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Conceptual Semantics

A micro-modular approach

Urpo Nikanne

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Conceptual Semantics

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Volume 23

Conceptual Semantics. A micro-modular approach
by Urpo Nikanne

Conceptual Semantics

A micro-modular approach

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This book is dedicated to Oksana Petrova, Ph.D. (1977–2015)

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Helsinki, 2 February 2018
Urpo Nikanne

Introduction

The purpose of this book

This book is an introduction to a micro-modular architecture of the linguistic system. As the micro-modular approach suggested in this book is new to most readers, I will show step by step how it is linked to its roots in generative linguistics. Because the book is an introduction to the micro-modular model of the language system, it may even be read as an academic textbook. The theory is illustrated by concrete analyses of different kinds of linguistic phenomena. The analyses that are given as examples are new research results, new ways to understand the well-known parts of the language system.

Ideology

The ideology of Tierenet comes from generative grammar and particularly from Conceptual Semantics (Jackendoff 1983, 1990, etc.). This means that language is assumed to be a system based on rules and principles. The ideological foundations of the approach are discussed in Chapter 1. The reason to start from the very foundations is to make sure that the theory suggested in this book is placed on a solid basis. Another reason is that the solutions to the problems of description of the linguistic system involve technical solutions and unfamiliar formalism, and one may easily lose sight of the main idea.

Constructions

Constructions are a major part of the approach. In the present approach, constructions are considered to be exceptions, i.e. exceptionally licensed links between micro-modules. Even though the constructions are considered to be devices that license exceptional linking, they can nevertheless be treated systematically in the theory.

There are several points of view on constructions in this book: (i) Constructions are one of the "symbolic" modules of the theory, meaning that they combine structures formed in different micro-modules. (In traditional terms, they are specified linking devices between form and meaning.) (ii) In addition to constructions,

the lexicon and morphology are also treated as modules that license specified links between structures formed in different micro-modules, and they can be treated as constructions. (iii) In Chapter 8, some Finnish proverbs are discussed. Proverbs are conventionalized expressions that can be seen as constructions. Yet, as we will see, proverbs allow a great deal of variation when it comes to their word-order, morphology and lexical choice.

The Finnish language

The reader will soon realise that examples from Finnish are often used in the examples in addition to examples from English. The reason for this is that the background work for the theory has mostly been done in the Finnish Department of Åbo Akademi University. The theoretical points made in this book are, however, clearly of direct interest to general linguistics.

Outline

The book has four parts: The first part, "Foundations" is an introduction to the ideological and theoretical foundations of the Tiernet approach and the motivation behind the micro-modular analysis. The second part, "Semantics" concentrates on meaning in the sense that it discusses those micro-modules that are not a part of the traditionally understood linguistic form (syntax, phonology, morphology). The third part, "Syntax" analyses syntax as a cluster of micro-modules and shows the linking between them and semantics. In this part, the lexicon and morphology are also discussed. The final part, "Conclusion" is a very brief summary of the main points of the book.

PART I

Foundations

CHAPTER 1

The rules of the game

In this chapter, the goals of research, the background assumptions of the research topic, and the methodological guidelines of scientific work that characterize the current approach and scientific research in general are introduced.

1.1 The goals, background assumptions and methodological guidelines

When characterizing a particular school of thought in science, the following things should be taken into account (Nikanne 2008, 2015):

1. Research goals
2. Background assumptions
3. Methodological guidelines
4. Formalisms and technical solutions

As the purpose of science is to find out or at least to better understand the true nature of natural phenomena, the **research goals** are the most fundamental features of a scientific approach. The goals consist of two parts: the **research topic**, the natural phenomenon that the research is about (e.g. language in the case of linguistics), and the **point of view**, the angle from which the natural phenomenon is approached (whether language is studied as a social phenomenon, as a part of the human mind, or as a formal apparatus, etc.). In order for the research to make sense, the research topic and the point of view must, naturally, be such that they can be studied by scientific methods.

Every theory must have some **background assumptions**, by which I mean well-motivated hypotheses about the nature of the research topic. These assumptions are necessary because otherwise the research would be based on wild guessing, without any direction. The background assumptions are the basis for choosing the guidelines and tools for the research.

Methodological guidelines are ideological instructions for the researcher because they are based on the idea of how to do scientific research in a proper way. As the methodological guidelines are supposed to be a part of a solid theory, they must be in accord with the background assumptions of the research topic and the goals of the research. The methodological guidelines can even be seen as an action plan for the researcher: they guarantee that there is a good discipline in the research and the theory is developed in a controlled manner.

The descriptions and explanations must be expressed in some way in order for the researcher to be able to operate with them and in order for researchers to communicate with each other. Therefore, **formalisms and technical solutions** are necessary. Even though they do not define the theory, they are nonetheless a very important part of the whole. The formalisms are supposed to express something essential about the true nature of the research topic from the chosen point of view. In addition, they should be compatible with the background assumptions and the methodological guidelines. This is the level of the expression of the scientific thinking. The logic of the formalism is supposed to express the logic of the research topic.

The formalisms and technical solutions are subject to change as the research makes progress, the goals of research are approached and new things are learned about the research topics. Because background assumptions are hypotheses, the researcher may find that these hypotheses do not hold, and they can be abandoned or modified. Additionally, one can come up with new motivated background assumptions during a successful research process. Because the methodological guidelines are dependent on the background assumptions, they are also subject to change. The goals of research, however, are more stable. One may abandon a goal of research, for instance, if it turns out that it cannot be scientifically studied. A theoretical approach may also become interested in new research topics, and new goals, if it turns out that they are closely related to the old ones and there is an available methodology capable of revealing something real about their nature.

The following illustration summarizes the discussion:

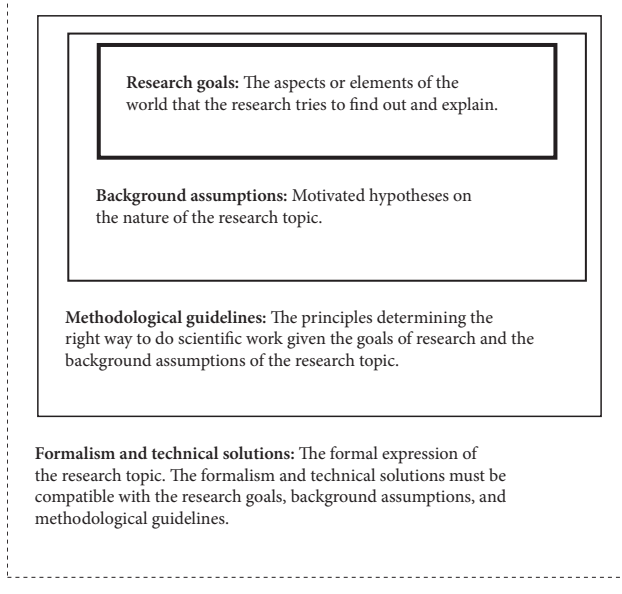


Figure 1-1 Hierarchical levels of a theoretical approach

1.2 Conceptual semantics as a scientific approach

1.2.1 Conceptual semantics in brief

Conceptual Semantics is a cognitively oriented theory of the language system, aiming at an integrated theory of mind. Conceptual Semantics would like the scientific community within linguistics to better understand how language functions as a part of human cognition. According to Nikanne (2008), Conceptual Semantics can be characterized as an approach as illustrated in Figure 1-2:

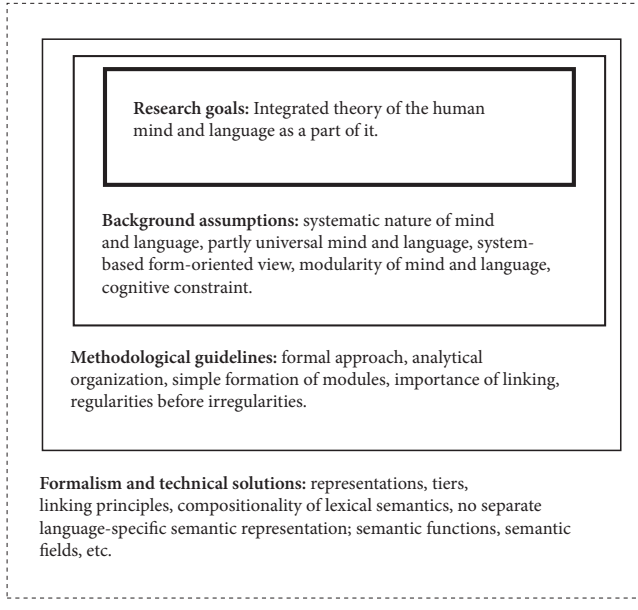


Figure 1-2 Hierarchical levels of Conceptual Semantics as a scientific approach. The research goals form the innermost level and the formalism and technical solutions the outermost one. (Cf. Nikanne 2008, 2015.)

Next, I will briefly go through what the different layers in Figure 2 stand for. I will only concentrate on the goals, background assumptions, and methodological guidelines. Many characteristic properties of Conceptual Semantics, such as compositionality of lexical meanings, semantic functions, semantic fields etc. belong to the formalisms and technical solutions of the theory, and they fall outside of the scope of this chapter.

1.2.2 Research goals

For Conceptual Semantics, the goals are shared with all cognitively oriented theories of language: How to best describe and explain language as a part of human

cognition? How does language function and what are the relationships between language and other cognitive domains?

At this level, the following two things must be taken for granted:

1. The relevance of the research topic: Language is a natural phenomenon (i.e. the research topic is something real).
2. The relevance of the point of view: Language is a part of the human mind.

These assumptions may sound self-evident, but they are still something to be aware of. If – against all odds – it turned out that there is reason to believe that language is not a real phenomenon or that it is not a part of the human mind, the approach would not be scientific.

Fortunately, there seems to be no reason to give up the goals of Conceptual Semantics: language has been described successfully and grammars have been written for thousands of years in different cultural traditions (Itkonen 1991), so this long experience of research gives us reason to believe that language is a relevant scientific research topic.

Some linguists want to study language primarily as a social phenomenon, a tool for communication, and other linguists will study language as a part of the human mind. There is, however, no contradiction between these points of view: even though language is a tool and a medium in communication between people, it must be processed in the minds of individual people.

In addition, communication is based on messages with a form and content: the content of linguistic communication often consists of different aspects of human life: emotions, actions, social relations, visual observations, aesthetic experiences, and so on. Language must link together all this different information and give it a linguistic form (see McNamara 1978, Jackendoff 1983). There is thus a connection between language and the other parts of human cognition (see the discussion on cognitive constraint below). Language can even be used for communicating information that is a result of imagination: lies, fairy tales, surrealistic jokes, etc. A cognitive approach to language is a crucial part of the puzzle when science tries to understand what human life consists of.

Note that e.g. Cognitive Linguistics (Langacker 1987a, b, etc.; Lakoff 1987, etc.) shares research goals with Conceptual Semantics but not the same background assumptions and methodological guidelines: Conceptual Semantics aims at a formal theory whereas the Cognitive Linguistics approaches do not. There are differences between the Cognitive Linguistics approaches, and for instance Langacker's approach has some formal features (e.g. larger meanings are derived from smaller parts). For Tiernet, and for a Conceptual Semantics approach in general, a formal approach is a priority and a crucial part of methodology. We will return to this as we discuss the methodological guidelines of Tiernet.

1.2.3 Background assumptions

In order to have a plan for how to meaningfully approach the research object, one must have some motivated assumptions about its nature. These background assumptions are needed in order to develop methodological tools for the research. I will argue that Conceptual Semantics has the following background assumptions (Nikanne 2008, 2015):

1. Systematic nature of language and mind
2. Partly universal mind and language
3. System-based form-oriented view
4. Modularity of mind
5. Cognitive constraint

These background assumptions can be characterized as follows:

Systematic nature of language and mind
According to Nikanne (2008), the following four degrees of strength can be recognized for the assumption of the systematic nature of language (and mind, *mutatis mutandis*):

1. *All* linguistic phenomena are governed by regular principles.
2. *The essential* linguistic phenomena are governed by regular principles.
3. *There are* linguistic phenomena governed by regular principles.
4. *No* linguistic phenomena are governed by regular principles.

Conceptual Semantics is at degree 2 on this scale: the core grammar is based on a system of rules. But outside of the core grammar, there is also room for irregularities, e.g. constructions, idiomatic expressions that are stored as wholes and may make exceptions to the principles that govern the core grammar.

Partly universal mind and language
As is well known, languages have successfully been described using the same formal means and categories: e.g. predicates and arguments; verbs and nouns, vowels and consonants, syllables and words. Linguistic categories even seem to be organized as larger units according to similar general principles.

Despite their similarities the grammatical systems of different languages and dialects differ, however, when it comes to small details. Here are some concrete examples from phonology: For instance, Arabic has three vowels (*a, i, u*) but Finnish has eight of them (*a, e, i, o, u, ü, æ, œ*). Still, both the Arabic and the Finnish vowel systems are based on the same universal set of possibilities. It is not uncommon that two dialects have the same set of phonemes, but different principles of

combining phonemes: in Finnish some dialects (in the Bothnia and Savo dialect areas) do not allow certain consonant clusters, e.g. *lm* and *hm*, even though most dialects do, including standard Finnish. An epenthetic vowel is added between the consonants in these dialects (for details, see e.g. Kettunen 1940a, 1940b, Karlsson 1983, Suomi 1990, Harrikari 1999).

In Conceptual Semantics, the innateness hypothesis of language – which often goes hand in hand with the hypothesis of universal grammar – has not been a major issue. The discussion on semantics has emphasized that it is methodologically better to link the linguistic representations directly to conceptual structures that are assumed to be universal (Jackendoff 1983). Linking principles may differ in different languages, and this includes also the lexicon which has been a part of the linking rule system (see e.g. Jackendoff 1987b, 1990). When it comes to the universal nature of linguistic representations (phonology, syntax), Conceptual Semantics seems to follow the mainstream of generative linguistics and assume that they are at least partly based on universal categories and combination principles (on the innateness hypothesis, see e.g. Chomsky 1986b).

The universal part of grammar consists of the principles that are the same in all human languages. The core grammar of a particular language is a realization of the possibilities offered by the universal principles that restrict and govern the structure of human language (see e.g. Chomsky 1986b for a discussion.)

The irregular parts are not always completely irregular, and the border between the core grammar and the "periphery" (see Chomsky 1986b) is not sharp. E.g., the English idiom *kick the bucket* 'die' can be described like any regular VP consisting of a transitive verb with an object: *The captain has kicked the bucket* cf. *The captain has kicked the football*. The irregular part of the VP *kick the bucket* is that the phrase as a whole can be understood to mean 'die', which leaves, for instance, the NP *bucket* without a clear reference. Therefore, the bucket seldom gets a modifier or is topicalized. (See, however, Petrova, 2011, for a thorough discussion on the variation of idioms in language use.) Unlike mainstream generative grammar, however, Conceptual Semantics (see e.g. Jackendoff 1990, Nikanne 1990, 2005a; Pörn 2004; Petrova 2011; Paulsen 2011) has been interested in the "periphery" and carefully studied irregular linking principles, constructions, etc.

The layers of the grammatical system can be visualized as in Figure 3.

In generative linguistics, the recent discussion on UG has modified the picture in Figure 1-3 slightly. According to Chomsky (2009), the grammar of an individual speaker is a result of the interaction between genetic factors, experience, and principles that are independent of language (e.g. general ability of efficient computation). UG is "the residue" when the effects of the language-independent factors are abstracted. The general idea is still the same as in Figure 1-3: there are universal factors (specific to languge and independent of language) that determine the limits of

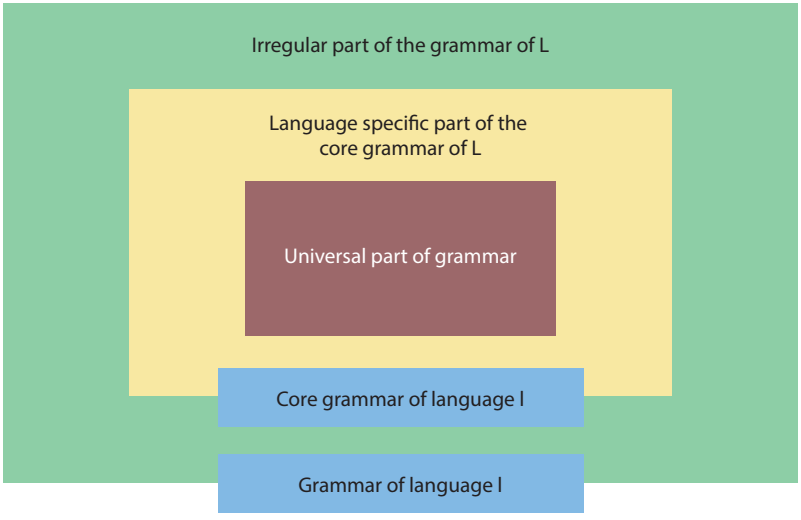


Figure 1-3 The layers of grammar. There is no clear cut borderline between the universal part of grammar, language specific part of the core grammar, and the irregular part of the grammar. The core grammar of L consists of the universal part and the language specific part. The whole grammar of the grammar of L consists of the core grammar and an irregular part

the language system for each individual speaker. The linguistic environment (experience) leads to differences between the linguistic systems of speakers as they learn to use language and their "individual version of language system" develops.

System-based form-oriented view

Most theories assume that language has a **form** (i.e. **structure**: phonology, morphology, syntax, etc.) and a system that can – at least to some extent – make a distinction between grammatical and ungrammatical forms. In addition, language as a whole and its parts are used for some **functions**. Linguistic forms are not useful if they are not used in concrete **utterances** and the utterances always appear in some **context.**

	SYSTEM		
FORM	Form	Function	USE
	Utterance	Context	
	OCCURRENCE		

Figure 1-4 Dimensions Form-Use and System-Occurrence

We can find four different **views** of language by using a simple model in Figure 1-4 to analyze which aspect of language the theory takes as primary and what are the consequences of it:

1. System-based function-oriented view
2. System-based form-oriented view
3. Occurrence-based use-oriented view
4. Occurrence-based form-oriented view

Language is used for several functions, and the different parts of the language system (syntactic categories, affixes, phonemes, etc.) typically serve particular functions. The theory may take the function of language as its starting point and consider the form of language to be subordinate to the function. This is the view that so called functional theories tend to have.

Another possibility is to take the form as primary aspect of the language. The form is there first, and certain forms are conventionalized to serve certain functions. In this approach, the function is subordinate to the form. Generative theories, for instance, tend to take this approach.

Some linguists would like to base their theory on the most concrete manifestation of language, namely the context. This view is quite different from the system based ones. Occurrence-based use-oriented approaches tend to take the frequency of particular parts of structure as the fundamental tool in their analysis. In this view the "system" is an approximation based on the typical (the most frequent) way the forms occur in concrete contexts.

The fourth possibility is to take concrete utterances – as formal units, without their contexts – as the starting point. Taking this view would mean that the primary aspect in language consists of concrete utterances which would somehow be recognized. Then they would be interpreted in the context in which they occur. The function and the structure are then subordinate to the concrete utterances and their concrete contexts. This is an unintuitive way of seeing language, and as it is not widely present among linguistic theories, I will not discuss it further.

The analysis above is only a tool for analyzing and understanding the view of language as a background assumption of a linguistic theory. One can easily come up with more possibilities by changing the order of the boxes and the direction of the arrows.

As pointed out already, Conceptual Semantics' view of language is system-based. The approach recognizes that there is an underlying system that governs both producing and understanding concrete utterances in their contexts. The regular part of grammar is based on rules and principles. There is also room for an irregular part of grammar (see Jackendoff 1990 and the account of adjuncts).

Conceptual Semantics aims at describing and explaining how language functions: how language translates ideas of human life (cf. Section 1.2.2 *Research goals*

above and the passage on *the cognitive constraint* below) into perceptible linguistic forms (sounds, signs, etc.) and vice versa. I would still say that Conceptual Semantics' view of language is form oriented: one of the basic assumptions of Conceptual Semantics is that the several subsystems of the human mind are built up out of simple primitive building blocks, and their combinations are governed by a set of principles. The form-orientation is reflected throughout the methodological guidelines (see below).

The modularity of mind
One of the background assumptions in Conceptual Semantics is that the human mind consists of several subsystems, i.e. modules. The modular hypothesis has been put forward by Fodor (1983) but the modularity in Conceptual Semantics differs from the one suggested originally by Fodor in two respects (see e.g. Jackendoff 1987b; Nikanne 1990, 2008, 2015):

1. In Conceptual Semantics, the autonomy of the modules is reflected in the formalism: each level of representation is a module of its own.
2. In Conceptual Semantics, there is not only one-way traffic from the peripheral modules to the central ones. Interaction both ways is possible.

Cognitive constraint
According to Jackendoff (1983: 16), "There must be levels of mental representation at which information conveyed by language is compatible with information from other peripheral systems such as vision, nonverbal audition, smell, kinesthesia, and so forth." This is the content of the cognitive constraint. A necessary prerequisite for the cognitive constraint is, of course, the modularity hypothesis (see the discussion above). The cognitive constraint is fundamental for the theoretical development of Conceptual Semantics. The ultimate goal of the theory is to come up with an integrated model of the human cognitive system, and without the cognitive constraint, a "representationally modular" human mind could not function as a whole.

1.2.4 Methodological guidelines

In this section, I will explain what the methodological guidelines mean and why they are motivated. In this section, I take up five guidelines that are characteristic for Conceptual Semantics (cf. Nikanne 2008, 2015).

1. Formal approach
2. Analytical organization
3. Simple formation of modules
4. Importance of linking
5. Regularities before irregularities

In the spirit of Martin Luther's Small Catechism, after each "commandment," I will explain what this guideline means (What does this mean?) and what its motivation is (Why this is?). There are certainly even more guidelines that could be mentioned and the discussions could be longer. My goal is to give the reader an idea of the methodological principles of Conceptual Semantics without sinking into deep philosophical discussions.

1. *Formal approach*
   "Formalize your statements."

   What does this mean?
   The Conceptual Semantics approach is formal, i.e. the statements of the research topic should be based on and presented in well-defined terms.

   Why is this?
   This guideline is based on the background assumption that language and mind are organized as systems. If language is a system, it should be described as a system and its behavior is to a large extent a consequence of the properties of the system. There is no way around this. As Itkonen (1983) points out, this is the same as the requirement of explicitness.

2. *Analytical organization*
   "Keep the formation of formally independent sub-systems apart."

   What does this mean?
   If it can be shown that there is a part of the system that has its own primitives and principles of combination, it constitutes a module of its own.

   Why is this?
   It makes sense methodologically to keep the independent systems apart. The understanding achieved of the independent modules is always useful. If it turns out that two previously assumed independent subsystems are actually in such close relationship that they should not be kept apart, the knowledge of both subsystems can be used for the theory of the integrated system. If, on the other hand, the research tried to describe and explain all phenomena with one large and complicated representation, the possibility of independent subsystems would not arise, at least it would be much more improbable. On the other hand the research that will formalize the model (guideline *Formal approach* above) tries to keep the formation of independent systems separate, and seeks and formalizes the links between subsystems (guideline *Simple formation of modules* below), is more likely to recognize if the model includes subsystems that serve the same function and should therefore be merged together.

3. *Simple formation of modules*
"Keep the formation of the sub-systems simple."

What does this mean?
The formation of sub-systems should contain as few primitives and as simple principles for their combination as possible.

Why is this?
This is an application of Occam's Razor: "One should not increase, beyond what is necessary, the number of entities required to explain anything." Also guideline *Analytical organizatio*n above suggests – even if it does not logically entail – that the representations be simple.

4. *Importance of linking*
"Study carefully the interaction between the modules."

What does this mean?
The principles that govern the correspondences between the sub-systems are a crucial part of the system.

Why is this?
As, according to the background assumptions of Conceptual Semantics, language is a part of mind and the mind works as a whole, the theory should describe and explain how the whole works. As the different parts of language together form a whole that can be expressed and understood and as the linguistic expressions include information about other cognitive domains (social relations, spatial relations, etc.), they must be linked together somehow. The model must include explicit assumptions of such links. Notice that the linking between representations does not always have to be one-to-one, because then the representations would be analogical, and in practice the guidelines *Analytical organization* and *Simple formation of modules* would both be violated.

5. *Regularities before irregularities*
"Try to find as general principles as possible."

What does this mean?
Check the possibility of regular principles before assuming irregular principles. Even though the importance of irregularities is accepted, the possibility of referring to regularities must be checked first.

Why is this?
This guideline, too, can be based on Occam's Razor. The more general the principles are, the more they cover. And in that way, we can learn what the

> deep down tendencies behind particular phenomena are. If each particular phenomenon was described with a particular principle, the research would not lead to generalizations. One could describe practically anything using particular principles but that would not help us understand human language or the mind as a whole. Using only particular principles would not help us to understand what is exceptional and what is typical. Chomsky (1965) calls the general principles weak and the particular principles strong, and he claims that a good theory should use the weakest possible.

When the methodological guidelines *Formal approach* and *Analytical organization* are combined, it follows that one should carefully study what is the most natural representation for each phenomenon. If there is a sub-system whose formation is independent of other sub-systems, it should be treated as a module of its own. As, according to *Simple formation of modules,* the representations are kept as simple as possible, the linking between representations plays a very central role in the theory.

In Conceptual Semantics there has never been any tendency to assume that the linking between representations is trivial or even has to be very simple (see Jackendoff 1990). In this respect, Conceptual Semantics is similar to construction grammars (Fillmore and Kay 1997, Fillmore, Kay & O'Connor, 1988, Goldberg 1995, Fried and Östman 2004, 2005, Kay 1995, Croft 2001). Conceptual Semantics differs from some construction grammars because of the guideline *Regularities before irregularities*. This guideline is based on the background assumption of the systematic nature of mind and language.

1.3 Summary

In this chapter, Conceptual Semantics has been discussed from a general methodological point of view. Conceptual Semantics is a school of thought that concentrates on studying language as a part of the human mind, but the ultimate goal of Conceptual Semantics is an integrated formal theory of the human mind as a whole. The characteristic property of Conceptual Semantics is the conviction that language – as well as the fundamental part of the rest of the human mind – is a form-based system. This makes it possible and to successfully describe and explain the structure of language by formal means. In this respect, Conceptual Semantics differs from many other cognitively oriented approaches to language. The methodological guidelines formulated in this chapter are based on the idea of language and mind as form-based systems.

In the chapters that follow, we discuss the linguistic system following the "rules of the game" described in this chapter. The focus is on the methodological guidelines.

The goal of Conceptual Semantics is to come up with an approach to language that is able to be used to analyze language as a part of mind. However, an analytical approach to language is a useful tool for research, even if the ultimate research goal was something other than analyzing language as a part of the human mind. Therefore, the goal of the Tiernet approach is not only to come up with an approach that is useful for understanding the cognitive properties of language. The goal is to come up with a theory that is useful for achieving a better understanding of the language system in general.

CHAPTER 2

Towards micro-modularity

In this chapter, the rules of the game established in Chapter 1 are applied to the modular organization of grammar (and the mind). The result is a modular network of very simple modules.

2.1 Introduction

The theory of Conceptual Semantics is based on the background assumption that the whole mind, including language, is modular (see the discussion in Chapter 1 above). In this chapter, we will take a closer look at modularity and develop it in accordance with the methodological guidelines discussed in Chapter 1.

One should note that even the traditional school-grammar is modular. Phonology, morphology, syntax, and the lexicon are hierarchically organized subsystems: morphemes consist of phonemes, and syntactic structures consist of lexemes in their morphological form. From that perspective, seeing grammar as a modular organization is not a new departure in linguistics.

According to Jackendoff's (1983, 1990) idea of representational modularity, each module has its own well-formedness principles, i.e. principles that define the primitive units of which the representation consists as well as the principles for combining these units. I will argue that within the present framework, this can be taken as a definition of a representation: if there is a subsystem that has its own primitive units and its own rules for combination, it is by definition a module.

2.2 Modular organization of generative grammar

As we saw in Chapter 1, the roots of Conceptual Semantics are in generative linguistics, and it shares a great deal of the research goals, background assumptions and methodological guidelines with other branches of generative grammar. One of them is modularity. Language as such has been seen as one module in the human mind. According to Noam Chomsky (2000),

> The faculty of language can reasonably be regarded as a "language organ" in the sense in which scientists speak of the visual system, or immune system, or circulatory system, as organs of the body. Understood in this way, an organ is not something that can be removed from the body, leaving the rest intact. It is a subsystem of a more complex structure.

The same idea is in Fodor's (1983) theory of modularity: language is one module of the human mind but Fodor makes no strong statements on the internal organization of the language faculty (or "organ").

In generative grammar, however, the internal organization of grammar has been seen as modular since the early days of that school of thought.

In the organization presented in Chomsky (1965), semantics is derived from the deep structure. Lexical items consist of idiosyncratic phonological and syntactic information. In syntax, the lexical items are inserted in the syntactic structures governed by the phrase structure rules and constraints e.g. by the idiosyncratic features of lexical items. Syntactic derivation has then two levels of representation: deep structure (D-structure) and surface structure (S-structure). Syntactic principles govern the form of the deep structure. Transformation rules govern the derivation of the surface structure from the deep structure. The phonological structure is derived from the surface structure. The phonological information of the lexical items is taken to use at this level, as well as phonological rules that concern larger units than words. I highlight the syntactic representations in the figures that show the development of the organization of grammar in mainstream generative linguistics.

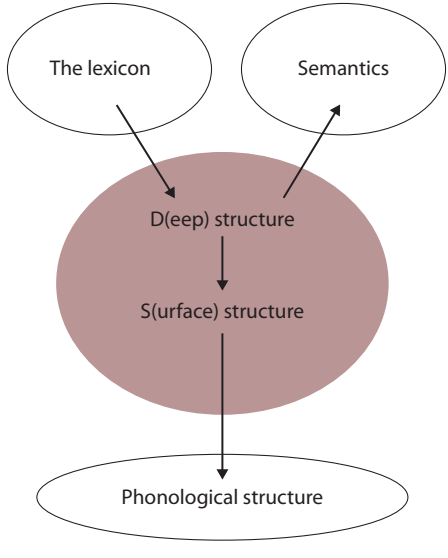


Figure 2-1 The modular organization of grammar in Standard Theory (Chomsky 1957, 1965). The syntactic module is divided into two levels of representation: deep and surface structure

In the 1970's and 1980's, the mainstream way of seeing the relationship between syntax and semantics changed. The role of syntax became more central in this model: As in the earlier model, syntactic principles govern the form of the deep structure and the lexical items are inserted in the deep structure. Transformation rules govern the derivation of the surface structure from the deep structure, and the surface structure has its own syntactic constraints. A new level of syntactic representation is the "logical form "(LF). LF is a syntactic representation derived from the surface structure and is an interface to semantics. Another new syntactic representation is the phonetic form (PF) which is the interface to pronunciation.

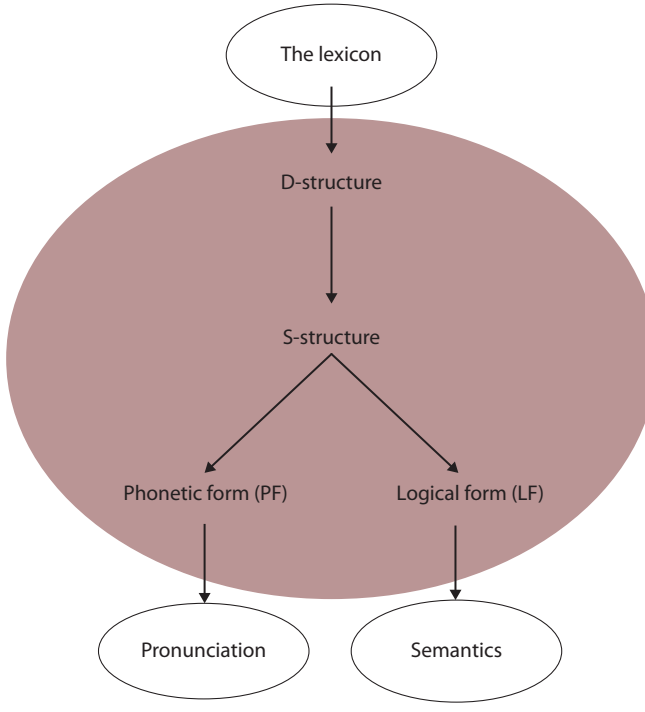


Figure 2-2 The Government and Binding architecture of grammar (Chomsky 1981, 1986a, 1986b). The syntactic module consists of four levels of representation

In the recent mainstream generative grammar (Chomsky 1995 etc.), the syntactic derivational process is the heart of grammar: lexical items inserted from the lexicon and syntactic principles govern the gradual formation of syntactic structures. The point at which the syntactic structure has a form that can be used as the phonetic form representation, it has reached its final surface form. This point is called "spell-out." The phonetic form representation is an interface to pronunciation. LF is a syntactic representation derived from the spell-out structure with eventual further transformations. The "covered" transformations that occur after

spell-out have no effect on the surface structure. The LF-representation is the syntactic interface to semantics.

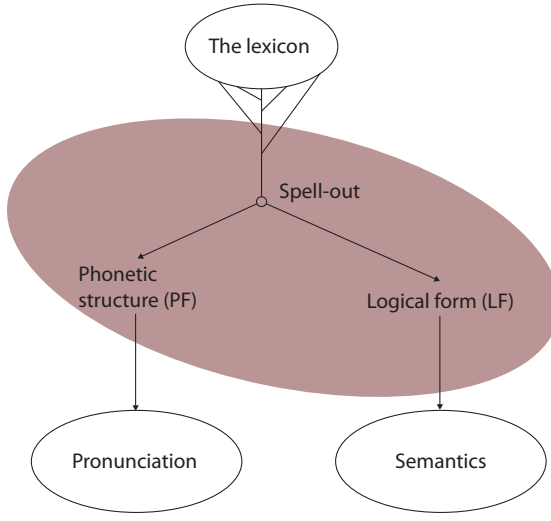


Figure 2-3 The minimalist architecture of grammar

As Jackendoff (1987b) points out, the organization has changed a great deal but syntax has remained the center of grammar throughout the development. The same holds for the minimalist model. Actually, the role of syntax has only become stronger and the role of semantics more distant and blurred at every move. In the standard theory, semantics had a role as the interface to the deep structure but in the later models, an abstract intermediate syntactic representation (LF) has been used to serve as the interface between syntax and semantics.

2.3 Conceptual Semantics architecture

As can be seen in the previous section, the mainstream generative grammar has concentrated on syntax, and throughout the development of the theory since the 1950's, there has always been more than one syntactic representation (which is the whole idea of transformation, of course). In addition, the syntactic module plays the central role and syntax has been studied very intensively in generative linguistics compared to other domains of grammar. The dominant status of the syntactic modules has been criticized by Jackendoff (1987b), who calls this organization "syntacto-centric." The Conceptual Semantics alternative to the syntacto-centric organization of grammar is to treat all grammatical domains as equally central

in the sense that they are not derived from each other. The modular organization of grammar is integrated tightly with the modular organization of the human mind. Jackendoff (1983, 1987a, 1987b, 1990, 1993) proposes the kind of organization illustrated in Figure 2-4. The model has been developed over time (see e.g. Jackendoff 2002, 2007), but the holistic way of seeing the grammar and the mind as an organized network of autonomous modules that interact with each other has remained the same. I highlight the syntactic representation just for the reader to see that syntax is now one part of the whole and has no superior status compared to phonology, conceptual structure, etc.

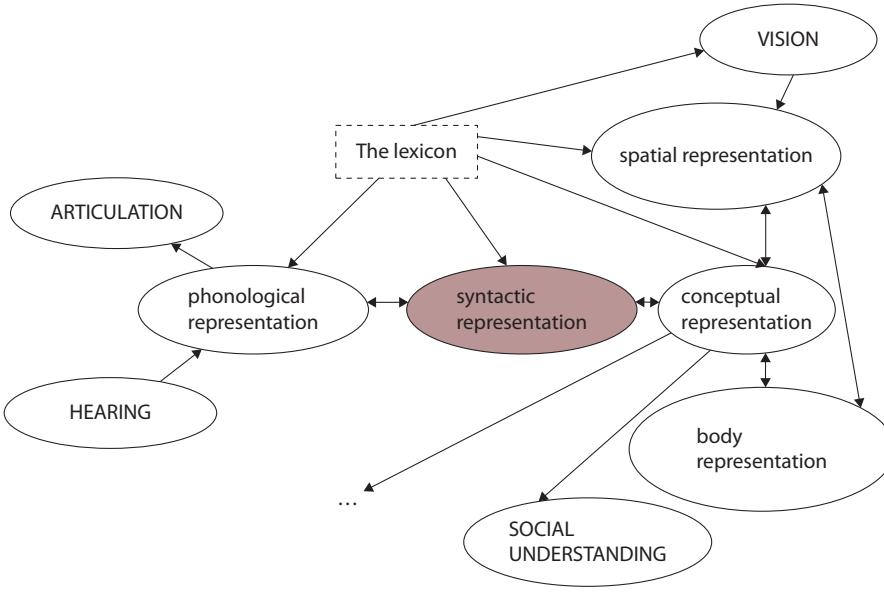


Figure 2-4 Organization of grammar integrated with (a fragment of) the organization of the human mind in Jackendoff (1983, 1987a, 1987b, 1990, 1992a). The arrows indicate linking rule systems between modules. There is no lexical insertion in this model: the lexicon is a linking rule system between linguistic modules (phonology, syntax) and non-linguistic ones; a typical lexical item includes information on its phonology, syntactic category, syntactic restrictions, and meaning

The conceptual semantics model differs from the mainstream generative linguistics models in several ways:

1. The focus of the goals of research is not as language-centered as in the early generative grammars or for instance in Minimalism. In Conceptual Semantics the main focus is on the human mind as a whole whereas Minimalism concentrates on language. These goals are not different as such, only the focus is different.

2. Each representation is governed by well-formedness rules that govern the form of that particular level of representation. There is only one level of representation for each module. The relations between representations are mapping relations (functions) and not derivations.

Figure 2-5 illustrates the organization of a module.

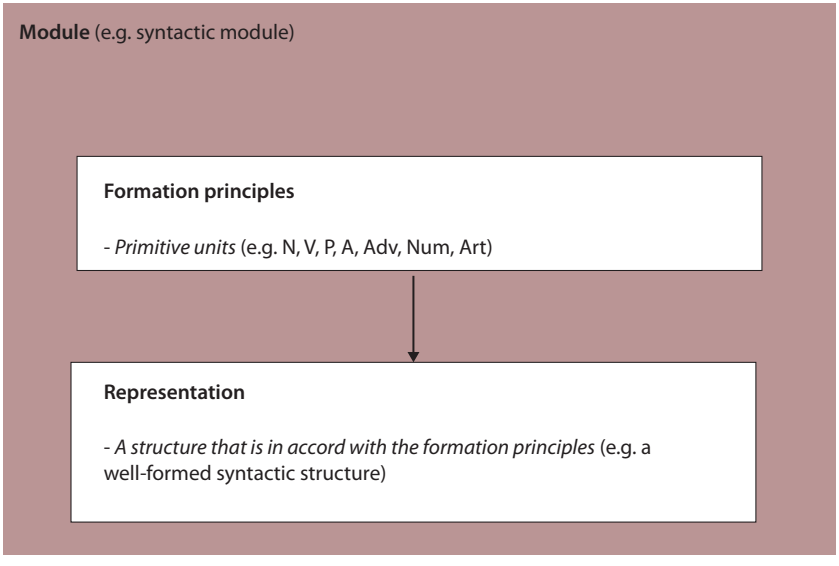


Figure 2-5 Organization of a module in Conceptual Semantics. The formation principles consist of primitive units and rules that govern the combinations of these units. (Jackendoff 1983, 1987b, 1990; Nikanne 1990, 2008.)

2.4 Tiers

One of the most interesting developments in the theory of grammar took place in phonology in the late 1970's and early 1980's when the idea of a non-linear phonology was introduced (see e.g. Goldsmith 1976, Clements 1985). In a non-linear model, the phonological representation was not seen as just one formal system but rather as a network of smaller formally autonomous subsystems, called **tiers**. Such subsystems are for instance tone, stress, etc. According to this way of thinking, each tier has its own formation principles (its own primitive units and rules that govern their combinations) but the tiers are linked to each other in systematic ways.

Tiers have been used in Conceptual Semantics theory since Jackendoff (1983). Jackendoff divides the conceptual structure representation into two tiers:

the **thematic tier** and the **action tier**. The same development continues in Jackendoff (1990) as the **temporal tier** is introduced. Actually, the seed of the multi-tiered organization of conceptual semantics can be seen in Jackendoff (1972). The semantics is divided into the functional structure, the modal structure, and the table of co-reference.

Conceptual structure representation is divided into several tiers. Different tiers contain different kinds of information and are linked to each other. In Jackendoff's (1990) model, there are three tiers: the thematic tier, the action tier, and the temporal tier. Nikanne (1990) adds to these also the semantic field tier and the modal tier. I will discuss these tiers in the following sections.

2.5 Micro-modularity

There is a problem with this kind of organization with both representations and tiers. The definition of a representation is namely the same as the definition of a tier: "an independent system with its own set of primitive units and principles of combining those primitive units." There is, thus, no need to assume representations that are combinations of independent tiers. The organization illustrated in Figure 2-6 allows the links between representations. These links between representations are formally inseparable from the links between tiers. The idea behind **micro-modularity** is that the whole modular organization of grammar and mind can be seen as a network of tiers.

There is no formal need to operate with such modules as phonology, syntax and conceptual structure as the smallest formally autonomous systems are tiers which are linked to each other anyway. For instance, we do not need to decide whether being a topic is a syntactic or semantic phenomenon. The tier that deals with topicality can be linked to both, say, the tier that governs word order and at the same time to other tiers like stress. I will not go in detail into this research plan, but in order to give the reader a better idea of micro-modularity, here is a preliminary sketch of the kind of organization I have in mind.

There are two kinds of modules: primary modules and symbolic modules. The symbolic modules do not have their own primitive units or combinatorial principles. They are linking devices that allow links between defined fragments of primary module representations.

The primary micro-modules are presented in Figure 2-6.

Primary modules have their own representations and well-formedness principles, i.e. principles that define when the representation is well-formed. As pointed out earlier, the same types of principle are used in several micro-modules. The micro-modules interact with each other, and are not autonomous in the very

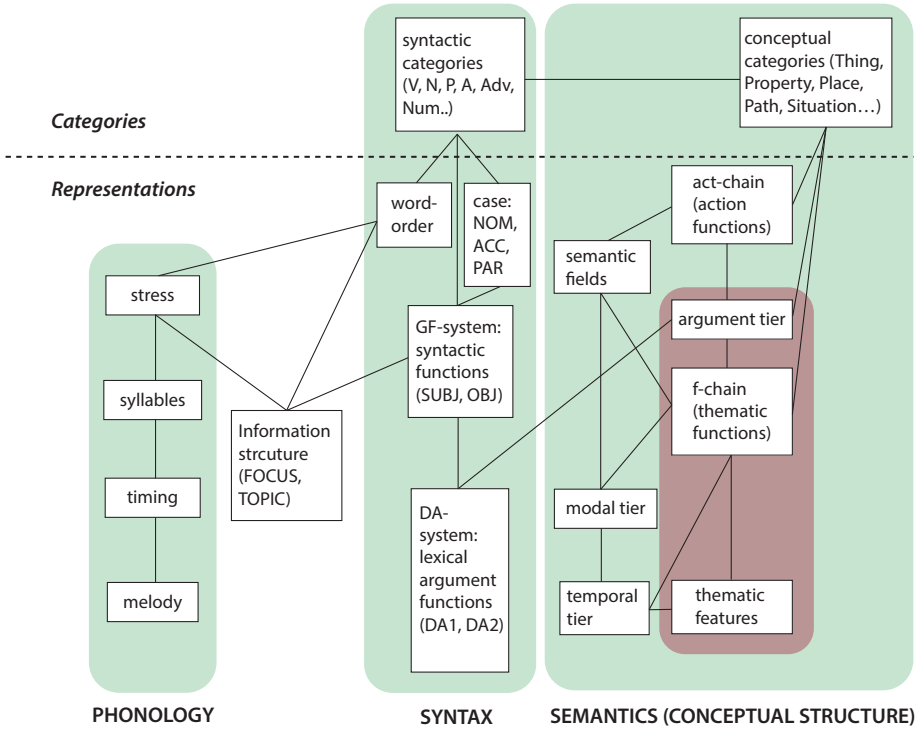


Figure 2-6 Primary micro-modules in Finnish grammar

strongest sense. The micro-modules are not even equal: one micro-module may be dependent on another one. As the micro-modules interact and are sometimes dependent on each other, they may form clusters. One of these clusters is the "thematic cluster" (argument tier, f-chain, and thematic features) that covers thematic (semantic) roles and is discussed in detail in Chapter 6. It is marked with a purple background in Figure 2-6.

The boxes in Figure 2-6 are micro-modules and the lines between them show that there is linking between the modules. It should be emphasized that the network in Figure 2-6 is only one part of a larger network; there are links from these modules to the modules responsible for vision, social understanding etc.

In Figure 2-6, I have sketched the links between the primary micro modules in Finnish grammar. The figures represent Finnish grammar, and in other languages the links are partly different. For instance in Finnish, the word order is strongly linked to information structure whereas in English the word order is linked strongly to the syntactic functions. Those readers who are not familiar with Finnish should not allow this to worry them. The idea is to show how the overall

architecture is meant to work, and, after all, English grammar is not very different at this level of abstraction.

Three things should be pointed out:

1. In Figure 2-6, I have put syntactic and conceptual categories in modules of their own. This is not necessarily the optimal solution as the "category modules" differ from those with combinations, and in Figure 2-8 (see below) they are separated by a dashed line. I just want to show that these categories are relevant for several micro-modules. I will concentrate on semantics and syntax, and I leave it to future research to come up with a more complete picture of the tiers concerning, for instance, phonology. When analyzing distinctive phonological features and phonemes further according to the principles of the Tiernet model, they would most probably form a micro-modular network that should be added to Figure 2-6 (probably instead of "melody"). I am concentrating on semantics and syntax as well as the big picture of the organization.
2. The traditional domains of language, i.e. phonology, syntax and semantics (conceptual structure) are marked with a turquoise color background in Figure 2-6. Recall the discussion on the role of syntax in generative grammar. In this model, those phenomena that normally are discussed under "syntax" are now a part of the network. However, as any linguist knows, linguists do not always agree on what phenomena belong to which part of grammar. Some linguists would for instance probably like to see information structure and thematic arguments as parts of syntax.
3. The primary modules given in Figure 2-6 will be reanalyzed in the chapters that follow. For instance, the temporal tier will be broken down into several inter-related micro-modules in Chapter 4.

Symbolic modules, i.e. *the lexicon, morphology*, and *constructions* do not have representations of their own: they consist of fragments of structures of the primary modules and allow defined kinds of links between these fragments. I call them symbolic modules following semiotic terminology: symbolic units, i.e. lexical entries, constructions, and morphological forms, all bring together information from different primary modules; a symbol in semiotic terms is a – more or less – arbitrary form that represents something else, e.g. a sound sequence of a word represents its meaning. Even morphological categories and constructions are, more or less, arbitrary categories that are associated with a particular meaning.

The linking between the levels of representations may be exceptional (e.g. that the word combination *throw up* can mean 'vomit'), partly exceptional (e.g. that

the well-formed sentence *The Volkswagen drove in front of the Fiat* means that the Volkswagen passed the Fiat and did not just keep on driving ahead of it – see Nikanne 2005b, Nikanne & van der Zee 2013) or regular (see e.g. Nikanne 1995, 1997a, 1998). The exceptional and even partly exceptional linking must be licensed by constructions.

The lexicon has been perhaps the part of the language system whose status and nature have been debated most among linguists: what is the relation between the lexicon and the (rest of the) grammar and what does the lexicon consist of? Some linguists would like to see the lexicon as a list of idiosyncrasies (following e.g. Chomsky 1965) and some linguists would like to have most of the grammar included in the lexicon (an example of this way of thinking is Word Grammar, see e.g. Hudson 1990, 2007). The status of the lexicon, its relation to the rest of the system as well as the internal structure and the well-formedness conditions of the lexical entries are discussed in Chapter 6. The idea of the lexicon as a linking device is pointed out by Jackendoff (1987b, and elsewhere).

The Tiernet-model follows Jackendoff's idea. I have argued (see e.g. Nikanne 2002, 2005) for separate symbolic modules for the lexicon, constructions, and morphology. It is possible to build a model in which constructions and morphology are part of the lexicon. However, the distinction between these three should be made within the lexicon. For instance, constructions have lexical items and morphological categories as parts.[1] Following the methodological guideline *Analytical organization*, I keep these three symbolic modules apart.

The network of primary and symbolic micro-modules are presented in Figure 2-7. The lines that have at least one end in a symbolic module are dashed in order to make the picture easier to understand.

Figure 2-8 demonstrates how the micro-modular system relates to the other modular architectures of generative approaches introduced earlier in this chapter, I have marked those micro-modules that cover the traditional syntactic module as blue. Those micro-modules that are sometimes considered as parts of syntax (information structure and (thematic) arguments) are marked as brown.

1. An anonymous reviewer points out that also compound words include lexical items and morphological forms. That is correct. Compounding and word formation in general form a complicated area, and it deserves a thorough treatment, but I leave it to further research for now.

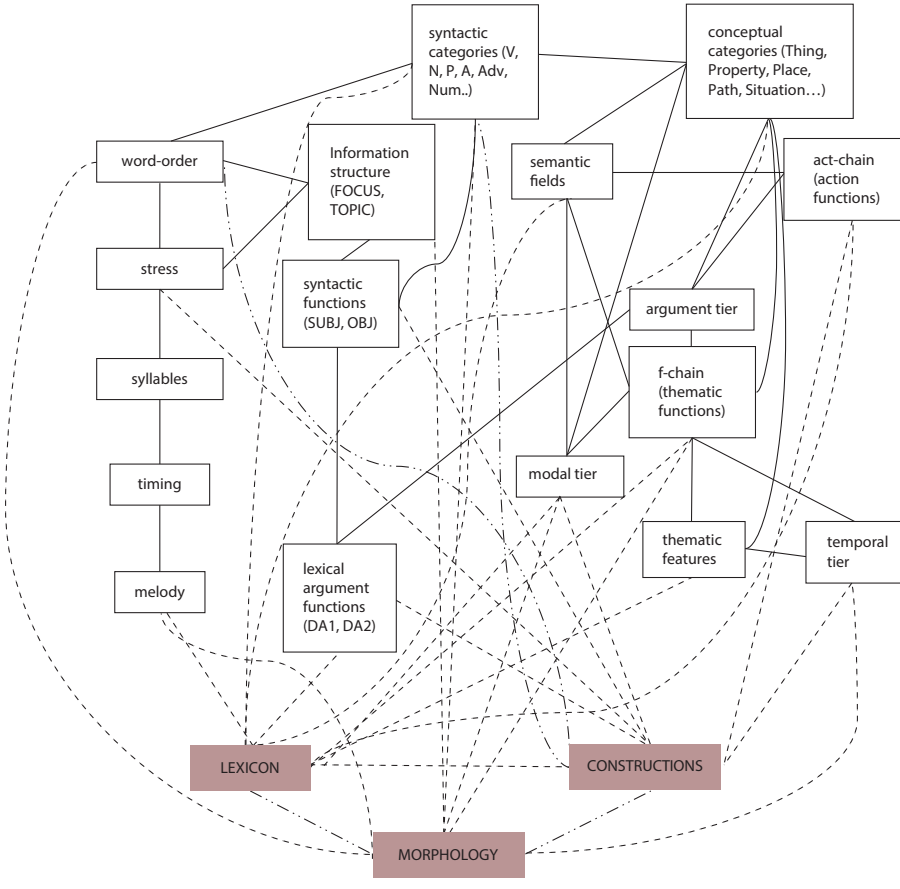


Figure 2-7 Primary and symbolic micro-modules of (in this case, Finnish) grammar

2.6 Combinatorial relations and the principle of asymmetry

The primary modules are autonomous in the sense that they have their own rule systems. However, when it comes to the rules of combination of the primitives, the same principles are repeated: **constituency**, **dependency**, **hierarchy** and **linear order**. These are all familiar to linguists. The use of the principles will become more concrete in the following chapters when we discuss the micro modules in detail.[2]

2. One possibility would be to treat these combinatorial principles as modules of their own and link them to the primary modules.

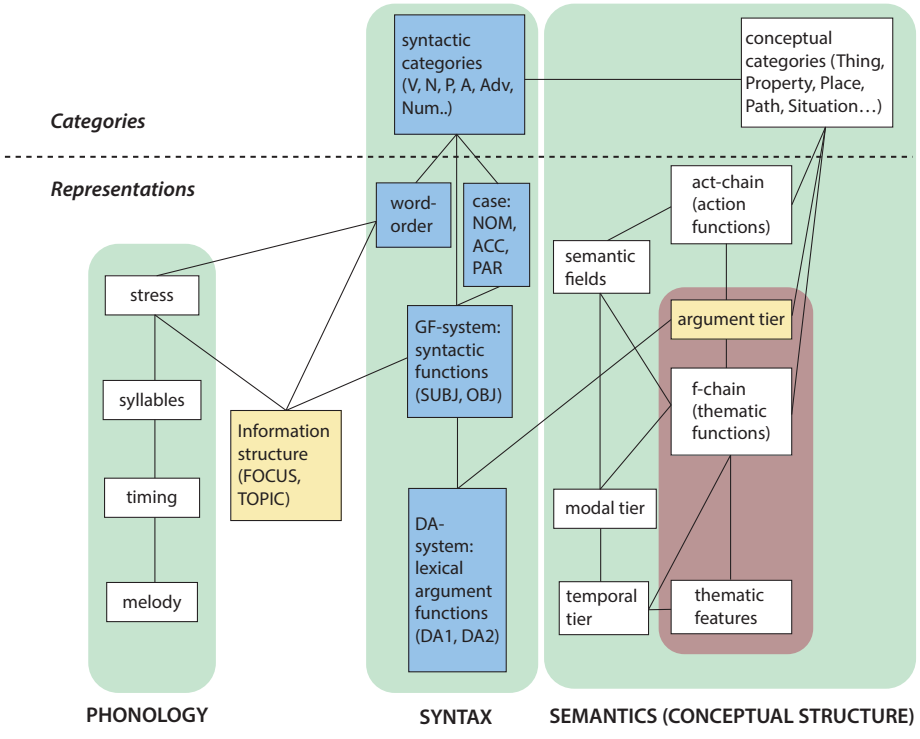


Figure 2-8 "Syntactic" modules in the network of micro-modules

Below I give a brief characterization of the link types – or relations – that are needed in the present model.

