is possible that the directional interpretation in (27) comes from the hidden preposition 于 *yú* 'to' instead of the motion morphemes themselves; it may not have been lexicalized by the morphemes as claimed by Ma (2008). In other words, motion morphemes in Old and Middle Chinese may well conform to manner/path complementarity. Due to the scope of this study, I leave the discussion of the motion morphemes in earlier stages of Mandarin Chinese for future studies and introduce studies of comparable motion morphemes in Modern Mandarin Chinese and other languages.

Like *climb* in English, in Modern Mandarin Chinese, there are also examples in which a manner-of-motion morpheme is followed by a ground NP directly and the whole sequence expresses directed motion. (29) is an example where the manner-of-motion morpheme 飞 *fēi* 'fly' is followed immediately by a ground NP, and the sentence has a directional meaning without a directional morpheme.

(29) 农村的散养鸡都是飞树上睡觉的。
*nóngcūn de sǎn-yǎng-jī dōu shì **fēi** shù-shàng shuìjiào*
village POSS scatter-raise-chicken all COP fly tree-on sleep
de (https://m.hupu.com/bbs/16033266.html)
SFP
'All free-range chicken in villages fly onto trees to sleep.'

In addition, like the English and Italian examples given in Section 3.4.2, some Chinese manner-of-motion morphemes can also be followed by a non-directional PP and describe directed motion events (also see for example Tai 1975; Liu 2009; Tham 2013, among many others). For instance, while 在 *zài* 'at' is a location preposition that does not lexicalize direction, when a PP headed by 在 *zài* occurs after the manner-of-motion morpheme, as in 跳 *tiào* 'jump' in (30a), the whole motion sequence seems to have a directional interpretation of 'onto'. Similarly, the sequence consisting of the manner-of-motion verb 滚 *gǔn* 'roll' and the 在 *zài* 'at' PP in (30b) also can be interpreted with the meaning of 'to'.

(30) a. 貓一跳跳在桌上。
*māo yī tiào, **tiào** zài zhuōshang* (Liu 2009: 16, (21a))
cat one jump jump at table-on
'The cat (made one jump and) jumped to the table.'

b. 小明的球滚在路边。
*Xiǎomíng de qiú **gǔn** zài lù-biān* (Liu 2009: 16, (21b))
NAME NOM ball roll at road-side
'Xiaoming's ball rolled to the roadside.'

Some studies, e.g., Liu (2009), hypothesize that the directional understanding of the motion expressions such as (30a) and (30b) may be associated with the meanings of the verbs. Specifically, these verbs (e.g., 跳 *tiào* 'jump', 滚 *gǔn* 'roll', and 滑 *huá*

'slide') denote motion events that involve displacement, which become directional when they are followed by a 在 *zài* 'at' PP. On the other hand, there is a set of manner-of-motion verbs that does not denote displacement, e.g., 走 *zǒu* 'walk', 跑 *pǎo* 'run', and 飘 *piāo* 'drift', which therefore do not allow for a directional understanding even when followed by a 在 *zài* 'at' PP, as in (31).

(31) a. 王明跑在最前线。
*WángMíng **pǎo** zài zuì qián-xiàn* (Liu 2009: 16, (22a))
Name run at most front-line
'Wang Ming ran at the front.'

b. 他悠闲地走在路上，欣赏着路边的风景。
*tā yōuxián de **zǒu** zài lùshang, xīnshǎng-zhe lù-biān de*
3SG leisurely ADV walk on road enjoy-CONT road-side NOM
fēngjǐng (Liu 2009: 16, (22b))
scenery
'He took a leisurely walk on the road while enjoying the scenery by the roadside.'

Liu (2009) also points out that some motion verbs, when followed by a 在 *zài* 'at' PP, can either be non-directional or directional, such as 飞 *fēi* 'fly' in (32a) and (32b) respectively.

(32) a. 导航雁飞在前面，其他的燕子在后面跟着。
*dǎoháng yàn **fēi** zài qiánmiàn, qítā de yànzi zài*
guide wild-goose fly at front other NOM wild-goose at
hòumiàn gēn-zhe (Liu 2009: 15, (20a))
back follow-CONT
'The guiding wild goose flew in front; other wild geese followed behind.'

b. 一只蝴蝶飞在他的肩膀上。
*yī zhī húdié **fēi** zài tā de jiānbǎng-shang*
One CLF butterfly fly at 3SG NOM shoulder-on
'A butterfly flow to his shoulder.' (Liu 2009: 15, (20b))

Liu's (2009) analysis of Chinese motion morphemes is, to some extent, similar to Beavers and Koontz-Garboden (2017) in that both argue that there is a set of motion verbs, which is traditionally classified as manner-of-motion verbs, that denotes both manner and direction information.

Tham (2013), however, supports the pragmatic account proposed in Levin et al. (2009) for Modern Mandarin Chinese. In the corpus-based analysis of "manner-of-motion verb + 在 *zài* 'at' PP", e.g., 飞在墙上 *fēi zài qiáng-shàng* 'fly onto the wall', Tham finds that such an expression tends to favor the directional interpretation when the motion is punctual, less specifically described, or has a shorter path (see more details in Tham 2013). More specifically, according to Tham's study, the same

manner-of-motion verb does not always express directional motion when it is followed by a 在 *zài* 'at' PP. Furthermore, the manner-of-motion verbs show a different tendency for the directional interpretation when they are followed by 在 *zài* 'at' PP: Tham's (2013) corpus investigation shows that 99% of "跳 *tiào* 'jump' + 在 *zài* 'at' PP" express directed motion, followed by 越 *yuè* 'climb' (89%), 扑 *pū* 'pounce' (77%), 流 *liú* 'flow' (59%), 滚 *gǔn* 'roll' (39%), 飞 *fēi* 'fly' (27%), 爬 *pá* 'crawl' (18%), and 滑 *huá* 'slip' (9%). For instance, even though the sequence "跳 *tiào* 'jump' + 在 *zài* 'at' PP" tends to express directed motion, not all cases of this sequence are directional: as in (33), instead of jumping into the sunlight, the pearls are jumping in the sunlight. In other words, the directional meaning is not lexicalized in the morpheme 跳 *tiào* 'jump'. Therefore, when compared with Liu's (2009) study that classifies verbs into three categories depending on whether the motion they denote involves displacement (30–32), Tham's (2013) pragmatic approach is able to provide a more consistent explanation, that is, all verbs are manner-of-motion verbs.

(33) 跳在阳光里的透明珠子。
***tiào**-zài yángguāng-lǐ de tòumíng zhūzi*
jump-at sunlight-inside NOM transparent pearl
'transparent pearls jumping in the sunlight'
(music.douban.com/review/1132356/ – China, cited from Tham (2013: 348))

Furthermore, even though the "manner-of-motion verb + 在 *zài* 'at' PP" + ground NP" construction can be interpreted with a directional understanding as in (30) or (32b), it is actually more common to have a goal morpheme (e.g., 到 *dào* 'arrive') introduce the ground NP, in the form "manner-of-motion + 到 *dào* 'arrive' + ground NP". For instance, Tham's (2013) corpus investigation finds that manner-of-motion verbs (e.g., 跳 *tiào* 'jump') tend to occur more frequently with 到 *dào* 'arrive' rather than the locative marker 在 *zài* 'at' (977 vs. 83 instances) when expressing directed motion. It is even far less common for a manner-of-motion verb to take a ground NP directly for directed motion. For instance, a Google search (January 17, 2016) of 飞树上 *fēi shù-shàng* fly tree-on ("manner-of-motion verb + ground NP"), 飞在树上 *fēi-zài shù-shàng* fly-at tree-on ("manner-of-motion verb + 在 *zài* 'at' + ground NP"), and 飞到树上 *fēi-dào shù-shàng* fly-arrive tree-on ("manner-of-motion verb + 到 *dào* 'arrive' + ground NP") retrieved about 6,490, 52,600, and 111,000 results respectively; it is approximately 17 times more common for the manner-of-motion verb 飞 *fēi* 'fly' to take a morpheme that explicitly marks a goal direction than to take a goal NP directly. Similar situations can be observed in English too. Recall from Section 3.4.1 that in certain contexts, an *in* PP can have a directional interpretation like the *into* PP, but it is much less frequently used than the latter. For instance, Nikitina's (2008: 180) investigation of corpus data finds that among the 518 motion expressions with *into* or *in* as the goal marker, only 15% are *in* PPs.

Therefore, this study follows Levin et al. (2009) and Tham (2013) and argues that although some manner-of-motion verbs can be found in motion expressions with directional interpretations despite the absence of directional morphemes, the directional interpretations do not come from the verbs. Such an account better captures the Chinese data and provides a more consistent account for the different interpretations of "manner morpheme (+ 在 *zài* 'at' PP) + ground NP" in Chinese, in particular, the cases exemplified by 飞 *fēi* 'fly' in (32a) and (32b) and the motion verbs raised in Tham (2013) that show a different tendency toward the directional interpretation. In other words, Chinese motion morphemes can be said to tend toward exhibiting the feature of manner/result complementarity. In Chapter 6, I will provide further evidence with examples using change-of-state verb compounds.

3.5 Summary

This chapter examined previous works on the classification of motion verbs. It then introduced tests that can differentiate manner-of-motion and path verbs in a more consistent manner and also argued Chinese motion morphemes usually conform to the manner/path complementarity.

This chapter has shown that it is not only semantically significant, but also syntactically relevant, to distinguish manner-of-motion information from path information. Nonetheless, the current two-way (manner-of-motion vs. path) classification of motion morphemes is not sufficiently fine-grained to answer all the research questions raised in this study. For example, it cannot account for the distributions of all types of motion morphemes in Chinese. Take (34) as an instance: a two-way classification of manner-of-motion morphemes and path morphemes cannot explain why a particular path morpheme (e.g., 落 *luò* 'fall') must precede the other path morpheme (e.g., 进 *jìn* 'enter').

(34) a. 忽然一块石子落进了水里。
*hūrán yī kuài shízi **luò-jìn-le** shuǐ-lǐ* (BCC)
suddenly one CLF pebble fall-enter-PFV water-inside
'Suddenly, a pebble fell into the water.'

b. *忽然一块石子进落了水里。
hūrán yī-kuài shízi **jìn-luò-le shuǐ-lǐ*
suddenly one-CLF pebble enter-fall-PFV water-inside

Therefore, a further classification of path morphemes is necessary in order to explain the relative order between path morphemes as in (34a). This issue will be explored in Chapter 4.

CHAPTER 4

Classifying Chinese motion morphemes

This chapter analyzes the semantics of Chinese motion morphemes in light of the "scale structure" (Rappaport Hovav and Levin 2010, among others). Specifically, in addition to the traditional two-way classification of motion morphemes into manner-of-motion morphemes and path morphemes (Talmy 1975, 1985, 2000), this study further classifies the path morphemes into three types depending on the type of scalar information they encode. As will be shown in Chapter 5, the scalar features of the Chinese motion morphemes are closely associated to their word orders in motion expressions. This chapter also proposes a set of independent tests to determine the scalar type an individual motion morpheme falls into. Additionally, this chapter looks into several "special" Chinese motion morphemes, including 来 *lái* 'come, hither' /去 *qù* 'go, thither', 上 *shàng* 'ascend to' /下 *xià* 'descend from', 到 *dào* 'arrive', and 过 *guò* 'cross'. Although each of these morphemes lexicalizes a scale, they sometimes do not behave exactly like the other morphemes in their scalar categories. Finally, this chapter introduces in more detail the bound motion morphemes in Modern Mandarin Chinese (e.g., 入 *-rù* 'enter' and 至 *-zhì* 'arrive') and shows that the proposed scalar classification and tests are also applicable to these morphemes.

4.1 The notion of scale structure

A scale corresponds to a set of ordered degrees in the form of points or intervals along dimensions such as height, cost, or temperature (Hay et al. 1999; Kennedy 1999, 2001, 2007, 2012; Kennedy and McNally 2005; Kennedy and Levin 2008; Rappaport Hovav 2008; Rappaport Hovav and Levin 2010; Levin and Rappaport Hovav 2013, 2014, among others). Previous studies (e.g., Hay et al. 1999; Kennedy and Levin 2001; Beavers 2008; Rappaport Hovav and Levin 2010) recognize three types of scales as corresponding to three types of verbs: property scales are associated with change-of-state verbs (e.g., *widen*, *lengthen*, *cool*), path (spatial) scales are associated with path verbs (e.g., *ascend*, *descend*, *come*), and extent (volume, area) scales are associated with incremental theme verbs (e.g., *eat*, *read*, *build*). As pointed out by Beavers (2008) and Kennedy and Levin (2008), these three types of verbs have also been recognized in other studies, albeit using different approaches, e.g.,

Tenny (1987, 1992, 1994), Krifka (1989, 1992), Dowty (1991), Jackendoff (1996), Rothstein (2003), Kratzer (2004), and Borer (2005). For instance, Tenny (1987, 1992, 1994) proposes that the events denoted by these three types of verbs are measured out by the affected theme, path, and incremental theme respectively. This study follows the scalar approach because this approach collectively views all three types under the notion of "scale". As will be shown by case studies in Chapter 6, such an approach can not only account for motion morphemes in Chinese, but also explain the properties of verbs in general, adjectives, and PPs in Chinese in a more consistent manner.

Of the three types of scales, this study is mainly concerned with the path (or spatial) scale. In this chapter, I will introduce the notion of spatial scale, mainly following from Rappaport Hovav and Levin (2010). In the domain of motion events, a scale is understood on the dimension of distance, that is, the distance of the figure with respect to the reference object. In addition, a scale is composed of points that form the path of motion and these points are ordered in the direction of movement. Therefore, the figure's location on the path represents a value for its distance with respect to the ground; when the figure's location changes along the path, the value changes accordingly, so the change is understood as a scalar change and the amount of change is measurable based on the values at the start and end of the event. One example is the path verb *ascend*: *ascend* lexicalizes a scale on the dimension of spatial distance, and the points in its scale are ordered against the direction of gravity; if a figure ascends, the value on the scale increases. In this sense, Rappaport Hovav and Levin (2010: 29) point out that a spatial scale is equivalent to a property scale (the scale of change-of-state verbs) because "being at a position on a path is comparable to having a particular value for a scalar attribute with change of state verbs, and movement along the path is comparable to a change in the value of an attribute".

However, Rappaport Hovav and Levin (2010) also point out a difference between change-of-state verbs and path verbs with respect to their scales. According to them, the degrees on the dimension of a particular property scale are inherently measured. For instance, on the temperature scale, 10 degrees is a value that is inherently lower than 11 degrees, or on the scale of height, 6 feet is inherently taller than 5 feet. On the contrary, the points on a spatial scale may not be inherently ordered but are determined with respect to a reference object on the scale. In other words, the increasing or decreasing distance on a particular spatial scale is determined in relation to the reference object. For this reason, they argue that a scalar change motion verb usually requires a reference object, and the reference object is usually specified either by a ground NP that is taken as object by the motion verb or determined from the context of use. For instance, the verb *enter* in *enter the house* lexicalizes a scale with points ordered toward the inside of the house, whereas the points on the scale associated with the deictic motion verb *come* are ordered toward

the contextually determined deictic center (usually the speaker). The authors also argue that there are a few motion verbs that have their points inherently ordered on their scales; however, these are limited to verbs denoting vertical motion along a scale consisting of points inherently ordered along the path either in or against the direction of gravity (e.g., *ascend, descend, drop*, and *fall*).

4.2 A scale-based classification of Chinese motion morphemes

According to Rappaport Hovav and Levin (2010), when interpreted in terms of scale structure, a path verb is associated with a scale on a particular spatial dimension and denotes changes along the scale. For instance, as mentioned above, *ascend* denotes change on the dimension of space with a direction against the direction of gravity. On the contrary, a manner-of-motion verb is not associated with any particular scale and thus the changes it denotes cannot be characterized in terms of a single dimension as a scale represents. In this sense, path verbs and manner-of-motion verbs in Talmy's (1975, 1985, 2000) framework correspond to "scalar change motion verbs" and "nonscalar change motion verbs" respectively.

While previous studies have seldom attempted to further classify path verbs, a finer-grained classification of path verbs based on their scale structure is possible due to the different types of scale. For instance, scales can be associated with multiple points (e.g., *return*) or only two points (e.g., *arrive*); scales can also be bounded (i.e. the scale has an inherent endpoint, e.g., *return*) or open (i.e. the scale does not have an inherent endpoint, e.g., *ascend*) (Beavers 2008; Kennedy and Levin 2008; Rappaport Hovav and Levin 2010). To summarize, the new and finer-grained classification is based on three binary features of scale. In the following, I will illustrate the classification with examples from Chinese.

The first feature is the existence of a scale, i.e. whether the motion denoted by the motion verb takes place along a scale; this feature ([+/− scale]) classifies Chinese motion morphemes into scalar change motion morphemes (e.g., 退 *tuì* 'recede', 回 *huí* 'return', 进 *jìn* 'enter') and nonscalar change motion morphemes (e.g., 飞 *fēi* 'fly', 跑 *pǎo* 'run', 走 *zǒu* 'walk'). The second feature is boundedness, i.e. whether or not a scale has an endpoint; this feature ([+/− bounded]) further divides scalar change motion morphemes into open scale motion morphemes (e.g., 退 *tuì* 'recede', 升 *shēng* 'ascend') and closed scale motion morphemes (e.g., 回 *huí* 'return', 进 *jìn* 'enter'). The third feature is punctuality, i.e. whether the motion along a scale is punctual or durative. This feature is closely associated with the length of a scale or the number of points on a scale. If a scale consists of only two points, i.e. the starting and ending points, the motion from the starting point to the ending point is punctual; on the contrary, if a scale consists of multiple points, i.e.

the starting point, ending point, and many points between them, then the travel from the starting point to the ending point is durative. The feature of punctuality ([+/− punctual]) divides closed scale motion morphemes into multi-point closed scale motion morphemes (e.g., 回 *huí* 'return') and two-point closed scale motion morphemes (e.g., 进 *jìn* 'enter'). Table 4.1 presents the four-way scalar classification based on the three features defining a scale.

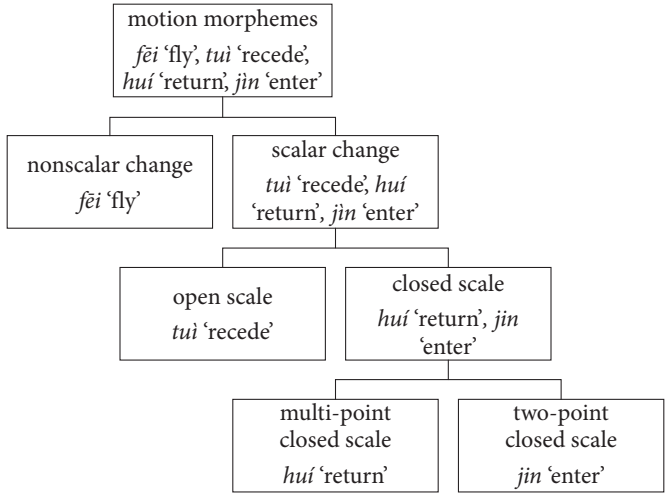
Table 4.1 Three scalar features determining four types of motion morphemes

Types of motion morphemes	Scalar feature		
	Existence of scale	Boundedness	Punctuality
nonscalar change (飞 *fēi* 'fly')	–	–	–
open scale (退 *tuì* 'recede')	+	–	–
multi-point closed (回 *huí* 'return')	+	+	–
two-point closed (进 *jìn* 'enter')	+	+	+

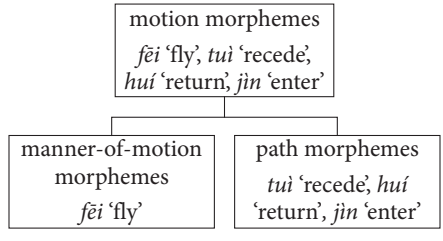
As mentioned in the beginning of this section, nonscalar change motion morphemes are congruous with the manner-of-motion morphemes in Talmy's framework, whereas the other three are subtypes of Talmy's path morphemes, each with a different scale structure. Figure 4.1 (a) and Figure 4.1 (b) illustrate the four-way classification of Chinese motion morphemes based on their scale structure and the two-way classification by Talmy (1975, 1985, 2000) respectively. Within the framework of the former, motion morphemes are first classified into nonscalar change and scalar change motion morphemes; then scalar change motion morphemes are classified into closed scale and open scale motion morphemes; finally, closed scale motion morphemes are further classified into multi-point closed scale and two-point closed scale motion morphemes.[6]

6. Rappaport Hovav and Levin (2010) first classify scalar change verbs into two types based on whether a given scalar change motion verb lexicalizes a multi-point scale or two-point scale, i.e. whether the directed motion denoted in the verb is durative or punctual. In this study, scalar change verbs are first classified into open scale and closed scale motion morphemes based on boundedness, and then the latter are classified into multi-point and two-point closed scale motion morphemes; this better brings out the hierarchical organization among the subtypes of motion morphemes, as shown in Table 4.1. However, the difference in the presentation of the types does not affect the classification of individual verbs.

In the rest of this section, I introduce each type of motion morphemes in more detail and provide the tests to determine the type of a given Chinese motion morpheme.



a. Four-way classification of Chinese motion morphemes based on their scale structure



b. Two-way classification of Chinese motion morphemes based on Talmy (1975, 1985, 2000)

Figure 4.1 Four-way and two-way classification of Chinese motion morphemes

4.2.1 Nonscalar change vs. scalar change motion morphemes

Unlike state verbs, all motion verbs denote dynamic events and thus involve some kind of change (see Vendler 1967; Dowty 1979; Verkuyl 1989; Filip 1999 for discussions of those events that involve and do not involve change). For verbs that lexicalize different types of change, the most fundamental distinction is whether or not the verb lexically specifies a scale of change (McClure 1994; Rappaport Hovav 2008).

As introduced in Section 4.1, in the domain of motion, a scale is composed of points ordered along the path with respect to the ground, and a figure's movement along the path can thus represents a type of scale. As each point on a scale represents a value along the path with respect to a reference object, a figure's movement along the scale is therefore measurable. For instance, an event of returning to a destination is half completed if the figure moves halfway on the scale from the starting point to the destination. In contrast, nonscalar change motion verbs do not involve measurements on any particular path because the change they specify cannot be featured within any single dimension. For example, Rappaport Hovav and Levin (2010: 32) point out that *jog* involves movements of the arms and legs, but no single one of the movements can be understood as "the necessary starting point of motion, that is, one can start jogging by moving one's left leg first or one's right leg first". Similarly, Rappaport Hovav (2008: 18, cf. Dowty 1979) points out that although *waltz* involves three ordered steps, a person "is not considered to be waltzing when going through a single sequence of three steps". Therefore, the progress of a nonscalar change motion event cannot be measured in terms of scale.

In the following, I introduce three tests that can be applied to distinguish nonscalar change motion morphemes from scalar change motion morphemes in Chinese. Because manner-of-motion and path morphemes correspond to nonscalar and scalar change motion morphemes respectively, these three tests can be also used to identify whether a motion morpheme lexicalizes manner information or path information. Of the three tests, the first two have been used in Chapter 3 when distinguishing manner-of-motion morphemes from path morphemes.

4.2.1.1 *Compatibility with a variety of adverbials expressing manners of motion*

As shown in Chapter 3, Chinese motion morphemes tend to conform to the manner/result complementarity: a motion morpheme that encodes scalar information (i.e. a scalar change motion morpheme) does not lexicalize manner. In other words, the motion expressed by a scalar change motion morpheme can be realized via different manners of motion, so such a morpheme is compatible with phrases expressing different types of manners (also see Section 3.3.1 for a discussion of differentiating manner-of-motion morphemes from path morphemes). For instance, the motion in a receding or a returning event can take place by jumping or running, as illustrated in (4) in Chapter 3, repeated here as (1).

(1) a. 他跑/跳着退。
tā *pǎo/tiào-zhe* ***tuì***
3SG run/jump-CONT recede
'He receded by running/jumping.'

b. 他跑/跳着回学校。
tā *pǎo/tiào-zhe* ***huí*** *xuéxiào*
3SG run/jump-CONT return school
'He returned to school by running/jumping.'

On the other hand, a nonscalar change motion morpheme corresponds to a manner-of-motion morpheme; since it already specifies a particular manner of motion, the motion event it denotes cannot be further modified by adverbials describing other kinds of manner in the same dimension (see Section 3.3.1). For example, 走 *zǒu* 'walk' denotes motion in the manner of walking, and thus the motion cannot be carried out by jumping or running, as illustrated in (6a) in Chapter 3, repeated here as (2).

(2) *他跳/跑着走。
tā* *tiào/pǎo-zhe* ***zǒu*
3SG jump/run-CONT walk
(intended) 'He walked by jumping/running.'

4.2.1.2 *Compatibility with a variety of resultative phrases*

This test has been also introduced in Chapter 3 (Section 3.3.1) to differentiate manner-of-motion morphemes from path morphemes. It also can be used to identify whether a given motion morpheme is a nonscalar change or scalar change motion morpheme. A nonscalar change motion morpheme is compatible with a variety of resultative phrases, whereas a scalar change motion morpheme is only compatible with resultative phrases that are consistent with the path of the motion event it denotes. In this section, I explain in more detail as to why this test can be used in such a manner.

A resultative phrase can contribute scalar information to a given event: when a resultative phrase co-occurs with a nonscalar change verb, it introduces a new scale to the event denoted by the verb; and when a resultative phrase co-occurs with a scalar change verb, it further elaborates the scale that is lexicalized by the verb (Goldberg 1991; Tenny 1994; Wechsler 2005; Rappaport Hovav 2008, among others). A nonscalar change motion verb does not lexicalize any change of state or denote a delimited motion event, so it is compatible with any resultative phrases that express the possible results brought about by the action denoted by the morpheme. For instance, as illustrated in (8) in Chapter 3, repeated here as (3), 跑 *pǎo* 'run' allows bare XP resultative complements and non-subcategorized objects (鞋子 *xiézi* 'shoes') with result XPs predicated of them, and these complements are not necessarily related to the path of motion (cf. English manner-of-motion verbs in Rappaport Hovav 2008, Rappaport Hovav and Levin 2010).

(3) a. 他跑到学校了。
tā ***pǎo-dào*** *xuéxiào le*
3SG run-arrive school CRS
'He ran to the school.'
b. 他跑累了。
tā ***pǎo-lèi*** *le*
3SG run-tired CRS
'He ran and as a result, he became tired.'
c. 他跑丢鞋子了。
tā ***pǎo-diū*** *xiézi le*
3SG run-lose shoe CRS
'He ran and as a result, he lost his shoes.'

However, scalar change verbs, including scalar change motion verbs, cannot take resultative phrases as freely as nonscalar change verbs do. It has been observed in many previous studies that a predicate cannot contain two elements that express result information, unless the second element further specifies the result information denoted by the first one (i.e. the "Single Delimiting Constraint" of Tenny 1994: 79, or the "Unique Path Constraint" of Goldberg 1991: 368–369, also see Gruber 1965, Simpson 1983, Levin and Rappaport Hovav 1995, Filip 2004, Matsumoto 2006, among others). Take the scalar change motion verb *arrive* as an example. *Arrive* lexicalizes a closed scale on the spatial scale, and thus it does not allow collocation with *breathless*, which describes a change of state on a non-spatial scale (4a); instead, *arrive* is compatible with *at the airport* in (4b) because the PP further specifies the endpoint of the motion (Levin and Rappaport Hovav 1995; Rappaport Hovav 2008).

(4) a. **Willa arrived breathless.* (Levin and Rappaport Hovav 1995: 55 (58))
b. *We arrived at the airport.* (Rappaport Hovav 2008: 23 (15a))

Similarly, (5a) has two *to* PPs that delimit the event of transferring the book. Although New York in the first *to* PP can be understood as the endpoint for the path of book transfer, Bill, who is located in New York, is more specific than New York as the endpoint for the path, and it is thus possible for *to Bill* to occur as the second *to* PP (Gruber 1965; Tenny 1994). In other words, the second *to* PP in (5a) functions to further specify the endpoint for the scale of sending, which thus does not violate the Single Delimiting Constraint or the Unique Path Constraint. In contrast, (5b) is not allowed because the second *to* PP is less specific than the first *to* PP with regard to the information about the endpoint.

(5) a. *John sent the book to New York to Bill.*
b. **John sent the book to Bill to New York.*
(Gruber 1965, cited in Tenny 1994: 78)

To summarize, a scalar change motion verb lexicalizes a change of location on the spatial scale, which can be understood as a kind of result; thus, such a verb can only combine with resultative phrases that are related to and further specify the path of motion denoted by the morpheme, e.g., phrases which specify an endpoint to the path. This semantically-motivated constraint also applies to the behaviors of Chinese motion morphemes. As illustrated in (9) in Chapter 3, repeated here as (6), 回 *huí* 'return' can be modified by a phrase that reinforces the endpoint of the receding event, i.e. 'the outside of the pass'; therefore, even though the figure can become tired or lose a weapon in an event of returning, no phrases denoting such states are allowed to co-occur with 回 *huí* 'return'.

(6) a. 敌人回到了关外。
dírén ***huí****-dào-le* *guān-wài*
enemy return-arrive-PFV pass-outside
'The enemy returned to the outside of the pass.'

b. *敌人回关外回累了。
dírén* *huí* *guān-wài* ***huí**-lèi* *le*
enemy return pass-outside return-tired CRS
(intended) 'The enemy returned to the outside of the pass and as a result, they became tired.'

c. *敌人回关外回丢了武器。
dírén* *huí* *guān-wài* ***huí**-diū-le* *wǔqì*
enemy return pass-outside return-lose-PFV weapon
(intended) 'The enemy returned to the outside of the pass and as a result, they lost their weapon.'

4.2.1.3 *Compatibility with a variety of directions*

This test is based on the semantic compatibility raised in Chapter 2. A nonscalar change motion morpheme has no inherent direction, so the motion it denotes can proceed in any direction. For instance, in a running event, a figure can run forward or backward, as in (7).

(7) a. 向前跑!
xiàng *qián* ***pǎo***
toward front run
'Run forward!'

b. 向后跑!
xiàng *hòu* ***pǎo***
toward back run
'Run backward!'

By contrast, a scalar change motion morpheme specifies an inherent direction, so it only allows phrases expressing directions that are compatible with the direction specified in the motion morpheme. For instance, a figure typically moves backward in a receding event, so 退 *tuì* 'recede' does not combine with a PP expressing a forward direction, as in (8).

(8) a. *向前退!
xiang qián* ***tuì*
toward front recede
(intended) 'Recede forward!'
b. 向后退!
xiàng hòu ***tuì***
toward back recede
'Recede backward!'

Table 4.2 summarizes the three tests that can be used to distinguish nonscalar change motion morphemes from scalar change motion morphemes.

Table 4.2 Tests distinguishing nonscalar change from scalar change motion morphemes

Tests	Nonscalar change motion morphemes	Scalar change motion morphemes
Compatible with a variety of manners of motion	No	Yes
Compatible with a variety of resultative complements	Yes	No
Compatible with a variety of directions	Yes	No

4.2.2 Open scale vs. closed scale motion morphemes

Scalar change motion morphemes can be classified into open scale motion morphemes and closed scale motion morphemes based on whether or not the scale they lexicalize has an endpoint (cf. Rappaport Hovav and Levin 2010).

A scalar change motion morpheme with a closed scale does not allow a given figure to progress beyond the bound, which is usually the point on the scale where the ground is located, because any motion beyond the bound is no longer considered the kind of motion denoted by the motion morpheme. Take *He returned to the classroom* as an example. The classroom is the bound of the event of returning, so the motion event is considered completed when the figure arrives at the inside of the classroom. Although the figure can continue moving inside the classroom, such motion is no longer taken as a part of the event of returning. On the contrary, a motion event with an open scale does not have a bound or endpoint for the figure

to arrive at. For instance, in an ascending event denoted by the verb *ascend*, a figure can potentially move upward forever if it is not terminated by other factors.

In Chinese, comparison can be expressed by the comparative adverb 更 *gèng* 'more', which is then followed by gradable adjectives, e.g., 更远 *gèng yuǎn* more far 'further' and 更高 *gèng gāo* more high 'higher'. If a scalar change motion morpheme is compatible with the 更 *gèng* 'more' comparative, then the morpheme has an open scale in that it allows a figure to move further along the scale; otherwise, it has a closed scale. As illustrated in (9), 升 *shēng* 'ascend' and 落 *luò* 'fall' allow the 更 *gèng* 'more' comparative; that is, an event of ascending or falling is perpetual without an inherent endpoint.

(9) a. 太阳此刻升得更高了。
*tàiyáng cǐ kè **shēng** de gèng gāo le* (BCC)
sun this moment ascend COMP more high CRS
'The sun has risen up higher than before.'

b. 这时太阳已落得更低了一些。
*zhè shí tàiyáng yǐ **luò** de gèng dī-le yīxiē*
this moment sun already fall COMP more low-PFV some
'The sun has set even further than before.' (BCC)

In contrast, 回 *huí* 'return' and 进 *jìn* 'enter' in (10) are incompatible with the comparative; this is because once the figure has reached the endpoint, the events of returning and entering are completed.

(10) a. 他在5分钟前就回家了, *现在应该回得更远了。
*tā zài 5 fēnzhōng qián jiù huí jiā le *xiànzài*
3SG at 5 minute before then return home CRS now
*yīnggāi **huí** de gèng yuǎn le*
must return COMP more far CRS
(intended) 'He began returning home five minutes ago, now he must have returned farther.'

b. 他在5分钟前就进教室了, *现在应该进得更远了。
*tā zài 5 fēnzhōng qián jiù jìn jiàoshì le *xiànzài*
3s at 5 minute before then enter classroom CRS now
*yīnggāi **jìn** de gèng yuǎn le*
must return COMP more far CRS
(intended) 'He entered the classroom five minutes ago, now he must have entered farther.'

In addition, directional PPs (or 'toward' PPs) typically do not entail a figure's arrival at the endpoint of the path motion, and thus such PPs can modify motion verbs denoting unbounded events, but not those denoting bounded events (Hsiao 2009;

Lamarre 2009; Rappaport Hovav and Levin 2010, among others, cf. Liu et al. 2015). In this sense, open and closed scale motion morphemes can also be distinguished by their compatibility with directional PPs. According to the BCC, 向 *xiàng* 'toward' is the most frequently used directional preposition in Chinese. Meanwhile, 向 *xiàng* 'toward' is also the least restricted in modifying motion verbs, as compared to the other two commonly used directional prepositions 往 *wǎng* 'toward' and 朝 *cháo* 'toward'. For example, a 向 *xiàng* 'toward' PP can modify the majority of motion verbs, and it can occur in both preverbal and postverbal positions when modifying motion verbs (cf. Lü 1980; Fan 1990; Zhao 2002; Fang 2004; Wang 2004).[7] As illustrated in (11–12), the 向 *xiàng* 'toward' PP is found compatible with 升 *shēng* 'ascend' and 落 *luò* 'fall' in both pre- and postverbal positions. But, as in (13–14), the PP cannot modify 回 *huí* 'return' or 进 *jìn* 'enter', be it in the pre- or postverbal position. Therefore, consistent with the 更 *gèng* 'more' test, the 向 *xiàng* 'toward' PP test also suggests that 升 *shēng* 'ascend' and 落 *luò* 'fall' lexicalize open scales whereas 回 *huí* 'return' and 进 *jìn* 'enter' lexicalize closed scales.

(11) a. 写满思念之语的灯笼，缓缓升向夜空。
xiě-mǎn sīniàn zhī yǔ de dēnglóng huǎn-huǎn
write-full miss NOM word NOM lantern slow-slow
shēng*-*xiàng *yè-kōng* (BCC)
ascend-toward night-sky
'The lantern (that is) written fully with words of forlorn ascended slowly toward the night sky'

b. 便是站到半空，都看不清炸弹落向何方。
biàn shì zhàn-dào bàn-kōng, dōu kàn-bu-qīng zhàdàn
even COP stand-arrive half-sky also see-NEG-clear bomb
luò*-*xiàng *héfāng* (BCC)
fall-toward where
'Even if (you) are in the mid-air, (you) also cannot see clearly where the bomb fell towards.'

7. When modifying non-motion events, a 向 *xiàng* 'toward' PP cannot occur in post-verbal position, e.g., 向我微笑 *xiàng wǒ wēixiào* toward 1SG smile 'smile at me' vs. *微笑向我 *wēixiào xiàng wǒ* smile-toward-1SG. Compared to 向 *xiàng* 'toward', the distributions of 朝 *cháo* 'toward' and 往 *wǎng* 'toward' is even more restricted. For instance, 朝 *cháo* 'toward' PPs predominantly occur in pre-verbal position regardless of the verb being modified is a motion verb or not, whereas a 往 *wǎng* 'toward' PP can only appear after a limited number of motion verbs, e.g., 往教室跑 *wǎng jiàoshì pǎo* toward classroom run 'run toward the classroom' vs. ??跑往教室?? *pǎo wǎng jiàoshì* run toward classroom (cf. Lü 1980; Fan 1990; Zhao 2002; Fang 2004; Wang 2004). See more discussions of Chinese directional PPs in Chapter 6.

(12) a. 一条细长的黑线沿着腿肚直向上慢慢的升。
*yī tiáo xì-cháng de hēi-xiàn yánzhe tuǐdù zhí **xiàng***
one CLF thin-long NOM black-line along calf straight toward
shàng** màn-màn de **shēng (BCC)
up slow-slow ADV ascend
'A thin and long black line is ascending slowly up along my calf.'

b. 白剑手中剑，也跟着向下一落。
Báijiàn shǒu-zhōng jiàn, yě gēn-zhe xiàng xià yī
NAME hand-inside sword also follow-CONT toward down one
luò (BCC)
fall
'The sword that Bai Jian held in his hand also fell down.'