Constituency

Constituency deals with inclusion (wholes, parts and their parts). A representation and parts of the representation may consist of several smaller parts, constituents. The adjective phrase *very good* consists of the head adjective *good* and its modifier *very*. Constituency is a principle used for instance in syntactic phrases, morphology, syllables, thematic features, etc. We will discuss constituency in Chapter 3 (organization of thematic features), Chapter 4 (constituents in the temporal structure), and Chapter 8 (the status of syntactic constituents in the Tiernet theory).

Selection

Selection is a property of an operator (feature, function) to pick the element to its scope. We will go into the formal and technical details in the following sections. To give a general idea, the verb *go* (i.e. the operators of the lexical item of the verb

go) selects two complements: the participant that moves, i.e. Theme, and the path along which the Theme moves. In the sentence *John goes to Helsinki*, the verb *go* has selected the Theme *John* and the path *to Helsinki*. Selection is discussed in Chapters 3, 4, 5, and 6 below, as selection plays a major role in linking throughout the whole language system.

Dependency

Dependency, as the term suggests, is a relation in which one element is licensed by another, i.e. if element A is allowed in the structure only as a complement of B, then A is dependent on B. For instance, the word *very* must modify an adjective (*very* ***good***), adverb (*very* ***beautifully***), or quantifier phrase (*very* ***much***). It is dependent on its adjective, adverb or quantifier head. Dependency is used to combine e.g. thematic functions and arguments, etc.

Linear order

The term linear order is fairly self-explanatory. It refers to a principle of combination in which elements are ordered linearly with respect to one another. Linear order does not refer to inclusion or selection among elements. The elements simply have a determined place in the line. Linear order is needed for instance in syntax when analyzing word order. For example, in Swedish, the verb by rule appears in the second position of the sentence. Thus, in the sentence *Johan kommer hem i dag* 'Johan comes home today' the verb *kommer* is in the second position after the subject *Johan*:

> [*Johan*] [***kommer***] [*hem*] [*i dag*]
> [Johan] [comes] [home] [today]

But when the adverb *I dag* 'today' is topicalized and put in the first position, the verb must appear in the second position and the subject *Johan* comes after the verb.

> [*I dag*] [***kommer***] [*Johan*] [*hem*].
> [today] [comes] [Johan] [home]

Linear order is discussed mostly in Chapter 8.

Allowance

The allowance relation indicates that the presence of one element allows the presence of another element of another micro-module. This is a technical relation, and will become clear when we discuss the relations between different micro-modules. Allowance is put to use in Chapter 4 on the temporal structure as well as in Chapters 6 and 7 when discussing the lexical entries.

Head-complement relation

There is another type of dependency: head-complement relation. This is familiar to linguists from X-bar syntax. In a projection [$_{XP}$ ZP [X' [X^0] YP], X^0 is the head of the whole projection XP. YP and ZP are complements of the X^0. (I use the term complement as a cover term that also covers the "specifier," i.e. the XP-level modifier ZP.) In addition, it has been suggested (see e.g. Ewen & van der Hulst 2001) that the nucleus of the syllable is its head. In English and Finnish the head of the syllable is typically a vowel (or a long vowel or diphthong). In the micro-modules used in this book, the f-chain also has a head, namely f2. The head is the obligatory part of a larger structure, and the whole structure is in that sense dependent on its head. The head may, but does not need to select the other elements in the structure. For instance, the AP-specifier *friendly* in the NP *a friendly dog* is not selected by the head N *dog* but is placed in a phrase headed by it.

Hierarchy

Hierarchy means that the elements of a representation do not have equal rights. Hierarchy is needed particularly in linking between micro modules. Hierarchy deals with the "picking order" and "preference" among elements. The element that is higher in the hierarchy (abbreviated A > B 'A is higher in the hierarchy than B') has the right to choose the most preferred choice before those elements that are lower than it. Hierarchies are used for instance as a part of argument linking in Chapter 6 and the finite sentence morphology in Chapter 8.

The different ways to link micro-modules to each other has one property in common: they are all asymmetrical. They are all one-way relations: one element selects, allows, includes or precedes the other element. We can make this a principle:

The principle of asymmetry

The links between representations of different modules are asymmetrical
In the analysis of the combination of the elements in the micro-modular network, we use the following types of links:

Combinations within modules:

Constituency: A ——•— B 'B is a constituent of A'

Selection: A ——→ B 'A selects B'

Linear order: A - - - - - - - - - - - - - ◆ B 'A precedes B in linear order'

Links across module-boundaries:

Selection: A ——————→ B 'A selects B'

Allowance: A - - - - - - - - - - - - - - → B 'A allows B'

Selection is listed both under combinations within modules and links between modules. This is not a mistake. We will see that the micro-modules are not equal. Even though they are autonomous when it comes to their internal combination, they are not independent of other modules. Selection and allowance may occur from one module to another, and as we will see, they often do.

The links may have different strengths that can be marked on the links (for details, see Petrova 2011):

fix 'fixed': An obligatory link.
dft 'default': The link is assumed if there is no reason to reject it.
opt 'optional': A possible link.

The idea of asymmetry will make the linking between elements and tiers simpler as linking goes only in one direction instead of two. There are plenty of examples of different relations in the chapters that follow. The list of the relations is presented here, in order for the reader to see them as a part of the whole system.

2.7 Summary

In this chapter we have motivated the micro-modular architecture. The micro-modular approach follows the methodological guidelines mentioned in Chapter 1 and emphasizes the guidelines "analytical organization," "simple formation of modules, and "importance of linking."

The organization of grammar (and mind) is a network of micro-representations ("tiers"). The network contains micro-modules on three levels: (i) primary micro-modules, with their own primitives, (ii) symbolic modules (lexicon, morphology, constructions) that license linking between defined fragments of primary micro-modules, and (iii) combinatorial micro-modules (constituency, dependency, linear order) that define the combinatorial principles that can be used to combine primitives within – and sometimes between – the primary micro-modules. The symbolic modules can even govern irregular and arbitrary linking between fragments of representations of the primary modules.

The reason for abandoning such representations as syntax, phonology, conceptual structure, etc. that consist of several tiers is that the definition of tier is

the same as the definition of representation, so we do not need both. No principle of formation or linking refers to these larger representations. Therefore labeling a group of tiers "syntax" or "phonology" is not needed in the analysis as the tiers must anyway communicate directly with each other. This does not of course mean that such labels as "syntax" or "phonology" could not be used as convenience terms when referring to such phenomena as have traditionally been discussed under the terms syntax, phonology etc.

This move in theory development has its consequences:

1. The network of the representational modular organization of language and the mind is as explicit as it can be.
2. The formation of each module is simple, but the network of modules is complex.
3. The linking between the micro-representations must be studied carefully.
4. From a methodological point of view, the network is an open system. One can add new micro-modules to the network if one finds them necessary – and omit micro-modules if they are not necessary.
5. The differences (and similarities) between languages can be explained by different linking: e.g. English word order is linked strongly to the syntactic functions Subject and Object whereas Finnish word order is strongly linked to the information structure functions Topic and Focus. In addition, languages may have a different inventory of micro-modules. For instance, Chinese has tone but English does not.
6. As will become more concrete in Chapter 3, the linking principles that govern the linking between the modules together govern the well-formedness of the combinations of structures that are represented in several modules, for instance linguistic expressions.

This model of modularity is highly analytical, as it only operates with the "smallest" possible formal systems and does not make any *a priori* assumptions about the links between these systems. As not all languages make use of all the tiers in their system (e.g. Finnish does not have tone in its grammar) and as the links between tiers may have different strengths in different languages (e.g. the link between word order and syntactic functions is stronger in English than in Finnish), the above organization offers a good ground for comparative studies between languages.

The step from the model of representational modularity (Figure 2-4) to micro-modularity (Figure 2-6) does not change the fundamental principles of the research program of conceptual semantics as presented in Chapter 1. In fact,

the micro-modular theory follows from the logic of the program. The Tiernet-organization has several desirable properties. It is irrelevant for the model where the limits of e.g. syntax, phonology, and semantics go. It is not relevant for the functioning of the model to state which micro-modules belong to language and which fall outside of it. It is only relevant to know the properties of the modules and how they interact.

PART II

“Semantics”

CHAPTER 3

Argument structure and its ingredients

F-chain, argument level, thematic features, and action tier

In this chapter we will discuss the core set of micro-modules that are involved in the semantics of the conceptual category Situation. The modules f-chain, argument level, thematic features, and action tier are tightly related to each other: argument level and thematic features must be linked to the f-chain, and the action tier must be linked to the argument level. This means that the modules are not equal: the f-chain is the core of this part of the micro-modular network. We go through the formation of and mutual relationships between the micro-modules discussed in this chapter.

3.1 Introduction

In Chapters 3 and 4, we will discuss in detail the semantics of situations (i.e. events or states of affairs). The main focus is on those tiers that are reflected in syntax, e.g. argument structure. It will be argued that a well-formed situation is the basis for the well-formedness of the thematic tier and that the thematic tier is the main link between syntax and the "non-linguistic" tiers. The Tiernet model of organization of grammar and mind was introduced in Chapter 2.

In this chapter, we will go through three very tightly connected micro-modules, namely f-chain, argument structure, and thematic features. These three modules form a cluster in the network, which is why they are discussed together The modules we will discuss in this chapter are highlighted with a dotted background in Figure 3-1 (which is identical to Figure 2-8 in Chapter 2):
In addition to the primary micro-modules, we will discuss the links between the primary and the combinatorial modules.

3.2 From constituency to dependency and from large representations to micro-representations

Before going to the micro-modules, I will show how the micro-modular analysis has evolved from the conceptual structure analysis in Jackendoff (1983, 1990).

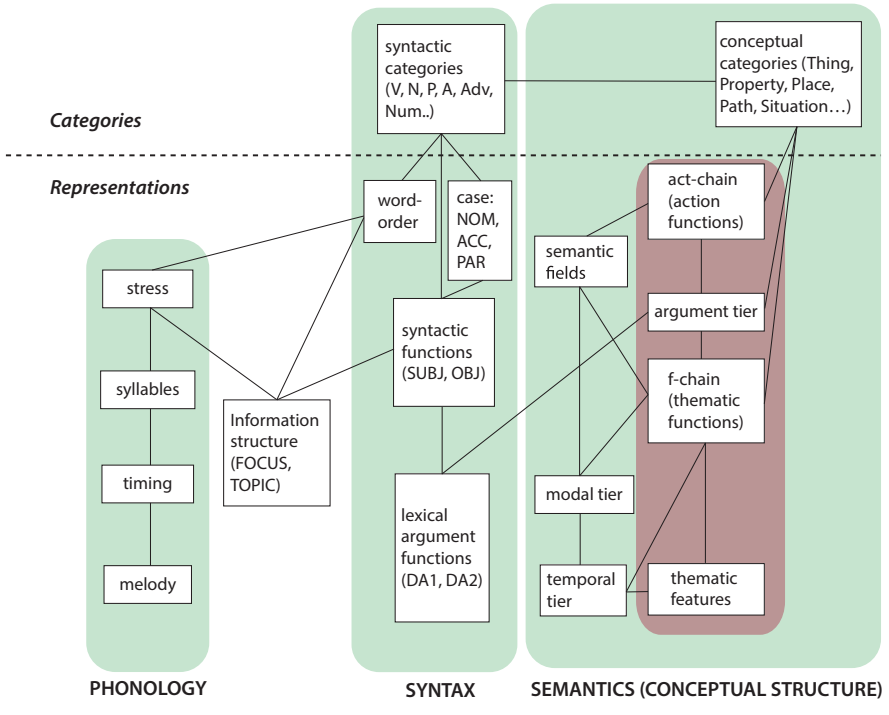


Figure 3-1 The purple background covers the cluster of modules that will be discussed in this chapter

Conceptual structure (Jackendoff 1983)

The argument for assuming the existence of a conceptual structure representation is based on linking linguistic representations to the representations of other domains of the human mind. Jackendoff (1983: 17) in fact assumed that the *conceptual structure hypothesis* holds that: "There is a *single* level of representation, *conceptual structure*, at which linguistic, sensory, and motor information are compatible". A hypothesis of a single representation that functions as a gate between language and the rest of the mind is not compatible with the micro-modular architecture suggested in Section 2. As Jackendoff points out himself, it is not logically necessary to assume a *single* level of representation through which all the other cognitive domains interact with language. The interaction between language and the other domains of mind, however, needs to be described in the model.

The conceptual structure hypothesis has played a very important role in the development of the theory. Jackendoff argued in his 1983 book that a separate language-specific "semantic" representation (level, structure) is not needed to explain the interaction between the language specific grammatical systems and a

universal conceptual representation. The semantic differences between languages can be explained by different linking rules between the linguistic structures and conceptual structure. Therefore, a language-specific intermediate level is superfluous. The name of the approach, "conceptual semantics," is motivated by this insight. These days the approach has developed into an integrated theory of the human cognitive system and – in principle – all of its domains. Even though the Conceptual Structure Hypothesis is not relevant to the present micro-modular approach, Jackendoff's assumption that there is no language-specific semantic representation, and the explanation of semantic differences between languages by referring to different linking principles, is still valid.

An early form of conceptual structure was presented in the semantic theory of Jackendoff (1972). In this theory, semantics was divided into three different parts: the functional structure, the modal structure, and the table of co-reference. Since Jackendoff (1976, 1983), the functional structure has been called the thematic structure because it is supposed to be responsible for most thematic roles (*i.e.*, semantic roles, thematic relations). The thematic roles are assigned to the arguments of particular functions. For instance, the argument of the function CAUSE is a causer, the argument of some of the functions BE, GO, STAY, EXT, ORIENT, CONF is a theme, the argument of the functions AT, IN, ON, UNDER, *etc*. is a Place, *etc.* (see further below). Because the thematic roles are defined as argument positions of particular semantic functions, the thematic roles are not primitive categories in this theory.

The motivation behind the Tiernet model of the information in conceptual structure

According to Nikanne (1990), the thematic tier of conceptual structure in Jackendoff's (1983, 1990) model can be analyzed as a set of autonomously formated tiers that interact with each other.

In Jackendoff's system, the **thematic tier** is the part of the semantic structure of situations based on semantic functions that together define those aspects of the situation that are reflected in the syntactic argument structure. According to Jackendoff's system, the thematic structure is a constituent structure. Each constituent is governed by a function. The function that governs the constituent in which the other constituents are included, governs the whole thematic structure.

The semantic functions are as follows:

Situation functions:	CS (x, Situation), GO (x, Path), BE (x, Place), STAY (x, Place), ORIENT (x, Path), CONF (x), MOVE (x)
Place functions:	AT (x), IN (x), ON (x), UNDER (x),…
Path functions:	TO (x), TOWARD (x), FROM (x), AWAY-FROM (x), VIA (x)

The meaning of the functions can be described informally as follows:

AT, IN, ON, *etc*. are Place-functions referring to different relations between the place and the reference object (*e.g*., the PPs *under the table* and *on the table* indicate different places with respect to the same reference object 'table').
TO, TOWARD, FROM, AWAY-FROM, VIA are Path functions, which indicate the relationship between a path and the reference object.
BE indicates a stative relation between a theme and a (concrete or abstract) place, expressed typically by the verb *be*.
GO indicates a change in the relation between a theme and a (concrete or abstract) path.
STAY indicates a stative but changeable situation between a I theme and a location; expressed *e.g*., by such verbs as *stay* and *remain*.
MOVE indicates a non-causative relation between the theme participant and the situation; typically expressed by intransitive verbs (*dance, float, laugh, etc*.).
ORIENT indicates a non-causative relation between the theme argument and a path: the theme argument's intrinsic direction (for instance vehicles, like car and boat have intrinsic fronts, according to their typical way of moving) is related to a path. (Expressed *e.g.* by verbs like *point, face*.)
EXT indicates a non-causative relation between the theme argument and a path: the extension of the theme covers the extension of the path. In spatial expressions EXT is often expressed by motion verbs. Some examples: *The road goes to Helsinki, The meeting lasted to midnight.*
CAUSE indicates a causative relation between causer and a caused situation. A part of causative verbs, for instance *throw* and *send*, whose lexical conceptual structure contains both causation and motion, i.e. CAUSE→GO; where the arrow indicates selection.
INCH indicates that the situation in its immediate scope starts. *E.g*., the functional chain (see below) for the sentence *The weathervane points to the east* is ORIENT, and the functional chain for the sentence *Suddenly, the weathervane pointed to the east* is INCH→ORIENT.

The argument types depend on the function:

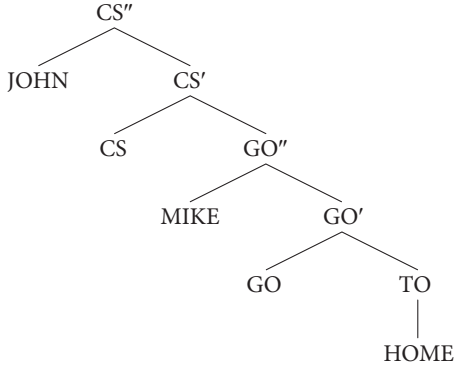
Causer is the first argument of CS.
Theme is the first argument of BE, GO, STAY, ORIENT, CONF, or MOVE.
Reference object (goal, source, route, location) is the thematic argument of a Place- or Path-function.

The thematic tier for the sentence *John makes Mike go home* can be analyzed in Jackendoff's (1983) notation as in (1)

(1) $[_{Event}$ CAUSE (John, $[_{Event}$ GO (Mike, $[_{Path}$ TO (home)])])]

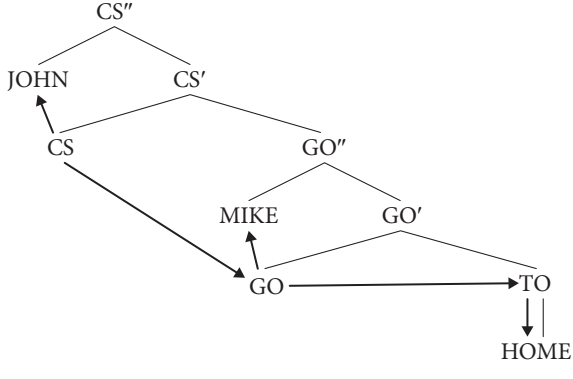
The square brackets [ ] indicate constituents and the parentheses ( ) indicate scope. The conceptual category (Situation, Path) is marked as subscribt at the constituent. The formal properties of this system can be illustrated by turning it into a kind of two-level "X-bar-structure" in which the constituents are projections of the semantic functions and the arguments are in the argument positions. The first argument is in the "specifier position" and the function selected by the head function is in the "complement position". The thematic structure of *John makes Mike go home* can be written as in (2):

(2)



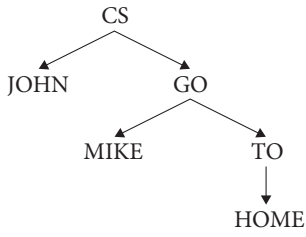
The formal approach mixes constituency and dependency. This can be seen when we add the dependency relations to the constituent tree, as is done in (3). Arrows indicate dependency and the lines indicate constituency:

(3)



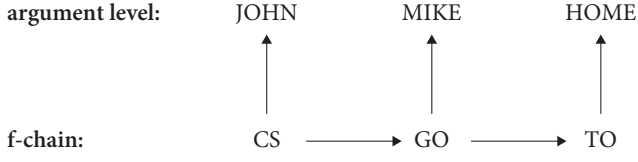
The whole structure is a projection of the function CS, which selects the causer-argument *John* and the situation function GO. GO selects the theme-argument *Mike* and the Path functon TO. TO selects the Reference object – argument *home*. Nikanne (1990) suggests that the constituency is not necessary, and the whole thematic structure can be seen as a dependency structure as shown in (4):

(4)



Further, according to Nikanne (1990), the structure is divided into two parts: the functions on one hand and the thematic arguments on the other. The backbone of the structure is the mutual dependency of the functions, and the functions form an independent system, a tier, called the **function chain** or briefly **f-chain**. In the example above, the function chain is CS→GO→TO. The arguments are on another tier, the **argument level**. This division to two tiers is easier to see when the dependency structure is written on two layers as in (5) (the arrows indicate selection):

(5)



In Jackendoff's system, a part of the constituent structure was the conceptual categories, e.g. Situation, Path, Place, Thing, Property, etc. Nikanne (1990) suggests that the categories are divided into simple and complex categories. The complex categories are function-argument structures and the category is determined by the function that governs the structure (i.e. has the scope over the rest of the struture). In our example, the whole structure is governed by the function CS, the Situation selected by CS is governed by the function GO and the Path selected by GO is governed by the function TO. The functions and their arguments (in addition to possible further modifiers) belong to the complex category. The argument level elements in our example represent simple categrories. We can say that *John* and *Mike* belong to the category Thing and *home* belongs to the category Area.

The whole discussion can be summarized in Figure 2, in which the material that belongs to the same conceptual category is surrounded with a box. The boxes can include other boxes, as in a constituent structure. The abbreviation Cat stands for "category". The arrows indicate selection/dependency relations. The dashed line indicates the division between the two tiers of the structure, the f-chain and the arg-level:

The constituent structure suggested by Jackendoff (1983) can be seen in the picture: the causative situation 'John made Mike go home' includes the non-causative situation 'Mike goes home' which, in turn, includes the path '(to) home.'

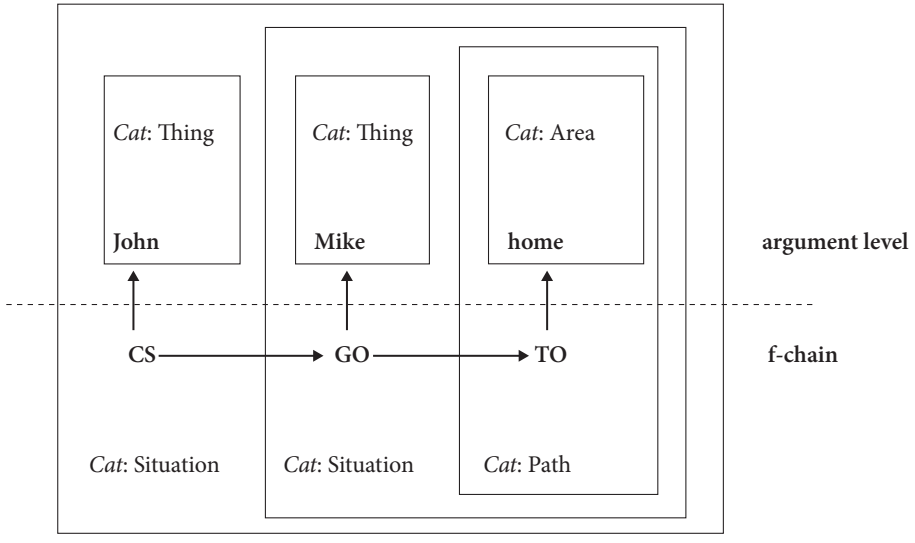


Figure 3-2 The dependency structure and conceptual categories of the thematic structure of the sentence *John made Mike go home*.

Thus, even though the well-formedness of the f-chain is based on dependency, constituency plays a role in the structure in which f-chain and argument level are combined.

It should be pointed out that the conceptual constituents are linked to the cluster of f-chain, argument level, and thematic features. The role of the thematic features will become clear later in this chapter. Different combinations of thematic features can be associated with the same f-chain, and the presence or absence of particular features can determine the conceptual category: e.g. if the feature [T] ('time-related') is associated with an f-chain governed by f2 (or f3), the (fragment of the) f-chain is linked to an Event instead of State of affairs, and if the feature D ['directional'] is linked to a fragment of f-chain governed by f1, the fragment is linked to the category Path instead of Place.

We can call this cluster the **thematic tier cluster**. The thematic tier in Jackendoff (1987a,b, 1990) is the successor of the functional structure introduced in Jackendoff (1972). The thematic tier cluster carries the information on those aspects of the situation structure that have to do with change (*e.g.*, moving from one concrete or abstract place to another as well as changing color or shape) or state of affairs (*e.g.*, being in a place or someone's possession, having a property, etc.) or causation.

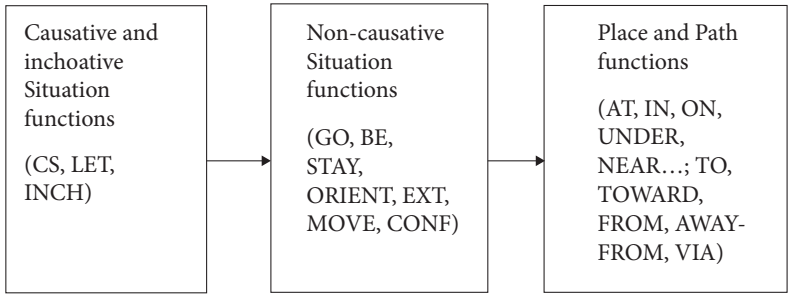
In the following sections, we will discuss the parts of the structure in more detail and see how the multi-tiered network is organized.

3.3 F-chain

Zones

As pointed out in Nikanne (1990), the f-chain is always built such that the Path and Place functions have the narrowest scope, and they are always selected by non-causative situation functions (GO, BE, STAY, ORIENT, EXT). These functions cannot select Situation functions to the f-chain but the causative and inchoative functions must do so. Therefore the order of the functions in the f-chain is always the same, as given in (8):

(6)



The f-chain position class can be seen as the most important combinatiorial property of the functions. The functions are divided into three parts, or zones (1) Location zone, (2) Non-causative situation zone, and (3) Causative and inchoative zone. (Nikanne 1990, and later). The well-formedness of the f-chain is defined by the f-chain schema

The f-chain schema
f3* → f2 → f1*

(* indicates that there are none, one or more functions of the kind in the dependency chain)

A causative situation function can select a causative or a non-causative situation. A non-causative situation function must select a Place- or Path-function. One f2 is always present in a well-formed conceptual structure.

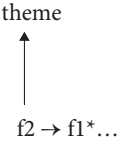
The arguments are in a different tier: The arguments are selected by the functions in the f-chain. Therefore, the argument tier is very simple: it only has one primitive Arg. The thematic role of the Arg depends on the function that selects it. The functions f1, f2, and f3 can be associated with semantic features such as Direction, Time, Bounded, etc. The combination of these features and the zone value of the function (1, 2, or 3) gives the Argument its participant role in the event.

Because the functions are divided into three zones, the thematic roles are divided into the same three zones as they are dependent on the f-chain.

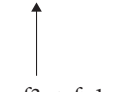
Here is an overview of the zones:

Zone 1, the location zone
Function: f1
Categories: Place and Path
Jackendovian functions: TO, TOWARD, AWAY-FROM, VIA; AT, IN, ON, UNDER, etc.)
Thematic role: Landmark (i.e. goal, source, route, location.)
The structure of a PLACE or PATH:
f1 → {PLACE / PATH / Landmark}

Zone 2, the non-causative situation zone:
Function: f2
Category: Situation
Jackendovian functions: non-causative situation functions (BE, GO, MOVE, etc.).
Thematic role: theme
The structure of non-causative situation (zone) (X* stands for none, one or more occurrences of X)



Zone 3, the causative (including inchoative) zone:
Function: f3
Jackendovian funtions: causative (and inchoative) functions (CS, INCH)
Category: Situation
Thematic role: causer.
The structure of Causative situation (zone 3):



3.4 Thematic features (th-features)

3.4.1 Hierarchical organization of thematic features

So far, we have used f1, f2, and f3 as abbreviations for the "jackendovian" functions. The f-chain schema, however, shows that they form an autonomous system.

According to the principles discussed in Chapter 1, the autonomous systems are separate tiers.

According to Nikanne (1990, 2006), the difference between different jackendovian semantic functions can be analyzed using features that are organized as a constituent structure. The organization is similar to the feature hierarchy in nonlinear phonology (see e.g. Clements 1985). The resemblance will become clear throughout the discussion that follows. The terminology used with the feature hierachy is given in Figure 3:

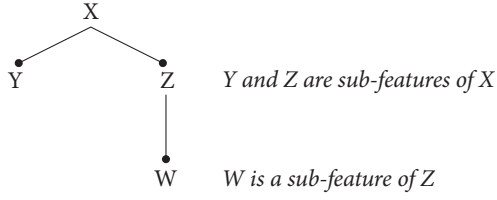


Figure 3-3 The hierarchical organization of features is based on constituency

The feature hierarchy presented in a tree form in Figure 3, can be presented in brackets, as shown in (7):

(7) [X [Y] [Z [W]]]

Sometimes, it is necessary to save some space, and use bracket notation. Most of the time, however, the tree notation is used because it is easier to read as the structures become complicated.

The thematic features – *thematic features* or briefly *th-features* – and their hierarchy are presented in Figure 4:

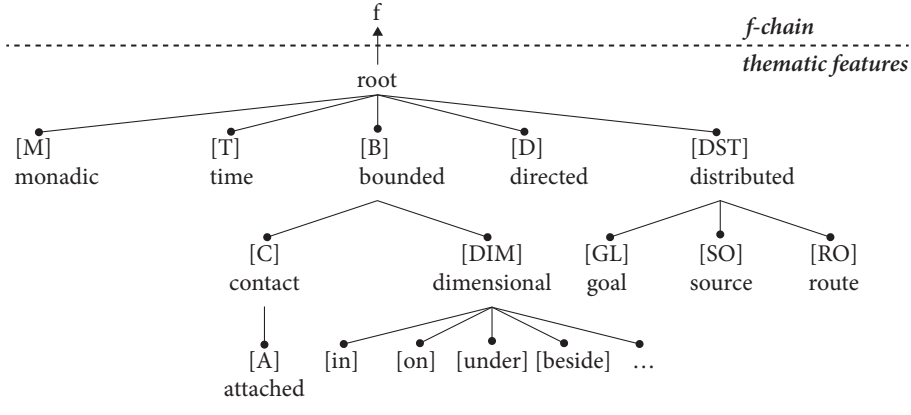
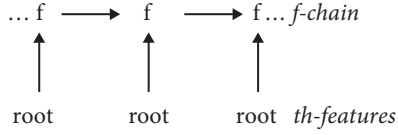


Figure 3-4 The hierachy of thematic features

The feature complex – whose maximal projection the root node is – is a feature, and it has scope over the function that it is attached to. The link (i.e. relationship) between the root node and the f-chain function is thus a selection. This is indicated by the arrow-link from the root to the function. (See Petrova 2011 for a discussion on the link between the f-chain and thematic features.) The links between the root node as well as the mutual features of the thematic features are based on constituency. The configuration resembles phonology in which the phonological root nodes are linked to the timing tier (see e.g. Sagey 1986).

The idea is that each f is linked to a root node which carries a set of features:

(8)



We need a term for the constituent of features whose maximal projection the root node is. The term is **feature set**.

Some of the thematic features are sensitive to zones, and can only be linked to a function that belongs to (a) certain zone(s). The restrictions are applied to the following features:

- The feature [T] (time), which can only appear in zones 2 and 3,
- The subfeatures of [B] (bounded), which can only appear in zone 1, and
- DST (distributed), which can appear only in zone 1.
- The subfeature RO (route) of D (directed), which can only appear in zones 1 and 2.

The features, their meaning and the zones they can belong to are given in Table 3.1:

In order to make Table 1 more concrete, I give examples of feature configurations of each zone in Table 3.2 below. It is impossible to give concrete examples of abstract features one by one. Therefore, the examples are combinations, or configurations, of features and f-chain functions. Those can be linked to words and expressions. It would not be possible to give all the configurations that the system allows, or even all the interesting ones. I hope that Table 3.2 below gives the reader an idea of how the features work. The configuration of features is in the first coulumn, and the English and Finnish examples in the second one. In the third column, there are comments concerning the corresponding function or function combination in Jackendoff's (1983, 1990) notation as well as other comments concerning the features.

A more detailed comparison between the notation in Jackendoff (1983, 1990) and the present notation can be found in Section 3.4.7.

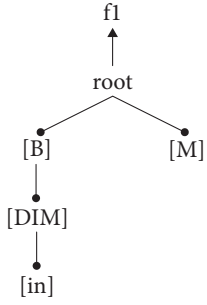
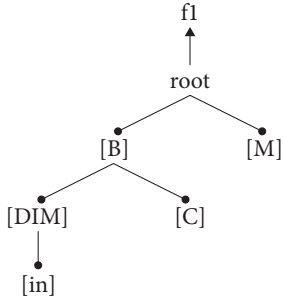
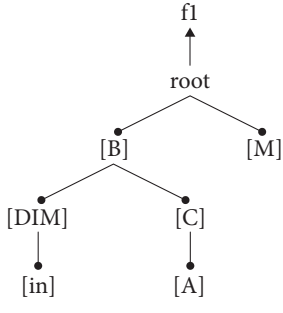
Table 3.1 Thematic features

Abbreviation	Feature	Description	Zone
T	Time-related	Situation has an internal time line.	2, 3
M	Monadic	Function can select only one element (arg of f).	1, 2, 3
B	Bounded	Boundedness of a Path or causation.	1, 3
C	Contacted	Contacted. Sub-feature of B.	1
A	Attached	Attached. Sub-feature of C.	1
D	Directed	Situation has a direction.	1, 2, 3
GL	Goal	Path-feature indicating the end of the path. Sub-feature of D.	1, 2, 3
SO	Source	Path-feature indicating the beginning of the path. Sub-feature of D.	1, 2, 3
RO	Route	Path-feature indicating a relevant mid-point of the path. Sub-feature of D.	1
DIM	Dimensional	Sub-feature of B.	1
in, on, under,…	(Location-features)	Sub-features of DIM. Place-features specifying the location with respect to the Landmark.	1
DST	Distributed	The theme/figure is distributed over the Path or Place.	1, 2

Table 3.2 Examples of feature configurations

Configuration	Examples in English and Finnish	Comments
Zone 1		
f1 ↑ root • [M]	The wedding party is *at the Church*. Hääjuhla on *kirkolla*. wedding-party is church-ADE 'The wedding party is at the Church.'	Cf. function AT. Feature [M] shows that the function is monadic. This is the most simple configuration in zone 1, as there is no boundedness feature [B]. The location of the theme argument (in the ex., *wedding party*) is therefore open when it comes to a more specific (spatial) relation to the location argument (in the ex., *Church*). The wedding party is somewhere in and around the Church.

Table 3.2 (*Continued*)

	A bird is *in the house*. *Talossa* on lintu house-INE is bird 'There is a bird in the house.' Cf. function IN.	The dimensionality feature DIM is dominated by the boundedness feature [B]. The feature [in] that stands for the meaning being inside something is dominated by [DIM]. Feature [B] does not have any subordinate features indicating that the theme argument (in the ex., *bird*) would be in contact (or attached) to the location argument (in the ex., *house*).
	The ear plug *is in the ear*. Korvatulppa on *korvassa*. ear-plug is ear-INE 'The ear plug is in the ear.'	Cf. function IN. Jackendoff (1990) introduced the feature [C] for contact. Feature [C] stands for the meaning that the theme argument (in the ex., *ear plug*) is in contact with the location object (in the ex., *ear*).
	The screw is *in the wall*. Ruuvi on *seinässä*. screw is wall-INE 'The screw is in the wall.'	Cf. function IN. Jackendoff (1990) introduced the feature [A] for attachment. In our hierarchy, the feature [A] is dominated by the feature [C], and it stands for the meaning that the theme argument (in the ex., *screw*) is not only in contact with the location object (in the ex., *wall*) but even attached to it.

(*Continued*)

Table 3.2 (*Continued*)

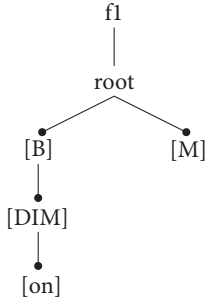
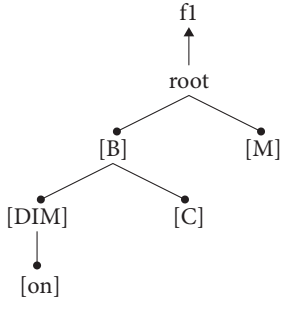
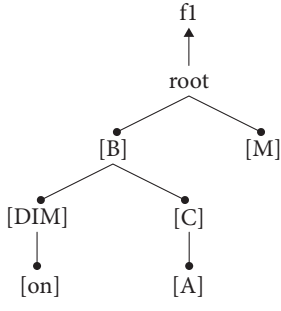
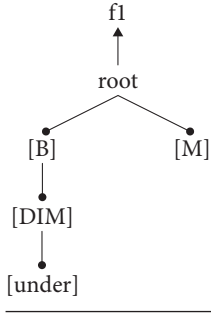
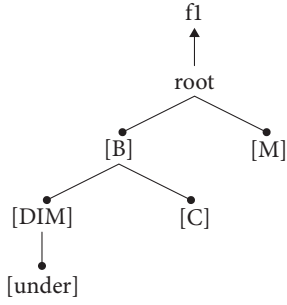
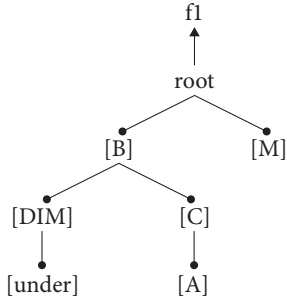
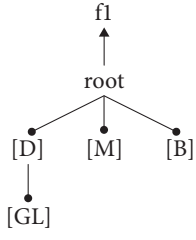
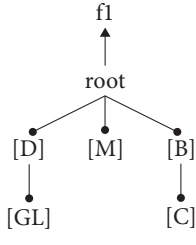
	There is a dark cloud *on/over the town*. *Kaupungin päällä/yllä* on town-GEN on/over is tumma pilvi. dark cloud. 'There is a dark cloud on/over the town.'	Cf. function ON. As the feature [C] is not present, the configuration stands for a meaning in which the theme argument (in the ex., *cloud*) does not have to be in contact or attached to the location argument (in the ex., *town*).
	John is *on the roof*. There are *ants on the wall.* Jussi on katolla Jussi is roof-ADE 'Jussi is on the roof.' Seinällä on muurahaisia. wall-ADE is ant-PL-PAR 'There are ants on the wall.'	Cf. function ON. Since the feature [C] is present, the configuration indicates that the theme argument (*John*) is in contact with the location argument (*roof*).
	The wallpaper *is on the wall*. Tapetti on seinässä wallpaper is wall-INE 'The wallpaper is on the wall.'	Cf. function ON. The feature [A] indicates that the theme argument (*wallpaper*) is attached to the location argument (*wall*). In Finnish attachement and contact are often expressed with the inessive case, whose prototypical meaning is 'in,' even though the spatial relation is 'on the surface of.'
	The car is *under the bridge*. Auto on sillan alla. car is bridge-GEN under-ADE. 'The car is under the bridge.'	Cf. function UNDER. No indication of contact. The Finnish postpositions are inflected in a limited number of locative cases, e.g. *alla* [adessive] 'under', *alle* [allative] 'to under', *alta* [ablative] 'from under'

Table 3.2 (*Continued*)

	The napkin is *under the cup*. lautasliina on kupin alla napkin is cup-GEN under-ADE 'The napkin is under the cup.'	Cf. function UNDER. Indication of contact, and therefore the feature [C] is present, but no indication of attachment, and the feature [A] is not present.
	There is chewing gum *under the desk*. *Pöydän alla* desk-GEN under-ADE on purukumia. is chewing-gum-PL-PAR 'There is chewing gum under the desk.'	Cf. function UNDER. Indication of attachment, and therefore the feature [A] is present.
	John went *to the Church*. Jussi meni kirkolle. Jussi went church-ALL 'Jussi went to the church.'	Cf. function TO. The feature [D] (direction) indicates that the function is a path function. No indication that the theme argument (*John*) would make physical contact with the goal argument (*Church*), and therefore the feature[C] is not present.
	The boys kicked the ball *against the wall*. Pojat potkivat boy-PL kicked palloa *seinään*. ball-PAR wall-ILL 'The boys kicked the ball against the wall.'	Cf. function TO. [D] indicates path. The end of the path is in contact with the goal, i.e. the theme argument (*ball*) gets in contact with the goal argument (*wall*). This is indicated by feature [C]. The Finnish illative case typically corresponds to the English preposition *into*.

(*Continued*)

Table 3.2 (*Continued*)

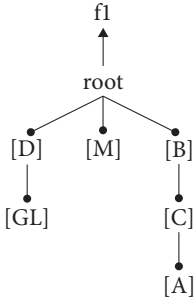
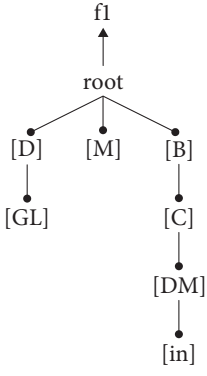
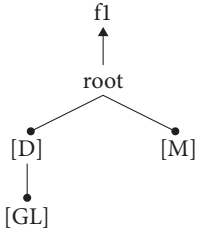
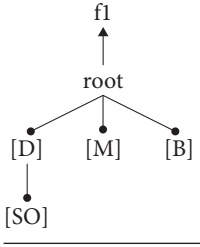
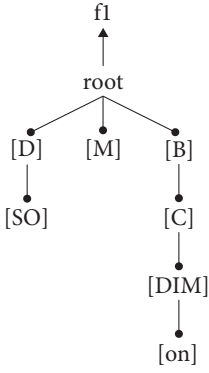
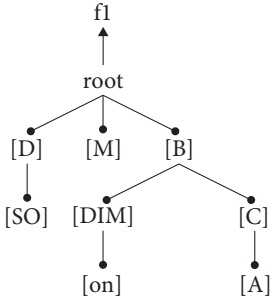
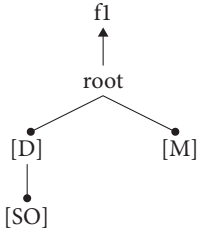
	Robin Hood shot his arrow *into the target*. Robin Hood ampui Robin Hood shot nuolensa *maaliin*. arrow-ACC-Px3 target-ILL 'Robin Hood shot his arrow into the target.'	Cf. function TO. [D] indicates path. The end of the path is attached to the goal, i.e. the theme argument (*arrow*) sticks to the goal argument (*target*).
	I put ear plugs *into my ears*. Panin korvatulpat put-past-1SG ear-plug-PL.ACC *korviini*. ear-PL-ILL-Px1SG 'I put ear plugs into my ears.'	Cf. function combination TO (IN). [D] indicates path. The feature[C]shows that the end of the path is in contact with the goal argument (*ear*), and the feature [in] shows that the specific location is inside the goal argument (*ear*).
	John walked *toward the Church*. Jussi käveli *kirkkoa kohti/kohden*. Jussi walked church toward 'Jussi walked toward the Church.'	Cf. function TOWARD. [D] indicates path. No indication of reaching the goal. Therefore, the feature[B]is not present.
	John came *from the Church*. Jussi tuli *kirkolta*. John came church-ABL 'John came from the church.'	Cf. function FROM. [D] indicates path. As there are no features under B, the location with respect to the the source argument (*Church*) is very generic.

Table 3.2 (*Continued*)

	I took the book from the table. Otin kirjan pöydältä. take-PAST-1SG book-ACC table-ABL 'I took the book from the table.'	Cf. function FROM. [D] indicates path. The feature[C]in the configuration indicates that the theme argument (*book*) has been in contact with the source argument (*table*). The feature [on] under feature [DIM] indicates the more specific source location with respect to the source argument (*table*).
	I removed the sticker from the wall. Irrotin tarran seinästä. remove-PAST-1SG sticker wall-ELA 'I removed the sticker from the wall.'	Cf. function FROM. [D] indicates path. The feature [A] in the configuration indicates that the theme argument (*sticker*) has been attached to the source argument (*wall*). The feature [on] under feature [DIM] indicates the more specific source location with respect to the source argument (*wall*).
	John came away from the Church. Jussi tuli *kirkolta päin*. Jussi came church PARTICLE 'Jussi came away from the Church/ from the direction of the Church.'	Cf. function AWAY-FROM. [D] indicates path. As the feature[B]is not present, the configuration does not indicate that the theme argument (*John, Jussi*) would have been in any particular (in the example spatial) relation with the source argument (*Church*). One function of the Finnish particle *päin* is to erase the feature [bounded] in path expressions (see Nikanne 1990.) *Päin* has no corresponding lexical item in English.

(*Continued*)

Table 3.2 (*Continued*)

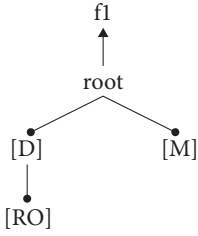
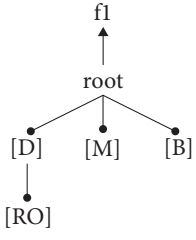
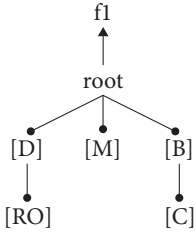
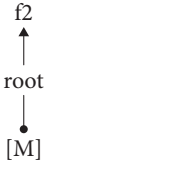
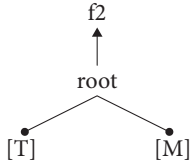
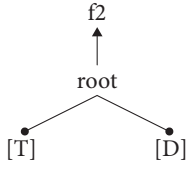
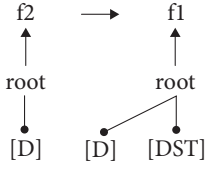
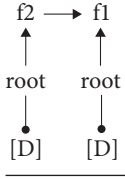
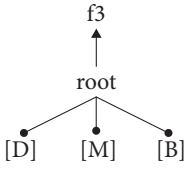
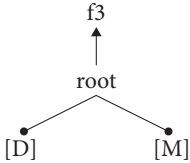
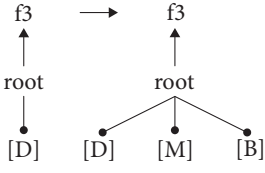
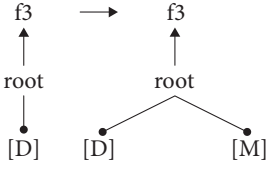
	Me menemme etelän kautta. We go-1PL south-GEN via 'We go using the southern route.'	Cf. function VIA. [D] indicates path. As the feature[B]is not present, the theme argument ('we') does not have to be in any particular (spatial) relation with the route argument ('south').
	The bird flew *through the window*. Lintu lensi *ikkunasta*. bird flew window-ELA The bird flew through the window' (which was open).	Cf. function VIA. [D] indicates path. As there is no feature[C] present, the theme argument (*bird*) does not have any contact with the route argument (*window*).
	Lintu lensi *ikkunan läpi*. 'bird flew through window' (and broke it).	Cf. function VIA. [D] indicates path. As the feature[C] is present, the theme argument ('bird') has been in contact with the route argument ('window'). In Finnish, the interpretation of the postposition *läpi* indicates that there has been a contact. In the example, the most obvious reading is that the bird has broken the window on its way through it.
Zone 2		
f2	John *is* in the Church. Jussi *on* kirkossa. Jussi is church-INE 'Jussi is in the Church'	Cf. function BE. This is the most simple configuration in zone 2. There are no thematic features.
	A nail *sticks out*. Naula *törröttää*. nail stick-out-3SG 'The nail sticks out (irritatingly).'	Cf. function CONF. The monadicity feature[M] in zone 2 indicates that the function does not select any other (zone 1) function in the f-chain. The feature T (time) is not present, and therefore the configuration stands for a state (and not event).

Table 3.2 (*Continued*)

	The ball *is rolling* on the floor. Pallo *pyörii* lattialla. ball roll-3SG floor-ADE 'The ball is rolling on the floor'	Cf. function MOVE. The feature T (time) indicates that the situation is an event (process, activity) and not state.
	John went to the Church. Jussi meni kirkkoon. Jussi went church-ILL. 'Jussi went (in)to the church.'	Cf. function GO. The feature T is present, and the configuration stands for an event. The feature[D](direction) indicates that there is a direction involved, which formally means that the f2 must select a path function. A path function is an f1 function that carries the feature [D].
Zones 1 and 2		
	The road *goes* to Helsinki. The rope *extends* from one wall to another. The paint stains *extend* from the kitchen to the living room. Tie *menee* Helsinkiin. road go-3SG Helsinki-ILL 'The road goes to Helsinki.' Köysi *ulottuu/yltää* rope extend-3SG seinästä toiseen. wall-ELA another-ILL 'The rope extends from one wall to another.' Maalitahrat *ulottuvat* paint-stain-PL extend-3PL keittiöstä olohuoneeseen. kitchen-ELA living-room-ILL 'The paint stains extend from the kitchen to the living room.'	Cf. function EXT. The feature [DST] indicates that the theme argument (*road, paint stains. rope*) is distributed (i.e. extended) along the path. The verbs used in both English and Finnish are often motion verbs (e.g. *go, mennä* 'go').
	The arrow *points* to the south. Nuoli *osoittaa* etelään. arrow point-3SG south-ILL 'The arrow points to the south.'	Cf. function ORIENT.

(*Continued*)

Table 3.2 (*Continued*)

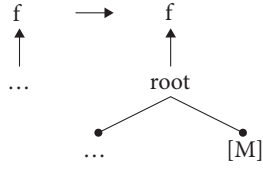
Zone 3		
	The room *was emptied* of people. Huone *tyhjentyi* room empty-INCH-PAST-3SG ihmisistä. people-ELA. 'The room was emptied of people.'	Cf. function INCH+. The Finnish derivative suffix *UtU* is often used for inchoative meanings. E.g. *tyhjenty* 'become empty' is derived from adjective *tyhjä* 'empty' and the suffix *UtU*. In English, causative expressions are often used even for inchoative meanings.
	The room was *about to be emptied* of people. Huone *oli* room was *tyhjentyä* ihmisistä. empty-INCH-INF1 people-ELA 'The room was about to be emptied of people.'	Cf. function INCH−. As the inchoative is undbounded, the change does not take place, at least not completely.
	John *emptied* the room of people. John *got* the people to go out of the room. Jussi *tyhjensi* huoneen ihmisistä Jussi emptied room-ACC people-ELA 'Jussi emptied the room of people.' Jussi *sai* ihmiset Jussi got people-ACC lähtemään huoneesta. go-away-INF3-ILL room-ELA. 'Jussi got the people to go out of the room.'	Cf. function CAUSE+. The analysis of causative expressions has two parts: the 'inchoative' part and the 'causative' part. If the inchoative part is bounded, the causation is successful.
	John *was emptying* the room of people. John *tried to get* the people to go out of the room. Jussi *tyhjensi* Jussi emptied huonet*ta* ihmisistä room-ACC people-ELA 'Jussi emptied the room of people.' Jussi *koetti* Jussi try-PAST-3SG *saada* ihmiset get-INF1 people-ACC lähtemään huoneesta. get-away-INF3-ILL room-ELA. 'Jussi tried to get the people go out of the room.'	Cf. function CAUSE−. If the 'inchoative' part is unbounded, the causation is not necessarily successful.

So far, we have mostly only discussed features separately. Even in Table 3.2 above, there are only fragments of feature combinations. In the following sections, we will go into the principiles that govern the combination of features.

3.4.2 Feature sharing and M-units

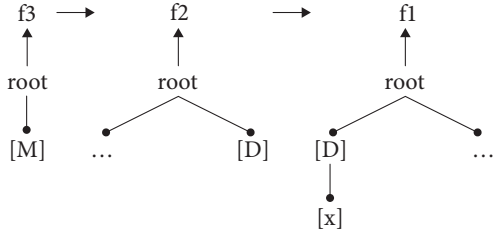
Nikanne (1990) points out that the D-features and semantic fields (see Chapter 4) are shared with zone 2 and zone 1 functions but they cannot spread across the boundary between zone 2 and zone 3. In addition, the semantic fields of zone 3 (see Chapter 4) are shared only within a unit formed by a non-monadic function and a monadic function that it selects. This unit was then called a "D-unit" because also the sub-features of the feature [D] (directed) are shared only within these units. As we have now introduced the feature [M] (monadic) as a part of the feature system, we can call the unit an M-unit. An M-unit can be defined as follows:

M-unit
M-unit is the following configuration:



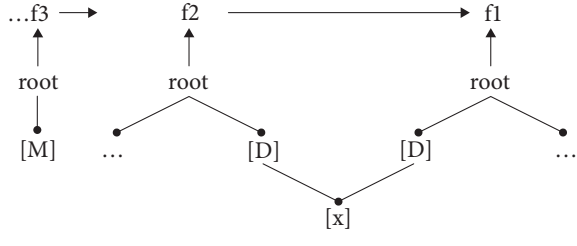
The D-features spread from right to left – i.e. in the opposite direction to the selection in the f-chain – and the feature [M] (monadic) blocks the spreading. Here is an example ([x] stands for a D-feature [GL], [SO], or[RO]):

(9)



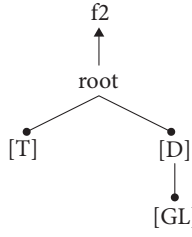
The feature [x] will spread from right to left, which means that it will be shared by the D-node under f2.

(10)

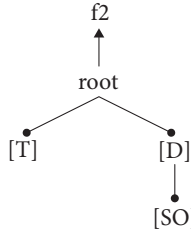


Note that the term "spread" is only a metaphor. The D-features are under f2 for instance because there are verbs like *arrive* that are goal oriented or verbs like *leave* that are source oriented. (Lexical entries are discussed in detail in Chapter 6.) The idea is that the lexical f-chain of these verbs includes the D-node with its subfeature, for instance:

(11) The lexical f-chain and thematic features of the verb *arrive*



(12) The lexical f-chain and thematic features of the verb *leave*

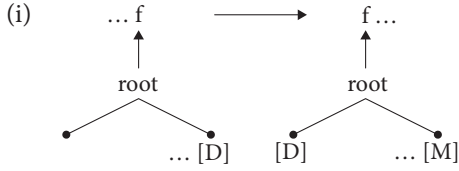


The verb *arrive* will then need to select a preposition with the D-feature [GL] – or the goal location is understood from the context. Another possibility would be to use unification as the formal tool and assume that the lexical f-chain and thematic features of the verb *arrive* would consist of both f2 and f1 with the D-feature [GL]. That solution would make it possible to assume that there is no [D] among the features of zone 2, and feature sharing does not need to be specified in the lexical entries of *arrive*, or *leave*. However, when building the conceptual structure from bits and pieces given in the lexical entries, we are using unification only very restrictively in order to keep the lexical entries as simple as possible. (See more on this in Chapters 6–8 in Part III in which we discuss linking.)

One of the formation principles that define a well-formed thematic feature structure is that the D-features are always shared within the same M-unit. This principle is called Direction Filter in Nikanne (1990). We can formulate it for instance as follows:

Direction Filter

In the configuration of the form (i), the features dominated by the [D]-nodes must be shared by both [D]-nodes.



The Direction Filter plays an important role for instance in lexical entries, as it allows the lexical conceptual structure of motion verbs (e.g. *move, go, travel*, etc.) to have a [D]-node without any D-features. The D-features lexicalized in the prepositions governed by the verb will be shared by the [D]-node that corresponds to the lexical conceptual structure of the verb. We will discuss this in detail in Chapter 6.

The thematic features, the f-chain, the argument tier, and the selection arrows between functions and arguments were explained earlier. In the following figure, the formalism experssing feature sharing and the M-units is presented in an analysis of the sentence *John took the book out of the box*:

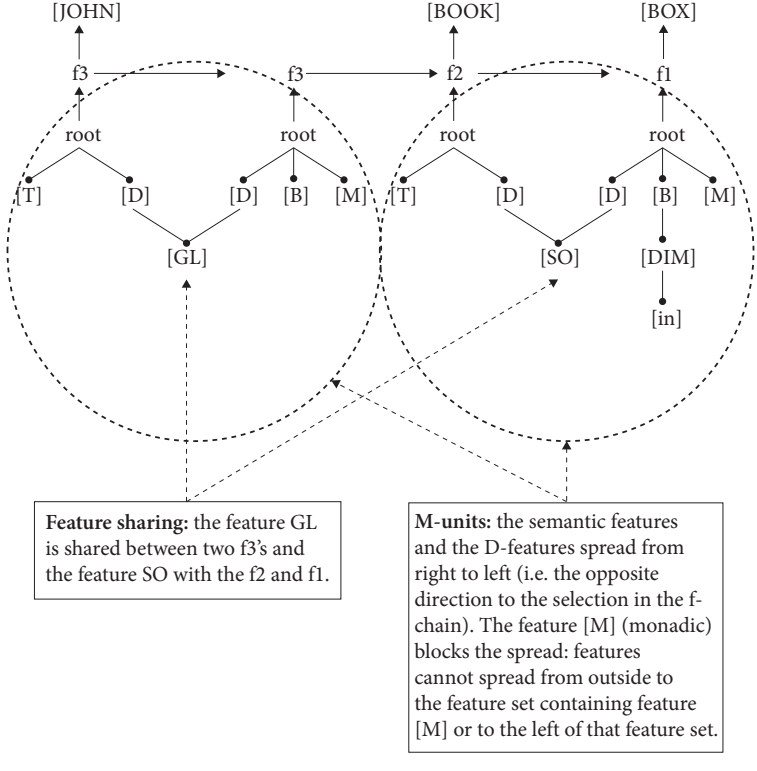


Figure 3-5 Feature sharing and M-units. (Analysis of the sentence John took the book out of the box.)

3.4.3 Some words on the feature [M]

In Nikanne (1990), the f-chain functions are divided into monadic and non-monadic ones. By monadic functions I mean functions that can select only one element. The selected element can be either a thematic argument or a function. The non-monadic functions can select more than one element. In the present formalism, I would like to analyze valence as a feature, which is not the most typical solution but it is a practical one.

Typically, in dependence grammars and other valence based approaches, verbs and other predicates may have a particular number (one, two, three) of obligatory arguments. When it comes to valence in the present approach the basic difference is that of monadic vs. non-monadic. Monadicity is a property that sets limits to valence but non-monadicity does not. It seems that it is natural to analyze monadicity as a feature, [Monadic]. Lacking this feature does not seem to limit the valence of the function in any way. We can analyze monadicity as a feature that is associated with a function. One property of the feature is that it cannot be shared with more than one function.

Note that the zone 1 functions are always associated with the feature [M]. This means that there is a **fixed link** between f1 and [M]. (On a discussion of the different strengths of links, see Petrova 2011.)

(13) **Fixed link between f1 and [M]**
The f-chain functions in zone 1 are always associated with the feature [M].

The fixedness of the link is not two-directional: f1 is always linked to the feature [M] but feature [M] is not always linked to f1: it may be linked to f2 or f3, too.

3.4.4 Some words on the functions that do not carry the feature [M]

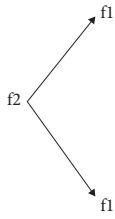
The functions that do not carry the feature [M] may select more functions than one. (Only the number of selected arguments is restricted to one per function.) This is a typical case when dealing with paths and places. For instance:

John traveled from Boston to New York.
John is sitting at the front of the room next to his best friend.

Both the paths corresponding to 'from Boston' and 'to New York' are selected by the same f2 and neither of the paths have selected the other. In the same vein, the places corresponding to 'at the front of the room' and 'next to his best friend' are selected by the same f2.

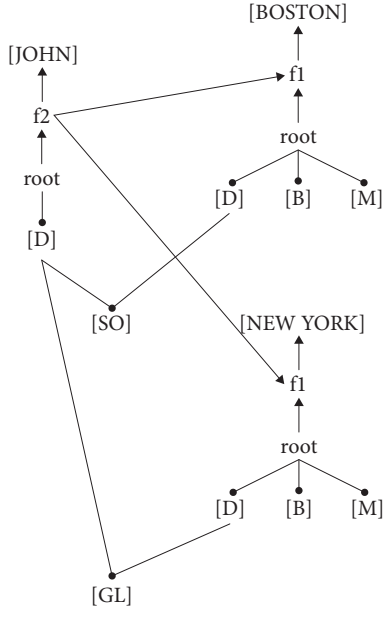
In Nikanne 1990, 2002, etc. the parallel relation was indicated simply with arrows from the f2 to each of the selected f1's as shown in (14).

(14)



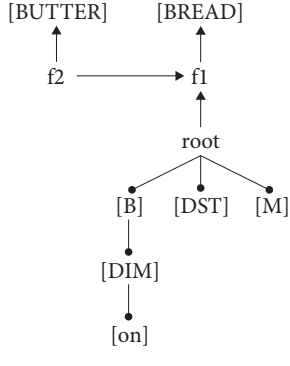
An analysis of the sentence *John traveled from Boston to New York* using this notation is given in (15):

(15)



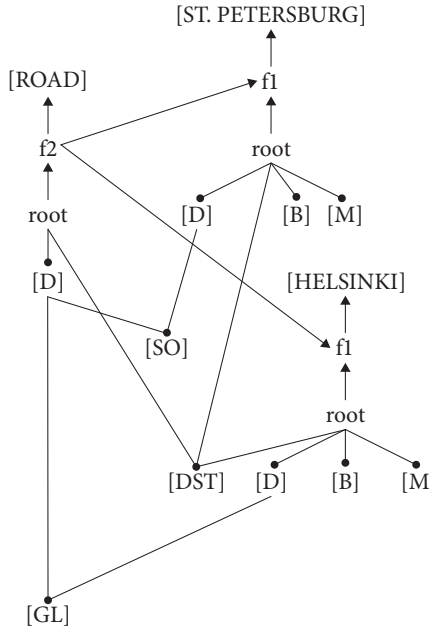
Nevertheless, the feature may be a part of any place or path indicating that the theme argument is spread all over the path or place. For instance, the most typical reading of the sentence *The butter is on the bread* is that the butter covers the upper side of the bread. In this case the thematic structure is as follows:

(16)

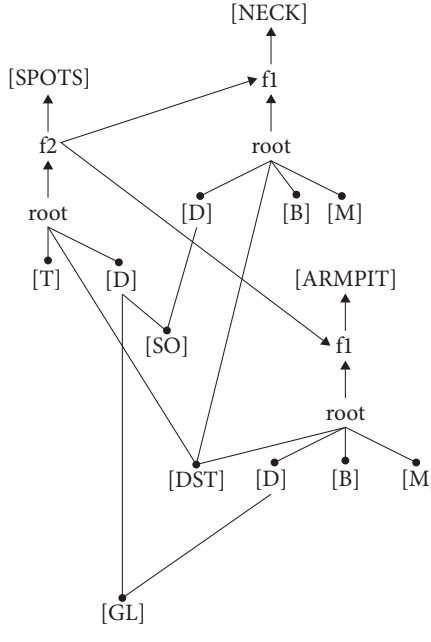


In addition, a Path may carry the feature [DST] as in (17–18):

(17) *The road goes from St. Petersburg to Helsinki.*



(18) *The red spots keep on spreading from the neck to the armpit.*



Note that the feature DST must be shared by all path functions. This can be stipulated as follows:

Distributed Path Priniciple
If an f2 carrying the feature [D] selects an f1 that carries the feature [DST], then the feature [DST] must be shared by all the f1's selected by the same f2.

The formulation "f2 carrying the feature [D]" only means that it is a path function. According to the Direction Filter discussed earlier in this chaper, the D-features are shared within the same M-unit. The Distributed Path Principle is a technical one the purpose of which is to gurantee that the path in its entirety is "distributed." In other words, the Distributed Path Principle says that if one part of the path is distributed in nature, so are all the other parts of the same path.

The sentence in (17) is a typical "EXT-case." It is a state of affairs, not an event, the sentence is (in a normal case) understood as an expression of the extension of the road. Still, the extension is expressed in such a way that it gives the road a direction 'from St. Petersburg to Helsinki.' The same thing could be said using the expression The *road takes you from St. Petersburg to Helsinki*. But still, the road is not understood to be moving anywhere. The sentence in (18) is an event. The red spots start from the neck and the spotted area grows along a path that goes to the armpit. The result is that the theme argument (red spots) are spread all over between the neck and the armpit. In the present formalism, it is natural to analyze this as an f2 with the features [T] (time-related) and [D] (directed) and f1's sharing the feature [DST].

3.4.5 The feature [DIM] as interface to spatial understanding

As mentioned, the feature DIM and its sub-features are closely related to spatial understanding. In this section, we will discuss what this close relation means for the system.

The network system is an open one, and the micro-modules we have discussed so far are not the only ones there are. They are just those modules that are needed for situation structure and that we have some kind of theory about. Still, they are just a small part of the wole micro-modular network. One – or probably many more than one – micro modules are needed for the spatial understanding (shapes, dimensions, orientations, etc.)

The spatial information must be able to interact with the situation structure and language. One important place in the network where this interaction can take place is zone 1, and especially the thematic feature DIM. The other thematic features are not as limited to the spatial concepts as DIM. The feature [D] and its subfeatures are needed for both concrete and abstract directions, and the feature

[B] is needed for different kinds of processes that have a closure or completion despite of the semantic field.

We will discuss semantic fields in Chapter 4 but at this point we must make a connection between the semantic field and the feature [DIM]. As [DIM] and its subfeatures can only be present in spatial concepts, we can formulate the following priciple:

[DIM] as a spatial feature
Feature [DIM] is allowed by a spatial semantic field.

Thus, if the semantic field is spatial, then [DIM] is allowed. Otherwise not.

3.4.6 Summary of zones, features, and thematic roles

A summary of the zones, features, and thematic roles is given in Table 3. The notation {X, Y, Z} stands for 'choose one of the elements X, Y or Z.'

There are two features that are not hierarchically organized with the other features, i.e. features [M] and [DST].

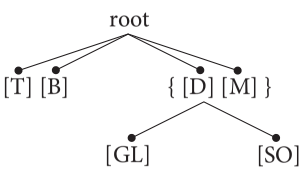
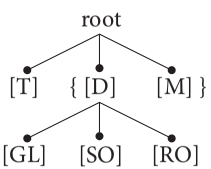
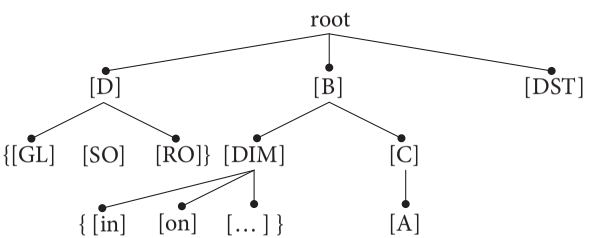
3.4.7 Comparison of the feature hierarchies to the formalism in Jackendoff (1990)

Many readers may be familiar with Jackendoff's (1972, 1976, 1983, 1990) treatment of conceptual structure as well as the formalism he has developed. In order to make the theory easier to understand, in this section, I compare the feature analysis to Jackendoff's functions.

The feature combinations that correspond to the semantic functions introduced by Jackendoff (1990) are given in the following tables. The tables are meant to be a "dictionary," a guide to understanding the features and the relationship between the Tiernet-system and the system in Jackendoff (1990). In the first column is the function that has been used by Jackendoff and that we have introduced earlier in this chapter. The feature combination can be found in the second column, and in the third column, there is an informal description of the meaning of the formal presentation. The third column is there just to make it easier for the reader to grasp and remember what – approximately – the formalisms stand for.

The zone 3 functions are based on a subset of the same features as the zone 1 and zone 2 features. It is worth noticing that, following Nikanne (1990), the Jackendovian functions CS+ and CS– are analyzed as a combination of two functions. Inchoation is understood as a change to or toward a state of affairs. Therefore inchoation is a part of causation: causation (CS+, CS–) is a combination of inchoation (change toward a state of affairs) and a relation between the inchoation and

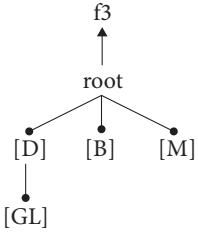
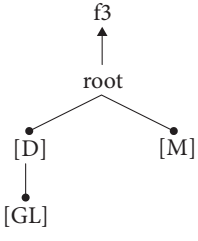
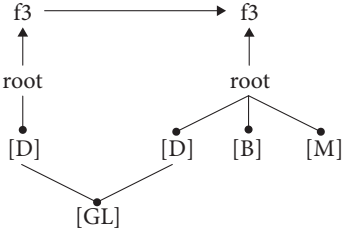
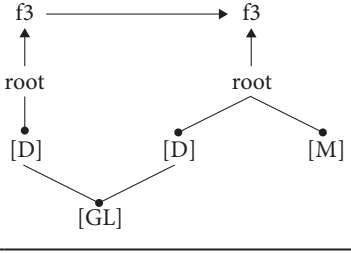
Table 3.3 Summary of the zones, features, and thematic roles

	Situation zones		**Location zone**
	Zone 3, causative zone	**Zone 2, figure zone**	**Zone 1, location zone**
f-chain element	f3	f2	f1
Features and their hierarchy			
Thematic role	Causer	Theme	Landmark (i.e. goal, source, route, location)
Complex category governed by f	Situation	Situation	Place or Path

the causer. The boundedness in zone 3 indicates the successfulness of the inchoation, and consequently, also the successfulness of the causation.

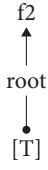
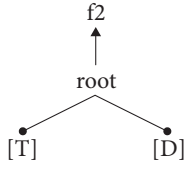
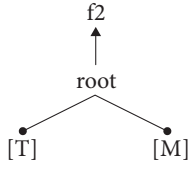
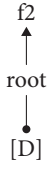
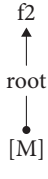
The causative and inchoative semantic functions of Jackendoff's (1990) system are compared in Table 4. In the present system, the functions are analyzed as combinations of features and f-chain functions, not as primitive units.

Table 3.4 Comparison between the Tiernet system zone 3 and the causative and inchoative functions in Jackendoff (1990)

Zone 3		
Jackendoff 1990	**Feature combination**	**Informal description**
INCH+		'Successful inchoation'
INCH−		'Situation is not actual, but it comes closer to taking place'
CS+		'Successful causation'
CS−		'Unsuccessful causation, trying'

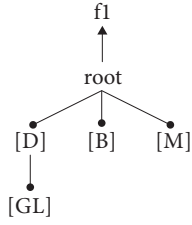
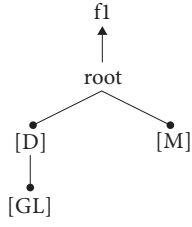
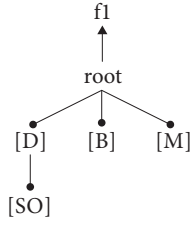
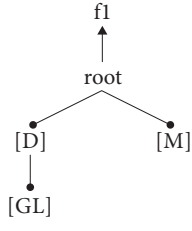
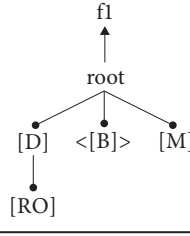
The zone 2 features are based on three features: monadic [M], directed [D], and time-related [T]. Therefore, their combination possibilities are limited. And because the feature directed [D] must be shared with a zone 1 function, the combination [M] and [D] is not possible. All the remaining possiblities (no feature, only [M], only [T], only [D], [T]+[D] and [T]+[M]) are in use. The Jackendovian function EXT is analyzed as a combination of an f2 and an f1 carrying feature distributed [DST].

Table 3.5 Comparison between the Tiernet system zone 2 and the non-causative Situation functions in Jackendoff (1990)

Zone 2		
Jackendoff 1990	**Feature combination**	**Informal description**
BE	f2	
STAY		Something is being somewhere or something. State of affairs that is time related and subject to a potential change.
GO		Something is somewhere or something. The state of affairs is not time-related: potential change is not relevant.
MOVE		Event that is not leading to a significant change in circumstances of the theme argument's position, appearance or other status. Therefore, it is not directed.
ORIENT		The theme argument is in such a position that its intrinsic direction (see e.g. van der Zee 1996) is in a particular relation with the Path selected by the f2 that also selects the theme argument. Therefore the relation is directed but does not involve time.
CONF		A state of affairs that deals with the theme argument's appearance or other status. Not directed nor related to time.

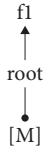
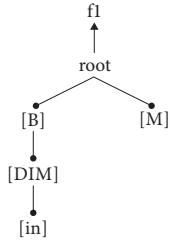
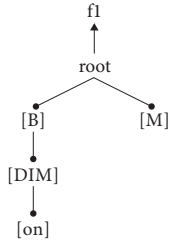
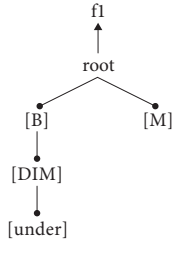
The features associated with the functions in zone 1 are as shown in Table 3.6.

Table 3.6 Comparison between the Tiernet system path functions and the path functions in Jackendoff (1990)

Zone 1: Path functions		
Jackendoff 1990	**Feature combination**	**Informal verbal description and examples**
TO		The end point of the path reaches the goal. *The train goes **(all the way) to** Helsinki*
TOWARD		The end point of the path does not necessarily extend to the goal. *The train goes **towards** Helsinki (but not necessarily all the way)*
FROM		The path starts from the source. *The train comes **from** Helsinki.*
AWAY-FROM		The path does not necessarily start from the source. *The train comes **from the direction of** Helsinki.*
VIA		The path goes via (through, across) the route. *The train goes **via** Helsinki.*

The feature systems of Place-functions are based on boundedness and the sub-features of the feature three-dimensional [DIM]. These sub-features are closely related to the spatial representation. I must underline that the subfeatures of [DIM] should be analyzed in more detail. The features used in the following table and the analyses of this book are based on English prepositions. This solution is chosen as it is intuitively easy to understand. A detailed analysis of these features is an important field of research in future, as it offers a link between the linguistic and spatial understanding.

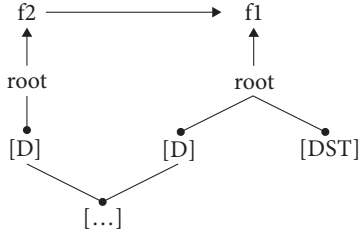
Table 3.7 Comparison between the Tiernet system place functions and the place functions in Jackendoff (1990)

Zone 1: Place functions		
Jackendoff 1990	**Feature combination**	**Informal verbal description and examples**
AT		The place is unspecified but it is related to the location landmark. *The party was **at** the old mansion.*
IN		The place is inside the borders of the location landmark. *The dog is **in(side)** the doghouse.* *The dog is **in** the yard.*
ON		The place is on the surface of the landmark. If the landmark is a 3-dimensional object, the place is on the upper side. *The stone is **on** the box* ('box' is a 3-dimensional object). *The picture is **on** the wall* ('wall' is a 2-dimensional object)
UNDER		The place is below or underneath the landmark. *The stone is **under** the box.* *The fresco is **under** the wallpaper.*
…	…	

The feature analysis and the previous function analysis are not formally the same thing in a new package. In the feature based analysis, the system provides more possibilities for distinguishing different kinds of semantic differences.

Jackendoff's (1990) function EXT is not mentioned in Table 3.7. This is not an accident. EXT could be expressed in the feature analysis as shown in Table 3.8.

Table 3.8 Comparison between the function EXT in Jackendoff (1990) and the Tiernet system

EXT		The theme argument is distributed along the Path selected by the f2 that also selects the theme argument. *The red carpet **reaches** from the Kodak Theatre to the intersection of Hollywood Boulevard and Highland Avenue.*

It is easy to see that in this analysis EXT differs from the other functions as it is the only one that includes the feature DST.

3.5 Argument level

Many theories of language operate with so called thematic arguments, perhaps best known as semantic roles. These roles are needed in order to label the roles that the different participants of event structure have in the event. Typically thematic arguments are called by names such as agent, patient, causer, theme, goal, source, etc. In the present approach, the thematic arguments are seen from a different perspective. The arguments are in a separate tier that is dependent on the f-chain.

There is one primitive in the argument level, called **Arg**. The argument level is dependent on the f-chain according to the following principles:

Argument level selection rules
General principle A: *f must select Arg.*

- Specific principle A.1: *f [M] does not need to select Arg.*
- Specific principle A.1.1: *f2 must select Arg.*General principle B.: *f may select max 1 Arg.*

There are two general principles, A and B. A has an exception A.1 which in turn has an exception A.1.1. The exceptions always overrule the general principles. One

could choose to write these principles in other ways and come to the same outcome. I have chosen this formulation as it expresses the strong status of f2 in the f-chain. The main point is, however, that the argument level is selected by the f-chain and that the selection is constrained by principles.

In the following section, we will see that the argument level is linked to the action tier so that the action tier functions select arguments from the argument level. However, the argument level is not dependent on the action tier in the same way as it is on the f-chain: we can actually even say that the action tier needs the argument level to have something to get linked to.

3.6 Action tier

3.6.1 Action tier formation

Many theories of argument structure use participant roles **actor** and **undergoer** (often called by other terms, such as "agent" and "patient"). The actor is an active participant controlling the situation in one way or another. The undergoer is a passive participant at whom the effects of the situation are directed. If both actor and undergoer are participants in the same situation, the actor dominates the undergoer. – This can be seen as a consequence of the actor controlling the situation and the effects of the situation being directed at the Undergoer. For instance in the sentence *John burned the house down* 'John' is actor as the causer of the burning down of the house. 'The house' is undergoer: it is the participant that is affected in the situation. In the sentence *John jumped down* John is an actor as jumping is controlled activity. On the other hand, in the sentence *John fell down* John is an undergoer because falling down is not a controlled way of coming down.

The roles actor and undergoer have been tested in English by the verbs *do* and *happen* (Jackendoff 1983) using the following contexts:

What X does is S
What X does to Y is S
What happens to Y is S

If we replace X with an argument of the tested sentence (S), and the outcome is intuitively acceptable, then X is an actor. The undergoer can be tested by replacing Y with an argument of S, *mutatis mutandis*. For instance,

(19) a. *What the man does is that he is dancing.*
→ ok > 'The man' is an actor.

b. *What the man does is that he is suffering.*
→ ? > 'The man' is not an actor.

c. *What happens to the man is that he is suffering.*
→ ok > 'The man' is an undergoer.

d. *What happens to the man is that he is dancing.*
→ ? > 'The man' is not an undergoer.

e. *What the man did to the house was that he burned it down.*
→ ok > 'The man' is actor and 'the house' is undergoer.

The problem with these tests is that the verbs *do* and *happen* used in the test are not semantically very simple or straightforward. The sentences (20b) and (20d) are not as impossible as one would hope. It is not difficult to think of contexts in which the verb *do* could be used in such a way that it is ok to say (20b) and the verb *happen* in a way that (20d) is possible. The same thing is true with the Finnish verbs *tehdä* 'do' and *tapahtua* 'happen' which are used in similar tests e.g. by Nikanne (1995). Still, the verb *do* has a tendency to have an active particpant as its subject argument and *happen* a passive participant as the object of its complement *to*-phrase. Therefore the tests have some intuitive value even though they are far from being watertight.

In conceptual semantics, the action tier has been treated as a separate tier since Jackendoff's (1972) observation against Fillmore's (1968) case filter that the roles of actor and undergoer are not dependent on the roles of causer, theme, goal, etc. – In order to avoid unnecessary confusion, I use the terms **actor**, **undergoer**, **causer**, etc. constantly in this book. In the original literature, the terminology is often slightly different.

3.6.2 Functions AC and UN

The values +/−/0 are suggested by Jackendoff (1987, 1990) as values of the function AFF, which is a function that has two potential arguments – actor and undergoer – but neither of these arguments is obligatory. The form of the function is thus as follows (the brackets < > indicate optionality and the parentheses indicate the scope of the function):

AFF (<Actor>, <Undergoer>)
The role actor has two properties:

1. The actor is the active particpant in the event. E.g. *The man* [actor] *is dancing.*
2. If the same event has both actor and undergoer, the actor dominates (controls, manipulates) the undergoer. E.g. *John is driving a car*, or *John* [actor] *is walking the dog* [undergoer].

The undergoer also has two properties:

1. The undergoer is the passive participant in the event. E.g. *The empty boat* [undergoer] *floated to the shore*, or *The child* [undergoer] *fell asleep.*

2. If the same event has both actor and undergoer, the undergoer is dominated by the actor.

In other words: activeness and passiveness are always a part of the actor and undergoer, respectively. The actor is understood to dominate the undergoer when both actor and undergoer are present in the same event.

If the undergoer is beneficiary (a participant who is benefitting from the situation, i.e. the effects of the situation are positive), the value of AFF is AFF^{+}, and if it is a patient (a participant who is suffering from the situation, i.e. the effects of the situation are negative), the value is AFF^{-}. A neutral undergoer is AFF^{0}.

Nikanne (1995) discusses the properties of the action tier and the linking between the action tier and the thematic structure. According to that model, there are two functions in the action tier, both of which select one argument. The argument of the function AC is the Actor and the argument of the funcion UN is the undergoer.

Action tier primitives, part 1
The action tier has two primitives, AC and UN, both of which are monadic functions that select their arguments among the arguments on the argument level. The argument selected by AC is an active participant in the event and the argument selected by UN is a passive participant in the event.

The functions AC and UN may form a unit, **act-chain**. The act-chain formation is very simple:

Act-chain formation
b. *An act-chain consists of one or more act-functions.*
c. *The same act-function (AC or UN) may occur in the act-chain only once.*

According to these principles, the act-chain may consists of the following combinations of functions:

Possible act-chains
AC
UN
AC and UN

The combination AC and UN is marked AC – UN in figures in order to indicate that they belong to the same act-chain. However, AC does not select UN or vice versa. In principle they are independent of each other. Their mutual relation is a consequence of their links to the arguments on the argument level which, in turn are selected by the f-chain: if both AC and UN are present in the same act-chain, then AC selects the argument that is the actor of the same event in which the UN is an undergoer.

Now we can add the information discussed earlier that the actor dominates the undergoer if they are participants in the same event:

Action tier primitives, part 2
If the act-chain consists of both AC and UN, the argument selected by AC dominates the argument selected by UN.

The AC and UN do not select each other. They just belong to the same unit. This does not mean, however, that they are equal. AC and UN form a hierarchy when it comes to selecting arguments.

According to Nikanne (1995), the action tier functions select their arguments out of those functions that the f-chain has selected on the argument level. The selection is not random. According to Nikanne (1995: 10, 1998) the following principles govern action tier formation:

Action tier formation principles
a. *No actors in zone 1 (i.e. no actors are Locations, Goals, Sources or Routes)*
b. *The same argument cannot be selected by more than one AC*
c. *The actor must cs-command the undergoer selected by the same act chain.*

The term *cs-command* (Jackendoff 1992b) can be defined by the present terminology as follows:

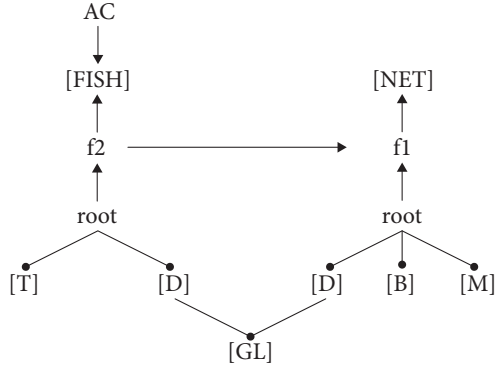
Cs-command
Argument *X cs-commands argument Y iff (a) and (b):*

a. *X and Y are selected by the same f-chain.*
b. *The function that has selected X has a scope over the function that has selected Y.*

In a certain sense, action tier formation principle c puts AC higher in the hierarchy than UN.

For instance, the sentence *The fish swam into the net* can be analyzed as in (20). I use the bracket notation for the thematic features, as the focus is on the relation between the argument level and the act-chain.

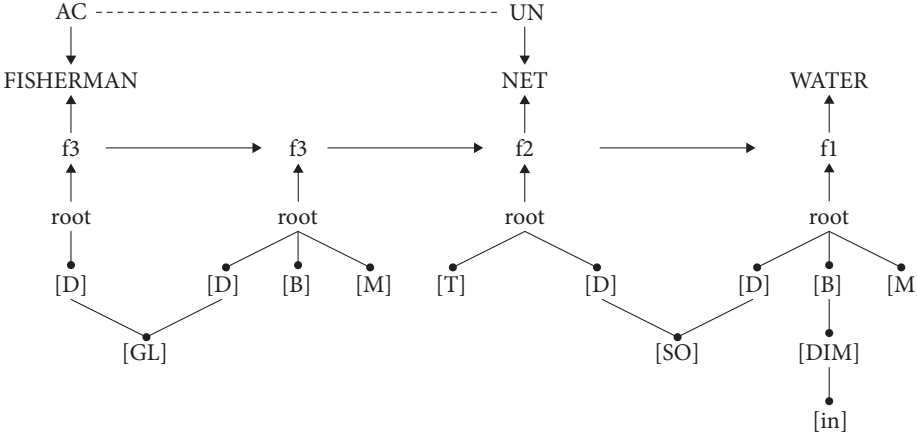
(20)



In this sentence, the *fish* is actor and it is selected by AC. The other argument on the argument level is not selected by any act-chain function.

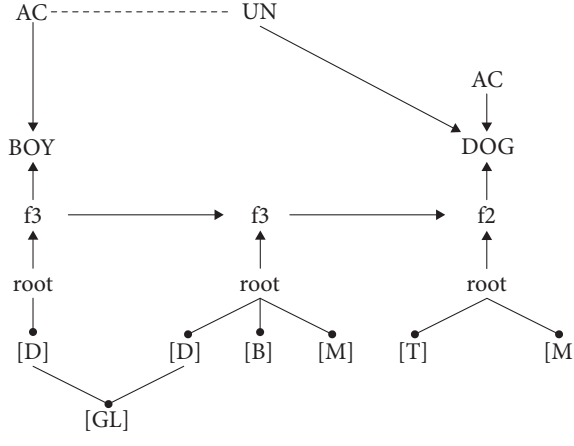
The sentence *The fisherman pulled the net out of the water* can be analyzed as follows. The line between AC and UN indicates only that these AC and UN belong to the same act-chain.

(21)



The sentence *The boy walks the dog* can analyzed as follows:

(22)



The other AC belongs to another act-chain (alone). The Action chain formation rule a forbids two ACs to select the same function, but the AC can select a function already selected by UN (and vice versa). The configuration above is typical for deverbal causative verbs when the root verb has a subject argument that is an actor. This is the case with the causative verb *walk* 'make walk' in which the root verb is the intransitive verb *walk*, and the causative derivation is done, typically for the English language, without an affix. In Finnish, the causative verbs

are typically marked with the ending tta/ttä: for instance, the stem of the non-causative verb for 'walk' is *kävele-* and the stem of the causative verb for 'walk' is *kävelyttä-* (walk-CAUS):

(23) *Poika kävelyttää koiraa*
boy walk-CAUS dog-PAR
'The boy is walking the dog.'

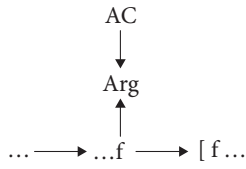
The analysis for (23) is the same as for the English sentence *The boy is walking the dog* given in (22).

3.6.3 A word on the action tier and linking

One of the motivations for assuming the roles actor and undergoer has traditionally been the linking to syntax: actor and undergoer (or in some terminologies "agent" and "patient") have been linked to the syntactic arguments subject and object. However, Nikanne (1995, 1997a) shows that they are not needed for argument linking in Finnish. The system that Nikanne suggests is that the linking between the argument level and the syntactic arguments subject and object is done in two stages: (i) determine the direct arguments DA1 (logical subject, subject argument) and DA2 (logical object, object argument) in the lexicon, and (ii) link DA1 and DA2 to syntax. We will return to this system in Chapter 6 in which we discuss linking. (A very similar system has later been suggested by Culicover and Jackendoff 2005.) At this point it is enough to point out that the direct arguments are determined by the status of the f-chain function in the lexical f-chain (i.e. the fragment of the f-chain that is a part of the lexical entry of the word): DA1 and DA2 form a hierarchy in which DA1 is higher than DA2. This means that DA1 has the right to pick up the most desired argument on the argument level. The arguments on the argument level are the more desired the more "left" they are. I.e. the hierarchy of arguments is based on the scope of the f-chain function that has selected the argument: the larger the scope is, the more desired is its argument. As the leftmost argument will be the linked to DA1, the fact that it is also the most desired argument for AC is superfluous.

The action tier is useful for the language system in other ways. Nikanne (1998) shows that there is a correlation between the actor and the left boundary of the lexical f-chain. The function AC always picks the leftmost argument on the lexical argument level of a verb in Finnish. In other words, if an argument is selected by AC, the f-chain function that has selected the argument is the leftmost function on the lexical f-chain. The configuration in ( ) shows the left boundary of the lexical f-chain of a verb if the AC is a part of the conceptual structure. (The lexical f-chain fragment is marked with the bracket [.)

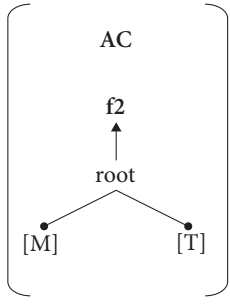
(24)



One must remember that the parts of the configuration in (24) are not equal. The f-chain is the core of this piece of the network. The argument level is selected by the f-chain functions and the act-chain functions must select their arguments from the argument level.

Note that there may be another AC within the lexical item of a verb. In that case, there is also another argument structure within the boundaries. This, in turn means, that the verb is derived from another verb. This is the case for instance with the verb kävelyttää (walk-CAUS) '(make) walk.' The lexical f-chain (with thematic features) and the act-chain of the stem *kävellä* 'walk (non-causative)' is given in (25):

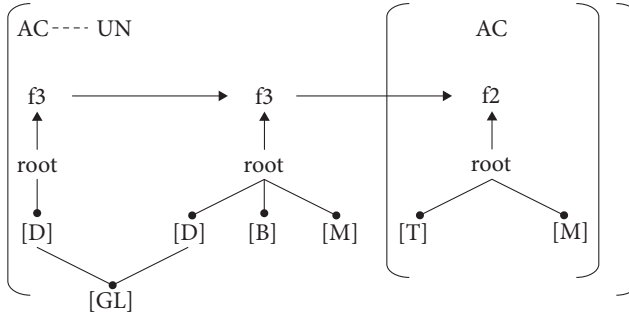
(25)



The function f2 needs to select an argument for itself, and it will then be selected by the AC as it is the only (and thus the "leftmost") argument of the lexical argument structure.

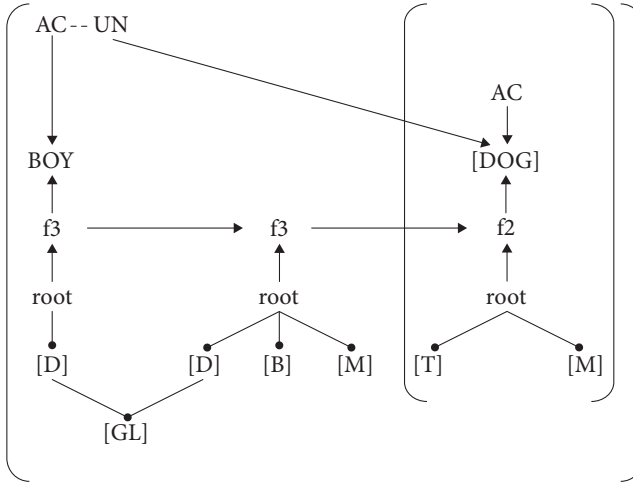
The lexical f-chain and act-chain of the deverbal verb *kävelyttää* '(make) walk' is in (26):

(26)



According to the argument level formation principles (see Chapter 3) the non-monadic f3 must select an argument for itself, just like the monadic f2. The argument of f3 is the leftmost argument of the f-chain and will be selected by the function AC. The function UN will then select the only other argument on the argument level, i.e. the argument of the f2. We get the configuration shown in (26), which I repeat here (27) marked with brackets that indicate the boundaries of the lexical items:

(27) *Poika kävelyttää koiraa*
boy walk-CAUS dog-PAR
'The boy is walking the dog.'



Thus, even though the action tier is not used for argument linking, it is used for language production as it helps the speaker with access to the lexicon by showing the left boundary of the lexical f-chain of the words that can be used for linking the meaning (i.e. the non-linguistic part of the network) to the linguistic structures. Even though the action tier is needed to indicate the activeness and the dominance relations among the particpants of the event structure, it has a similar function to many systems in phonology such as the main stress (no more than one syllable with a main stress per word) and phonotactic restrictions within the word. They tell us where the lexical boundaries are and make it easier to access the lexicon (see further discussion in Nikanne 1998).

3.6.4 Undergoer as beneficiary or malefacive: Linguistic meaning and contextual meaning

The Undergoer may have an extra value + (plus) or − (minus). The argument of UN+ is a beneficiary, and the argument of UN− is patient. It is the undergoer that is

affected in the event, and therefore it is natural that the positive or negative value is marked on the function that selects the undergoer. According to this solution, the actor is always neutral when it comes to positive or negative value of domination.

I would like to emphasize that the values +/– of UN are marked in the lexicon only if the undergoer argument of the lexical item is marked as a beneficiary or patient in all contexts. E.g. the verbs *help, benefit, enjoy, be pleased*, etc. mark their undergoer as beneficiary and the verbs *torture, bully, harm*; *suffer, be annoyed*, etc. mark their undergoer as patient. On the other hand, such verbs as *kiss, relax, die, vomit*, etc. do not marking their undergoer argument lexically as beneficiary or patient. Whether the undergoer is suffering or benefitting from the situation is context dependent, even if we have the tendency not to like vomiting and a tendency to think of dying as something avoidable.

We must, in other words, make a distinction between the semantic interpretations that are marked in the language system, for instance the lexical items or constructions, and the interpretations that are added when the language is used in actual situations. The interpretation that follows from applying the linguistic system only gives a start for understanding the message conveyed by the linguistic expression. The interpretation that follows from the linguistic system is something that cannot be denied in any context whereas the interpretation that depends on the situation can be denied by changing the interpretation of the context. For instance, consider the undergoer 'girl' in sentence (28):

(28) *The boy kissed the girl.*

Girl is a neutral undergoer when it comes to the linguistic system and the argument corresponding to the word *girl* is selected by a neutral function UN. If we know (or believe) that the girl wants to be kissed by the boy, a + can be added to the UN in the by the interpreter. If we believe that the girl does not want to be kissed by the boy, a – may be added to the UN. If we do not know the girl's attitude towards the kiss or if we believe that the girl does not either like or dislike being kissed by the boy, no + nor – is added. – If the UN of the lexical act-chain is lexically marked as UN– (e.g. the verb *torture*) or UN+ (e.g. the verb *enjoy*), the interpretation is context independent. One cannot read the sentence *X tortures Y* in a way that Y is not suffering from the situation. Neither can the sentence *Jane enjoyed the party* mean that Jane suffered from being at the party.

The theoretical tools and terms needed to describe this situation are **linguistic meaning** and **contextual meaning**:

Linguistic meaning
Meaning that follows from the semantic features marked in the lexicon and constructions plus application of the principles of combination and linking.

Contextual meaning
Meaning that takes into account the information provided by the context, i.e. the previous text, prior knowledge of speaker and hearer, the situation in which the language is used, the environment including all physical, social, and mental features of the situation in which the language is used.

The linguistic meaning is a part of the contextual meaning, but more features can be added to the linguistic meaning in the context. The contextual meaning should be compatible with the context in the sense that it makes the message coherent and relevant (cf. the discussion on the interpretation of idioms in language use by Petrova 2011). The possibility of complementing the linguistic meaning to make it compatible with the context makes language flexible as a tool for communication. This, in turn, makes it possible for language to be a useful tool for communication when the environment changes: we do not need to change the language system or radically change the meanings of the lexicon as the linguistic meaning only serves as a starting point for the contextual meaning.

In some schools of thought, it is assumed that the meaning is negotiated. For instance Esa Itkonen (e.g. 1988) has criticized the French philosophers Derrida, Levi-Strauss, Lacan, and Foucault for their assumption that linguistic expressions do not have a basic meaning. Itkonen's criticism is well justified: if the meanings of words were completely unspecified, there would be no way to tell whether the sentence is true or false, nonsense or meaningful – and how could language users even start to negotiate the meaning if some of the meaning was not fixed to start with? Assuming that the linguistic meaning (fixed) can be complemented in order to make it compatible with the context is the Tiernet counterpart to negotiation. It is not, however, negotiation in any traditional sense of the word (see also Itkonen 1988). It should be understood to be an application of Grice's (1975) maxim of relevance (see also e.g. Sperber and Wilson 1986, Larjavaara 2007).

3.7 Summary

In this chapter, we have discussed the core of the internal structure of the conceptual category Situation. The micro-modules involved are f-chain, argument level, and thematic features. These modules form a tight cluster as the argument level is directly dependent on the f-chain and the thematic features are organized as constituents with the f-chain functions.

One could, however, claim that these modules should be seen as one single module. I have kept these three micro-modules apart for the following three reasons:

1. The f-chain well-formedness principle "f-chain schema" is independent of the argument level and the thematic functions.
2. The argument level formation principles do not refer to the thematic features.
3. The thematic features constituents are independent of the argument level.

Therefore, because of the methodological guidelines *analytical organization* and *simple formation of modules*, I have analyzed them as separate modules.

However, the modules discussed in this chapter form a tight cluster with the f-chain as its core. The linking between modules should, thus, be analyzed carefully and it is much more than just mapping one element onto another element. The links may be based on principles, dependency, and even constituency. This property of the Tiernet-system emphasizes the methodological guideline *importance of linking*.

In addition, we have discussed the action tier. The action tier has its own primitives and principles of combination but it must be linked to the thematic tier cluster via the argument level. Therefore, it is an autonomous micro-module. However, the action tier needs an argument level to be linked to. The argument level, in turn is completely dependent on the f-chain. The thematic features must be linked to the f-chain, as well. Even though the thematic features have their own primitives and organization, the features are sensitive to the zones of the f-chain functions.

The micro-modules are, thus, not equal parts of the network. The autonomy of a micro-module means that the micro-representations are based on primitives and rules of combination that are only found in that module. It does **not** mean independence in the sense that the representation should not be linked to other modules. The f-chain is the central node of the part of the micro-modular network that deals with the meaning of situations.

CHAPTER 4

Temporal structure of situations

The temporal structure deals with the internal time structure of the situation (cf. Vendler 1957). The temporal structure is a set of several tiers, and it is linked to the thematic structure via the thematic features.

4.1 Introduction

The temporal tier is the micro-representation that covers the internal time structure of the event that it is associated with. The temporal tier in conceptual semantics was first introduced by Jackendoff (1990). According to Jackendoff, the temporal tier consists of two primitives, P and R:

P = point of time
R = region of time

In the combination principle system suggested by Nikanne (1990), these primitives may be combined as follows:

Table 4.1 Temporal tier variants and linguistic examples in English

Temporal tier	Description	Example
P	A momentany event	*The cane snapped in two;* *Wilfred Bungei crossed the finishing line at 1.44,63.*
R	A process without a starting point, end point, or particular middle point.	*The man was laughing (for hours).*
PR	An event with a starting point	*The boy left home.*
RP	An event with an end point	*The boy walked home.*
PRP	An event with a starting and end point	*The boy walked from home to the next town.*
RPR	A process with a particular middle point	*The bird flew through the open window.*
PRPR	A process with a starting point and a particular middle point.	*The bird flew from its nest through the open window.*
RPRP	An event with a particular middle point and an end point.	*The bird flew through the open window into the kitchen.*
PRPRP	An event with a starting point, particular middle point and an end point	*The bird flew from its nest into the kitchen through the open window.*

States do not have a temporal tier "of their own". Consider for instance:

(1) a. *John is Mary's son.*
b. *The road goes to Rome.*
c. *Barrack Obama is the president of the United States.*
d. *The sign points to the left.*

These sentences express relations between entities, and they do not have an intrinsic time sturcture. (1a) is simply a statement of the kinship relation between two persons. It would require a rather extraordinary context in which for instance the following temporal adverbials would be natural:

(2) *#John is Mary's son at 6 o'clock*
#John is Mary's son on Wednesday.
#John is Mary's son for a week.
#John is Mary's son 2009–2013.

The same goes for (3):

(3) *#The road goes to Rome at 6 o'clock*
#The road goes to Rome on Wednesday.
#The road goes to Rome for a week.
#The road goes to Rome 2009–2013.

The strangeness of (2) and (3) is not based on grammar but rather on our normal world view. In some very special contexts, one could find the sentences in (2) acceptable: assume, for instance, that it is not clear whose son John is, and the (not so wise) king orders Mary and someone else take turns as John's mothers. The sentences in (3) may be acceptable in a very special context as well. For instance, one could imagine that in the future the roads can easily be moved to places where they are needed. In that kind of world, it would not be strange to use the sentences in (3). The same time adverbials can be added to sentences (1c) and (1d), and it is easier to find a suitable context. This is because we know that signs can be movable and presidency is a temporary thing in the United States.

4.2 Temporal structure as a network of tiers

When we look at the temporal tier closely, we can see that the notation in which there are two R's (RPR, RPRP, PRPR, PRPRP) is actually misleading. There is only one process going on, only one region of time, and the points of time belong to that region of time. Therefore, Nikanne (1990) suggests that the temporal tier has two primitives:

Region of time ("the situation internal time line"), marked as a horizontal line -----
Point of time, marked as a vertical line |

The region of time (R) is a time line, and the direction of time is from left to right. When the primitives combine, the points of time (P) are located on the region of time. The region of time (horizontal line) continues through a point of time (vertical line) that is set in the middle of it but ends when the point of time is set at the ends of the line.

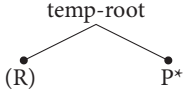
process without end, start or middle point ("R"): ---
process with an end ("RP"): ---|
process with a start ("PR"): |---
process with a middle point ("RPR"): ---|---
process with an end and a start ("PRPRP"): |---|---|
process with an end and a middle point ("RPRP"): ---|---|
process with a start and a middle point ("PRPR"): |---|---

Michaela Pörn (2004) and Oksana Petrova (2011) develops this analysis into a more analytical model. According to Petrova's model, the temporal tier is divided into two "sub-tiers" which we can call the **RP-tier** and the **order tier**. With minor changes in Petrova's terminology, we can define the RP-tier as follows:

The RP-tier formation
Primitives: R, P, Temp-root

Combination principles:

a. The primitives of the RP-tier are organized as a constituent structure: The "maximal projection" of the RP tier is the "temp-root" node, which represents the whole temporal tier. The RP-tier must include one R and none, one, or more P's. (The linear order is not relevant.) I.e.:



b. If R is not present, no more than one P is allowed in the RP- tier.
c. Temp-roots may share the same P but they cannot share the same R.

Petrova follows the guideline analytical organization and sets the order of the points of time in a separate tier with three primitives, features [s] 'start,' [i] 'intermediate,' and [f] 'finite.' The features are a part of Michaela Pörn's (2004) analysis of the time structure of complex sentences. The features [s], [i], and [f] are the primitives of the order tier, which we can define as follows:

Order tier
Primitives: [s], [i], [f]
Properties of the primitives:
[s]: A P selected by [s] defines the starting point of the region of time defined by the R under the same temp-root.
[i]: A P selected by [i] defines a particular intermediate point in the region of time defined by the R under the same temp-root.
[f]: A P selected by [f] defines the end point of the region of time defined by the R under the same temp-root.

Combination principles: Random.
The order tier is restricted by their properties:

a. The order tier features may select a P of the RP-tier, if the R is present.
b. The primitives may not select more than one P each.
c. More than one primitive may select the same P.

Even though the RP-tier and the order tier are separate tiers, they are, however, are very closely connected to each other. Compared to the analysis in Nikanne (1990) or Jackendoff (1990), this one superior as it clearly shows the relationships between the parts of the temporal structure without any interpretation of the direction of the time line that represents R. The order tier primitives are allowed by thematic features [SO], [RO], and [GL]. We will discuss the allowance in the following section.

4.3 Temporal tier and thematic features

4.3.1 States

As pointed out earlier, states are "atemporal situations." For instance, the sentences in (4) do not express any process, only a relation between the particpants in the situation:

(4) a. *Squirrels are mammals.*
b. *Helsinki is the capital of Finland.*
c. *Urho Kekkonen was the president of Finland.*
d. *The railroad goes from Helsinki to Moscow.*

The situations do not take place in time. In the present formalism, this means that they are not linked to the feature [T] and therefore, not linked to the R in their temporal structure. Being atemporal does not mean that the states would not have a temporal structure. They just do not have "an internal time line," which, in our formalism is represented by R. I will stipulate the following rule:

P as the default RP-tier

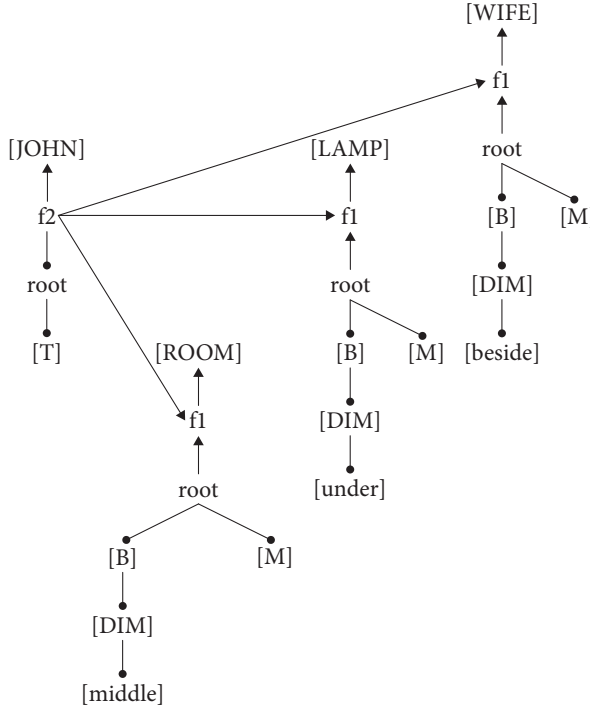
If the thematic field tier does not include the feature [T], then the RP-tier consists of a temp-root that has P as its daughter.

Intuitively, this can be understood in the following way: states expresses relations between particpants without referring to time, and as a point of time does not have any extension on the time line, it is natural that an "atemporal" situation can be linked to a point of time.

Consider the following sentences in which the theme argument is placed in different locations at the same time:

(5) a. *John stood next to his wife under a beautiful lamp in the middle of the room.*
b. *John was next to his wife under a beautiful lamp in the middle of the room.*

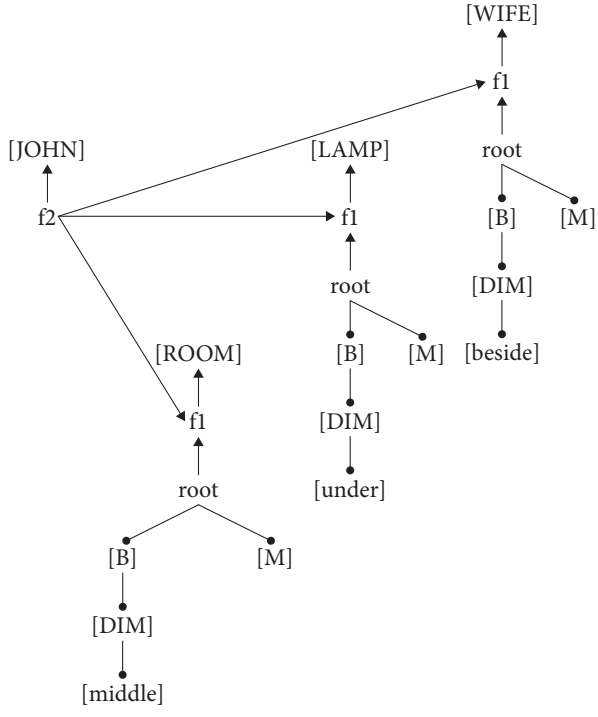
As sentence (5) does not express a change, i.e. it does not have both thematic features [T] and [D], we must assume that we are talking about one single situation with one single temp-root. Sentence (5a) expresses a time related process, 'standing,' which can be described as follows:



The thematic feature allowed R. However, as no subfeatures of [D] are present, no order tier features are licensed. Then, since only the feature R is present, the RP-tier

is [temp-root [R]]. John is located at the same time next to his wife, under the lamp and in the middle of the room, and this takes place as long as the situation lasts.

Sentence (5b) expresses a state, and the only formal difference is that the f2 is not linked to the feature [T]. Then, no RP-elements are allowed by the thematic features, and the RP-tier consists of P, because it is the default value of the RP-tier.



The reason why states, too, need to have a temporal structure will become even clearer in the following sections in which we discuss relating the temporal structures of different situations together.