(13) *向教室回/*回向教室
xiàng jiàoshì **huí /***huí** xiàng jiàoshì*
toward classroom return /return toward classroom
(intended) 'return toward the classroom'

(14) *向教室进/*进向教室
xiàng jiàoshì **jìn /***jìn** xiàng jiàoshì*
toward classroom enter /enter toward classroom
(intended) 'enter toward the room'

Table 4.3 summarizes the tests for identifying the boundedness of the scales lexicalized by motion morphemes.

Table 4.3 Tests distinguishing open scale and closed scale motion morphemes

Tests	Open scale motion morphemes	Closed scale motion morphemes
Compatibility with the comparative 更 *gèng* 'more'	Yes	No
Compatibility with the directional 向 *xiàng* 'toward' PPs	Yes	No

4.2.3 Multi-point closed scale vs. two-point closed scale motion morphemes

As introduced earlier in Section 4.2, closed scale motion morphemes can be further classified into multi-point and two-point closed scale motion morphemes. According to Beavers (2008), the scale of a two-point closed scale motion morpheme is associated with only two values, that is, having or not having a property on a particular dimension, e.g., being alive or dead in a property scale, and being at an endpoint or not in a path scale. Beavers (2008) also argues that the transition from

one point to the other on a two-point scale is usually understood as instantaneous. For example, the event of entering a room is often punctual and does not take time. In English, *arrive*, *depart*, *enter* and *exit* are two-point closed scale motion verbs (Rappaport Hovav and Levin 2010: 30). Unlike two-point closed scales, multi-point closed scales are composed of a minimum and a maximum value as well as many intermediate values (Beavers 2008; Rappaport Hovav and Levin 2010). The starting point of a motion event is understood to be associated with the minimum value, the endpoint with the maximum value, and the points in between the two points are understood as the values that the motion event may have as the figure moves along the scale. Therefore, although motion along a multi-point closed scale is also telic, the motion is usually understood as gradual and takes time, and thus, the event is durative. Examples of directed motion verbs describing gradual traversals of a closed path in English include *return*, *come*, and *go* (Rappaport Hovav and Levin 2010).

To differentiate a motion morpheme with a two-point closed scale from a motion morpheme with a multi-point closed scale in Chinese, we can look at whether a given closed scale motion morpheme allows durative adverbials. If the morpheme is compatible with a durative adverbial, it lexicalizes a multi-point scale; otherwise, it has a two-point closed scale.

As illustrated in (15), the closed scale motion morphemes 进 *jìn* 'enter' and 出 *chū* 'exit' are typically not compatible with durative adverbials that refer to the time period that a figure takes to complete the motion event, which indicates that they are two-point closed scale motion morphemes (it should be noted that sometimes examples like (15) are acceptable, but in these cases, the durative adverbials can only be understood as the time period after the motion event is completed).

(15) ?他进/出房间进/出了半个小时。
*?tā jìn/chū fángjiān **jìn/chū**-le bàn gè xiǎoshí*
3SG enter/exit room enter/exit-PFV half CLF hour
(intended) 'He has been entering/exiting the room for half an hour.'
(okay if) 'He entered the room and stayed there for half an hour. / He exited the room and stayed outside for half an hour.'

By contrast, the closed scale motion morpheme 回 *huí* 'return' usually allows a durative adverbial and can be understood in both ways: one is that a figure spends that period of time denoted by the adverbial in returning to a location, and the other is that a figure returns to a location and stays there for that period of time.

(16) 他回家回了半个小时。
*tā huí jiā **huí**-le bàn gè xiǎoshí*,
3SG return home return-PFV half CLF hour
a. 'He has been returning home for half an hour.'
b. 'He returned home and stayed there for half an hour.'

The difference between 进 *jìn* 'enter'/出 *chū* 'exit' and 回 *huí* 'return' becomes more pronounced when a 'but' clause is added. As illustrated in (17a) and (17b) respectively, (15) does not allow a 'but' clause as the two clauses are semantically incompatible, whereas (16) allows the 'but' clause, and the motion can then only be understood in the first meaning, i.e. spending a period of time in moving to a location. The 'but' clause indicates that an event of entering or exiting involves a maximal change instantaneously, and thus the change cannot be cancelled by the 'but' clause; on the contrary, a returning event does not necessarily entail arrival at the destination instantaneously.

(17) a. *他进/出房间进/出了半个小时，可是还没到房间里。
tā jìn/chū fángjiān **jìn/chū-le bàn gè xiǎoshí, kěshì hái méi dào fángjiān-lǐ*
3SG enter/exit room enter/exit-PFV half CLF hour but still NEG arrive room-inside
(intended) 'He has been entering/exiting the room for half an hour but has not arrived at the room yet.'

b. 他回家回了半个小时，可是还没到家。
*tā huí jiā **huí**-le bàn gè xiǎoshí, kěshì hái méi dào jiā*
3SG return home return-PFV half CLF hour but still NEG arrive home
'He has spent half an hour on the way returning home but has not arrived at home yet.'

As pointed out by Beavers (2012: 48), in a motion event along a scale with multiple points, a figure can stop for a while during its motion along the scale or even repeatedly backtrack toward the starting point before it arrives at the endpoint. Therefore, we can examine whether a given closed scale motion morpheme allows a figure to stop on the scale before arriving at the endpoint, and thus determine whether the morpheme has a multi-point scale. As illustrated in (18), the motion denoted by 回 *huí* 'return' allows a figure to stop on the scale of the event of returning:

(18) 他在回宿舍的路上，停下休息一会儿，又出发了。
*tā zài **huí** sùshè de lù-shàng, tíng-xià xiūxī yíhuìr, yòu chūfā le*
3SG at return dormitory NOM road-on stop-down rest a.while again set.off CRS
'He stopped on his return to the dormitory, rested for a while, and then continued returning to the dormitory.'

By contrast, for a closed scale motion morpheme lexicalizing only two points in its scale, the change from one point to the other is instantaneous, so there is no way for a figure to stop or backtrack during the motion from one point to the other.

As illustrated in (19), it is much less natural for a figure to stop during the motion events denoted by 进 *jìn* 'enter' and 出 *chū* 'exit', which again suggests that they lexicalize a two-point scale.

(19) ??他在进/出房间的路上，停下休息一会儿，又出发了。
??*tā zài **jìn/chū** fángjiān de lù-shàng, tíng-xià xiūxī yíhuìr,*
3SG at enter/exit room NOM road-on stop-down rest a.while
yòu chūfā le
again set.off CRS
(intended) 'He stopped on his way entering/exiting the room, rested for a while, and then continued entering/exiting the room.'

Recall in Chapter 2, Liu et al. (2015) adopt the phrase 到一半 *dào yíbàn* arrive half 'to the middle point' as a test to determine whether a Chinese motion morpheme encodes "Route" (i.e. the contour along which the motion is carried out). This study argues that 到一半 *dào yíbàn* arrive half 'to the middle point' is compatible with motion morphemes that are associated with a full path of motion, that is, a path with multiple points and an endpoint. Therefore, while the phrase 到一半 *dào yíbàn* arrive half 'to the middle point' is compatible with multi-point motion morphemes, it can also co-occur with manner-of-motion morphemes such as 跑 *pǎo* 'run' if a multi-point closed path is suggested by the context. Therefore, the compatibility test that involves 一半 *yíbàn* 'half' should be exercised with caution given that not all motion morphemes that are compatible with the phrase are multi-point closed. However, if a motion morpheme is already found to lexicalize a closed scale, 一半 *yíbàn* 'half' can be effectively used to determine whether the closed scale is multi-point or two-point: the latter is incompatible with 一半 *yíbàn* 'half' because a two-point closed scale only has two points (i.e. the starting and ending points) with no midpoint. As illustrated in (20), 一半 *yíbàn* 'half' occurs much more naturally with 回 *huí* 'return' than it does with 进 *jìn* 'enter' and 出 *chū* 'exit', which thus again suggests that 回 *huí* 'return' lexicalizes a multi-point closed scale and 进 *jìn* 'enter'/出 *chū* 'exit' a two-point closed scale.

(20) a. 他回宿舍回了一半，决定不回了。
*tā huí sùshè **huí**-le yíbàn, juédìng bù huí le*
3SG return dormitory return-PFV half decide NEG return CRS
'He returned halfway to the dormitory, and then decided not to go back.'

b. ??他进/出房间进/出了一半，决定不进/出了。
*tā jìn/chū fángjiān **jìn/chū**-le yíbàn, juédìng bù*
3SG enter/exit room enter/exit-PFV half decide NEG
jìn/chū le
enter/exit CRS
(intended) 'He entered/exited the room halfway, and then decided not to go into/out.'

Table 4.4 summarizes the tests that distinguish multi-point closed scale motion morphemes from two-point closed scale motion morphemes.

Table 4.4 Tests distinguishing multi-point from two-point closed scale motion morphemes

Tests	Multi-point closed scale motion morphemes	Two-point closed scale motion morphemes
Compatible with durative adverbials that refer to the period of time the motion takes	Yes	No
Allowing a figure to stop on the scale	Yes	No
Compatible with 一半 *yíbàn* 'half'	Yes	No

4.3 A further look into "special" motion morphemes

Section 4.2 proposed a set of tests to identify whether a Chinese motion morpheme lexicalizes a scale and if so, the kind of scale it lexicalizes. The morphemes associated with the same kind of scale usually behave the same way with regard to these tests. However, despite these similarities, a few Chinese motion morphemes do not align with the other morphemes of the same scale type in all aspects of their distribution. These morphemes mainly come from the category of scalar change motion morphemes, including 来 *lái* 'come, hither' /去 *qù* 'go, thither', 到 *dào* 'arrive', 过 *guò* 'cross', and 上 *shàng* 'ascend to' /下 *xià* 'descend from'. In this section, I discuss them in more detail.

4.3.1 来 *lái* 'come, hither' /去 *qù* 'go, thither'

According to Talmy (1985, 2000), deictic verbs can be analyzed as path verbs, but studies have shown that these verbs very often behave differently from other path verbs, e.g., those in Korean (Choi and Bowerman 1991) and Thai (Muansuwan 2000). Studies in Chinese often distinguish deictic morphemes 来 *lái* 'come, hither' /去 *qù* 'go, thither' from other path morphemes (e.g., Chu 2004, 2009; Lamarre 2008; Chen and Guo 2009, among many others). Chu (2004, 2009) points out that even though the deictic features of hither and thither exist in both Chinese and English, these features are much more prominent and thus, more frequently expressed in Chinese. For instance, Chu (2004: 169–170) observes that for a motion expression such as 飞出去 *fēi-chū-qù* fly-exit-thither 'fly out (away from the deictic center)', the English equivalent tends not to profile the deictic feature and describes the event as *fly out*. This study agrees with Chu (2004, 2009) that 来 *lái* 'come, hither' /去 *qù* 'go, thither' are more frequently used than their counterparts in English. In

fact, they are the most frequently used motion morphemes in Chinese according to the survey of the Novel Corpus in Chapter 2 (Table 2.3).

However, this study argues that the prominence of the deictic features is not the only, and probably not the key reason, for the high occurrence frequencies of 来 *lái* 'come, hither' /去 *qù* 'go, thither' in Chinese. Additionally, this section attempts to provide a more comprehensive discussion of 来 *lái* 'come, hither' /去 *qù* 'go, thither' in the motion domain. In addition to previous studies that usually distinguish 来 *lái* 'come, hither' /去 *qù* 'go, thither' in terms of their grammatical status, i.e. as a motion verb vs. as a verbal complement, this study will show that there is a difference in meaning and function too. More specifically, this study will highlight the semantic and syntactic distinctions between two types of 来 *lái* /去 *qù*. When a motion expression consists of multiple motion morphemes and 来 *lái* /去 *qù* occurs in the complement position (usually as the last motion morpheme of the sequence), e.g., 跑出来 *pǎo-chū-lái* run-exit-hither 'run out (toward a deictic center)' and 回房间去 *huí fángjiān qù* return-room-thither 'return to the room (away from a deictic center)', 来 *lái* /去 *qù* no longer denotes information of boundedness and punctuality, but mainly functions to provide some information of ground that is required by the preceding motion morphemes. On the other hand, when 来 *lái* /去 *qù* does not occur in the complement position of a motion morpheme sequence, e.g., when they occur as the only motion morpheme in the motion construction, they are then specific about boundedness and punctuality. For the purpose of distinguishing between these two types, this study terms the former as "complement 来 *lái* /去 *qù*" and glosses them as 'hither' and 'thither' respectively, whereas the latter are called "verbal 来 *lái* /去 *qù*" and glossed as 'come' and 'go' respectively. Table 4.5 is a summary of the distributions of 来 *lái* 'come, hither' /去 *qù* 'go, thither' in the Novel Corpus. As suggested by the data, both 来 *lái* and 去 *qù* have more than half of their occurrences as a complement, i.e. as 'hither/thither'. Table 4.6 lists the possible distributions where each meaning of 来 *lái* 'come, hither' /去 *qù* 'go, thither' is found. A more comprehensive analysis will be given in the rest of this section.

Table 4.5 Meanings and frequencies of 来 *lái* /去 *qù* in the Novel Corpus

Type	来 ***lái***		去 ***qù***	
	Freq. (%)	**Meaning**	**Freq. (%)**	**Meaning**
Verbal	83 (36.2%)	'come'	70 (40%)	'go'
Complement	146 (63.8%)	'hither'	105 (60%)	'thither'
Total	229 (100%)		175 (100%)	

Table 4.6 Meanings and distributions of 来 *lái* /去 *qù*

来 *lái* /去 *qù*	**Distribution**
Verbal 来 *lái* 'come' /去 *qù* 'go'	a. the only motion morpheme (i.e. motion verb) in a motion expression, e.g., 来北京 *lái Běijīng* come Beijing 'come to Beijing' b. "来 *lái* /去 *qù* + 到 *dào* + ground NP", e.g., 来到北京 *lái-dào běijīng* come-arrive Beijing 'come to Beijing'
Complement 来 *lái* 'hither' / 去 *qù* 'thither'	a. (i) "(motion morpheme +) motion morpheme + 来 *lái* /去 *qù*", e.g., (走)进来 *(zǒu)-jìn-lái* walk-enter-hither 'come in (by walking)'; (ii) "motion morpheme + (motion morpheme) + 来 *lái* /去 *qù*", e.g., 走(进)来 *zǒu-(jìn)-lái* run-enter-hither 'come (in) by walking' b. "(motion morpheme +) motion morpheme + ground NP + 来 *lái* /去 *qù*", e.g., (走)进教室来 *(zǒu)-jìn jiàoshì lái* walk-enter classroom hither 'come into the classroom (by walking)' c. (i) "(motion morpheme +) motion morpheme + 来 *lái* /去 *qù* + ground NP", e.g., (飞)回来北京 *(fēi)-huí-lái běijīng* fly-return-hither Beijing 'come back to Beijing (by flight)'; (ii) "motion morpheme + (motion morpheme +) 来 *lái* /去 *qù* + ground NP", e.g., 飞(回)来北京 *fēi-(huí)-lái běijīng* fly-return-hither Beijing 'fly (back) to Beijing'

4.3.1.1 来 lái *'come'* /去 qù *'go' as scalar change motion morphemes: The verbal* 来 lái /去 qù

When 来 *lái* 'come' /去 *qù* 'go' occurs as the only verb in a sentence, they behave like scalar change motion morphemes. For example, they are compatible with different types of manner modifiers, as in (21), but do not allow resultatives in dimensions other than the path, as in (22).

(21) a. 我每天走路来学校。
wǒ měitiān zǒulù ***lái*** *xuéxiào* (BCC)
1SG everyday walk come school
'I walk to school everyday.'

b. 我哥哥开车去三亚。
wǒ gēge kāi chē ***qù*** *Sānyà* (BCC)
1SG brother drive car go Sanya
'My brother drives to Sanya.'

(22) a. *他来/去累了。
tā* ***lái/qù**-lèi le*
3SG come/go-tired CRS
(intended) 'He came/went (to a place) and as a result, he became tired.'

b. *他来/去丢了鞋子。
tā* ***lái/qù**-diū-le xiézi*
3SG come/go-lose-PFV shoes
(intended) 'He came/went (to a place) and as a result, he lost his shoes.'

c. 我终于来到了学校。
wǒ zhōngyú lái-dào-le xuéxiào (BCC)
1SG finally come-arrive-PFV school
'I finally come to the school.'

However, where boundedness is concerned, 来 *lái* 'come' and 去 *qù* 'go' seem to behave differently: while 来 *lái* 'come' is more associated with a closed scale, 去 *qù* 'go' behaves more like an open scale motion morpheme. For instance, examples are found where 去 *qù* 'go' collocates the directional 向 *xiàng* 'toward' PP (23), but 来 *lái* 'come' is rarely found in this collocation.[8]

(23) a. 几个人嘻嘻哈哈地向书房去了。
jǐ gè rén xīxīhāhā dì xiàng shūfáng ***qù*** *le*
several CLF person laugh.and.talk ADV toward study go CRS
'These few people went toward the study while laughing and talking.' (BCC)

b. 辛良就到车库里开了一辆车，然后就向市里去了。
Xīnliáng jiù dào chēkù-lǐ kāi-le yī liàng chē,
NAME then arrive garage-inside drive-PFV one CLF car
ránhòu jiù xiàng shì-lǐ ***qù*** *le* (BCC)
then then toward downtown-inside go CRS
'Xin Liang then went to the garage, drove a car, and then went toward the downtown.'

Furthermore, 更 *gèng* comparative is found with 去 *qù* 'go', but typically incompatible with 来 *lái* 'come', as in (24).[9]

(24) 所以你只剩半天的时间逛巴黎，若想去得更远，可能要等下一趟
suǒyǐ nǐ zhǐ shèng bàn tiān de shíjiān guàng bālí, ruò
so 2SG only remain half day NOM time visit Paris if
xiǎng ***qù*** *de gèng yuǎn, kěnéng yào děng xià yī tàng*
want go ADV more far perhaps need wait next one CLF
'So, you are only left with half a day to visit Paris. If you want to go farther, perhaps you need to wait for the next time.' (BCC)

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8. A search in BCC (literature) for the construction "向 *xiàng* + noun + 来 *lái* /去 *qù* + 了 *le*" returned 99 instances for 去 *qù* 'go', but only two instances for 来 *lái* 'come', which indicates that 去 *qù* 'go' behaves more like an open scale motion morpheme than 来 *lái* 'come' does.

9. A search in BCC (literature) for the construction "来 *lái* /去 *qù* + 得 *de* + 更远 *gèng yuǎn* " retrieved 14 instances for 去 *qù* 'go' and zero instance for 来 *lái* 'come', which again indicates that 去 *qù* 'go' behaves more like an open scale motion morpheme than 来 *lái* 'come' does.

Given that 来 *lái* 'come' behaves more like a closed scale motion morpheme, the next question is whether the closed scale lexicalized in 来 *lái* 'come' consists of multiple points or only two points, i.e. whether the motion it denotes is durative or punctual. As shown in (25a), when 来 *lái* 'come' co-occurs with a durative phrase, the durative phrase is understood as the time period after the motion of coming is finished; on the other hand, as illustrated in (25b), the durative phrase cannot be understood as the time period during which the motion of coming takes place.[10] Both examples suggest that 来 *lái* 'come' lexicalizes a two-point closed scale, that is, a change along the scale of 来 *lái* 'come' entails the maximal change, i.e. arrival at the endpoint of the scale.

(25) a. 我都来了一个多小时了，还没人理我。
wǒ doū ***lái****-le yī gè duō xiǎoshí le, hái méi*
1SG already come-PFV one CLF more hour CRS still NEG
rén lǐ wǒ (BCC)
person pay.attention 1SG
'I have come for more than one hour, but still no one paid any attention to me.'

b. ??他来学校来了半个小时，可是还没到学校。
tā lái xuéxiào ***lái****-le bàn gè xiǎoshí, kěshì hái méi*
3SG come school come-PFV half CLF hour but still NEG
dào xuéxiào
arrive school
(intended) 'He has been coming to school for half an hour, but he has not arrived at the school yet.'

In addition to its occurrence as the only motion verb in a motion expression, 来 *lái* 'come' can precede the motion morpheme 到 *dào* 'arrive', as in (26). There are 13 instances found in the Novel Corpus (vs. 70 instances of 来 *lái* 'come' as the only

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10. In a survey of 30 native speakers of Mandarin Chinese (*female* = 15, *male* = 15, *age range* = 18–50, as of May 2018), the sentence in (25b) was rated 2.26 on average on a 5-point Likert scale, which indicates that the sentence is generally unnatural. Note that according to Nakazawa (2006), a sentence as in (i) is acceptable, which thus indicates that 来 *lái* 'come' may encode a multi-point closed scale. However, the acceptability of (i) may be attributed to the context. For example, if the first clause 'he came to school at eight' is understood as what the speaker was expecting, the whole sentence is acceptable; however, the whole sentence sounds unnatural if the first clause refers to what actually has happened.

(i) 他八点来学校，但是还没到。
tā bā diǎn ***lái*** *xuéxiào, dànshì hái méi dào*
3SG eight o'clock come school but still NEG arrive
'He came to school at eight, but he has not arrived.' (Nakazawa 2006: 290, (6))

motion verb in an expression). This study proposes that in these expressions, 来 *lái* 'come' still functions as a two-point closed scale motion morpheme, because 到 *dào* 'arrive' can be deleted without changing the acceptability and meaning of the sentence (Chapter 5 will discuss in more detail the function of 到 *dào* 'arrive' when it follows multi-point and two-point closed scale motion morphemes). However, 去 *qù* 'go' is rarely found in such an expression.[11]

(26) 有人来到我身后。
yǒurén ***lái-dào*** *wǒ* *shēn-hòu* (*Xiǎojiě*)
someone come-arrive 1SG body-behind
'Someone came behind me.'

In sum, this subsection has demonstrated that both 来 *lái* 'come' and 去 *qù* 'go' lexicalize a scale when they occur as a motion verb. However, the two verbs are associated with different types of scales: 来 *lái* 'come' with a two-point closed scale and 去 *qù* 'go' with an open scale.

4.3.1.2 来 lái *'hither'* /去 qù *'thither' as non-typical motion morphemes: The complement* 来 lái /去 qù

Table 4.5 shows that in the Novel Corpus, 63.8% of 来 *lái* and 60% of 去 *qù* occur as complements. In fact, all these 来 *lái* and 去 *qù* occur as the last morpheme in a motion expression consisting of multiple motion morphemes. This section will argue that such 来 *lái* and 去 *qù* are not typical motion morphemes in that they no longer possess the scalar properties boundedness and punctuality. Rather, the boundedness and punctuality of a motion event are determined by the motion morphemes preceding 来 *lái* /去 *qù*. This study glosses such complement 来 *lái* /去 *qù* as 'hither/thither', which thus is distinguished from 来 *lái* /去 *qù* as a motion verb, i.e. 'come/go'.[12]

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11. "去 *qù* 'go' + 到 *dào* 'arrive' + ground NP" is much less frequently used than "来 *lái* 'come' + 到 *dào* 'arrive' + ground NP" in Mainland China Mandarin. No such use is found in the Novel Corpus, and as shown in BCC (literature), in the first 200 instances of "来 *lái* /去 *qù* + 到 *dào* " sequence, there are 199 instances of 来到 *lái-dào*, but only one instance of 去到 *qù-dào*. However, 去到 *qù-dào* go-arrive is commonly found in other varieties of Mandarin such as Singapore Mandarin Chinese (Khoo and Lin 2016). Such variations may be attributed to language contact to local dominant dialects and even English, but this study will leave this issue for future discussions.

12. A number of studies have discussed the meanings and functions of 来 *lái* 'come, hither' /去 *qù* 'go, thither'. For instance, Chao (1968), Lü (1980), and Lu (1985) compare来 *lái* /去 *qù* before or after VPs, e.g., "来 *lái* /去 *qù* + VP" vs. "VP + 来 *lái* /去 *qù*". Due to space constraints, this study only provides evidence showing that complement 来 *lái* 'hither' /去 *qù* 'thither' in Modern Chinese motion expressions is no longer a typical motion morpheme (cf. Chao 1968; Lü 1980; Lu 1985), but leaves questions such as their phonetic features, syntactic status, and pragmatic functions for future discussion.

Boundedness of the complement 来 lái /去 qù

As introduced in Section 4.2, nonscalar and open scale motion morphemes do not lexicalize endpoints, so they are compatible with directional PPs. On the other hand, when occurring as the only verb in a motion expression, 来 *lái* 'come' and 去 *qù* 'go' lexicalize a closed scale and an open scale respectively; thus, directional PPs are often found with 去 *qù* 'go', but not 来 *lái* 'come'. However, when 来 *lái* 'hither' /去 *qù* 'thither' occurs as a complement to a nonscalar (e.g., 走 *zǒu* 'walk' and 跑 *pǎo* 'run' in (27)) or open scale motion morpheme (e.g., 退 *tuì* 'recede' and 升 *shēng* 'ascend' in (28)), the combination is compatible with directional PPs, which suggests that the motion event described in the combination is unbounded.

(27) a. 一个年轻的小伙子向她走来。
yí gè niánqīng de xiǎohuǒzi xiàng tā ***zǒu-lái*** (BCC)
one CLF young NOM lad toward 3SG walk-hither
'A young lad walked toward her.'

b. 他向小溪跑去。
tā xiàng xiǎo xī ***pǎo-qù*** (BCC)
3SG toward small stream run-thither
'He ran toward the stream.'

(28) a. 但是众人迎面又向她退来。
dànshì zhòngrén yíng miàn yòu xiàng tā ***tuì-lái*** (BCC)
but everyone meet face again toward 3SG recede-hither
'But everyone faced and receded toward her again.'

b. 这些烟柱笔直地向高空升去。
zhèxiē yānzhù bǐzhí de xiàng gāo-kōng ***shēng-qù*** (BCC)
these smoke straight ADV toward high-sky ascend-thither
'The straight column of smoke ascended toward the sky'

In fact, the sequence "nonscalar/open scale change motion morpheme + 来 *lái* 'hither' /去 *qù* 'thither' is highly frequently found with directional PPs. Take the commonly-used nonscalar change motion morpheme 走 *zǒu* 'walk' and the open scale motion morpheme 退 *tuì* 'recede' as examples. Among the first 100 instances of "走 *zǒu* /退 *tuì* + 来 *lái* /去 *qù*" that denote motion events (400 instances in total) in BCC (literature), more than half are found with directional PPs (i.e. PPs headed by 向 *xiàng* 'toward', 往 *wǎng* 'toward', or 朝 *cháo* 'toward'), as in Table 4.7.

Table 4.7 Frequencies of "走 *zǒu* /退 *tuì* + 来 *lái* /去 *qù*" with a directional PP

Motion morpheme	来 ***lái* 'hither'**	去 ***qù* 'thither'**
走 *zǒu* 'walk'	57 (57%)	85 (85%)
退 *tuì* 'recede'	73 (73%)	54 (54%)

Even for the instances that do not co-occur with directional PPs, there is evidence showing that the motion events are not bounded, or the information of boundedness is insignificant in expressing the motion events. For instance, 走去 *zǒu-qù* walk-thither in (29a) is modified by the adverb 一直 *yìzhí* 'continuously' which indicates that the motion has no endpoint; in (29b), the endpoint (if there is any) is not traceable from the context; and in (29c), the endpoint seems not important at all compared with the other ground 在你身边 *zài nǐ shēn-biān* at 2SG body-side 'at your side'.

(29) a. 假使我们如庸愚人们的走路，一直走去，遇见歧路不彷徨，逢见艰险不惊悸。
jiǎshǐ wǒmen rú yōngyú rén-men de zǒulù, yìzhí
suppose 1PL like foolish person-PL ADV walk still
zǒu-qù, *yùjiàn qílù bù pánghuáng, féng jiàn*
walk-hither meet crossroad NEG hesitate every.time meet
jiānxiǎn bù jīngjì (BCC)
danger NEG frightened
'Suppose we were walking like fools and continued walking, and never hesitated when we encounter crossroads, and never frightened every time we run into danger.'

b. 转眼就是烈日炎炎，洪水也早已经退去。
zhuǎn-yǎn jiù shì lièrìyányán, hóngshuǐ yě zǎo yǐjīng
turn-eye then COP scorching.sun flood also early already
tuì-qù (BCC)
recede-thither
'In the blink of an eye, the scorching sun came back, and the flood had long receded away.'

c. 刚才跟你一路走来，在你身边地那种感觉很舒服。
gāngcái gēn nǐ yī-lù ***zǒu-lái***, *zài nǐ shēn-biān de*
just.now with 2SG one-road walk-hither at 2SG body-side NOM
nà zhǒng gǎnjué hěn shūfu (BCC)
that CLF feeling very comfortable
'While walking with you all the way here just now, the feeling (I had) by your side is very comfortable.'

On the contrary, when 来 *lái* 'hither' /去 *qù* 'thither' occurs after a closed scale motion morpheme, the event denoted by the combination is bounded. For instance, 回 *huí* 'return' and 出 *chū* 'return' denote bounded events, and when they are followed by 来 *lái* 'hither' /去 *qù* 'thither', e.g., 回来 *huí-lái* return-hither and 出去 *chū-qù* exit-thither, they still denote bounded events and typically do not allow directional PPs, as in (30).

(30) a. *向房里回来
xiàng fáng-lǐ **huí-lái*
toward room-inside return-hither
b. *向房外出去
xiàng fáng-wài **chū-qù*
toward room-outside exit-thither

This is also supported by corpus investigation: in the first 100 instances of "回 *huí* 'return' /进 *jìn* 'enter' /出 *chū* 'exit' + 来 *lái* 'hither' /去 *qù* 'thither' (600 instances in total) in BCC (literature), no example is found with directional PPs.

In sum, when 来 *lái* 'hither' /去 *qù* 'thither' occurs after another motion morpheme, they lose information about the boundedness of their scales and become unspecified as to whether the motion they denote has an inherent endpoint or not. When they occur after a nonscalar change or open scale motion morpheme, the whole sequence is unbounded, whereas when they occur after a closed scale motion morpheme, the whole sequence is bounded. In other words, the boundedness of the sequence is determined by the boundedness of the motion morpheme preceding 来 *lái* 'hither' /去 *qù* 'thither'. The contrast is particularly strong with regard to 来 *lái* 'hither'. When occurring alone as a motion verb, 来 *lái* 'come' denotes a closed scale, but it becomes unspecific about boundedness when occurring after other motion morphemes.

Punctuality of the complement 来 lái /去 qù

In addition to the loss of boundedness, 来 *lái* 'hither' /去 *qù* 'thither' has also lost the feature of punctuality when they occur at the end of a motion expression. As illustrated in (29a) and (29c), when 来 *lái* 'hither' and 去 *qù* 'thither' occur after the nonscalar change motion morpheme 走 *zǒu* 'walk', both combinations denote a durative event, as they are compatible with adverbs such as 一直 *yìzhí* 'continuously' and 一路 *yī-lù* 'all the way'. Furthermore, the contrast in (31a) and (31b) also suggests that when either 来 *lái* 'hither' or 去 *qù* 'thither' co-occurs with the multi-point closed motion morpheme 回 *huí* 'return', the combination tends to be understood as a durative event, whereas the co-occurrence of 来 *lái* 'hither' /去 *qù* 'thither' and the two-point closed scale motion morpheme 进 *jìn* 'enter' gives rise to a punctual event.[13]

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13. In a survey of 30 native speakers of Mandarin Chinese (*female* = 15, *male* = 15, *age range* = 18–50, as of May 2018), on a 5-point Likert scale, the sentences in (31a) were rated on average 3.03 and 4.4 for 来 *lái* 'hither' and 去 *qù* 'thither' respectively, and the sentences in (31b) were rated on average 1.8 and 2.26 for 来 *lái* 'hither' and 去 *qù* 'thither' respectively. The contrast indicates that sentences like in (31a) are generally more acceptable than (31b).

(31) a. 他8点回学校来/去了，可是现在8:30了还没到学校。
tā 8 diǎn huí xuéxiào ***lái/qù*** *le, kěshì xiànzài*
3SG 8 o'clock return school hither/thither CRS but now
8:30 le hái méi dào xuéxiào
8:30 CRS still NEG arrive school
'He has been on the way of returning to school (toward/away from the deictic center) since 8 o'clock, but it is 8:30 already and he has not arrived yet.'

b. ??他8点进房间来/去了，可是现在8:30了还没到房间里。
??*tā 8 diǎn jìn fángjiān* ***lái/qù*** *le, kěshì xiànzài 8:30*
3SG 8 o'clock enter room hither/thither CRS but now 8:30
le hái méi dào fángjiān-lǐ
CRS still NEG arrive room-inside
(intended) 'He has been entering (toward/away from the deictic center) since 8 o'clock, but it is 8:30 already and he has not arrived yet.'

Functions of the complement 来 lái /去 qù

The examples above show that when occurring as a complement, 来 *lái* 'hither' /去 *qù* 'thither' no longer denotes information about boundedness, nor are they specific about whether the scales they lexicalize are multi-point or two-point. In other words, complement 来 *lái* 'hither' /去 *qù* 'thither' has been grammaticalized and only indicates deictic information about a motion event.

Motion morphemes such as 回 *huí* 'return', 进 *jìn* 'enter', 出 *chū* 'exit', and 过 *guò* 'cross' usually require explicitly expressed information about the reference object (cf. Ju 1992; Liu 1998; Qi 1998; Lamarre 2008). These motion morphemes can directly take a ground NP as their object. For convenience, I call these directional morphemes "transitive scalar change motion morphemes". The set of transitive scalar change motion morphemes comprises of closed scale motion morphemes.

Take 进 *jìn* 'enter' as an example. As illustrated in (32), 进 *jìn* 'enter' usually does not occur alone without any explicit ground information (32a); it can take a ground NP denoting a ground (32b); if no ground NP is present, it is usually followed by the deictic motion morpheme 来 *lái* 'hither' /去 *qù* 'thither' (32c).[14]

14. Although 到 *dào* 'arrive' is also a transitive motion morpheme, unlike other transitive motion morphemes, 到 *dào* 'arrive' cannot be followed by 来 *lái* 'hither' /去 *qù* 'thither' immediately when a locative NP is absent. Instead, 到 *dào* 'arrive' must be followed by a ground NP before it is followed by 来 *lái* 'hither' /去 *qù* 'thither'. More discussions of 到 *dào* 'arrive' can be found in Section 4.3.2 and Chapter 5.

(32) a. ?他进了。
?*tā* ***jìn*** *le*
3SG enter CRS
(intended) 'He entered (a place).'
b. 他进学校了。
tā ***jìn*** *xuéxiào le*
3SG enter school CRS
'She entered the school.'
c. 他进来/去了。
tā ***jìn-lái/qù*** *le*
3SG enter-hither/thither CRS
'She entered (a place toward/away from the deictic center).'

The constraint is also true in general when these morphemes are preceded by another motion morpheme, as in (33).

(33) a. *他跑进了。
tā* ***pǎo-jìn* *le*
3SG run-enter CRS
(intended) 'He ran into (some place).'
b. 他跑进学校了。
tā ***pǎo-jìn*** *xuéxiào le*
3SG run-enter school CRS
'He ran into to school.'
c. 他跑进来/去了。
tā ***pǎo-jìn-lái/qù*** *le*
3SG run-enter-hither/thither CRS
'He ran in (a place toward/away from the deictic center).'

Furthermore, as shown in (34), a ground NP and 来 *lái* 'hither' /去 *qù* 'thither' can co-occur after a transitive scalar change motion morpheme, usually with the ground NP preceding 来 *lái* 'hither' /去 *qù* 'thither'.[15]

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15. In Mainland China Mandarin Chinese, "motion morpheme + 来 *lái* 'hither' /去 *qù* 'thither' + ground NP" is found much less frequently than "motion morpheme + ground NP + 来 *lái* 'hither' /去 *qù* 'thither'. In the Novel Corpus, the former word order is only found in three instances, with one given in (i).

(i) 她飞去北京。
tā fēi-qù Běijīng (*Xiǎojiě*)
3SG fly-go Beijing
'She went to Beijing by taking flight.'

(34) 他(跑)进学校来/去了。
tā *(pǎo)-jìn* *xuéxiào* ***lái/qù*** *le*
3SG (run)-enter school hither/thither CRS
'He (ran and) entered school (toward/away from the deictic center).'

As shown in Table 2.3 in Chapter 2, 78 instances of 进 *jìn* 'enter' are found in the Novel Corpus. Table 4.8 below summarizes the collocation of 进 *jìn* 'enter' with ground NPs and 来 *lái* 'hither' /去 *qù* 'thither'.

Table 4.8 Collocation of 进 *jìn* with ground NPs and 来 *lái* /去 *qù* in the Novel Corpus

Collocation	**Freq. (%)**
a. (motion morpheme) + 进 *jìn* + ground NP	52 (66.7%)
b. (motion morpheme) + 进 *jìn* + 来 *lái* /去 *qù*	22 (28.2%)
c. (motion morpheme) + 进 *jìn* + ground NP + 来 *lái* /去 *qù*	3 (3.8%)
d. (motion morpheme) + 进 *jìn*	1 (1.3%)
Total	78 (100%)

Table 4.8 first suggests that 进 *jìn* 'enter' highly prefers explicitly expressed ground information. There is only one instance (1.3%) where 进 *jìn* 'enter' is not followed by a ground NP or 来 *lái* 'hither' /去 *qù* 'thither', as in (35).[16]

(35) 我关上门，她仍低头看书，我走进才发现，她在啜泣。
wǒ *guān-shàng* *mén*, *tā* *réng* *dī-tóu* *kàn* *shū*, *wǒ* *zǒu-jìn*
1SG close-up door 3SG still lower-head read book 1SG walk-enter
cái *fāxiàn*, *tā* *zài* *chuòqì* (*Xiǎojiě*)
then find 3SG PROG weep
'When I closed the door, she was still bowing down her head and reading a book. I walked into (the room) and then found she was weeping.'

According to previous studies (e.g., Hu 2010), the latter (i.e. 来 *lái* 'hither' /去 *qù* 'thither' preceding a ground NP) became less frequent than the former since the Tang Dynasty (Middle Chinese) and disappeared in the Qing Dynasty (Early Modern Chinese). However, the word order is still frequently found in other varieties of Mandarin Chinese, e.g., those spoken in Taiwan, Hong Kong, and Singapore (Khoo and Lin 2016; Lin et al. 2018). It is possible that the word order remains in some southern Chinese dialects, which then influenced these Mandarin varieties via language contact.

16. It is also likely that in (35), 进 *jìn* 'enter' is a typographic error, with its homonym 近 *jìn* 'close' being the intended word. That is, the speaker 'walked closer to her in the room' rather than 'the speaker walked into (the room)'. The evidence comes from the first clause: the speaker may have been already located inside the room before he closed the door.

Second, Table 4.8 shows that 进 *jìn* 'enter' prefers to take a ground NP directly (66.7%), and there are only three instances (3.8%) where 来 *lái* 'hither' /去 *qù* 'thither' co-occurs with a ground NP. This suggests that when a ground NP is used after the motion morpheme, since the NP expresses ground information, the ground information indicated by a co-occurring 来 *lái* 'hither' /去 *qù* 'thither' is no longer required; instead, that information can be understood as additional. In other words, the use of 来 *lái* 'hither' /去 *qù* 'thither' after a transitive scalar change motion morpheme is determined by the presence of a ground NP: 来 *lái* /去 *qù* is required if an NP is absent, and optional if the NP is present.

Table 4.5 shows that 146 out of 229 instances (63.8%) of 来 *lái* 'come, hither' and 105 out of 175 instances (60%) of 去 *qù* 'go, thither' occur in the complement position. Table 4.9 below presents the occurrence of these 来 *lái* 'hither' /去 *qù* 'thither' with respect to the presence of ground NPs. The data in Table 4.9 suggests that when a ground NP is not present, a complement 来 *lái* 'hither' /去 *qù* 'thither' is used in most motion expressions (93.3% in total: 58.0% with 来 *lái* 'hither' and 35.3% with 去 *qù* 'thither'); this is consistent with Table 4.8. On the contrary, when a ground NP is present, the majority of the motion expressions (87.4%) tend to not use complement 来 *lái* 'hither' /去 *qù* 'thither'. The data further confirms that the main function of complement 来 *lái* 'hither' /去 *qù* 'thither' is to specify ground information required by transitive motion morphemes. In other words, 来 *lái* 'hither' /去 *qù* 'thither' occurs more frequently than other motion morphemes because Chinese tends to profile the reference object in a motion event, cf. previous proposals (e.g., Chu 2004, 2009) that Chinese tends to profile deictic information. Therefore, when a ground NP is present, such deictic information becomes unnecessary, or even not preferred, for the description of a motion event.

Table 4.9 Frequencies of complement 来 *lái* /去 *qù* with respect to ground NPs in the Novel Corpus

MCVCs	**With 来 *lái* /去 *qù***		**Without 来 *lái* /去 *qù***	**Total**
	With 来 *lái*	**With 去 *qù***		
MCVCs without a ground NP	138 (58.0%)	84 (35.3%)	16 (6.7%)	238 (100%)
MCVCs with a ground NP	8 (3.5%)	21 (9.1%)	202 (87.4%)	231 (100%)
Total	146	105	218	469

4.3.1.3 *Summary*

In summary, this section discussed in detail the meanings and distributions of the deictic motion morphemes 来 *lái* 'come; hither' and 去 *qù* 'go; thither' from the scalar perspective. It is found that both 来 *lái* and 去 *qù* have two meanings and each meaning is associated with a particular syntactic distribution. Specifically, 来 *lái* and 去 *qù* are two-point closed scale and open scale motion morphemes respectively when they occur as the only motion morpheme in a motion construction (i.e. occurring as a motion verb) or occur before the motion morpheme 到 *dào* 'arrive'. This study refers to such 来 *lái* and 去 *qù* "verbal 来 *lái* /去 *qù*" and glosses them as 'come/go'. On the other hand, 来 *lái* and 去 *qù* frequently occurs as the final motion morphemes in a motion construction with multiple motion morphemes. In such instances, 来 *lái* /去 *qù* no longer functions as a typical scalar change motion morpheme. They are semantically bleached and only function to add information of reference object that is required by transitive scalar change motion morphemes. This study terms them as "complement 来 *lái* /去 *qù*" and glosses them as 'hither/thither'. In other words, complement 来 *lái* 'hither' /去 *qù* 'thither' becomes neutral in terms of boundedness and duration, and the boundedness and duration of the motion event are contributed by the preceding motion morpheme. Specifically, when 来 *lái* 'hither' /去 *qù* 'thither' occurs after a nonscalar change or an open scale motion morpheme, the motion event is unbounded, but when they occur after a closed scale motion morpheme, the event is bounded. Additionally, when 来 *lái* 'hither' /去 *qù* 'thither' occurs after a multi-point scale motion morpheme, the event is durative, but when they occur after a two-point scale motion morpheme, the event is punctual.

4.3.2 到 *dào* 'arrive'

Previous studies have observed that 到 *dào* 'arrive' differs from other path morphemes in Chinese, but no consensus has been reached with regard to whether 到 *dào* 'arrive' is a motion verb when it occurs with other motion morphemes. Despite the differences between 到 *dào* 'arrive' and other path morphemes, this study treats 到 *dào* in motion expressions as a verbal morpheme and analyzes its scalar features.

4.3.2.1 *The grammatical status of* 到 dào *'arrive'*

Previous studies disagree on the grammatical status of 到 *dào* 'arrive'. 到 *dào* 'arrive' has been treated either as a motion verb, a directional complement (satellite), or a preposition (or a coverb) depending on the different position it occurs in a sentence and different studies (cf. Chao 1968; Lü 1980; Li and Thompson 1981; Poteet 1987; Liu 1998; Lamarre 2007, 2008, 2009; Chen and Tao 2014; Yiu 2014, among many others). For example, Lamarre (2009) points out that 到 *dào* 'arrive' is a postverbal locative preposition in (36a), but an independent verb in (36b).

(36) a. 推到屋里去。
*tuī-**dào** wū-lǐ qù* (Lamarre 2009: 3, (3))
push-arrive room-inside thither
'Push [it] into the room.'
b. 到屋里去推。
***dào** wū-lǐ qù tuī* (Lamarre 2009: 3, (3'))
arrive room-inside go push
'Go into the room and push [it].'

Li and Thompson (1981: 366) propose that 到 *dào* 'arrive' in (37) is a coverb, i.e. a preposition, if the sentence means 'He has gone to London'. The authors point out that it is possible for 到 *dào* 'arrive' in (37) to function as a verb, but in such a case, the sentence is understood as a serial verb construction and means 'He arrived in London and went (somewhere).'

(37) 他到伦敦去了。
*tā **dào** lúndūn qù le* (Li and Thompson 1981: 366, (42))
3SG to London go CRS
'He has gone to London.'

Nonetheless, despite the different analysis of 到 *dào* 'arrive', when 到 *dào* 'arrive' occurs as the only motion morpheme in a sentence, as in (38), it is clearly functioning as a motion verb.

(38) 我到学校了。
*wǒ **dào** xuéxiào le* (BCC)
1SG arrive school CRS
'I've arrived at school.'

Moreover, when 到 *dào* 'arrive' occurs after another motion verb, the perfective marker 了 *-le* has to occur after 到 *dào* 'arrive' rather than the verb, e.g., 跑到了学校 *pǎo-dào-le xuéxiào* run-arrive-PFV school 'ran to school' vs. *跑了到学校 **pǎo-le-dào xuéxiào* run-PFV-arrive school. In order to provide a more comprehensive analysis and include as many motion-related morphemes as possible, this study treats 到 *dào* 'arrive' as a verbal motion morpheme, rather than a coverb or a preposition, when it occurs in motion expressions.

4.3.2.2 *The scalar features of* 到 dào *'arrive'*

According to the tests introduced in Section 4.2, 到 *dào* 'arrive' is a two-point closed scale motion morpheme, like 进 *jìn* 'enter' and 出 *chū* 'exit'. 到 *dào* 'arrive' is a scalar change morpheme in that it does not take on a variety of resultative phrases, and an arrival event denoted by 到 *dào* 'arrive' can be realized using various manners of motion, as illustrated in (39) and (40), respectively.

(39) a. *他到累了。
*tā **dào**-lèi le*
3SG arrive-tired CRS
(intended) 'He arrived and as a result, he became tired.'

b. *他到丢了鞋子。
*tā **dào**-diū-le xiézi*
3SG arrive-lose-PFV shoe
(intended) 'He arrived and as a result, he lost his shoes.'

(40) 他跑/跳/走着到了学校。
*tā pǎo/tiào/zǒu-zhe **dào**-le xuéxiào*
3SG run/jump/walk-CONT arrive-PFV school
'He arrived at school by running/jumping/walking.'

Where the boundedness of scale is concerned, 到 *dào* 'arrive' is shown to specify a closed scale. As illustrated in (41), the 更 *gèng* 'more' comparative is not allowed to co-occur with 到 *dào* 'arrive'; that is, it is not possible to express that the figure arrives at a location further away than the location he has previously arrived at.

(41) a. 他在5分钟前就到学校了,*现在应该到得更远了。
*tā zài 5 fēnzhōng qián jiù dào xuéxiào le *xiànzài*
3SG in 5 minute before then arrive school CRS now
*yīnggāi **dào** de gèng yuǎn le*
should arrive COMP more far CRS
(intended) 'He arrived at school five minutes ago; now he should have arrived farther.'

It should also be noted that an event of arriving at a location is usually understood as being instantaneous, and thus, the figure in such an event cannot stop for a while on the path to the location (42a). Furthermore, when 到 *dào* 'arrive' is modified by a duration phrase, the time period denoted by the duration phrase can only be understood as the period after the event of arrival is completed, but not the time period that a figure takes to achieve the event of arrival, as in (42b). These examples suggest that the scale lexicalized by 到 *dào* 'arrive' has only two points.

(42) a. *他到学校到了一半，停下休息一会儿，又出发了。
*tā dào xuéxiào **dào**-le yíbàn, tíng-xià xiūxī yíhuìr,*
3SG arrive school arrive-PFV half stop-down rest a.while
yòu chūfā le
again set.off CRS
(intended) 'He arrived halfway to school, stopped to rest for a while, and then continued arriving again.'

b. 我老板现在还在路上呢!我已经到了一个小时了。
wǒ lǎobǎn xiànzài hái zài lù-shàng ne! wǒ yǐjīng ***dào-le***
1SG boss now still at road-on SFP 1SG already arrive-PFV
yī gè xiǎoshí le. (BCC)
one CLF hour CRS
'My boss is still on his way! I've arrived for one hour.'

4.3.2.3 *The special features of* 到 dào *'arrive'*

However, 到 *dào* 'arrive' does not behave exactly like the other two-point closed scale motion morphemes, such as 进 *jìn* 'enter' and 出 *chū* 'exit', in terms of some facets of distribution. As introduced in Section 4.3.1, as transitive scalar change motion morphemes, 进 *jìn* 'enter' and 出 *chū* 'exit' should be accompanied by an explicit specification of the ground; they can be followed by a locative NP denoting a ground; if no locative NP is present, then they are usually followed by the complement 来 *lái* 'hither' /去 *qù* 'thither'. Like 进 *jìn* 'enter' and 出 *chū* 'exit', 到 *dào* 'arrive' typically requires explicitly expressed information about the ground. It can take a ground NP as object, as in (43).

(43) 李小兰到布帘子那边的房间接受检查。
Lǐxiǎolán ***dào*** *bù liánzi nà biān de fángjiān jiēshòu*
NAME arrive cloth curtain that side NOM room accept
jiǎnchá (*Tàiyáng*)
examination
'Li Xiaolan went to the room on the other side of the cloth curtain for examination.'

The Novel Corpus finds 48 instances of 到 *dào* 'arrive' that functions as the only motion verb in a motion expression. There is only one instance (2.1%) in which a ground NP is not explicitly expressed, as in (44). Nonetheless, the ground information (解放路 *jiěfàng lù* 'Jiefang Road') has already been introduced in the preceding sentence and is thus easily accessible to readers.[17]

17. With a supportive context, 到 *dào* 'arrive' can occur without any ground NP, as in (44). However, the Novel Corpus suggests that 到 *dào* 'arrive' tends to take a ground NP. The tendency also holds for spoken Chinese. A preliminary investigation in the spoken corpus MLC shows that in the first 1000 instances of 到 *dào* 'arrive' in conversations involving multiple speakers, there are 85 motion constructions where 到 *dào* 'arrive' is used as the only motion verb, but only two (2.4%) instances are found without a ground NP.

(44) 路是从中央农民运动讲习所旧址出发，上解放路，经由彭刘杨路到达阅马场，再转入首义路回到解放路。如果走直线，他们十分钟就到了。
lù shì cóng zhōngyāng nóngmín yùndòng jiǎngxí suǒ
road COP from central peasant movement instruct place
jiù-zhǐ chūfā, shàng Jiěfàng lù, jīngyóu Péngliúyáng lù
former-site set.off go Jiefang road via Pengliuyuan road
dào-dá mǎchǎng, zài zhuǎn-rù Shǒuyì lù huí-dào
arrive-arrive racecourse again turn-enter Shouyi road return-arrive
Jiěfàng lù. rúguǒ zǒu zhí-xiàn, tāmen shí fēnzhōng jiù ***dào***
Jiefang road if walk straight-line 3PL ten minute only arrive
le (*Tàiyáng*)
CRS
'The route starts from the former site of the Central Peasants Movement Lecture Hall, up along Jiefang Road, passing through Pengliuyang Road to arrive at the racecourse, and then turning back to Jiefang Road via Shouyi Road. If (they) walk straight across, they can arrive (on Jiefang Road) in only ten minutes.'

However, unlike 进 *jìn* 'enter' and 出 *chū* 'exit', 到 *dào* 'arrive' cannot be followed by the complement 来 *lái* 'hither' /去 *qù* 'thither' directly (Ju 1992; Qi 1998; Lamarre 2008), as in (45).[18]

(45) *他到来/去了。
tā* ***dào-lái/qù* *le*
3SG arrive-hither/thither CRS
(intended) 'He arrived (toward/away from the deictic center).'

Rather, 到 *dào* 'arrive' must be followed by a ground NP before preceding 来 *lái* 'hither' /去 *qù* 'thither', as in (46).

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18. 到来 *dào-lái* arrive-hither is frequently used in Chinese. However, when it is used as a verbal compound, it only denotes non-physical arrival, as in (i). In addition, 到来 *dào-lái* arrive-hither has become a compound in that it does not allow the potential markers 得 *de* /不 *bù*, e.g., *到得来 **dào-de-lái* arrive-POT-hither. 到来 *dào-lái* arrive-hither is understood as physical motion only when it is used as a noun, as in (ii). In contrast, 到去 *dào-qù* arrive-thither is not allowed either as a verbal construction or a noun.

(i) 新的一年到来了。
xīn de yī nián ***dào-lái*** *le* (BCC)
new NOM one year arrive-hither CRS
'A new year has come.'

(ii) 欢迎你们的到来。
huānyíng nǐmen de ***dàolái*** (BCC)
welcome 2PL NOM arrival
'(We) welcome your arrival.'

(46) a. 陈阵仍然经常到老阿爸家去。
Chénzhèn réngrán jīngcháng ***dào*** *lǎo ābà jiā* ***qù*** *(Láng)*
NAME still often arrive old dad home thither
'Chen Zhen still goes to old dad's home often.'

b. 他们是长征前的那次"扩红"到部队来的。
tāmen shì chángzhēng qián de nà cì "kuò-hóng" ***dào***
3PL COP Long.March before NOM dem CLF expand-red arrive
bùduì ***lái*** *de* *(Hóng)*
troop hither NOM
'They arrived at the troop during the expansion of red army before the Long March.'

In addition to the features introduced above with regard to complement 来 *lái* 'hither' /去 *qù* 'thither', 到 *dào* 'arrive' also behaves differently from the other two-point closed scale motion morphemes in that it can occur after all other motion morphemes. Chapter 5 will focus on the ordering of motion morphemes and discuss this feature of 到 *dào* 'arrive' in more detail.

4.3.3 上 *shàng* 'ascend to'/下 *xià* 'descend from'

上 *shàng* and 下 *xià* denote motion in the same direction as 升 *shēng* 'ascend' and 降 *jiàng* 'descend', respectively, and they are usually glossed in the same way as 升 *shēng* and 降 *jiàng*, i.e. 'ascend' and 'descend' respectively in previous studies (e.g., Lamarre 2008; Chen and Guo 2009; Yiu 2014, among others). As shown in Section 4.2, 升 *shēng* 'ascend' and 降 *jiàng* 'descend' are classified as open scale motion morphemes. 上 *shàng* and 下 *xià* also display some features of open scale motion morphemes. For instance, as illustrated in (47), both 上 *shàng* and 下 *xià* are sometimes found to be compatible with a 更 *gèng* 'more' comparative.

(47) a. 上墙怎么才能上得更高。
shàng qiáng zěnme cái néng ***shàng*** *de gèng gāo*
ascend wall how really can ascend.to COMP more high
'How can [I] ascend a wall higher?'
(http://tieba.baidu.com/f?kz=939318261)

b. 太阳慢慢地从本来就不高的位置下得更低了。
tàiyáng màn-màn de cóng běnlái jiù bù gāo de
sun slow-slow adv from original already NEG high NOM
wèizhi ***xià*** *de gèng dī le*
position descend.from COMP more low CRS
'The sun descended to a position lower than its initial position that is already not high.' (http://archjail.spaces.live.com/blog/cns!11577DDFCD02AB7F!286.entry)

However, this study argues that 上 *shàng* and 下 *xià* are more aligned with multi-point closed scale motion morphemes and should better be interpreted as 'ascend to' and 'descend from'. As (48) and (49) illustrate, 升 *shēng* 'ascend'/ 降 *jiàng* 'descend' and other open scale motion morphemes usually cannot be followed by ground NPs immediately.[19] However, 上 *shàng* 'ascend to'/ 下 *xià* 'descend from' typically requires explicitly expressed information about the reference object.[20] Therefore, they behave like other closed scale motion morphemes such as 回 *huí* 'return', 进 *jìn* 'enter', and 出 *chū* 'exit', which are transitive and require an explicit ground NP or the complement 来 *lái* 'hither' /去 *qù* 'thither' (see more in Section 4.3.1).

(48) a. 气球升*(到)了天空。
qìqiú ***shēng***-*(*dào*)-*le* *tiānkōng*
balloon ascend-(arrive)-PFV sky
'The balloon ascended into the sky.'

b. 气球降*(到)了地面。
qìqiú ***jiàng***-*(*dào*)-*le* *dì-miàn*
balloon descend-(arrive)-PFV ground-surface
'The balloon descended to the ground.'

(49) a. 他上/下了山。
tā ***shàng/xià***-*le* *shān*
3SG ascend.to/descend.from-PFV hill
'He went up/down the hill.'

---

19. 升 *shēng* 'ascend' and 降 *jiàng* 'descend' are occasionally immediately followed by a ground NP. Yet, most of these instances involve fixed phrases such as 升天 *shēng-tiān* ascend-sky 'die and go to paradise', which are often used metaphorically.

20. According to Lamarre (2009), 下 *xià* 'descend from' can take either a source NP or a goal NP as its object. For example, 二楼 *èrlóu* 'second floor' in (ia) and 海 *hǎi* 'sea' in (ib) are understood as source and goal, respectively.

(i) a. 下二楼到大厅里
xià *èrlóu* *dào* *dàtīng-lǐ*
descend.from second.floor arrive hall-inside
'go down from the second floor and go in to the hall'

b. 下海
xià *hǎi*
descend.from sea
'go into business'

However, 下海 *xià hǎi* is usually used as a fixed phrase meaning 'go into business' rather than its literal meaning 'go into the sea'. Similarly, in other examples such as 下凡 *xià fán* '(a god) descended to the world', 下地狱 *xià dìyù* 'go to hell', and 下地 *xià dì* 'go to the fields and work' where 下 *xià* takes a goal NP as object, 下 *xià* usually does not encode physical descending motion.

b. 他上/下来了。
tā ***shàng/xià****-lái* *le*
3SG ascend.to/descend.from-hither CRS
'He came up/down (toward/away from the deictic center).'

c. ?他上/下了。
?*tā* ***shàng/xià*** *le*
3SG ascend.to/descend.from CRS
(intended) 'He ascended to/descended from (a place).'

However, given that 升 *shēng* 'ascend'/ 降 *jiàng* 'descend' and 上 *shàng* 'ascend to'/ 下 *xià* 'descend from' all denote vertical motion, it is worthwhile to explore why the former cannot take ground NPs directly whereas the latter have to take a ground NP as object if there is no complement 来 *lái* 'hither' /去 *qù* 'thither'. This study hypothesizes that the requirement of ground NPs is determined by the boundedness of the scale lexicalized by Chinese motion morphemes. As shown in Section 4.3.1, all closed scale motion morphemes require explicitly expressed ground information, whereas nonscalar change and open scale motion morphemes, which are all unbounded, cannot take ground NPs directly. Therefore, given that 上 *shàng* 'ascend to' and 下 *xià* 'descend from' behave like other closed scale motion morphemes, it is more consistent to analyze them as such. In Chapter 5, I will further show that 上 *shàng* 'ascend to' /下 *xià* 'descend from' behaves in the same way as other closed scale motion morphemes when occurring in motion expressions consisting of multiple motion morphemes.

4.3.4 过 *guò* 'cross'

According to Rappaport Hovav and Levin (2010), English verbs of traversal, e.g., *cross* and *traverse*, are not typical scalar change motion verbs; although these verbs lexicalize paths, they do not specify the direction of the points ordered and thus, without context, it is not possible to tell from which side of a ground a traversal event starts. For instance, in *John crossed that street*, *cross* does not specify which side of the street John started crossing from. The Chinese motion morpheme 过 *guò* 'cross' is similar to English verbs of traversal in that it does not lexically specify in which direction the points are ordered along its path. For instance, in (50), the starting side and ending side of the street are not identifiable from the meaning of 过 *guò* 'cross'. However, this study includes 过 *guò* 'cross' in the list of closed scale motion morphemes.

(50) 两人过了马路。
liǎng rén ***guò****-le* *mǎlù* (BCC)
two person cross-PFV road
'Two people crossed the street.'

4.3.4.1 过 guò *'cross' as a closed scale motion morpheme*

According to the tests proposed in Section 4.2, 过 *guò* 'cross' has a distribution similar to other closed scale motion morphemes. First, (51) and (52) indicate that 过 *guò* 'cross' is a scalar change motion morpheme. In (51), the crossing event expressed by 过 *guò* 'cross' can take place in a variety of manners.

(51) 他跳/跑着过了街，到了对面的酒店。
tā tiào/pǎo-zhe ***guò**-le jiē, dào-le duìmiàn*
3SG jump/run-CONT cross-PFV street arrive-PFV opposite
de jiǔdiàn
NOM hotel
'He crossed the street by jumping/running and arrived at the hotel on the other side.'

Furthermore, 过 *guò* is compatible with phrases that elaborate the endpoint of an event of crossing (52a), but it typically does not allow resultatives in other domains, e.g., 累 *lèi* 'tired', as in (52b); on the contrary, a nonscalar change motion morpheme such as 游 *yóu* 'swim' can collocate with resultatives of various dimensions, as in (53).[21]

(52) a. 一只小小的水泥船悠悠地过到河埠头，接了他们两个。
yī zhǐ xiǎo-xiǎo de shuǐní chuán yōuyōu de
one CLF small-small NOM cement boat leisurely ADV
***guò**-dào hé bùtóu, jiē-le tāmen liǎng gè* (BCC)
cross-arrive river quay pick.up-PFV 3PL two CLF
'A tiny cement boat leisurely crossed the river quay and picked the two of them up.'

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21. BCC (literature) finds one instance where 过 *guò* 'cross' takes 累 *lèi* 'tired' as a resultative, as in (i). However, 过 *guò* 'cross' in this case is used metaphorically, referring to living a life by passing day by day. It should be noted that the agent does not become tired as a result of passing a single day. Instead, the agent is tired of repeating 'the passing of every single day'. It is interesting to further study motion morphemes in their metaphorical uses from a scalar perspective, but this study will leave this for future investigation.

(i) 她只是过日子过累了，找个人结婚似乎也不是个太差的主意。
tā zhǐshì ***guò** rìzi guò-lèi le, zhǎo gè rén jiéhūn sìhū yě*
3SG just pass life pass-tired CRS find CLF person get.married seem also
bù shì gè tài chà de zhǔyì (BCC)
NEG COP CLF too bad NOM idea
'She is just tired of living her life. It seems not a very bad idea to find someone and get married.'

b. ??他过累了这条桥。
??*tā* ***guò****-lèi* *le* *zhè* *tiáo* *qiáo*
3SG cross-tired CRS this CLF bridge
(intended) 'He crossed the bridge and as a result, he become tired.'

(53) a. 我游到了沙滩，人累极了。
wǒ ***yóu****-dào-le* *shātān*, *rén* *lèi-jíle* (BCC)
3SG swim-arrive-PFV beach person tired-extremely
'I swam and arrived at the shore and as a result of this, I am now extremely tired.'

b. 她游累了，上岸在太阳伞下趴着。
tā ***yóu****-lèi* *le*, *shàng* *àn* *zài* *tàiyáng* *sǎn-xià*
3SG swim-tired CRS ascend.to shore at sun umbrella-under
pā-zhe (BCC)
lie-CONT
'She became tired after swimming, went up to the shore and laid face down under the sun umbrella.'

Second, the scalar change that 过 *guò* 'cross' lexicalizes takes place in a closed scale. The locative NP taken by 过 *guò* 'cross' as its object describes the ground to be crossed. Once the entire ground is crossed, the traversal event is completed. Therefore, 过 *guò* 'cross' has a closed scale, and the length of the scale is determined by the length of the ground. As illustrated in (54), 过 *guò* 'cross' does not allow a 更 *gèng* 'more' comparative, because after the bridge is crossed (as indicated by the perfective marker 了 *-le*), the figure's motion is no longer perceived as crossing.

(54) 他在5分钟前过了大桥，*现在过得更远了。
tā *zài* *5* *fēnzhōng* *qián* *guò-le* *dà* *qiáo*, **xiànzài* ***guò*** *de*
3SG in 5 minute ago cross-PFV big bridge now cross COMP
gèng *yuǎn* *le*
more far CRS
(intended) 'He crossed the big bridge five minutes ago, and now he/she crossed further.'

4.3.4.2 *The special features of* 过 guò *'cross'*

The above has shown that 过 *guò* 'cross' denotes a scalar change, and it behaves like a closed scale motion morpheme. However, it differs from other closed scale motion morphemes in two respects.

First, 过 *guò* 'cross' is the least specific of all scalar change motion morphemes in terms of the ordering of points in the scale they lexicalize, i.e. the direction of motion. As introduced in Section 4.1, only motion morphemes expressing motion in vertical direction fully lexicalize the direction of motion, e.g., 升 *shēng* 'ascend' and 降 *jiàng* 'descend' with a direction with or against gravity. Other scalar change

motion morphemes do not lexicalize all components of their scales. For instance, 回 *huí* 'return' only specifies that a figure will return to a destination in a returning event but does not specify the exact destination that the figure returns to. Rather, in each returning event, the information about the destination is provided by the ground NP that follows 回 *huí* 'return', which then specifies the direction in which the points along the scale of 回 *huí* 'return' are ordered. For example, the points in the scale of 回 *huí* 'return' in 回家 *huí jiā* return home 'return home' are ordered in the direction of the figure's home, whereas in 回学校 *huí xuéxiào* return school 'return to school', the points are ordered in the direction of the school. Like 回 *huí* 'return', most closed scale motion morphemes take goal or source NPs as their objects, which thus specifies the direction of motion, e.g., 出 *chū* 'exit' normally takes a source NP and 进 *jìn* 'enter' a goal NP. 过 *guò* 'cross' differs from these motion morphemes in that the NP object that 过 *guò* 'cross' takes does not encode the direction of motion as it denotes the route of motion, e.g., 马路 *mǎlù* 'street' in (50).

However, this study proposes that 过 *guò* 'cross' indeed lexicalizes a scale, even though the ordering of the points along the scale of 过 *guò* 'cross' has to be determined in a context larger than the ground NP it takes as its object. Although 过 *guò* 'cross' does not inherently lexicalize the direction of motion, in a crossing event that involves a ground to be crossed, the direction is always from the side where the figure starts, to the other side of the ground. In other words, there is always a starting point and an endpoint in an event of crossing; although these points are not specified in the meaning of 过 *guò* 'cross' nor the ground NP it takes as its object, they can be retrieved from the context. For example, when (50) is provided with a larger context, as in (55), the subsequent clause suggests that the event of crossing started from the side opposite to the apartment.

(55) 两人过了马路，回到公寓楼下。
liǎng rén ***guò****-le mǎlù*, *huí-dào gōngyù lóuxià*
two person cross-PFV road return-arrive apartment downstairs
'The two of them crossed the road and returned to the downstairs of the apartment' (BCC)

(56) is another example. We can infer from the context that the event of crossing the bridge starts from the side where the speaker is located, and ends at the other side of the bridge, i.e. where the open field is located.

(56) 过了桥那边是几十丈宽的空旷场地。
guò*-le qiáo nà-biān shì jǐshí zhàng kuān de*
cross-PFV bridge that-side COP dozens CLF wide NOM
kōng-kuàng chǎngdì (BCC)
empty-wide field
'The other side crossing the bridge is a wide, open field that is dozens of feet in width.'

In sum, both verbs of traversal and other non-vertical scalar change motion morphemes such as 回 *huí* 'return' can be understood as scalar change motion morphemes that partially lexicalize their scales. The difference is that for 回 *huí* 'return', the direction of motion can be inferred from the ground NP it takes as its object, whereas for 过 *guò* 'cross', a larger context is needed.

The second special feature of 过 *guò* 'cross' is that it can take two different types of route NPs as its object. One is an NP denoting a long path/route with multiple points, e.g., a long bridge, an ocean; the other is a short, boundary-like path, e.g., a cordon or a door. Depending on the kind of NP that 过 *guò* takes as its object, 过 *guò* 'cross' behaves either like a multi-point or two-point closed scale motion morpheme. For instance, a bridge is a path that usually takes a figure some time to cross, so when 过 *guò* 'cross' takes 大桥 *dà qiáo* 'big bridge' as its object, it is understood as a multi-point closed scale motion morpheme. As illustrated in (57), 过 *guò* 'cross' is compatible with a duration phrase and describes an event in which the figure has been spending half an hour crossing the bridge.

(57) 他过大桥过了半个小时还没过完。
*tā guò dà qiáo **guò**-le bàn gè xiǎoshí hái méi guò-wán*
3SG cross big bridge cross-PFV half CLF hour still NEG cross-finish
'He had been crossing the bridge for half an hour but has not finished doing so.'

过 *guò* 'cross' can also take a boundary-like ground NP as its object, e.g., a cordon, and in these instances, it behaves like a two-point closed scale motion morpheme. For instance, because crossing a line is usually instantaneous, 过警戒线 *guò jǐngjièxiàn* cross cordon 'cross the cordon' typically does not allow a duration phrase, as in (58).

(58) ??他过警戒线过了半个小时。
*??tā guò jǐngjièxiàn **guò**-le bàn gè xiǎoshí*
3SG cross cordon cross-PFV half CLF hour
(intended) 'He has been crossing the cordon for half an hour.'

To summarize, 过 *guò* 'cross' is a closed scale motion morpheme, but it does not lexically specify whether its scale is multi-point or two-point. When 过 *guò* 'cross' takes a ground NP with a multi-point path as its object, it behaves like a multi-point closed scale motion morpheme like 回 *huí* 'return'. In contrast, when 过 *guò* 'cross' takes a boundary-like ground NP as its object, it behaves like a two-point closed scale motion morpheme like 进 *jìn* 'enter' and 出 *chū* 'exit'.

4.4 A four-way scalar classification of motion morphemes in the Novel Corpus

Recall that Chapter 2 identified all the free motion morphemes from the Novel Corpus (Table 2.3). This section presents the four-way scalar classification of these motion morphemes based on the tests proposed in Section 4.2 and the discussion of special motion morphemes in Sections 4.3. Tables 4.10–4.14 below list the motion morphemes identified in each type, along with their frequencies in the Novel Corpus.

Of the 74 free motion morphemes found in the Novel Corpus, 53 denote nonscalar change motions and 21 scalar change motions.[22] It is worth noting that the difference in the numbers of verb types is consistent with previous studies. Scalar change motion verbs are fewer in type than nonscalar change motion verbs because location and direction are the only dimensions available for spatial scales, as opposed to the many dimensions such as motor pattern, rate, contact, and medium available for nonscalar change motion verbs (Levin and Rappaport Hovav 2010; Slobin 2003, 2004; Hsiao 2009). The results also echo Chen and Guo (2009), who have identified more manner verbs (41 in total) than path verbs (12 in total). However, this study differs from their study with respect to the analysis of several morphemes. For instance, 退 *tuì* 'recede', 掉 *diào* 'fall', and 落 *luò* 'fall' are classified as manner verbs (i.e. nonscalar change) in Chen and Guo (2009), but as path verbs (i.e. scalar change) in this study.

It should be noted that even though scalar change motion morphemes are fewer in terms of type, they occur in higher frequencies. According to Tables 4.10–4.14, the frequencies of nonscalar change and scalar change motion morphemes are 478 and 1,043 respectively. In other words, even though scalar change motion morphemes are about half of nonscalar change motion morphemes in terms of type, they are twice higher than the latter in terms of frequency.

Furthermore, the survey discussed in Chapter 2 finds 477 instances of motion expressions where only one motion morpheme is used (refer to Table 2.2). As presented in Table 4.15, of these instances, 178 (37.3%) are nonscalar change motion morphemes and 299 (62.7%) are scalar change motion morphemes. Furthermore, even though 53 nonscalar change motion morphemes are free motion morphemes and able to occur alone in a motion expression, only 32 (60.4%) have been found to do so in the Novel Corpus; on the contrary, 18 out of 21 (85.7%) scalar change motion morphemes occur as the only motion verb in the Novel Corpus. These contrasts highlight that when only one motion verb is used, Chinese tends to express

22. Although the complement 来 *lái* 'hither' and 去 *qù* 'thither' are listed separately from the verbal 来 *lái* 'come' and 去 *qù* 'go', they are not counted as two independent types of motion morphemes; therefore, there are 21, instead of 23, scalar change motion morphemes in total.

path information in the verb and thus behaves more like a verb-framed language (cf. Peyraube 2006; Chen and Guo 2009; Shi and Wu 2014, among many others). Nonetheless, this study will leave the issue of event integration for future discussions.

What is more important to this study, however, is that there is also a similar number (469 instances) of motion expressions that consist of more than one free motion morpheme. Some of them are composed of both nonscalar and scalar change motion morphemes, whereas some with scalar change motion morphemes only. Therefore, it is necessary to discuss the further classification of scalar change motion morphemes and their relative word order.