4.3.2 Events

Nikanne (1990) suggests that the thematic features are connected to the temporal tier of events. The thematic feature [T] allows a region of time. As the region of time is the time line of which the starting point, end point and the middle points can be set, the region of time is needed for allowance points of time in a situation with an internal time structure (i.e., which has the thematic feature [T]).

According to Nikanne (1990: 179), the temporal tier of an event (a time related situation) is dependent on the thematic features: thematic features allow the different parts of the temporal tier. The suggestion in Nikanne (1990) has been developed by Pörn (2004) and Petrova (2011).

It is quite easy to undestand that if the time line of a situation has an end point, it also has the feature [GL]. However, the feature [GL] alone is not enough. Compare the sentences in (6):

(6) a. *The bird flew towards the kitchen.*
b. *The bird flew into the kitchen.*

The sentence in (6a) does not express a situation with an end point: the bird approaches the end of the path but the sentence does not say that it reaches it. The sentence in (6b) on the other hand expresses a situation with an end point. The end point of the situation is the time when the bird arrives in the kitchen. In our terminology, this means that both the features [B] and [GL] are needed to allow an end point. The same goes mutatis mutandis with the starting point ([SO] and [B]) and the middle point ([RO] and [B]).

Oksana Petrova (2011) develops Nikanne's (1990) and Pörn's (2004) analyses and suggests that there are three features [s] ('start'), [i] ('intermediate') and f ('final') which can select one P each. Petova's suggestion works as deisred: we only need one R, and the P's will get their status via features [s], [i], and [f]. Petrova's allowance rules for the temporal tier are as follows (p. 123):

Allowance principles for the temporal structure of events

a. *If the situation is an event, thematic features allow elements of the temporal structure as follows:*
   – *[T] allows R*
   – *[B] allows P*
   – *[SO] allows [s]*
   – *[RO] allows [i]*
   – *[GL] allows [f]*
b. *Each thematic feature may allow only one element of the temporal structure.*

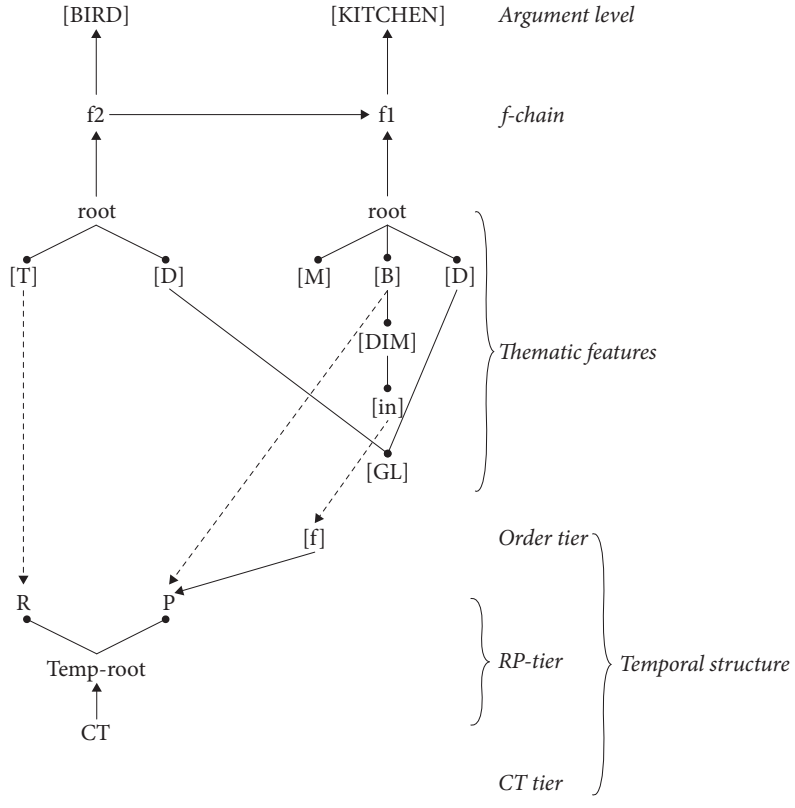
As pointed out earlier, the presence of R leads to restrictions in the rest of the structure.

Linking RP-tier to other tiers

a. *R must be allowed by at least one thematic feature [T].*
b. *When the R is present, each P must be allowed by a [B].*
c. *When the R is present P may be selected by order tier features [s], [i], or[f].*

As the R represents the internal "time line" of a situation and the P's are points on that time line, the R is the head of the RP-structure when it is present.

The analysis of the sentence *The bird flew into the kitchen* is as follows:



The dashed arrow indicates a link that is based allowance. The arrow points from "allower" (the element that is allowing the other element) to the "allowee" (the element that is allowed). In the analysis above, there are three kinds of links: selection (solid arrow), constituency (lines with a ball at the end), and allowance (dashed arrow). The CT-tier will be discussed in the section in which we see how the temporal structures of complex sentences can be combined.

4.3.3 Events and inferred states

Consider the following sentence:

(7) *John went home from his office via the local supermarket.*

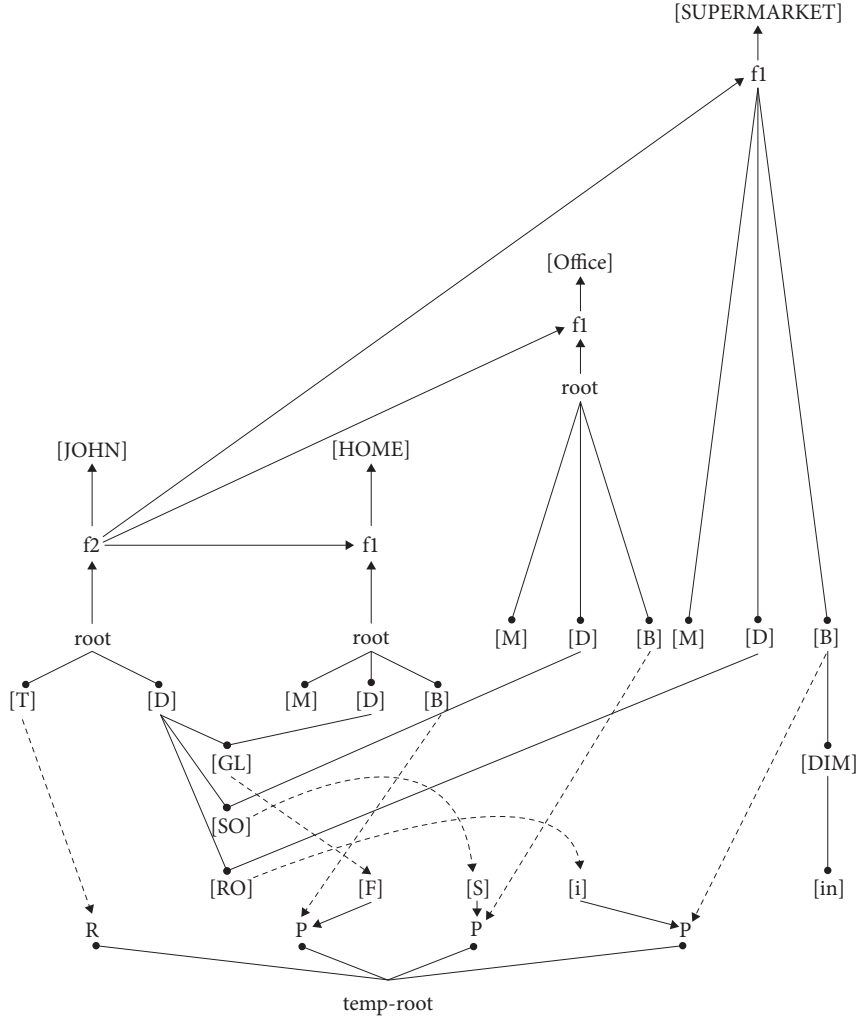
The sentence leads us to the following inferences pointed out by Jackendoff (1972, etc.): If sentence (7) is true, then

a. at the beginning of the event, John was in his office,
b. at the end of the event John was at home, and
c. at some point in the middle of the event, John was in the supermarket.

These inferences can easily be formalized by the present formalism. The inference rules are independent of the semantic field: they are inferences of change. The critical features are

- the features [T] and [D] that define a change (Nikanne 1990) and
- the subfeatures of [D], i.e. [GL], [SO], and [RO] as they place the inferred events in relation to the temporal structure of the process, and
- the feature [B] that indicates that the process had a definite start, was completed and went through the intermediate place or state.

John went home from his office via the local supermarket



Nikanne (1990) points out that the inference rules are related to the allowance of the RP-tier: 'going' is a process in time, and the lexical conceptual sturtcure of the verb go consists among other things of the function f2 linked to a feature set with the feature [T]. The [T] allows R in the RP-tier. The end point, intermediate point and the starting point of the event are allowed by the features of the lexical feature set of the words *home* ([B] and [GL]), *via* ([B] and [RO]) and *from* ([B] and [SO]). The analysis of sentence (7) is as follows:

The internal time line of the situation (i.e. R of the RP-tier) is allwed by the feature [T]. We only have P's in the RP-tier. In addition, when the change is taken away from the picture, the feature [D] and its subfeatures are also omitted. We have three states: 'John is in his office,' 'John is in the local supermarket,' and 'John is at home.' As the points of time associated with these events are located in different places on the internal time line of the original process, we know that they cannot be valid at the same time when it comes to inferring states on the basis of the process.

Of course, we can also make an inference even if the event is a stative one and not a change. If we have a stative event, for instance:

(8) *John stayed the whole evening in his room*

then we can infer that at any point of time during the duration of that event, John was in his room. The mechanism of this "inference" is the same as with the inference concerning changes: omitting [T] leaves R unallowed and the RP-tier element that is allowed is the default element P, which can be placed anywhere on the internal time line of the event.

The inference is not only a theoretical issue. It can also have lexico-grammatical consequences. Consider, for instance, the following sentence:

(9) *Mies tuli kotiin tunniksi*
Man came home-ILLATIVE hour-TRANSLATIVE
'The man came home and stayed there for an hour.'

We can make the inference that when the process 'The man goes home' is completed, 'The man is at home.' As Nikanne (1990) points out, in Finnish a set of temporal adjuncts (e.g. *tunti* 'hour') in the translative case (*tunniksi*) points to the situation that logically (according to the inference rules of the system) immediately follows the situation expressed by the matrix sentence. The sentence in (9) means that 'the man came home and, after getting there, stayed there for an hour.'

4.4 Complex temporal structures in a single situation: Causation

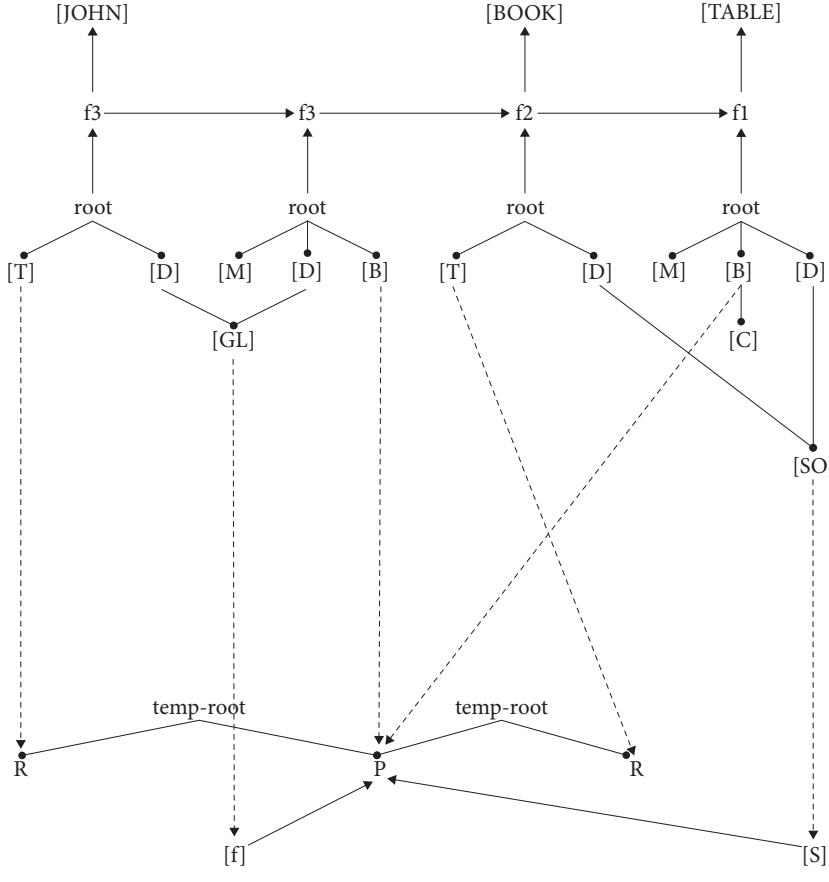
The temporal relations of causation and the caused event can be divided into **launching** and **entraining** (see Jackendoff 1983) on the basis of their temporal structure. Launching refers to a causative situation in which the causer just starts the process

but does not take any part in it after that. An example of launching is for instance *John nudged the book down from the table onto the floor*: John does something that causes the book to fall. However, John does not participate in the event after the very start. Entraining refers to a situation in which the causer takes part to the caused event as long as it lasts. For instance, the sentence John lifted the book from the table is an entrainment: John is participating the event as long as the book moves.

When analyzing launching, we need a different solution: as Petrova (2011: 124–125) poits out, the parts of the RP-tier can be shared by different temp-root nodes (Petrova uses another terminology, but the idea is the same). The following analysis of launching is in its essential parts the same as Petrova's (enriched with the parts of the network that are innovations after Petrova's theory). I will also leave out the CT-tier (see following section) from my analysis as it is not needed for licensing any parts of the structure and we still get the meaning that is intuitively correct.

Here is the analysis of the sentence *John nudged the book down from the table*.

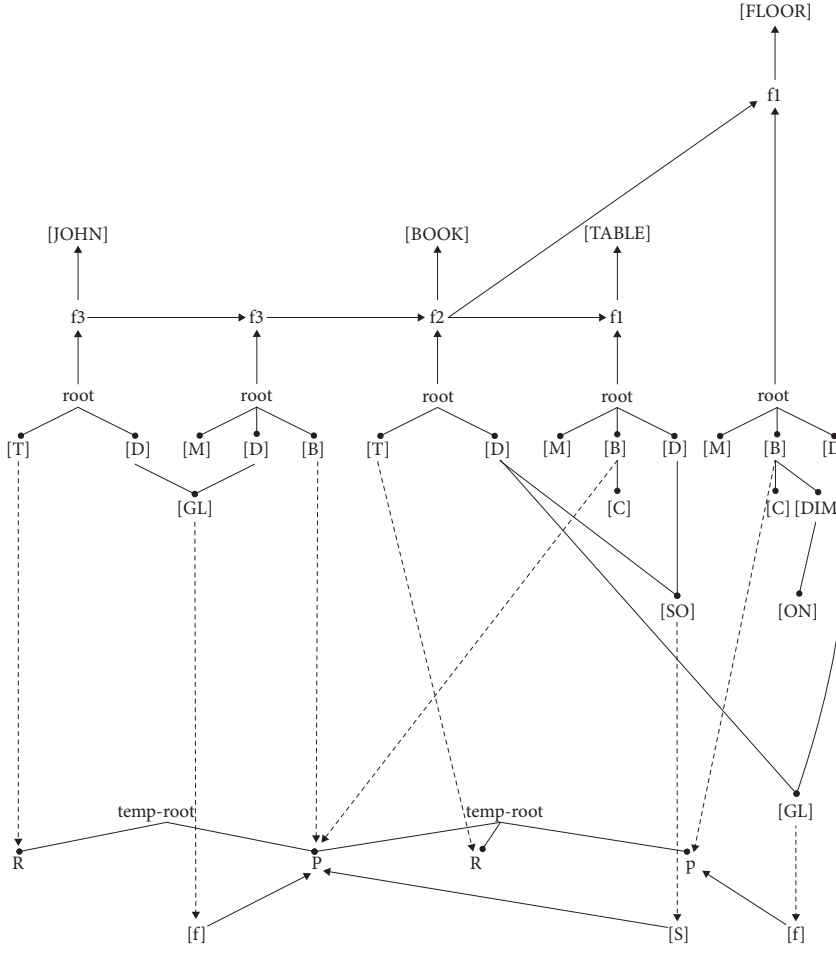
John nudged the book down from the table



There are two temp-roots that share one element, P. The shared P is allowed twice by features [B] that can be found both in zone 3 and zone 1. The two temp-roots have their both own R-nodes, which means that there are two "time lines." The shared P is selected by both the feature [f] of zone 3 and the feature [s] of zone 1, which means that the same point of time is the end of the time line (i.e. R) allowed by zone 3 (causation) and the start of the time line line allowed by zone 2 (caused situation). In this way the whole situation is linked together in the desired way.

If the path has more parts than one, the analysis becomes more interesting. We can add the goal path *onto the floor* to the sentence: *John dropped the book from the table onto the floor*. The feature [B] of the goal path allows a P, and the feature [GL] of the goal path allows the feature [f]. The P that is at the same time the end

John dropped the book from the table onto the floor

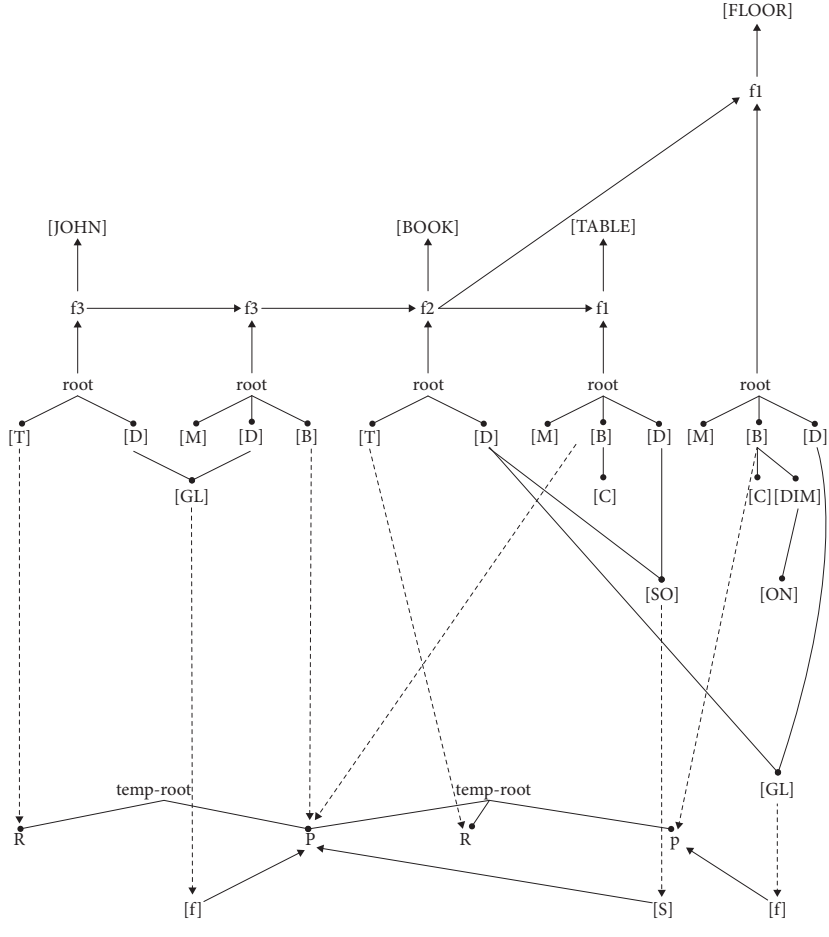


point of the causation and the starting point of the caused event (book falling from the table onto the floor) is shared by the two temp-roots. However, the end point of the caused event (the point of time when the book hits the floor) is not shared. The analysis is as follows:

In the analysis of entrainment, my analysis starts from the idea that if the internal time of the causation is the same as the internal time of the caused event, they share the same temp-root. (My account of entrainment differs slightly from Petrova's account as she does not merge the temp-roots.) The analysis of *John carried the book from the table onto the floor* is as follows:

There is only one temp-root. The R is allowed by both the [T] in zone 3 and the [T] in zone 2. Notice that even though each [T] can only allow one R, the R may be allowed by more than one [T]. The feature [SO] of zone 1 allows the feature

John carried the book from the table onto the floor



[s], which selects a P from the RP-tier and makes it the starting point of the situation. The features [GL] in both zone 3 and zone 2 allow a feature [f] each of which select the same P and make it the end point of the situation. If there is only one RP-tier (with one R) and several allowed order tier features, the P can be selected by more than one order tier feature as long as they have the same value [s], [i], or [f]. There cannot be a mismatch. This is intuitively easy to understand: there cannot be a conflict of values assigned to the same element. We can formulate this as a principle:

Order tier selection constraint
If a P is a constituent of only one temp-root and it is selected by more than one order tier feature, the order tier values (i.e. [s], [i], or [f]) must be the same.

However, if the P is shared by two temp-roots, then it can be selected by different order tier features, just as we saw in the case of launching. Then the same point of time has a different status on two (or perhaps even more) time lines. The same point of time can be the end of one process and the start of another, for instance. But the same point cannot be the start and the end of the same process.

4.5 Deictic RP-elements

There is still one question that we must deal with: the fact that launching is a momentany situation: we can easily say *John nudged the book down from the table to the floor at 6:23 am* but it is very odd to say ??*John nudged the book dwn from the table to the floor for hours*. It seems that the point of time that is critical for launching is the P that is shared by the two temp-roots and that is selected by the feature [f] allowed by zone 3 and the feature [s] allowed by zone 1. That is the moment that we refer to when we say that the event takes place at a particular point in time (e.g. *6:23 am*). In a way, that P stands for the whole temporal structure when it comes to the temporal deixis of the launching event.

Note that the parts of the RP-tier are not always equal when it comes to deixis. As we saw with launching, a P may stand for the whole temporal structure of the event with respect to its deictic properties. There are some other cases as well. For instance, the English verbs like *arrive* and *leave* focus on a particular point of motion: leave focuses on the starting point and arrive on the end point of the motion. In Vendler's (1957) terminology *arrive* is an achievement-verb, and its temporal structure is a point of time: the point when the (moving) theme argument (Figure) achieves the relevant point. However, as the verb *arrive* expresses motion, and motion is a temporal process, there must

be a region of time (R) preceding the point of time (P) at which the arrival takes place. In the notation, I will mark the **deictic RP-element** with underlining. The deictic P is underlined. Some examples of lexicalized temporal deictic P's are given in Table 2.

Table 4.2 'Arrive' and 'leave' and the RP-tier

Example	Notation	Reading
Engl. *arrive,* Fin. *saapua*	R P	The end point of the event stands for the deixis of the event. The process before it is presupposed.
Engl. *leave,* Fin. *lähteä*	P R	The start point of the event stands for the deixis of the event. The process after it is presupposed.

Notice that the presupposed time structure is resupposed but not irrelevant for the meaning of these verbs: it is necessary to understand that there is a process in the background in order to see what the status of the deictic P is in the temporal structure of the event.For instance, consider the following sentences:

(10) a. *Mark arrived in Helsinki from Moscow at 5:01 pm.*
b. ??*Mark arrived in Helsinki from Moscow for many hours.*
c. *Mark traveled from Moscow to Helsinki for many hours.*

(11) a. *Markku saapui Moskovasta Helsinkiin kello 17.01.*
Markku arrive-PAST-3SG Moscow-ELA Helsinki-ILL clock 17:01
'Markku arrived in Helsinki from Moscow at 5:01 pm.'

b. ??*Markku saapui Moskovasta Helsinkiin*
Markku arrive-PAST-3SG Moscow-ELA Helsinki-ILL
monta tuntia.
many hour-PAR
'Markku arrived in Helsinki from Moscow for many hours.'

c. *Markku matkusti Moskovasta Helsinkiin*
Markku travel-PAST-3SG Moscow-ELA Helsinki-ILL
monta tuntia.
many hour-PAR
'Markku traveled from Moscow to Helsinki for many hours.'

As Vendler (1957) points out, the aktionsart properties are often lexically marked in verbs. It is a lexical property of the verbs *arrive* and *saapua* that the situation expressed by these verbs is linked deictically to the "external time" via the P that represents the end point of the internal time line of the situation. In sentences (10a) and (11a) *5:01 pm* is represents the external time, and

it is the point of time that ends the event expressed by these sentences. The sentences in (10b) and (11b) are unnatural, because *for hours* and *monta tuntia* 'many hours' require that the link between the external time and the temporal structure of the situation could be made via an R. In (10c) and (11c) the verbs are travel and matkustaa 'travel' which do not have a lexically marked deictic RP-element.

The lexically marked deictic P can be the finishing point of the situation, as with the verb cross:

(12) a. *Wilfred Bungei crossed the finishing line at 1.44,63.*
b. ??*Wilfred Bungei crossed the finishing line for a second.*

It can also be the starting point of the situation as with the verbs *leave,* and *lähteä* 'leave':

(13) a. *Jussi lähti Moskovaan kello 6.02*
Jussi leave-PAST-3SG Moscow clock 6:02
'Jussi left for Moscow at 6:02 am.'
b. *John left from Helsinki for Moscow at 6:02 am.*

The time 6:02 am is the starting point of the situation. The time when Jussi's or John's traveling from Helsinki to Mocow started. The point is lexically marked in these verbs.

Let us now consider momentany verbs. In Finnish, the verbs marked with the derivational suffix *ahta/ähtä* typically express momentany event. For instance

huuta- 'shout' : *huudahta-* 'make a short shout'
lentä- 'fly' : *lennähtä-* 'make a short flight'

The verb *huutaa* 'shout, scream, cry' expresses a process, and it may have an RP-tier consisting of R. The verb lentää 'fly' is a typical motion verb. These verbs go well together with an adverb exprssing an extension of time, for instance:

(14) a. *Vauva huusi koko yön.*
baby cry-PAST-3SG whole night-ACC
'The baby was crying for the whole night.'
b. *Lintu lensi Välimereltä Lappiin viikon.*
bird fly-PAST-3SG Mediterranean-ABL Lapland-ILL week-ACC
'The bird flew from the Mediterranean sea to Lapland for a week.'

The momentany derivatives of these verbs express a short process that only takes one moment, one point of time, if you like. They are not easily compatible with adverbs expressing an extension of time:

(15) a. ??*Vauva huudahti koko yön.*
baby cry-PAST-3SG whole night-ACC
'The baby was crying for the whole night.'

b. ??*Lintu lennähti Välimereltä Lappiin viikon.*
bird fly-PAST-3SG Mediterranean-ABL Lapland-ILL week-ACC
'The bird flew from the Mediterranean sea to Lapland for a week.'

The verbs can, as expected, be used with adverbs expressing a moment of time:

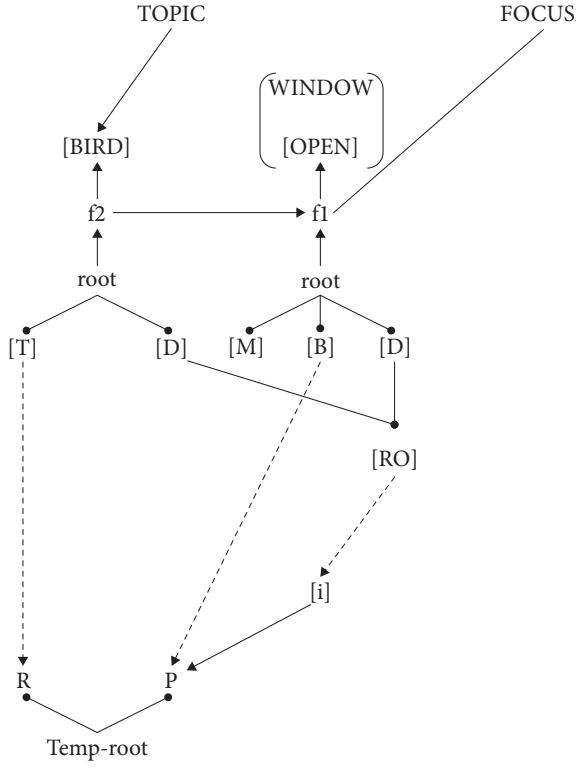
(16) a. *Vauva huudahti seitsemältä aamulla*
baby cry-MOMENT-PAST-3SG seven-ABL morning-ADE
'The baby made a loud sound at 7 am.'

b. *Lintu lennähti Välimereltä*
bird fly-PAST-3SG Mediterranean-ABL
Lappiin aamulla.
Lapland-ILL morningADE
'The bird flew (quickly) from the Mediterranean sea to Lapland in the morning.'

In addition to being lexically marked, the deictic RP-element may depend on the information structure of the sentence. If we read closely the example sentences in Table 4.1 above, we can see that the parts of the temporal tier are not equally important. For instance, the sentence with the temporal tier RPR, *The bird flew through the open window,* the focus is on the P, the moment when the bird crosses the line between being inside or outside of the open window. Still, the verb *fly* expresses a process, and thus, allws and requires that the R is present.

The process is typically in the background and the P is in the foreground. However, if we emphasize the word *fly* – i.e. *The bird FLEW through the open window* –, the R is foregrounded and the P is in the background. This is linked to the fact that in the normal interpretation, the route is in focus, and if the verb fly is emphasized, the process of flying is in focus. Therefore, it is natural to assume that the temporal tier is a reflection of the activity or the path being in focus. Focus is a part of the information structure, and we will discuss it in Chapter 8. The idea is that the information structure is in a tier of its own, and has its own primitives including topic and different kinds of focus, i.e. focus1 ("contrastive focus," "emhasizing focus") and focus2 (focus without strong emphasis). I will use three functions, i.e. TOPIC, FOCUS1 and FOCUS2, which can select parts of the situation structure. Thus, the analysis of the sentence *The bird flew through the open window* is as follows:

(16) *The bird flew through the open window*



The temporal structure is allowed by the thematic features, which, in turn, are strongly linked to the f1 that is in focus. The topic of the sentence is 'the bird'. The information structure in this case consists of two primitives TOPIC and FOCUS2. The information structure as a tier FOCUS1 will be discussed in Chapter 5, and then we will also return to FOCUS1 (contrastive focus, emphasis).

I will not go deeper into linking the internal temporal structure of situations to what we have called the "external time," the time around us. That would require a compatible theory of the external time, and I will leave that to later research. However, we have been able to show that it is reasonable to assume that the interface to the external time is the RP-structure and the order tier features. We have thus been able to pinpoint the link to that part of the temporal structure.

4.6 Temporal structure of complex sentences: Relating the temporal structure of two situations together

Nikanne (1997b) widens the theory of the temporal tier to cover the internal time structure of a complex sentence. The idea is that a complex sentence consists of

a matrix sentence and its complements and adjunct sentences, finite or infinite. Each of the sentences have their own internal time structure but these time structures must be temprally related even to one another. According to the theory in Nikanne (1997b), the whole complex sentence also has a temporal tier to which the temporal tiers of the individual sentences are related. In this study, the research is focused on a set of Finnish infinitival adjuncts that indicate different kinds of temporal and causal relations to the matrix sentence. For instance:

(17) a. *Pekka joi pullon olutta nukkuessaan*
Pekka drank bottle-GEN beer-PAR sleep-INF2-INESSIVE-PX3
'Pekka drank a bottle of beer while he was sleeping.'

b. *Pekka joi pullon olutta nukuttuaan.*
Pekka drank bottle-GEN beer-PAR sleep-PASS-PASTPTC-PX3
'Pekka drank a bottle of beer after he had been sleeping.'

c. *Pekka joi pullon olutta nukkuakseen.*
Pekka drank bottle-GEN beer-PAR sleep-INF1-TRANSLATIVE-PX3
'Pekka drank a bottle of beer in order to sleep.'

d. *Pekka joi pullon olutta nukkuen.*
Pekka drank bottle-GEN beer-PAR sleep-INF2-INSTRUCTIVE
'Pekka drank a bottle of beer sleeping.'

e. *Pekka joi pullon olutta nukkumatta.*
Pekka drank bottle-GEN beer-PAR sleep-INF3-ABESSIVE
'Pekka drank a bottle of beer without sleeping.'

The idea is that the whole complex sentence forms a "micro universe of discourse" (cf. the idea of universe of discourse in Givón 1984: 338–339). The temporal structures of the different part events of this "universe" must be related to each other. The technical solution in this model is to introduce a temporal tier of the whole construction, "CT-tier." The CT-tier is optionally divided into two parts, the "earlier" part CT1 and the "later" part CT2. The earlier and later mean that in the "micro universe of discourse" CT1 chronologically precedes CT2. When analyzing the sentences in (17) the temporal tiers of the matrix sentence and the infinitival adjunct, we can use the following relations:

= (is equal to)
$\subseteq$ (is included in)
$\not\subset$ (is not included in)

Now we are ready to analyze the temporal relations between the part events of the "universe" expressed by the whole construction. The Temp-root node of the RP-tier represents the whole structure, and will be linked to the CT. In the following, T-AD stands for the temporal tier of the ajdunct (i.e. the Temp-root node of the adjunct) and T-MX for the temporal tier of the matrix sentence:

(18) a. [$_{\text{MATRIX}}$ *Pekka joi pullon olutta*] [$_{\text{ADJUNCT}}$ *kävellessään*].
Pekka drank bottle-GEN beer-PAR walk-INF2-INESSIVE-PX3
'Pekka drank a bottle of beer while he was walking.'
T-MX ⊆ CT
T-AD = CT

b. [$_{\text{MATRIX}}$ *Pekka joi pullon olutta*] [$_{\text{ADJUNCT}}$ *käveltyään*].
Pekka drank bottle-GEN beer-PAR walk-PASS-PASTPTC-PX3
'Pekka drank a bottle of beer after he had been walking.'
T-MX ⊆ CT2
T-AD ⊆ CT1

c. [$_{\text{MATRIX}}$ *Pekka joi pullon*
Pekka drank bottle-GEN
olutta] [$_{\text{ADJUNCT}}$ *kävelläkseen*].
beer-PAR walk-INF1-TRANSLATIVE-PX3
'Pekka drank a bottle of beer in order to walk.'
T-MX ⊆ CT1
T-AD ⊆ CT2

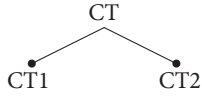
d. [$_{\text{MATRIX}}$ *Pekka joi pullon olutta*] [$_{\text{ADJUNCT}}$ *kävellen*].
[$_{\text{MATRIX}}$ Pekka drank bottle-GEN beer-PAR walk-INF2-INSTRUCTIVE
'Pekka drank a bottle of beer walking.'
T-MX = CT
T-AD = CT

e. [$_{\text{MATRIX}}$ *Pekka joi pullon olutta*] [$_{\text{ADJUNCT}}$ *kävelemättä*].
Pekka drank bottle-GEN beer-PAR walk-INF3-ABESSIVE
'Pekka drank a bottle of beer without walking.'
T-MX = CT
T-AD ⊄ CT

In this system, it is not necessary to analyze the internal structure of temporal tiers of the individual events. They – whatever their structure is – are related to the CT as wholes.

Michaela Pörn (2004) develops this model by focusing on the starting points and end points of situations expressed by the individual sentences as well as the chronological order of the points on the internal time line of the complex situation. Pörn's model has been developed by Petrova (2011) into the feature system that is called the order tier in the previous section of this chapter. (The marking > for chronological order is introduced by Pörn 2004.)

CT-tier
Primitives: CT, CT1, CT2
Principles of combination: CT can be divided into two parts that form a constituent structure:



If CT is divided, then CT1 prcedes CT2 on the internal timeline of the micro universe of discourse. This relation is abbreviated with the symbol "is larger than," i.e. CT1 > CT2.
Linking to other tiers: CT is a function that must select one temp-root. If CT is divided, then its parts CT1 and CT2 must select one temp-root each.

Temp-root nodes can be linked to the CT, CT1, and CT2 with the links = (is equal to), $\subseteq$ (is included in), and $\not\subset$ (is not included in). This is not the same thing as constituency, temp-roots are not structural parts of the CT. Inclusion or being equal in this case indicates temporal inclusion or sameness not that they are parts of the same structure.

4.7 Summary

When the temporal structure of situations is studied following the methodological guidelines presented in Chapter 1, we come to the conclusion that it is a piece of the micro-modular network. In this chapter, we have seen that the internal time structure of situations can be divided into three mutually connected micro-modules: the RP-tier, the order tier, and the CT-tier. We have also pointed out the place of the micro-modules of the temporal structure in the overall network: the temporal micro-modules are connected with each other and to other micro-modules as follows:

1. RP-tier elements are partly allowed by thematic features.
2. Order tier elements are allowed by thematic features.
3. Order tier elements select RP-tier elements.
4. CT-tier functions are linked to the RP-tier via set-theoretical operators.
5. RP-tier elements are linked to the external time (temporal deixis of situations).

We can now add the temporal micro-modules to the overall sketch of the micro-modular organization of language. The temporal modules form a tight subnetwork of the system and we can call the subnetwork the *temporal cluster*.

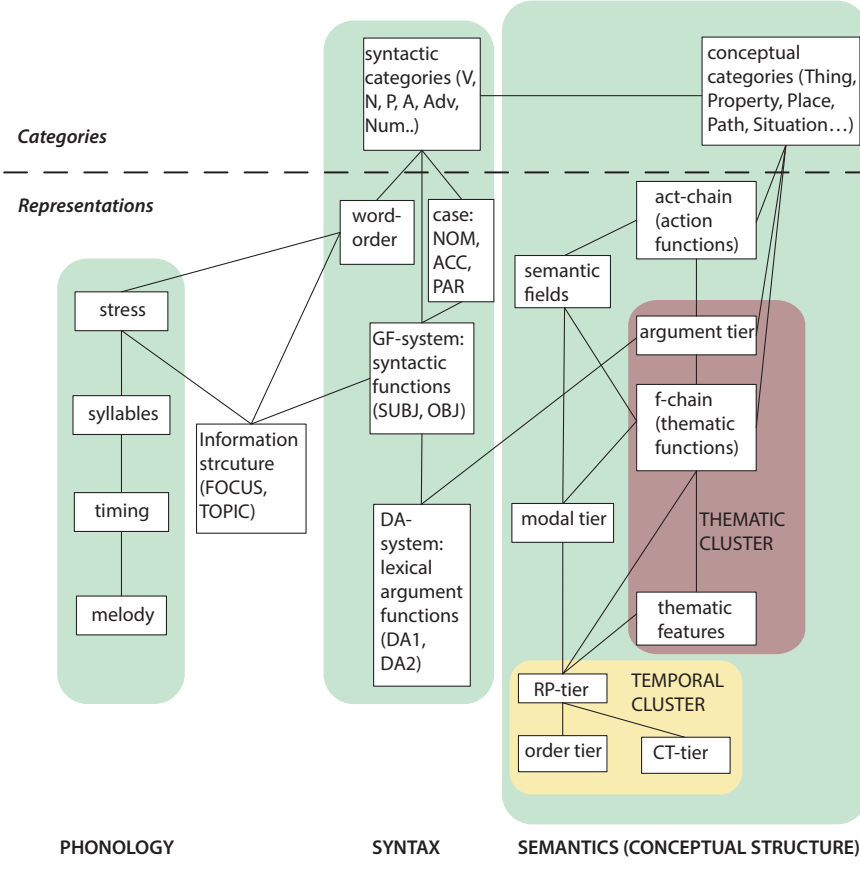


Figure 4-1 The temporal cluster as a part of the micro-modular network

CHAPTER 5

Semantic fields and the modal tier

The micro-modules semantic fields and the modal tier are introduced in this chapter. These modules are linked to the understanding of situations. Semantic fields deal with the concrete or abstract "space" in which the situation is taking place.The modal tier consists of epistemic and deontic modal operators that can have a scope over the situation or its parts.

5.1 Semantic field tier

The function of semantic fields is to make a semantic distinction between structures that seem to express the same logic and semantic roles but belong to different conceptual areas. For instance, the sentences *The horse went to the field* and *The horse went to a new owner* both express a relationship between the theme (horse) and a goal (field, new owner). The theme argument (horse) must undergo a change: in the former sentence, the change is spatial, wheras in the latter sentence, the change is possessive. The theoretical tool to make a distinction between spatial and possessive expressions is the semantic field.

The semantic fields were first introduced into the part of the model that in the present theory is called the f-chain. However, semantic fields can be used in other parts of the theory as well: I will argue that even the modal tier has its own semantic fields.

5.1.1 Semantic fields linked to the f-chain functions of zone 1 and non-monadic functions of zone 2

As pointed out by Jackendoff (1983, 1990), in many languages, the same prepositions, postpositions, case forms and verbs can be used to express situations in different "spaces." Jackendoff (1983, 1990) mentions the following semantic fields for non-causative situations:

Spatial
E.g. *The man walked to the restaurant.* (Theme: *man*, Goal: *restaurant*)

Possessive
E.g. *The man got 3 dollars.* (Theme: *3 dollars*, Goal: *man*)

Characterizing
E.g. *The man went blind.* (Theme: *man*, Goal: *blind*)

Temporal
E.g. *The meeting went on to 3 am.* (Theme: *meeting*, Goal: 3 am)

Circumstantial
E.g. *The man began to shout.* (Theme: *man*, Goal: [the man] *shout*[s])

Existential
E.g. *A thunderstorm emerged*. (Theme: thunderstorm, Goal: 'existence')

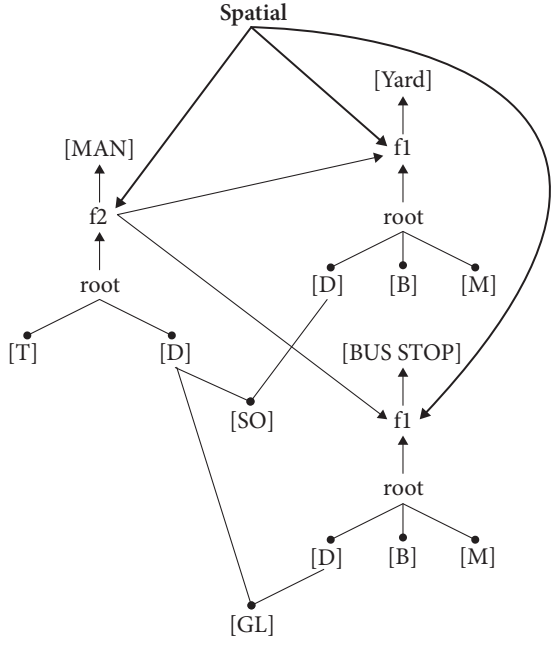
Jackendoff treats the semantic field as a feature of thematic functions and the functions behave the same way with respect to each other in all semantic fields. The spatial field, according to Jackendoff (1983), is the "mother of all fields" in the sense that other semantic fields follow the same logic. (For instance Lakoff and Johnson 1980, 1999 express similar ideas as they would like to see bodily concepts as the basis of all abstract thinking.)

In Jackendoff's model, the semantic field correlates with the conceptual category of arguments and, naturally, the semantic relation of the theme and location argument. Under the present model in this book, we have already analyzed the functions as separate tiers (f-chain and thematic features). Consequently, according to the methodological guidelines *analytical organization* and *simple formation of modules*, the semantic fields should be analyzed as a separate tier as well. The semantic field tier for the f-chain functions has been suggested in Nikanne (1990). According to this way of modeling the phenomenon, the sentences in (1) all have the same f-chain and thematic features, but they are linked to different semantic fields. Note also that in practise, in Jackendoff's analyses the place or path function must have the same semantic field feature as the governing non-causative function (BE, GO, EXT, ORIENT…). Therefore, as Nikanne (1990) points out, it is natural to treat semantic fields as a feature outside of the f-chain.

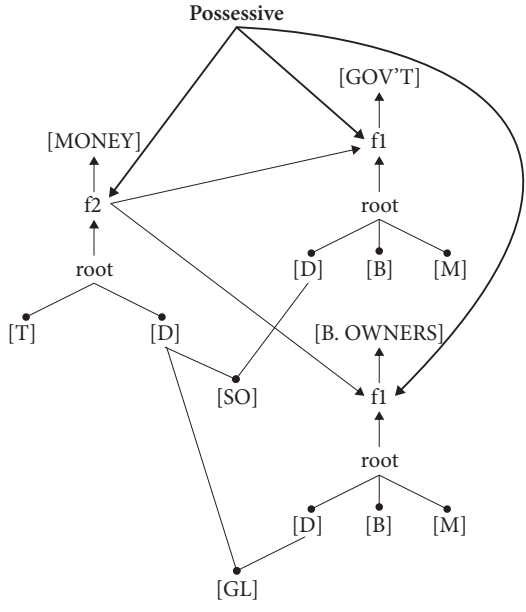
The semantic fields in Jackendoff (1983, 1990) can be seen as features. The features have scope over the element that they are associated with. This can be understood as a kind of selection, i.e. a directed link: the semantic field selects a function in the f-chain. Therefore, following Petrova (2011), I mark the links with an arrow, indicating selection.

To show how the semantic fields are analyzed in the Tiernet model, I will give examples in English and Finnish in (1). The analyses of these sentences is given below the examples. (The semantic field tier is marked in these examples with boldface and the selection arrows are drawn with a thicker line to emphasize the relevant parts of the structure.)

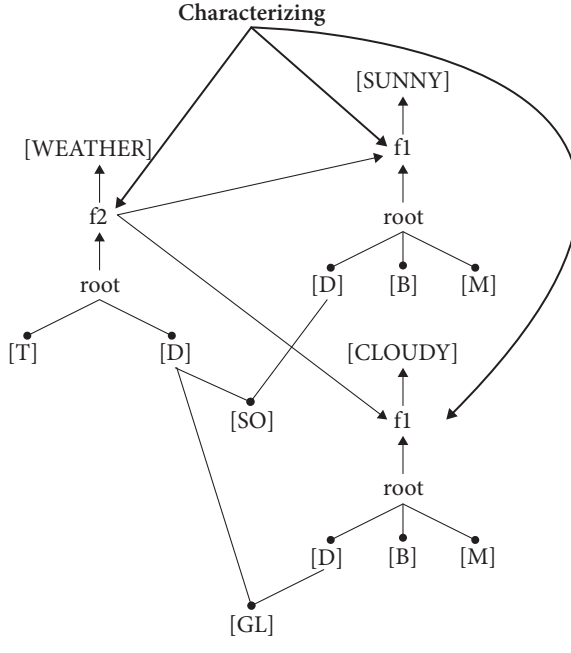
(1) a. Spatial
English: *The man went from his yard to the bus stop.*
Finnish: *Mies meni pihaltaan bussipysäkille.*
Man go-PAST-3SG yard-3Px bus-stop-ALL



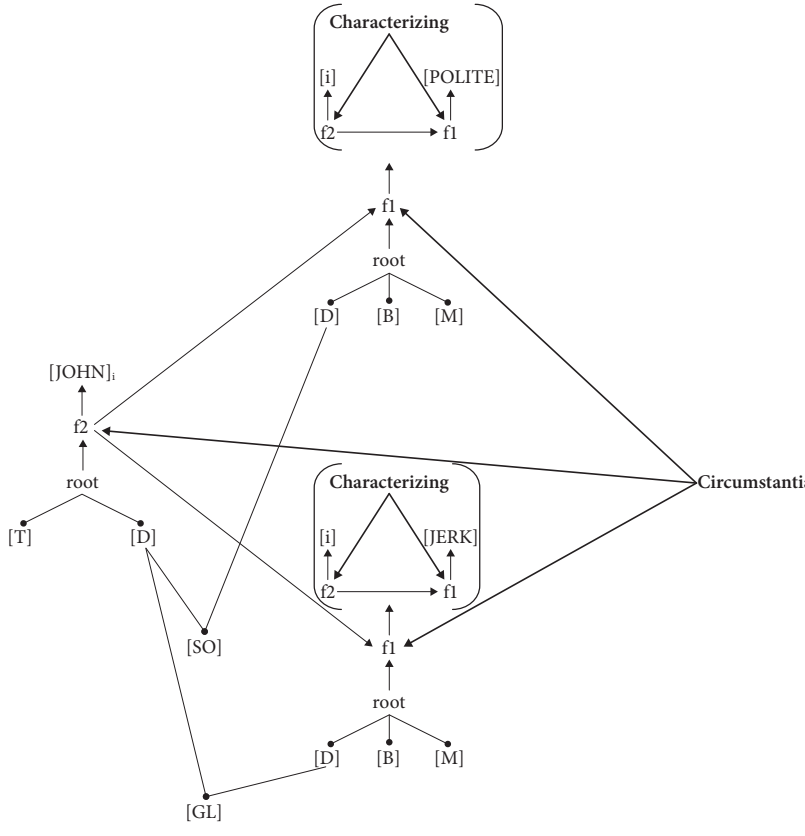
b. Possessive
English: *The money went from the government to the business owners.*
Finnish: *Rahat menivät*
money-PL go-PAST-3PL
hallitukselta yrittäjille.
government-ABL business-owners-ALL



c. Characterizing
English: *The weather went from sunny to cloudy.*
Finnish: *Sää muuttui aurinkoisesta pilviseksi.*
weather change-PAST-3SG sunny-ELA cloudy-TRA



d. Circumstantial
English: John went from being polite to acting like a jerk.
Finnish: *John siirtyi kohteliaasta*
John move-PAST-3SG polite-ELA
käytöksestä öykkäröintiin.
behavior-ELA jerk-like-action-ILL



Sentence (1d) is an example of the circumstantial field. The arguments selected by f1's are situations. They are analyzed within brackets as they appear as arguments of another f-chain. The situations that function as arguments have their own semantic fields.

In the circumstantial field, the theme argument of the matrix situation (here: [JOHN]) is coindexed (marked with subscript index i) with the argument of the leftmost f-chain function of those situations that appear as the arguments of f1's (marked as [i]). (See Jackendoff 1983.) The choice of the semantic field leads to some other restrictions concerning argument level (see Jackendoff 1983). Even though Jackendoff uses this observation to define the semantic fields, this is an

important observation also from the point of view of the network model. In the present model, we must interpret these restrictions to be a consequence of the links between separate modules.

Nikanne (1990) points out that the semantic fields are not equally "strong." For instance the spatial field is the only one that can select an f1 that is linked to the D-feature [RO] (route), i.e. 'via,' 'through' etc. in the other fields. In addition, the feature [DST] can only be linked to an f1 that is selected by the semantic fields Spatial or Temporal. These restrictions on network building between the f-chain, semantic fields, and thematic features are an example of the network's ability to set constraints on well-formed links.

5.1.2 Semantic fields linked to monadic functions of zone 2

The list of semantic fields suggested by Jackendoff (1983, etc.) works well with non-causative situatons when the zone 1 is present. However, verbs whose lexical conceptual structure is governed by a monadic f2 are more difficult to interpret for their semantic field. These verbs are typically intransitive verbs. While some of these verbs, like *wiggle, rock* or *shiver* seem to be clearly spatial as they describe the movement of the theme argument, some like *laugh, dance, float*, etc. are more difficult as they describe a situation in which many semantic fields are involved. For instance, the verbs *laugh* and *cry* describe a physical activity but at the same time it suggests that the activity is caused by an emotion and also that the activity causes some kind of sound. The verb *dance* is movement in space but at the same time it suggests that the movement is following music or at least a rhythm and has some kind of an aesthetic value.

In order to give a formal analysis of these verbs, we need to take into account the action tier and its semantic fields. I will return to these verbs after discussing the action tier. However, at this point, I would suggest that there are more semantic fields in zone 2 than there are in zone 1. The fields pointed out by Jackendoff (spatial, possessive, temporal, chracterizing, circumstantial, existential) are the only features that an f1 can carry. f2's may carry these features but their selection of semantic fields is not restricted to them.

Let us take for instance the following verbs in Finnish (and the corresponding words in English, see glosses. (When it comes to these verbs and other descriptive words, translations into another language are seldom very accurate. The translations in this case are there to give at least some kind of idea of the meaning and to show that there are also similar verbs in English. For translations, see sanakirja.org):

keikkua 'wiggle, jiggle, sway'
keinua 'swing, rock, sway'
heilua 'swing, rock, sway, wiggle'

huojua 'sway, wobble'
horjua 'stagger, lurch'
tutista 'quail, wiggle, tremble, shudder'
vavista 'quiver, shiver, tremble, shudder'
vapista 'shiver, shake'
väristä 'shiver, shudder'
täristä 'shake, vibrate, tremble'
kieppua 'gyrate, swirl'

These kinds of verb have been classified as spatial "manner of motion verbs" by Nikanne and van der Zee (2013) in a study of motion verbs. The study focused on the lexicalization of the shape of the path the theme argument is understood to follow (curved, straight, or unspecified). The manner of motion verbs do not express motion along a path: they express the fact that the theme argument is in some kind of motion but it does not necessarily change its general location. A manner of motion verb can be used as the predicate verb indicating a motion, e.g.

(2) a. *Lentokone kieppui kiitoradalle.*
airplane gyrate-PAST-3SG runway-ALL
'The airplane gyrated onto the runway.'

b. *Mies horjui kapakasta kotiin.*
man rock-PAST-3SG bar-ELA home-ILL
'The man rocked from the bar home.'

In these sentences, the form of the path is not specified. The movement from one place to another is indicated by the PPs governed by the locative cases and allowed by a construction (see Nikanne and van der Zee 2013, van der Zee, Nikanne and Sassenberg 2010). The motion verb indicates that the airplane or the man are undergoing a particular kind of motion which is independent of the movement along the path. If there is no PP indicating a path, the sentence does not indicate that the theme argument is moving from one place to another, as shown in the sentences in (3).

(3) a. *Lentokone kieppui.*
airplane gyrate-PAST-3SG
'The airplane gyrated.'

b. *Mies horjui.*
man rock-PAST-3SG
'The man rocked.'

I must emphasize that the sentences in (3) do not exclude the possibility that the airplane or the man in question would be changing its general location; the

sentences just do not express any such movement. The sentences concentrate solely on expressing the motion the theme argument is undergoing in the location whatever that happens to be. The verb *heilua* 'rock' indicates a repetitive motion (or potential motion) back and forth so that the object that is undergoing the movement does not change its location. The verbs *huojua, täristä, väristä, tutista* etc. resemble the verb heilua in this respect, but certain nuances are different: *huojua* indicates that the theme argument is elongated, vertical, and that its main axis is moving in such a way that its lowest end does not move, e.g.

(4) a. *Puu/metsä huojuu tuulessa.*
tree/forest sway-3SG wind-INE
'The tree/the forest is swaying in the wind.'

b. *Sebastian huojuu taas kanjonin reunalla*
Sebastian swing-3SG again canyon-GEN edge
(Title of the TV-show Salatut elämät 30 May 2012)
'Sebastian is again swaying on the edge of the canyon.'