Table 4.10 Nonscalar change motion morphemes identified in the Novel Corpus

No.	Nonscalar change motion morpheme	Freq.
1	走$_1$ *zǒu*$_1$ 'walk'	161
2	跑$_1$ *pǎo*$_1$ 'run'	69
3	冲 *chōng* 'rush'	43
4	赶 *gǎn* 'rush'	20
5	飞 *fēi* 'fly'	15
6	追 *zhuī* 'chase'	15
7	跳 *tiào* 'jump'	12
8	爬 *pá* 'crawl/climb'	10
9	逃 *táo* 'escape'	10
10	开 *kāi* 'drive'	8
11	踏 *tà* 'step'	8
12	渡 *dù* 'ferry'	7
13	跟 *gēn* 'follow'	6
14	跨 *kuà* 'stride'	6
15	绕 *rào* 'move around'	6
16	驶 *shǐ* 'drive'	6
17	流 *liú* 'flow'	5
18	跑$_2$ *pǎo*$_2$ 'escape'	5
19	逛 *guàng* 'stroll'	4
20	骑 *qí* 'ride'	4
21	涌 *yǒng* 'gush'	4
22	奔 *bēn* 'dash'	3
23	穿 *chuān* 'pass through'	3
24	闯 *chuǎng* 'rush'	3
25	登 *dēng* 'climb'	3
26	滚 *gǔn* 'roll'	3
27	跑$_3$ *pǎo*$_3$ 'move for certain purpose'	3
28	踩 *cǎi* 'trample'	2

(*continued*)

Table 4.10 (*continued*)

No.	Nonscalar change motion morpheme	Freq.
29	窜 *cuàn* 'flee'	2
30	灌 *guàn* 'pour'	2
31	滑 *huá* 'slide'	2
32	迈 *mài* 'stride'	2
33	喷 *pēn* 'spray'	2
34	漂 *piāo* 'float'	2
35	扑 *pū* 'throw oneself to'	2
36	渗 *shèn* 'seep through'	2
37	钻 *zuān* 'duck; dig'	2
38	蹦 *bèng* 'jump'	1
39	传 *chuán* 'transmit'	1
40	蹿 *cuān* 'leap'	1
41	颠 *diān* 'turn over'	1
42	遁 *dùn* 'escape'	1
43	翻 *fān* 'overturn'	1
44	拐 *guǎi* 'turn on a road'	1
45	溜 *liū* 'slide; sneak'	1
46	遛 *liù* 'stroll'	1
47	掠 *lüè* 'snatch'	1
48	漫 *màn* 'overflow'	1
49	攀 *pān* 'climb'	1
50	飘 *piāo* 'drift'	1
51	洒 *sǎ* 'spill'	1
52	射 *shè* 'shoot'	1
53	摔 *shuāi* 'fall'	1

Table 4.11 Open scale motion morphemes identified in the Novel Corpus

No.	Open scale motion morpheme	Freq.
1	去 *qù* 'go'	70
2	走$_2$ *zǒu*$_2$ 'leave'	21
3	掉 *diào* 'fall'	13
4	撤 *chè* 'recede'	6
5	升 *shēng* 'ascend'	6
6	落 *luò* 'fall'	5
7	退 *tuì* 'recede'	5
8	陷 *xiàn* 'sink'	4
9	散 *sàn* 'scatter'	2
10	沉 *chén* 'sink'	1
11	坠 *zhuì* 'fall'	1

Table 4.12 Multi-point closed scale motion morphemes identified in the Novel Corpus

No.	Multi-point closed scale motion morpheme	Freq.
1	回 *huí* 'return'	95
2	过 *guò* 'cross'	85
3	上$_1$ *shàng$_1$* 'ascend to'	45
4	下$_1$ *xià$_1$* 'descend from'	33
5	上$_2$ *shàng$_2$* 'go'[1]	12
6	赴 *fù* 'go'[2]	1

1. Note that when 上 *shàng* is used in a more generalized sense, i.e. 'go', it behaves more like a multi-point closed scale motion morpheme (cf. 去 *qù* 'go'). For instance, it is not compatible with 更 *gèng* 'more' comparative.
2. Like 上$_2$ *shàng$_2$* 'go', 赴 *fù* 'go' also behaves like a multi-point closed scale motion morpheme when it occurs alone as a motion verb.

Table 4.13 Two-point closed scale motion morphemes identified in the Novel Corpus

No.	Two-point closed scale motion morpheme	Freq.
1	到 *dào* 'arrive'	146
2	出 *chū* 'exit'	84
3	来 *lái* 'come'	83
4	进 *jìn* 'enter'	78

Table 4.14 Complement 来 *lái* /去 *qù* identified in the Novel Corpus

No.	Complement来 *lái* /去 *qù*	Freq.
1	来 *lái* 'hither'	146
2	去 *qù* 'thither'	105

Table 4.15 Nonscalar and scalar change motion morphemes as the only motion verb in motion constructions in the Novel Corpus

No.	Nonscalar change motion morpheme	Freq.	No.	Scalar change motion morpheme	Freq.
1	走$_1$ *zǒu$_1$* 'walk'	57	1	来 *lái* 'come'	70
2	跑$_1$ *pǎo$_1$* 'run'	38	2	去 *qù* 'go'	70
3	冲 *chōng* 'rush'	12	3	到 *dào* 'arrive'	36
4	追 *zhuī* 'chase'	9	4	回 *huí* 'return'	24
5	逃 *táo* 'escape'	7	5	走$_2$ *zǒu$_2$* 'leave'	20
6	跑$_2$ *pǎo$_2$* 'escape'	5	6	进 *jìn* 'enter'	19
7	渡 *dù* 'ferry'	5	7	上$_1$ *shàng$_1$* 'ascend to'	12
8	飞 *fēi* 'fly'	4	8	过 *guò* 'cross'	11
9	跟 *gēn* 'follow'	4	9	下$_1$ *xià$_1$* 'descend from'	11

(*continued*)

Table 4.15 (*continued*)

No.	Nonscalar change motion morpheme	Freq.	No.	Scalar change motion morpheme	Freq.
10	踏 *tà* 'step'	4	10	出 *chū* 'exit'	8
11	赶 *gǎn* 'rush'	3	11	上$_2$ *shàng*$_2$ 'go'	7
12	逛 *guàng* 'stroll'	3	12	落 *luò* 'fall'	3
13	流 *liú* 'flow'	3	13	撤 *chè* 'recede'	2
14	奔 *bēn* 'dash'	2	14	升 *shēng* 'ascend'	2
15	迈 *mài* 'stride'	2	15	赴 *fù* 'go'	1
16	漂 *piāo* 'float'	2	16	掉 *diào* 'fall'	1
17	骑 *qí* 'ride'	2	17	退 *tuì* 'recede'	1
18	跳 *tiào* 'jump'	2	18	陷 *xiàn* 'sink'	1
19	蹦 *bèng* 'jump'	1			
20	闯 *chuǎng* 'rush'	1			
21	颠 *diān* 'turn over'	1			
22	滚 *gǔn* 'roll'	1			
23	开 *kāi* 'drive'	1			
24	遛 *liù* 'stroll'	1			
25	漫 *màn* 'overflow'	1			
26	爬 *pá* 'climb'	1			
27	喷 *pēn* 'spray'	1			
28	洒 *sǎ* 'spill'	1			
29	射 *shè* 'shoot'	1			
30	驶 *shǐ* 'drive'	1			
31	涌 *yǒng* 'gush'	1			
32	跑$_3$ *pǎo*$_3$ 'move for certain purpose'	1			
	Sum (%)	178 (37.3%)		Sum (%)	299 (62.7%)

4.5 Bound motion morphemes and their scale-based classification

Recall that Chapter 2 introduced the notions of free and bound motion morphemes. In Chinese, there are motion morphemes which only function as independent verbs (e.g., 飞 *fēi* 'fly', 滚 *gǔn* 'roll', and 漂 *piāo* 'float'), and motion morphemes which can function either as independent verbs or as path satellites (or directional complements), e.g., 回 *huí* 'return', 进 *jìn* 'enter', and 到 *dào* 'arrive'. Because these morphemes can still function as independent verbs, they are analyzed as free morphemes in this study. On the contrary, there are also motion morphemes that

typically cannot occur as an independent verb. They are treated as bound morphemes in this study. For instance, 入 *-rù* 'enter' denotes the same type of motion as the free morpheme 进 *jìn* 'enter', but it typically can only occur in combination with another morpheme, whereas 进 *jìn* 'enter' can either occur alone or with another morpheme, as illustrated in (59).[23]

(59) a. 他*(跑)入了房间。
tā **(pǎo)-**rù**-le* *fángjiān*
3SG (run)-enter-PFV room
'He ran into the room.'

b. 他(跑)进了房间。
tā *(pǎo)-**jìn**-le* *fángjiān*
3SG (run)-enter-PFV room
'He ran into the room.'

This study discusses bound motion morphemes for two reasons. First, they still lexically specify manners or directions in Modern Chinese. As illustrated in (60), 跑 *pǎo* 'run' and 飘 *piāo* 'drift' are nonscalar change motion morphemes that do not specify a direction of motion, so it is the bound morphemes, 入 *-rù* 'enter' and 起 *-qǐ* 'rise', that contribute to the directional interpretation in the motion expressions. On the other hand, the bound motion morpheme 奔 *-bēn* 'dash' contributes the manner information for the expression in (61) as 进 *jìn* 'enter' and 出 *chū* 'exit' do not specify any manner information.

(60) a. 手持奥林匹克火炬的运动员将从这里跑入会场。
shǒu chí Àolínpǐkè huǒjù de yùndòngyuán jiāng cóng zhèlǐ
hand hold Olympic torch NOM athlete will from here
*pǎo-**rù** huìchǎng* (BCC)
run-enter venue
'The athlete holding the Olympic torch will enter into the venue by running from here.'

b. 此时河面飘起一层迷蒙的薄雾。
*cǐ-shí hé-miàn piāo-**qǐ** yī céng míméng de bówù*
this-time river-surface drift-rise one CLF misty NOM mist
'At this moment, a thin layer of mist drifted over the river'. (BCC)

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23. Recall that as introduced in Chapter 2, 奔 *bēn* 'dash' typically co-occurs with other motion morphemes to form a motion verb, it may occasionally occur alone in a motion expression. This study adopts a dichotomic approach in taking 奔 *bēn* 'dash' as a bound motion morpheme in general, but in the few cases where it occurs like a motion verb, it is counted a free motion morpheme.

(61) a. 她奔进一个房间里。
*tā bēn-**jìn** yí gè fángjiān-lǐ* (BCC)
3SG dash-enter one CLF room-inside
'She ran into a room.'

b. 从教室里奔出一个10岁左右的女孩。
*cóng jiàoshì-lǐ bēn-**chū** yí gè 10 suì zuǒyòu de*
from classroom-inside dash-exit one CLF 10 CLF around NOM
nǚhái (BCC)
girl
'A girl, who is about 10 years old, dashed out of the classroom.'

Second, these bound motion morphemes were independent verbs denoting directed motion in earlier stages of Chinese (see Peyraube 2006; Liang 2007; Ma 2008; Shi and Wu 2014; Shi 2015 for a diachronic description of the development of some motion morphemes in earlier stages of Chinese). A study of their distributions in Modern Chinese may shed light on other motion morphemes such as 到 *dào* 'arrive', 来 *lái* 'come, hither', and 去 *qù* 'go, thither' in Modern Chinese that are claimed by previous studies to be in the process of grammaticalization, that is, changing from more lexical morphemes to less lexical and even grammatical morphemes.

In the following, this section first gives an overview of the bound morphemes that denote motion information in Modern Chinese. It then shows that these morphemes can also be classified based on the scale information they lexicalize, and that the tests proposed in Section 4.2 can also be applied to bound motion morphemes.

4.5.1 An overview of Chinese bound motion morphemes

Ma (2008) observes that the inventory of scalar change motion morphemes in earlier stages of Chinese was much larger than that in Modern Chinese. However, many verbs used in the past have undergone changes in their grammatical status or meaning, and some verbs are no longer used. For instance, according to Ma (2008: 36–54), there was a variety of motion verbs in Old Chinese that denoted events of arrival and going: 造 *zào* 'arrive', 诣 *yì* 'arrive', 逝 *shì* 'go', 如 *rú* 'go', 适 *shì* 'go', 之 *zhī* 'go', 躅 *zhǒng* 'follow', 趋 *qū* 'rush, chase', 及 *jí* 'arrive', and 即 *jí* 'approach, arrive'. Two examples are given in (62), in which 诣 *yì* 'arrive' and 适 *shì* 'go' are used as main verbs to denote motion in the historical text *Shǐjì* (104 BCE – 91 BCE).

(62) a. 于是秦王大怒，益发兵诣赵。
*yúshì qín-wáng dà nù, yì fā bīng **yì** Zhào*
then Qin-King big angry more dispatch soldier arrive Zhao
'Then the King of Qin flew into a fury and dispatched more soldiers to Zhao.' (Old Chinese, *Shǐjì*, cited from Ma 2008: 51)

b. 孔子适周, 将问礼于老子。
kǒngzǐ ***shì*** *zhōu jiāng wèn lǐ yú Lǎozi*
NAME go Zhou intend ask rites to NAME
'Confucius went to Zhou and intended to ask Laozi about rites.'
(Old Chinese, *Shǐjì*, cited from Ma 2008: 39)

However, in Modern Chinese, many of these verbs only keep their motion meanings in frozen phrases, for instance, 如 *-rú* 'go' in 如厕 *rú-cè* 'go to toilet' and 趋 *-qū* in 趋之若鹜 *qū-zhī-ruò-wù* rush-it-like-wild.duck 'a group of people scramble for something'. Some only function as prepositions in Modern Chinese. For instance, 从 *cóng* denoted an event of following, but in Modern Chinese, it is mainly used as a source preposition. In addition, there is a group of morphemes that usually can only occur as bound morphemes in combination with another morpheme in Modern Chinese, such as 入 *-rù* 'enter' in (60a). These bound morphemes still maintain the manner or path information associated with the motion they denoted in the past. Most of these bound morphemes have corresponding independent motion verb(s) in Modern Chinese. For instance, 返 *-fǎn* and 归 *-guī* correspond to 回 *huí*, and all of them denote 'return', and 达 *-dá*, 至 *-zhì*, 临 *-lín*, 就 *-jiù*, 抵 *-dǐ* correspond to 到 *dào*, and denote 'arrive'. Table 4.16 lists the bound motion morphemes that are identified from the Novel Corpus (cf. Table 2.3 for a list of free motion morphemes from the same corpus).

Among the bound motion morphemes, some can combine with a variety of motion verbs. For instance, 入 *-rù* 'enter' can follow a diverse range of motion verbs, as shown in (63).

(63) a. 救生员也跳入水中。
*jiùshēngyuán yě tiào-**rù** shuǐ-zhōng* (BCC)
lifeguard also jump-enter water-inside
'The lifeguard also jumped into the water.'

b. 那铁锚的一半已经陷入地下。
*nà tiě-máo de yíbàn yǐjīng xiàn-**rù** dìxià* (BCC)
that iron-anchor NOM half already sink-enter underground
'Half of the anchor has already sunk into the ground.'

c. 匈奴兵全部退入城内。
*xiōngnú bīng quánbù tuì-**rù** chéng-nèi* (BCC)
Xiongnu army all recede-enter city-inside
'The entire army of Xiongnu receded into the city.'

Such bound morphemes are called "productive bound motion morphemes" in this study. In contrast, there are also bound morphemes which are relatively unproductive. For instance, 翔 *xiáng* 'fly' can only combine with a very limited set of morphemes, as in 飞翔 *fēi-xiáng* fly-fly and 翱翔 *áo-xiáng* soar-fly. It usually does not

productively composite a word with path morphemes to describe a directed motion event, e.g., *翔出 **xiáng-chū* fly-exit (intended) 'fly out' and *翔上 **xiáng-shàng* fly-ascend.to (intended) 'fly up to (a place)'.

Table 4.16 Type and token frequencies of bound motion morphemes in the Novel Corpus

Order	Bound morpheme	Freq.	Order	Bound morpheme	Freq.
1	离 *-lí* 'leave'	21	15	翔 *-xiáng* 'fly'	2
2	开 *-kāi* 'away'[1]	20	16	至 *-zhì* 'arrive'	2
3	入 *-rù* 'enter'	17	17	逐 *-zhú* 'chase'	2
4	行 *-xíng* 'walk, travel'	16	18	临 *-lín* 'arrive'	1
5	奔 *-bēn* 'dash'	14	19	就 *-jiù* 'approach'	1
6	起 *-qǐ* 'rise'[2]	13	20	徒 *-tú* 'walk'	1
7	越 *-yuè* 'cross'	9	21	抵 *-dǐ* 'arrive'	1
8	跃 *-yuè* 'jump'	5	22	拢 *-lǒng* 'gather'	1
9	达 *-dá* 'arrive; reach'	5	23	没 *-mò* 'sink'	1
10	随 *-suí* 'follow'	4	24	泳 *-yǒng* 'swim'	1
11	经 *-jīng* 'pass'	3	25	涉 *-shè* 'cross water'	1
12	返 *-fǎn* 'return'	3	26	腾 *-téng* 'gallop'	1
13	驰 *-chí* 'run fast'	3	27	蹴 *-cù* 'stride'	1
14	归 *-guī* 'return'	2	28	陨 *-yǔn* 'fall'	1

1. As introduced in Chapter 2, in Modern Chinese, 开 *kāi* can be used as a free motion morpheme and it encodes manner of motion, i.e. 'drive'. Meanwhile, 开 *kāi* can occur after another motion morpheme (i.e. as a directional complement in previous studies such as Li and Thompson (1981) and Liu (1998)), e.g., 跑开 *pǎo-kāi* run-away 'run away', and denotes a direction away from the deictic center. However, unlike the other directional bound morphemes that developed from verbs in earlier stages of Chinese, there is no solid evidence showing that 开 *kāi* was used as a verb denoting motion of leaving or departing. According to the diachronic study of 开 *kāi* by Bei and Sun (2008), in the texts where 开 *kāi* was found to denote 'away' for the first time (Early Modern Chinese), 开 *kāi* appears after another motion morpheme (e.g., 离开去 *lí kāi qù* leave away thither 'leave away' in *Zhūzi Yǔlèi* and 走开去 *zǒu kāi qù* leave away thither 'leave away' in *Niǎnyù Guānyīn*). In other words, it is difficult to tell whether 开 *kāi* in these constructions functions as a verb or a directional complement, as it is possible that the directional meaning of 开 *kāi* is only available when 开 *kāi* is used after another motion morpheme. In this sense, this study treats 开 *kāi* as a bound morpheme when it denotes direction and glosses it as 'away'.

2. When 起 *qǐ* 'rise' was an independent verb denoting spontaneous motion, it usually did not denote motion involving the figure's displacement in space, but rather a positional change from a kneeling/lying/sitting position to a standing position (i.e. self-contained motion in Talmy 2000). Therefore, such a usage of 起 *qǐ* 'rise' is not included in the discussion of this study. However, in Modern Chinese, 起 *qǐ* can also refer to 'up' in motion constructions where the figure carries out motion involving displacement, as in (i). However, such a meaning is usually only available when 起 *qǐ* 'up' occurs after another motion morpheme, so 起 *qǐ* 'up' is included in this study as a bound motion morpheme.

(i) 不时有鸟儿飞起。
bùshí *yǒu* *niǎor* ***fēi-qǐ*** (BCC)
occasionally have bird fly-rise
'Birds flew up occasionally.'

4.5.2 A scale-based classification of bound motion morphemes

The scales associated with bound motion morphemes can be identified via the tests introduced in Section 4.2. In this section, the scale structure of four bound morphemes, 奔 *-bēn* 'dash', 开 *-kāi* 'away', 越 *-yuè* 'cross', and 入 *-rù* 'enter' are used for exemplification in the following analysis.

The first test is to determine whether these four morphemes lexicalize a scale. As illustrated in (64), only 奔 *-bēn* 'dash' is incompatible with a variety of manner-of-motion morphemes.[24]

(64) a. *飞/飘/跳奔
fēi/piāo/tiào-bēn***
fly/drift/jump-dash
(intended) 'run by flying/floating/jumping'

b. 飞/飘/跳开
*fēi/piāo/tiào-**kāi***
fly/drift/jump-away
'move away by flying/floating/jumping'

c. 飞/飘/跳越
*fēi/piāo/tiào-**yuè***
fly/drift/jump-cross
'move across (some place) by flying/floating/jumping'

d. 飞/飘/跳入
*fēi/piāo/tiào-**rù***
fly/drift/jump-enter
'move into (some place) by flying/floating/jumping'

Therefore, it can be said that 奔 *-bēn* 'dash' lexicalizes a manner of motion, whereas 开 *–kāi* 'away', 越 *–yuè* 'cross', and 入 *-rù* 'enter' lexicalize a spatial scale.

Then, it is necessary to identify what kind of spatial scale is lexicalized in 开 *-kāi* 'away', 越 *-yuè* 'cross', and 入 *-rù* 'enter'. Because these morphemes do not occur alone, they are tested in combination with the nonscalar change motion morpheme 飞 *fēi* 'fly'. A nonscalar change motion morpheme does not have scale, so it will not interfere with the interpretation of the scale structure lexicalized by the bound morphemes.

The 更 *gèng* 'more' comparative test is used to determine whether the three morphemes lexicalize open scales. As shown in (65), the 更 *gèng* comparative is compatible with飞开 *fēi-kāi* fly-away, but less natural with 飞越 *fēi-yuè* fly-cross and 飞入 *fēi-rù* fly-enter, which indicates that 开 *-kāi* 'away' lexicalizes an open scale, whereas 越 *-yuè* 'cross' and 入 *-rù* 'enter' lexicalize closed scales.

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24. 飞奔 *fēi-bēn* fly-dash is acceptable only when 飞 *fēi* 'fly' functions as a modifier of 奔 *bēn* 'dash', that is, the speed of the motion denoted by 奔 *bēn* 'dash' is as fast as flying.

(65) a. 小鸟5分钟前飞开了, 现在飞开得更远了。
*xiǎo niǎo 5 fēnzhōng qián fēi-kāi le, xiànzài fēi-**kāi***
small bird 5 minute before fly-away CRS now fly-away
de gèng yuǎn le
COMP more far CRS
'The little bird flew away five minutes ago, and now it flew further away.'

b. 飞机5分钟前飞越国境了, *现在飞越得更远了。
*fēijī 5 fēnzhōng qián fēi-yuè guójìng le, *xiànzài*
plane 5 minute before fly-cross nation.boundary CRS now
*fēi-**yuè** de gèng yuǎn le*
fly-cross COMP more far CRS
(intended) 'The plane flew across the national boundary five minutes ago, and now it flew across further.'

c. 飞机5分钟前飞入旧金山机场了, *现在飞入得更远了。
fēijī 5 fēnzhōng qián fēi-rù Jiùjīnshān jīchǎng le,
plane 5 minute before fly-enter San.Francisco airport CRS
xiànzài fēi-rù** de gèng yuǎn le*
now fly-enter COMP more far CRS
(intended) 'The plane flew into the San Francisco Airport five minutes ago, and now it flew further.'

Finally, we need to determine whether 越 *-yuè* 'cross' and 入 *-rù* 'enter' lexicalize multi-point or two-point closed scales. As illustrated in (66), 飞越 *fēi-yuè* 'fly-cross' allows the durative adverbial in (66a), where the ground 海峡 *hǎixiá* 'channel' has a multi-point path; but the motion event it denotes can be instantaneous too when the ground NP is understood as a two-point scale, e.g., 警戒线 *jǐngjièxiàn* 'cordon' in (66b).

(66) a. 飞越海峡用了36分钟。
*fēi-**yuè** hǎixiá yòng-le 36 fēnzhōng* (BCC)
fly-cross straits use-PFV 36 minute
'It takes 36 minutes to fly across the straits.'

b. 在它跨越警戒线那一瞬间
*zài tā kuà-**yuè** jǐngjièxiàn nà yīshùnjiān* (BCC)
at 3SG stride-cross cordon that one.split.second
'In the second when he strode across the police cordon'

Therefore, like the corresponding free morpheme 过 *guò* 'cross' (see Section 4.3.4), 越 *-yuè* 'cross' lexicalizes a closed scale, but it does not specify whether the scale is composed of multiple points or two points.

By contrast, 入 *-rù* 'enter' lexicalizes a two-point closed scale; this is illustrated in (67), where a durative adverbial is not allowed to co-occur with 入 *-rù* 'enter'.

(67) 小鸟从窗户外飞入房间，*飞入了半个小时，还没到房间里。
*xiǎo niǎo cóng chuānghù-wài fēi-rù fángjiān, *fēi-**rù**-le bàn*
small bird from window-outside fly-enter room fly-enter-PFV half
gè xiǎoshí, hái méi dào fángjiān-lǐ
CLF hour still NEG arrive room-inside
(intended) 'The small bird flew into the room from the outside of the window; it has been flying in for half an hour, but still has not yet arrived at the room.'

4.6 Summary

This chapter introduced the notion of scale in the domain of motion. Based on their scale structure, Chinese motion morphemes were first classified into two major types, i.e. nonscalar change motion morphemes and scalar change motion morphemes, which correspond to manner-of-motion morphemes and path morphemes in the sense of Talmy (1975, 1985, 2000). This chapter then further classified scalar change motion morphemes into three types, based on the kinds of scales they lexicalize, i.e. open scale, multi-point closed scale, and two-point closed scale motion morphemes. This study also proposes a set of tests that can be used to distinguish and identify the four types of motion morphemes. The four-way scalar classification and the tests were also shown to be applicable to the bound motion morphemes in Chinese. Section 4.3 also discussed in detail several Chinese motion morphemes that do not behave in the same way as other morphemes that lexicalize the same types of scale.

It is beyond the scope of this study to test the scale structure of every existing motion morpheme in Chinese. However, the tests proposed in this chapter are expected to determine which type an individual motion morpheme falls into, and thus to be able to classify all Chinese motion morphemes into the four types based on their scale structure. Given that the scale structure of all individual Chinese motion morphemes can be determined, it is now possible to move on and analyze the distributions of motion morphemes in all types of motion expressions, especially for those consisting of multiple motion morphemes.

CHAPTER 5

Ordering Chinese motion morphemes

Chapter 4 has shown that Chinese motion morphemes can be classified into four types according to the type of scale they lexicalize: nonscalar change motion morphemes (e.g., 跑 *pǎo* 'run'), open scale motion morphemes (e.g., 退 *tuì* 'recede'), multi-point closed scale motion morphemes (e.g., 回 *huí* 'return'), and two-point closed scale motion morphemes (e.g., 进 *jìn* 'enter'). As introduced in Chapter 2, in Chinese, two or more motion morphemes, either lexicalizing the same type or different types of scale, can frequently co-occur in a motion expression. For instance, 跑 *pǎo*, a nonscalar change motion morpheme, and 进 *jìn*, a two-point closed scale motion morpheme, can occur together in 跑进房间 *pǎo-jìn fángjiān* run-enter room 'run into the room'. This chapter will generalize the ordering of Chinese motion morphemes within a Motion Morpheme Hierarchy that is based on the scale structure of motion morphemes. As verified by a corpus study, the proposed hierarchy is able to account for almost all motion expressions in the corpus. There are also a few motion expressions whose order is not handled by the hierarchy. This chapter will introduce these expressions and show that the predicting power of the hierarchy is not challenged by these expressions. This chapter will also go beyond the generalization of the ordering of motion morphemes, and probe into the semantic motivations of the Motion Morpheme Hierarchy. This study proposes that the morpheme with more specific path information tends to occur after the morpheme with less specific path information. I term such a constraint as the "Scalar Iconicity Constraint". The constraint not only provides better coverage of the data involving Chinese motion expressions, but also highlights the role that the path information a motion morpheme lexicalizes plays in the morpheme's distribution.

5.1 Collocation of motion morphemes in Chinese

As shown in Chapter 2, a motion expression in Chinese can be composed of different numbers of motion morphemes. Where scalar information is concerned, these co-occurring morphemes can be associated with the same or different scales. In this section, I give an overview of the order of motion morphemes and present more examples which might suggest that a generalization over the morpheme order in the expressions cannot be easily formulated.

In a two-morpheme motion expression consisting of a nonscalar change motion morpheme and a scalar change motion morpheme, it is very often that the nonscalar change morpheme precedes the scalar change morpheme, as illustrated in (1–3). Such collocations have been observed in previous studies and analyzed as resultative verbal compounds (e.g., Li and Thompson 1981, among others).

(1) Nonscalar change + open scale
a. 焰夜叉如断线凤筝飞退。
*Yànyèchā rú duàn-xiàn fèngzhēng **fēi-tuì*** (BCC)
NAME like break-line kite fly-recede
'Yan Yecha flew away like a broken kite.'
b. *退飞
tuì-fēi*
recede-fly

(2) Nonscalar change + multi-point closed scale
a. 大鸟飞回屋顶。
*dà niǎo **fēi-huí** wūdǐng* (BCC)
big bird fly-return roof
'The big bird returned to the roof by flying.'
b. *回飞屋顶
huí-fēi *wūdǐng*
return-fly roof

(3) Nonscalar change + two-point closed scale
a. 一只小鸟飞进了赛场。
*yì zhī xiǎo niǎo **fēi-jìn**-le sàichǎng* (BCC)
one CLF small bird fly-enter-PFV stadium
'A small bird flew into the stadium.'
b. *进飞赛场
jìn-fēi *sàichǎng*
enter-fly stadium

However, as illustrated by 流回 *liú-huí* flow-return and 回流 'flow' *huí-liú* return-flow in Chapter 1, a nonscalar change motion morpheme does not necessarily always precede a scalar one. Another example is given in (4), where the nonscalar change motion morpheme 滑 *huá* 'slide' and the scalar change motion morpheme 下 *xià* 'descend from' are found to occur in both orders.

(4) a. 一滴冷汗正顺着他的额头缓缓地下滑
yī dī lěnghàn zhèng shùnzhe tā de étóu huǎnhuǎn
one CLF cold.sweat PROG along 3SG NOM forehead slowly
*de **xià-huá*** (BCC)
ADV descend.from-slide
'A drop of cold sweat is slowly sliding down along his forehead.'

b. 两滴泪水也滑下眼眶
liǎng dī lèishuǐ yě ***huá-xià*** *yǎnkuàng* (BCC)
two CLF tear also slide-descend.from eye
'Two drops of tear also slid down from the eyes.'

The word order seems to be even more difficult to predict when two scalar change motion morphemes co-occur. Take (5) and (6) as examples: the scalar change motion morpheme 回 *huí* 'return' must follow the other scalar change motion morpheme 落 *luò* 'fall', but must precede 到 *dào* 'arrive', which is also a scalar change motion morpheme.

(5) a. 抛物体会落回地球。
pāowùtǐ huì ***luò-huí*** *dìqiú* (BCC)
parabolic will fall-return earth
'The parabolic will fall back to the earth.'
b. *回落地球
**huí-luò dìqiú*
return-fall earth

(6) a. 两人沉默的回到营地。
liǎng rén chénmò de ***huí-dào*** *yíngdì* (BCC)
two person silently ADV return-arrive camp
'The two of them returned to the camp silently.'
b. *到回营地
**dào-huí yíngdì*
arrive-return camp

In addition, two scalar change motion morphemes lexicalizing similar directions may occur together in an expression. However, despite the similar directions expressed in these morphemes, they are not allowed to appear in just any order. For instance, both 退 *tuì* 'recede' and 回 *huí* 'return' lexicalize motion going back to the source location, but only 退 *tuì* 'recede' can precede 回 *huí 'return'*, and not the other way around, as in (7).

(7) a. 官兵从锦鲤一带退回城中。
guānbīng cóng Jǐnlǐ yīdài ***tuì-huí*** *chéng-zhōng* (BCC)
army from Jinli district recede-return city-inside
'The troops receded into the city from Jinli district.'
b. *回退城中
**huí-tuì chéng-zhōng*
return-recede city-inside

Furthermore, the co-occurring scalar change motion morphemes do not always occur in a fixed order. Some scalar change motion morphemes are found in both orders too, as illustrated by 升 *shēng* 'ascend' and 上 *shàng* 'ascend to' in (8).

(8) a. 两颗照明弹升上天空。
liǎng kē zhàomíng dàn ***shēng-shàng*** *tiānkōng* (BCC)
two CLF flare bomb ascend-ascend.to sky
'Two flare bombs ascended to the sky.'

b. 闪光弹还在徐徐上升。
shǎnguāng dàn hái zài xúxú ***shàng-shēng*** (BCC)
flare bomb still PROG slowly ascend.to-ascend
'The flare bomb is still ascending slowly.'

There are also a few motion morphemes that seem to be able to occur after all other motion morphemes. 到 *dào* 'arrive' is one of such motion morphemes. As illustrated in (9), 到 *dào* 'arrive' can occur after the nonscalar change 跑 *pǎo* 'run', the open scale 退 *tuì* 'recede', the multi-point closed scale 回 *huí* 'return', and the two-point closed scale 进 *jìn* 'enter'.

(9) 他跑/退/回/进到学校。
*tā pǎo/tuì/huí/jìn-**dào** xuéxiào*
3SG run/recede/return/enter-arrive school
'He ran to/receded to/returned to/entered the school.'

Like 到 *dào* 'arrive', the complement 来 *lái* 'hither' /去 *qù* 'thither' also can occur after all the different types of motion morphemes, as introduced in Chapter 4.

(10) a. 他跑/退/回/进来了。
*tā pǎo/tuì/huí/jìn-**lái** le*
3SG run/recede/return/enter-hither CRS
'He ran/receded/returned/entered (toward the deictic center).'

b. 他跑/退/回/进去了。
*tā pǎo/tuì/huí/jìn-**qù** le*
3SG run/recede/return/enter-thither CRS
'He ran/receded/returned/entered (away from the deictic center).'

However, as introduced in Chapter 4, 到 *dào* 'arrive' cannot immediately precede complement 来 *lái* 'hither' /去 *qù* 'thither'; rather, it must be immediately followed by a ground NP before preceding 来 *lái* 'hither' /去 *qù* 'thither'. (11) consists of two examples repeated from Chapter 4.

(11) a. 陈阵仍然经常到老阿爸家去。
*Chénzhèn réngrán jīngcháng **dào** lǎo-ābà jiā **qù*** *(Láng)*
NAME still often arrive old-dad home thither
'Chen Zhen still goes to old dad's home frequently.'

b. 他们是长征前的那次"扩红"到部队来的。
tāmen shì chángzhēng-qián de nà cì "kuò-hóng" ***dào***
3PL COP Long.March-before NOM that CLF expand-red arrive
bùduì ***lái*** *de* *(Hóng)*
troop hither NOM
'They arrived at the troop during the expansion of red army before the Long March.'

In expressions consisting of more than two motion morphemes, the morphemes are to appear in a particular order as well. As illustrated in (12), 飘 *piāo* 'drift' must be followed by 落 *luò* 'fall', and then by 到 *dào* 'arrive'.

(12) a. 白雪飘落到了地面。
báixuě ***piāo-luò-dào****-le* *dìmiàn* (BCC)
white.snow drift-fall-arrive-PFV ground
'White snow drifted and fell onto the ground.'
b. *飘到落/*落飘到/*落到飘/*到落飘/*到飘落
**piāo-dào-luò/*luò-piāo-dào/*luò-dào-piāo/*dào-luò-piāo/*dào-piāo-luò*
drift-arrive-fall/fall-drift-arrive/fall-arrive-drift/arrive-fall-drift/arrive-drift-fall

In sum, when a nonscalar change motion morpheme and a scalar change motion morpheme co-occur in a motion expression, the former very often precedes the latter. However, the word orders can be reversed and enough examples of such a case can be found to show that the reversal is not simply a minor exception to the rule. Furthermore, the various orderings in motion expressions consisting of scalar change motion morphemes indicate that the two-way classification of motion morphemes into manner-of-motion and path morphemes (or nonscalar change and scalar change motion morphemes) is not sufficiently fine-grained to provide a comprehensive account of the possible orders. It is therefore necessary to investigate and find out if there is a better generalization for the ordering, and if so, what motivation that the generalization is based on.

5.2 Generalizing the morpheme order: The Motion Morpheme Hierarchy

This section will show that the order of motion morphemes in a multi-morpheme compound verb construction (MCVC) is closely associated with the types of scale that these morphemes lexicalize. More specifically, their order can be characterized using a Motion Morpheme Hierarchy consisting of the four types of motion morphemes that emerged based on the scale they lexicalize:

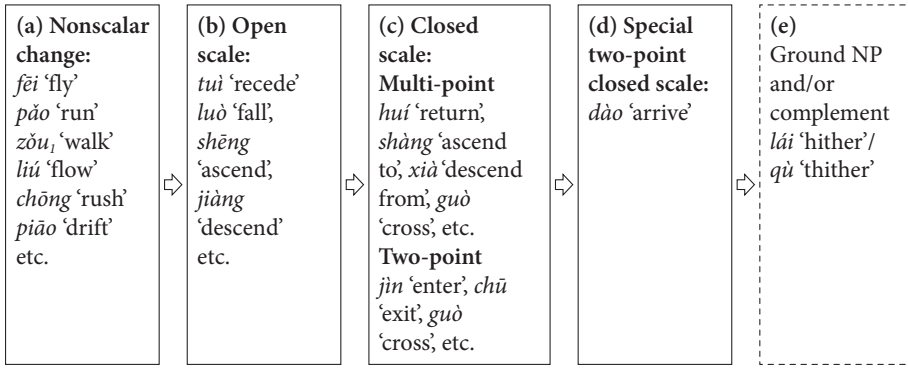

Figure 5.1 The Motion Morpheme Hierarchy

The Motion Morpheme Hierarchy predicts that when semantically compatible motion morphemes from different scalar classes co-occur in a motion expression, they will be ordered from left to right according to the position of their types in the hierarchy shown in Figure 5.1. Before going into the details of how the hierarchy operates, I first introduce three features of the hierarchy that may need to be noted.

First, because a multi-point and a two-point closed scale motion morpheme usually do not occur together in a motion expression (see discussions of the possible reasons in Section 5.4) and both occur in the same position in sequences of multiple motion morphemes, these two types are not differentiated in the hierarchy; instead, they are grouped together as one type in the hierarchy, i.e. closed scale motion morphemes.

Second, the two-point closed scale motion morpheme 到 *dào* 'arrive' is treated as a special motion morpheme and positioned after the other motion morphemes in the hierarchy because 到 *dào* 'arrive' can occur after all other motion morphemes, including the other two-point closed scale motion morphemes such as 进 *jìn* 'enter' and 出 *chū* 'exit'.

Third, as introduced in Chapter 4, there are two types of 来 *lái* and 去 *qù*: the first is used as typical motion morphemes and glossed as 'come/go', whereas the second type occurs in the complement position, losing information about boundedness and punctuation, and is therefore glossed as 'hither/thither'. As observed in the Novel Corpus, when 来 *lái* and 去 *qù* refer to 'come' and 'go' respectively, they usually occur as the only motion morpheme in a motion expression, with some examples of 来 *lái* 'come' being followed by the special motion morpheme 到 *dào* 'arrive'. In addition to their tendency to occur alone, 来 *lái* 'come' and 去 *qù* 'go' lexicalize deictic meanings, which semantically differs from the other scalar change motion morphemes. Taking into consideration their distributions and meanings, 来 *lái* 'come' and 去 *qù* 'go' are not included in the Motion Morpheme Hierarchy. On the other hand, as introduced in Chapter 4, the complement 来 *lái* 'hither' /去 *qù* 'thither' is usually required to occur when a ground NP is absent, but optional to occur when a ground NP is present.

The hierarchy places "Ground NP and/or complement 来 *lái* 'hither' /去 *qù* 'thither' at the end as they are used to complete a motion construction in Chinese. Nonetheless, given that complement 来 *lái 'hither'* / 去 *qù* 'thither' is no longer a typical motion morpheme and their position in a motion construction is fixed, the rest of this section will mainly discuss the ordering of the motion morphemes in (a-d) in Figure 5.1.

5.2.1 The operation of the Motion Morpheme Hierarchy

Chapter 4 has shown that complement 来 *lái* 'hither' and 去 *qù* 'thither' are not typical motion morphemes. Therefore, if we do not count them as motion morphemes, the motion construction consisting of a non-deictic motion morpheme and a complement 来 *lái* /去 *qù* (e.g., 回来 *huí-lái* return-hither 'return (toward the deictic center)') is treated as a one-morpheme (回 *huí* 'return') motion construction, whereas expressions such as 跑进房间来 *pǎo-jìn fángjiān lái* run-enter room hither 'run into the room (towards the deictic center)' and 飘落回去 *piāo-luò-huí-qù* drift-fall-return-thither 'drift down back (away from the deictic center)' are treated as two-morpheme (跑 *pǎo* and 进 *jìn* 'enter') and three-morpheme (飘 *piāo* 'drift', 落 *luò* 'fall', and 回 *huí* 'return') MCVCs, respectively. In the following, I first provide examples of two-morpheme MCVCs to illustrate how the hierarchy can be used to predict morpheme order. Then, I present examples of MCVCs with three or more motion morphemes.

5.2.1.1 *The Motion Morpheme Hierarchy and two-morpheme MCVCs*

In a construction consisting of two motion morphemes, the first morpheme tends to come from a type that is located on the left of the type the second morpheme comes from in the Motion Morpheme Hierarchy. In Figure 5.1, we see that nonscalar change motion morphemes occupy the leftmost position of the hierarchy, and therefore, a morpheme such as 飞 *fēi* 'fly', which is from this particular type, is predicted to precede any motion morphemes that belong to the other types in the hierarchy, as long as these morphemes are semantically compatible. As illustrated in (1–3), repeated here as (13–15), there are attested examples of 飞 *fēi* 'fly' preceding the open scale 退 *tuì* 'recede', the multi-point closed scale 回 *huí* 'return', the two-point closed scale 进 *jìn* 'enter'. In addition, as in (16), 飞 *fēi* 'fly' also precedes the special motion morphemes 到 *dào* 'arrive'. The reverse orders of these consequences, however, are not acceptable.

(13) a. 焰夜叉如断线凤筝飞退。
*Yànyèchā rú duàn-xiàn fèngzhēng **fēi-tuì*** (BCC)
NAME like break-line kite fly-recede
'Yan Yecha flew away like a broken kite.'

b. *退飞
tuì-fēi*
recede-fly

(14) a. 大鸟飞回屋顶。
*dà niǎo **fēi-huí** wūdǐng* (BCC)
Big bird fly-return roof
'The big bird flew back to the roof.'

b. *回飞屋顶
**huí-fēi wūdǐng*
return-fly roof

(15) a. 一只小鸟飞进了赛场。
*yì zhī xiǎoniǎo **fēi-jìn**-le sàichǎng* (BCC)
one CLF small-bird fly-enter-PFV stadium
'A small bird flew into the stadium.'

b. *进飞赛场
**jìn-fēi sàichǎng*
enter-fly field

(16) a. 突然有一只小鸟飞到那棵树上。
*tūrán yǒu yì zhī xiǎo niǎo **fēi-dào** nà kē shù-shàng*
suddenly have one CLF small bird fly-arrive that CLF tree-on
'A bird flew up to the tree suddenly.' (BCC)

b. *到飞那棵树上
**dào-fēi nà kē shù-shàng*
arrive-fly that CLF tree-on

Similarly, the class of open scale motion morphemes appears to the left of the class of closed motion morphemes (both multi-point and two-point) and the special morpheme 到 *dào* 'arrive'. Therefore, an open scale motion morpheme, e.g., 退 *tuì* 'recede', is predicted to precede morphemes from the latter, but not vice versa, as in (17–19).

(17) a. 她从窗边退回屋内，继续等待。
*tā cóng chuāng-biān **tuì-huí** wū-nèi jìxù děngdài*
3SG from window-side recede-return house-inside continue wait
'She went back into the house from the side of the window and continued waiting.' (BCC)

b. *回退屋内
**huí-tuì wū-nèi*
return-recede house-inside

(18) a. 康得言等慌忙退进屋内，关上门。
*Kāngdéyán děng huāngmáng **tuì-jìn** wū-nèi*
NAME others hurriedly recede-enter house-inside
guān-shàng mén (BCC)
close-up door
'Kang Deyan and others went back into the house hurriedly and closed the door.'

b. *进退屋内
*jìn-tuì wū-nèi
enter-recede house-inside

(19) a. 西门耀连忙退到父亲身后。
Xīménɣào liánmáng **tuì-dào** fùqīn shēn-hòu (BCC)
NAME promptly recede-arrive father body-behind
'Ximen Yao went behind his father immediately.'

b. *到退父亲身后
*dào-tuì fùqīn shēn-hòu
arrive-recede father body-behind

Finally, as the hierarchy predicts, although closed scale motion morphemes usually do not co-occur, they can occur before the special closed scale motion morpheme 到 *dào* 'arrive', as in (20–22).[25]

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25. The two-point closed scale motion morpheme 出 *chū* 'exit' in Modern Mandarin Chinese usually takes a source NP as its object, whereas 到 *dào* 'arrive' takes a goal NP as its object. Therefore, the two motion morphemes are not expected to co-occur and share one ground NP. However, some examples of 出到 *chū-dào* exit-arrive followed by a ground NP are found the BCC corpus, such as (22). In these examples, the ground NP is understood as the goal of the arrival event, but not the source of the exiting event. In other words, the source NP is not explicitly expressed, although it can be inferred from the context. For example, the source of the exiting event in (22) is shrine.

As introduced in Chapter 3, some studies (e.g., Levin et al. 2009; Nikitina 2008; Tham 2013) observe that in English and Chinese, the sequence "manner-of-motion verb + non-directional preposition PP" can have a directional goal reading. These studies propose that the reading does not come from the manner-of-motion verb, but from the context, and usually is only possible when the path of the motion event is short. Take *jump on the bed* from Levin et al. (2009) as an instance. The authors point out that only if the moving object is standing right beside the bed, can *on* have the meaning of *onto*. The proposal can also be applied to explaining the interpretation of the NP after 出到 *chū-dào* exit-arrive. When 出 *chū* 'exit' and 到 *dào* 'arrive' co-occur and take a locative NP, the path from exiting a source location to the arrival at the goal location is typically very short. The goal is usually right outside the source of the exiting event. For example, (i) is much more acceptable than (ii). This may explain why 出到 *chū-dào* exit-arrive is occasionally found in natural language use.

(i) ?(从房里)出到房外
? *(cóng fáng-lǐ)* ***chū-dào*** *fáng-wài*
from house-inside exit-arrive house-outside
'exit (the house) and arrive at the outside of the house'

(ii) ??(从家里)出到学校
?? *(cóng jiā-lǐ)* ***chū-dào*** *xuéxiào*
from house-inside exit-arrive school
(intended) 'exit (the house) and arrive at the school.'

(20) a. 两人一起回到学校。
liǎng rén yīqǐ ***huí-dào*** *xuéxiào* (BCC)
two person together return-arrive school
'The two returned to school together.'
b. *到回学校
*****dào-huí*** *xuéxiào*
arrive-return school

(21) a. 他们进到一个办公室模样的房间。
tāmen ***jìn-dào*** *yí gè bàngōngshì múyàng de fángjiān*
3PL enter-arrive one CLF office look NOM room
'They entered a room that looks like an office.' (BCC)
b. *到进一个房间
*****dào-jìn*** *yí gè fángjiān*
arrive-enter one CLF room

(22) a. 大家又出到神厅外面来坐。
dàjiā yòu ***chū-dào*** *shéntīng wàimiàn lái zuò* (BCC)
everyone again exit-arrive shrine outside come sit
'Everyone came out to the exterior of the shrine again to sit.'
b. *到出神厅外面
*****dào-chū*** *shéntīng wàimiàn*
arrive-exit shrine outside

The above examples in this section show that both multi-point and two-point closed scale motion morphemes can follow nonscalar change and open scale motion morphemes. However, the two types of closed scale motion morphemes usually do not occur together in a motion expression. Take the multi-point closed scale 回 *huí* 'return' and the two-point closed scale 进 *jìn* 'enter' as examples. Neither ??回进房间 ??*huí-jìn fángjiān* return-enter room nor ??进回房间 ??*jìn-huí fángjiān* enter-return room is naturally acceptable in Chinese. Therefore, these two types are grouped together as "closed scale motion morphemes" in the hierarchy. However, this does not mean the differentiation of multi-point and two-point is not meaningful. First, as demonstrated in Chapter 4, motion morphemes lexicalizing these two types of scales exhibit different syntactic behaviors with respect to duration. Second, even though in Modern Chinese, a multi-point and two-point scalar change morpheme typically do not co-occur, such collocations are quite frequently found in earlier stages of Chinese, and in these examples, they mainly follow the order where the multi-point precedes the two-point closed scale change motion morphemes, e.g., 回进书房 *huí-jìn shūfáng* return-enter study 'return and enter the study' and 回出宫来 *huí-chū gōng lái* return-exit palace hither 'return from the palace (toward a deictic center)'. Therefore, the distinction between multi-point and two-point closed scale motion morphemes may contribute to the study of the motion construction

in earlier stages of Chinese. Third, as will be discussed in Chapter 6, the distinction is significant for the aspectual classification of verbs in other domains too.

Another point worth noting is that the distribution of 上 *shàng* 'ascend to'/ 下 *xià* 'descend from' resembles those of multi-point closed scale motion morphemes such as 回 *huí* 'return', which again suggests that they should be categorized as closed scale motion morphemes. For instance, 上 *shàng* 'ascend to' / 下 *xià* 'descend from' usually does not co-occur with other closed scale motion morphemes except for 到 *dào* 'arrive', as in (23); and 上 *shàng* 'ascend to' / 下 *xià* 'descend from' can occur after semantically compatible open scale motion morphemes such as 退 *tuì* 'recede', as in (24).

(23) a. *回上/下二楼
**huí-shàng/xià* *èr-lóu*
return-ascend.to/descend.from two-floor
(intended) 'return up/down to the second floor'

b. *上/下回二楼
**shàng/xià-huí* *èr-lóu*
ascend.to/descend.from-return two-floor
(intended) 'ascend/descend back to the second floor'

c. 上/下到二楼
shàng/xià-dào *èr-lóu*
ascend.to/descend.from-arrive two-floor
'go up/down to second floor'

(24) a. 晟军第一道防线开始崩溃，纷纷退上山坡。
Shèng jūn dìyī dào fáng-xiàn kāishǐ bēngkuì fēnfēn
NAME army first CLF defensive-line begin collapse in.succession
tuì-shàng *shānpō* (BCC)
recede-ascend.to hillside
'The first defensive line of the Sheng army began to collapse and they started receding up the hillside in succession.'

b. 两人小心地退下楼梯。
liǎng rén xiǎoxīn de ***tuì-xià*** *lóutī* (BCC)
two person careful ADV decede-descend.from staircase
'The two went down from (upstairs) the staircase carefully.'

5.2.1.2 *The Motion Morpheme Hierarchy and MCVCs with more than two morphemes*

In motion expressions consisting of three motion morphemes, the order of the three morphemes from left to right is expected to follow the hierarchy from left to right as well. For instance, (25a) is a motion expression with three motion morphemes 飘 *piāo* 'drift', 落 *luò* 'fall', and 回 *huí* 'return', and they conform to the prediction by

the hierarchy in the order "nonscalar change + open scale + closed scale", whereas the morphemes 退 *tuì* 'recede', 回 *huí* 'return', and 到 *dào* 'arrive' in (25b) are in the order "open scale + closed scale + special motion morpheme 到 *dào* 'arrive'", which is also expected from the hierarchy.

(25) a. 龙跃宝身形飘落回高丝身旁。
*Lóngyuèbǎo shēnxíng **piāo-luò-huí** Gāosī shēn-páng* (BCC)
NAME figure drift-fall-return NAME body-side
'Long Yuebao returned to the Gao Si's side by floating down.'

b. 一班警察退回到了公路上。
*yì bān jǐngchá **tuì-huí-dào**-le gōnglù-shàng* (BCC)
one CLF police recede-return-arrive-PFV high.way-on
'The group of police officers returned back to the highway.'

MCVCs with four motion morphemes are rarely found, but their orders also tend to be consistent with the hierarchy. As shown in (13a) from Chapter 2, repeated here as (26a), the sequence 飘落回到 *piāo-luò-huí-dào* drift-fall-return-arrive is in an order of "nonscalar change + open scale + (multi-point) closed scale + special motion morpheme 到 *dào* 'arrive'. Another example of four-morpheme MCVCs, which is from Liu et al. (2015: 506), is given in (26b). The relative order of these four morphemes also conforms to the hierarchy: "nonscalar change + open scale + (two-point) closed scale + special motion morpheme 到 *dào* 'arrive'".

(26) a. 等树老了，树叶飘落回到根部。
*děng shù lǎo le, shùyè **piāo-luò-huí-dào** gēnbù*;
wait tree old CRS leaf drift-fall-return-arrive root
'When the tree becomes old, the leaves will drift and fall back to the root.'
(https://zhidao.baidu.com/question/364005776.html)

b. 球滚落进到洞里。
*qiú **gǔn-luò-jìn-dào** dòng-lǐ* (Liu et al. 2015: 506 (2b))
ball roll-fall-enter-arrive hole-inside
'The ball rolled-fell into the hole.'

5.2.1.3 *The Motion Morpheme Hierarchy and the ordering of bound motion morphemes*

It should be mentioned that even though the Motion Morpheme Hierarchy is proposed for the ordering of free motion morphemes, it applies to the order of bound motion morphemes as well. (27) are examples with bound motion morphemes. The ordering of these bound morphemes is consistent with the hierarchy: in (27a), the two-point closed 入 -rù 'enter' follows the nonscalar change 奔 *-bēn* 'dash'; in (27b), the multi-point closed scale 返 *-fǎn* 'return' follows the nonscalar change 驶 *-shǐ* 'drive'; and in (27c), the bound motion morpheme 至 *zhì* 'arrive', which corresponds

to the special free motion morpheme 到 *dào* 'arrive', follows the multi-point closed 归 *-guī* 'return'.

(27) a. 那船主人奔入内舱。
*nà chuán zhǔrén **bēn-rù** nèi-cāng* (BCC)
that boat owner dash-enter inner-cabin
'The boat owner rushed into the inner cabin.'

b. 车子驶返市区。
*chēzi **shǐ-fǎn** shìqū* (BCC)
car drive-return downtown
'The car drove back downtown.'

c. 余知其必能归至旧巢。
*yú zhī qí bì néng **guī-zhì** jiù-cháo* (BCC)
1SG know 3SG certainly can return-arrive old-nest
'I know he can certainly return back to the old home.'

5.2.2 Motion expressions "challenging" the Motion Morpheme Hierarchy

The Motion Morpheme Hierarchy in Figure 5.1 will be verified with the MCVCs identified from the Novel Corpus introduced in Chapter 2. Before that, however, I will first introduce a few motion expressions that seem to be counterexamples to the hierarchy and that seem to weaken its predicting power. For instance, there are cases where motion morphemes from two different scalar classes occur in an order reverse to what the hierarchy predicts. Furthermore, there are also motion expressions that are predicted by the hierarchy, but in fact rarely found in natural language data. Finally, while the hierarchy is intended to predict the order of motion morphemes of different types that occur in an MCVC, examples are found where motion morphemes from the same scalar type co-occur; the ordering of such motion morphemes is thus not covered by the hierarchy. This section will show that these expressions do not actually weaken the proposed hierarchy.

5.2.2.1 *Motion morphemes from different scalar classes but in an order reverse to the Motion Morpheme Hierarchy*

As introduced by the examples 流回 *liú-huí* flow-return /回流 *huí-liú* return-flow and 滑下 *huá-xià* slide-descend.from /下滑 *xià-huá* descend.from-slide in Chapter 2 and Section 5.1 of this chapter, a nonscalar change (or manner-of-motion) morpheme does not always occur before a scalar change (or path) morpheme. Rather, the two morphemes can appear in both orders. Furthermore, examples are also found where two scalar change motion morphemes occur in both orders, e.g., 落回 *luò-huí* fall-return 'fall back' and 回落 *huí-luò* return-fall 'fall backward', 退

下 *tuì-xià* recede-descend.from and 下退 *xià-tuì* descend.from-recede. In each of these pairs, only the first expression follows the order of the Motion Morpheme Hierarchy, whereas the second shows an order reverse to the hierarchy. For example, in 回流 *huí-liú* return-flow, the multi-point closed scale 回 *huí* 'return' occurs before the nonscalar change 流 *liú* 'flow'. It should be noted that no motion morphemes are found only in an order reverse to the hierarchy; rather, whenever two motion morphemes are found in a reverse order, these two particular motion morphemes can also occur in the order as predicted by the hierarchy.

This study argues that the existence of the second expression of the above pairs does not challenge the hierarchy in that they are semantically and structurally different from the first expression and should not be treated as MCVCs. Structurally, these expressions do not allow potential markers to occur in between the morphemes, e.g., *回得流 *huí-de-liú* return-POT-flow vs. 流得回 *liú-de-huí* flow-POT-return 'be able to flow back to some place'. Such compound verbs are categorized as "compounding as a lexical unit" (see Chapter 2). In these compound verbs, the first morpheme in these expressions functions as an adverbial and specifies the direction of the event denoted by the second morpheme (also see Chang 2010 for the adverbial uses of 回 *huí* 'return'). For instance, 回 *huí* 'return' in 回流 *huí-liú* return-flow specifies a returning direction for the event of flowing. Furthermore, if a motion morpheme lexicalizes a closed scale (i.e. being bounded with an inherent endpoint), it loses the boundedness feature when occurring as the first morpheme in these expressions. For example, although 回 *huí* 'return' denotes a bounded event, 回流 *huí-liú* return-flow does not necessarily entail the returning to an endpoint, as illustrated in (28a), cf. 流回 *liú-huí* flow-return that is associated with a closed scale in (28b). Accordingly, the two orders in each pair should be interpreted differently. More examples are given in Table 5.1.

(28) a. 雨水回流了，可是还没到达回流槽里。
yǔshuǐ ***huí-liú*** *le, kěshì hái méi dào-dá*
rainwater return-flow CRS but still NEG arrive-arrive
huíliú-cáo-lǐ
reflux-tank-inside
'The rainwater had flowed backward but had not arrived at the reflux tank yet.'

b. 雨水流回了大海，*可是还没到达大海里。
yǔshuǐ ***liú-huí-le*** *dà hǎi, *kěshì hái méi dào-dá*
rainwater flow-return-PFV big sea, but still NEG arrive-arrive
dà hǎi-lǐ
big sea-inside
(intended) 'The rainwater had flowed back but had not arrived at the sea yet.'

Table 5.1 Motion morphemes occurring in both orders

Predicted by the Motion Morpheme Hierarchy	Reverse to the Motion Morpheme Hierarchy
流回 *liú-huí* flow-return 'flow back (to a place)'	回流 *huí-liú* return-flow 'flow backward'
滑下 *huá-xià* slide-descend.from 'slide down (to a place)'	下滑 *xià-huá* descend.from-slide 'slide downward'
落回 *luò-huí* fall-return 'fall back (to a place)'	回落 *huí-luò* return-fall 'fall backward'
升上 *shēng-shàng* ascend-ascend to 'ascend (to a place)'	上升 *shàng-shēng* ascend to-ascend 'ascend'
退下 *tuì-xià* recede-descend.from 'recede down (to a place)'	下退 *xià-tuì* descend.from-recede 'recede downward'

5.2.2.2 *MCVCs predicted by the Motion Morpheme Hierarchy but rarely found in natural speech*

In contrast to the examples in Section 5.2.2.1, there are also cases of motion expressions that are allowed by the Motion Morpheme Hierarchy, but in fact, only occur with a very low frequency in natural language. The most noticeable are MCVCs with three non-deictic motion morphemes occurring immediately adjacent to each other. For instance, the order of the morphemes 滚落进 *gǔn-luò-jìn* roll-fall-enter follows the hierarchy (nonscalar change + open scale + two-point closed scale), but only 38 instances are found in BCC (literature, 3 billion Chinese characters). On the contrary, the frequencies of 滚落 *gǔn-luò* roll-fall, 滚进 *gǔn-jìn* roll-enter, and 落进 *luò-jìn* fall-enter, i.e. MCVCs consisting of any two morphemes from 滚落进 *gǔn-luò-jìn* roll-fall-enter, are much higher in the same corpus, as in Table 5.2.[26]

Table 5.2 An example illustrating the frequencies of two-/three-morpheme MCVCs in BCC (literature)

MCVCs	Frequency
滚落进 *gǔn-luò-jìn*	38
滚落 *gǔn-luò*	9,923
滚进 *gǔn-jìn*	1,695
落进 *luò-jìn*	3,647

26. Due to the large sample size, the examples from the corpus search have not been examined one by one to include those that express translational motion events only, but the raw data exemplified by the three motion morphemes still suggests a significant difference in the frequencies between three-morpheme MCVCs and two-morpheme MCVCs.

This study hypothesizes that the strong preference of disyllabic compounding over three-morpheme compounding may be related to an important prosodic feature of Modern Mandarin Chinese, that is, the dominant metrical structure of Modern Mandarin Chinese is a disyllabic unit (Feng 1997, 1998, 2007, among others). However, further study is necessary to verify the hypothesis. Nonetheless, when a three-morpheme MCVC does occur in Chinese, as exemplified by 滚落进 *gǔn-luò-jìn* roll-fall-enter, the ordering of the constituent morphemes conforms to the Motion Morpheme Hierarchy.

The other combination worth noting is the two-morpheme motion expression consisting of a nonscalar change motion morpheme and an open scale motion morpheme. The hierarchy predicts that when these two types of motion morphemes co-occur, the nonscalar change one should precede the open scale one, e.g., 飘落 *piāo-luò* drift-fall. However, even when there is no semantic conflict, not all nonscalar change and open scale motion morphemes are found to freely co-occur with each other. For example, combinations such as 跑撤 *pǎo-chè* run-recede, 走退 *zǒu-tuì* walk-recede, and 流降 *liú-jiàng* flow-descend are seldom found in natural speech. Furthermore, even when two open scale motion morphemes denote a similar direction, one may collocate much more frequently than the other with the same nonscalar change motion morpheme. For instance, both 降 *jiàng* 'descend' and 落 *luò* 'fall' denote a downward direction (29), but 飘 *piāo* 'drift' strongly prefers 落 *luò* 'fall' over 降 *jiàng* 'descend'.[27] Also, while 升 *shēng* 'ascend' and 降 *jiàng* 'descend' are often treated as a pair, they do not occur equally frequently with 飞 *fēi* 'fly' even though an event of flying can be either upward or downward (30).[28]

(29) a. 不久，小雪花悄然飘落。
*bùjiǔ, xiǎo xuěhuā qiǎorán **piāo-luò*** (BCC)
not.long small snow quietly drift-fall
'Not long after, the snow silently fell.'

b. 天色完全黑下来了，雪花开始飘降。
tiān-sè wánquán hēi-xià-lái le, xuěhuā
sky-color completely dark-descend.from-hither CRS snow
*kāishǐ **piāo-jiàng*** (BCC)
start drift-descend
'The sky became completely dark and the snow began to drift down.'

27. An unfiltered search in BCC (literature) shows 13,786 instances of 飘落 *piāo-luò* drift-fall, but only 222 instances of 飘降 *piāo-jiàng* drift-descend.

28. An unfiltered search in BCC (literature) shows 21,296 instances of 飞升 *fēi-shēng* fly-ascend, but only 620 instances of 飞降 *fēi-jiàng* fly-descend.

(30) a. 飞机慌忙飞升，扔下来一颗尖头炸弹。
*fēijī huāngmáng **fēi-shēng**, rēng-xià-lái yī kē*
plane hurry fly-ascend throw-descend.from-hither one CLF
jiāntóu zhàdàn (BCC)
pointed bomb
'The plane flew up in a hurry and threw down a pointed bomb.'

b. 这只隼鸟仿佛通灵，竟随着杨叔度的招手之势，缓缓飞降。
zhè zhī sǔn-niǎo fǎngfú tōnglíng, jìng suízhe
this CLF falcon-bird seem psychic unexpectedly follow
*Yángshūdù de zhāoshǒu zhī shì, huǎnhuǎn **fēi-jiàng***
NAME NOM wave NOM gesture slowly fly-descend
'The falcon seems to be psychic. It unexpectedly flew down slowly following Yang Shudu's gesture.' (BCC)

This study proposes two possible reasons for the low-frequency collocations between some nonscalar change and open scale motion morphemes. First, the relatively lower frequent collocations may be attributed to speakers' preferences in describing events. Take upward and downward motion events as examples. It is likely that the upward motion is cognitively more prominent and thus more frequently described. This may explain why 飞升 *fēi-shēng* fly-ascend is found much more frequently than 飞降 *fēi-jiàng* fly-descend. In fact, even where the closed scale motion morphemes 上 *shàng* 'ascend to' and 下 *xià* 'descend from' are concerned, 飞 *fēi* 'fly' also occurs much more frequently with 上 *shàng* 'ascend to' than with 下 *xià* 'descend from', which further suggests that the upward direction is preferred than the downward direction in event description.[29] The second possible reason is that some open scale motion morphemes (e.g., 撤 *chè* 'recede', 退 *tuì* 'recede') may have retained relatively stronger verbal properties, especially compared with multi-point and two-point closed scale motion morphemes. Thus, they tend to occur more often as the head in the motion construction, and less frequently after a nonscalar change motion morpheme, which is often taken as a position for verbal complements. In this sense, even though a figure can recede by running, 跑撤 *pǎo-chè* run-recede or 跑退 *pǎo-tuì* run-recede is rarely found in natural speech. The two motion morphemes can be seen to co-occur, though, when the nonscalar change motion morpheme 跑 *pǎo* 'run' is suffixed by the continuous marker 着 *zhe* and the open scale motion morpheme becomes the head (or co-head) of the motion construction, as in (31).

29. An unfiltered search in BCC (literature) returned 14,550 instances of 飞上 *fēi-shàng* fly-ascend.to, but only 3,293 instances of 飞下 *fēi-xià* fly-descend.from.

(31) a. 哈叭狗想朝后跑着退。
*hābā-gǒu xiǎng cháo hòu **pǎo-zhe tuì*** (BCC)
Pekingese-dog want toward back run-CONT recede
'The Pekingese dog wanted to run backward.'

b. 于是人们开始满地跑着撤，黑灯瞎火的，人们在高粱茬地里栽的跤没了数。
*yúshì rénmen kāishǐ mǎn-dì **pǎo-zhe chè**,*
then people start full-field run-CONT recede
hēi-dēng-xiā-huǒ de, rénmen zài gāoliang-zhā dì-li
black-light-blind-fire adv people at sorghum-residue field-inside
zāi de jiāo méi le shù
fall NOM fall NEG PFV count
'The people then began to run around and retreat. It was so dark that they fell down for countless times in the sorghum field.'
(http://www.ziyexing.com/files-6/zhxs_x43.htm)

Nonetheless, the lower frequent collocation between some nonscalar change and open scale motion morphemes does not challenge the predicting power of the Motion Morpheme Hierarchy either, because when motion morphemes from these two scalar types do co-occur, as those in (29–30), they usually follow the order predicted in the hierarchy.

5.2.2.3 *Motion morphemes from the same scalar class*

As introduced in Section 5.2.1, the Motion Morpheme Hierarchy only predicts the order of motion morphemes belonging to different classes. However, combinations where the constituent motion morphemes come from the same scalar class are also frequently observed in Chinese. For instance, the components of compounds like 攀登 *pān-dēng* climb-climb 'climb', 撤退 *chè-tuì* recede-recede 'recede', and 返回 *fǎn-huí* return-return 'return' are all from the same scalar category, i.e. nonscalar change, open scale, and multi-point closed scale, respectively.

However, this study argues that these combinations are also semantically and structurally different from MCVCs. Semantically, the two co-occurring morphemes in each of these combinations come from the same scalar class and denote exactly the same components of motion, e.g., both 攀 *pān* 'climb' and 登 *dēng* 'climb' lexicalize a manner of climbing. In contrast, two morphemes in an MCVC denote different information, e.g., 跑回 *pǎo-huí* run-return 'run back' specifies a running manner and a returning direction respectively. Structurally, these combinations do not allow potential markers to occur in between their constituents, but MCVCs do, cf. *攀得登 *pān-de-dēng* climb-POT-climb and 跑得回 *pǎo-de-huí* run-POT-return 'be able to run back to some place'. In this sense, these combinations are lexical words. This study therefore differentiates such juxtaposed motion synonyms from MCVCs and does not treat them as exceptions to the Motion Morpheme Hierarchy, even though the hierarchy cannot predict the order of their constituent morphemes.

In fact, juxtaposed motion synonyms belong to a larger class of Chinese compounds that are composed of two semantically and syntactically parallel morphemes. In addition to motion, such compounds can be found in other domains. For example, 休息 *xiū-xi* rest-rest 'rest', 哭泣 *kū-qì* cry-cry 'cry', and 喊叫 *hǎn-jiào* shout-shout 'shout' are all formed from two synonymous morphemes, and each compound as a whole describes the same non-motion event as its individual morpheme does. Furthermore, two synonymous adjectives or nouns can form such a compound too, e.g., 困乏 *kùn-fá* tired-tired 'tired', 勤奋 *qín-fèn* diligent-diligent 'diligent', 疾病 *jí-bìng* disease-disease 'disease', and 颜面 *yán-miàn* face-face 'face'. While in some of the combinations, the two components can appear in reverse orders, e.g., 登攀 *dēng-pān* climb-climb 'climb', 乏困 *fá-kùn* tired-tired 'tired' and 叫喊 *jiào-hǎn* shout-shout 'shout', these juxtaposed motion synonyms usually occur in fixed orders, e.g., *退撤 *tuì-chè* recede-recede, *息休 *xi-xiū* rest-rest and *奋勤 *fèn-qín* diligent-diligent. Studies (Zheng 1964; Chen and Yu 1979; Mao 2008, among others) have proposed different accounts for the ordering of these morphemes: the ordering may depend on the phonological features (especially tones) or the relative occurrence frequencies of the constituent morphemes. However, the ordering of these compounds is beyond the scope of this study and thus will not be discussed in detail. What should be noted is that the existence of these compounds does not challenge the predicting power of the Motion Morpheme Hierarchy proposed in this study.

5.3 Verifying the Motion Morpheme Hierarchy: A corpus study

Because the Motion Morpheme Hierarchy was formulated based on a set of limited data, this section verifies the hierarchy by investigating a larger set of data. To do so, the morpheme order of all MCVCs found in the Novel Corpus introduced in Chapter 2 will be examined. Recall that Table 2.4 in Chapter 2 presented the frequencies of MCVCs where complement 来 *lái* 'hither' /去 *qù* 'thither' is counted as a motion morpheme. Table 5.3 presents the new frequencies of MCVCs, where the complement 来 *lái* 'hither' /去 *qù* 'thither' is not counted as a motion morpheme.

Table 5.3 New type and token frequencies of MCVCs in the Novel Corpus

MCVCs	Frequency where complement 来 *lái* /去 *qù* is not counted as a motion morpheme	Frequency where complement 来 *lái* /去 *qù* is counted as a motion morpheme
with two motion morphemes	321 (99.4%)	362 (77.2%)
with three motion morphemes	2 (0.6%)	106 (22.6%)
with four motion morphemes	0 (0%)	1 (0.2%)
Total	323 (100%)	469 (100%)

The study found 321 two-morpheme MCVCs and two three-morpheme MCVCs where complement 来 *lái* 'hither' /去 *qù* 'thither' is not counted as a motion morpheme. As introduced in Section 5.2.2.2, the strong preference for two-morpheme MCVCs over three-morpheme MCVCs could be attributed to the prosodic features of Modern Mandarin Chinese. In the following, I present the orderings of these motion expressions.

The Motion Morpheme Hierarchy gives rise to nine possible types of two-morpheme motion expressions, as illustrated in (a-i) in Table 5.4, and all the 321 two-morpheme motion expressions found in the Novel Corpus can be grouped into the nine types, as suggested in Table 5.4. That is, all the morpheme orders in the 321 two-morpheme motion expressions are consistent with the hierarchy.

Table 5.4 Ordering type and token frequencies of two-morpheme MCVCs in the Novel Corpus

Ordering of two-morpheme MCVCs	**Frequency (%)**	**Predicted by the Motion Morpheme Hierarchy**
(a) nonscalar change + open scale, e.g., 飞走 *fēi-zǒu* fly-leave	5 (1.6%)	yes
(b) nonscalar change + multi-point closed scale, e.g., 跑回 *pǎo-huí* run-return	112 (34.9%)	yes
(c) nonscalar change + two-point closed scale, e.g., 走出 *zǒu-chū* walk-exit	84 (26.2%)	yes
(d) nonscalar change + 到 *dào* 'arrive', e.g., 跑到 *pǎo-dào* run-arrive	54 (16.8%)	yes
(e) open scale + multi-point closed scale, e.g., 退回 *tuì-huí* recede-return	11 (3.4%)	yes
(f) open scale + two-point closed scale, e.g., 掉进 *diào-jìn* fall-enter	12 (3.7%)	yes
(g) open scale + 到 *dào* 'arrive', e.g., 升到 *shēng-dào* ascend-arrive	6 (1.9%)	yes
(h) multi-point closed scale + 到 *dào* 'arrive', e.g., 回到 *huí-dào* return-arrive	25 (7.8%)	yes
(i) two-point closed scale + 到 *dào* 'arrive', e.g., 来到 *lái-dào* come-arrive	12 (3.7%)	yes
Total	321 (100%)	

As shown in Table 5.3, the corpus study also found two three-morpheme MCVCs; the two instances are given in (32).

(32) a. 生怕她滑落到地上。
*shēngpà tā **huá-luò-dào** dì-shàng* (*Chūshì*)
fear 3SG slide-fall-arrive floor-on
'[They were] afraid that she would slide and fall onto the floor.'

b. 巴勒和几条大狗，一见到活黄羊，猎性大发，杀心顿起，拼命地跳爬过来，但爬到狼群止步的地方，也再不敢往前迈一步。
BāLè hé jǐ tiáo dà gǒu, yī jiàn-dào huó huángyáng,
NAME and few CLF big dog one look-arrive live gazelle
liè-xìng-dà-fā shā-xīn-dùn-qǐ pīnmìng de
hunt-instinct-big-trigger kill-heart-sudden-rise desperate ADV
***tiào-pá-guò**-lái dàn pá-dào láng-qún zhǐbù de*
jump-crawl-cross-hither but crawl-arrive wolf-pack stop NOM
dìfāng, yě zài bù gǎn wǎng qián mài yī bù (*Láng*)
place also again NEG dare toward front step one CLF
'Bale and a few other big dogs were triggered by the sight of live gazelles and began pouncing and springing towards the gazelles; but as they approached where the wolf pack had stopped, the dogs did not dare move an inch forward.'

In (32a), the first morpheme 滑 *huá* 'slip' is a nonscalar motion morpheme with no inherent direction, the second morpheme 落 *luò* 'fall' is open scale, which is in turn followed by the special motion morpheme 到 *dào* 'arrive'. Therefore, their relative order is consistent with the Motion Morpheme Hierarchy.

However, (32b) presents a counterexample to the hierarchy. In this example, the motion expression 跳爬过来 *tiào-pá-guò-lái* jump-crawl-cross-hither 'jumping and crawling across (toward the deictic center)' has two co-occurring nonscalar change motion morphemes, 跳 *tiào* 'jump' and 爬 *pá* 'crawl'. As introduced in Chapter 2 and Section 5.2 of this chapter, when two non-scalar change motion morphemes co-occur, the sequence often has two possible understandings: (a) the first morpheme modifies the second (e.g., 飞跑 *fēi-pǎo* 'run in a fast speed like flying'), or (b) the two morphemes are synonymous denoting the same manner of motion (e.g., 奔跑 *bēn-pǎo* dash-run 'run'). Yet, 跳 *tiào* 'jump' and 爬 *pá* 'crawl' in (32b) are not synonymous, and it is not quite acceptable to interpret the first morpheme 跳 *tiào* 'jump' as a modifier of the second morpheme 爬 *pá* 'crawl' as it would describe an almost impossible event where the dogs crawl by jumping. Rather, a possible understanding of what 跳爬 *tiào-pá* jump-crawl describes in (32b) could be a kind of motion where the dogs jump and crawl alternatively during their movement. However, Chinese rarely adopts co-occurring nonscalar change motion morphemes for description of alternative manners of motion. A search in BCC (assorted) only finds two such instances of 跳爬 *tiào-pá* jump-crawl. Furthermore,

as illustrated in (33), both instances occur in one paragraph and describe a motion event that is apparently not natural or normal. Therefore, this study does not treat 跳爬 *tiào-pá* jump-crawl as a strong challenge to the Motion Morpheme Hierarchy.