Note that it is possible to use the verb *huojua* when the subject argument is a collective (forest) of elongated objects (trees), as in (4a). (4b) is used for a person (in this case metaphorically). Typically, when a person is swaying, there is a reason for that, e.g. exhaustion, intoxication, or weakness.

The differences between *täristä, väristä*, and *tutista* are more complicated. They all indicate a small movement of the object. The verbs *täristä* and *väristä* 'vibrate' are associated with a certain sensory information. If you touch the object that *tärisee* or *värisee*, you can feel it. *Täristä* indicates more intense vibration than *väristä*. Sensory information is also an essential part of the semantics of the verb *tutista. Tutista* 'quail, wiggle, tremble, shudder' indicates vibration as well, but it also suggests that the theme object is about to collapse or is at least not strong enough to stay still. The verb *tutista* is used with the subject argument *jalat* 'legs,' *polvet* 'knees,' *puntit* 'pant legs,' etc. in sayings indicating that the person is afraid.

The verb *väristä* 'vibrate' can, however, be used to indicate a visual observation: the air or the tv-screen picture may *väristä* 'vibrate' if it seems to be in a small, subtle movement ('gleam, glimmer').

In addition to *tutista*, there are other verbs indicating that the reason for the movement is weakness of the theme argument. For instance the verb *horjua* 'stagger, lurch' is such a verb. It indicates that the theme object is not stable and that it is possibly about to collapse.

The verb *heilua* is often used to indicate a potential movement, e.g.

(5) *Jos hammas heiluu, suositellaan, että*
if tooth-NOM wiggle-3SG, recommend-PASS, that

soitat *hammaslääkärille.*
call-2SG dentist-ALL
'If your tooth wiggles, it is recommended that you call the dentist.'
(http://www.sairaana.com/sairaudet/hammasvauriot)

According to the advice in Example (5), you are supposed to call the dentist if your tooth is not properly attached and is not stable when you move it (i.e. it has the potential to wiggle). The tooth does not have to be moving when you call the dentist.

In order to analyze these verbs, we need to see what ingredients we need for the analysis. One ingredient is the **feature** [**T**], as they all express a process that takes place in time. An exception is when the verbs indicate a potential movement. Another ingredient is the **spatial semantic field**. All the verbs discussed above express some kind of a spatial movement. The third ingredient is the **sensory information** that is involved especially with the verbs *väristä, täristä* and *tutista*. The forth ingredient is the **reason for the motion** (weakness of the theme argument) that is lexicalized with the verbs *horjua* and *tutista*.

As an example of these verbs, we will now analyze sentence (6) from the point of view of the semantic field in zone 2:

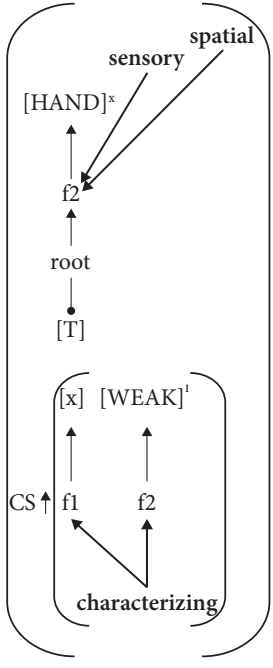
(6) *Käsi* *tutisee.*
hand tremble-3SG
'The hand trembles.'

The reason for the motion can be analyzed as an implicit causative structure. For this, I use the notation developed by Paulsen (2011). An embedded thematic level that is the reason for the matrix thematic level is marked with the operator CS↑ and an embedded thematic level that is caused by the matrix thematic level is marked with CS↓. So, for instance the verb *tutista* indicates that the reason for the movement is some kind of weakness. The weakness, in turn, may be caused by old age, sickness, exhaustion, nervousness, etc.

The verbs like *tutista, täristä* and *väristä* have even a strong sensory ingredient in their lexical information. You do not need to see the movement, and the spatial movement does not even have to be in the focus. For instance mobile phones have a vibration alert, and it is called *värinähälytys* in Finnish. (*värinä* 'vibration,' is a deverbal noun derived from the verb väristä, and hälytys means 'alert.') The point of the vibration alert is that the phone owner gets a sensory alert when the phone is "ringing." Still, värinä 'vibration' is spatial movement. My solution is that the f2 functions may be associated with a larger set of semantic fields than f1 functions. The f1 functions must share their semantic fields with f2 functions but not vice versa. In addition, I assume that the f2 functions may be associated with more than one semantic field at the same time.

Following the discussion above, here is the analysis of sentence (6):

(7) *Analysis of sentence (6)* Käsi tutisee *'The hand is trembling'*



The analysis above is not an exhaustive analysis of the sentence or the verb tutista. In addition to the argument structure and the semantic fields, the particular kind of spatial and sensory information must be a part of the lexical entry of the verb. The parts of the meaning given in the analysis above only take into account those parts of the meaning that we have discussed.

One short note on the verb lexicon in Finnish is in place: in the examples above, I have use the continuative verbs. The verbs have also momentany derivations (suffix *ahta, ähtä* from which, in turn, can be derived frequentative verbs (suffix *ele*). Only the verb *tutista* in the list does not have momentany and frequentative derivations. On should also be aware that the verbs in the list are given in the infinitive form (infinitive 1) which is used as the dictionary form in the Finnish tradition. The verbs in Finnish always appear in an inflected form.

Here are the derivations of the manner of motion verbs that are discussed in this chapter. Below I give the stem of the verbs to make it easier to recognize the derivative suffixes *ahta/ähtä* and *ele*:

The different derivative forms of the verbs change the "manner" of the action but not the semantic field. The momentany verbs typically express a an action that is fast and

Table 5.1 Finnish continuative, momentany, and frequentative verbs

continuative	momentany	momentany- frequentative	meaning
keikku-	*keikahta-*	*keikahtele-*	'wiggle, jiggle, sway'
keinu-	*keinahta-*	*keinahtele-*	'swing, rock, sway'
heilu-	*heilahta-*	*heilahtele-*	'swing, rock, sway'
huoju-	*huojahta-*	*huojahtele-*	'sway, wobble'
horju-	*horjahta-*	*horjahtele-*	'stagger, lurch'
tutise-	**tutahta-*	**tutahtele-*	'quail, wiggle, tremble, shudder'
vavise-	*vavahta-*	*vavahtele-*	'quiver, shiver, tremble, shudder'
vapise-	*vavahta-*	*vavahtele-*	'shiver, shake'
värise-	*värähtä-*	*värähtele-*	'shiver, shudder'
tärise-	*tärähtä-*	*tärähtele-*	'shake, vibrate, tremble'
kieppu-	*kiepahta-*	*kiepahtele-*	'gyrate, swirl'

if there is a movement involved, the movement is not repeated. The frequentative verbs imply that the action (e.g.) movement is repeated. Kalevi Wiik (1975) points out that the semantics of *ele*-frequentatives involves besides repetition, also an uneven and random rhythm of the repetition and if the subject argument of the verb is human, also that the she or he is not taking the action very seriously. (For more detailed analysis of Finnish frequentative and continuative verbs, see Wiik 1975.)

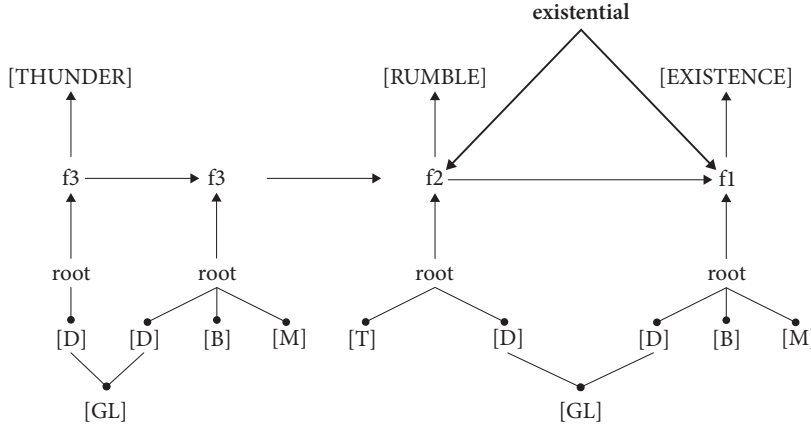
Another semantic field for f2 functions is the auditory field. Consider for instance the following Finnish intransitive verbs:

liplattaa ('lap,' quiet sound typically made by small waves against the boat or dock.)
ujeltaa (high whistling noise typically caused by the wind.)
soida 'sound, ring, play'
kilistä 'tinkle, chink, jingle' (high noise caused when pieces of e.g. glass, china, or metal touch each other)
kolista 'clack, clatter, rattle'
kopista 'clack'
kumista 'peal, rumble, toll'
humista 'hum, whoosh'
rätistä 'crackle'
ritistä 'crackle'
siristä 'buzz'
litistä (sound of water)

lätistä (sound of water)
lotista (sound of water)
paukkua 'bang'
tömistä 'rumble'
jyristä 'rumble, thunder'

These and more verbs express different kinds of sounds. (The translations above may give a wrong idea of the verbs. It is not always possible to find English verbs that would correspond to these Finnish words. The translations are taken from sanakirja.org.) One way to analyze them is to assume that they are all causative verbs, and the theme argument (linked to the subject argument) causes a sound to come into existence.

(8) *Ukkonen jyrisee.*
Thunder rumble+3SG
'Thunder is rumbling'



This is not, however, a very elegant or intuitively satisfactory solution. In Finnish, it is even possible to use these verbs without a subject, as in (9a). Sometimes the subject argument indicates the sound itself, as in (9b):

(9) a. *Ulkona jyrisee.*
outside rumble-3SG
'it rumbles/thunders outside.'

b. *Musiikki soi.*
music sound-3SG
'The music is playing.'

The subject argument may also be an object (10a–d) or a force of nature (e–f), for instance:

(10) a. *Kitara soi.*
guitar sound-3SG
'The guitar is playing.'

b. *Lattia paukkuu.*
floor bang-3SG.
'The floor bangs.'

c. *Puut rätisevät ja ritisevät takassa.*
wood-PL crackle and crackle fireplace-INE
'The wood are crackling in the fireplace.'

d. *Metsä humisee.*
Forest swoosh-3SG
'The forest is humming.'

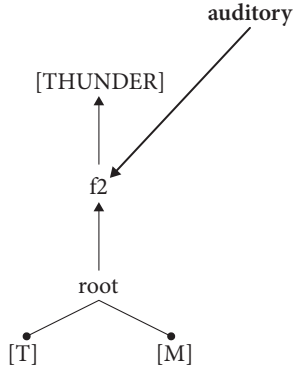
e. *Ukkonen jyrisee.*
thunder rumble-3SG
'The thunder is rumbling.'

f. *Tuuli ujeltaa.*
wind whistle-3SG
'The wind is whistling.'

These verbs can be analyzed as auditory verbs, f2's associated with the feature [T] and the auditive semantic field. The particular auditory information associated with each verb is a part of the lexical entry of these verbs.

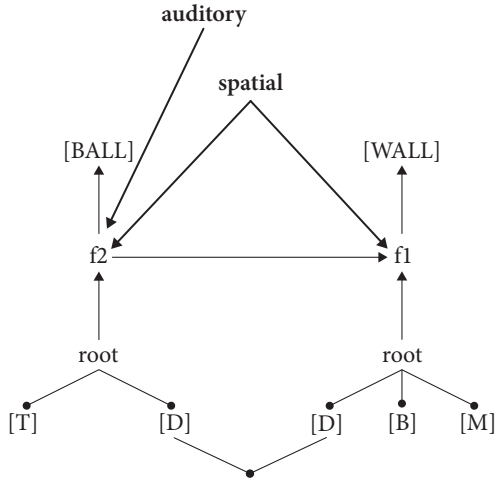
The analysis of (10e) is, thus, as follows. The other sentences can be analyzed in the same way, *mutatis mutandis*:

(11)



Often the auditive verbs are used together with spatial path expressions (for discussion of these verbs, see e.g. Levin 1993). As was stipulated above in the discussion of monadic spatial verbs, the f2's can be associated with more than one semantic field. Then we can analyze these expressions as follows:

(12) *Pallo pamahti/humahti seinään.*
ball bang-MOMENTANY-PAST-3SG wall-ILL
'The ball banged/swooshed against the wall.'



The motor and auditory semantic fields are not the only exclusively zone 2 semantic fields. There may be other ones, as well. For instance, such intransitive verbs as *nauttia* 'enjoy,' *kärsiä* 'suffer,' *iloita* 'be happy,' *tuskailla* 'be anxious,' etc. express emotion, e.g.

(13) a. *Koira nauttii uimisesta.*
dog enjoy-3SG swimming-ELA
'The dog enjoys swimming'

b. *Tuskailin aikani, ja sitten*
be-anxious-PAST-1SG time-PX1SG, and then
jatkoin töitä.
continue-PAST-1SG work-PL-PAR
'I was anxious for a while, and then I continued working.'

We can assume that they are f2's linked to the **emotional** semantic field. In addition, such Finnish emotional causative verbs as *harmittaa* 'feel bad,' *naurattaa* 'feel like laughing,' etc. discussed recently by Pörn (2004) and Siiroinen (2001) may be linked to the emotional semantic field. For the use and meaning of these verbs, see Pörn (2004) and Siiroinen (2001).

The "emotional causative" verbs like *kutista* 'tickle,' *kirvellä* 'smart, bite,' *pistellä* 'sting,' kuumottaa 'feel hot' and several verbs meaning 'feel pain', e.g. *sattua, jomottaa, juilia,* physical states, e.g. janottaa 'be thirsty,' *oksettaa* 'feel like vomiting/vomit' etc., for instance:

(14) a. *Jalkoja kirvelee/sattuu/kutittaa.*
leg/foot-PL-PAR smart-3SG
'(My) legs/feet smart/hurt/tickle.'

b. *Potilasta janottaa.*
patient-PAR thirst-CAUS-3SG
'The patient is thirsty.'

c. *Suola janottaa.*
salt thurst-CAUS-3SG
'Salt makes (you) thirsty.'

are called psychological-physiological causative verbs by Pörn (2004). They express the experience of a physiological state. We can assume that they are linked to the **psych-phys** semantic field.

So far, we have found need for auditory, sensory, motoric, emotional, and psych-phys semantic fields for zone 2. This is not meant to be an exhaustive list. The goal of the discussion above is to show that there are more semantic fields linked to f2's than to f1's. When we discuss the semantic fields of zone 3, we will see that their range is even more limited. The idea that there are a large number of semantic fields for zone 2 is very natural, because f2 is the head of the f-chain (see Chapter 3) and therefore the heart of the semantics of the conceptual category situation.

When it comes to the possibility that f2's but not f1's may be associated with more than one semantic field, the following examples are interesting:

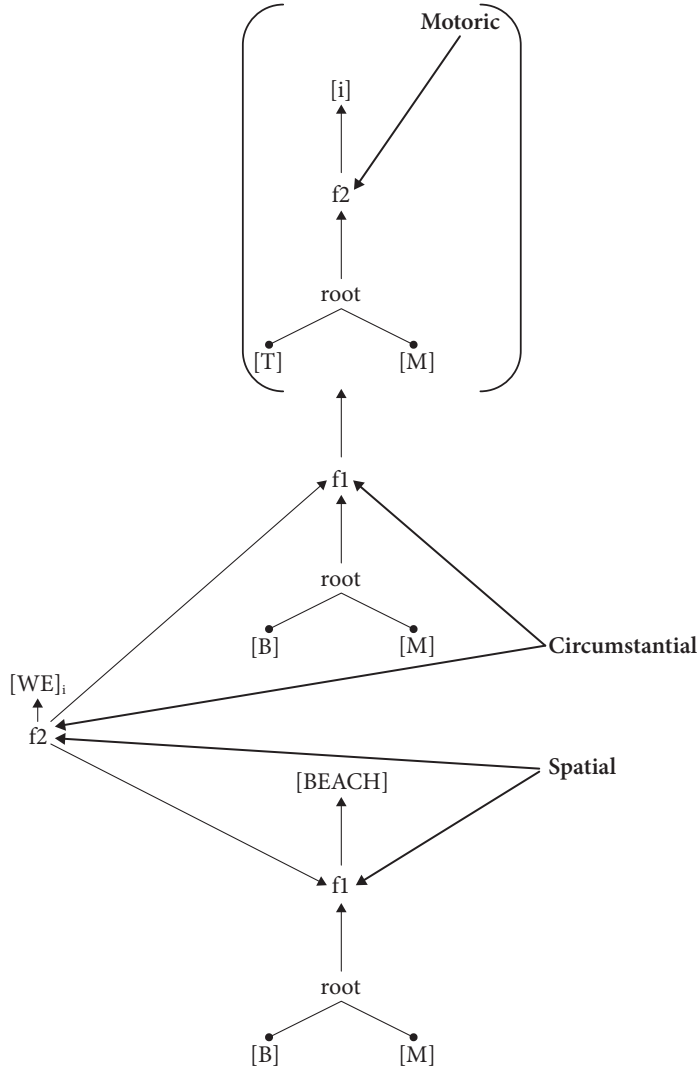
(15) a. *Me olemme rannassa uimassa.*
we be-1PL beach-INE swim-INF3-INE
'We are at the beach swimming.'

b. *Me menemme rantaan uimaan.*
we go-1PL beach-ILL swim-INF3-ILL
'We go to the beach to swim.'

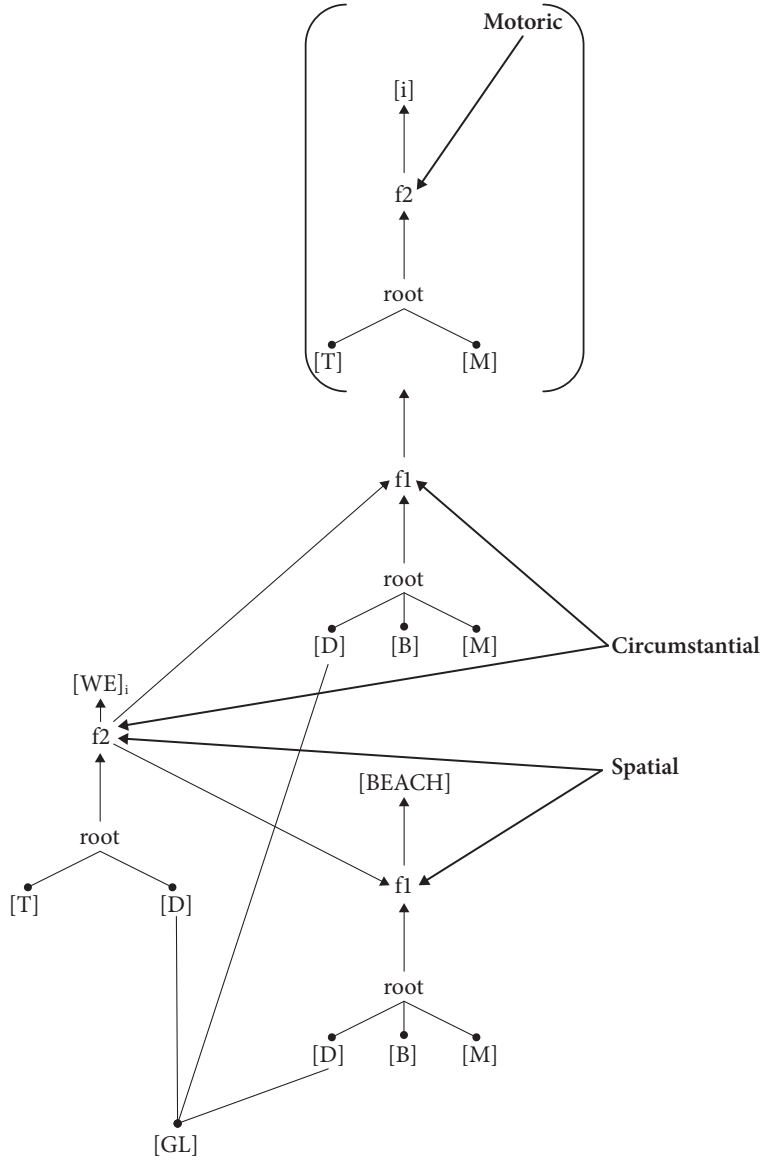
c. *Me tulimme kotiin suoraan uimasta.*
we come-PAST-1PL home-ILL straight swim-INF3-ELA
'We came home straight from swimming.'

In the examples in (15), the predicate verb *olla* 'be' (15a), mennä 'go' (15b), and *tulla* 'come' (15c) govern both the PP expressing a spatial relation 'at/to/from the beach' and the PP expressing a circumstantial relation 'being swimming.' One possibility would be to analyze these examples as conjunctions of two thematic structures but that would duplicate the whole zone 2. If we assume that the f2 can be linked to more than one semantic field, we can analyze these examples as follows:

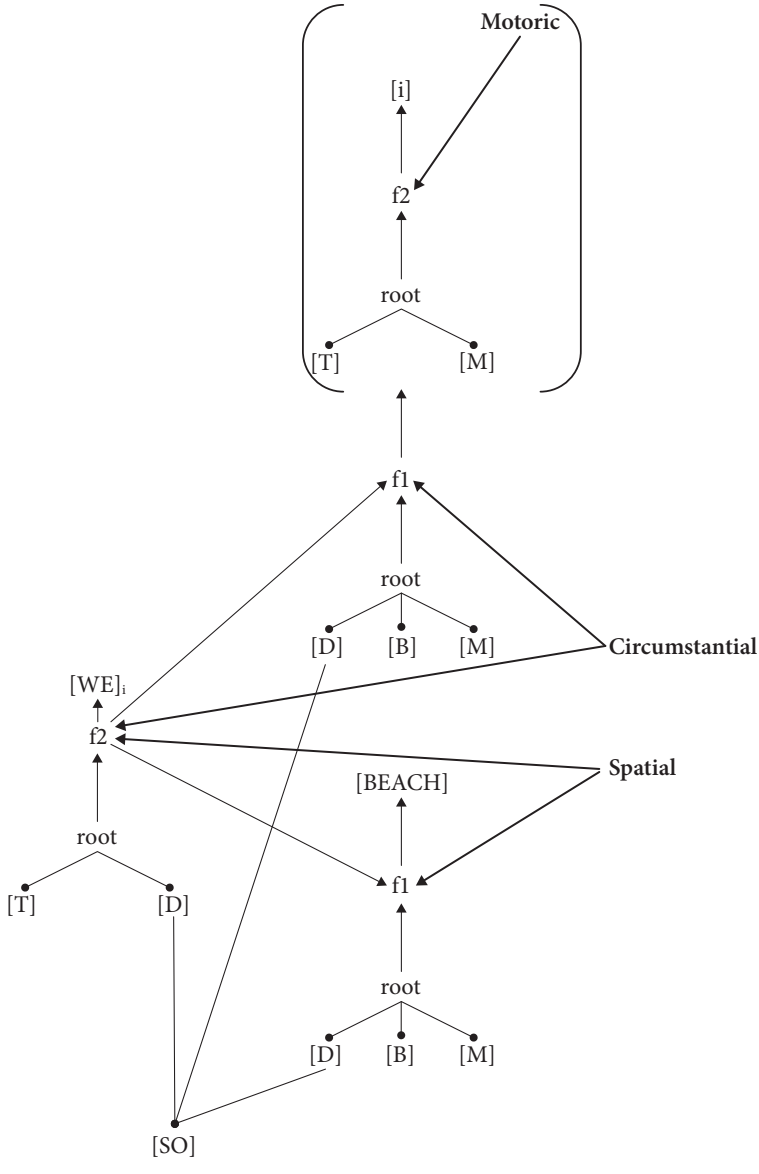
(16) a.



b.



c.



The analysis is based on the idea that the f2 may be linked to more than one semantic field but f1's must be linked to only one semantic field. The analysis above is in accord with the fact that the sentences in (15) describe both spatial and circumstantial relations. (The analysis of the infinitival verb *uida* 'swim' is here simply that it is a monadic non-causative verb associated with the motoric semantic field. The rest of the features that are associated with the lexical entry of the verb *uida* 'swim' (e.g. water, etc.) are not mentioned in the analyses above as here we concentrate on the semantic fields.)

We can formulate the following principle that governs the semantic fields of the f-chain:

F-chain Semantic Field Principle
General principle: *Each f may be linked to only one semantic field.*
Exception: *f2 may be linked to more than one semantic field.*

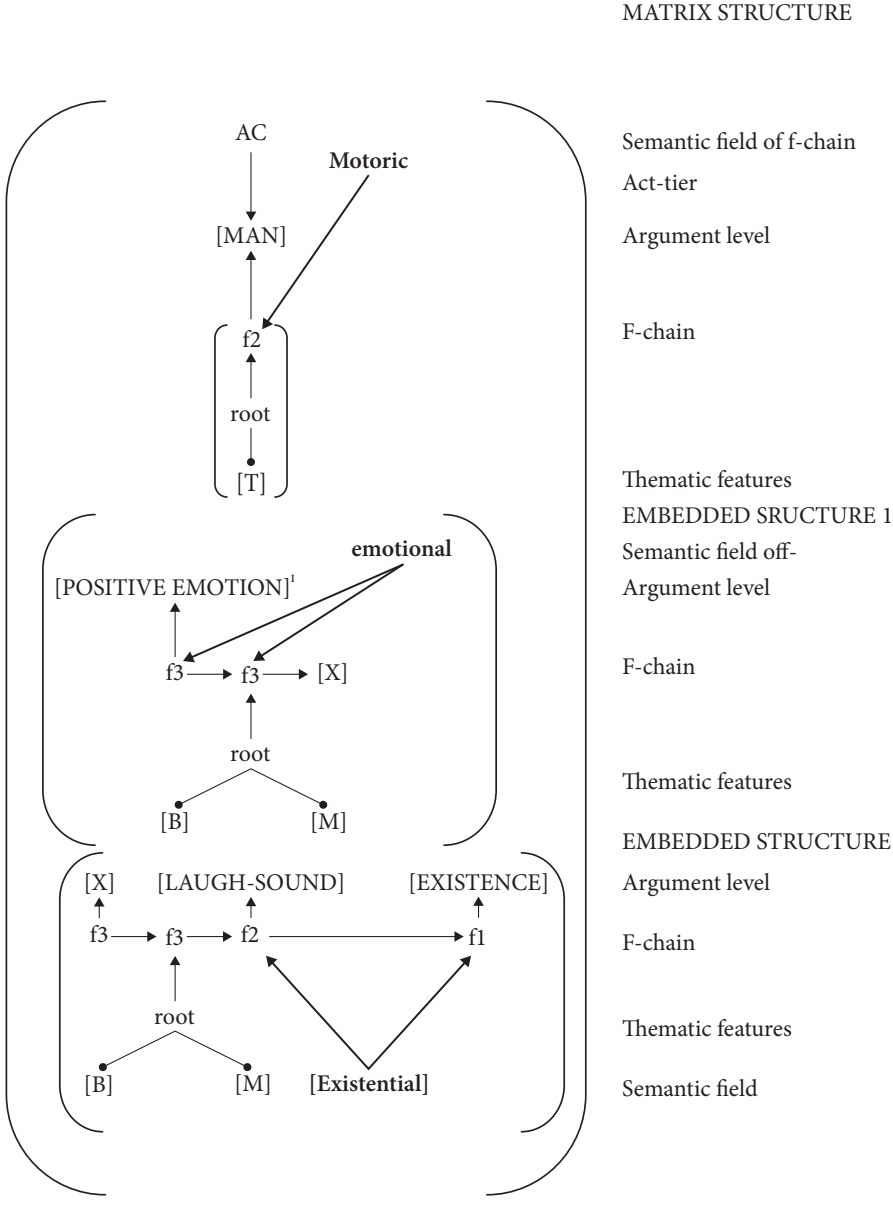
The logic of the principle above is the same as in the Argument Level Formation Principles: f2 makes an exception to the general principle. This is in accord with the assumption that f2 is the head of the f-chain.

We can now come back to those verbs that have a lexical f-chain governed by a monadic f2 and see what an analysis of the Finnish sentences *Mies nauraa* 'the man laughs' and *Mies tanssii* 'The man dances' could be. As pointed out in the section on semantic fields, the semantics of verbs like *laugh, cry, dance*, etc. is complicated because the verbs seem to be linked to both motoric action, the reason for the action, the consequences of the action, etc. In this section, I will show how these verbs may be analyzed within the Tiernet framework.

We can start with the English verb *laugh* or Finnish *nauraa*. The verb expresses certain kind of motoric activity that typically is caused by an emotion, mostly joy relief or some other positive emotion (positive emotion should be understood as a pleasant emotion from the laugher's point of view, which covers even the cases in which someone is laughing at somebody else's misfortune). Laughing can be recognized by a certain kind of sound. Laughing does not have to be a consequence of an emotion: in atypical cases it may be caused by for instance a drug or the like. In addition, laughing does not necessarily make any sound, but it typically does. in Finnish, people say that a magpie 'laughs' (*harakka nauraa*) because the magpie's "singing" sounds a little bit like human laughing.

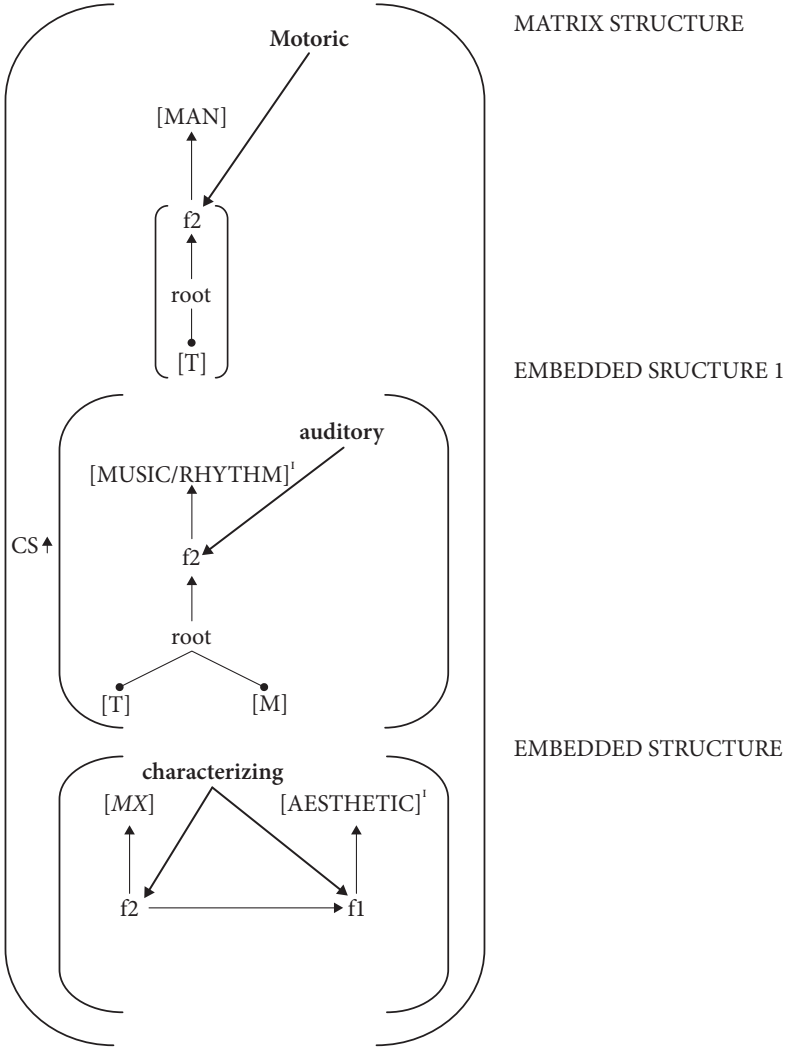
According to this intuition, the motor activity is the core of the meaning of the verbs *nauraa* in Finnish and *laugh* in English. The reason for laughing (positive emotion) and the consequence (laughing sound) are typically associated with the meaning of the verb but they are not necessary parts of it.

(17) *Mies nauraa.*
man laugh-3SG
'a/the man laughs'



The analysis of the sentence *Mies tanssii* 'The man dances' is given below. There are some innovtions in the notaton: The abbreviation ***MX*** placed in the theme argument position of the embedded structure 2 stands for "Matrix" and is coindexed with the matrix thematic level. The operator **TYP** indicates that the structure in its scope is typically – but not completely necessarily – a part of the semantics of the verb. In other words, the sentence (17) is true even if the laughing was not caused by the man having an emotion. However, it is a good guess that some emotion is the reason for laughing.

(18) *Mies* *tanssii*
man dance-3SG
'A/The man dances'



5.1.3 Semantic fields linked to functions of zone 3

Jackendoff (1990) points out that causation may be **physical**, e.g.

(19) *John pushed the door open.*

social, e.g.

(20) *The referee ordered the player to leave the field.*

or **logical**, e.g.

(21) *John's fingerprints on the gun made him the primary suspect.*

(For more detailed discussion on the physical, social, and logical semantic fields, see Jackendoff 1990.)

Nikanne (1990, 2002) also adds a **magical** semantic field to the semantic fields of zone 3. Even though educated people do not believe in magic, there are many causative verbs meaning magical causation in the Finnish and English languages, e.g. Finnsih: *taikoa, loihtia, noitua*, English: *conjure, hex, bewitch*, etc. For instance:

(22) *A spiteful fairy bewitched/conjured the handsome prince into a frog.*

(23) *Ilkeä noita noitui/loihti/taikoi uljaan*
nasty witch bewitch/conjure-PAST-3SG handsome-ACC
prinssin sammakoksi.
prince-ACC frog-TRA
'A/the nasty witch bewitched/conjured the handsome prince into a frog.'

So, there is a reason to assume that magic is a part of the conceptual system even if the speakers do not believe in magic.

Sometimes, the semantic field of causation is not expressed. For instance:

(24) a. *The joke made me laugh.*
b. *I will make this young boy into a prince.*
c. *Sain kirjan valmiiksi.*
get-1SG book-ACC ready-TRA
'I got the book ready.'
d. *The medicine cured me.*
e. *The boy got his dog out of the doghouse.*

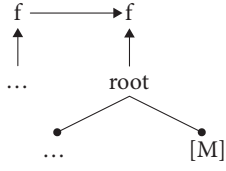
The causative verbs like *cause, make, get* etc. (22a–c,e) that express just causation do not express anything other than causation. In these cases, I would like to assume that there is no semantic field in the meaning expressed by these sentences. That solution is in accord with Occam's Razor: if there is no particular reason to assume that a semantic field is a part of the structure, then one should not assume one. The semantic field may be added in the context (cf. the feature +/− of the action

tier function UN). For instance, the sentence in (22e) does not express whether the causation is physical (the boy pulled the dog out) or social (the dog obeyed when the boy told it to come out) or magic (the boy made some magic trick that got the dog out of the doghouse).

5.1.4 The domain of the semantic fields for the f-chain

In Nikanne (1990), the domain of semantic fields for f-chain functions is the M-unit (see Chapter 3, thematic features). The M-unit is defined as an element of two functions such that the first function is not monadic but the second function is monadic, i.e. (see Chapter 3):

M-unit



The non-causative situations whose f2 is not monadic form an M-unit. Therefore the semantic field is linked to all the functions in the M-unit.

Linking between semantic fields and f-chain

a. *f may be selected by a semantic field.*
b. *Generally, f may be selected by no more than one semantic field, but f2 may be selected by more than one semantic field.*
c. *A semantic field that selects a monadic f must also select the f immediately on the left of it in the f-chain.*
d. *The domain of feature spreading for semantic fields is an M-unit.*

5.2 Modal tier

Human concepts not only tell us how things are, they are also capable of informing us how things are not, possibly are, probably are, should be, must be, may be, etc. There is an extensive philosophical literature concerning modality since Epictetus (c. 55–135) and other Stoics, and it is later discussed for instance by von Wright (1957) among others. For the present argument, however, there is no need to get into a deep philosophical discussion. In this section, the goal is very practical: to show the reasons why modality can (and, according to the guideline *Analytical organization*, should) be handled in the theory as a separate tier as well to suggest a technical solution for how it can be done.

There are traditionally two kinds of modality: epistemic, dealing with possibility and probablity, and deontic, dealing with what must or should be done. Deontic modality expresses the 'moral' necessity of doing something. The modal verbs used in English are often the same as in epistemic modality *must, should, may, have to*, etc. Some expressions are specifically deontic, like *be allowed to* and *ought to*. In Finnish, too, the epistemic verbs can often be used for deontic modality, e.g. täytyy 'must, has to,' *voi* 'may, can, is allowed to,' – and there are verbs that express just deontic modality, like *saa* 'may, is allowed to,' *kuuluu* 'may, has to,' pitää 'must, has to, etc. Nikanne (1990, 2002) proposed that the modal tier also includes negation.

The primitives of the modal tier are as follows:

Negation: NOT
Necessity: NEC
Probabilty: PRB
Possibility: PSB

These primitives are operators with a scope. In addition to the operators, the modal tier has semantic fields of its own. Following the traditional distinction, I assume that these semantic fields are *Epistemic* and *Deontic*. Negation is not associated with the semantic fields.

In the following table, the modal operators are given in the leftmost column, some examples of lexical and corresponding morphological expressions in English in the second and Finnish in the third column.
The negation operator interacts with the modal operators. As a starting hypothesis I assume that the modal tier allows the following combinations. Mod stands for

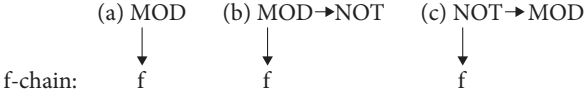
Table 5.2 Epistemic modal operators

Modal operator	English modal expression	Finnish modal expression
NEC ↑ Epistemic	*must, should, ought to*	*varmasti, pitää, täytyy, on* ('be') *V-PTC1*
NEC ↑ Deontic	*certainly, must*	*varmasti, pitää, täytyy*
PRB ↑ Deontic	*be recommended*	*on syytä, on suositeltavaa, olisi* ('be-COND') *V-PTC1*
PRB ↑ Epistemic	*probably*	*luultavasti,* potential mood

Table 5.2 (*Continued*)

Modal operator	English modal expression	Finnish modal expression
PSB ↑ Deontic	*be allowed, may*	*sopii, on mahdollista*
PSB ↑ Epistemic	*be possible, may*	*voi, saattaa, on mahdollista*

any modal operator, NOT for negation, an arrow stands for selection and scope, and f for an f-chain function:



I.e. modal operators and negation are monadic operators with a scope. Both modal operator may use their ability to selection for selecting a an f-chain function (a, b, c). A modal operator may also select negation (b) and negation may select a modal operator (c).

In the following table, the meaning of the combination of different modal operators with the negative operator is given. The modal tier combination is in the leftmost column, a description of the meaning in the middle column and examples of English adverbials in the rightmost column:

Table 5.3 Epistemic modal operators and negation

	Combination	Meaning	Examples of English adverbials
a.	NOT → PSB ↑ Epist	'It is not possible that X'	*certainly not*
b.	PSB → NOT ↑ Epist	'It is possible that not X'	*possibly not*
c.	NOT → PRB ↑ Epist	'It is not probable that'	*probably not, hardly, unlikely*
d.	PRB → NOT ↑ Epist	'It is probable that not'	*probably not, hardly, unlikely*

(*Continued*)

Table 5.3 (*Continued*)

	Combination	Meaning	Examples of English adverbials
e.	NOT → NEC ↑ Epist	'It is not necessary that X'	*not necessarily*
f.	NEC → NOT ↑ Epist	'It is certain that not X'	*certainly not, never*

Note that there are equal implications for the following pairs:

NOT → PSB = NEC → NOT
NOT → PRB = PRB → NOT
NOT → NEC = PSB → NOT

Should one then abandon some of the primitives, in order to have a simpler system with only three primitives: NOT, NEC, and PRB?

In his modal logic, von Wright (1957) uses the primitive "permission" and negation, which also gives us necessity: (given that A is an action,) if it is not permitted that not A, then A is obligatory. In the same way, of course, we can use the primitive "possible" and negation and get necessity: if it is not possible that not A, then A is necessary.

Keeping this in mind, we have reasons to use the three primitives and negation. One reason is that it is closer to the lexical and grammatical systems of the languages we have been analyzing (Finnish and English). In addition, the implications of PRB 'the possibility that X is bigger than the possiblity than NOT (X)' cannot be expressed by the other modal operators. The same goes for the operator PRB in the deontic field, i.e. the meaning expressed in English by modal verbs like *should, ought to*,' etc. ('the moral acceptance of X is bigger than not X'). – However, the formalism may be simplified without rejecting the idea of the need for the modal tier or the analysis that the modal tier is linked to semantic fields.

Deontic and epistemic modality can be combined, e.g. in English: *it is possibly allowed, I certainly should*; and in Finnish: *luultavasti saa* 'probably it is allowed,' *varmasti pitää* 'certainly one must,' etc. When combined, the deontic modality is always in the scope of the epistemic modality. This is intuitively quite easy to understand: it does not make much sense to give a moral judgment on the possibility of doing something. However, this intuition must be regulated in the theory somehow.

The suggested difference between deontic and epistemic modality is the semantic field: epist vs. deontic. I will at this point just stipulate it as a principle:

Modal tier scope principle
Two modal operators may select the same f if the modal operators are linked to different semantic fields (deontic and epistemic). In this case, the modal operator associated with the epistemic field has scope over the modal operator associated with the deontic field.

Note that the word order in linguistic expressions does not affect the reading. Here are some examples from Finnish:

saa varmasti/luultavasti/ehkä = varmasti/luultavasti/ehkä saa
'may certainly/probably/possibly = certainly/probably/possibly may'
sopii varmasti/luultavasti/ehkä = varmasti/luultavasti/ehkä sopii
'is-allowed certainly/probably/possibly = certainly/probably/possibly is allowed'
täytyy varmasti/luultavasti/ehkä = varmasti/luultavasti/ehkätäytyy
'must certainly/probably/possibly = certainly/probably/possibly must'

In English, the negation of the word *must* (NEC [deontic]), i.e. *must not,* means 'is not allowed,' i.e. NOT (PSB [deontic]). In Finnish most of the words meaning the same as must work in the same way *pitää* 'must,' kuuluu 'must,' vs. *ei pidä* 'is not allowed,' *ei kuulu* 'is not allowed.' In Finnish, the most frequent verb for deontic necessity, *täytyy* 'must,' behaves differently: the negation *ei täydy* means 'is not necessary (in a moral sense),' i.e. NOT (NEC [deontic]). In English, the verb need to behaves in the same way: not need to 'be not necessary to.' The following table shows the combinations, their meanings and examples of English expressions:

Table 5.4 Deontic modal operators and negation

	Combination	Meaning	Examples of English
a.	NOT → PSB ↑ Deontic	'It is not allowed to'	*must not*
b.	PSB → NOT ↑ Deontic	'It is allowed not to'	*not have to, not need to*
c.	NOT → PRB ↑ Deontic	'It is not recommended that'	*is not recommended*
d.	PRB → NOT ↑ Deontic	'It is recommended not to'	*is not recommended*

(*Continued*)

Table 5.4 (*Continued*)

	Combination	Meaning	Examples of English
e.	NOT → NEC ↑ Deontic	'It is not necessary that X'	*is not necessary; not need to*
f.	NEC → NOT ↑ Deontic	'It is necessary not to'	*must not*

One can see that the meanings of the negations of the modal operators form pairs in the same way as in epistemic modality, i.e.:

NOT → PSB = NEC → NOT
NOT → PRB = PRB → NOT
NOT → NEC = PSB → NOT

5.3 Summary

In this chapter, we have discussed semantic fields on one hand and the modal tier on the other.

The thematic features are in a separate tier that selects functions in the f-chain. The zone structure and the M-units – and therefore also thematic features – play a role in the linking between semantic fields and the f-chain. M-units are the domains within which the semantic field must be sh ared between the f-chain functions. Zone 3 has its own semantic fields. Zones 2 and 1 share a part of the semantic fields (spatial, possessive, temporal, circumstantial, and existential) but zone 2 has semantic fields of its own. I have suggested above such fields as motoric, auditory, aesthetic, etc. The zone 2 function is also the only function in the f-chain that can be linked to more than one semantic field. As pointed out in Chapter 3, the zone 2 function is the head of the f-chain, and therefore it is natural that zone 2 also has the richest selection of choices when it comes to the semantic fields f2 can be linked to.

The modal operators – both deontic and epistemic – are placed in their own tier. It is well known that the modal operators form a system of their own. According to our methodological guideline of *Analytical organization* (see Chapter 2), modality belongs to a tier of its own. I suggest that the modal tier functions select functions in the f-chain. The goal of the sketch of the modal tier is to show that modality can be treated as a separate tier and that it makes sense to analyze the modal operators as small networks of micro-modules.

The modal operators are put to use in Chapter 7 in which we discuss embedded sentences.

PART III

“Syntax”

CHAPTER 6

The lexicon and argument linking

In this chapter, we will discuss the linking between the argument level and the syntactic functions subject and object. The linking is based on three levels: (i) the argument level, (ii) the DA-system that represents the lexically determined "logical subject" and "logical object," and (iii) the GF-system including the grammatical functions subject and object. The chapter discusses the relevant parts of the lexical entries of predicates and the principles that govern the linking between the argument level, DA-system, and GF-system.

6.1 The lexicon

6.1.1 General notes

As discussed in Chapter 2, the lexicon, constructions and morphology are **symbolic modules**, which means that they do not have primitives of their own. They link together fragments of representation from the primary modules.

The lexicon consists of three kinds of information:

1. Lexical entries contain information on lexicalized fragments of representation, i.e. lexical entries.
2. The fragments may be linked to each other in a specified way, which does not follow from the more general principles. This information is specified in lexical entries.
3. The lexion as a part of the linguistic system contains information on the relationships between lexical entries. The information on the relations between the lexical entries includes for instance the derviational morphology: derivative affixes function as indices of the syntactic category and the semantic group of words to which the word most probably belongs. For instance, the Finnish deverbal frequentative suffix *ele* indicates that the word is a verb and it refers to a repetition of the action expressed by the meaning of the root verb means. In addition, the repetition is not rhythmically even and the actor does not take the action very seriously (see e.g. Wiik 1975).

6.1.2 Lexical entry

Each lexical entry is a package of information, and more information on the concept can be added to it on the basis of the speaker's experience. A very simplified example of a lexical entry is the following description of the lexical entry for the Finnish word *sika* 'pig' (see Nikanne 2002; for more details on the associations of the word *sika* in Finnish, see Petrova 2011):

(1)

(1) Melody (phonology): /sika/

Syntactic category: N

Conceptual category: thing

Animacy: animate

Humanity: non-human

Prototypical visual appearance:

Prototypical sound: [rœh]

…

Etc.

As the speaker learns more about pigs, he or she can add more information to the package and omit information that is not valid. So, a farmer may have different information packaged in the entry for *sika* than a person who has lived in a city and never seen a living pig.

The idea is that the lexical entry includes those pieces of representation that do not follow from the system, i.e. the formation principles of primary modules or the regular linking principles. We can take a look at the phonological part of the example above. Here are some points, which, I hope, will make the idea of lexical entries more concrete:

The melody of the word *sika* consists of the consonant /s/, vowel /i/, consonant /k/, and vowel /a/. Then, the CV-tier is CVCV, which, according to the syllabification principles of the Finnish language, is divided into two syllables: *si* and *ka*. In Finnish syllabification goes "from left to right" and the syllable boundary is set before a C that is followed by a V. So, there is no need to mark the syllables in the lexical entry.

According to the Finnish principles of word stress, the main stress is always on the first syllable, and the last syllable of a multi-syllabic word is unstressed.

Therefore, we do not need to mark the stress in the lexicon in Finnish. – In languages like Russian, in which the lexical stress is not assigned by a general principle, it must be marked in the lexicon.

When inflected in case forms, the the word *sika* undergoes a stem formation process called qualitative consonant gradation: in Standard Finnish: single *p* alternates with *v, t* with *d,* and *k* with zero. The consonant will be affected when the case ending closes the syllable whose onset the consonant is. E.g. NOM: *si.ka* GEN: *si.a-n*, INE: *si.a-s.sa*, ABL: *si.a-l.ta*, PAR: *si.ka-a*, ESS: *si.ka-.na*. The qualitative consonant gradation is not a completely productive principle: most new loan words do not undergo the qualitative consonant gradation, e.g. *muki* 'mug' : GEN: *mu.ki-n* (see Karlsson 1983). We must therefore decide whether to mark the gradation or non-gradation in the lexicon. If we decide that the qualitative consonant gradation is a principle in Finnish grammar, then we do not mark it in the lexicon and the stem formation follows that principle. In this case, the new loan words are marked in the lexicon with an index that blocks the principle.

We will follow the same kind of reasoning throughout the system. This is in accord with the methodological guideline *regularities before irregularities* (see Chapter 2). If there is a regular principle that can take care of the formation or linking of a lexical entry, then we let it do that. In the lexical entry we will mark those things that make the word special or are exceptions to the general principles.

The melody of the the word is a code that gives access to the lexical entry in language comprehension. For instance, imagine you hear someone say (2):

(2) *Poliisi jahtasi sikaa torilla.*
police chase-PAST-3SG pig-PAR market-place-ADE
'A/The policeman was chasing a pig in the market place.'

(Given that you are fluent in Finnish), you hear that the syllable *si* has the main stress and the following main stressed syllable is the syllable *to* (the first syllable of the word form *to.ri-l.la* [market-place-ADE] 'in the market place'). Then you know that the melody *sikaa* must be a word form. The case ending of the partitive case is *a* after a stem that ends with a back vowel. The partitive ending does not trigger consonant gradation, so the stem must be *sika*. The melody *sika* can be found in the Finnish vocabulary, in a lexical entry something like (1). When you have applied a set of linking rules (which we will discuss shortly), and checked that the rest of the content of the lexical entry of *sika* is compatible with the sentence as a whole, you understand that the speaker is telling you that a policeman has been chasing a pig in the market place.

A lexical entry is thus a fragment of the micro-modular network. The speaker may add and erase the links according to his experience of the concept expressed

by the word in question. The fragment must of course follow well-formedness principles in the sense that it does not contain illegal links. We will shortly discuss the lexical entries of predicates. It will turn out that predicates are incomplete fragments of the micro-modular network, and must be complemented with the information that can be found in the lexical entries of other words (or sometimes with the information given in the context). There is also another way to describe what a lexical entry is. The description of a lexial entry is not a full definition of the lexical entry in question but it is a crucial part of it.

Lexical entry
A lexical entry is a fragment of the micro-modular network. Lexical entries are stored in the lexicon and cannot contain illegal links.

That said, we must define the term *illegal link*:

Illegal link
An illegal link is a representation of an internal or external link that is disallowed by the formation principles of representations or linking principles between representations.

The counterpart "legal link" is of course a link that obeys the priniciples of formation an linking. This whole book is a definition of legal links.

6.1.3 A word on inflection and derivation

When it comes to derivational morphology, I follow the lexical hypothesis of Chomsky (1970) and give the derived words their own lexical entries. As Chomsky points out, there are many irregularities in the relationships between the root and the derived word, unproductive derivations, and derived words whose root is not in the lexicon. On the other hand, some of the derivations are very productive. In Finnish, for instance, the general nominalization suffix *minen* [istu-minen [sit-MINEN] 'sitting,' syö-minen [eat-MINEN] 'eating') and the deverbal agent suffix *ja/jä (istu-ja* [sit-JA] 'sitter, someone who sits,' *syö-jä* [eat-JA] 'eater, someone who eats') can be applied practically to all the verbs. Therefore, the decision is not completely self evident.

I would still make a distinction between derivational and inflectional morphology. We can use the following metaphor: the derived words have the right to live their own life but they normally choose to stay close to the words with the same derivational morphology. In other words, each derived word has a lexical entry which is in principle an independent package of information, and new information can be added to the package. For instance the minen-derivations *syöminen* [eat-MINEN] and *juominen* [drink-MINEN] may refer not only to the action of eating or drinking (see (3a)) but also to 'food, something to eat' (3b) and 'drink, something to drink' (3c):

(3) a. *Kunnollinen syöminen ja juominen on*
Proper eat-MINEN and drink-MINEN is
urheilijalle tärkeää.
athelete-ALL important-PAR
'It is important for an athelete to eat and drink properly.'

b. *Ruisleipä ja pinaatti ovat hyvää syömistä*
rye-bread and spinach are good-PAR eat-MINEN-PAR
raudanpuutteesta kärsivälle.
iron-deficiency-ELA suffer-PRESPTC-ALL
'Rye bread and spinach are good food for iron deficiency.'

c. *Ota kaapista jotain juomista, jos*
take-IMPERAT closet-ELA something drink-MINEN-PAR, if
on jano.
is thirst
'Take something to drink from the closet if you are thirsty.'

Syöminen [eat-*minen*] and *juominen* [drink-*minen*] are not at all the only exceptions among the *minen*-words. For instance *tapaaminen* [meet-MINEN] can refer to 'meeting, get-together' and *kuuluminen* [sound-MINEN] to 'news, i.e. something interesting that has happened lately that the listener does not know about,' etc. Nominalization with the suffix *minen* is as productive as derivational morphology can be. Most derivative word groups are even less homogenous. Note that this is not the same thing as what happens when an inflectional form is used exceptionally. Inflectional forms may be used exceptionally in constructions, whereas the derived words that stand out of their group are used like any regular lexical items according to the information included in their lexical items.

In addition, inflectional morphology shows the syntactic and syntactico-semantic relations between words in the same sentence. For instance, the subject is marked with the subject case and the object with the object case. Here are some other examples from Finnish:

In Finnish, the predicate verb agrees with the subject in number and person:

(4) *Minä lue**n** kirjaa : sinä lue**t** kirjaa : tyttö lukee*
I read-1SG book-PAR : you read-2SG book-PAR : girl read-3SG
*kirja**a** : me lue**mme** kirjaa : te lue**tte** kirjaa :*
book-PAR : we read-1PL book-PAR : you read-2PL book-PAR :
*tytöt luke**vat** kirjaa*
girl-PL.NOM read-3PL book-PAR

The examples in (4) are Standard Finnish. In most dialects, in 3PL the verb is in the 3SG form instead of 3PL, and the verb is in the passive form if the subject is 'we.' When it comes to other forms, the agreement system is followed very strictly.