(33) 那条蛊虫显然已知道目标所在，跳爬向云飞扬，那种跳爬的姿势非常怪异，简直就像是变了另外一种生物。
nà tiáo gǔchóng xiǎnrán yǐ zhīdào mùbiāo suǒzài,
that CLF poison.insect obviously already know target whereabouts
tiào-pá*-*xiàng yún fēiyáng, nà zhǒng tiào-pá de zīshì
jump-crawl-toward NAME that CLF jump-crawl NOM posture
fēicháng guàiyì, jianzhi jiù xiàng shì biàn-le lìngwài yī
very strange almost just like COP change-PFV another one
zhǒng shēngwù (BCC)
CLF creature
'That insect seems to know where its target is at, as it jumped and crawled toward Yun Feiyang. Its posture when jumping and crawling is very strange, making it just look like another creature.'

Despite this exception, the overall results of this corpus study show that the Motion Morpheme Hierarchy can predict most of the naturally occurring MCVCs in a corpus of Chinese, which indicates that the order of a motion morpheme in an MCVC with respect to other motion morphemes is determined by the type of scale lexicalized in the morphemes.

5.4 Motivating the Motion Morpheme Hierarchy: The Scalar Iconicity Constraint

The corpus study in Section 5.3 shows that the Motion Morpheme Hierarchy holds true for most of the natural Chinese data. The next question then is to ask why Chinese MCVCs display such a tendency as presented in the hierarchy. This question will be discussed in this section.

The corpus study in Section 5.3 implies that MCVCs consisting of three or more motion morphemes (not including complement 来 *lái* 'hither' /去 *qù* 'thither') are rare in Chinese. In other words, Chinese MCVCs primarily consist of two motion morphemes. In addition, when two morphemes occur together in an MCVC, their relative order is primarily in one of the three orders in (34) allowed by the Motion Morpheme Hierarchy:

(34) a. nonscalar change + open scale, e.g., 滚 *gǔn* 'roll' + 落 *luò* 'fall';
b. nonscalar change + closed scale, e.g., 滚 *gǔn* 'roll' + 进 *jìn* 'enter';
c. open scale + closed scale, e.g., 落 *luò* 'fall' + 进 *jìn* 'enter'

In each of the three orders, the second morpheme is always more specific than the first in terms of the information it provides about the scale associated with a motion event: in (34a), the second morpheme is more specific in that it indicates the existence of a scale in the motion event, whereas the first provides no information about a scale; in (34b), the second morpheme is more specific in that it indicates that the motion event has a scale and the scale is bounded, whereas the first provides no information about a scale; in (34c), although both morphemes lexicalize the existence of a scale in the motion event, the second morpheme is more specific because it indicates that the scale is bounded, whereas the first provides no information about the endpoint of the scale. Therefore, this study proposes that the order of motion morphemes in a Chinese MCVC conforms to a semantic constraint that the morpheme that adds more specific information about the scale in a motion event tends to occur after the morpheme with less information. I term this constraint the "Scalar Iconicity Constraint."

In the rest of this section, I will discuss the conceptual bases on which scalar specificity arises as a type of iconicity, and how the Scalar Iconicity Constraint operates to account for the order of motion morphemes in Chinese. I will also show how the constraint provides a more unified account than the temporal iconicity proposed in Tai (1985, 1987, 1989, 2011) and Li (1993) does.

5.4.1 The operation of the Scalar Iconicity Constraint

The Scalar Iconicity Constraint is a type of iconicity that motivates the structure of Chinese. Iconicity refers to the cognitively motivated principle that the structure of language reflects the structure of reality or experience (Haiman 1980; Croft 2003, among others). Where word order is concerned, the temporal iconicity has been widely observed in languages, including Chinese. However, this study argues that the Scalar Icocnity Constraint has more advantages in accounting for the ordering of motion morphemes in Chinese. Before introducing the operation of the constraint, I first review the temporal iconicity proposed in previous studies for Chinese.

Recall that the temporal iconicity was first introduced in Chapter 2, which relates the word order in Chinese to the temporal order of the events denoted by the linguistic elements (Tai 1985, 1987, 1989, 2011; Li 1993). The iconicity correctly predicts the order of motion morphemes in many Chinese motion expressions. As suggested in (35), the sub-event described by the second morpheme 进 *jìn* 'enter' is temporally later than the sub-event described by the first morpheme 走 *zǒu* 'walk', because the figure had started walking on the path from his bed to the washroom before the sub-event of 'entering the washroom' happened.

(35) 我从床上爬起来走进洗手间
*wǒ cóng chuáng-shàng pá-qǐ-lái **zǒu-jìn** xǐshǒujiān* (*Xiǎo*)
1SG from bed-on climb-rise-hither walk-enter washroom
'I got up from the bed and went into the bathroom.'

However, as also shown in Chapter 2, sometimes the co-occurring motion morphemes may denote sub-events that happen simultaneously, and in these cases, the temporal iconicity is unable to explain why these motion morphemes have to occur in a fixed word order. (36) is an example repeated from Chapter 2, where a person can be running and ascending at the same time if he was standing at the lower end of stairs before starting to run up them.

(36) a. 他跑上楼梯。
*tā **pǎo-shàng** lóutī*
3SG run-ascend.to stairs
'He went up the stairs by running.'
b. *上跑楼梯
***shàng-pǎo** lóutī*
ascend.to-run stairs

Simiar examples can be found in the Novel Corpus. (37) describes a scenery where the crowd of sheep were on their way down the mountain, but because of the wolves, they climbed up back to the mountain ridge and then rushed down the snow cave. Two motion expressions are found in this example, each with two consituent motion morphemes: 爬上 *pá-shàng* climb-ascend.to and 冲下 *chōng-xià* rush-descend.from. As the crowd of sheep were already in the mountain, in both motion expressions, the sub-events denoted by the two motion morphemes take place simultaneously.

(37) 失去头羊公羊的乌合之群，吓得重又蜂拥爬上山梁，并呼噜呼噜地冲下大雪窝
shīqù tóu-yáng gōng-yáng de wūhézhīqún, xià de chóng
lose head-sheep male-sheep NOM crowd horrify COMP again
*yòu fēngyōng **pá-shàng** shān-liáng, bìng hūlūhūlū de*
again flock climb-ascend.to mountain-ridge then ONOM ADV
***chōng-xià** dà xuě-wō* (*Láng*)
rush-desecend.from big snow-cave
'The crowd which had lost their leading sheep and male sheep, were horrified and flocked back to the mountain ridge, and then rushed down the snow cave in a snoring sound.'

As the temporal iconicity does not hold for examples like (36–37), Tai (1985, 2011) proposes that Chinese also follows the structural principle "modifier-before-modified", which comes into operation for the counterexamples against the temporal iconicity.

The Scalar Iconicity Constraint proposed in this study, however, aims to cover both kinds of composite motion events, i.e. those with sequential sub-events and those with simultaneous sub-events. Furthermore, this study proposes that the word orders of the two kinds of events are cognitively motivated by two operating principles under the constraint: the order in physical experience and the order of knowledge. The two are based on Greenberg (1966: 103) who observes that "the order of elements in language parallels that in physical experience or the order of knowledge" in investigating the universals of word order. In the following, I will elaborate the operation of the constraint.

For a motion event consisting of sub-events that occur in a temporal sequence, the motion morpheme with more specific scalar information (especially when there is an endpoint of motion) typically denotes the sub-event that occurs temporally later, thus the morpheme occurs after the other morpheme that denotes the earlier sub-event, as in (35). Note that for these cases, the Scalar Iconicity Constraint is compatible with the temporal iconicity, because the order of the motion morphemes is iconic to the order in physical experience (or reality).

For a motion event consisting of sub-events that occur simultaneously, the order of motion morphemes is no longer iconic to the order in reality, and thus such an event exists as an exception to the temporal iconicity. However, the Scalar Iconicity Constraint still holds for these cases. Take (36) as an example. The closed scale motion morpheme 上 *shàng* 'ascend to' is more specific in that it lexicalizes a closed scale, and as predicted by the Scalar Iconicity Constraint, it occurs after the nonscalar change motion morpheme 跑 *pǎo* 'run' which does not specify any information about scale. It should be noted, however, for these cases, the scalar specificity is iconic to the order of knowledge, rather than the order of physical experience or reality. Specifically, in MCVCs comprising of a scalar and a nonscalar motion morpheme, the scalar motion morpheme expresses a sub-event with a result information, and the nonscalar motion morpheme does not. In our knowledge, a sub-event with result typically occurs later than the sub-event with no result, so the ordering of the scalar motion morphemes after the nonscalar motion morphemes is an iconic reflection of the order of our knowledge, although it is not iconic to our physical experience. Similarly, the scalar motion with more specific information about scale denotes more specific result information, thus the ordering of closed scale motion morphemes after the open scale motion morphemes is also iconic to the order of knowledge.

In the following sections, I will show some further advantages of the Scalar Iconcity Constraint for the order of Chinese motion morphemes, which includes the ordering in three-morpheme MCVCs, as well as why two closed scale motion morphemes typically do not co-occur in Chinese.

5.4.2 The Scalar Iconicity Constraint vs. the RVC account

As discussed in Chapter 2, Chinese directional motion expressions are treated by some previous studies (e.g., Hashimoto 1964; Thompson 1973; Li and Thompson 1981; Ross 1990; Xiao and McEnery 2004; Hsiao 2009; Tham 2015) as a type of RVC in which the second element expresses the result of the action denoted by the first element. Such an account indeed can cover a large number of two-morpheme MCVCs in Chinese, e.g., (38a-b) where the second morpheme (open scale 落 *luò* 'fall' in (38a) and closed scale 进 *jìn* 'enter' in (38b)) can be understood as a result. However, it does not account for the order in (38c-d), where the open scale morpheme 落 *luò* 'fall' must precede the closed scale morpheme 进 *jìn* 'enter', although both are result morphemes.

(38) a. 石块继续滚落，有时互相撞在一起。
*shíkuài jìxù **gǔn-luò**, yǒushí hùxiāng zhuàng-zài*
stone continue roll-fall sometimes each.other hit-at
yīqǐ (BCC)
together
'The stones continued rolling down, sometimes hitting at each other.'

b. 那块条石滚进了岩下的水涧。
*nà kuài tiáoshí **gǔn-jìn**-le yán-xià de*
that CLF square.stone roll-enter-PFV cliff-under NOM
shuǐ-jiàn (BCC)
water-stream
'That square stone rolled into the stream under the cliff.'

c. 忽然一块石子落进了水里。
*hūrán yī kuài shízi **luò-jìn**-le shuǐ-lǐ* (BCC)
suddenly one CLF pebble fall-enter-PFV water-inside
'Suddenly, a pebble fell into the water.'

d. *忽然一块石子进落了水里。
hūrán yī kuài shízi **jìn-luò-le shuǐ-lǐ*
suddenly one CLF pebble enter-fall-PFV water-inside
(intended) 'Suddenly, a pebble fell into the water.'

In contrast, the Scalar Iconicity Constraint is able to provide an explanation for this. The constraint assumes that all Chinese scalar change motion morphemes express result meanings and can be further classified into different types of result based on the kind of associated scale. Both 落 *luò* 'fall' and 进 *jìn* 'enter' are scalar change motion morphemes. However, 落 *luò* 'fall' lexicalizes an open scale, whereas 进 *jìn* 'enter' lexicalizes a scale with an endpoint and thus provides more specific information about the scale than 落 *luò* 'fall' does. The Scalar Iconicity Constraint

requires the motion morpheme with more specific information about the scale to follow the morpheme with less specific information, so 进 *jìn* 'enter' tends to follow 落 *luò* 'fall', but not vice versa.

5.4.3 The Scalar Iconicity Constraint and three-morpheme MCVCs

The corpus study in Chapter 2 indicates that three-morpheme MCVCs are seldom used in Chinese. However, when motion expressions with three non-deictic motion morphemes occur, their relative order also conforms to the Motion Morpheme Hierarchy and the Scalar Specificity Constraint, i.e. the morpheme denoting the least specific information about the scale tends to occur as the leftmost of the three morphemes, whereas the morpheme denoting the most specific information about the scale tends to occur as the rightmost. (39) is an example repeated from (25a): 飘 *piāo* 'drift', which does not specify a scale, is followed by 落 *luò* 'fall', which specifies an open scale, and then followed by 回 *huí* 'return', which specifies a scale with an endpoint.

(39) 龙跃宝身形飘落回高丝身旁。
Lóngyuèbǎo shēnxíng ***piāo-luò-huí*** *Gāosī shēn-páng* (BCC)
NAME figure drift-fall-return NAME body-side
'Long Yuebao returned to the Gao Si's side by floating down.'

5.4.4 The Scalar Iconicity Constraint and the incompatibility of closed scale motion morphemes

As introduced in earlier sections of this chapter, unless one of the two morphemes happens to be 到 *dào* 'arrive', two closed scale motion morphemes typically do not occur together. In this section, I focus on closed scale motion morphemes other than 到 *dào* 'arrive', which I will come back to in the next section.

Both multi-point closed scale motion morphemes (e.g., 回 *huí* 'return') and two-point closed scale motion morphemes (e.g., 进 *jìn* 'enter') are associated with a bounded scale. Although the two types of motion morphemes differ from each other in whether they lexicalize a multi-point or a two-point scale, morphemes of either type are able to express a single delimited motion event in which a moving object moves along a path in a certain direction to an endpoint. For instance, both 回 *huí* 'return' and 进 *jìn* 'enter' independently specify a delimited motion event: 回 *huí* 'return' denotes an event in which a figure moves back to the location it comes from, whereas 进 *jìn* 'enter' denotes an event in which a figure crosses a boundary and moves into an enclosed region. A motion expression consisting of both 回 *huí*

'return' and 进 *jìn* 'enter' would describe two delimited events with two independent directions, paths, and endpoints, which thus could be a violation of the Single Delimiting Constraint (Tenny 1994) (see Section 3.2.1.2). In terms of the degree of specificity of a scale, a two-point closed scale motion morpheme is not more specific than a multi-point closed scale motion morpheme is, or vice versa; both specify the existence of a scale and the existence of an endpoint for the scale. In this sense, the low frequent collocation between the two types of closed scale motion morphemes is also consistent with the Scalar Specificity Constraint.

5.4.5 The two-point closed scale motion morpheme 到 *dào* 'arrive'

As shown in Chapter 4 and previous sections of Chapter 5, the two-point closed scale motion morpheme 到 *dào* 'arrive' can follow other closed scale motion morphemes, as in 回到房间 *huí-dào fángjiān* return-arrive room 'return to the room' and 进到房间 *jìn-dào fángjiān* enter-arrive room 'enter the room', whereas other two-point closed scale motion morphemes such as 进 *jìn* 'enter' usually do not naturally follow another closed scale motion morpheme, as in ??回进房间 ??*huí-jìn fángjiān* return-enter room. In terms of the degree of specification of scale information, 到 *dào* 'arrive' is as specific as other two-point closed scale motion morphemes, i.e. they all specify the existence of a scale, as well as the existence of an endpoint for the scale. Therefore, the fact that 到 *dào* 'arrive' can follow closed scale motion morphemes represents an exception to the Scalar Iconicity Constraint. In this section, I suggest why 到 *dào* 'arrive' is able to do this and explore the pragmatic functions of 到 *dào* 'arrive' when it occurs after closed scale motion morphemes.

5.4.5.1 *A possible reason for* 到 dào *'arrive' to follow closed scale motion morphemes*

Chapter 4 has shown that 到 *dào* 'arrive', 进 *jìn* 'enter' and 出 *chū* 'exit' all denote bounded and instantaneous events and are two-point closed scale motion morphemes. However, 到 *dào* 'arrive' differs from 进 *jìn* 'enter' and 出 *chū* 'exit' with respect to the degree of specificity it provides about the ground and path involved in the motion event (Lin 2013a). I propose that this difference makes it possible for 到 *dào* 'arrive' to follow other closed scale motion morphemes.

Both 进 *jìn* 'enter' and 出 *chū* 'exit' are highly specific about the ground and path: 进 *jìn* 'enter' expresses a boundary-crossing motion event involving motion from the outside to the inside of an enclosed region, whereas 出 *chū* 'exit' expresses a boundary-crossing motion event involving motion from the inside of an enclosed region to the outside. For instance, 进 *jìn* 'enter' and 出 *chū* 'exit' only select NPs expressing enclosed regions (e.g., house, but not table) as their objects, as in (40).

(40) a. 他进/出房子了。
tā ***jìn/chū*** *fángzi le*
3SG enter/exit house CRS
'He entered/exited the house.'

b. *蚂蚁进/出桌子了。
mǎyǐ* ***jìn/chū* *zhuōzi le*
ant enter/exit table CRS
(intended) 'The ant went into/out of the table.'

In addition, both 进 *jìn* 'enter' and 出 *chū* 'exit' are specific about their paths of motion, and thus, express very precise spatial relationships between the figure and the ground, e.g., for 进 *jìn* 'enter', the figure moves into the ground and is located there at the end of an entering event. Thus, localizers that express spatial relationships (e.g., 里 *-lǐ* 'inside') need not co-occur with an NP taken as object by 进 *jìn* 'enter' and 出 *chū* 'exit' (Lin 2013a). As illustrated in (40a), although a localizer such as 里 *-lǐ* 'inside' is not explicitly expressed, it is understood that in an event of entering denoted by 进 *jìn* 'enter', the figure moves from the outside to the inside of an enclosed region, whereas in an event of exiting denoted by 出 *chū* 'exit', a figure moves in the reverse direction.

In contrast, 到 *dào* 'arrive' is unspecific about both the ground and the path of the motion it denotes (Lin 2013a). First, 到 *dào* 'arrive' does not specify what kind of ground is involved in the motion event, so it is able to take any kind of ground NP as its object. As (41) illustrates, both 房子 *fángzi* 'house' (enclosed region) and 桌子 *zhuōzi* 'table' (non-enclosed region) can be the objects of 到 *dào* 'arrive', cf. 进 *jìn* 'enter' and 出 *chū* 'exit' in (40).

(41) a. 他到房子里了。
tā ***dào*** *fángzi-lǐ* *le*
3SG arrive house-inside CRS
'He went into the house.'

b. 蚂蚁到桌子上了。
mǎyǐ ***dào*** *zhuōzi-shàng le*
ant arrive table-on CRS
'The ant went onto the table.'

Second, 到 *dào* 'arrive' is not specific about the path along which a figure moves to the ground, and thus provides no information about the precise spatial relationship between the figure and the ground at the end of a motion event. For instance, when 到 *dào* 'arrive' is followed by the bare NP 房子 *fángzi* 'house', it does not indicate whether the figure arrived at the outside or the inside of the house, and thus, 到 房子 *dào fángzi* arrive house is usually not allowed in Chinese, as shown in (42a).

Instead, a localizer such as 里 *-lǐ* 'inside' must be explicitly expressed to specify the figure's final location, as in (41a). Similarly, for 桌子 *zhuōzi* 'table', a localizer such as 上 *shàng* 'on' is required in order to be taken as the object of 到 *dào* 'arrive', as in (41b), cf. (42b).

(42) a. *他到房子了。
tā* ***dào* *fángzi le*
3SG arrive house CRS
b. *蚂蚁到桌子了。
mǎyǐ* ***dào* *zhuōzi le*
ant arrive table CRS

Therefore, when 到 *dào* 'arrive' occurs with another closed scale motion morpheme, it does not add new information about the ground or path that may be different from or incompatible with the information denoted by the co-occurring motion morpheme. This may explain why 到 *dào* 'arrive' can co-occur with other closed scale motion morphemes, whereas 进 *jìn* 'enter' and 出 *chū* 'exit' cannot. For instance, 回 *huí* 'return' in (43a) denotes a returning event, and when it is followed by 到 *dào* 'arrive', the sequence 回到 *huí-dào* return-arrive still denotes an event of returning, as in (43b); similarly, where 进 *jìn* 'enter' is concerned, both (44a) (without 到 *dào* 'arrive') and (44b) (with 到 *dào* 'arrive') denote an event of entering a classroom.

(43) a. 他回教室了。
tā ***huí*** *jiàoshì le*
3SG return classroom CRS
'He returned to the classroom.'
b. 他回到教室了。
tā ***huí-dào*** *jiàoshì le*
3SG return-arrive classroom CRS
'He returned to the classroom.'

(44) a. 他进教室了。
tā ***jìn*** *jiàoshì le*
3SG enter classroom CRS
'He entered the classroom.'
b. 他进到教室了。
tā ***jìn-dào*** *jiàoshì le*
3SG enter-arrive classroom CRS
'He entered the classroom.'

In contrast, as illustrated in (45), 回 *huí* 'return' is usually not followed by the two-point closed scale motion morpheme 进 *jìn* 'enter', while still expressing an event of returning.

(45) ʔ他回进教室了。
ʔ*tā* ***huí-jìn*** *jiàoshì* *le*
3SG return-enter classroom CRS

Table 5.5 lists the number of occurrences of 回到 *huí-dào* return-arrive and 回进 *huí-jìn* return-enter taking a selection of different ground NPs in BCC (literature).[30] It suggests that 到 *dào* 'arrive' frequently follows multi-point closed scale motion morphemes, but it is very rare for the other two-point closed scale motion morpheme, 进 *jìn* 'enter', to do so.

Table 5.5 Frequencies of 回到 *huí-dào* and 回进 *huí-jìn* in BCC (literature)

X + Ground NP	**X = 回到 *huí-dào* return-arrive**	**X = 回进 *huí-jìn* return-enter**
X + 房间 *fángjiān* 'room' (+ localizer)	4,354	5
X + 家 *jiā* 'home' (+ localizer)	27,723	0
X + 学校 *xuéxiào* 'school' (+ localizer)	2,093	0
X + 车 *chē* 'car' (+ localizer)	1,824	1
Total	35,994	6

5.4.5.2 *The functions of* 到 dào *'arrive' after closed scale motion morphemes*

In this section, I discuss the functions of 到 *dào* 'arrive' when it occurs after closed scale motion morphemes. I will first argue that such 到 *dào* 'arrive' does not function exactly in the same way as English *to*, although 到 *dào* 'arrive' is often glossed as 'to' in some previous studies.

As introduced in Chapter 4, Tenny (1994: 79) proposes the Single Delimiting Constraint that the event described by a verb can only be delimited once unless the second delimiting expression further specifies the endpoint of the event (also Gruber 1965; Simpson 1983; Goldberg 1991; Levin and Rappaport Hovav 1995; Filip 2004, among others). However, as discussed in Section 5.4, 到 *dào* 'arrive' does not further specify the endpoint for a motion event because 到 *dào* 'arrive' itself is unspecific about the ground and the path. On the contrary, the closed scale motion morpheme preceding 到 *dào* 'arrive', e.g., 进 *jìn* 'enter', is more specific than 到 *dào* 'arrive' in terms of information about the endpoint. For instance, 进 *jìn* 'enter' specifies that the endpoint of an event of entering must be the inside of an enclosed region. As such, although both 到 *dào* 'arrive' and English *to* PPs can

30. Due to the large sample size, the examples in the search results have not been filtered for translational motion events only, but the raw data still indicates a significant difference between the frequencies of 回到 *huí-dào* return-arrive and 回进 *huí-jìn* return-enter.

occur in an expression that has a preexisting expression specifying the endpoint, they do not have the same functions.

Instead, this study proposes that 到 *dào* 'arrive' functions at the pragmatic level and helps reinforce the arrival at the endpoint of a motion event when it occurs after a closed scale motion morpheme. I will discuss the cases of multi-point and two-point motion mrphemes respectively.

Chapter 4 showed that motion along the scale lexicalized by a multi-point closed scale motion morpheme such as 回 *huí* 'return' usually has duration. Therefore, a multi-point closed scale motion morpheme indicates the existence of an endpoint for the path of motion but does not always entail that the moving object has reached the endpoint. For instance, (46) may have two interpretations: on one, the figure is located at school at 8am, and on the other, the figure started to return to school at 8am and was on the way to school at speech time.

(46) 他早上八点回学校了。
tā zǎoshàng bā diǎn ***huí*** *xuéxiào le*
3SG morning eight o'clock return school CRS
a. 'He returned to school at 8am.'
b. 'He started to return to school at 8am.'

However, when 到 *dào* 'arrive' follows 回 *huí* 'return', it reinforces the arrival of the figure at the endpoint, and thus leaves only one possible interpretation for the returning event, i.e., the one where the figure must have returned to the endpoint. For instance, (47) can only be understood as expressing that the figure was located at school at 8am.

(47) 他早上八点回到学校了。
tā zǎoshàng bā diǎn ***huí-dào*** *xuéxiào le*
3SG morning eight o'clock return-arrive school CRS
'He returned to school at 8am.'

A two-point closed scale motion morpheme such as 进 *jìn* 'enter' lexicalizes a scale with only two points, and thus the motion events it is used to describe are usually instantaneous. Therefore, when an event of entering happens, a figure must have moved into an enclosed region. For instance, the figure must be located inside the school at 8am in the event described in (48), so regardless of the presence or absence of 到 *dào* 'arrive', the moving object must be at school at 8am.

(48) a. 他早上八点进学校了。
tā zǎoshàng bā diǎn ***jìn*** *xuéxiào le*
3SG morning eight o'clock enter school CRS
'He entered the school at 8am.'

b. 他早上八点进到学校了。
tā zǎoshàng bā diǎn ***jìn-dào*** *xuéxiào le*
3SG morning eight o'clock enter-arrive school CRS
'He entered school at 8am.'

(48) indicates that the use of 到 *dào* 'arrive' after 进 *jìn* 'enter' is semantically redundant in describing the motion event, especially compared with 回 *huí* 'return'.[31] However, this study proposes that 到 *dào* 'arrive' is pragmatically-motivated when it indeed occurs after a closed scale motion morpheme such as 进 *jìn* 'enter'. Specifically, it helps enhance speaker's subjective stance, i.e. emphasizing the successful arrival at the endpoint. It is worth noting that similar uses of 到 *dào* 'arrive' have been noticed even in non-motion domains. Chen and Tao (2014) observe that while syntactically unnecessary, 到 *dào* 'arrive' has started to occur after non-motion transitive verbs such as 影响 *yǐngxiǎng* 'influence' and 感染 *gǎnrǎn* 'affect'. They further find that many of the transitive verbs that are followed by 到 *dào* 'arrive' inherently denote a physical or metaphorical meaning of 'reaching', i.e. arrival at an endpoint. Chen and Tao (2014: 30) propose that such uses of 到 *dào* 'arrive' elevates the degree of transitivity of the clause, which thus "increases the psychological impact in the interpersonal sphere".

To summarize, this section discusses the two-point closed scale motion morpheme 到 *dào* 'arrive', which can occur after all other closed scale motion morphemes and seems to present an exception to the Scalar Iconicity Constraint. However, although 到 *dào* 'arrive' is equally specific in terms of scale to other closed scale motion morphemes, it is unspecific about the ground and the path involved in the motion it denotes. Therefore, the addition of 到 *dào* 'arrive' after another closed scale motion morpheme does not add information about motion that would be incompatible with the information denoted by the co-occurring closed scale motion morpheme(s). Instead, because 到 *dào* 'arrive' is unspecific about the ground and the path, it is compatible with closed scale motion morphemes and follows them. In terms of functions, when 到 *dào* 'arrive' occurs after a closed scale motion morpheme, it pragmatically contributes to the description of the motion event in that it reinforces the moving object's arrival at the endpoint of the scale.

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31. An unfiltered search in BCC (literature) shows that 回到 *huí-dào* return-arrive is about 22 times more frequent than 进到 *jìn-dào* enter-arrive (352,184 and 15,715 instances respectively). Hsiao (2009) has also observed that 回到 *huí-dào* return-arrive (696 instances) occurs much more frequently than 进到 *jìn-dào* enter-arrive (26 instances) in the Academia Sinica Corpus 4.0 (7.95 million characters).

5.5 Summary

In sum, this chapter proposed a generalization (the Motion Morpheme Hierarchy) based on the scale structure of motion morphemes to predict the order of motion morphemes in Chinese with a larger coverage. This chapter also discussed the types of motion expressions whose morpheme order is not predicted by the hierarchy and showed that those cases do not really challenge the hierarchy. Additionally, this chapter proposed a Scalar Iconicity Constraint that a motion morpheme lexicalizing more specific information about the scale of a motion event occurs after the one lexicalizing less scalar information. The constraint, which is semantically- and conceptually-based, motivates the ordering of motion morphemes as generalized by the Motion Morpheme Hierarchy and is able to provide a more unified account for the distributions of motion morphemes in Chinese.

CHAPTER 6

Moving beyond motion (verbs)

This chapter first summarizes the major proposals of this study. It then reviews issues for future research of motion verbs and events. Finally, it moves beyond motion and motion verbs, and explores how the major proposals of this study can be extended to other domains.

This study probed into the key questions surrounding the encoding of motion events in Chinese: What motion information can a motion morpheme lexicalize? How can the lexicalized motion information be identified? For motion expressions consisting of more than one motion morpheme, what is the generalization over the morpheme order? And what motivates the generalization?

This study first showed that Chinese motion morphemes exhibit a tendency toward the manner/result (path) complementarity, that is to say, a motion morpheme does not tend to encode manner and path information at the same time. The complementarity hypothesis provides a more unified account for the behaviors of motion morphemes in Chinese.

Then, by analyzing the scale structure associated with motion morphemes, this study provided a finer-grained classification of Chinese motion morphemes. Specifically, Chinese motion morphemes are classified into four scalar types: nonscalar change motion morphemes (e.g., 飞 *fēi* 'fly', 跑 *pǎo* 'run'), open scale motion morphemes (e.g., 退 *tuì* 'recede', 升 *shēng* 'ascend'), multi-point closed scale motion morphemes (e.g., 回 *huí* 'return', 来 *lái* 'come'), and two-point closed scale motion morphemes (e.g., 进 *jìn* 'enter', 出 *chū* 'exit'). In other words, while being consistent with Talmy's two-way classification of motion verbs into manner-of-motion (i.e. nonscalar change) verbs and path (i.e. scalar change) verbs, this study further classified Talmy's path verbs into three sub-types (open scale, multi-point closed scale, two-point closed scale). This study also proposed a set of independent tests to identify the scalar type that each Chinese motion morpheme belongs to.

Based on the four scalar types, this study formulated the Motion Morpheme Hierarchy to predict the ordering of motion morphemes in Chinese MCVCs: the motion morphemes are ordered from left to right according to how their types appear in the hierarchy "(a) nonscalar change + (b) open scale + (c) closed scale (multi-point or two-point) + (d) special two-point closed scale 到 *dào* 'arrive' + (e) ground NP and/or complement 来 *lái* 'hither' /去 *qù* 'thither'". This study also proposed the Scalar Iconicity Constraint that underlies the operation of the Motion

Morpheme Hierarchy: in a motion expression with multiple motion morphemes, each morpheme is more specific in terms of the scale it specifies than the preceding morpheme. The constraint explains why the hierarchy emerges: a scalar change (open or close scale) motion morpheme follows a nonscalar change motion morpheme because it specifies a scale, whereas the latter does not; a closed scale motion morpheme follows an open scale one because it specifies a scale and an endpoint of the scale, whereas the latter is unspecific about endpoint. Fundamentally motivated by the iconicity of the order of physical experience or the order of knowledge, the Scalar Iconicity Constraint is able to provide a more unified account for the distribution of Chinese motion morphemes.

6.1 Future directions of studies on motion (verbs)

While this study has provided a relatively comprehensive analysis of motion expressions in Modern Mandarin Chinese, much still remains to be explored, including the motion morphemes and the motion constructions in other genres, in earlier stages of Chinese, in other languages, their extended meanings, and how they can be characterized from a scalar perspective. This section will only briefly touch upon some of the areas that would be interesting for future studies.

Motion morphemes and constructions in other genres

It has been shown that written Chinese may differ from spoken Chinese in both lexicon and grammar (Chao 1968; Tao 1996, 2015, among others). While this study has primarily focused on motion morphemes in written texts, it may yield interesting findings too when investigating whether the motion morphemes exhibit different semantic and syntactic properties in spoken Chinese. As shown earlier in Chapter 4, 到 *dào* 'arrive' tends to take ground NPs when used as the only motion verb in a motion expression in both written and spoken corpora, but differences may still be found in other aspects, particularly on manner-of-motion morphemes. For instance, the written corpus-based investigation in this study finds that 走 *zǒu* 'walk' is mainly used in two senses (i.e. walk and leave), 跑 *pǎo* 'run' in three senses (i.e. run, escape, and move for some purpose), and both denote motion carried out by animate figures. However, examples are frequently found where the two morphemes are used in a more generalized sense in spoken language. (1) are utterances by two speakers in a conversation, where both 跑 *pǎo* 'run' and 走 *zǒu* 'walk' are used twice. Rather than denoting specific motion that involves movement of the legs of animate figures, all instances of 跑 *pǎo* 'run' and 走 *zǒu* 'walk' as shown in

(1) would be better understood as 'move at a fast rate' and 'move' respectively, with the figure being either animate or inanimate.

(1) a. Speaker 1: 挺远处有点亮的那样，他说不好，这是水。这车掉过头来就跑。[32]

tǐng yuǎn chù yǒu diǎn liàng de nàyàng, tā shuō bu
quite far place have a.bit bright NOM that.kind 3SG say NEG
hǎo, zhè shì shuǐ. Zhè chē diào-guò tóu lái jiù
good this COP water this car turn-cross head hither then
pǎo (MLC)
move.fast

'It looked a bit bright in the far front. He said, 'Not good. This is water.' The car turned around and ran rapidly.'

b. Speaker 2 (following Speaker 1): 就是我们跑的过程当中，有一辆红旗轿车跟我们走对面，我直按喇叭他也没停，就过去了，等我绕过来的时候，那水几乎已经把他快淹了，然后他也走不了。

*jiù shì wǒmen **pǎo** de guòchéng dāngzhōng, yǒu*
then COP 1PL move.fast NOM process in.the.middle have
*yī liàng hóngqí jiàochē gēn wǒmen **zǒu** duìmiàn, wǒ*
one CLF Hongqi sedan with 1PL move opposite 1SG
zhí àn lǎbā tā yě méi tíng, jiù guò-qù le,
all.the.time press horn 3SG still NEG stop then cross-thither CRS
děng wǒ rào-guò-lái de shíhòu, nà shuǐ
wait 1SG move.around-cross-hither nom time that water
jīhū yǐjīng bǎ tā kuài yān le, ránhòu tā yě
almost already BA 3SG almost submerge CRS then 3SG also
***zǒu**-bùliǎo* (MLC)
move-NEG

'While we were moving quickly, there was a Hongqi sedan moving opposite to us. Even though I kept blaring my horn, he did not stop and instead passed us by. When I turned around, he had been almost submerged by water, and then he could not move.'

In addition to the semantic and syntactic properties of motion morphemes, spoken Chinese may differ from written Chinese in the expressions of motion construction. For instance, in a preliminary investigation of a conversation that involves multiple speakers, this study finds 34 instances of motion expressions consisting of only one motion morpheme and 10 instances of motion expressions consisting of more than

32. The original text in MLC has 也点亮 *yě diǎn liàng*, which could be a typographical error of 有点亮 *yǒu diǎn liàng*.

one motion morpheme (four instances if complement 来 *lái* 'hither' /去 *qù* 'thither' is excluded).[33] However, as shown in Chapter 2, the two types of motion expressions occur equally frequently in the Novel Corpus. Thus, it is intriguing to explore how spoken Chinese differs from written Chinese in encoding motion events, including whether the Motion Morpheme Hierarchy can be simplified by collapsing different scalar types of motion morphemes.

Motion morphemes and constructions in earlier stage of Chinese

A survey of historical texts would find that not all motion morphemes in earlier stages of Chinese had exactly the same distributions as their counterparts in Modern Chinese. For instance, as mentioned in previous chapters, scalar change motion morphemes such as 出 *chū* 'exit' require explicitly expressed information about the ground in Modern Chinese, but in Old Chinese, they did not necessarily take ground NPs or deictic motion morphemes as their objects or complements, as illustrated in (2).

(2) a. 晏子出，见之曰。
Yànzi ***chū*** *jiàn* *zhī* *yuē* (Old Chinese, *Yànzi Chūnqiū*)
NAME exit cause.to.meet 3SG say
'Yanzi went out (from the room), asked him to meet, and said…'

b. 晏子出了*(房间)
Yànzi ***chū-le*** ***fángjiān*** (Modern Chinese)
NAME exit-PFV room
'Yanzi went out of his room.'

In addition, as discussed in Chapter 3, some manner verbs in earlier stages of Chinese can take a ground NP directly as their object, but cannot do so in Modern Chinese, e.g., 逃 *táo* 'escape' in (3). Chapter 3 argued that it is possible that the ground NP was introduced by a hidden directional preposition 于 *yú* 'to, at, from' instead of the manner verb 逃 *táo* in Old Chinese. However, a detailed study is necessary for a systematic account of the change in the distribution of manner verbs.

(3) a. 伍子胥逃楚而之吴。
Wǔzǐxū ***táo*** *Chǔ* *ér* *zhī* *Wú*
NAME escape Chu then arrive Wu
'Wu Zixu escaped from Chu and went to the State of Wu.'
(Old Chinese, *Zhànguócè*, cited in Ma 2008: 29)

33. The conversation investigated was from a radio program (结伴走天下 *Jiébàn zǒu tiānxià* 'travel the world together') broadcasted in 2008, available in the MLC.

b. *伍子胥逃楚国而到了吴国。
*Wǔzǐxū **táo** Chǔ-guó ér dào-le Wú-guó
NAME escape Chu-state then arrive-PFV Wu-state
(Modern Chinese)

Furthermore, the Motion Morpheme Hierarchy and the Scalar Iconicity Constraint predict that two closed scale motion morphemes (other than 到 *dào* 'arrive') usually do not occur together in Modern Chinese. However, more instances can be found in earlier stages of Chinese where two such morphemes did co-occur, as in (4).

(4) 回进内房。
huí ***jìn*** *nèi-fáng* (Early Modern Chinese, *Shuōyuè Quánzhuàn*)
return enter inner-room
'(He) went back (to the house] and entered the inner room.'

There have been studies on the historical development of motion morphemes and constructions in Chinese (e.g., Peyraube 2006; Liang 2007; Ma 2008; Shi and Wu 2014; Shi 2015, among others), but the issues raised here have not been discussed in depth. Therefore, a study is necessary to investigate Chinese motion morphemes and constructions from a diachronic perspective and find out how and when the Motion Morpheme Hierarchy came into being as a generalization over the distribution of Chinese motion morphemes, and whether the Scalar Iconicity Constraint held true in earlier stages of Chinese. Furthermore, such an investigation can also shed light on why some motion morphemes are special in Modern Chinese, for instance, how and why the deictic motion morphemes 来 *lái* 'hither' and 去 *qù* 'thither' grammaticalized and lost their basic meanings of boundedness and duration when they occur as the last motion morpheme in a motion expression consists of multiple motion morphemes.

Motion morphemes and constructions in other languages

Another typologically interesting direction for further studies is the exploration of the scalar approach in motion expressions of other languages. Serial verb languages, such as Thai, Ewe, and Akan, allow multiple motion verbs to occur in a motion expression too (Thepkanjana 1986; Muansuwan 2000; Zlatev and Yangklang 2004; Ameka and Essegbey 2001, among others). For instance, like in Chinese, the deictic motion morpheme in Thai usually occur at the end of motion expressions, and the manner morphemes, i.e. nonscalar change motion morphemes, usually occur at the beginning of a motion expression, as in (5).

(5) a. *khǎw dɔn troŋ ʔɔ̀ɔk maa* (Muansuwan 2000: 145, (8a))
he walk go.straight exit come
'He walked straight out, towards the speaker.'

b. *khǎw dɔn khaw paj* (Muansuwan 2000: 145, (9a))
he walk enter go
'He walked in, away from the speaker.'

However, up to six motion verbs can occur together in a motion expression in Thai (Thepkanjana 1986). As illustrated in (6), while the first and last motion verbs denote manner of motion and deictic information respectively, there are four other motion verbs that occur in the middle. This then raises two questions: whether the relative word order of the four motion verbs is fixed and whether there is any generalization between the orders.

(6) *khǎw* ***wìŋ troŋ yɔ́ɔn klàp khâw pay***.
he run go.straight reverse return enter go
'He ran along straight back in (away from the speaker).'
(Thepkanjana 1986: 136–137, (8))

The different proposals by previous studies on these two questions indicate that a better generalization over the distribution of Thai motion verbs is still needed (see more discussion on the order of Thai motion verbs in Thepkanjana 1986, Muansuwan 2000, Zlatev and Yangklang 2004). Therefore, it is meaningful to investigate from a cross-linguistic perspective to see if the scale structure approach and the Motion Morpheme Hierarchy are extensible to Thai and other serial verb languages.

Motion morphemes in extended uses

While this study has primarily focused on the Chinese motion morphemes for self-agentive and nonagentive motion, these motion morphemes have also been pervasively used in caused motion events (e.g., 把风筝拉下来 *bǎ fèngzhēng lā-xià-lái* BA kite pull-descend.from-hither 'pull down the kite'). Furthermore, as motion is conceptually analogous to time and change of state (Lakoff and Johnson 1980; Lakoff 1987; Langacker 1987; Talmy 2000, among many others), Chinese motion morphemes have been abundantly used in their extended senses such as metaphorical meanings (e.g., 把任务分派下来 *bǎ rènwù fēnpài-xià- lái* BA task assign-descend.from-hither 'assign the tasks down') and grammaticalized meanings (e.g., 把生活安定下来 *bǎ shēnghuó āndìng-xià-lái* BA life settle-descend.from-hither 'settle down in life'). It is beyond the scope of this study to review and discuss the numerous literature on a full range of uses of Chinese motion morphemes (e.g., Liu 1998; Yu 1998,

among many others). However, it may be interesting to look into some remaining issues in these aspects from the scalar approach, for instance, whether scalar features are associated to the motion morphemes that tend to develop metaphorical senses or occur as the resultative complements in resultative verb compounds, and why some motion morpheme pairs (e.g., 来 *lái* 'hither' and 去 *qù* 'thither') exhibit asymmetrical meanings and functions when used in metaphorical or grammaticalized ways.

6.2 Moving beyond motion (verbs)

While the major proposals of this study are intended for Chinese motion morphemes and constructions, this section will go beyond motion (verbs) and demonstrate using four case studies that the proposals of this study and the scalar approach based on which the proposals were developed may shed light onto a more unified analysis of other elements and domains in Chinese, including verbs or verb compounds in general, adjectives, and the word order of adjuncts.[34]

6.2.1 The Manner/Result Complementarity in Chinese

As introduced in Chapter 3, Levin and Rappaport Hovav (1991, 1995, 2013, 2014) and Rappaport Hovav and Levin (2010) propose the manner/result complementarity, that is, a verb either lexicalizes a manner or a result meaning in each of its use, but not both manner and result simultaneously. In the domain of motion, Talmy's (1985, 2000) dichotomous classification of motion verbs into manner-of-motion and path verbs aligns with the manner/result complementarity hypothesis, as path denotes a directed change of location and thus is a type of result. Like how Talmy's two-way classification being challenged by studies that argue for the existence of MP verbs (e.g., Zlatev and Yangklang 2004; Özçalışkan and Slobin 2000; Hsiao 2009, among others, see Chapter 3), the manner/result complementarity hypothesis is also challenged by some studies (e.g., Goldberg 2010; Beavers and Koontz-Garboden 2012, 2017 and Mateu and Acedo-Matellán 2012) that argue for the existence of verbs that encode both manner and result information. Counterexamples raised in these studies include verbs of creation (e.g., *write*), verbs of consumption (e.g., *eat*), verbs of killing (e.g., *guillotine*), and verbs of cooking (e.g., *sauté*). Recall in Chapter 3 where I have shown that Chinese motion morphemes exhibit a tendency for the complementarity as a motion morpheme tends to encode either manner

34. Section 6.2.2 and Section 6.2.3 of this section are partially based on Peck et al. (2013), Lin and Peck (2016), Peck and Lin (2019).

or path information (cf. Ma 2008; Hsiao 2009; Shi 2015). In this section, I will go beyond motion verbs and show that Modern Chinese verbs, in general, exhibit a strong tendency for the manner/result complementarity.

First, it is important to note that like motion verbs, the notions of manner verbs and result verbs in general can be understood from the scalar perspective. A result verb is associated with a scale on a particular dimension and denotes changes along the scale, whereas a manner verb is not associated with any particular scale and thus the changes it denotes cannot be characterized in terms of a single dimension as a scale represents (Rappaport Hovav and Levin 2010). In the following paragraphs, I will discuss Chinese examples using verbs of consumption, creation, and killing, respectively.

When a verb of consumption takes an object denoting the food to be consumed, the VP expresses a change along a single dimension, i.e., a change in which the amount of food decreases (Kennedy 2012, cf. Krifka 1989, 1992; Ramchand 1997). However, verbs of consumptions do not lexicalize result information (Rappaport Hovav 2008; Rappaport Hovav and Levin 2010; Kennedy 2012; Peck et al. 2016, among others). Rather, they are manner verbs lexicalizing nonscalar changes. Chapter 3 has introduced a test to distinguish manner from path for Chinese motion morphemes: a manner verb does not lexicalize any particular scale, so it is compatible with resultative phrases in a variety of dimensions, whereas a path verb is associated with a particular scale, so it is only compatible with resultative phrases that further specifies the existing scale, but not with resultatives in other dimensions. The test is also applicable to these verbs in general. Take the verb of consumption 吃 *chī* 'eat' in Chinese as an example. A corpus search of BCC (assorted) found that 吃 *chī* 'eat' can be followed by 197 types of adjectival complements, that is, 197 different results of eating specified by the adjectives. The most frequent ones include 吃饱 *chī-bǎo* eat-full 'become full as a result of eating', 吃胖 *chī-pàng* eat-fat 'become fat as a result of eating', 吃坏 *chī-huài* eat-bad 'become sick as a result of eating', 吃死 *chī-sǐ* eat-die 'die as a result of eating (poisonous or bad food)', 吃穷 *chī-qióng* eat-poor 'become poor as a result of eating (too much/very expensive food)', and 吃恶心 *chī-ěxīn* eat-nauseous 'feel nauseous as a result of eating'. A few examples are given in (7).

(7) a. 光吃栗子就吃饱了。
guāng chī lìzi jiù ***chī-bǎo*** *le* (BCC)
solely eat chestnut already eat-full CRS
'I ate myself to full by eating chestnuts only.'

b. 今天心情好，吃胖了3斤。
jīntiān xīnqíng hǎo, ***chī-pàng****-le 3 jīn* (BCC)
today mood good eat-fat-PFV 3 jin
'I ate so much that I put on 3 jin because I was in a good mood.'

c. 这两天吃太杂，把肠胃都吃坏了。
zhè liǎng tiān chī tài zá bǎ cháng-wèi dōu
this two day eat too various BA intestines-stomach all
chī-huài *le* (BCC)
eat-bad CRS
'I ate so much junk food these two days that I upset my stomach.'

d. 卖假药吃死了人。
mài jiǎ yào ***chī-sǐ****-le rén* (BCC)
sell fake medicine eat-die-PFV person
'Killed a person by selling the person fake medicine.'

In these examples, each "吃 *chī* 'eat' + adjective" construction expresses a kind of change along the dimension denoted by the adjective, e.g., fullness, fatness, poorness, etc., which suggests that the verb 吃 *chī* 'eat' itself does not lexicalize any particular scale, and thus being a manner verb only.

Similar to verbs of consumption, verbs of creation in Chinese do not lexicalize any scale either (cf. Goldberg 2010).[35] For instance, 写 *xiě* 'write' can collocate with 129 different types of adjectival complements in BCC (assorted) and express changes on different scales, including scales of quantity (8a), straightness (8b), tiredness (8c), and clearness (8d).

(8) a. 他写满了一张纸。
tā ***xiě-mǎn****-le yī zhāng zhǐ* (BCC)
3SG write-full-PFV one CLF paper
'He wrote on the piece of paper and filled it up with words.'

b. 字写歪了，擦去重写。
zì ***xiě-wāi*** *le, cā-qù chóng xiě* (BCC)
word write-crooked CRS erase-go again write
'The words are written in a crooked fashion; erase them and rewrite.'

c. 写累了喝咖啡提提神。
xiě-lèi*-le hē kāfēi tí-tí-shén* (BCC)
write-tired-PFV drink coffee raise-raise-spirit
'Drink some coffee to freshen up if you are tired from writing.'

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35. Goldberg (2010) argues that the analysis of the manner/result issue depends on what counts as a result. According to Goldberg (2010), even though it seems that the verb *write* denotes both manner and result (the action of writing results in some form of content), and the verb *scribble* denotes manner only (the action of scribbling does not specify anything specific content), *scribble* can be a "manner + result" verb because it indeed creates something in writing. Unlike Goldberg (2010), this study follows Rappaport Hovav and Levin (2010) and related studies that result involves changes in a particular dimension. Even though for an event of writing, the default result would be the content being written, there can be results in other dimensions too, such as those in (8).

d. 我必须在明年之前把明年的计划写清楚了。
wǒ bìxū zài míngnián zhīqián bǎ míngnián de jìhuà
1SG must at next.year before BA next.year NOM plan
***xiě-qīngchǔ** le* (BCC)
write-clear CRS
'I must write clearly the plan for the coming year before next year comes around.'

Verbs of killing in English belong to an important type that Beavers and Koontz-Garboden (2012) term as "manner + result" verbs, e.g., *crucify*, *drown*, *electrocute*, *guillotine*, and *hang* (cf. Levin 1993). Assuming the verbs discussed in Beavers and Koontz-Garboden (2012) denote both manner and result, that is, the patient becomes dead after the action, no equivalent "manner + result" monomorphemic verbs can be found in Chinese.[36] Rather, all the Chinese translation equivalents need at least two morphemes to express manner and result separately (9a–d) or manner only (9e).

(9) a. crucify: 钉死 *dīng-sǐ* nail-die;
b. drown: 淹死 *yān-sǐ* submerge-die;
c. electrocute: 电死 *diàn-sǐ* give.an.electric.shock-die;
d. hang: 吊死 *diào sǐ* hang-die;
e. guillotine: 斩首 *zhǎn-shǒu* cut-head

Note that for (9e), even though 斩首 *zhǎn-shǒu* cut-head 'guillotine' typically leads to the death of the person being beheaded, death is not lexicalized in the verb either, as illustrated in (10). In other words, 斩首 *zhǎn-shǒu* cut-head 'guillotine' describes only the manner of killing and becoming dead is a result that is often associated with the manner.

(10) 听说斩首的时候一下子没砍死，犯人就会被放回去。
*tīngshuō **zhǎnshǒu** de shíhòu yīxiàzi méi kǎn-sǐ, fànrén*
hearsay cut.head NOM time immediately NEG cut-die prisoner
jiù huì bèi fàng-huí-qù
then will PASS release-return-thither
'It is said that if a prisoner does not die immediately after guillotine, the prisoner will be released.' (https://zhidao.baidu.com/question/95466927.html)

In fact, even the verb KILL itself, which is an accomplishment verb (a durative process leading to a patient's death) in many languages, does not necessarily entail

36. Further discussion is necessary regarding whether the English examples raised in Beavers and Koontz-Garboden (2012) are indeed "manner + result" verbs. For example, see Husband (2011) for a different analysis of some "manner of death" verbs.

death in Modern Chinese (Tai 1984; Chief 2007; Chen 2018; cf. Teng 1985). While 杀 *shā* 'do killing' is commonly translated as 'kill', as illustrated in (11a–b), a patient does not necessarily become dead from the action that the verb denotes. Only when 杀 *shā* 'do killing' is followed by the result verb 死 *sǐ* 'die' will the combination entail death, as in (11c). Based on empirical studies, Chen (2018) proposes that 杀 *shā* 'do killing' (and other 15 verbs often used to describe events involving destruction or creation of an object) does not lexicalize a change of state. Rather, these verbs imply a change of state, with different degrees of implicature strength. Therefore, cancellation of an implied change of state (such as (11a)) is acceptable to speakers, even though the speakers also prefer to interpret these verbs as change of state verbs when no cancellation is involved.

(11) a. 张三杀了李四两次，李四都没死。
Zhāngsān ***shā****-le* *Lǐsì* *liǎng* *cì*, *Lǐsì* *dōu* *méi* *sǐ*
NAME kill-PFV NAME two CLF NAME all NEG die
'Zhang San killed Lisi twice, but Li Si didn't die.' (Tai 1984: 291, (14))

b. 就像卡斯特罗一样怎么杀也杀不死。
jiùxiàng *Kǎsītèluō* *yīyàng* *zěnme* ***shā*** *yě* *shā* *bù* *sǐ*
just.like NAME same how kill also kill NEG die
'It was like Castro; it does not die no matter how you try to kill it.'
(http://www.evolife.cn/html/2010/56789.html)

c. 穆雪已经被我杀死了！你再也别想见到她了。
Mùxuě *yǐjīng* *bèi* *wǒ* ***shā-sǐ*** *le* *nǐ* *zài* *yě* *bié* *xiǎng*
NAME already PASS 1SG kill-die CRS 2SG again also NEG want
jiàn-dào *tā* *le* (http://www.69shu.com/txt/3549/2185377)
see-arrive 3SG CRS
'I have already killed Mu Xue! Stop thinking that you will see her again!'

The above examples show that Chinese tends to not adopt monomorphemes that can encode both manner and result information (cf. Tai 1984; Xiao and McEnery 2004; Peck et al. 2013). Rather, when both manner and path need to be specified, different individual morphemes are required to encode the two separately. Such a manner/result complementarity is best evidenced by the pervasiveness of RVCs in Modern Chinese. As those RVCs shown in (7–11), the first morpheme typically encodes an action and the second morpheme encodes some result brought about by the action.[37]

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37. In a recent study, Tham (2018) points out that caused change of location and caused motion can be expressed via monomorphemic verbs in Chinese, e.g., 放 *fàng* 'put' and 扔 *rēng* 'throw' respectively. These monomorphemic verbs seem to encode both manner and result information. However, these verbs usually require a phrase to explicitly introduce the result (e.g., change of location), e.g., 放在桌子上 *fàng zài zhuōzi-shàng* put at table-on 'put (something) onto the table' and 扔到地上 *rēng dào dì-shàng* throw arrive ground-on 'throw (something) onto the ground'. In

6.2.2 Scale-based classifications beyond motion verbs

Chapter 4 classified Chinese motion morphemes into four types based on the types of scale structure each morpheme lexicalize; it also showed that the semantic classification is grammatically relevant. This section presents the scale-based classification of Chinese verbs in general and of Chinese adjectives. It will show that the scalar approach is able to provide a more unified explanation to their syntactic features.

6.2.2.1 *A scale-based aspectual classification of verbs in general*

Lexical aspect (also called "situation aspect" in Smith 1997) refers to the temporal properties of events represented by verbs or verb phrases.[38] Traditional aspectual classification based on Vendler (1967) or Dowty (1979) usually adopts three binary temporal features, i.e. dynamicity, duration, and telicity, and groups verbs/verb phrases into four or five classes (Olsen 1997; Smith 1997; Kearns 2000, among many others), as illustrated in Table 6.1.

Table 6.1 Aspectual classification of verbs based on temporal features

Aspectual classes	±dynamic	±durative	±telic
State (*know*, *believe*)	–	+	–
Activity (*run*, *walk*)	+	+	–
Accomplishment (*run three miles*, *build a house*)	+	+	+
Achievement (*arrive*, *die)*	+	–	+
Semelfactive (*cough* (once), *knock* (once))	+	–	–

The aspect of verbs in Chinese has also been widely studied, e.g., Tai (1984), Teng (1985), Chen (1988), Smith (1997), Xiao and McEnery (2004), among others. However, better justification is still necessary for two major issues relevant to RVCs

this sense, the result is implied rather than lexicalized in these verbs (cf. Chen 2018). Note that sometimes verbs of throwing can occur without a resultative phrase, e.g., 把空箱子扔了 *bǎ kōng xiāngzi rēng le* BA empty box throw CRS 'throw away the empty box'. However, in such a use, 扔 *rēng* 'throw' is unspecific about manner (e.g., the vertical/horizontal direction of hand movement, the physical positions of the arm and hand before/after the action, see more dimensional features of verbs of throwing in Gao et al. 2016), and thus behaves more like a path verb rather than a verb with both manner and result. In other words, verbs for caused change of location and caused motion in Chinese do not falsify the manner/result complementarity.

38. This study mainly focuses on the aspectual classification of verbs. Note that aspectual shift may happen when a verb takes an argument NP or is modified by some adjuncts. For instance, 吃 *chī* 'eat' is an activity verb, but when it takes a quantified object NP, e.g., 吃一碗饭 *chī yī wǎn fàn* eat one CLF rice 'eat a bowl of rice', the whole VP is an accomplishment.

(e.g. 找到 *zhǎo-dào* look.for-arrive 'find', 拉长 *lā-cháng* stretch-long 'lengthen') and degree achievement verbs (e.g. 降 *jiàng* 'descend', 冷却 *lěngquè* 'cool').

The first unresolved issue centers around the different analysis of RVCs. For instance, Teng (1985) and Smith (1997) treat RVCs as accomplishments, whereas Tai (1984), Chen (1988) and Xiao and McEnery (2004) classify them as achievements (or a similar category, e.g., as "complex change" in Chen 1988 and as "result" in Tai 1984). In other words, while all these studies recognize that RVCs denote dynamic and telic events, they analyze the durative feature of RVCs differently, i.e. [+durative] for the accomplishment analysis and [-durative] for the achievement analysis. However, upon closer examination, we can find that not all RVCs behave the same with regard to both duration and telicity – some RVCs behave like durative verbs, while others do not, and some RVCs behave like telic verbs, while others do not. For instance, the progressive marker 在 *zài* is only compatible with dynamic and durative verbs, but as illustrated in (12), 在 *zài* can modify the RVC 拉长 *lā-cháng* stretch-long 'lengthen', but not the RVC 找到 *zhǎo-dào* look.for-arrive 'find', suggesting that the former is durative whereas the latter is not.

(12) a. 人民生活在改善。
*rénmín shēnghuó zài **gǎi-shàn*** (BCC)
people life PROG change-good
'People's life is improving.'

b. *我在找到钱包。
wǒ zài **zhǎo-dào qiánbāo*
1SG PROG look.for-arrive wallet
(intended) 'I am looking for my wallet.'

Furthermore, in terms of telicity, once a telic event reaches its end, the action can no longer be continued, but an atelic event can continue forever because there is no inherent endpoint. As illustrated in (13), 改善 *gǎi-shàn* change-good 'improve' is compatible with the modifiers that indicate the continuation of an action or state, such as 继续 *jìxù* 'continue', 进一步 *jìnyībù* 'further', and 更加 *gèngjiā* 'more', but 找到 *zhǎo-dào* look.for-arrive 'find' cannot.

(13) a. 人民生活进一步改善了。
*rénmín shēnghuó jìnyībù **gǎi-shàn** le*
people life further change-good CRS
'People's life has been further improved.'

b. *我进一步找到钱包了。
wǒ jìnyībù **zhǎo-dào qiánbāo le*
1SG further look.for-arrive wallet CRS

The second issue is about the degree achievement verbs. It has been observed in English that verbs such as *cool*, *widen*, *dry*, *lengthen*, and *darken* do not fit neatly into Vendler's (1967) aspectual system (see more discussion in Hay et al. 1999, Kennedy and Levin 2008). Some degree achievement verbs are found to be inherently atelic and thus are compatible with *for* adverbials like activity verbs do, contrary to achievements and accomplishments that are telic and thus do not allow *for* adverbials, as in (14).

(14) a. Degree achievement verb: *The soup cooled for an hour*.
b. Activity: *He ran for an hour*.
c. Achievement: **He found his wallet for an hour*.
d. Accomplishment: **He ran to school for an hour*.

However, these degree achievement verbs cannot be treated as activity verbs because the former denote changes along a particular dimension, but the latter do not. For instance, the verb *cool* describes a change on the dimension of coolness and an event of cooling results in an entity becoming cooler. However, the event of wiping denoted by the activity verb *wipe* does not necessarily entail an entity becoming clean; rather, the entity being wiped can not only become clean, but also dirty, dry or wet.

Chinese is also found to contain a group of degree achievement verbs (e.g., 降 *jiàng* 'descend', 冷却 *lěngquè* 'cool'). Like English, these verbs pattern with activity verbs in being atelic, and pattern with achievement/accomplishment verbs in denoting changes on particular dimensions. Take 吃 *chī* 'eat', 降 *jiàng* 'descend', and 进 *jìn* 'enter' as examples for activity verbs, degree achievement verbs, and achievement verbs respectively. As illustrated in (15), 降 *jiàng* 'descend' behaves the same with 吃 *chī* 'eat' in that neither of them is associated with any inherent endpoint and thus the events they denote can potentially continue forever, whereas in (16)–(17), 降 *jiàng* 'descend' behaves the same with 进 *jìn* 'enter' in that both do not allow a variety of resultative phrases, cf. (7) where 吃 *chī* 'eat' collocates with a variety of resultative phrases.

(15) a. 他吃了一个小时了，还在吃。
tā ***chī***-*le* *yí* *gè* *xiǎoshí* *le* *hái* *zài* ***chī***
3SG eat-PFV one CLF hour CRS still PROG eat
'He has eaten for one hour and is still eating.'
b. 气温降了三天了，还在降。
qìwēn ***jiàng***-*le* *sān* *tiān* *le* *hái* *zài* ***jiàng***
temperature descend-PFV three day CRS still PROG descend
'The temperature has dropped for three days, and it is still dropping.'
c. 他进了房间一个小时了，*还在进。
tā ***jìn***-*le* *fángjiān* *yí* *gè* *xiǎoshí* *le*, **hái* *zài* ***jìn***
3SG **enter**-PFV room one CLF hour CRS still PROG enter
(intended) 'He has entered the room for one hour and is still entering.'

(16) a. ??气温降坏了同学们旅游的计划。
qìwēn ***jiàng****-huài-le* *tóngxué-men* *lǚyóu* *de* *jìhuà*
temperature descend-bad-PFV student-PL travel NOM plan
(intended) 'The temperature dropped and as a result, it ruined the students' travel plans'

b. ??气温降死了很多小动物。
qìwēn ***jiàng****-sǐ-le* *hěn-duō* *xiǎo* *dòngwù*
temperature descend-die-PFV very-many small animal
(intended) 'The temperature dropped and as a result, many small animals died'

c. 气温降到了零下30度。
qìwēn ***jiàng****-dào-le* *líng-xià* *30* *dù*
temperature descend-arrive-PFV zero-below 30 degree
'The temperature dropped to negative thirty degrees'

(17) a. ??他进教室进累了。
tā *jìn* *jiàoshì* ***jìn****-lèi* *le*
3SG enter classroom enter-tired CRS
(intended) 'He entered the classroom and as a result, he was tired.'

b. ??他进教室进丢了鞋子。
tā *jìn* *jiàoshì* ***jìn****-diū-le* *xiézi*
3SG enter classroom enter-lose-PFV shoe
(intended) 'He entered the classroom and as a result, he lost his shoe.'

c. 他进到了教室。
tā ***jìn****-dào-le* *jiàoshì*
3SG enter-arrive-PFV classroom
'He entered and arrived in the classroom.'

The above examples suggest that Chinese RVCs and degree achievements cannot be categorized into the traditional aspectual classes. The problem can be solved, however, by introducing a [±scalar] feature into the aspectual system. As discussed in Chapter 4, a verb is scalar if it describes an event that involves changes along a particular dimension, e.g., temperature, length, size, and distance. Therefore, degree achievement verbs are scalar verbs, just as achievements and accomplishments are. In addition, as discussed in Chapter 4, scalar change verbs can be further classified into open scale and closed scale verbs depending on whether the scale is inherently bounded or not. At the same time, scalar change verbs can also be classified into multi-point and two-point scales, depending on whether the scale is consisted of multiple points/degrees or only two points/degrees. When compared to the traditional aspectual features, the scalar feature of "open/closed" is equivalent to "atelic/telic", and the feature of "multi-/two-point" is equivalent to "durative/punctual". In this sense, multi-point closed scale verbs (e.g., *return, come, kill*) correspond to

accomplishments because they are [+dynamic, +durative, +telic], two-point closed scale verbs (e.g., *enter, arrive, reach, die*) correspond to achievements because they are [+dynamic, -durative, +telic], whereas nonscalar change verbs are equivalent to activity verbs because they are [-dynamic, +durative, -telic]. In other words, we can still distinguish clearly between activities, achievements, and accomplishments even after adding the [±scalar] feature to the traditional aspectual system. More importantly, with the new scalar feature, degree achievement verbs can be better fitted into the aspectual system: verbs such as *dry* and *straighten* with closed scales are equivalent to accomplishments, whereas the verbs that cannot be properly classified in traditional Vendler's (1967) system, such as *cool* and *lengthen*, are verbs with open scales, and can be treated as an independent class within the aspectual classification system based on the scalar approach.

Similarly, for Chinese, the addition of the scalar feature is able to provide a finer-grained aspectual classification. As illustrated in Table 6.2, the four features, the new scalar feature and the three traditional aspectual features, give rise to six attested aspectual classes, each with a set of distinctive aspectual or scalar properties.

Table 6.2 A scale-based aspectual classification of Chinese verbs (based on Peck et al. 2013: 679)

Aspectual classes	**±dynamic**	**±scalar**	**±telic (±closed)**	**±punctual (±two-point)**
State = no change (知道 *zhīdào* 'know', 喜欢 *xǐhuan* 'like')	–	–	–	–
Semelfactive = nonscalar punctual change (咳嗽 *késòu* 'cough', 眨眼 *zhǎyǎn* 'wink')	+	–	–	+
Activity = nonscalar durative change (飞 *fēi* 'fly', 吃 *chī* 'eat')	+	–	–	–
Open scale verb (升 *shēng* 'ascend', 改善 *gǎi-shàn* change-good 'improve')	+	+	–	–
Multi-point closed scale change = Accomplishment (过 *guò* 'cross (a bridge)', 回 *huí* 'return')	+	+	+	–
Two-point closed scale change = Achievement (死 *sǐ* 'die', 找到 *zhǎo-dào* look.for-arrive 'find')	+	+	+	+

According to Table 6.2, [±dynamic] distinguishes states from all other classes of verbs, [±scalar] distinguishes nonscalar verbs (semelfactives and activities) from scalar change verbs (the rest of dynamic verbs), [±telic] distinguishes open scale verbs from the rest of scalar change verbs, and finally [±punctual] distinguishes multi-point closed scale verbs (accomplishments) from two-point closed scale

verbs (achievements). Among these six types of verbs, the open scale verb is a new type, and it accounts for the verbs that previously do not fit in the traditional aspectual classification. Furthermore, many of the scalar tests introduced in Chapter 4 for Chinese motion morphemes can also be applied for identifying the scalar features of Chinese verbs in general (see Peck et al. 2013 for more introduction to the tests).

The new aspectual system justifies the existence of both RVCs and degree achievement verbs in Chinese. As demonstrated earlier in (12–13), RVCs show differences in terms of duration and telicity. Using the scalar approach, RVCs fall into two major classes. The first are open scale verbs that denote durative and atelic events, e.g., 改善 *gǎi-shàn* change-good 'improve' which indicates that people's life can (should) be always further improved. The second are achievements that denote punctual and telic events, e.g., 找到 *zhǎo-dào* look.for-arrive 'find'.[39] Degree achievement verbs such as 降 *jiàng* 'descend', 升 *shēng* 'ascend', and 冷却 *lěngquè* 'cool' are analyzed as open scale as they do not lexicalize any bound or maximal value of change.

In sum, adding the scalar feature to the traditional Vender-based aspectual classification generates a finer-grained aspectual system. The system not only accommodates all previous recognized verbal classes, but also properly brings in the RVCs and degree achievement verbs that are previously unanalyzable.

6.2.2.2 *A scale-based classification of adjectives*

This section goes beyond verbs and shows that the scalar approach also enables a more systematic and finer-grained analysis of Chinese simple adjectives. Simple adjectives in Chinese, also called 性质 *xìngzhì* adjectives (Zhu 1999), refer to adjectives in the bare forms, e.g., 热 *rè* 'hot', 脏 *zāng* 'dirty', 空 *kōng* 'empty', and 干净 *gānjìng* 'clean'. A number of previous analysis of simple adjectives involve notions such as "gradeability", "quantity", and "boundedness" (Zhu 1999; Li and Thompson 1981; Shen 1995; Zhang 2000, 2006a, 2006b; Shi 2001, 2003; Piao 2009). For instance, Li and Thompson (1981: 141–142) classify adjectives into two: gradable and non-gradable (or "scalar adjectives" and "absolute adjectives" in their terms).[40] Other studies such as Shi (2001, 2003) and Piao (2009) provide a further classification of adjectives according to their compatibility with different degree adverbs,

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39. RVCs like 找到 *zhǎo-dào* look.for-arrive 'find' describe events where a process can exist before the state described by the complement is reached, e.g., the action of 找 *zhǎo* 'look for' happens before the wallet was found. In this sense, these RVCs are semantically accomplishments (Chief 2007). However, syntactically, they behave like achievements, as the tests in (12–13) have illustrated.

40. Note that even though Li and Thompson (1981) also use the terms "scalar" and "absolute" like the scale-based studies such as Kennedy (2007) and Kennedy and McNally (2005), their study does not propose a systematic account based on scale structure. Furthermore, Li and Thompson (1981) do not further classify the scalar adjectives that they have identified.

or other syntactic tests such as negation and reduplication, but these studies tend to agree that all simple adjectives are unbounded.

Nonetheless, these previous analyses are unable to distinguish some important differences reflected in the syntactic and semantic behaviors of simple adjectives. Take 热 *rè* 'hot', 脏 *zāng* 'dirty', 空 *kōng* 'empty', and 直 *zhí* 'straight' as examples. These four adjectives are typically grouped into one class in previous studies, e.g., "Type A adjectives" in Piao (2009: 176–177) and "degree adjectives" in Shi (2003: 17). However, these four adjectives respond differently when they are modified by the comparative degree adverb 更 *gèng* 'more' and the negator 不 *bù* 'not'. As illustrated in (18–19), only 热 *rè* 'hot' and 脏 *zāng* 'dirty' are compatible with 更 *gèng* 'more' to describe a higher degree of the property denoted by the adjectives; on the other hand, as in (20–23), when these four adjectives are negated by 不 *bù*, only 脏 *zāng* 'dirty' and 直 *zhí* 'straight' entail their antonyms 干净 *gānjìng* 'clean' and 弯 *wān* 'bent', whereas negating 热 *rè* 'hot' and 空 *kōng* 'empty' does not necessarily result in their antonyms 冷 *lěng* 'cold' and 满 *mǎn* 'full'.

(18) a. 天气变得更热了。
tiānqì biàn dē gèng ***rè*** *le*
weather become COMP more hot CRS
'The weather became hotter.'

b. 地板变得更脏了。
dìbǎn biàn dē gèng ***zāng*** *le*
floor become COMP more dirty CRS
'The floor became dirtier.'

(19) a. ??这个杯子变得更空了。
??*zhè ge bēizi biàn de gèng* ***kōng*** *le*
this CLF cup become COMP more empty CRS
??'This cup became emptier.'

b. ??这根棍子变得更直了。
??*zhè gēn gùnzi biàn de gèng* ***zhí*** *le*
this CLF rod become COMP more straight CRS
??'This rod became straighter.'

(20) a. 地板不脏。
dìbǎn bù ***zāng***
floor NEG dirty
'The floor is not dirty.'

b. 地板干净。
dìbǎn ***gānjìng***
floor clean
'The floor is clean.'

(21) a. 这根棍子不直。
*zhè gēn gùnzi bù **zhí***
this CLF rod NEG straight
'This rod is not straight.'

b. 这根棍子弯。
*zhè gēn gùnzi **wān***
this CLF rod bent
'This rod is bent.'

(22) a. 天气不热。
*tiānqì bù **rè***
weather NEG hot
'The weather is not hot.'

b. 天气冷。
*tiānqì **lěng***
weather cold
'The weather is cold.'

(23) a. 这个杯子不空。
*zhè ge bēizi bù **kōng***
this CLF cup NEG empty
'This cup is not empty.'

b. 这个杯子满。
*zhè ge bēizi **mǎn***
this CLF cup full
'This cup is full.'

Table 6.3 is a summary of the responses of the four adjectives to the modification of 更 *gèng* 'more' and 不 *bù* 'not'. It shows that a further analysis of these adjectives is necessary as each behaves differently from the others.

Table 6.3 Simple adjectives modified by comparative 更 *gèng* and negator 不 *bù*

Adjective	Compatibility with 更 *gèng* 'more'	Negation → antonym
热 *rè* 'hot'	Yes	No
脏 *zāng* 'dirty'	Yes	Yes
直 *zhí* 'straight'	No	Yes
空 *kōng* 'empty'	No	No

The scalar approach can again be adopted for Chinese adjectives. According to previous studies on the gradeability and scale structure of English adjectives (Kennedy 1999, 2001, 2007; Paradis 2001; Rotstein and Winter 2004; Kennedy and McNally 2005), the internal differences among Chinese simple adjectives can be ascribed to

the differences of boundedness inherent in the scale structure of these adjectives. The rest of this section will introduce in more detail how the scalar classification can better capture the syntactic features of Chinese simple adjectives.

Under the scalar approach, an adjective that lexicalizes a scale serves to map objects to a scale (Kennedy 2001; Kennedy and McNally 2005). For instance, according to Kennedy and McNally (2005), when we say *Michael Jordan is tall*, the adjective *tall* maps the height of Michael Jordan onto degrees, i.e. points or intervals ordered along the dimension of height. More specifically, the meaning of *tall* can be understood as a relation between the degree of height Michael Jordan possesses and the standard of comparison. Adjectives that express such a relationship are called "gradable adjectives" (Paradis 2001; Rotstein and Winter 2004; Kennedy and McNally 2005; Kennedy 2007). For consistency, this study adopts the term "scalar adjectives" to refer to gradable adjectives. In contrast to scalar adjectives, there are also a small group of adjectives that are not associated with any scale, i.e. nonscalar adjectives such as 真 *zhēn* 'real', 假 *jiǎ* 'fake', 方 *fāng* 'square', and 圆 *yuán* 'round' in Chinese (cf. Li and Thompson 1981 and other studies). For instance, when 真 *zhēn* 'real' is used in its literal sense, such as (24). It denotes a property that cannot be measured on any scale, or in other words, it does not mean that the authenticity of the passport exceeds a standard value of authenticity.[41]

(24) ??这本护照是真的，但那本护照更真。
zhè běn hùzhào shì zhēn de, dàn nà běn hùzhào
this CLF passport COP authentic NOM but that CLF passport
gèng ***zhēn***
more authentic
(intended) 'This passport is authentic, but that one is more authentic than this one.'