In addition, for instance, the NP specifier of an NP or AP must be in the genitive case in Finnish:

(5) [$_{NP}$ NP-**GEN** [$_{N'}$ [N]]]
a. *Tytö**n*** *kirja* : *tytö**n*** *kirjasta*
girl-GEN book : girl-GEN book-ELA
'the girl's book' : 'about/from/out of the girl's book'
b. *leivä**n*** *syöminen* : *leivä**n*** *syömiselle*
bread-GEN eat-MINEN : bread-GEN eat-MINEN-ALL
'eating bread' : 'for/to eating bread'

(6) [$_{AP}$ NP-**GEN** [$_{A'}$ [A]]]
*piru**n*** *kiva* : *piru**n*** *kivoja*
devil-GEN nice : devil-GEN nice-PL
'very nice' : 'very nice' (partitive form)

In addition, there are also agreement and concord principles that show that certain words belong together, e.g. the number and case agreement of the AP specifier of NP in Finnish. The AP specifier must agree with the head noun in case and number:

(7) *vanha**a*** *kirja**a*** : *vanha**sta*** *kirja**sta*** : *vanho**ista*** *kirjo**ista***
old-PAR book-PAR : old-ELA book-ELA : old-PL-ELA book-PL-ELA
'old book' (partitive) : 'about an old book' : 'about old books'

These kinds of effect may happen even at a distance, as is the case in the Finnish perfect tense: the main predicate (wrt. argument structure and meaning of the sentence) is in the past partiticipial form while the auxiliary verb *olla* 'be' agrees with the subject. The participial main predicate must still agree with the subject in number:

(9) a. *Poliisi on jahdan**nut** sikaa torilla.*
police be-3SG chase-PASTPTC pig-PAR market-place-ADE
'A/The police(man) has chased a pig in the market place.'
b. Poliisi**t** o**vat** jahdan**neet** sikaa torilla.
police-PL be-3PL chase-PASTPTC-PL pig-PAR market-place-ADE
'(The) policemen have chased a pig in the market place.'

One major function of inflectional morphology is to help make the relations between words visible. The inflectional forms interact with each other "horizontally" at the same level of representation without referring to the lexicon. The derivational morphology does not do that: it belongs to the lexicon. – Inflectional forms may be linked to meaning, e.g. the locative cases in Finnish correspond semantically the most common English prepositions *in, on, from, to, of*, etc. However, the case forms are not linked to the meaning when triggered by agreement principles (as seen above).

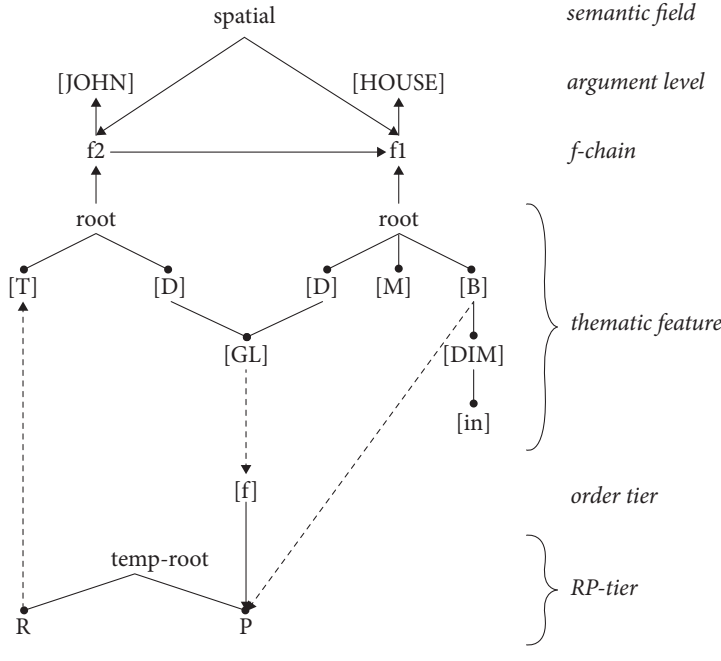
The principal difference between inflectional and derivational morphology can also be seen in traditional grammars: the inflectional categories form tight systems and subsystems – person, number, tense, mood, grammatical cases, locative cases, etc. – whereas the derivational categories do not.

6.1.4 The semantics in the lexical entries of predicates

In the first section of this chapter, we discussed the methodological guideline *Regularities before irregularities* and the policy that the lexical entry should only contain information that does not follow from the general principles. This policy will show its nature when discussing the lexical entries of predicates. In this section we will see how the formation and linking principles interact with the lexicon, and what kind of information is needed in the lexical entries of predicates.

To keep this discussion concrete, let us see what kinds of ingredients the English sentence *John went into the house* needs. The f-chain, argument level, thematic features, semantic field, RP-tier and order tier of the sentence are as follows:

(10) *John went into the house.*



The starting point here is that there is nothing exceptional in the sentence. The **RP-tier and** the **order tier** are dependent on the thematic features, therefore we do not need to mark them in the lexical entries. The **argument level** is dependent on

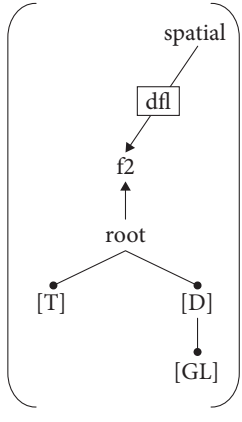
the f-chain, so there is no need to mark it in the lexical entries. The semantic field cannot be derived from any other part of the structure.

The **semantic field** is not dependent on any other tier. We could argue that the verb *go* is a general verb for change, and the preposition *into* a general preposition for goal, and the spatial semantic field is not marked in their lexical entries. However, the spatial field must be a part of the possibilities for these words, as the default interpretation of the sentence *John went into the house* is spatial. The interpretation is based on the combination of the f-chain, thematic features, and the argument level plus our world view: the theme argument is a human being (at least has a human name) and the goal argument is a building.

The sentence has four words – *John, go, into*, and *house* – and our model should show how they can stored and combined so that the result is the one in (10). The nouns *John* and *house* are simple in this respect (but less simple in many other ways). They both belong to the conceptual category thing and are linked to arguments. The verb *go* and the preposition *into* are predicates, and we will now see how their lexical semantics is linked together and to the lexical semantics to the words *John* and *house*.

The verb *go* expresses a situation and is not causative. Therefore it is has the f-chain function f2. More precisely, it expresses a movement. Movement is a combination of features [T] and [D]. So, we will have these in the lexicon as the features of the f2. As discussed earlier, the verb *go* is used typically to indicate spatial movement but it can express other semantic fields as well. We will add the semantic field *spatial* as a part of the lexical semantics of *go* and mark the strength of the link between the f2 and the spatial semantic field as default (abbreviation dfl on the selection arrow):

(11) the lexical semantics of *go:*

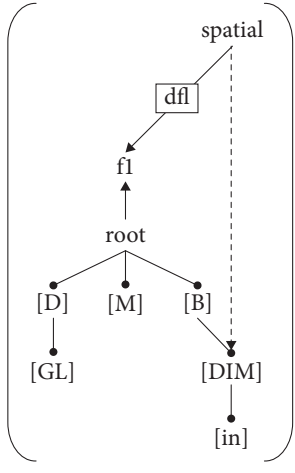


Note that the verb *go* may indicate movement in any direction but the goal path is always present. It is slightly odd not to express the goal path. We do not normally

say *??John went from the house*. We add the goal path – e.g. *away* or *out of* in the sentence*: John went away from the house* or *John went out of the house*. Therefore, we have to mark the feature [GL] as a lexical feature of *go*.

The preposition *into* expresses a path, which means that it has a lexical f-chain that is governed by an f1. The spatial field is by default linked to the f1. The spatial meaning is also typically listed first in dictionaries. The preposition *into* may also be used to express circumstantial semantic field, as in sentences *John got into trouble* or *John went into farming* (examples from http://www.merriam-webster.com/dictionary/into). The preposition *into* indicates a goal path and therefore the feature [GL] is a part of its lexical meaning. The semantic part of the lexical entry is given in (12):

(12) Lexical situation structure of the preposition *into*:



According to the principle *[DIM] as a spatial feature*, the feature DIM and its subfeatures are allowed by the spatial field and they can be present only when the semantic field is spatial (see Chapter 3). So, for instance, they are not a part of the semantics of such sentences as for instance those in which the semantic field is circumstantial. The allowance is marked in the lexical entry in (12) for clarity. In principle, it is not necessary, as the allowance follows from a general principle.

Now we are ready to check how the proposed lexical entries work in practise. The goal is to combine the lexical fragments of situation structure and make sure that the result follows well-formedness principles.

This is one way to do it:

1. According to the *f-chain schema*, the f2 is an obligatory part of the situation structure. We can start with the lexical entry of *go*.
2. The f2 in the lexical f-chain requires an argument according to *argument level selection principle A* as all functions without the feature [M] must select an

argument. We have two possible candidates for the argument of f2: *John* and *house*. We will return to the argument selection shortly.

3. According to the *argument level selection principle B*, no function can have more than one argument. The f2 in the lexical entry of *go* is not monadic, so it must make at least one more selection. The rest of the selected elements must be functions. And the *f-chain schema* requires that there is always one but never more than one f2 in the f-chain. The f-chain schema requires also that the selected function is f1. We can find this f1 in the lexical entry of *into*.
4. The function f1 is monadic, but it must still make one selection, either an argument or another function. There is an argument available in the lexical entry of *house*.
5. There is one more thing to do. The lexical entry of the preposition *into* has the feature [D] and so does the lexical entry of the verb *go*. We must establish a principle that allows the unification of these features:

   Unification of D-features
   When combining lexical entries, the D-features of f2 and f1(s) are unified.

   Unification is afrequently used operation. We do not need to start a long set theoretical discussion. It is enough to remember that when we unify two sets {x, y, z} and {f, x, y, k, w}, the result of the unification is {f, x, y, z, k, w}. The matching parts are merged together and the parts without an identical counterpart are taken into the new set as such. According to the principle of *unification of D-features*, we can accept the feature sharing of the D-features found in the lexical entries of *go* and *into*.
6. Now, we have the structure we wanted.

The procedure above shows what it means to say that the lexical entries of the verb *go* and the preposition *into* must be complemented in order to satisfy the formation and linking principles. We can call these kinds of lexical entry *incomplete*. We can now define linguistic predicates as follows:

Linguistic predicate
A linguistic predicate is a lexical item with an incomplete lexical entry.

We started with the verb but we could also have started with the preposition. The f-chain requires that there is always one f2 in the f-chain. Therefore, to satisfy this requirement, an f1 must be completed with an f2 that can select it. In our example, this f2 can be found in the lexical entry of the verb *go*. (See Nikanne 1990 and Nikanne and Östman 2006 for a discussion on this procedure.)

6.2 Argument linking: Linking between argument tier and syntactic functions

6.2.1 Argument level, lexically determined arguments and syntactic functions

In linguistic theories of argument structure, the term *argument* has often been used in fuzzy ways. The argument may mean either a semantic argument or a syntactic argument. We have defined the semantic arguments as positions in the argument level and thus avoided the fuzziness of definition of semantic roles that is common in grammatical literature. In syntax, argument often refers to those NP's that are selected by a verb and whose syntactic function is subject, object, or indirect object. Some theories use the term argument for any word or phrase selected by any predicate. In this section, we will concentrate on subject and object.

As is often the case with traditional theoretical terms in linguistics, they are used in many ways. To give an example, according to the online Oxford Dictionaries Online, the grammatical subject is defined as follows: "In a statement clause, the subject: comes at or near the beginning of the clause, comes before the verb, agrees with the verb in number and person, often denotes the doer of an action. It also often gives a clear idea of what the sentence is about" (Oxford Dictionaries, s.v. *subject*). The grammatical object is defined as follows: "a noun or noun phrase governed by an active transitive verb or by a preposition" (Oxford Dictionaries, s.v. *object*). The definition of the term object is somewhat circular, as the term transitive verb is by definition a verb "able to take a direct object" (Oxford Dictionaries, s.v. *transitive*). The definition of subject is more interesting to us: the definition combines both morpho-syntactic information (word order, agreement with the verb), semantic information ("doer of an action"), and information structure ("what the sentence is about").

The micro-modular view of the subject is that those aspects that are mentioned in the Oxford Dictionaries' definition of subject, i.e. word order, morpho-syntax, semantics and information structure, are all linked to the syntactic function subject. In different languages the links may differ. For instance, in English the link between subject and word order is very strong whereas in Finnish it is not.

Another observation concerning the Oxford Dictionaries' definitions of subject and object is that the terms are strongly linked to the lexicon. In the definition of object, the link is stronger as the object is said to be "governed by an active transitive verb or by a preposition". The definition of subject makes the connection less directly but the semantic element "the doer of an action" refers to the action expressed by the main verb of the sentence.

Traditional grammars make a distinction between the terms "grammatical" subject and object and "logical" subject and object. The terms logical subject and logical object refer to an argument that typically appears as the subject or object, respectively, but in passive and other constructions gets another status. For instance, the logical object of the verb *write* is the subject of the sentence *The book is written by me*. Actually, there is no logic behind the term logical object. There is only the knowledge that the argument *book* is in some "normal conditions" the object of the verb *write*. Therefore, the logical subject and logical object should be placed in the lexicon. The logical subject and logical object are lexical properties as they stay the same regardless of the syntactic constrution.

According to Nikanne (1997a), the link between the syntactic arguments subject and object and the argument level is not direct and involves an intermediating module within the lexicon. This module corresponds to the concepts of logical subject and object.

This module is called the DA-system (DA is an abbreviation for "direct argument.") A very similar system has also been suggested for instance by Culicover and Jackendoff (2005).

Direct arguments (DA's) can be defined as follows:

DA-system

a. *DA is a function that intermediates between the argument level and the grammatical functions. A DA*
   i. *selects one argument among the arguments that are generated by the lexical f-chain or listed in the lexical entry*.
   ii. *selects one grammatical function (subject or object)*.
b. *The primitives of the DA-system are of two kinds: DA1 and DA2. These primitives are hierarchically ordered: DA1 > DA2*.

In addition, we need to define the grammatical functions (GF's). The grammatical functions do not behave in the same way in all languages, in micro-modular terms: the grammatical functions are not linked to other modules in the same way in all languages. Nevertheless, cross-linguistically, being a subject or object of the sentence gives an NP a special status among the NP's in the sentence. Metaphorically, the subject and object have special "rights": the right to have a grammatical case, the right to have a particular word order position, the right to trigger an agreement in the verb, the right to be the topic of the sentence, etc. It is widely known that these "rights" differ somewhat from language to language, so we do not want to use them in the definition of subject and object. We can therefore stipulate that there is an abstract system behind subjecthood and objecthood, and that the "rights" of the subject and object are a consequence of linking between this abstract system and other micro-modules, like word-order, information structure, the case tier, etc.

GF-system

a. *GF is a function that selects an NP and is selected by a DA.*
b. *The primitives of the GF-system are SUBJ (subject) and OBJ (object).*
c. *SUBJ and OBJ are hierarchically organized: SUBJ > OBJ*

Two clarifications are in order: (i) The two primitive GF-system works in Finnish and English. I do not want to rule out the possibility that there are languages with more or fewer GF's. In addition, the terms SUBJ and OBJ refer strongly to accusative languages. The idea is however, that there is an abstract system of grammatical functions and they are linked to the NP's of the sentence on one hand an to the lexicon on the other. At this level of abstraction, the idea is not restricted to accusative languages.

Next, we must link the grammatical functions with the direct arguments. The system has three steps:

1. Finding the arguments that may appear as direct arguments.
2. Setting the direct arguments in a hierarchical order.
3. Linking the direct arguments to the syntactic functions subject and object.

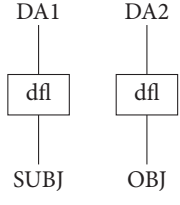
In more detail, these three steps are based on the following **argument linking principles**:

The argument linking principles

Step 1
a. *If an argument is not implict, it is a potential direct argument.*

Step 2
b. *The potential direct argument selected by the function with the scope over the largest number of other functions in the same lexical f-chain is linked to DA1*
c. *The potential direct argument selected by the function with the scope over the next largest number of functions in the same lexical f-chain is linked to DA2.*
d. *If the selection of direct arguments by DA1 and/or DA2 is specified in the lexicon, the lexically specified selections overrule (b) and (c).*

Step 3
e. *Default linking between DAs and grammatical functions (in Finnish and English) is as follows:*



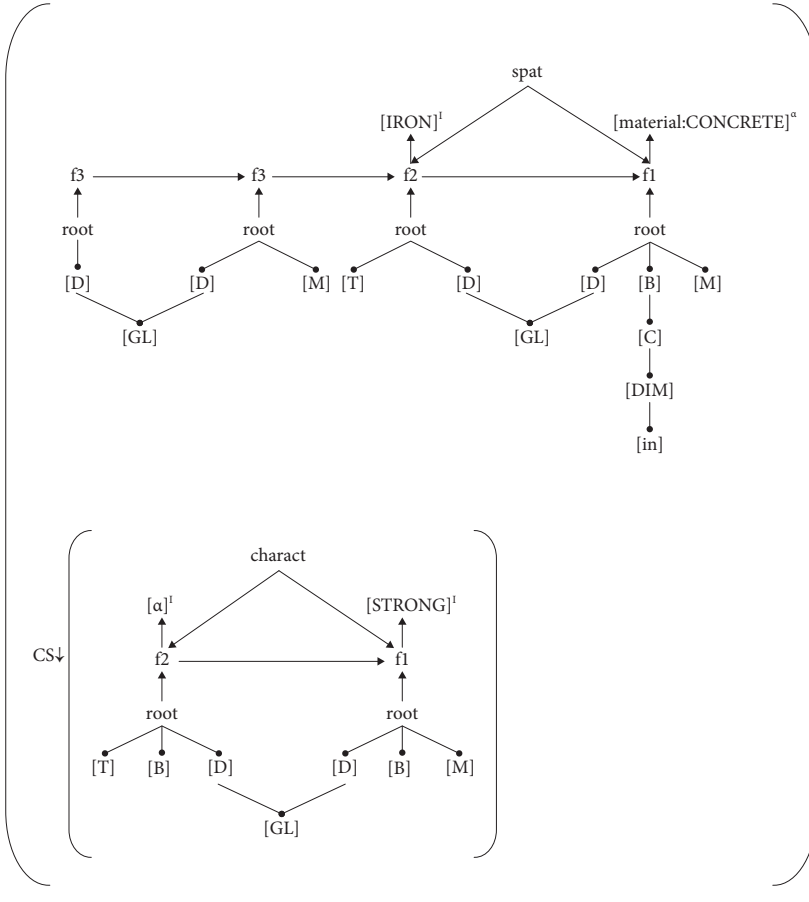
Implicit argument means, in technical terms, an argument that is lexically marked with an index that blocks the selection by a DA. Therefore, the argument is not

linked to any NP. A typical case of an implicit argument is for instance the Finnish verb *raudoittaa* 'mount with iron.' The verb is used as a building term and refers to putting iron into the construction, typically concrete so that it becomes stronger. The theme argument 'iron' is not expressed as an NP:

(11) *Työmiehet raudoittivat sillan.*
worker-PL mount-with-iron-3PL bridge-ACC.
'The workers reinforced the bridge by (mounting it with) iron.'

The reader who knows the verb *raudoittaa* understands that the theme argument is iron. Note that the object is the NP silta 'bridge.' It is expressed in syntax. The default way to understand the sentence is that the bridge is made of concrete. Therefore, the information on concrete must be present in the lexical entry, too. The lexical f-chain, thematic features, and argument level are as follows:

(12)



The superscript index I stands for "implicit." Thus, the theme argument of the matrix structure ('iron') is not linked to syntax. The arguments in the embedded

structure ('in order to make the concrete stronger') are also implicit. The goal argument of the matrix structure has inbuilt information, namely that the material is concrete. According to Jackendoff (1983, 1990), this kind of lexical information will be "fused," i.e. unified with the lexical information that is added in argument linking. For instance, in Example (11), the argument linked to this position is *silta* 'bridge.' Then, the lexical information *silta* 'bridge' is unified with this information, and we know that the bridge is made of conrete even though "no one has said it."

Now we can go through how the argument linking principles work in this case. Only the f-chain and argument level are relevant here. We must start with argument level selection principles, and then go to argument linking principles:

Argument level selection:

1. The leftmost f3 of the matrix f-chain must select an argument because the general principle requires that every function must select an argument if they are not monadic.
2. The second f3 of the matrix f-chain is monadic, so it can select either an argument or another function, but because of the f-chain schema, it must select a function of zone 2. This is also specified in the lexical f-chain.
3. The f2 of the matrix f-chain is not monadic and must select an argument. The argument is already specified in the lexical argument level, and the argument is marked implicit.
4. As a monadic function, the f1 of the matrix f-chain must select an argument or another function. The lexical argument level specifies that the f1 has an argument. In addition, the lexical argument level specifies a property for the argument: it is made of concrete.
5. The f2 in the embedded f-chain must select an argument because it is not monadic and because the functions of zone 2 must always select an argument. The argument is marked as implicit coindexed with the argument of the f1 in the matrix f-chain.
6. As a monadic function, the f1 of the embedded f-chain must select an argument or another function. The argument of the f1 is specified in the lexical chain, and is marked implicit.

Now we have an argument level and can go to linking it to the DA-system.

We take the step 1 first. According to principle (a) of the argument linking principles, the potential direct arguments are determined as follows:

1. The argument of the f3 in the matrix f-chain is a potential DA beacause it is not implicit.
2. The argument of the f2 in the matrix f-chain is marked as implicit and is therefore not a potential direct argument.
3. The argument of the f1 in the matrix f-chain is not marked as implicit and is therefore a potential direct argument.

4. The argument of the f2 in the embedded f-chain is marked as implicit and is not a potential direct argument.
5. The argument of the f1 in the embedded f-chain is marked as implicit and is not a potential direct argument.

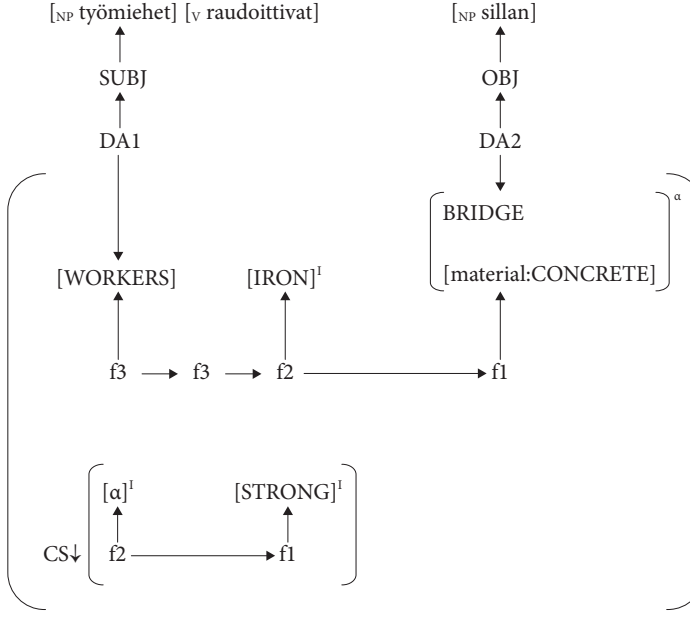
Then we can go to step 2. We have two potential direct arguments: the argument of the f3 in the matrix f-chain, the causer of the event, and the argument of the f1 of the matrix sentence, the goal of the event.

1. The argument of the f3 has the largest scope and, according to principle (b), it is selected by DA1.
2. The argument of the f1 has the second largest scope of the potential direct arguments and is selected by DA2, following principle (c).
3. There are no exceptional lexical specifications conserning the DA-system in the lexical entry of the verb *raudoittaa*.

Now we have determinded the DA1 and DA2 for the verb *raudoittaa*. This is a lexical property of the verb. When linking the verb to a particular syntactic structure, we must take into account the syntactic structure and whether there are any particular specifications determined by constructions.

The sentence in (11) is a straightforward indicative sentence without any particularities. We can apply the default principle in (e): the DA1 selects the subject and the DA2 selects the object. The configuration looks like this:

(13) worker-PL-NOM mount-with-iron-PAST-3PL bridge-ACC



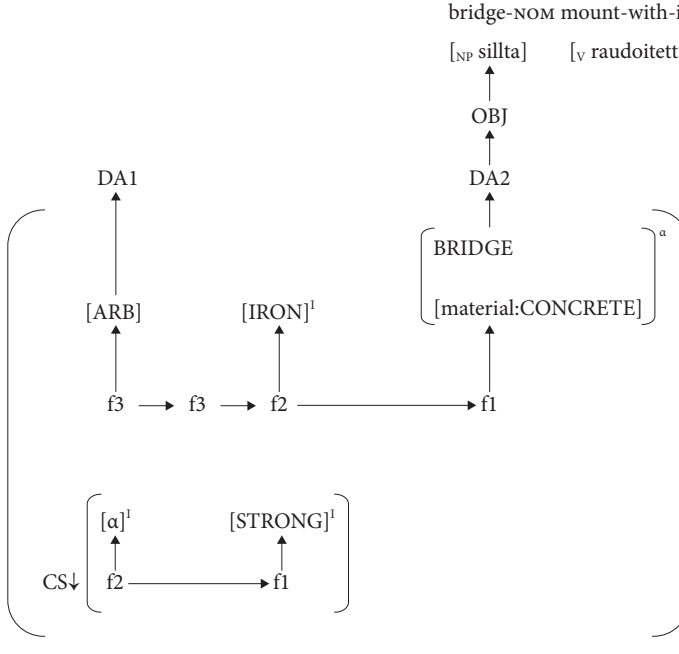
(I leave out the thematic features and semantic fields as they are not relevant for the argument linking at this point. They are still a part of the semantics, as well as e.g. the temporal structure even though I only show the parts that play a role in the argument linking.)

There are syntactic constructions that require another kind of linking between the DA-system and the GF-system than the default one. For instance the Finnish passive construction drops the subject but does not affect the objecthood. The object case in the passive construction is nominative if the event is telic (perfective, completed). The case tier of Finnish is described in detail by Maling (1993). So, for instance the passive sentence with the verb *raudoittaa* is (14):

(14) *Silta* *raudoitettiin.*
bridge-NOM mount-with-iron-PASS-PAST
'The bridge was reinforced by mounting with iron.'

In the passive construction of Finnish, the DA1 is not linked to the GF-system. The passive construction comes with the passive morphology, and the semantic interpretation of the DA1 is that it is 'someone,' '(an) arbitrary person(s).' As this 'arbitrary' argument appears not only in the passive but also in generic constructions in general, I mark it as ARB.

(15)



Other generic constructions in which a DA is not linked to the GF-system and the semantic interpretation of the "dropped" DA is ARB are for instance the generic subject construction (16a) and the generic object construction (16b):

(16) a. *Kyllä tämän sillan raudoittaa, jos on*
yes this-ACC bridge-ACC mount-with-iron-3SG if is
kunnolliset välineet.
proper-PL-NOM tool-PL-NOM
'This bridge can be reinforced by mounting iron if one has proper tools.'

b. *Virtanen raudoittaa.*
Virtanen mount-with-iron-3SG
'Virtanen [proper name] does the mounting with iron.'

In the generic subject construction (13a), the predicate verb is in the 3SG-form and the subject is omitted. The interpretation of the DA1 is ARB. The generic object construction (13b) leaves the DA2 unlinked to the GF-system and the DA2 has the semantic interpretation ARB, i.e. it is Virtanen's job (or habit or skill) to do the mounting with iron, whatever must be reinforced that way. (For a discussion of these constructions, see Nikanne 1997a.)

The theme argument is often implicit, and typically the verbs mean 'putting or adding something somewhere.' For instance: *paint* 'spread paint on smth,' *butter* 'spread butter on smth,' *oil* 'put oil somewhere,' *nail* 'force nail into smth,' etc. As Nikanne points out, there are also verbs meaning 'taking or removing smth from smth,' for instance the Finnish verb *kyniä* 'pluck (a bird),' 'take the feathers off from a bird' or *suolistaa* 'gut,' 'disembowel,''take the guts out.'

(17) a. *Maanviljelijä kyni kanan päivälliseksi.*
farmer-NOM pluck-PAST-3SG hen-ACC dinner-TRA
'The farmer plucked the chicken for dinner.'

b. *Metsästäjä suolisti hirven.*
Hunter gut-PAST-3SG moose-ACC
'The hunter gutted the moose.'

Also the English verb *disembowel* behaves in the same way as the Finnish verb *suolistaa*:

(18) *The crocodile disemboweled its prey.*

The understood theme is 'guts' and the source is *prey*. The theme is implicit, so the source argument is selected by the DA2 and becomes the object.

The verb *pluck* is a more general verb for removal than the Finnish verb *kyniä*. Even when it is used in a rather similar way, the understood implicit theme argument does not have to be 'feathers.' For instance:

(19) a. *The farmer plucked a chicken for dinner.*
b. *Do you pluck your eyebrows?*
(Ex. from Cambridge Dictionaries Online, sv. *pluck*)

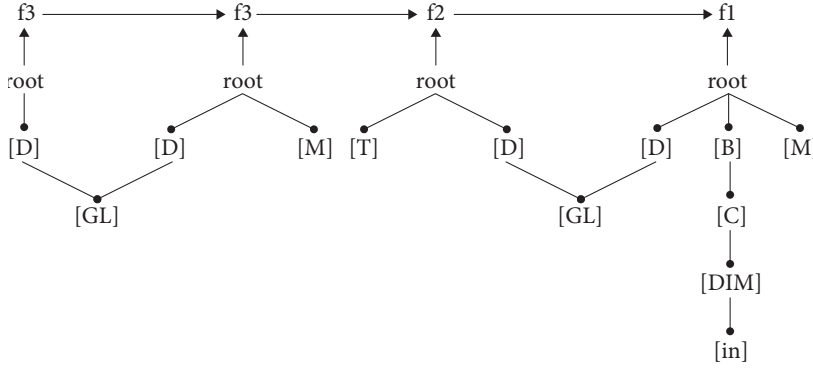
In (19a) the understood theme is 'feathers' and implicit and so cannot be a direct argument. The source argument chicken is therefore selected by DA2 and appears as the object of the sentence. In this use, the verb *pluck* behaves in the same way as *kyniä*. In (19b), the object is *eyebrows* and the understood theme is 'some hair.'

What happens if there are more than two potential DA's? We can use for instance the Finnish causative verb *sisällyttää* 'incorporate,' 'include,' 'subsume,' which can have the meaning 'to make something to belong to something.'

(20) *Mitä asioita olisi hyvä sisällyttää lukion*
what thing-PL-PAR be-COND good-NOM include-INF1 high-school-GEN
opettajien väliseen verkostoyhteistyöhön?
teacher-PL-GEN interjacent-ILL network-cooperation-ILL.
'What things should be included in the network cooperation between high school teachers.' (http://www.sometu.fi/forum/)

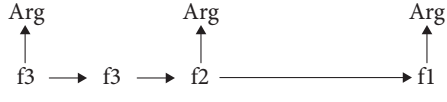
The verb *sisällyttää* is a causative derivation of the non-causative verb *sisältää* 'include,' (which, in turn, has the root *sisä* 'inside'). The lexical f-chain and the thematic features are as follows:

(21)



According to the argument level selection principles, the argument level (and the f-chain is as follows):

(22)



There are no lexically implicit arguments, so all the arguments are potential DA's. According to argument linking principles (b) and (c), the causer (the argument of f3) is DA1 and the theme (argument of f2) is DA2. The third potential DA, the goal (argument of f1) is not selected by any DA. The default rule for expressing such an element is the following:

Expressing a potential direct argument that is not selected by a DA

A potential direct argument that is not selected by a DA is expressed by a lexical entry whose lexical f-chain and lexical thematic features can be unified with the f-chain function that has selected the argument function and the thematic features of that function.

In example (20), the lexical entry is the p-position that governs the illative case. (See Nikanne 1990, 1993 for the phonologicaly empty p-positions that govern the locative cases and other semantic cases in Finnish.)

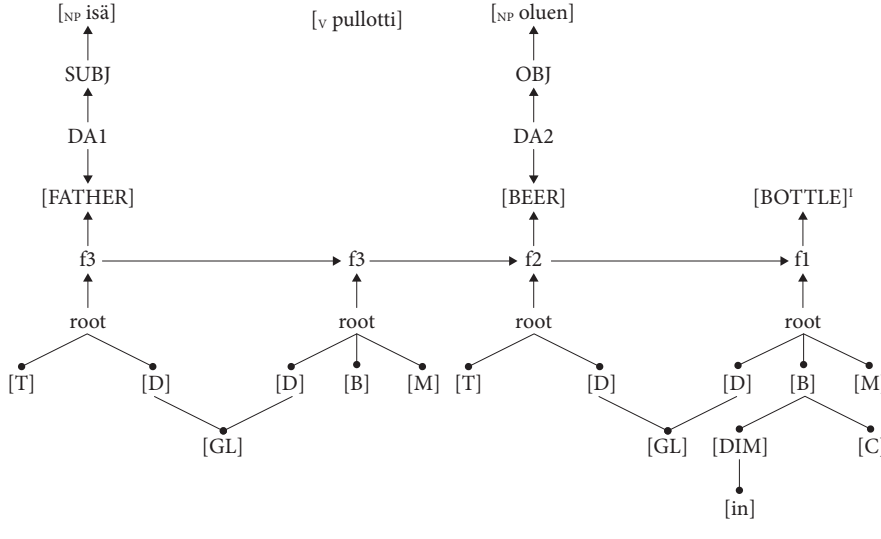
Nikanne (1990) gives more examples on implicit arguments in Finnish. The goal argument may be implicit in such verbs as *pullottaa* 'bottle' that means basically 'put something in a bottle.' The English verb *bottle* has very much the same argument structure. For many verbs whose meaning is 'put something in/on X' the argument X is implicit. For instance *pussittaa* 'bag,' *hyllyttää* 'shelve,' etc.:

(23) a. *Isä pullotti oluen.*
father bottle-PAST-3SG beer-ACC
'Father bottled the beer.'

b. *Kirjastonhoitajat hyllyttivät palautetut kirjat.*
librarian-PL.NOM shelf-PAST-3PL returned-PL-ACC book-PL.ACC
'The librarians shelved the returned books.'

The causer gets selected by the DA1 and the theme by DA2. The implicit argument 'bottle' stays implicit and is not expressed by lexical means.

(24) *Isä pullotti oluen.*
father bottle-PAST-3SG beer-ACC



The implicit argument may also be a causer. In Finnish, it is possible to derive causative verbs from other causative verbs. If the root of a deverbal causative verb is causative, then we have two causers: the higher causer that causes the whole situation and the lower causer that is the causer of the event caused by the higher causer. For instance, the verb *lyhentää* 'shorten' is a causative verb meaning 'make shorter.' Lyhentää is the root of the deverbal causative verb *lyhennyttää* 'make shorten.' Consider for instance:

(25) a. *Morsian lyhennytti äidiltä saamansa*
bride-NOM make-shorten-PAST-SG3 mother-ABL get-AGPTC-ACC-PX3
hääpuvun sopivaksi.
wedding-dress-ACC fitting-TRA
'The bride had the wedding dress she had got from her mother shortened so it was the right size.'

b. *Tuottaja* lyhennytti *alun perin*
producer make-shorten-PAST-3SG originally
10-tuntisen elokuvan hieman yli kolmetuntiseksi.
10-hour-long-ACC film-ACC slightly over three-our-long-TRA
'The producer had the film shortened from 10 hours to slightly over three hours.'

The theme argument, the thing that becomes shorter, is the object. This is because the lower object is always implicit (Nikanne 1990). The lower causer is understood to be 'anyone, someone,' i.e. ARB. (For more details, see Nikanne 1990.)

6.2.2 Expressing an argument marked as implicit

6.2.2.1 *Erasing the impliciteness index*

The impliciteness index does not always sit very tight: it is possible erase the impliciteness index. Then one can follow the procedure of DA selection. For instance:

(26) a. *Jussi maalasi talon seinän.*
Jussi-NOM paint-PAST-3SG house-GEN wall-ACC
'Jussi painted the wall of the house.'

b. *Jussi maalasi talon seinän*
Jussi-NOM paint-PAST-3SG house-GEN wall-ACC
sinisellä maalilla.
blue-ADE paint-ADE
'Jussi painted the wall of the house with blue paint.'

c. *Jussi maalasi sinisen maalin talon seinään.*
Jussi-NOM paint-PAST-3SG blue-ACC paint-ACC house-GEN wall-ILL
'Jussi painted the blue paint onto the wall of the house.'

The implicit argument of *maalata* 'paint' is 'paint.' In (20a), the verb is used as such without any adjuncts, and the implicit argument is skipped by DA-selection. In (19b), the implicit argument is expressed by an ADE-adjunct. In (20c), the impliciteness index has been erased, and, according to the DA-selection process, the theme argument has been selected by DA2, which then has been linked to the object. The goal argument has been expressed by lexical means, i.e. the illative case phrase.

In Finnish, the telic vs. atelic (perfective vs. imperfective) aspect is expressed by the object case: the completed activity (telic, perfective) is marked with the accusative case, and an uncompleted activity (atelic, imperfective) is marked with the partitive case. Erasing the impliciteess index allows us to change the measure that is used for the aspect (on measuring out, see Tenny 1987). In (20b), the measure is *talon seinä* 'the wall of the house': the whole wall got painted with the blue paint, but we do not know whether all the blue paint was used up. In (20c), the measure is *sininen maali* 'blue paint': Jussi used up all the blue paint as he painted the wall of the house. We do not know whether the wall was completely painted when Jussi had used up the blue paint.

As the object function plays such an important role in the aspectual meaning of the sentence in Finnish, it is quite natural that there is a mechanism in the language that allows the impliciteness index of a theme to be erased. Erasing the impliciteness index can only be used for the theme argument.

The impliciteness index can also be erased from zone 1 arguments (arguments selected by an f1). Typically, as Jackendoff 1990 points out, an implicit argument is expressed with lexical means when there is a semantic reason to emphasize the argument that otherwise would not get linked to syntax. This works particularly well with zone 1 implicit arguments, which is not surprising since potential direct arguments in zone 1 often fall outside of the selection by DA1 and DA2 and must therefore be expressed by lexical means. For instance:

(27) a. *Isä pullotti oluen käytettyihin pulloihin.*
father bottle-PAST-3SG used-PL-ILL bottle-PL-ILL
'Father bottled the beer in used bottles.'

b. *Kirjastonhoitajat hyllyttivät palautetut*
librarian-PL-NOM shelf-PAST-3PL returned-PL-ACC
kirjat uutuushyllylle.
book-PL-ACC new-arrival-shelve-ALL
'The librarians shelved the returned books on the shelve for new arrivals.'

The new information – that the bottles were used (in (27a)) and that the shelf was the shelf for new arrivals in (27b) – compared to the information given in the

lexical entry makes the sentences natural. If the semantic information is more or less the same as in the lexical entry, the implicit argument may be expressed if it is focused:

(28) a. *Isä pullotti oluen pulloihin eikä*
father-NOM bottle-PAST-3SG beer-ACC bottle-ILL and-not
saviruukkuihin niin kuin tavalllisesti.
clay-pot-PL-ILL as than normally.
'Father bottled the beer in bottles and not in clay pots as he normally does.'

b. *Kirjastonhoitajat hyllyttivät palautetut kirjat*
librarian-PL-NOM shelve-PAST-3PL returned-PL-ACC book-PL-ACC
hyllylle eivätkä penkille, kuten sinä luulit.
shelf-ALL and-not-3PL bench-ALL as you think-PAST-2SG.
'The librarians shelved the books on the shelf and not on the bench as you thought.'

The implicitness index cannot, however, be erased from an implicit causer:

(29) *Morsian lyhennytti ompelijan* […]
bride make-shorten-PAST-3SG dressmaker-ACC […]
'The bride had the dressmaker shortened […]'

The object of the double causative verb is understood as the theme argument, no matter what. (26) is grammatical only in the (strange) meaning that the bride had the dressmaker shortened.

6.2.2.2 *Fill-in adjuncts*

An implicit argument can be expressed by using adjuncts. In English, the With-Theme Adjunct has been discussed by Jackendoff 1990, among others. The With-Theme Adjunct is a *with*-phrase, and is not selected by any element in the sentence. It is licensed by its ability to express an implicit theme argument. The NP governed by the preposition *with* is unified with the implicit argument, for instance:

(30) [$_{\text{matrix}}$ *John painted the house*] [$_{\text{adjunct}}$ *with blue paint*].

In sentence (24) the matrix sentence John painted the house is a complete sentence, and it does not need to be complemented in any way to be grammatical. The verb *paint* 'spread paint on smth' has an implicit theme 'paint.' The *with*-phrase *with blue paint* expresses the implict theme without changing the structure of the matrix sentence. (For more detailed description and discussion on the With-Theme Adjunct, see Jackendoff 1990.)

The With-Theme Adjunct fills in the argument structure of the matrix sentence. Therefore, Nikanne (1995) calls this type of adjunct fill-in adjunct.

According to Nikanne (1990), Finnish has a fill-in adjunct that is very close to the English With-Theme Adjunct but rather more general. This adjunct is the ADE-Adjunct, which can fill in an implicit theme argument and even an implicit causer argument:

(31) a. [$_{matrix}$ *Virtanen raudoitti*
[Virtanen mount-iron-PAST-3SG
sillan] [$_{adjunct}$ *harjateräksell*ä].
bridge-ACC] [rebar-ADE]
'Virtanen mounted the bridge with rebar.'

b. [$_{matrix}$ *Morsian lyhennytti äidiltä saamansa*
[bride make-shorten-PAST-3SG mother-ABL get-AGPTC-PX3
hääpuvun sopivaksi] [$_{adjunct}$ *ompelijalla*].
wedding-dress-ACC fitting-TRA] [dressmaker-ADE]
'The bride had the wedding dress she had got from her mother shortened by a dressmaker so it was the right size.'

The ADE-adjunct can be described as follows:

ADE-Adjunct (Finnish)
If in construction [$_{matrix}$ …V….][$_{adjunct}$ NP-ADE] *the lexical entry of V has an implicit argument selected by a f > 1, then the content of the lexical entry of NP may be unified with the content of the implicit argument*.

f > 1 stands for f2 or f3 (i.e. "f bigger than 1"): the ADE-adjunct cannot fill in an implicit argument selected by an f1. The following sentences are not ungrammatical but the meaning is very strange as the adjunct cannot fill in the implicit goal, and the only possible interpretations of the adessive phrase are to understand it as an instrument (another adjunct whose form is NP-ADE) or location 'on/at':

(32) a. [$_{matrix}$ *Isä pullotti oluen*] [$_{adjunct}$ *käytetyillä pulloilla*].
[father bottle-PAST-3SG] [used-PL-ADE bottle-PL-ADE]
'Father bottled the beer with/on used bottles.'

b. [$_{matrix}$ *Kirjastonhoitajat hyllyttivät palautetut*
[librarian-PL.NOM shelve-PAST-3PL returned-PL-ACC
kirjat] [$_{adjunct}$ *uutuushyllyllä*].
book-PL.ACC] [new-arrival-shelve-ADE]
'The librarians shelfed the returned books with/on (i.e. the librarians being on)/at the shelve for new arrivals.'

6.2.3 Exceptional DA-selection

So far, we have discussed verbs whose DA-selection follows the argument linking principles a-c. Principle d says that "if the selection of direct arguments by DA1 and/or DA2 is specified in the lexicon, the lexically specified selections overrule (b) and (c)." This principle implies that verbs may have exceptional DA-selections. In this section we will discuss some of these.

6.2.3.1 *Verbs meaning 'get,' 'lose,' and 'have'*

The argument linking principles that we have discussed indicate that the theme argument, as selected by f2, is higher in the hierarchy than the argument selected by f1. The English verbs *get*, receive, *lose*, and *have* as well as the Finnish verbs *saada* 'get' ja *menettää* 'lose' have an exceptional DA-selection:

(33) a. *Peter got/received money.*
b. *Peter lost his money.*
c. *Peter has money.*
d. *Peter sai rahaa.*
Peter-NOM get-PAST-3SG money-PAR
'Peter got money.'
e. *Peter menetti rahansa.*
Peter-NOM lose-PAST-3SG money-ACC-PX3
'Peter lost his money.'

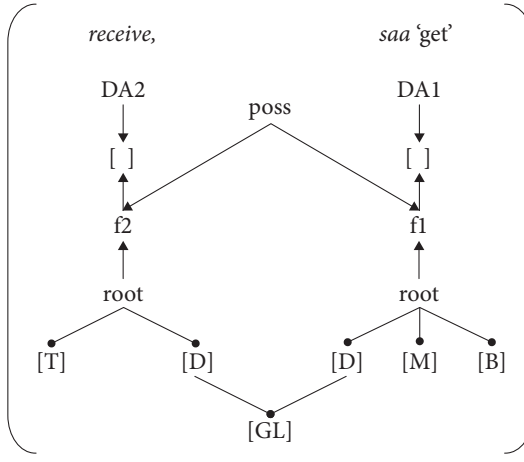
In all sentences in (33), the subject (*Peter*) is a zone 1 argument, goal in (33a, d), source in (33b, e), and the location in (33c). The same argument structure can be expressed by using other verbs, e.g. the verbs *tulla* 'come' and *mennä* 'go' in Finnish:

(34) a. *Peterille tuli rahaa.*
Peter-ALL come-PAST-3SG money-PAR
'Peter got money.'
b. *Peteriltä menivät rahat.*
Peter-ABL go-PAST-3SG money-PL-NOM
'Peter lost his money.'

In sentences (34), the theme argument *rahaa* 'money' is the subject. The goal argument in (34a) *Peter* 'Peter' is in the allative case *Peterille* 'to Peter' and the source argument is in the ablative case in (34b) *Peteriltä* 'from Peter.'

The relevant parts of the lexical entries of the English verb *receive* and the Finnish verb *saada* is as in (35). (35) describes the part of the lexical entry that is relevant to the argument structure for the possessive use of these verbs (the verb *saada* is also used as a causative and even a modal verb):

(35)



The lexical entries of *lose* and *menettää* 'lose' are otherwise similar but the thematic feature under [D] is [SO] (and not [GL]). The trick is that the DA2 selects the theme argument and the DA1 selects the goal argument.

6.2.3.2 *Constructions that license exceptional links between grammatical functions and direct arguments*

In regular structures, the default links between the direct arguments and grammatical functions is followed: DA1 selects the subject and DA2 selects the object. However, many grammatical constructions operate with an exceptional linking between DA1 and DA2 and the subject and object of the sentence. Therefore, the direct arguments and grammatical functions cannot be reduced to each other. In this section, I show how some of these constructions are analyzed within the present framwork. I mark the argument linked to DA1 with the subscript index "da1" and the argument linked to DA2 with a subscript index "da2."

Passive in English:
DA2 selects the subject and DA1 is not linked to the GF system but can be expressed by a by-phrase:
The money$_{\text{da2}}$ *was received/gotten* (*by John*)

Passive in Finnish:
DA1 is not linked to the GF system.

Rahaa$_{\text{da2}}$ *saatiin.*
money-PAR get-PASS-PAST
'Money was received.'

Agent participial in Finnish:
DA1 is linked to the head noun of the NP, specified by the agent participial. DA2 is linked to a genitive specifier of the participial verb:

[$_{NP}$ [$_{PtcP}$ *äidin* $_{da1}$ *antamalla*] *rahalla*$_{da2}$] (Normal DA-selection)
[$_{NP}$ [$_{PtcP}$ mother-GEN give-AGPTC-ADE] money-ADE]
'with the money mother has given.'

[$_{NP}$ [$_{PtcP}$ *äidin*$_{da1}$ *saamalla*] *rahallad*$_{a2}$]
[$_{NP}$ [$_{PtcP}$ mother-GEN get-AGPTC-ADE] money-ADE]
'with the money mother has received.'

The arguments of deverbal nouns in English and Finnish:
In English, the DA1 of the root verb of a deverbal noun appears as a genitive specifier of the head noun and the DA2 of the root verb appears as an of-complement of the head noun:

The boys'$_{da1}$ *singing of the psalm* $_{da2}$ *sounded beautiful.*
The boys'$_{da1}$ *receiving of the money*$_{da2}$ *was too much for me.*

In Finnish, the direct arguments of the root verb of a deverbal noun appear as genitive specifiers of the head noun. If both are present at the same time, DA1 becomes before DA2 in linear order:

Poikien$_{da1}$ *laulaminen kuulosti kauniilta.*
boy-PL-GEN singing-NOM sound-PAST-3SG beatiful-ABL
'The boys' singing sounded beautiful.'

Virren$_{da2}$ *laulaminen kuulosti kauniilta.*
psalm-GEN singing-NOM sound-PAST-3SG beatiful-ABL
'The singing of the psalm sounded beautiful.'

Poikien$_{da1}$ *virren*$_{da2}$ *laulaminen kuulosti kauniilta.*
boy-PL-GEN psalm-GEN singing-NOM sound-PAST-3SG beautiful-ABL
'The boys' singing of the psalm sounded beautiful.'

Äidin$_{da1}$ *rahan*$_{da2}$ *saaminen*
mother-GEN money-GEN receiving-NOM
tuli *yllätyksenä.*
come-PAST-3SG surprise-ESS (Lexically specified)
'That mother received money came as a surprise.'

Often grammars talk about subject and object in these cases instead of logical subject (da1) and logical object (da2). In the present approach, it is important to keep the DA-system and the GF-system apart even though they correlate strongly because of the default mapping rule (argument linking principle e).

The GF-system plays a role for instance in the Finnish "pro-drop." In Finnish, especialy in standard Finnish, the subject is optional in the first and second person (but not in the third person).

(36) a. *Minä ostan kirjan.* / *Ostan kirjan.*
I-NOM buy-1SG book-ACC / buy-1SG book-ACC
'I (will) buy a book.'

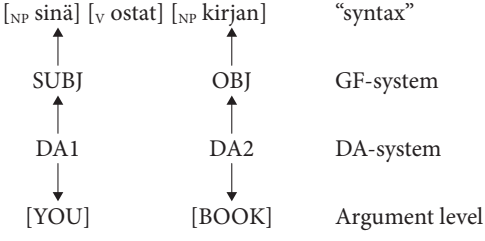
b. *Sinä ostat kirjan.* / *Ostat kirjan.*
you-NOM buy-2SG book-ACC / buy-2SG book-ACC
'You (will) buy a book.'

c. *Me ostamme kirjan.* / *Ostamme kirjan.*
we-NOM buy-1PL book-ACC / buy-1PL book-ACC
'we (will) buy a book.'

d. *Te ostatte kirjan.* / *Ostatte kirjan.*
you[PL]-NOM buy-2PL book-ACC / buy-2PL book-ACC
'You[PL] will buy a book.'

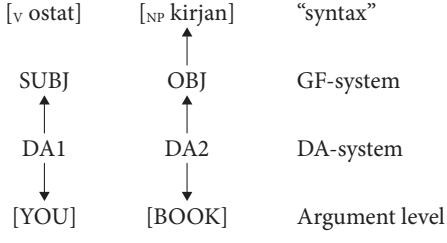
In this case, it is the subject that is "dropped," not the subject argument of the verb. The verb agrees with the subject even though it is not linked to any NP. The non-pro-dropped sentence is linked as follows:

(37) you-NOM buy-2SG book-ACC



The pro-dropped version is linked in the same way but the SUBJ is not linked to syntax:

(38) buy-2SG book-ACC

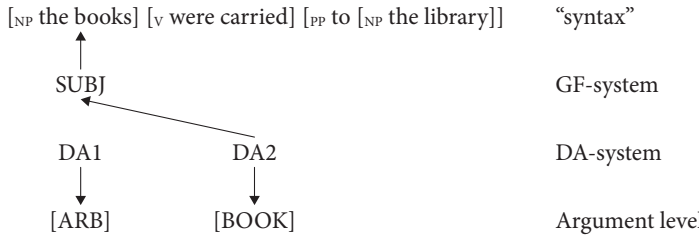


The semantic information of the "dropped" subject is in the argument level, and the verb agrees with it. The verb agreement makes the sentence unambiguous and reveals that the da1 is 'you' (SG2) even though the subject is not linked to any lexical element. The subject role is taken, and linked to the argument level, so it cannot

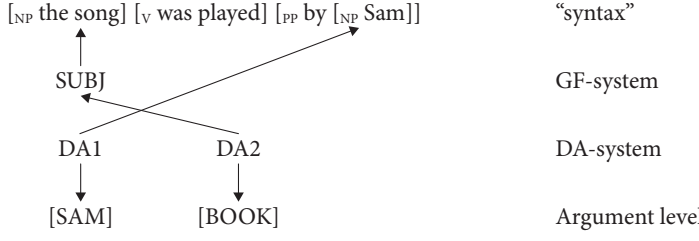
be assigned to any other NP in the sentence. This configuration corresponds to the small pro in many versions of generative syntax.

We can now go back to the English passive. English grammar requires that the subject must be present in syntax. (In generative literature this principle is known as the Extended Projection Principle, EPP.) In (33), the da2 (*song, books*) gets the subject role, and the da1 either remains unexpressed (39a) or is expressed by a by-adjunct (33b):

(39) a. *The books were carried to the library.*



b. *The song was played by Sam.*



The predicate verb agrees with the subject: plural form with a plural subject in (33a) and singular form with a singular subject in (33b). The passive construction requires that DA2 selects SUBJ, and the passive morphology reveals that the construction follows the passive configuration in linking. That is all the information we need. If the *by*-phrase is present, the NP governed by the preposition *by* is selected by DA2.

Sentences with weather verbs behave differently in English and Finnish because English must link SUBJ to some NP whereas Finnish does not. English speakers use a formal subject to fullfil the requirement:

(40) a. *It is raining.*
b. *It is snowing.*

The formal subject *it* is not linked to the argument structure but is selected by SUBJ:

(41)

[$_{NP}$ it] [$_{V}$ is raining/snowing]		"syntax"
SUBJ		GF-system
		DA-system
[WATER/SNOW]^{I}	[DOWN]^{I}	Argument level

Assuming that the verb *rain* means roughly 'water is coming down' and snow 'snow is coming down,' the theme argument 'water' and 'snow' are implicit as well as the goal argument (for convenience, I will just write [DOWN] for the goal argument, as it is accurate enough for the analysis at this point; a detailed analysis of "down" is more complicated). The verbs *rain* and *snow* have no potential direct arguments. Therefore no argument is selected by the DA-system. But because of the subject requirement, SUBJ must have some element to select. English uses the pronoun *it* (or *there*) for this purpose. This is a grammar's way of solving the problem. Now, the configuration tells us that the formal subject *it* is not linked to the argument structure of the verb. The sentence has an interpretation because all the necessary information is in the lexical entry.