Like motion morphemes introduced in earlier chapters or the verbs introduced in Section 6.2.2.1, scalar adjectives can also be classified into open and closed adjectives according to the boundedness of the scale they lexicalize. That is, a scalar adjective has an open scale (i.e. unbounded) if the scale has no minimum or

41. Some nonscalar adjectives may behave similarly to scalar adjectives by appearing in comparative constructions or being modified by degree adverbs (e.g., 很 *hěn* 'very'), as in (i). However, in such constructions, these adjectives are used in their non-literal senses (e.g., the property of an abstract entity).

(i) 谎言比实话更真。
huǎngyán bǐ shíhuà gèng ***zhēn*** (BCC)
lie COMP truth more **real**
'Lies are more real than truth.'

maximum degrees, whereas a scalar adjective has a closed scale (i.e. bounded) if the scale has a minimum and/or maximum degree(s). In this sense, the notion of boundedness in this study differs from previous studies (e.g., Zhu 1999; Shen 1995, among others) that treat unbounded as gradable and bounded as non-gradable.

It is worth noting that the difference between open scale and closed scale adjectives is also correlated to two different types of standard of comparison that are associated with open and closed scale adjectives (Kennedy and McNally 2005; Kennedy 2007, among others). For open scale adjectives such as *tall* and *long*, there is no minimum or maximum degree on the scale, so the standard of comparison is determined by context. For example, a sentence such as *Michael Jordan is tall* is true if Michael Jordan is compared to the heights of average human beings, but the statement could be false when Michael Jordan is compared to buildings, which are usually much taller than human beings. In contrast, the standard of comparison for closed scale adjectives is determined by the scale itself and thus is independent of context (Kennedy and McNally 2005; Kennedy 2007). For example, a glass is full only if the degree of fullness of the glass reaches the maximal degree; on the contrary, a door is considered open as long as the door possesses some minimal (greater than zero) degree of openness.

Assuming a scale has a lower end and an upper end, then a scale with a maximal value is considered a closed scale which is bounded at its upper end, a scale with a minimal value is a closed scale which is bounded at its lower end, and a scale with both minimal and maximal values is bounded at both ends. Therefore, depending on which end of scale is bounded, closed scale adjectives can be further classified into three groups: lower-closed scale, upper-closed scale, and totally-closed scale, whose standards of comparison are the minimal value, maximal value, and minimal or maximal value of the scale, respectively (Kennedy and McNally 2005; Kennedy 2007).

Chinese adjectives such as 弯 *wān* 'bent' and 脏 *zāng* 'dirty' lexicalize lower-closed scales, because their scale only has a minimal value and does not have a maximal value. For example, 脏 *zāng* 'dirty' does not have a degree at which an entity it describes is maximally dirty. Similarly, 弯 *wān* 'bent' does not have a maximal value, i.e. 100% bent. On the other hand, adjectives such as 直 *zhí* 'straight' and 干净 *gānjìng* 'clean' lexicalize upper-closed scales, because their scale only has a maximal value. For example, the denotation of the adjective 直 *zhí* 'straight' is based on a scale that has a maximal value, i.e. being completely straight, but does not have a minimal value, i.e. zero degrees of straightness. Finally, adjectives such as 满 *mǎn* 'full' and 空 *kōng* 'empty' belong to totally-closed scale adjectives because their scales have both lower and upper bounds. The standard of comparison for this type of adjectives corresponds to either the minimal or maximal values of the scales they have. For example, the minimal degree of 满 *mǎn* 'full' is 0% in fullness which corresponds to 100% empty, whereas the maximal degree of 满 *mǎn* 'full' is

100% fullness which corresponds to 0% empty. Figure 6.1 presents the classification of Chinese simple adjectives based on their scale structure. Simple adjectives are classified into five classes: nonscalar adjectives, open scale adjectives, lower-closed-scale adjectives, upper-closed-scale adjectives, and totally-closed-scale adjectives. However, the latter four types are often grouped into one class as unbounded or unquantized adjectives by previous studies (Shi 2001; 2003; Piao 2009, among others).

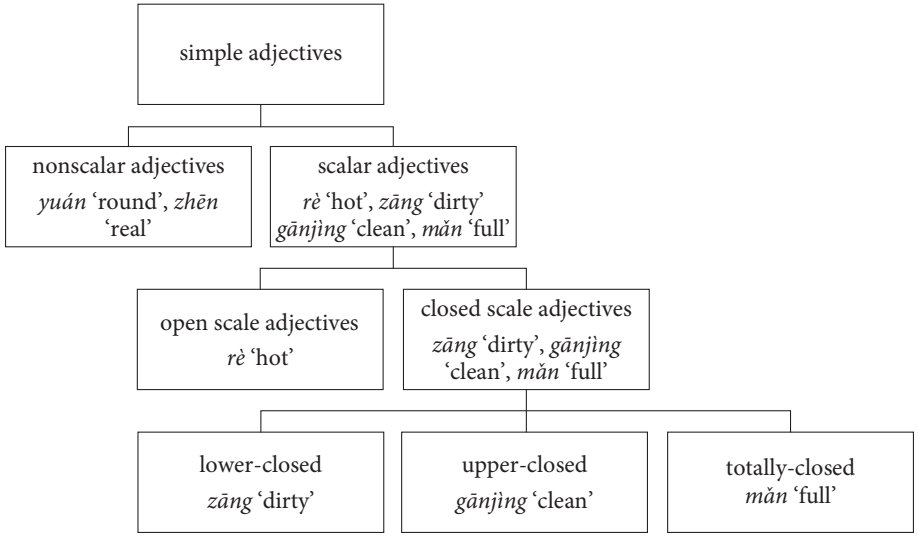

Figure 6.1 Scale-based classification of Chinese simple adjectives (based on Lin and Peck 2016: 846)

Such a classification is then able to explain the different syntactic and semantic features of each type of simple adjectives. Going back to the sentences in (18) and (19), when 更 *gèng* 'more' is used for comparison between changed properties of the same entity, it is compatible with 热 *rè* 'hot' and 脏 *zāng* 'dirty' because both have no maximal values and thus allow the property to reach at higher values; however, 更 *gèng* 'more' does not occur naturally with 直 *zhí* 'straight' or 空 *kōng* 'empty' because both have maximal values, and no higher value is allowed when an entity has already reached the maximal value.

The different responses of the adjectives to the negator 不 *bù* can also be accounted in terms of their scale structure. 脏 *zāng* 'dirty' refers to any degree on the scale of "dirtiness" that is higher than the zero degree (i.e. the minimal degree, which is equivalent to its antonym 干净 *gānjìng* 'clean'). Therefore, negating 脏 *zāng* entails 干净 *gānjìng* 'clean'. Similarly, since 直 *zhí* 'straight' indicates the maximal degree of a scale, 不直 *bù zhí* NEG straight 'not straight' refers to any degree on the scale that is lower than the maximal degree. These degrees are equivalent to the

range of degrees that 弯 *wān* 'bent' (the antonym of 直 *zhí* 'straight') denotes. On the contrary, 热 *rè* 'hot' expresses a degree that is higher than a context-dependent standard of comparison. 不热 *bù rè* NEG hot 'not hot' can refer to a temperature that is equivalent to the standard of comparison (neither hot nor cold), or a temperature that is cold (i.e. its antonym 冷 *lěng* 'cold'). Finally, 空 *kōng* 'empty' lexicalizes a scale with both a maximal value (i.e. 100% empty) and a minimal value (i.e. 0% empty) and many other values in between them that are neither empty or full. Thus, the negation of 空 *kōng* 'empty' can refer to its antonym 满 *mǎn* 'full' or any value between 0% empty and 100% empty.

6.2.3 The Scalar Iconicity Constraint and Chinese word order

In this section, I extend the discussion of word order beyond motion morphemes. Using locative PPs as examples, this section will demonstrate the application of the "Scalar Iconicity Constraint" for the word order of elements larger than the constituents of motion verb compounds discussed in earlier chapters.

6.2.3.1 *The Chinese locative PPs*

This study adopts the term "locative PPs" for all spatial PPs including both directional (e.g., PPs head by 向 *xiàng* 'toward') and non-directional phrases (e.g., PPs headed by 在 *zài* 'at').[42] (25) is a list of the major types of locative PPs and the typical prepositions that head these PPs in Chinese.[43]

(25) a. Source PP: 从 *cóng* 'from';
b. Route PP: 沿(着) *yán*(*zhe*) 'along', 顺(着) *shùn*(*zhe*) 'along', 绕(着) *rào* (*zhe*) 'around';
c. Direction PP: 向 *xiàng* 'toward', 往 *wǎng* 'toward', 朝 *cháo* 'toward';
d. Location PP: 在 *zài* 'at'

These PPs vary in terms of their relative order with verbs. The orders of source PPs and route PPs are usually fixed, that is, they typically occur in preverbal position, as in (26)–(27).

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42. Unlike English location prepositions such as *in, on, above*, and *below*, 在 *zài* in Chinese does not express a specific spatial reference (Sun 2006; Lin and Sun 2016). Rather, it is its objects, especially the localizers that an object takes, that specify the spatial reference, e.g., 在箱子上 *zài xiāngzi-shàng* at box-on 'on the box', 在箱子下 *zài xiāngzi-xià* at box-under 'under the box', and 在箱子里 *zài xiāngzi-lǐ* at box-inside 'in the box'. So, this study glosses 在 *zài* as 'at' in a general sense.

43. Previous studies are not consistent with regard to the grammatical status of 到 *dào* 'arrive', especially when it appears in the postverbal position. As discussed in Chapter 4, this study does not treat postverbal 到 *dào* 'arrive' as a preposition.

(26) a. 我们则从后门离开。
*wǒmen zé **cóng hòu-mén** líkāi* (BCC)
1PL then from back-door leave
'We then left from the back door.'

b. *我们则离开从后门。
women zé líkāi **cóng hòu-mén*
1PL then leave from back-door

(27) a. 孩子们沿着大街跑。
*háizimen **yánzhe dàjiē** pǎo* (BCC)
children along street run
'The children ran along the street.'

b. *孩子们跑沿着大街。
háizimen pǎo **yánzhe dàjiē*
children run along street

However, as shown in (28) and (29), direction PPs and location PPs can occur in both preverbal and postverbal positions.

(28) a. 快向森林跑。
*kuài **xiàng sēnlín** pǎo* (BCC)
quickly toward forest run
'Run toward the forest quickly!'

b. 许多人跑向森林。
*xǔduō rén pǎo **xiàng sēnlín*** (BCC)
many people run toward forest
'Many people ran toward the forest.'

(29) a. 朵多特喜欢在沙发上跳。
*duǒduō tè xǐhuan **zài shāfā-shàng** tiào* (BCC)
NAME very like at sofa-on jump
'Duoduo loves to jump on the sofa.'

b. 他回到家里，就看到皮卡丘跳在沙发上，四脚朝天仰面躺在灰色的沙发上。
*tā huí-dào jiā-lǐ, jiù kàn-dào píkǎqiū tiào **zài***
3SG return-arrive home-in at.once see-arrive NAME jump on
***shāfā-shàng**, sì-jiǎo-cháo-tiān yǎng miàn tang zài huī-sè*
sofa-on four-leg-face-sky raise face lie at grey-colour
de shāfā-shàng (m.yushuwu.org/novel/47142/6235442.html)
NOM sofa-on
'He saw Pikachu jump onto the grey sofa and laid on his back on the sofa just as he reached home.'

Furthermore, when the PPs occur in postverbal position, the preposition may incorporate into the preceding verb and the two elements form a verbal compound,

which then leaves the NP of the PP functioning like an object argument. The process is called "preposition incorporation (PI)" in the sense of Baker (1988). PI is evidenced by the suffixation of the perfective marker 了 *le* to the "V + PP" compound. Take (28b) and (29b) as examples. As illustrated in (30), the verbal aspect marker 了 *le* has to occur after 向*xiàng* 'toward' and 在 *zài* 'at' instead of the verbs 跑 *pǎo* 'run' and 跳 *tiào* 'jump', and the location NPs of the PPs (森林 *sēnlín* 'forest' and 沙发上 *shāfā-shàng* sofa-on 'sofa') consequently function like an objects of the verbal compounds that are comprised of the motion verb and the preposition.

(30) a. 跑向了森林
*pǎo-**xiàng**-le sēnlín*
run-toward-PFV forest
'ran toward the forest'

b. 跳在了沙发上
*tiào-**zài**-le shāfā-shàng*
jump-at-PFV sofa-on
'jumped onto the sofa'

It is worth noting that with certain verbs, 在 *zài* 'at' PPs in pre- and postverbal position are understood as the same and no PI is allowed. As in (31), both pre- and postverbal 在 *zài* 'at' PPs denote the location where the walking event takes place, and as in (32), no perfective marker is allowed for the postverbal case, cf. the 在 *zài* 'at' PPs in (30b).

(31) a. 今天在路上走~~两次差点被出租车撞到。
*jīntiān **zài lù-shàng** zǒu liǎng cì chàdiǎn bèi chūzūchē*
today at road-on walk two CLF nearly PASS taxi
zhuàng-dào (BCC)
knock-arrive
'(I) was nearly knocked down by taxi twice today while walking along the street.'

b. 我走在路上，鞋子跑进一颗石头。
*wǒ zǒu **zài lù-shàng** xiézi pǎo-jìn yī kē shítou* (BCC)
1SG walk at road-on shoe run-enter one CLF stone
'I was walking on the street and a stone went into my shoe.'

(32) a. ??我走在了路上。
*??wǒ zǒu-**zài**-le lù-shàng*
1SG walk-at-PFV road-on
(intended) 'I walked on the street.'

b. ??我走了在路上。
*??wǒ zǒu-le **zài** lù-shàng*
1SG walk-PFV at road-on
(intended) 'I walked on the street.'

The above examples suggest that the distribution of Chinese locative PPs seems to be complicated and unpredictable. However, the order of these PPs can be explained in a unified way based on their scale structure and the semantic constraints of word order in Chinese. Recall that Chapter 5 proposed the "Scalar Iconicity Constraint" for the ordering of motion morphemes: the morpheme with more specific information about the scale (or path of motion) tends to occur after the ones with less specific information. This section will show that the constraint also holds for the word order of Chinese locative PPs. That is, the PP that is associated with more specific scalar information of an event tends to occur in postverbal position and allows PI.

The constraint holds for both the distributions of source PPs and route PPs. Both types of PPs do not specify direction or endpoints for an event, that is, they do not carry scalar information, so both occur in preverbal position only (26–27).[44] In the following, I will introduce the distributions of directional PPs and location PPs respectively in more detail.

6.2.3.2 *Distributions of Chinese directional PPs*

向 *xiàng* 'toward' and 往 *wǎng* 'toward' are two mostly frequently used directional prepositions in Chinese according to the BCC Corpus.[45] They specify an open scale (or a direction) to the motion event that they modify. For instance, 走 *zǒu* 'walk' is a nonscalar motion morpheme, but when it is modified by a 往 *wǎng* 'toward' PP, the walking event becomes scalar (or directional). Yet, directional PPs do not

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44. The source PPs headed by 自 *zì* 'from' occur in postverbal position, e.g., 来自北京 *lái-zì Běijīng* come-from Beijing 'came from Beijing', but such usage is usually limited to the more classical styles of writing. Furthermore, such an expression does not allow PI, *来自了北京 **lái-zì-le Běijīng* come-from-PFV Beijing. Therefore, this study does not take such source PPs as a counterexample.

45. The BCC Corpus shows that PPs headed by both 向 *xiàng* 'toward' and 往 *wǎng* 'toward' are highly frequently used in both pre- and postverbal positions. In contrast, 朝 *cháo* 'toward' PPs are predominantly preverbal. However, 朝 *cháo* 'toward' became a directional preposition for motion events much later than 向 *xiàng* 'toward' and 往 *wǎng* 'toward' in the way of developing into a directional preposition. According to Ma (2002), 朝 *cháo* 'toward' started to function as a preposition to specify the direction toward which the agent is facing only as late as in Yuan and Ming dynasties. It later on acquired the prepositional function to modify motion verbs and specify the direction of motion. It could be possible that in future 朝 *cháo* 'toward' can occur in postverbal position too when it modifies motion verbs. A search in BCC returns a few examples where 朝 *cháo* 'toward' occurs after motion verbs, as in (i).

(i) 有如巨鹰飞朝天空。
*yǒurú jù-yīng fēi-**cháo** tiānkōng* (BCC)
like huge-eagle fly-toward sky
'[She] flew toward the sky like a giant eagle.

turn a telic motion event into a telic one. As shown in (33b), 往 *wǎng* 'toward' can take a directional NP, which specifies a direction to the event, but does not provide any information regarding the endpoint of the motion. In addition, even when 往 *wǎng* 'toward' takes an NP that denotes an endpoint, the PP does not entail the arrival at the endpoint, as in (33c) where the figure stopped the motion toward the endpoint (the door).

(33) a. 我一个人在走。
*wǒ yī gè rén zài **zǒu*** (BCC)
1SG one CLF person PROG walk
'I am walking alone.'

b. 她昏昏沉沉不知该走往何方。
*tā hūnhūnchénchén bù zhī gāi zǒu-**wǎng** **héfāng***
3SG faint-faint-heavy-heavy NEG know should walk-toward where
'She was drowsy and did not know where she should walk toward.'(BCC)

c. 瑞琦在走往门口的中途停住，提起笨拙的黑色礼服裙摆转过身去。
*Ruìqí zài zǒu-**wǎng** **ménkǒu** de zhōngtú tíng-zhù,*
NAME at walk-toward door NOM half.way stop-stay
tí-qǐ bènzhuō de hēi sè lǐfú qúnbǎi zhuǎn-guò
raise-up clumsy NOM black colour gown hem turn-across
shēn qù (BCC)
body thither
'While walking toward the door, Ruiqi stopped halfway to pick up the hem of her bulky gown and turned her body around.'

Although as shown in (28), 向 *xiàng* (and 往 *wǎng*) 'toward' PPs can occur in both pre- and postverbal positions, their distribution tends to conform to the hypothesis of the Scalar Iconicity constraint, that is, the one with more specific information tends to occur in the postverbal position. Two pieces of evidence are presented in the following.

First, postverbal 向 *xiàng* /往 *wǎng* 'toward' PPs can only collocate with motion verbs such as 飞 *fēi* 'fly' and 开 *kāi* 'drive' for which they specify an open path of motion (cf. Lü 1980; Fan 1990; Ma 2002; Zhao 2002; Fang 2004; Wang 2004, among others). When the PPs do not function to specify scalar information for an event, they cannot occur in the postverbal position. For instance, verbs such as 微笑 *wēixiào* 'laugh', 报告 *bàogào* 'report', and 下跪 *xiàguì* 'kneel down' denote events that do not necessarily involve motion in space. A 向 *xiàng* 'toward' PP can collocate with these non-motion verbs, but it can only occur in the preverbal position, as in (34), cf. (28). Furthermore, rather than specifying an open scale for these events, such a preverbal 向 *xiàng* 'toward' PP only specifies the direction where the agent is facing when carrying out the actions (e.g., smiling in (34a)).

(34) a. 她向我微笑。
tā ***xiàng*** ***wǒ*** *wēixiào* (BCC)
3SG toward 1SG smile
'She smiled at me.'
b. *她微笑向我。
tā *wēixiào* ***xiàng*** ***wǒ***
3SG smile toward 1SG
(intended) 'She smiled at me.'

On the other hand, a 往 *wǎng* 'toward' PP is even more restricted in the types of verbs it modifies. As shown in (35), it does not co-occur with non-motion verbs, be it in the preverbal or the postverbal position, which thus is also consistent with the Scalar Iconicity Constraint.

(35) a. *她往我微笑。
tā* ***wǎng* ***wǒ*** *wēixiào*
3SG toward 1SG smile
(intended) 'She smiled at me.'
b. *她微笑往我。
tā* *wēixiào* ***wǎng* ***wǒ***
3SG smile toward 1SG
(intended) 'She smiled at me.'

Second, even though as shown in (28), 向 *xiàng* (and 往 *wǎng*) 'toward' PPs can occur in both pre- and postverbal position and specify a direction for a motion event, the postverbal position is preferred when the PPs express result information that is more specific. The evidence comes from the distribution of the different kinds of NPs following 向 *xiàng* /往 *wǎng* 'toward' in pre- and postverbal positions respectively. Both pre- and postverbal 向 *xiàng* /往 *wǎng* 'toward' can take a nominal object which refers to a location (e.g., 北京 *Běijīng* 'Beijing') or a direction (e.g., 北方 *běifāng* 'north'), as exemplified by 向 *xiàng* in (36). However, a location NP denotes more specific information of the motion than a direction NP does in that the former specifies the intended endpoint of motion, even though a 向 *xiàng* /往 *wǎng* 'toward' PP does not entail the arrival at the endpoint.

(36) a. 向北京/北方飞
xiàng ***Běijīng/běifāng*** *fēi*
toward Beijing/north fly
'fly toward Beijing/north'
b. 飞向北京/北方
fēi ***xiàng*** ***Běijīng/běifāng***
fly toward Beijing/north
'fly toward Beijing/north'

As predicted by the Scalar Iconicity Constraint, a corpus survey finds that location NPs are preferred by postverbal 向 *xiàng*/往 *wǎng* 'toward', whereas direction NPs are preferred by preverbal 向/往 *xiàng/wǎng* 'toward'. For instance, we chose five motion verbs, 走 *zǒu* 'walk', 飞 *fēi* 'fly', 冲 *chōng* 'rush', 逃 *táo* 'escape', and 退 *tuì* 'recede' that frequently co-occur with both 向 *xiang* 'toward' and 往 *wǎng* 'toward' (Fang 2004), and investigated the types of NPs that 向 *xiàng* 'toward' and 往 *wǎng* 'toward' take in pre- and postverbal positions in BCC (assorted).[46] For each verb, 100 sentences where 向 *xiàng* 'toward' and 往 *wǎng* 'toward' occur in pre- and postverbal positions respectively (1,000 in total for the two prepositions respectively) were randomly examined. The results are presented in Table 6.4 and Table 6.5.[47]

Table 6.4 The location and direction NPs occurring in pre- and postverbal 向 *xiàng* PPs (Peck and Lin 2019: 109)

Verb	Preverbal		Postverbal		Total
	direction NP	location NP	direction NP	location NP	
走 *zǒu* 'walk'	47 (47%)	53 (53%)	3 (3%)	97 (97%)	200
冲 *chōng* 'rush'	44 (44%)	56 (56%)	13 (13%)	87 (87%)	200
逃 *táo* 'escape'	69 (69%)	31 (31%)	34 (34%)	66 (66%)	200
飞 *fēi* 'fly'	50 (50%)	50 (50%)	23 (23%)	77 (77%)	200
退 *tuì* 'recede'	96 (96%)	4 (4%)	50 (50%)	50 (50%)	200
Total (mean %)	306 (61.2%)	194 (39.8%)	123 (24.6%)	377 (75.4%)	1000

46. According to previous studies (e.g., Lü 1980; Fang 2004), while some verbs can co-occur with both 向 *xiàng* 'toward' and 往 *wǎng* 'toward', some (e.g., 扑 *pū* 'throw oneself to', 射 *shè* 'shoot') tend to only co-occur with 向 *xiàng* 'toward' and some (送 *sòng* 'send', 搬 *bān* 'carry') only with 往 *wǎng* 'toward'. The five motion verbs 走 *zǒu* 'walk', 飞 *fēi* 'fly', 冲 *chōng* 'rush', 逃 *táo* 'escape', and 退 *tuì* 'recede' were selected for the corpus study because all of them co-occur frequently with both 向 *xiàng* 'toward' and 往 *wǎng* 'toward', as shown in Fang (2004) and also evidenced by the corpus data of this study.

47. While for most examples, whether an NP denotes a direction (e.g., 北方 *běifāng* 'north') or a goal location (e.g., 北京 *Běijīng* 'Beijing') can be clearly determined, sometimes the boundary between the two is vague. For instance, neither 山上 *shān-shàng* mountain-on 'on the mountain' nor 山下 *shān-xià* mountain-under 'downhill' specifies a definite position as its endpoint. However, this study takes 山上 *shān-shàng* mountain-on 'on the mountain' as a goal NP and 山下 *shān-xià* mountain-under 'downhill' as a direction NP. The reason is that examples like 向山上跑 *xiàng shān-shàng pǎo* toward mountain-on run 'run uphill' entail that the top of the mountain is the potential endpoint, but 向山下跑 *xiàng shān-xià pǎo* toward mountain-under run 'run downhill' does not specify that the motion will end right at the foot of the mountain, or any other further location down the mountain. In other words, an NP is taken as a location NP if it denotes a location with limited space and any part of the location within the space can be considered as an endpoint, but a direction NP if it denotes an open space without a readily identifiable endpoint.

Table 6.5 The location and direction NPs occurring in pre- and postverbal 往 *wǎng* PPs (Peck and Lin 2019: 109)

	Preverbal		Postverbal		Total
Verb	direction NP	location NP	direction NP	location NP	
走 *zǒu* 'walk'	81 (81%)	19 (19%)	21 (21%)	79 (79%)	200
冲 *chōng* 'rush'	60 (60%)	40 (40%)	16 (16%)	84 (84%)	200
逃 *táo* 'escape'	63 (63%)	37 (37%)	14 (14%)	86 (86%)	200
飞 *fēi* 'fly'	61 (61%)	39 (39%)	8 (8%)	92 (92%)	200
退 *tuì* 'recede'	95 (95%)	5 (5%)	32 (32%)	68 (68%)	200
Total (mean %)	360 (72%)	140 (26%)	91 (18.2%)	409 (81.8%)	1000

Both Table 6.4 and Table 6.5 indicate two distributional tendencies: (a) in the preverbal position, there are more direction NPs (e.g. 北方 *běifāng* 'north') than location NPs (e.g. 北京 *Běijīng* 'Beijing'); (b) in the postverbal position, there are more location NPs than direction NPs. This can be further verified by Chi-square tests (Fisher's exact tests), where a significant association ($p < .0001$) is found between the positions (pre- or postverbal) and the type of NPs (direction or location) for both 向 *xiàng* 'toward' and 往 *wǎng* 'toward'. The distributional differences suggest that the word orders in pre- and postverbal 向 *xiang* /往 *wǎng* 'toward' PPs are consistent with the Scalar Iconicity Constraint, as postverbal 向 *xiàng* /往 *wǎng* 'toward' PPs tend to express more specific endpoint than preverbal 向 *xiàng* /往 *wǎng* PPs do.

6.2.3.3 *Distribution of Chinese location PPs*

在 *zài* 'at' PPs denote a location and do not turn a nonscalar event into a scalar one. For instance, the addition of 在公园里 *zài gōngyuán-lǐ* at park-in 'in the park' in (37b) does not change the event of running into a scalar motion event.

(37) a. 他跑得飞快。
tā pǎo de fēi-kuài
3SG run COMP fly-fast
'He ran very fast.'

b. 他在公园里跑得飞快。
tā ***zài gōngyuán-lǐ*** *pǎo de fēi-kuài*
3SG at park-inside run COMP fly-fast
'He ran very fast in the park.'

As shown in (29) and (31), a 在 *zài* 'at' PP may occur in both pre- and postverbal position. However, the postverbal 在 *zài* 'at' PPs do not behave consistently: some postverbal 在 *zài* 'at' PPs have the same interpretation as the preverbal 在 *zài* 'at' PPs but some pre- and postverbal 在 zài 'at' PPs are understood differently, e.g., (29) and (31), and some postverbal 在 *zài* 'at' PPs can undergo PI but some cannot, e.g.,

(30b) and (32).[48] Nonetheless, a closer examination will find that such distribution of 在 *zài* 'at' PPs also conforms to the "Scalar Iconicity Constraint".

As shown earlier, in the postverbal position, 在 *zài* 'at' PPs fall into two types, one that allows PI, like in (30b), and the other that does not, as in (32a). This study finds that only when the motion expressions denote scalar change, can the 在 *zài* 'at' PPs undergo PI. (38) present a few more examples. All these examples denote events that involve scalar change, with an endpoint (38a–b) or a resultant state (38c), and the 在 *zài* 'at' PPs elaborate where the endpoint or resultant state is.[49]

(38) a. 大部分雪降在了平原地带。
*dà bùfèn xuě jiàng-**zài-le** **píngyuán dìdài*** (BCC)
most part snow descend-at-PFV plain zone
'Most of the snow fell upon the plains.'

b. 我一下子跳在了她的桌子上。
*wǒ yīxiàzǐ tiào-**zài-le** **tā** **de** **zhuōzi-shàng*** (BCC)
1SG immediately jump-at-PFV 3SG NOM table-on
'I immediately jumped onto her table.'

c. 到省城的通路那是死亡之路，南顺十万人全部死在了路上。
dào shěngchéng de tōnglù nà shi sǐwáng zhī lù
arrive provincial.capital REL path that COP death REL road
*Nánshùn shíwàn rén quánbù sǐ-**zài-le***
Nanshun one.hundred.thousand people all die-at-PFV
lù-shàng (BCC)
road-on
'All the paths toward the provincial capital led to the death – all one hundred thousand people from Nanshun died on the roads.'

Moreover, 在 *zài* 'at' PPs are either not allowed to occur in the preverbal position or will express a different meaning when occurring in the preverbal position, as in (39).

(39) a. ??雪在平原地带降了。
*xuě **zài** **píngyuán** **dìdài** jiàng le*
snow at plain zone descend CRS
(intended) 'Snow fell at the plains.'

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48. There are a number of studies that discuss the distributions and functions of 在 *zài* 'at' PPs in Chinese, e.g., Wang (1957, 1980), Tai (1975), Zhu (1981), Fan (1982), Liu (2009), Luo (2011), and Tham (2013), but these studies do not distinguish the postverbal 在 *zài* PPs that can undergo PI from those that cannot.

49. Chapters 3 and 4 show that 跳 *tiào* 'jump' lexicalizes nonscalar changes, but as discussed in Chapter 3, with a supportive context, an expression may have a directional interpretation even if no scalar motion morpheme is involved (see more discussion in Chapter 3).

b. 我在她的桌子上跳了。
wǒ ***zài*** ***tā*** ***de*** ***zhuōzi-shàng*** *tiào* *le*
1SG at 3SG POSS table-on jump CRS
'I was jumping on her table.'

c. ??南顺十万人全部在路上死了。
Nánshùn *shíwàn* *rén* *quánbù* ***zài*** ***lù-shàng***
Nanshun one.hundred.thousand people all at road-on
sǐ *le*
die CRS
'One hundred thousand people from Nanshun all died on the road.'

On the contrary, when a motion event is nonscalar, even though a 在 *zài* 'at' PP can occur in the postverbal position, it expresses the same meaning with the preverbal 在 *zài* 'at' PP, cf. (31a) and (31b). Furthermore, no PI is allowed with such postverbal 在 *zài* 'at' PPs, cf. (30b) and (32).

To summarize, when modifying a nonscalar change event, be it occurring in the preverbal or postverbal position, the 在 *zài* 'at' PPs function in the same way, i.e. modifying a given event as a whole and denoting the location where an event takes place, and such a 在 *zài* 'at' PP does not undergo PI even if it occurs in the postverbal position. Only when modifying a scalar change event can a postverbal 在 *zài* 'at' PP be associated with result information and undergo PI.

6.2.3.4 *Ordering of multiple adjuncts*

The previous sections discuss the cases with only one adjunct, i.e. one PP, and show that only the ones that lexicalize scalar information or are associated with scalar information can occur in the postverbal position and allow PI. This section further demonstrates that when there is more than one adjunct modifying a verb, these adjuncts are ordered in a way that conforms to the Scalar Iconicity Constraint.

As illustrated in (40) and (41), a 向 *xiàng* 'toward' PP is used in both examples, but it appears in postverbal only in (40a), and preverbal only in (41a). Such an ordering can be explained by the constraint: in (40a), the 向 *xiàng* 'toward' PP describes more specific scalar information than the 从 *cóng* 'from' PP, so the 向 *xiàng* 'toward' PP takes the postverbal position; in contrast, the 到 *dào* 'arrive' adjunct (or complement) in (41a) specifies the endpoint of motion, which is thus more specific than the directional 向 *xiàng* 'toward' PP and takes the postverbal position.

(40) a. 那人匆匆地从巴士站跑向露营车。
nà *rén* *cōngcōng* *de* ***cóng*** ***bāshì-zhàn*** *pǎo* ***xiàng***
DEM person hurry ADV from bus-stop run toward
lùyíng-chē (BCC)
camping-car
'That person ran hurriedly from the bus stop toward the camping car.'

b. *向露营车跑从巴士站
**xiàng lùyíng-chē pǎo cóng bāshì-zhàn*
toward camping-car run from bus-stop

(41) a. 向东跑到医院。
xiàng dōng** pǎo-**dào** **yīyuàn (BCC)
toward east run-arrive hospital
'Run east toward the hospital.'

b. *到医院跑向东
**dào yīyuàn pǎo xiàng dōng*
arrive hospital run toward east

The Scalar Iconicity Constraint can also be extended to temporal adjuncts. As shown in (42), the duration phrase 十分钟 *shí fēnzhōng* ten minute 'ten minutes' has to take the postverbal position when co-occurring with the nonscalar 在 *zài* 'at' PP, because besides as a temporal bound, 十分钟 *shí fēnzhōng* also provides a spatial bound to the event of walking. That is, the motion of walking terminates at a location when the figure completes the ten-minute walking.

(42) a. 在道路上走了十分钟
zài dàolù-shàng** zǒu-le **shí fēnzhōng (BCC)
at street-on walk-PFV ten minute
'walked on the street for ten minutes'

b. *花了十分钟走在道路上
**huā-le shí fēnzhōng zǒu zài dàolù-shàng*
spend-PFV ten minute walk at street-on

By contrast, as in (43), when 十分钟 *shí fēnzhōng* ten minute 'ten minutes' and 到邮局 *dào yóujú* arrive-post.office 'arrive at the post office' co-occur, the latter has to occur in the postverbal position because although both adjuncts provide a bound to the event of walking, the latter explicitly denotes the endpoint of motion and thus is more specific than the temporal adjunct, which only indicates that the motion terminates at a certain location.

(43) a. 十分钟走到邮局。
shí fēnzhōng** zǒu-**dào** **yóujú (BCC)
ten minute walk-arrive post.office
'I spent ten minutes walking to the post office.'

b. *到邮局走十分钟。
**dào yóujú zǒu shí fēnzhōng*
arrive post.office walk ten minute
(intended) 'I spent ten minutes walking to the post office.'
(okay if) 'I came to the post office and walked (in there) for 10 minutes.'

6.2.3.5 *The advantages of the Scalar Iconicity Constraint*

Cross-linguistically, it has been observed that goal locatives tend to participate in the composition of event structure by delimiting the event, whereas source locatives usually do not, and the locative that is semantically closer to an event is also syntactically closer to the verb (i.e. the "source-goal asymmetry", Nam 2005, 2012, among others). In addition to locatives, studies also observe that a non-categorized argument in general (e.g., locative and temporal NPs) may be realized as an object argument if they function as event delimiters (Dowty 1991; Tenny 1994; Wechsler and Lee 1996, among others). For instance, as in (44a), if an event of loading is considered completed when the truck is fully loaded, the truck has to appear in the object position; on the contrary, in (44b), if an event of loading is considered completed when all of the hay is loaded into the truck (when the truck may not be fully loaded), then the hay has to appear in the object position.

(44) a. *Mary completely loaded **the truck** with hay.* (Dowty 1991: 589)
b. *Mary completely loaded **the hay** onto the truck.* (Dowty 1991: 589)

However, the delimiter hypothesis cannot explain the distributions of direction PPs (向 *xiàng* /往 *wǎng* 'toward' PPs) and location PPs (在 *zài* 'at' PPs) in Chinese. Neither of these two types delimit an event, but the preposition can be incorporated into a verb compound, which then take the NP of the preposition as its object. In this sense, the scalar approach is able to account for a larger range of data. That is, compared with previous studies that only focus on delimiting elements, an adjunct that is associated with scalar information can undergo PI in Chinese and tend to occur in the postverbal position, be it delimiting an event, adding an open scale to an event, or elaborating the endpoint or the location of the resultant state of a scalar event. Furthermore, even though the temporal iconicity principle proposed in previous studies can explain a large amount of Chinese data, the Scalar Iconicity Constraint is able to account for the word order variations as illustrated in (31), where the 在 *zài* 'at' adjunct and the verb 走 *zǒu* 'walk' show no temporal differences.

6.3 Summary

This book has now moved to its endpoint. The study on motion and beyond, however, is an open scale journey that will never end.

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Subject index

This book is a corpus-based description and discussion of how Modern Mandarin Chinese encodes motion events, with a focus on how the distribution of verbal motion morphemes is closely associated with the meanings they lexicalize. The book is not only the first work that proposes a finer-grained classification and diagnostics of Chinese motion morphemes from the perspective of scale structure, but also the first to more comprehensively account for the ordering of Chinese motion morphemes. The findings of this study will not only enrich the literature on motion events, but more importantly, further our understanding of the nature of motion events and the way motion events are conceived and represented in the Chinese language. The major proposals and the cognitive functional approach of this work will also shed light on studies beyond motion. The book will be a valuable resource for scholars interested in motion events, syntax-semantic interface, and typology.

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