If English speakers need to express the implicit arguments, they typically change the verb to one that fits the meaning but does not have implicit arguments, e.g. *fall*: *The snow is falling onto the roof*. One may erase the impliciteness index and use the verb *snow*, but it is not the first choice of native speakers: *It is snowing onto the roof*. (I thank Teresa Salvato for personal information.)

In Finnish, weather predicates work as in (42):

(42) a. *Sataa*.
rain-3SG
'It is raining'

b. *Sataa lunta.* / *Lunta sataa.*
rain-3SG snow-PAR / snow-PAR rain-3SG
'It is snowing.'

c. *Lumi/lunta* // *vesi/vettä sataa katolle.*
Snow-NOM/PAR // water-NOM/PAR rain-3SG roof-ALL
'It is raining/snowing onto the roof.'

In Finnish, the verb rain has an implicit argument. There is no subject requirement, and the implicit argument is 'water' when nothing else is mentioned:

(43) *Sataa*.
rain-3SG
'It is raining.'

[$_V$ sataa]		"syntax"
		GF-system
		DA-system
[WATER]^I	[DOWN]^I	Argument level

The Finnish the verb *sataa* can be used for snowing and in principle for describing any possible substance that nature sends down outdoors. If the substance that comes down is not water, it must be expressed as the partitive subject of the sentence. This is the case with (42b). It is not completely clear whether the partitive argument is a subject or object, but it is not very important for the description. The partitive subject argument can be used in intransitive (44a) as well as in transitive sentences (44b):

(44) a. *Nyt kaatuu myös isompia yrityksiä* […]
Now fall-3SG also bigger-PL-PAR company-PL-PAR […]
'Even bigger companies are falling now.'
(www.yle.fi, 22 November 2013)

b. […] *yhä enemmän ihmisiä syö lääkkeitä*
[…] still more people-PL-PAR eat-3SG medicine-PL-PAR
käytännössä turhaan […]
in-practice-INE in-vain […]
'[…] even more people are taking medicines for no real reason […]
(http://www.tiede.fi/keskustelut/, 8 June 2013)

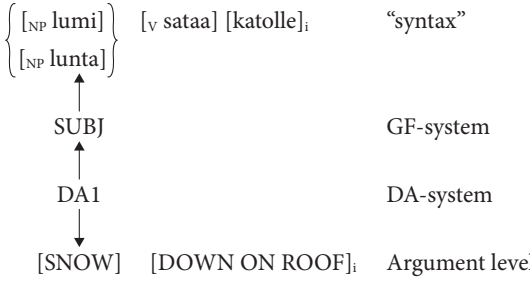
The partitive subject indicates that the quantity (number or amount) of the subject argument is not definite. (On quantitative indefiniteness in Finnish, see Terho Itkonen 1980.) Nikanne (1994) assumes that the partitive could even be an object. However, as shown in sentence (42c), the theme argument may be in the nominative case, and then it behaves like a typical subject. Therefore, I will analyze the partitive form as the subject, too. The analysis of the sentences (42b) is given in (45):

(45) rain-3SG snow-PAR

[$_V$ sataa] [$_{NP}$ lunta]		"syntax"
↑		
SUBJ		GF-system
↑		
DA1		DA-system
↓		
[SNOW]	[DOWN]^I	Argument level

The analysis of (42c) is in (46):

(46) snow-NOM/PAR rain-3SG roof-ALL



The phrase *katolle* 'roof-ALL' is unified with the implicit goal 'down' and the impliciteness index is erased from the argument, according to what was said in the section "Erasing the impliciteness index" above (Section 6.2.2.1). The linking between the allative case phrase *katolle* 'roof-ALL' and the argument level element is marked with the subscript index i.

The verbs *rain* and *sataa* are used in a special context in the translations of the second book of Moses, 16:4. Finnish translations published in 1642 (47a), 1776 (47b), 1938 (47c) and 1992 (47d) constantly use the verb *sataa* as a non-causative verb and the the theme argument is in the partitive case, as lunta 'snow-PAR' in (42b) (the relevant sentence is marked with boldface):

(47) Finnish:

a. *Nijn sanoi HERra Mosexelle: Cadzo* / ***minä annan sata teille leipä taiwast*** /
so said the-LORd to-Moses: Look / I-NOM let-3SG rain-INF1 you-ALL bread-PAR heaven-ELA /[…]

b. *Niin sanoi \Herra\ Mosekselle: katso,* ***minä annan sataa teille leipää taivaasta***
so said \the-Lord\ to-Moses: look, I-NOM let-3SG rain-INF1 you-ALL bread-PAR heaven-ELA

c. *Niin Herra sanoi Moosekselle: "Katso,* ***minä annan sataa teille leipää taivaasta****.* […]"
so the-Lord said to-Moses: "Look, I-NOM let-3SG rain-INF1 you-ALL bread-PAR heaven-ELA […]"

d. *Herra sanoi Moosekselle: "****Minä annan sataa teille ruokaa taivaasta*** […]"
The-Lord said to-Moses: "I-NOM let-1SG rain-INF1 you-ALL ood-PAR heaven-ELA […]"

We will return to the argument linking of the infinitival complements in Chapter 7. In (47), the theme argument of the verb *sataa*, i.e. *ruokaa* 'food-PAR' or *leipää* 'bread-ALL' is the only direct argument.

On the web page www.biblegateway.com, one can find all the English translations of the Bible. I have chosen the translations of Exodus 16:4 from there (https://www.biblegateway.com/verse/en/Exodus%2016:4).

(48a) is from the American Standard Version (new translation, 2000). (48b) is from King James Version (1611). (48e) is from Geneva Bible (1599). (48c) is from the Lexham English Bible, which tends to stay closer to the original Hebrew form than most translations (https://www.biblegateway.com/versions/Lexham-English-Bible-LEB/). Example (48d) is from the Wycliff translation, whose early versions were hand-written in 1382. The Wycliff translation has been critizised as cumbersome (https://www.biblegateway.com/versions/Wycliffe-Bible-WYC/). (48f) is from the God's Word Translation, which tends to translate the Bible into everyday English while keeping God's name in its original form, as in this example *Yahweh* (https://www.biblegateway.com/versions/Names-of-God-NOG-Bible/).

Most English translations (see (48a–b)) use the verb *rain* as a causative verb but the modern spelling version of the 1599 Geneva Bible (48e) uses the verb *rain* as a non-causative verb and makes the theme argument the subject of the sentence (the relevant part is written in boldface):

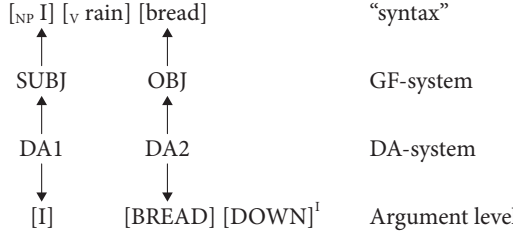
(48) English:
- a. *Then said Jehovah unto Moses, Behold,* ***I will rain bread from heaven for you*** […].
- b. *Then said the LORD unto Moses, Behold,* ***I will rain bread from heaven for you*** […]
- c. *And Yahweh said to Moses, "Look,* ***I am going to rain down for you bread from the heavens,*** […]
- d. *Forsooth the Lord said to Moses, Lo!* ***I shall rain to you loaves*** *from heaven;* […]
- e. *Then said the LORD unto Moses, Behold,* ***I will cause bread to rain from heaven to you*** […]
- f. *Yahweh said to Moses,* ***"I'm going to send you food*** *from heaven like rain*. […]

In addition, there are other ways to translate this sentence. For instance, those in (48d–f).

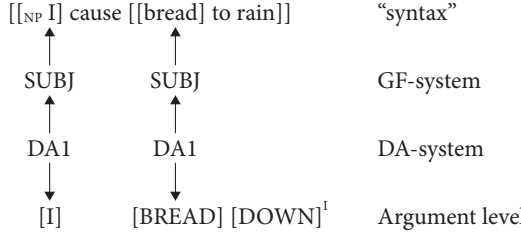
The Examples (48d) differs from (48a–c) in terms of its word-order. However, (48d) has the same argument structure as (48a–c). (48e) has a different argument structure from (48a–d). (48f) solves the problem by changing the verb *rain* to *send* and explaining that the sending will take place "like rain".

English grammar allows the derivation of causative verbs from non-causative roots without a suffix, as is done in (48a–d). In (48e), a separate causative verb is used. In (48a–d), the theme argument is the object and in (48e) the subject of the verb rain. This follows the argument linking principles discussed in this chapter. The impliciteness index is erased as is done in the Finnish translations. The analysis of (48a–d) is in (49a) and the analysis of (48e) is in (49b). In (49b), there are two argument structures, that of the verb *cause* (the subject is *I*) and that of *rain* (the subject is *bread*):

(49) a. *I will rain bread from heaven for you* (48a)
I will rain bread from heaven for you (48b)
I am going to rain down for you bread from the heavens (48c)
I shall rain to you loaves (48d)



b. *I will cause bread to rain from heaven to you* (48e)



6.3 A simple concrete example of argument linking: Possessive expressions in English and Finnish

The micro-modules are introduced in detail later in this book as we go through the formalism and the technical solutions of the Tiernet model. However, in order to make the idea of linking a little more concrete for the reader, I will now give an example of linking between modules. The purpose of this example is to show how the system works with representations, lexical entries, and constructions. The example should give the reader an idea of the sorts of question that should be taken into account in linking. The main message at this point is to show that linking is not just a matter of drawing lines or arrows. Each link must be studied carefully

to find out the principles and linking devices (words, constructions, morphology) that are needed to establish the link.

The example presents a short description of the mapping of a possessive expression between syntax and conceptual structure in two languages, Finnish and English. Finnish and English link the same conceptual structure in different ways. English has a special verb *have* (*X has Y*) for the purpose whereas Finnish uses a possessive construction with a copula and the adessive case: 'X-ADESSIVE copula Y' (semantically, the adessive case in Finnish corresponds roughly to the English prepositions *on* or *at* and the copula is the verb *ole-* 'be.' cf. "There is a Y on X").

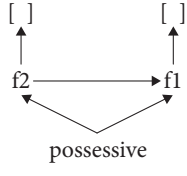
English:	*The boy has a book.*		
Finnish:	*Pojalla*	*on*	*kirja.*
	'Boy-ADESSIVE	is	book'

I would like to point out two important things:

1. The conceptual structure representation is the same for both English and Finnish. As discussed in Chapter 1, it is the standard policy in Conceptual Semantics not to assume any language-dependent "semantic" representation. Instead, there may be differences in linking between languages. (See Jackendoff 1983.)
2. Links between representations must be **licensed**. Licensing may be based on regular principles or constructions, as for instance the possessive construction in Finnish in the example above.

In this section, we will concentrate on the argument structure and, in order to save some space, the micro-modules of the thematic features and the linguistic structure are not shown in the descriptions.

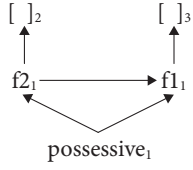
Constructions are to some extent exceptional mappings. The links between morphology, syntax, and the lexicon are determined for fragments of representation that fulfill given criteria. If we leave small details aside, the **Finnish possessive construction** can be described as follows: the morpho-syntactic structure [NP-ADESSIVE copula NP-{NOMINATIVE, PARTITVE}] may be linked to the conceptual structure representation



in the following way: (i) The NP marked with the adessive case in the morpho-syntactic structure is linked to the argument selected by f2. (ii) The argument marked with the nominative in the morpho-syntactic structure is linked to the argument selected by f1.

This gives us the following linking. The (arbitrarily chosen) subscript indices (1, 2, and 3) indicate which parts of the linguistic structure correspond to which parts of the conceptual structure.

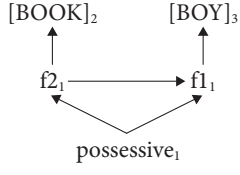
(50) NP $_3$-ADE$_1$ *olla*$_1$-3SG$_1$ NP $_2$ -{NOM, PAR}$_1$



The second NP is typically in the nominative but it may be in the partitive case if the quantity of the referent is unspecified: e.g. in *Pojalla on **vettä*** [boy-ADESSIVE is water-PARTITIVE] 'The boy has (some) water.' As the possessive construction links the NP's to the argument level, no DA- or GF-selection is needed. In other words, the question of which NP is the subject or the object of the sentence is not relevant. Nor is there any logical subject or logical object: the construction as a whole gives the sentence a semantic interpretation.

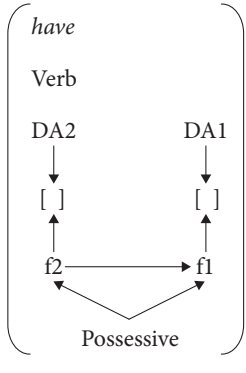
In our example the sentence *pojalla on kirja* 'the boy has a book' is linked between the conceptual structure and lexico-syntax in the following way, according to the Finnish possessive construction.

(51) *poja*$_3$-*lla*$_1$ *on*$_1$ *kirja*$_2$
boy-ADE be-3SG book-NOM



The English linking is organized around the lexical entry of the verb *have*, the relevant parts of which are as follows:

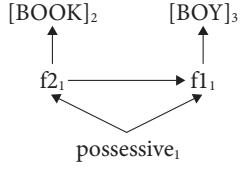
(52)



Linking of the possessive expressions with the verb *have* does not involve a construction. However, the verb *have* has somewhat exceptional argument linking. Typically the higher argument, i.e. the argument that is more to the "left" has the right to be the logical subject (DA1) and the next available argument to the right has the right to be the logical object (DA2). The verb *have* has fixed the theme argument (the argument of f2) as the logical object (DA2) and the owner is the logical object (DA2).

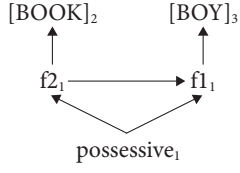
In our example, the logical subject (possessor) of *have* is linked to the higher argument position, the argument of f2, and the logical object (possessed) is linked to the lower argument position, the argument of f1. This gives us the following linking:

(53) [The boy]$_2$ has$_1$ [a book]$_3$



Now, if we compare the English and the Finnish sentences, we can see that they are both linked to the same conceptual structure but the languages differ in the way the links are organized:

(54) English: [The boy]$_2$ has$_1$ [a book]$_3$

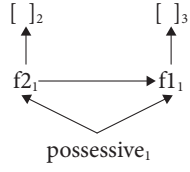
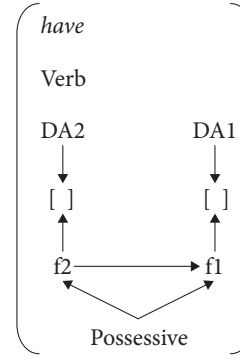
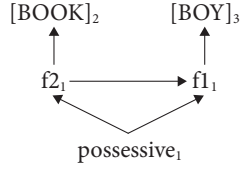
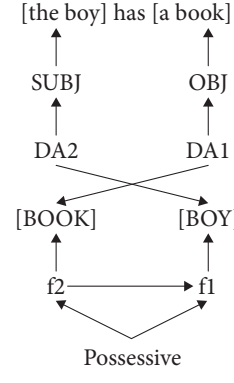


Finnish: poja$_3$-lla$_1$ on$_1$ kirja$_2$-NOM$_1$

As the discussion above shows, the system gives us the desired interpretation of the sentences *the boy has a book* and *pojalla on kirja*. The following table illustrates how the process goes. The intention is not to simulate the psycholinguistic process but to show how the different representations are related to each other.

First, the form must be recognized. For this, we need the grammar and the lexicon of the particular language (e.g. English and Finnish). This is a complicated process, and it involves a whole theory of phonology, morphology, syntax, the lexicon etc. In the figure, all these details are omitted and only the result of the process is given in the box "recognition of the form." The next step is to go to check whether the form has an interpretation. This is done by checking the linking rules and the lexical entries of the particular language. In the figure, this step is

Table 6.1 The interpretation of possessive expressions in English and Finnish: From form to meaning

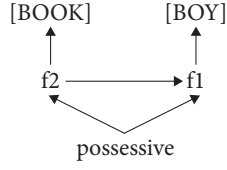
1. Recognition of the form	**FINNISH**: *Pojalla on kirja* ['boy' 'be'-3SG 'book'-NOM]	**ENGLISH**: *The boy has a book*
2. Access to symbolic modules	– Possessive construction fits the form: NP $_3$-ADE$_1$ olla$_1$-3SG$_1$ NP $_2$ -{NOM, PAR}$_1$  – The lexical entries of *poika* 'boy' and *kirja* 'book' fit the form. The morphological forms of *pojalla* [boy-ADE] and *kirja* [book-NOM] fit the form.	– The verb *have* fits the form:  – The lexical entries of *boy* and *book* fit the form.
3. Linking	Specified in the possessive construction.  	Default GF-selection rule: DA1 selects SUBJ and DA2 selects OBJ. 

illustrated by finding the lexical entry of *have* in English and the possessive construction in Finnish. In the lexical entry of *have*, the DA1 is the logical subject and DA2 is the logical object. This is because the verb *have* does not follow the general principles of English grammar. The logical subject is the argument of AT, i.e. the participant that has the theme in its possession. The theme, i.e. the argument of BE, the participant that is in someone's possession, is the logical object for the verb *have*. The sentence *The boy has a book* does not include any morpho-syntactic irregularities, and therefore the subject of the sentence (*boy*) is linked to DA1 and

the object (*book*) to DA2. In the description of the Finnish possessive construction, the word on 'be-3SG' represents the copula. We can see that the morpho-syntactic form of the sentence matches the form defined in the construction. The NP in the adessive case *pojalla* is linked to the theme and the NP in the nominative *kirja* is linked to the location (i.e. the argument position of BE). Then the system is happy: the interpretation is licensed and the linking between the different representations is established. The result of the processes is the same in both languages even though the process is different when it comes to details.

It is not enough that the system can give a semantic interpretation of an utterance. Language, and also the model of language, should also show how it is possible to go from a meaning to a linguistic expression. Production is done by using the same linguistic system as when interpreting linguistic expressions. The process is to a large extent a mirror image of interpretation. It is described in the following table:

Table 6.2 The production of possessive expressions in English and Finnish: From meaning to form

1. The structure to be expressed recognized			
2. Access to symbolic modules	**FINNISH:** – Possessive construction fits the form. – The lexical entries of *poika* 'boy' and *kirja* 'book' fit the form.	**ENGLISH:** – The verb *have* fits the form – The lexical entries of *boy* and *book* fit the form	
3. Linking	According to the possessive construction: the links to the NP's are specified in the construction. The morphology is specified in the construction. The unmarked word order is specified in the construction.	According to the default GF-linking principle: DA1 selects SUBJ and DA2 selects OBJ. (The morphology and word order follows English grammar.)	
4. Linking established and syntactic structure licensed.	*Pojalla on kirja* ['boy' 'be'-3SG 'book'-NOM]	*The boy has a book*	

In other words: when the speaker has a meaning that he or she would like to express, he or she should find the linguistic means to do that, i.e. the words, morphological forms, syntactic structures etc. In the English lexicon, there is

the verb *have* that matches the conceptual structure. The theme argument will be linked – exceptionally – to DA2 and, according to the default GF-selection principle, becomes the object of the sentence. The location argument is linked to DA1 and becomes the subject of the sentence. Then the speaker applies English grammar with all its syntactic, phonological, and morphological rules and the result is the sentence *the boy has a book*. In Finnish the possessive construction matches the conceptual structure that must be expressed. The linking is specified in the construction. The system is happy, and the result is the sentence *pojalla on kirja*.

6.4 Summary

In this chapter, we have discussed the linking between the lexical and syntactic arguments. In order to be able to do so, we have discussed for instance the following issues:

1. The relevant parts of lexical entries of predicates.
2. The lexical argument system (DA-system, primitives DA1 and DA2) that gives us the "logical subject" and "logical object." The DA-system has the lexical functional chain and its arguments as its domain.
3. The syntactic argument system (GF-system, primitives SUBJ and OBJ) that selects NPs to be subjects and objects. The domain of the GF-system is the finite sentence.

The lexical information plays a role in the micro modular networks that are based on building sentences and meanings out of lexical entries. The information ensures that the links between nodes are legal, i.e. they follow the – general and particular – linking principles of the language in question.

The micro-modular approach makes it possible to describe the linking with simple representations (cf. methodological guideline *Simple formation of modules*) and concentrating on linking (cf. guideline *Importance of linking*).

The regular linking of arguments is complemented by more specific linking principles, which can be called constructions as they establish linking between fragments of representation with specified forms.

The system is made simpler by assuming only those elements that are needed. No empty arguments are needed on the syntactic level in order for the system to express all the necessary information. For instance, in the Finnish "pro-drop," in which the subject may be omitted in the first and second person, there is a linking Arg ← DA → SUBJ but no link from SUBJ to any NP. The system as a whole needs

to know which lexical argument is the subject, and the predicate verb knows to agree with it even though there is no empty "small pro" or other empty NP in syntax. This is an example of the strength of the network: no one-to-one linking and no duplication of information is needs as the whole network includes the information necessary for the interpertation of a linguistic expression.

CHAPTER 7

Complex sentences

This chapter concentrates on argument linking in complex sentences, in which the matrix sentence has a sentential complement or adjunct, either infinite or finite. The discussion focuses on the Finnish language, but English examples are analyzed, too, in order to make the discussion easier to understand for readers who do not have a prior knowledge of Finnish.

7.1 Introduction

Some verbs have a lexical entry that must be complemented with a situation, and situations are typically expressed by verbs in English and Finnish. The default linking between syntactic categories (parts of speech) and the f-chain in Finnish and English is as follows (see Nikanne 1990):

Default links between lexical f-chain and syntactic categories of predicates in English and Finnish
If the leftmost f in the lexical f-chain is

(i) *f1, the syntactic category is most likely P.*
(ii) *f>1, the syntactic category is most likely V.*

Verbs that require a situation, and according to the above default linking, typically a verb as their complement are for instance:

- Causative verbs *cause, make, have* and *get* (in their causative use) in English and *saada* 'get,' *panna* 'put,' *pistää* 'stick, set,' etc. in Finnish.
- Verbs of decison or decision making as well as starting and ending a situation: e.g. *decide, plan, refuse, begin, stop* (doing smth) in English and *päättää* 'decide,' *aikoa* 'plan,' *kieltäytyä* 'refuse,' *alkaa* 'begin,' *ryhtyä* 'begin,' *lakata* 'stop,' etc. in Finnish.
- Modal verbs like *must* and *may* in English and *pitää* 'must,' *täytyä* 'must,' *saada* 'may,' etc. in Finnish.

This is not an exhaustive list of verbs that take situations as complements but I will discuss these different kinds of verb as examples of complementing the lexical f-chain or a lexical modal tier with a situation.

At the end of this chapter, we will also discuss subordinate clauses that are add-on adjuncts: they do not participate in the argument structure of the matrix verb.

7.2 Infinite complements

7.2.1 Causative matrix verbs

Causative verbs have a lexical f-chain governed by f3. Some causative verbs include part of the f-chain that belongs to the caused situation. For instance, the verb *throw* means roughly 'cause to move through the air,' so the motion (f2) is a part of the lexical f-chain of the verb. Then, there are verbs like *make, get, have* (smth do smth) etc. that do not include the f2. We will discuss the latter type of verb first.

There is a group of verbs in English and Finnish that, when used as causative verbs, express just causation and nothing else. The verbs like *get, have*, and *make* as well as the Finnish verbs *saada, panna*, and *pistää* also have other uses. The English verbs are also used as possessive verbs as well as the Finnish verb *saada* 'get' (e.g. *John got/has a book*; *John sai kirjan* [John-NOM get-PAST-3SG book-ACC] 'John got a book'). The English verb *make* means also 'construct, build.' The Finnish verbs *panna* and *pistää* mean basically 'putting something somewhere.' All these verbs are used in various idiomatic expressions and constructions. As interesting as the meaning shifts of these verbs and their motivation is, here we will only concentrate on their causative meaning.

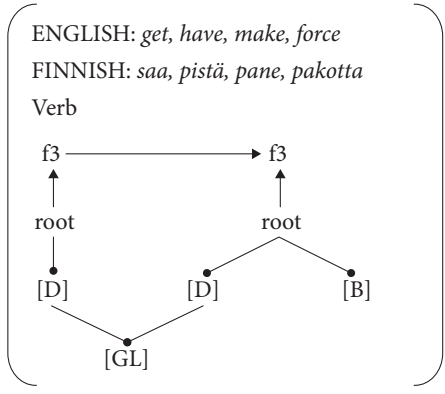
The verbs *get, have, saada, panna*, and *pistää* are used as causative verbs in the following way:

(1) a. *John got/had/made me (to) stay at home.*
b. Jussi sai/pani/pisti minut pysymään kotona.
Jussi-NOM get/put/set-PAST-3SG I-ACC stay-INF3-ILL home-ESS
'Jussi got/had/made me (to) stay at home.'

Both the Finnish and English sentences are neutral when it comes to the semantic field of the causation (see Chapter 5). The verbs are not completely synonymous: get and saada imply that the "I" who stays at home does it voluntarily whereas *have, make, panna*, and *pistää* imply that the staying was forced by the causer (*John, Jussi*), and the staying home does not have to be voluntary. Some causative verbs like *force* (to do smth) and the corresponding Finnish verb *pakottaa* 'force' indicate that the caused action is not voluntary. However, when it comes to the the f-chain and the argument structure, all the verbs work in the same way.

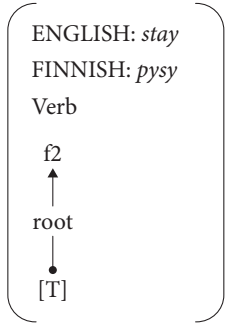
The relevant part of the lexical entry of these verbs is given in (2):

(2)



The f-chain schema requires that the lexical f-chain in (2) must be complemented by a function of zone 2 or 3, i.e. a situation. The verb *stay*, or *pysyä* 'stay' is as given in (3):

(3)



The f2 in the lexical f-chain in (3) does not carry the feature [M]. So, according to the f-chain schema, the f-chain must be complemented with an f1. The lexical f-chain of the English preposition *at* and the Finnish essive. (Another possibility would see the word *kotona* 'at home' as a lexicalized word form, and the English phrase *at home* as a lexicalized PP. Then, the f1 would be a part of the lexical entry of *kotona* and the phrase *at home*.)

The lexical f-chains of both of the verbs in the sentence, i.e. the causative verb *get, have, saada, panna* etc. and the verbs *stay* and *pysyä* 'stay' only select one argument. The verbs do not have implicit arguments, and therefore the argument gets selected by DA1.

English causative verbs require that the complement verb is in the infinitive form. The Finnish causative verbs require that the complement verb is in the 3rd infinitive (INF3) illative form.

The GF-system has one restriction that we must stipulate here:

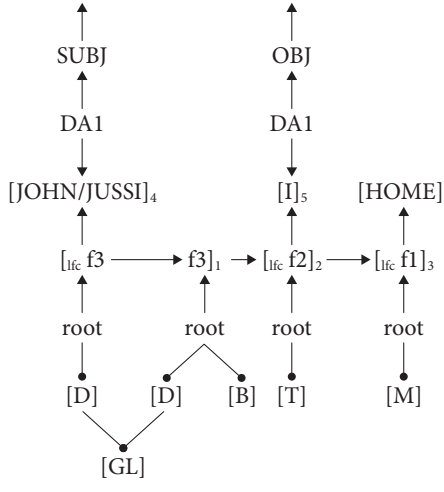
SUBJ constraint
SUBJ may select an argument only if it is selected by a function that belongs to the lexical functional chain of a finite verb.

At this point, I will not argue for or motivate the SUBJ constraint. In the discussions that follow, I will refer to it repeataedly and it will show its usefulness in that way.

The lexical f-chains (lfc) are marked in the f-chain with brackets and a subscript index: $[_{lfc}$ …]. The linking between words of the sentence and the f-chain and the argument level are marked with subscript indices. The indices are arbitrary, but in order to be consistent, I start numbering from left to right in the f-chain and continue from left to right on the argument level. The syntactic matrix and complement sentences are in parentheses and marked with subscript indices MX (= matrix) and CPL (= complement). As we have discussed, *the domain of the DA-system is the lexical functional chain and its arguments. The domain of the GF-system is the finite or infinite sentence*. If it makes it easier to see the relationships between different micro-modules, one can think that the DA-system is a lexical system, and the GF-system a syntactic system.

(4) $(_{MX}\ [_{NP}$ John$]_4$ made$_1$ $[_{NP}$ me$]_5$ $)$ $(_{CPL}$ stay$_2$ $[_{PP}$ at$_3$ home$_6$$])$

$(_{MX}\ [_{NP}$ Jussi$]_4$ pani$_1$ $[_{NP}$ minut$]_5$ $)$ $(_{CPL}$ pysymään$_2$ $[_{PP}$ koto$_6$-na$_3$$])$



The GF-system only allows there to be subjects in finite sentences, so the da1 of the dominating verb, i.e. the causative verb, gets the honor of being selected by SUBJ.

In the case of these particular verbs, the da1 of the embedded verb may select the function OBJ of the matrix sentence. In English, this is a typical configuration. In Finnish, this happens when the complement verb is in the INF3-form. If the matrix verb requires that the complement is in the INF1 form, the da1 of the complement verb appears in the genitive form:

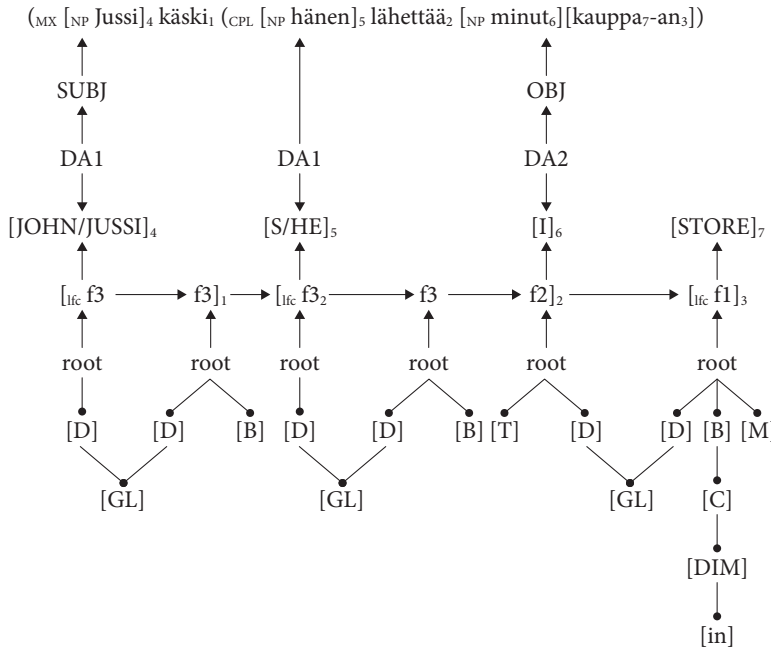
(5) a. *John told him to stay at home.*
b. *Jussi käski* ***häntä*** *pysymään kotona.*
Jussi tell-PAST-3SG s/he-PAR stay-INF3-ILL home-ESS
'Jussi told him/her to stay at home.'
c. *Jussi käski* ***hänen*** *pysyä kotona.*
Jussi tell-PAST-3SG s/he-GEN stay-INF1 home-ESS
'Jussi told him/her to stay at home.'

Even though an infinite sentence cannot have a subject, it may have an object. In (6), the da2 of the complement sentence is in either the accusative or the partitive case, which are the object cases in Finnish. I have deliberately used the personal pronouns *hän* 'she, he' and *minä* 'I' as they have a clearly distinguishable accusative form (ending t).

(6) a. *Jussi käski* ***hänen*** *lähettää* ***minut*** *kauppaan.*
Jussi tell-PAST-3SG s/he-GEN send-INF1 I-ACC store-ILL
'Jussi told him/her to send me to the store.'
b. *Jussi käski* ***häntä*** *lähettämään* ***minut*** *kauppaan.*
Jussi tell-PAST-3SG s/he-PAR send-INF3-ILL I-ACC store-ILL
'Jussi told him/her to send me to the store.'
c. *Jussi kielsi* ***häntä*** *lähettämästä* ***minua*** *kauppaan.*
Jussi forbid-PST-3SG s/he-PAR send-INF3-ELA I-PAR store-ILL
'Jussi told him/her not to send me to the store.'

In (6), the da1 of the infinitive verb is selected by the OBJ operating in the matrix sentence, and the da2 is selected by the object operating in the complement structure. The sentences in (49b–c) have the complement verb in the INF3 form and the DA1 of the complement verb has selected the OBJ of the matrix sentence. This is the same configuration as (4). In (6a), on the other hand, the complement verb is in the INF1 form, and the da1 of the complement verb is in the genitive form. The da2 of the complement verb is in the object case form (accusative) as it is the object of the complement (infinitival) sentence. The relevant parts of the linking of (6a) are given in (7):

(7) Jussi-NOM tell-PAST-3SG s/he-GEN send-INF1 I-ACC store-ILL



In Finnish, causative verbs are often derived from other verbs with the suffix *tta*/*ttä*, and sometimes the inchoative suffix *utu*/*yty* is attached to the *tta*/*ttä* and the ending is *tutta*/*tyttä*. (For the role of the suffix *utu*/*yty* in the causatives, see Paulsen 2011, and on the *u*/*y*-verbs in Finnish in general, see Siitonen 1999.) The DA-system gets rather more complicated, as we must take into account both the DA-system of the root verb and the DA-system of the derived causative verb. As Geda Paulsen (2011) shows, the da1 of the root verb becomes the da2 of the derived verb. Here is an example from Paulsen (2011: 50); the verb is *haetuttaa*, the root of which is *hakea* 'bring, fetch':

$[_V\ [_V$ *hae* 'bring'] *tutta* 'CAUS'].

(8) *Maija*$_{da1}$ *haetuttaa* *Matilla* *kirjan* $_{da2}$ *kirjastosta.*
Maija-NOM bring(-INCH-)CAUS Matti-ADE book-ACC library-ELA
'Maija made Matti bring the book from the library.'

The root verb *hakea* 'bring, fetch' is a causative verb itself: the causer *Matti* makes the theme *kirja* 'book' move from the library to a certain (context dependent) place. As discussed earlier in the section on implicit arguments, the embedded causer is always implicit in Finnish, and it cannot be a potential direct argument. It can be expressed by the adessive adjunct, as is done in (8). The da1 of the root

verb is the da2 of the derived verb. (Paulsen uses the terms SAD for the subject argument of the derived verb, OAD for the object argument of the derived verb, SOR for the subject argument of the root verb, and OAR for the object argument of the root verb. So, we can say that in these cases, OAD = SAR.)

7.2.2 Verbs of deciding, planning, refusing, starting and ending as matrix verbs

Verbs of deciding, planning, refusing, starting and ending (to do something) take a verbal complement as semantically they must be complemented by a situation. The English verbs *decide, plan, refuse, begin, stop* (doing smth) behave in the same way as the corresponding Finnish verbs *päättää* 'decide,' *aikoa* 'plan,' *kieltäytyä* 'refuse,' *alkaa* 'begin,' *ryhtyä* 'begin,' *lakata* 'stop (doing smth),' etc. The da1 of the complement verb of these verbs is not present in syntax: it is coindexed with the da1 of the matrix verb. The object of the complement verb is in the object case.

(9) a. *Mary planned/decided/refused/began drive him home.*

b. *Marja aikoi/päätti kuljettaa hänet kotiin.*
Marja plan/decide-PAST-3SG drive-INF1 s/he-ACC home-ILL
Marja planned/decided to drive him/her home.'

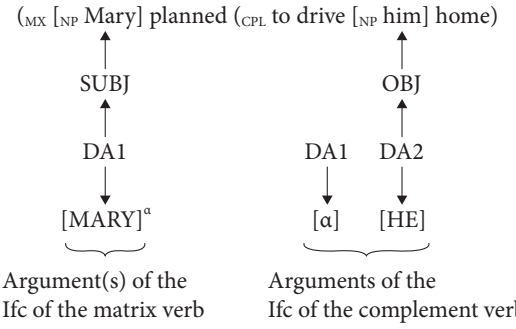
c. *Marja alkoi kuljettaa häntä kotiin.*
Marja start-PAST-3SG drive-INF1 s/he-PAR home-ILL
'Mary began to drive him/her home.'

d. *Marja ryhtyi/rupesi kuljettamaan häntä kotiin.*
Marja start-PAST-3SG drive-INF3-ILL s/he-PAR home-ILL
'Mary started to drive him/her home.'

e. *Marja kieltäytyi/lakkasi kuljettamasta häntä kotiin.*
Marja refuse/stop-PAST-3SG drive-INF3-ELA s/he-PAR home-ILL
'Mary refused to drive/ stopped driving him/her home.'

These Finnish verbs differ when it comes to the form of the infinitival complement verb. With the verbs *aikoa* 'plan,' *päättää* 'decide,' and *alkaa* 'start, begin,' the complement verb is INF1 but with the verbs ryhtyä 'start,' ruveta 'start,' the complement verb is in the INF3 illative form and with the verbs kieltäytyä 'refuse' and lakata 'stop,' the complement verb is in the INF3 elative form. The object case may be either the partitive or the accusative depending on the aspect of the sentence. But the configuration of the linking of arguments is similar with all these verbs:

(10) The Arg selected by the da1 of the complement verb is coindexed with the Arg selected by DA1 of the matrix verb and is not linked to syntax:



7.2.3 Verbs of desire and belief as matrix verb

When it comes to argument linking, the verbs of desire and belief such as *want, hope, believe* and the Finnish verbs *haluta, toivoa* 'hope,' and *uskoa* 'believe, trust' behave either in the same way as the causative verbs (as in (11)) or in the same way as the verbs of deciding, planning, refusing, starting and stopping we discussed above (as in (12)).

(11) a. ($_{MX}$ *The salesmen want you*)($_{CPL}$ *to get new clothes.*)

b. *Kauppiaat* *haluavat* *sinun* *hankkivan*
salesman-PL-NOM want-3PL you-GEN get-PRESPTC
uudet *vaatteet.*
new-PL-ACC clothe-PL-ACC
'The salesmen want you to get new clothes.'

(12) a. *The salesmen want to get new clothes.*

b. *Kauppiaat* *haluavat* *hankkia* *uudet* *vaatteet.*
salesman-PL-NOM want-3PL get-INF1 new-PL-ACC clothe-PL-ACC
'The salesmen want to get new clothes.'

Different verbs may require different morpho-syntactic form, as shown in (13) and (14). The English verbs *believe* and *hope* do not behave in the same way as the verb *want* (cf (13a) and (b)). The Finnish *uskoa* 'believe, trust' and *toivoa* 'hope' in (14) require that the infinite complement verb is in the participial form. If the da1 of the complement verb is not coindexed with the da1 of the matrix verb, it appears in the genitive form as a part of the complement structure (14a, c). If the da1 of the complement verb is coindexed with the da1 of the matrix verb, the complement verb is marked with a possessive suffix (14b, d). The participial form may be either present participial (14a, b) or past participial (14c, d), depending on the "tense."

(13) a. *The salesmen believe/hope that he will get new clothes.*
b. *The salesmen believe/hope to get new clothes.*

(14) a. *Kauppiaat* *uskovat/toivovat* *sinun* *hankkivan*
salesman-PL believe/hope-3PL you-GEN get-PTC
uudet *vaatteet.*
new-PL-ACC clothes-PL-ACC
'The salesmen believe/hope that you will get new clothes.'

b. *Kauppiaat* *uskovat/toivovat* *hankkivansa*
salesman-PL believe/hope-3PL get-PTC-PX3
uudet *vaatteet.*
new-PL-ACC clothes-PL-ACC
'The salesmen believe/hope they will get themselves new clothes.'

c. *Kauppiaat* *uskovat/toivovat* *sinun* *hankkineen*
salesman-PL believe/hope-3PL you-GEN get-PSTPTC
uudet *vaatteet.*
new-PL-ACC clothes-PL-ACC
'The salesmen believe/hope you to have got yourself new clothes.'

d. *Kauppiaat* *uskovat/toivovat* *hankkineensa*
salesman-PL believe/hope-3PL get-PSTPTC-PX3
uudet *vaatteet.*
new-PL.ACC clothes-PL.ACC
'The salesmen believe/hope that they have got themselves new clothes.'

If we concentrate on the argument linking, we have three patterns – which we have already seen when analyzing other verbs. In the following, the part of the sentence based on the matrix verb is in boldface and the part of the sentence based on the complement verb is in italics. The subject of the sentence is marked with subscript index SUBJ, the object of the matrix sentence is marked as OBJM and the object of the complement structure is marked with index OBJC. The matrix sentence and the complement are in parentheses marked with indices MX (matrix) and CPL (complement). The da2 of the complement verb (subscript index da2C) is always the object of the complement structure and the da1 of the matrix verb (subscript index da1M) is always the subject of the sentence.

(15) (i) The da1 of the complement verb (subscript index da1C) is the object of the matrix sentence (OBJM) (cf. 13a):
English:
($_{MX}$ ***The salesmen***$_{da1M\text{-}SUBJ}$ ***want*** *him*$_{da1C\text{-}OBJM}$)($_{CPL}$ *to get new clothes*$_{da2C\text{-}OBJC}$)

(ii) The da1 of the complement verb is a genitive modifier of the infinite complement verb (cf. 14a, c):
Finnish:
($_{MX}$ ***Kauppiaat***$_{da1M\text{-}SUBJ}$ ***haluavat***)($_{CPL}$ *sinun hankkivan uudet vaatteet*$_{da2C\text{-}OBJC}$)
($_{MX}$ **salesmen**-NOM **want**-3PL)($_{CPL}$ *you*-GEN *get*-PTC *new*-PL.ACC *clothe*-PL.ACC)

(iii) The Arg selected by the da1 of the complement verb is coindexed with the Arg selected by da1 of the matrix verb and is not linked to syntax (cf. 13b, 14b, d):
English:
($_{MX}$ ***The salesmen***$_{da1M\text{-}SUBJ}$ ***want***)($_{CPL}$ *to get new clothes*$_{da2C\text{-}OBJC}$)
Finnish:
($_{MX}$ ***Kauppiaat***$_{da1M\text{-}SUBJ}$ ***haluavat***)($_{CPL}$ *hankkia uudet vaatteet*$_{da2C\text{-}OBJC}$)
($_{MX}$ **salesmen**-NOM **want**-3PL)($_{CPL}$ *get*-INF1 *new*-PL-ACC *cloth*-PL.ACC)

7.2.4 Modal verbs as matrix verb

We discussed the motivation for a separate modal tier in Chapter 5. Modal verbs differ from the verbs discussed earlier in this section because their lexical semantics is based on the modal tier and not a lexical f-chain. I will only go through examples of 'must' to illustrate the configuration behind the argument linking.

Both English Finnish have different verbs and constructions to express the modal operator NEC (necessary). English has for instance the verbs *must, have* and *need*. Finnish has for instance verbs *pitää, täytyy, kuuluu* and constructions *on pakko* 'is obligation' and *on V-PASS-PTC* meaning 'is' and a verb in the passive present participal form (more this form, see Pekkarinen 2011). The Finnish verbs are all only inflected in the third person singular form.

In (16), there are examples of the verbs *must* (16a), *have* and *need* (16b):

(16) a. *John must throw the ball to the catcher.*
b. *John has/needs to throw the ball to the catcher.*

The complement verb is in the basic infinitival form and the da1 of the complement verb appears as the subject of the sentence.

The verbs *have* and *need* behave similarly, but when used as modal verbs, they require that their complement infinitival verb is preceded by the preposition *to*.

In the light of the discussion on the modal tier in Chapter 5, the lexical entries of the English modal verbs *must* and *have* are as follows (*need* works in the same way as *have*). The semantic field of the modal operator (deontic or epistemic) is unspecified with these verbs. It may be specified with some other modal verbs, like for instance *should* (for the modal tier, see Chapter 5):

(17)

must
V
NEC

have
V
__[to V]
NEC

The verb *must* is syntactically like any other English verb. The verb *have* (and *need*) have a requirement that the complement verb is preceded by the preposition (inifinitival marker) *to*. The linking patterns are as in (18):

(18) a. ($_{MX}$ *John*$_{da1C\text{-}SUBJ}$ **must**)($_{CPL}$ *throw the ball*$_{da2C\text{-}OBJC}$ *to the catcher*)
b. ($_{MX}$ *John*$_{da1C\text{-}SUBJ}$ **has/needs**)($_{CPL}$ **to** *throw the ball*$_{da2C\text{-}OBJC}$ *to the catcher*)

The lexical modal tier of the modal verb needs to be complemented by a situation and it selects the leftmost f-chain in the lexical f-chain of the complement verb. English grammar requires that every sentence must have a subject, but the modal verb does not have a lexical f-chain, and consequently, no potential direct argument either. The English language solves this problem by a principle that the DA1 of the complement verb selects the SUBJ of the sentence whose predicate is a modal verb. This principle can be formalized as follows:

(19) *The English modal verb argument linking principle*

($_{MX}$ NP$_3$ … V$_1$ …)($_{CPL}$ …V$_2$ …)	"syntax"
↑	
SUBJ	GF-system
↑	
DA1	DA-system
↓	
[…]$_3$	Argument level
↑	
[$_{lfc}$ f …]$_2$	f-chain
↑	
[$_{lmt}$ MOD]1	modal tier

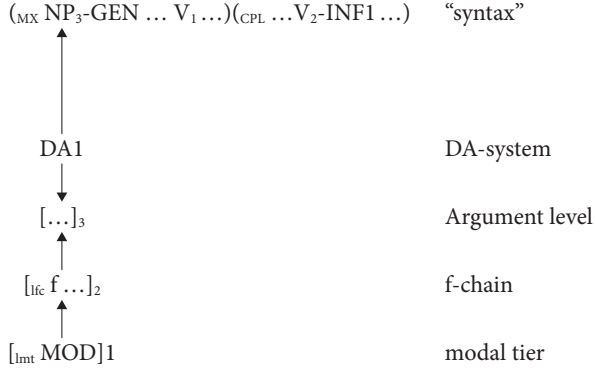
The principle can be applied to all the verbs that have a lexical modal tier (lmt). If one wants to call it a construction, that is fine: it is a linking prinicple that regulates the linking of a particular verb group, modal verbs. This principle is needed as the modal verbs do not have a lexical f-chain and so the more general linking principles cannot apply.

The Finnish verbs *täytyy, pitää, kuuluu* behave a bit differently as can be seen in (20):

(20) *Sinun* *täytyy/pitää/kuuluuheittää* *pallo* *siepparille.*
You-GEN must/need-to/have-to-3SG throw-INF1 ball-NOM catcher-ALL
'You must/need to/have to throw the ball to the cathcer.'

Unlike English, Finnish does not require that there is a subject in every (finite) sentence. The da1 of the complement verb is the topic of the sentence, and it is in the topic position of the matrix sentence (we will return the topic position and the information structure in Chapters 7 and 8). The modal verb is always in the third person singular form, which is the neutral, unmarked form in Finnish. The da1 is in the genitive form. Traditional grammars call this NP the genitive subject, but it seems to me to be unnecessary to call it the subject as it is not in the nominative case nor does it agree with the predicate verb. We can formalize the Finnish modal verb argument linking as follows:

(21) *The Finnish modal verb argument linking principle*



The Finnish modal verbs *saada* 'may,' *voida* 'may, can' follow the principle in (21). The lexical modal tier (i.e. MOD in (21)) of these verbs is PSB:

(22) *Sinä* *saat/voit* *heittää* *pallon* *siepparille.*
you-NOM may/can-2SG throw-INF1 ball-ACC catcher-ALL
'You may/can throw the ball to the catcher.'

The only requirement that may be added to (21) for Finnish is that the complement verb must be in the INF1 form. That may not be necessary, though, if

we assume that the INF1 form is the unmarked infinitival form for infinitival complements.

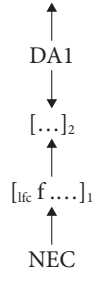
The Finnish modal verbs with the lexical modal tier NEC are linked according to a somewhat different principle. The principle skips the GF system and sets morphological requirements for the da1 of the complement verb as it must be in the genitive form. The complement verb must be in the INF1 form.

In Finnish, there is a modal construction in which the finite predicate verb is the third person singular form of the verb *olla* 'be' as the complement verb is the passive present participial form:

(23) *Sinun* *on* *heitettävä* *pallo* *siepparille.*
you-GEN be-3SG throw-PASS-PTC ball-NOM catcher-ALL
'You must throw the ball to the catcher.'

Note that the da1 of the complement verb *heittää* 'throw' is in the genitive form just like with the modal verbs we discussed above. However, as the interpretation of the modal tier operator NEC is based on the combination of the particular verb (*olla* 'be') and a particular morphological form of the complement verb, the interpretation must take both these elements into account. The way to do this is to assume that there is a construction that does just that. The construction can be formalized as in (24):

(24) *The Finnish* [olla-3SG V-PASS-PTC] *modal conctruction*
($_{MX}$ NP$_2$-GEN…[$_V$ olla-3SG]…)($_{CPL}$ …[$_V$ V$_1$-PASS-PTC]…])



7.2.5 Other matrix verbs

In order not to give the reader the false impression that we have discussed all the verbs of interest, I would like to recall that there are several word groups that take a situation as complement but the analysis of which must be postponed for another occasion. For instance, the following verbs are interesting for further analysis:

Finnish verbs *ehtiä* and *joutaa* mean 'have time to' do something, and they take a situation as their complement:

(25) *Minä ehdin/joudan kirjoittaa kirjan.*
I-NOM have-time-1SG write-INF1 book-ACC
'I have time to write a book.'

The Finnish verb *tarjeta* 'be warm enough' (in a cold temperature) can take a situation as its complement:

(26) *Minä tarkenin juosta pitkän lenkin.*
I-NOM was-warm-enough-PAST-1SG run-1INF long-ACC run-ACC
'I could do a long run despite the cold (weather).'

The verb *tarjeta* can also be used without a complement situation to mean that one is warm enough.

(27) *Kyllä minä hyvin tarkenen.*
yes I-NOM well stand-cold-enough-1SG
'I am warm enough.'

The English verb *dare* and the corresponding Finnish verbs, e.g. *rohjeta* and *uskaltaa* take a situation as their complement: the situation that one has courage enough to do:

(28) a. *I did not dare to go to Psycho's house.*
b. *En rohjennut/uskaltanut mennä Psychon taloon.*
NOT-1SG dare-PSTPTC go-INF1 Psycho-GEN house-ILL
'I did not dare to go to Psycho's house.'

There are some verbs in Finnish indicating that one is bold enough to do something despite that doing it is shameful. The verbs are *kehdata* and *iljetä* both meaning 'dare despite the shame':

(29) *Rocktähti kehtasi/ilkesi soittaa alasti konsertissa.*
rock-star-NOM dare-PAST-3SG play-INF1 naked concert-INE
'The rockstar dared to play naked in a concert.'

The argument linking of all these verbs may follow the pattern (15iii) above or the linking pattern is that of the modal verbs in (21). The analysis depends on the description of the lexical entry of the verb.

7.3 Subordinate finite sentences

So far, we have discussed the argument linking of single clauses and complex sentences with a finite matrix sentence and an infinite complement. In this section, we will briefly discuss the treatment of finite subordinate clauses. I will use Finnish in

my examples. I believe, however, that the analyses can be to a large extent applied to other languages as well.

7.3.1 Subordinate conjunctions and relative pronouns in Finnish

Here is a list of Finnish subordinate conjunctions with examples. The labels for the groups of conjunctions are traditional (for subordinate clauses in Finnish, see e.g. Hakulinen &al. 2004: 1057ff. and the references there.)

General subordination
että 'that'

(30) a. *Uskon/haluan/toivon,* ***että*** *sinä tulet kotiin.*
believe/want/hope-1SG **that** you-NOM come-2SG home-ILL
'I believe/want/hope **that** you (will) come home.'

b. Pek*ka kertoi/väitti/kirjoitti, että sinä*
Pekka-NOM said/claim/write-PAST-1SG **that** you-NOM
tulet kotiin.
come-2SG home-ILL
'Pekka told/claimed/wrote **that** you (will) come home.'

c. *Pekka kysyi,* ***että*** *tuletko*
Pekka-NOM ask-PAST-3SG **that** come-2SG-QCL
sinä kotiin. (Colloquial)
you-NOM home-ILL
'Pekka asked whether you (will) come home.'

d. *On varmaa/luultavaa,* ***että*** *sinä tulet kotiin.*
be-3SG certain/probable-PAR **that** you-NOM come-2SG home-ILL
'It is certain/probable **that** you (will) come home.'

Final
jotta 'for, in order to'

(31) *Menen kotiin,* ***jotta*** *voin levätä.*
go-1SG home-ILL **in-order-to** can-1SG rest-1INF
'I am going home so I can rest.'

Causal
koska 'because'

(32) *Menen kotiin,* ***koska*** *olen sairas.*
go-1SG home-ILL because be-1SG sick-NOM
'I am going home because I am sick.'

sillä 'because'

(33) *Menen kotiin,* ***sillä*** *olen sairas.*
go-1SG home-ILL **because** be-1SG sick-NOM
'I am going home because I am sick.'

Temporal
kun 'when'

(34) *Menen kotiin,* ***kun*** *olen sairas.*
go-1SG home-ILL **when** be-1SG sick-NOM
'I go home when I am sick.'

kunnes 'until'

(35) *Pysyn kotona,* ***kunnes*** *olen terve.*
stay-1SG home-ESS **until** be-1SG healthy-NOM
'I am staying at home until I am healthy.'

Conditional
jos 'if'

(36) *Menen kotiin,* ***jos*** *olen sairas.*
go-1SG home-ILL **if** be-1SG sick-NOM
'I go home if I am sick.'

mikäli 'if'

(37) *Menen kotiin,* ***mikäli*** *olen sairas.*
go-1SG home-ILL **if** be-1SG sick-NOM
'I go home if I am sick.'

Concessive
vaikka 'even though, even if'

(38) a. *En mene kotiin,* ***vaikka*** *olen sairas.*
not-1SG go-NEGF home-ILL **even though** be-1SG sick-NOM
'I do not go home even though I am sick.'

b. *En mene kotiin,* ***vaikka*** *olisin sairas.*
not-1SG go-NEGF home-ILL **even though** be-COND-1SG sick-NOM
'I do not go home even if I were sick.'

joskin 'although'

(39) *Menen kotiin,* ***joskin*** *teen siellä töitä.*
go-1SG home-ILL **although** do-1SG there work-PL-PAR
'I am going home, although I wil work there.'

Comprarative
niin kuin '(just) as'

(40) *Menen kotiin,* ***niin kuin*** *sinä käskit minun tehdä.*
go-1SG home-ILL **just as** you-NOM tell-2SG I-GEN do-1INF
'I am going home, just as you told me to do.'

In addition to the conjunctions, a finite sentence can be subordinated as a relative clause. The relative pronouns in Finnish are *joka* and *mikä*:
joka 'that'

(41) *Sain kirjan, joka on kiinnostava.*
get-PAST-1SG book-ACC that be-1SG interesting-NOM
'I got a book that is interesting.'

mikä 'which'

(42) *Sain kirjan, mikä on kiinnostavaa.*
get-PAST-1SG book-ACC which be-1SG interesting-PAR
'I got a book, which is interesting.'

One common type of subordinate finite sentence in Finnish as well as in many other languages is indirect questions. Typically the matrix verb is a communicative verb or verb of 'knowing,' 'guessing,' and the like. Some typical examples are given in (43):

(43) a. *Presidentti kertoo, matkustaako hän Moskovaan.*
President-NOM tell-3SG travel-QCL s/he Moscow-ILL
'The president will say whether s/he will travel to Moscow.'

b. *Näytän/tiedän, millaisen lahjan presidentti*
show/know-1SG what-kind-of-ACC present-ACC president-NOM
sai pääministeriltä.
get-PAST-3SG prime-minister-ABL
'I show (you)/I know what kind of present the president got from the prime minister.'

Subordinate sentences can be divided into the following groups according to their semantic status:

1. The subordinate sentence expresses a situation that is in the argument place of the lexical f-chain of the matrix verb. (Verbs of communication or belief: *sanoa, kertoa, väittää, kirjoittaa, uskoa*…(30a–c), indirect questions (43).)
2. The matrix sentence is linked to a modal operator, and the subordinate sentence expresses the situation selected by that operator. (Predicative constructions *on varmaa/luultavaa/oikein/väärin*… (30d).)

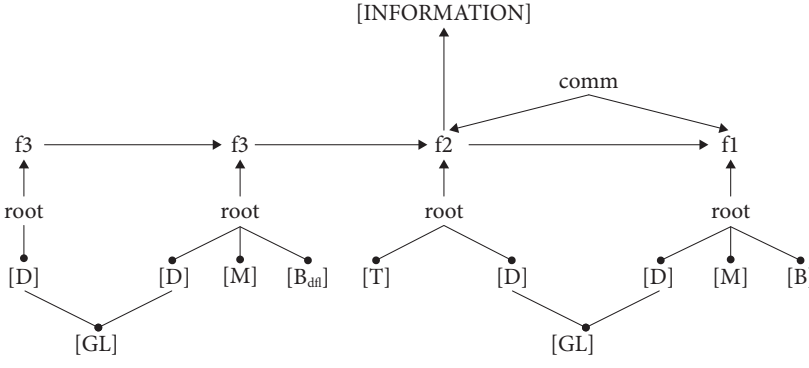
3. The subordinate sentence is an adjunct and embedded in the matrix thematic situation by a subordinate operator. (Conjunctions *jos, kun, mikäli, jotta…* (31)–(40).)
4. Relative clauses are embedded as properties in the conceptual category linked to the N that is the head of the NP to which the relative clause belongs.

I will next give short analyses of the different groups. The analysis is not exhaustive but should give the reader an idea of the way subordinated sentences can be analyzed in the Tiernet approach.

7.3.2 Subordinate sentence in an argument position of a verb of communication

A typical case in which the content of the subordinate sentence is linked to the argument position of the lexical f-chain of the matrix verb is that of the verbs of communication, e.g. (30a–c), (43). The common parts of the lexical entries of communicative verbs are as follows:

(44)

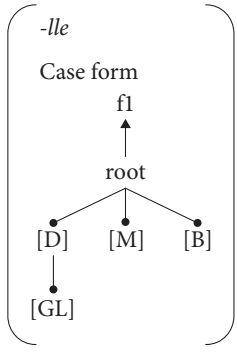


The subscript index dfl indicates that the feature (here [B]) is the default choice when the verb is used. The semantic field is communication. (One could also think of calling the semantic field in question something more general than "information," e.g. "knowledge," but a more detailed analysis of the semantic field is not relevant here.) The piece of information conveyed by the causer appears in the theme position of the lexical f-chain. The content of the expression is unified with the lexical content in the theme position, i.e. that it is information. The theme of a communicative verb does not have to be a situation and the syntactic complement of the verb does not have to be a sentence. It can also be a noun phrase, e.g.

(45) *Kerroin* *Pekalle* *tarinan/tiedon/tuloksen.*
tell-PAST-1SG Pekka-ALL story/piece-of-information/result-ACC.
'I told Pekka a story/piece of information/the result.'

The receipient of the information is expressed by the allative case. The relevant parts of the lexical entry of the allative case are given in (46):

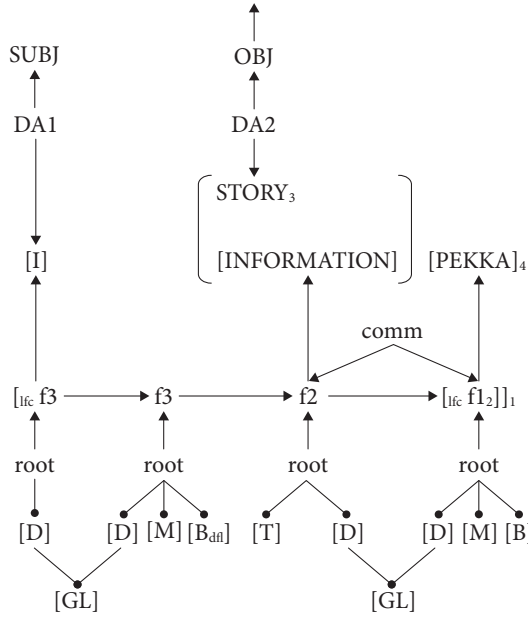
(46)



The lexical f-chain and thematic features of the allative case are unified with the lexical f-chain and thematic features of the verb *kertoa* 'tell.' In (47), the unification is visible as the lfc of the allative case is included in the lfc of the verb *kertoa*:

(47) tell-1SG Pekka-ALL story-ACC

kerroin$_1$ [$_{PP}$ Peka$_3$-lle$_2$] [$_{NP}$ tarinan]$_4$



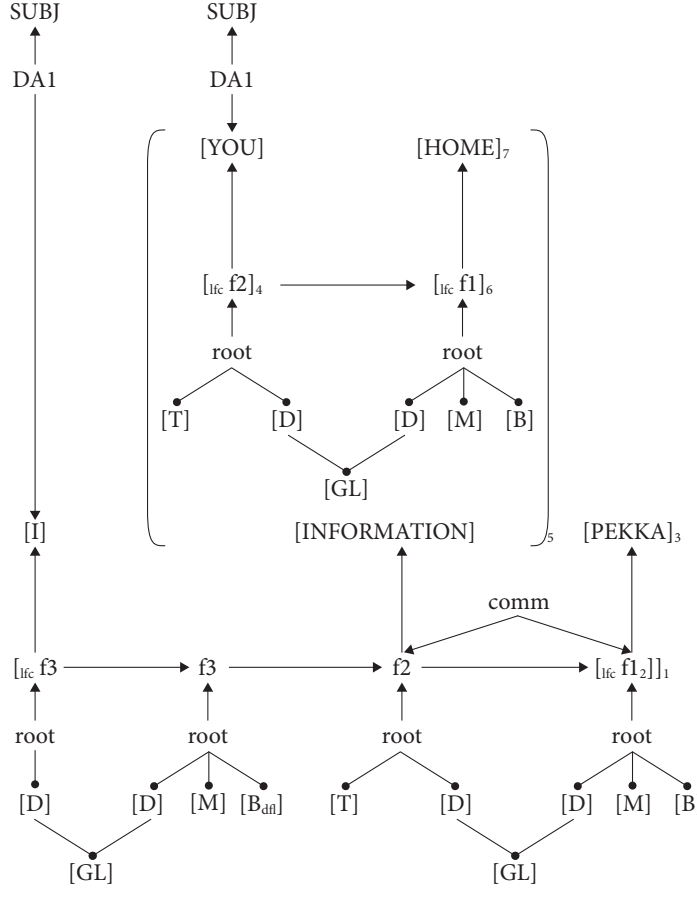
A situation can function as a theme argument. In Finnish, a situation that is the theme argument of a communicative verb is typically expressed as a subordinate clause, using the general subordinating conjunction *että* 'that' (as in as (48), see also (30b)):

(48) *Kerron Pekalle,* ***että*** *tulet kotiin.*
tell-1SG Pekka-ALL **that** you-NOM come-2SG home-ILL
'I tell Pekka **that** you (will) come home.'

An analysis of the relevant semantics and the argument linking of a simple embedding with the conjunction *että* is given in (49). The content of the situation 'you come home' is unified with the lexical information (i.e. INFORMATION) placed in the theme argument position of the verb *kertoa* 'tell.'

(49) tell-1SG [Pekka-ALL]) [that [come-2SG home-ILL]

($_{MX}$ kerroin$_1$ [$_{PP}$ Peka$_3$-lle$_2$]) ($_{CPL}$ [että [tulet$_4$ koti$_7$-in$_6$]]$_5$)



The theme position of the verb *kertoa* is now occupied by a situation that is linked to a sentence. In traditional grammar, this kind of subordinate clause is analyzed as the object of the matrix sentence. In the present framework, this is not necessary. If one wants, it might be possible to assume that the situation in the theme position is selected by DA2 of the matrix verb. This would make it the "logical

object" of the matrix verb. As the linking in (49) functions well without such an assumption, I do not find it necessary.

The embedded situation may also be an indirect question, as in (50). The sentence in (50b) is colloquial style.

(50) a. *Kerron Pekalle, kuka tulee kotiin.*
tell-1SG, who-NOM come-2SG home-ILL
'I tell Pekka who (will) come home.'

b. *Kerron Pekalle, että kuka tulee kotiin.* (Colloquial)
tell-1SG, who-NOM come-2SG home-ILL
'I tell Pekka who (will) come home.'

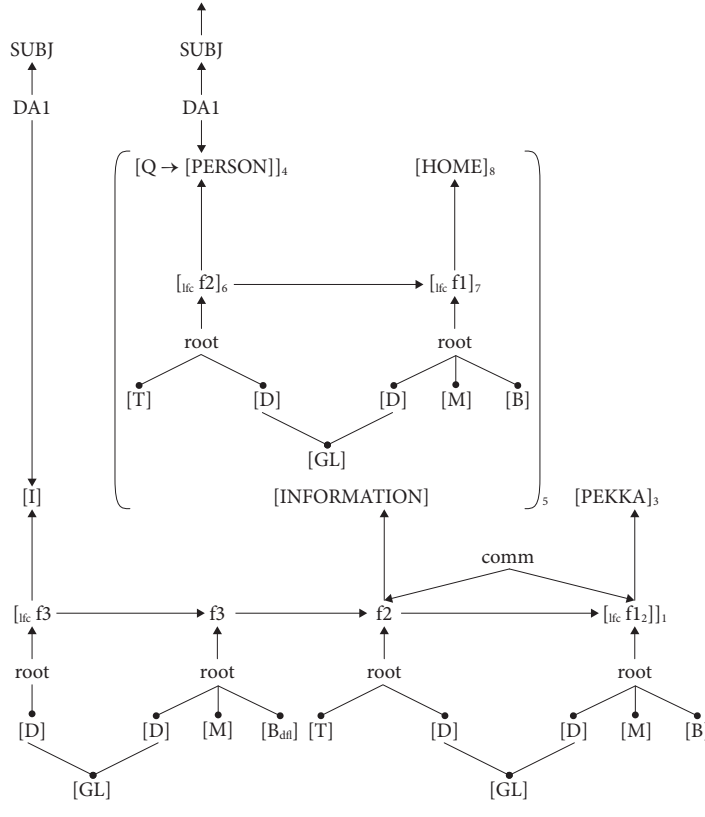
The lexical entry of the interrogative pronoun kuka 'who' is as in (51):

(51) [Q → [PERSON]]

The operator Q stands for "question" and selects the element that is the missing part of the information. The interrogative pronoun kuka 'who' includes the fact that the it refers to a person. The linking of the sentence in (50a) is as in (52):

(52) tell-1SG [Pekka-ALL]) [come-2SG-QCL home-ILL]

($_{MX}$ kerron$_1$ [$_{PP}$ Peka$_3$-lle$_2$]) ($_{CPL}$ [kuka$_4$ tulee$_6$ koti$_8$-in$_7$]]$_5$)



The linking of sentence (50b) is otherwise the same but the operator EMB is linked to the conjunction *että*.

As shown in (30c) It is possible to use the question clitic ko/kö to form an indirect question in Finnish. The clitic is an operator that can select a lexical semantic structure and make it a piece of missing information:

(53) a. *Pekkako tulee tänään Helsinkiin?*
Pekka-NOM-QCL come-3SG today Helsinki-ILL
'Is it Pekka who is coming to Helsinki today?'

b. *Helsinkiinkö Pekka tulee tänään?*
Helsinki-ILL-QCL Pekka-NOM come-3SG today
'Is it Helsinki where Pekka is coming today?

c. *Tänäänkö Pekka tulee Helsinkiin?*
today-QCL Pekka-NOM come-3SG Helsinki-ILL
'Is it today that Pekka is coming to Helsinki?'

d. *Tuleeko Pekka tänään Helsinkiin?*
come-3SG-QCL Pekka-NOM today Helsinki-ILL
'Is Pekka coming today to Helsinki?'

The lexical entry of the clitic ko/kö is given in (54). (Note: following the rules of Finnish vowel harmony, the phonological form is *ko* when the word stem has back vowels (a, o, u) and *kö* when the stem has front vowels (ä, ö, y, i, e). The vowels i and e are called neutral, as they may be present in the same stem with back vowels.)

(54)

-ko/kö

clitic

Q → [lexical semantic structure

If *ko*/*kö* is attached to a verb, as in (53d) it has a scope over the whole situation expressed by that verb. If we modify the sentence in (50), and change the question word kuka to the question clitic ko/kö, we get the following sentences. (55a) is the normal indirect question and (55b) colloquial style with the conjunction *että*:

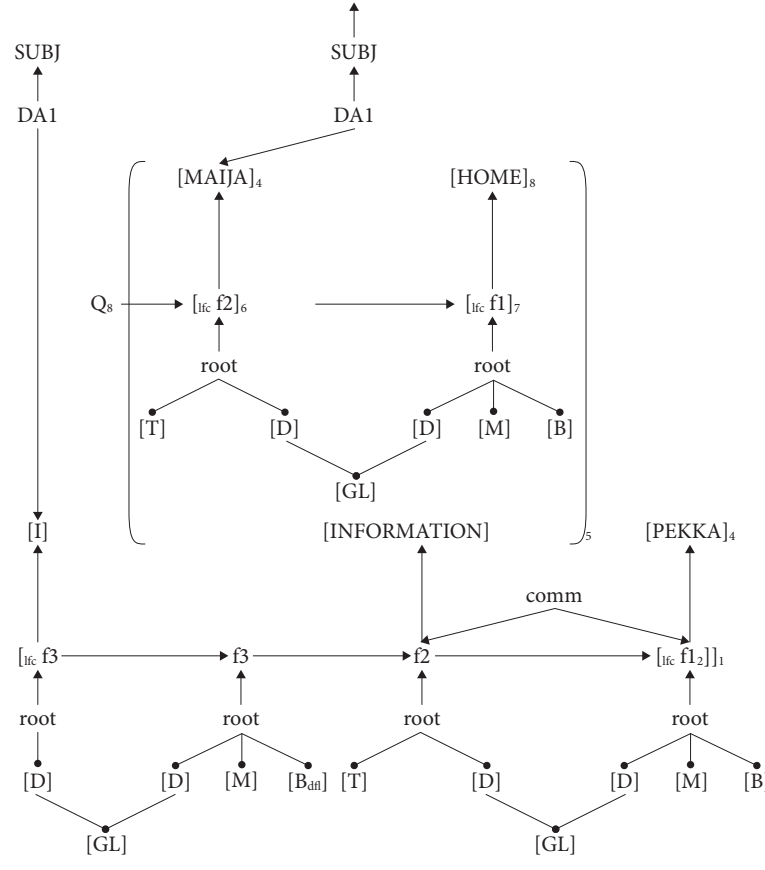
(55) a. *Kerron Pekalle, tuleeko Maija kotiin.*
tell-1SG Pekka-ALL, come-3SG-QCL Maija-NOM home-ILL
'I tell Pekka whether Maija will be coming home.'

b. *Kerron Pekalle, että tuleeko*
tell-1SG Pekka-ALL, that come-3SG-QCL
Maija kotiin. (Colloquial)
Maija-NOM home-ILL
'I tell Pekka whether Maija will be coming home.'

The argument linking of the sentence in (55a) can be analyzed as in (56). The opearator Q selects the lexical information of the verb *tulla* 'come.' (The analysis of (55b) is the same but the conjunction *että* is lnked to the subordinate operator EMB):

(56) ($_{MX}$ tell-1SG [Pekka-ALL]) ($_{CPL}$ [come-2SG-QCL home-ILL])

($_{MX}$ kerron$_1$ [$_{PP}$ Peka$_3$-lle$_2$]) ($_{CPL}$ [tulee$_6$-ko$_8$ Maija$_4$ koti$_8$-in$_7$]]$_5$)



7.3.3 Subordinate clause as the complement of a modal or evaluative expression

The conjunction *että* is used for embedding also in modal expressions. The adjectives like *varma* 'certain,' *luultava* 'probable,' *suotava* 'desirable, advisable,' i.e. 'morally recommended' etc. can be used in a construction, whose morpho-syntactic form is given in (57). The only obligatory morphological affix in a finite verb in Finnish is the subject agreement suffix (AgrS), which cannot appear in infinite verb forms. I use this information as a part of the construction:

(57) [*olla*-3SG [$_{AP}$…[A-PAR]] että […V-AgrS…]]

in which the adjective may be one of the modal ones. The adjectives in this construction are typically modal or evaluative. For instance the following adjectives can appear in this construction. In the list they are given in the partitive form:

uskottavaa 'probable'
varmaa 'certain'
luultavaa 'probable'

Many evaluative adjectives can appear in the same construction, but the difference between these adjectives and the modal ones is that the complement verb may appear not only in the finite verb with the embedded conjunction *että* but also in the INF1 form as given in (58). The modal adjectives can only appear in constructions (58a) and (58b), examples in (58c) and (58d).

(58) a. [NP-GEN *olla*-3SG [$_{AP}$…[A-PAR]] […V-1INF…]]
b. [*olla*-3SG [$_{AP}$…[A-PAR]] […V-1INF…]]
c. *Sinun on hauska tulla kotiin.*
you-GEN be-3SG nice-NOM
'It is nice for you to come home.'
d. *On hauska tulla kotiin.*
be-3SG nice-NOM come-1INF home-ILL
'It is nice to come home.'

That, however, is another construction, and I will have leave it to future research.

Here are some examples of evaluative adjectives that can appear in the constructions (57) and (58) (in the partitive form):

toivottavaa 'esirable'
epäilyttävää 'suspendable'
kaunista 'beautiful'
hienoa 'great'
huvittavaa 'amusing'
jännittävää 'exciting'
tylsää 'boring'
ikävää 'sad, unfortunate'
inhottavaa 'disgusting'
viisasta 'wise'
järkevää 'wise, clever'
typerää 'stupid'

hullua 'crazy'
idioottimaista 'idiotic'
tuhmaa 'naughty'
kilttiä 'nice'
turhaa 'unnecessary, pointless, useless'
etc.

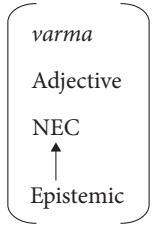
The words *hyvä* 'good' and *paha* 'bad' appear in the same – or almost the same – construction in the nominative form. The adverbs *oikein* 'right' and *väärin* 'wrong' can be used instead of the A-PAR in the construction, but that can be analyzed as another – but very similar – construction as the one with the partitive case. – Then, there is another construction in which e.g. the words *hyvä* 'good,' *kurja* 'miserable,' *paha* 'bad,' *hauska* 'nice,' etc. appear in the nominative, but that constrcution has another meaning ('it is good/miserable/bad/nice/… for someone to do something'). We will however leave that construction for future research.

Keeping this in mind, we can analyze the construction with modal adjectives, i.e. (30c), repeated here as (59):

(59) *On varmaa, että sinä tulet kotiin.*
be-3SG certain-PAR that you-NOM come-2SG home-ILL
'It is certain that you (will) come home.'

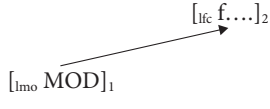
The lexical entry of the adjective varma is as follows:

(60)



The construction in (57) can be described as in (61). (The subscript index "lmo" stands for lexical modal operator, MOD stands for any modal operator.)

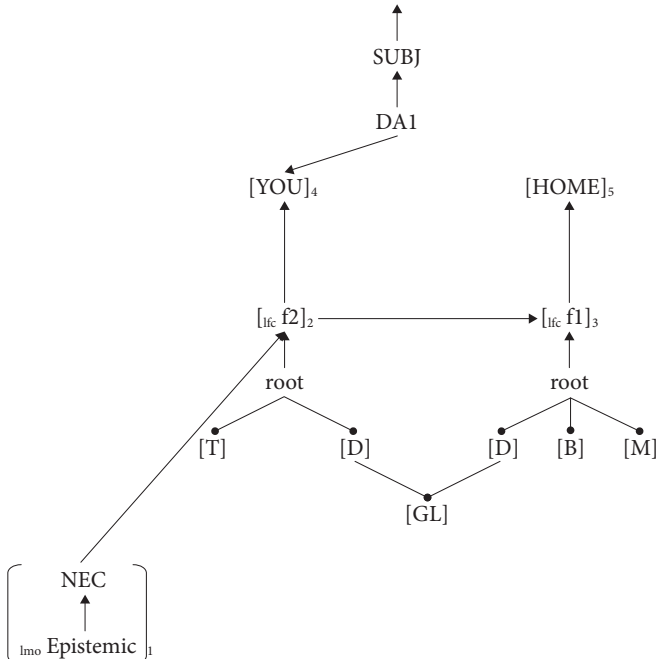
(61) Modal adjective + *että* construction
($_{MX}$ [*olla*-3SG [$_{AP}$…[A_1-PAR]]) ($_{CPL}$ *että* […V_2 -AgrS…]])



The sentence in (59) can be analyzed as follows:

(62) ($_{MX}$ be-3SG certain-PAR) ($_{CPL}$ that you-NOM come-2SG home-ILL)

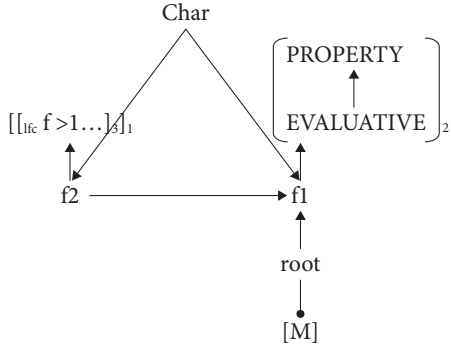
($_{MX}$ on varmaa$_1$) ($_{CPL}$ että sinä$_4$ tulet$_2$ koti$_5$-in$_3$)



As pointed out above, evaluative adjectives may appear in a construction whose syntactic form is the same as in (61) but the predicate verb of the complement clause may be either in a finite form or in the INF1-form.

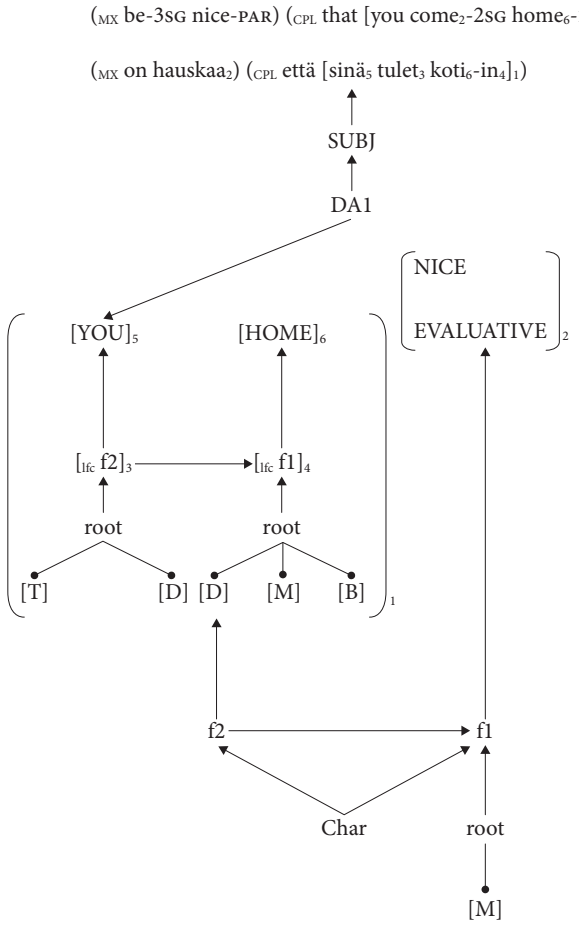
The evaluative adjectives stand for properties that are assigned to the situations expressed in the complement clause. So, they are closer to normal predicative clauses. The construction that is responsible for the interpretation of the *että*-clauses with an evaluative adjective is given in (63):

(63) ($_{MX}$ *olla*-3SG …A$_2$-PAR) ($_{CPL}$ *että* [...V$_3$-AgrS…]$_1$)



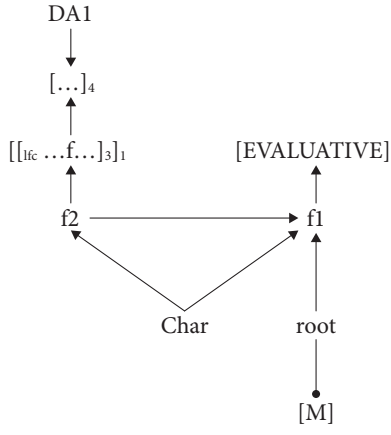
I have only marked EVALUATIVE as the semantic information that comes with the construction. Further studies on the lexical semantics of the adjectives that can be used in construction (63) could certainly help to come up with more precise information. However, at this point, the goal is to show how the system works, and the formulation in (63) is precise enough for that purpose.

For instance, the sentence (64) is analyzed as in (65):

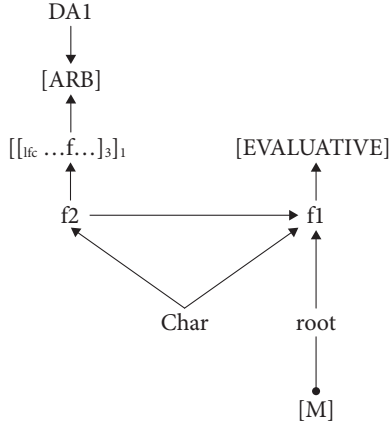


If the verb is in the INF1-form, the da1 of the complement verb is expressed as an NP in the genitive form in the topic position of the matrix clause. If the da1 of the complement verb is generic (i.e. linked to the generic argument ARB), it is not expressed at all. We need new constructions for the infinitive complements. I will divide these constructions into two: the one with the genitive NP in the topic position is in (66a) and the generic one is in (66b):

(66) a. ($_{MX}$ NP$_4$-GEN *olla*-3SG …A$_2$-PAR) ($_{CPL}$ […V$_3$-1INF…]$_1$)



b. ($_{MX}$ *olla*-3SG …A$_2$-PAR) ($_{CPL}$ […V$_3$-1INF…]$_1$)

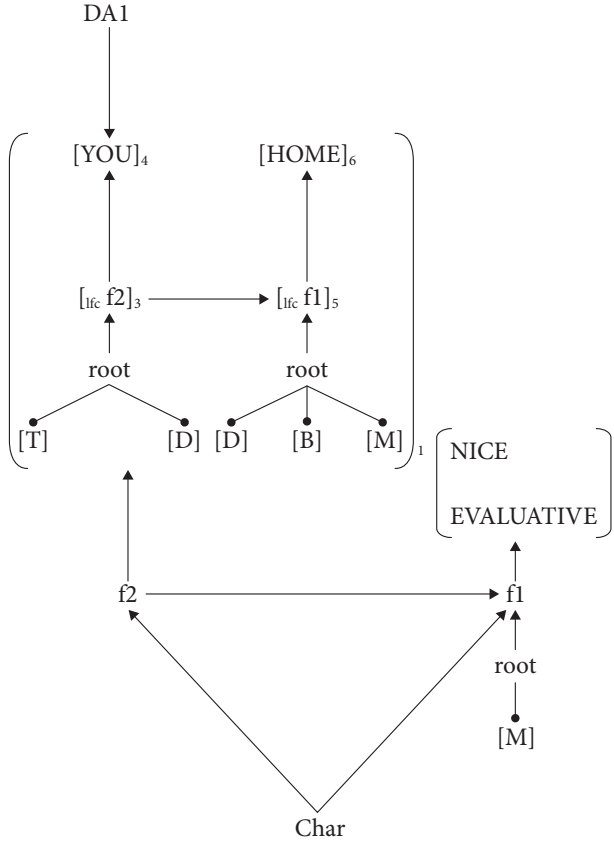


The sentence in (67) is an example of the construction (66a) and the sentence in (68) is an example of the construction (66b):

(67) *Sinun on viisasta tulla kotiin.*
you-GEN be-3SG wise-PAR come-INF1 home-ILL
'It is wise of you to come home.'

($_{MX}$ NP-GEN be-3SG wise-PAR) ($_{CPL}$ [come-1INF home-ILL])

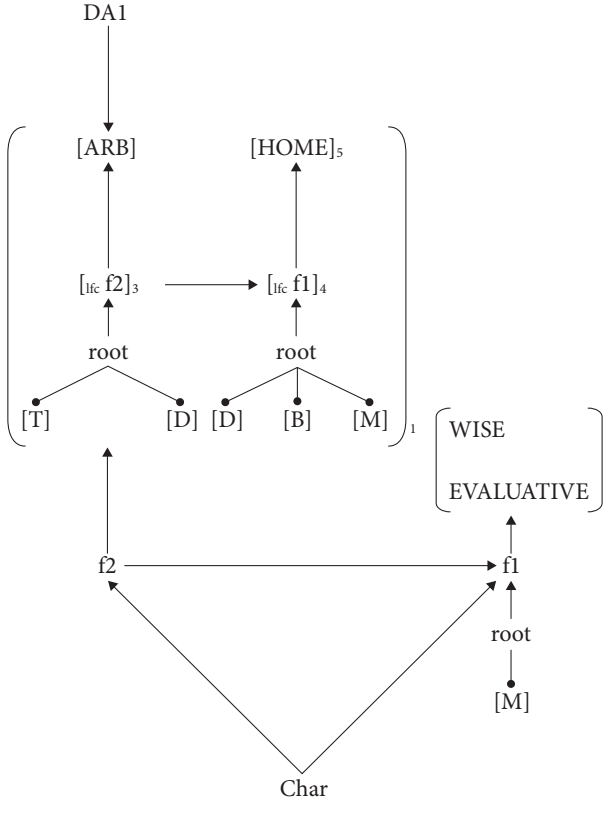
($_{MX}$ sinun$_4$ on viisasta$_2$) ($_{CPL}$ tulla$_3$ koti$_6$-in$_5$)



(68) *On viisasta tulla kotiin.*
be-3SG wise-PAR come-INF1 home-ILL
'It is wise to come home.'

($_{MX}$ be-3SG wise-PAR) ($_{CPL}$ [come-1INF home-ILL])

($_{MX}$ on viisasta$_2$) ($_{CPL}$ tulla$_3$ koti$_5$-in$_4$)



7.3.4 Other subordinating conjunctions and their lexical entries

We have seen above that interpreting complex sentences with the general subordinating conjunction *että* 'that' or an indirect question involves specific constructions depending particularly on the matrix verb. Finnish, as well as English and most other languages, has several subordinating conjunctions that express particular causative, temporal and other semantic relations between the situations expressed by the matrix and the subordinate clauses. Finnish conjunctions

are listed in (31)– (40) above. I will analyze some of them (but not all: that would require another book).

The final and causal conjunctions indicate a causal relation between the matrix clause and the subordinate clause. The conjunctions *koska* 'because' and *sillä* 'because' (see Examples (69) and (70), cf. (32 and (33)) indicate that the situation expressed in the subordinate clause is a cause of the situation expressed in the matrix clause.

(69) *Menen kotiin/Olen kotona, **koska** olen sairas.*
go-1SG home-ILL/ be-1SG home-ESS, **because** be-1SG sick-NOM
'I am going home/I am at home, because I am sick.'

(70) *Menen kotiin/ Olen kotona, **sillä** olen sairas.*
go-1SG home-ILL/ be-1SG home-ESS, **because** be-1SG sick-NOM
'I am going home/I am at home because I am sick.'

The sentences in (69) and (70) express the fact that being sick is the reason (cause) for going or staying at home. The lexical entry of the conjunctions *koska* and *sillä* 'because' is given in (71):

(71)

koska

Conjunction

($_{MX}$ […V-AgrS…]$_2$) ($_{CPL}$ *koska*$_1$ […V-AgrS…]$_3$)

[….]$_2$

CS↑$_1$ → […]$_3$

We have already introduced the subordinate operatore CS↑ in Chapter 5: it indicates that the situation it subordinates is the cause of the matrix situation. The conjunction is used to join two finite clauses. Therefore, both the matrix and the subordinate clauses have V-AgrS.

The conjunction *jotta* 'in-order-to, so-that' sentence in (72) (cf. (31)) indicates that the situation expressed in the matrix clause is a requirement (cause) for the situation expressed in the subordinate clause to take place:

(72) *Menen kotiin/Olen kotona, **jotta** voin levätä.*
go-1SG home-ILL/be-1SG home-ESS, **in-order-to** can-1SG rest-1INF
'I am going home/I am at home, so I can rest.'

The lexical entry of *jotta* includes at least the information given in (73):

(73)
jotta
Conjunction
($_{MX}$ […V-AgrS…]$_2$) ($_{CPL}$ *jotta*$_1$ […V-AgrS…]$_3$)
[….]$_2$
CS↓$_1$ → […]$_3$

A more detailed analysis of *jotta* is more complicated: the conjunction *jotta* indicates, in addition to (73), that the awareness of this causal chain leads to the situation expressed in the matrix clause. I will not go into such details: the ingredients of the analysis are, however, the following:

1. An operator for awareness. It selects two arguments : a piece of information and the one that is aware of that information.
2. A causal operator that selects the awarness and shows that it causes the situation expressed in the matrix sentence.

Languages tend to have subordinating conjunctions that indicate a temporal relation between the situations expressed in the matrix and the subordinate clauses. In Finnish, there are for instance the conjunctions *kun* 'when,' *kunnes* 'until,' and *jahka* or *kunhan* 'as-soon-as.' Consider the examples in ((74) [34]), ((75) [35]) and (76):

(74) *Menen kotiin,* ***kun*** *olen sairas.*
go-1SG home-ILL **when** be-1SG sick-NOM
'I am going home because I am sick.'

(75) a. *Pysyn kotona,* ***kunnes*** *olen terve.*
stay-1SG home-ESS **until** be-1SG healthy-NOM
'I'll stay at home until I am healthy.'

b. *Yleisö oli hiljaa* ***kunnes***
audience-NOM be-PAST-3SG **until**
lähtölaukaus pamahti.
starting-shot-NOM bang-PAST-3SG
'The spectators were quiet until the starting shot banged.'

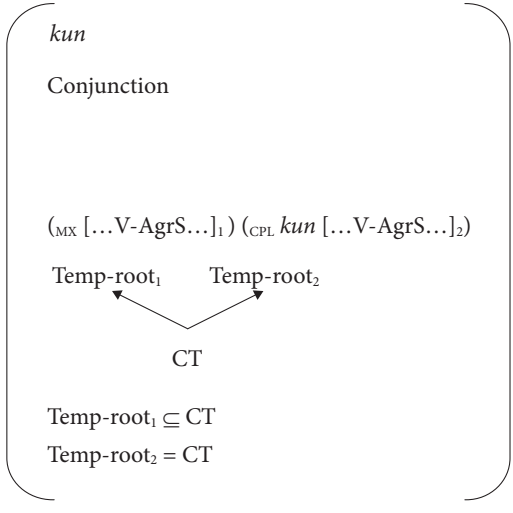
(76) *Menen kotiin, **jahka/kunhan** saan työt valmiiksi.*
go-1SG home-ILL, **as-soon-as** get-1SG work-PL-ACC ready-TRA
'I go home as soon as I am ready with my work.'

(77) *Menen kotiin **jahka/kunhan/kun** kello on kolme.*
go-1SG home-ILL as-soon-as/when clock-NOM be-3SG three-NOM
'I go home **as soon as/when** it is three o'clock.'

The conjunction *kun* 'when' is a general temporal conjunction: it indicates that the situations expressed by the matrix clause and the subordinate clause are taking place simultaneously.

The lexical entry of *kun* is something like as in (78). Recall the discussion of the CT-tier in Chapter 4. T-MX stands for "the temporal structure of the situation expressed by the matrix clause" and T-CPL for "the temporal structure of the situation expressed by the complement (subordinate) clause."

(78)



The CT-tier is the tier that can bind together different temporal structures. The CT-tier selects temp-roots of situations and shows their chronological relation. As the temporal structure of the complement sentence is equal to CT, the semantic part of (75) means in practise that the temporal structure of the matrix clause is included in the temporal structure of the subordinate clause.

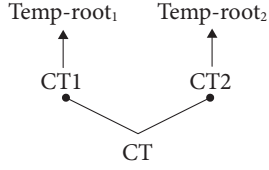
The conjunction *kunnes* 'until' indicates that the the situation expressed by the matrix clause lasts until the situation expressed by the subordinate clause starts. Recall from Chapter 4 that the CT-tier may be divided into two constituents CT1 and CT2. CT1 precedes CT2 in chronological order. The lexical entry of *kunnes* 'until' is, thus, something like as in (79):

(79)

kunnes

Conjunction

($_{MX}$ […V-AgrS…]$_1$) ($_{CPL}$ *kunnes* […V-AgrS…]$_2$)



Temp-root$_1$ = CT1

Temp-root$_2$ = CT2

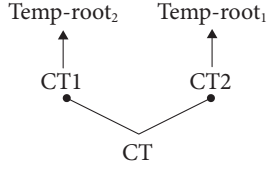
The conjunctions *jahka* and *kunhan* 'as soon as' indicate that the situation expressed in the matrix clause can take place as soon as the situation expressed in the subordinate is over. Therefore, the lexical entry of *jahka* and *kunhan* is a mirror image of *kunnes* when it comes to the CT-tier. The lexical entry of *jahka* is in (80):

(80)

jahka

Conjunction

($_{MX}$ […V-AgrS…]) ($_{CPL}$ *jahka* […V-AgrS…])



Temp-root$_1$ = CT2

Temp-root$_2$ = CT1

I will not go through all the subordinating conjunctions. However, the principle in approaching their semantics is clear: the subordinating conjunctions express different kinds of semantic relations between the matrix and the subordinate clauses. This relation is specified in the lexical entry of the conjunction, and the lexical entries of conjunctions are fragments of micro-modular network just like all the other lexical entries discussed in Chapter 6.

7.3.5 Relative clauses

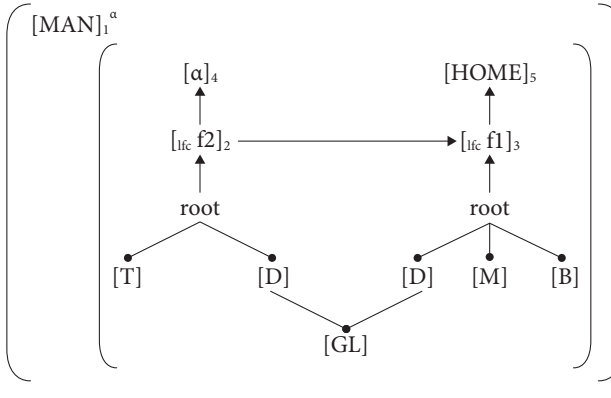
Relative clauses express a situation that is a property either of a thing, as in (81) or a situation, as in (82)

(81) *mies joka meni kotiin*
man that go-PAST-3SG home-ILL
'a/the man who went home.'

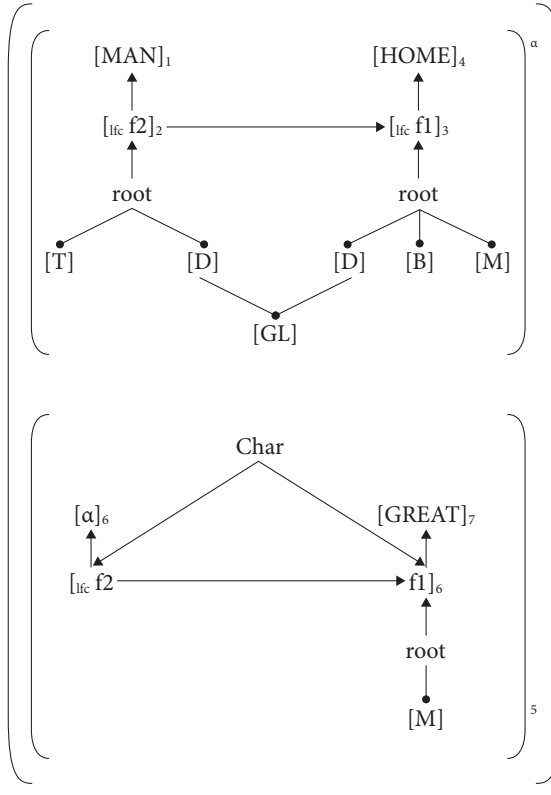
(82) M*ies meni kotiin, mikä on hienoa.*
man go-PAST-3SG home-ILL, which-NOM be-3SG great-PAR
'The man went home, which is great.'

The difference between the relative clauses (81) and (82) is that the *joka*-relative clauses, as in (81), are embeddings but the *mikä*-relative clauses, as in (82) are not. When the relative pronoun (the typical use of Finnish *mikä* and English *which*) is coindexed with a whole sentence, it is not embedded in it: the relative clause and the matrix clause do not have any parts that they share. Thus, semantically such a relation is merely a coordnation rather than a subordination. (I thank my father Osmo Nikanne for pointing that out to me a long time ago.) An analysis of (81) is in (83) and an analysis of (82) is in (84). The superscript α indicates binding: […]$^{\alpha}$ binds (and is, thus, coindexed with) [α].

(83) man-NOM REL go-PAST-3SG home-ILL
mies$_1$ joka$_4$ meni$_2$ koti$_5$-in$_3$



(84) man-NOM go-PAST-3SG home-ILL, REL be-PAST-3SG great-PAR
mies$_1$ meni$_2$ koti$_4$-in$_3$, [mikä$_5$ oli$_6$ hienoa$_7$]$_4$



7.4 Summary

In this chapter we have discussed complex sentences. The analysis has shown that the linking between infinite and finite clauses is often based on constructions. This is especially typical of the general subordinations, like the infinitive form INF1 and the conjunction *että* in Finnish. In addition, languages tend to have several subordinating conjunctions that can express different kinds of semantic relation between the matrix sentence and the embedded clause. In these cases, the subordination is based on the lexical entries of the conjunctions. The lexical entries of conjunctions as well as constructions follow the formation and linking principles of the micro-modular network.

CHAPTER 8

The finite sentence

In this chapter, we will discuss syntax and morphology and come up with a multi-tiered model that is compatible with the theoretical goals and assumptions of conceptual semantics as discussed in previous chapters. Word order is treated separately as a tier of its own. Finite sentence morphology is analyzed in a new way, in a separate tier. The chapter discusses the linking between the word order and the finite sentence morphology as well as information structure. The system is tested using a corpus of Finnish proverbs.

8.1 Introduction

According to Vilkuna (1989), the word order of Finnish finite sentences is based on information structure. The topic of the sentence and a contrastively focused phrase have their designated positions in the finite sentence in Finnish. Holmberg and Nikanne (1994, 2002, 2008) have shown that the word (verb or negation word) carrying the subject agreement suffixes has its own designated position in the finite sentence word order. The information structure, finite sentence morphology and word order thus all interact closely with one another. Following the logic of the methodology in the Tiernet approach, we will check which tiers and links between them we need in order to describe and better understand Finnish finite sentence. We will focus on the sentence intital positions and concentrate on matrix sentences.

8.2 Background: The finite sentence as a constituent structure with functional heads

The interaction between finite sentence structure and morphology has been discussed in generative grammar especially since the late 1980's. Finite verb morphology has been viewed as a reflection of the syntactic structure (Pollock 1989, Baker 1988, Chomsky 1995, etc.). In the late 1980's the solution was based on incorporation (inspired by Baker 1988): the morphological affixes of the finite verb were understood as heads of functional projections. The verb was raised from VP by head movement from one functional head at a time and on its way, the verb

picked up the the morphological affixes. The order of the morphological affixes was understood to be a mirror image of the syntactic structure. In the Minimalist Theory (Chomsky 1995 etc.). The basic idea remains the same even if the technical solutions have changed: it is now assumed that the verb is entered in the syntactic structure in its inflected form, and, instead of picking up affixes, it undergoes a head movement in order to check that the morphological features it is carrying are compatible with the features in the syntactic tree.

8.2.1 Holmberg's and Nikanne's theory of the Finnish finite sentence

Holmberg, Nikanne, Oraviita, Reime and Trosterud (1993) suggest a structure of finite sentence of Finnish compatible with Mark Baker's Mirror Image Principle. Holmberg and Nikanne (1994, 2002, 2008) and Holmberg (2005) have developed the basic idea further and applied it to explain Finnish word order phenomena. According to this hypothesis, the Finnish finite sentence in its fullest possible form is as shown in Figure 1:

The passive marker *ttA* is also base generated in the Spec(VP), as it is (in standard Finnish) in a complementary distribution with an overt subject. The passive form also has an AgrS-suffix – *Vn* if the negation word or the auxiliary are not present (e.g. in (1a)). For instance:

(1) a. *usko-tta-isi-in*
believe-PASS-COND-AgrS
'would be believed'

c. *on usko-tt-u*
is believe-PASS-PST.PTC
'has been believed'

b. *ei usko-tta-isi*
NEG believe-PASS-COND
'would not be believed'

d. *ei ol-isi usko-tt-u*
NEG be-COND believe-PASS-PST.PTC
'it would not have been believed'

Only AgrS and T are obligatory. The minimal structure of the finite sentence in Finnish is in (2).

(2) *Lapset söivät makkaraa*
child-PL-NOM eat-PAST-3PL sausage-PAR
'The children ate sausage.'

The D-structure is given in (3) The information on the finite sentence morphology is in the functional positions, and the subject NP is in the Spec(VP) position; note that then both arguments of the verb *syödä* 'eat' are in the maximal projection whose head the verb is. The object case (here the partitive case) is assigned in the D-structure.

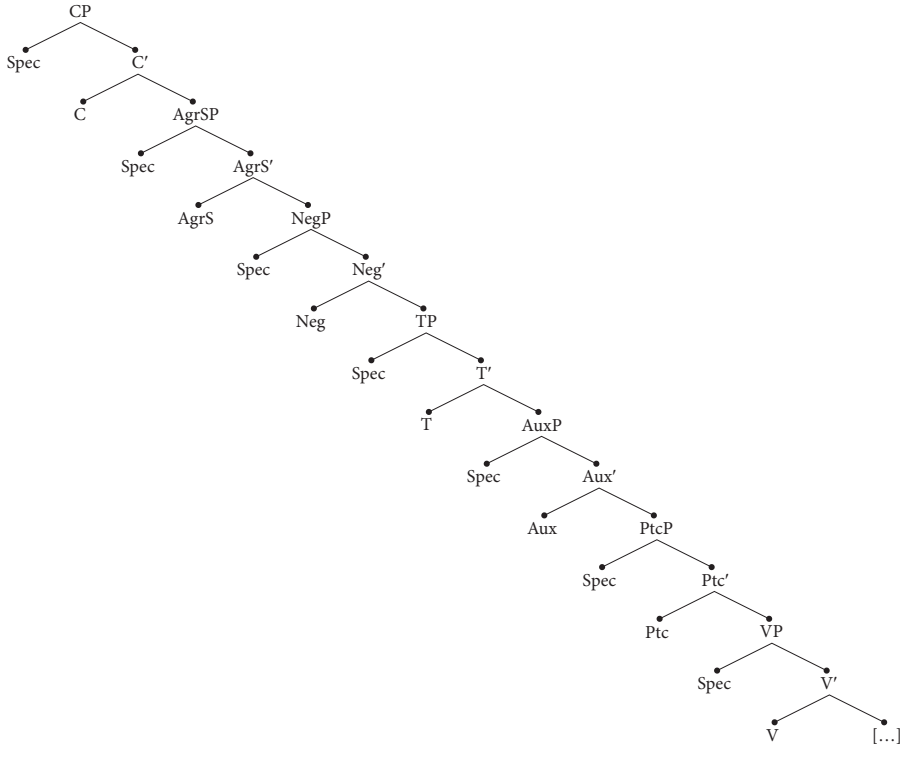
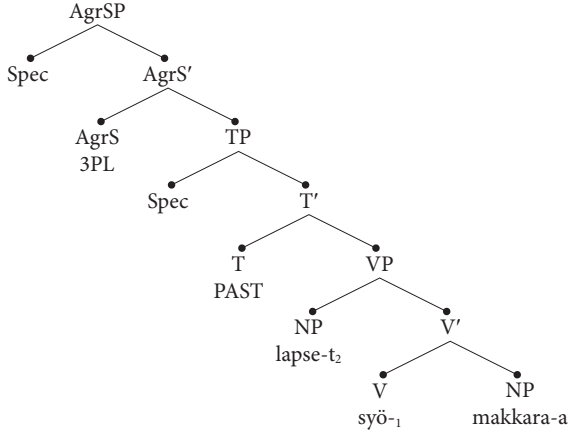


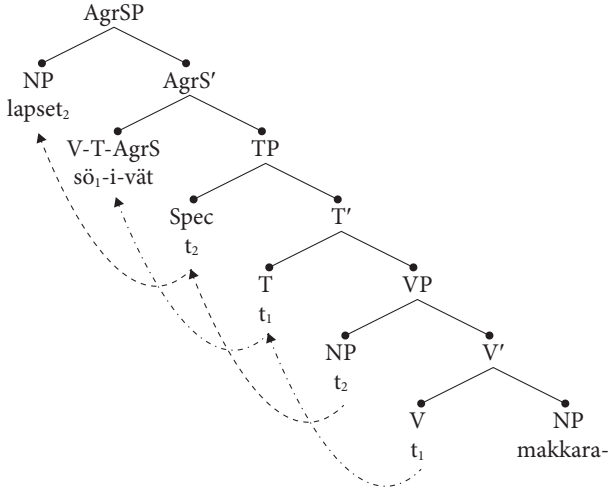
Figure 8-1 The maximal structure of the Finnish finite sentence. C stands for complementizer, AgrS for subject agreement (i.e. person 1sg, 2sg, 3sg, 1pl, 2pl, 3p, and the passive agreement ending), Neg for negation, T for tense (i.e. present, past) and in Finnish also mood (i.e. conditional, potential, imperative), Aux for auxiliary verb (olla 'be'), Ptc for participial (past, present), and Spec for specifier

(3) D-structure



The derivation from D-structure to S-structure is illustrated in (3): The verb undergoes a head movement from the head of the VP position (V) via the head of the Tempus/modus phrase (T) to the head of the AgrSP position (AgrS). The morphological stucture is a mirror image of the head-to-head movement chain. The subject NP is assumed to be base generated in the Spec(VP) position. As the subject NP is in the nominative case and the AgrS feature (3PL) is compatible with the person and number of the subject NP, the sentence is grammatical. The verb and the subject NP leave behind traces in the positions in which they land on the way to their S-structure positions. The S-structure is given in (4), with the arrows indicating the movements:

(4) S-structure



In order to save some space, in the examples that follow, I will mark the relevant positions above the words. (5a) corresponds to the S-structure in (3).

(5) a.

Spec(AgrSP)	**AgrS**	**T**	**V**	
Lapset	*söivät$_i$*	*t$_i$*	*t$_i$*	*makkaraa.*
child-PL-NOM	ate-3PL			sausage-PAR

b.

Spec(AgrSP)	**AgrS**	**T**	**V**	
Lapset	*söisivät$_i$*	*t$_i$*	*t$_i$*	*makkaraa.*
child-PL-NOM	ate-COND-3PL			sausage-PAR

If the auxiliary *olla* 'be' is present, i.e. in the perfect or pluperfect tense, the Aux undergoes a head movement from the head of the auxiliary phrase position (Aux)

to AgrS. Then, the verb moves from V to the head of the participial phrase position (Ptc).

(6)

Spec(AgrSP)	AgrS	T	Aux	Ptc	V	
Lapset	*ovat*$_i$	*t*$_i$	*t*$_i$	*syöneet*$_j$	*t*$_j$	*makkaraa*
child-PL-NOM	have-3PL			eat-PASTPTC-PL		sausage-PAR

If the negation is present, the negation word *ei* undergoes a movement from the head of the negation phrase (Neg) to AgrS. Then, the auxiliary moves from Aux to T and the predicate verb from V to Ptc.

(7)

Spec(AgrSP)	AgrS	Neg	T	Aux	Ptc	V	
Lapset	*eivät*$_i$	*t*$_i$	*olleet*$_j$	*t*$_j$	*syöneet*$_k$	*t*$_k$	*makkaraa.*
child-PL-NOM	not-3PL		be-PASTPTC-PL		eat-PASTPTC-PL		sausage-PAR

The complementizer phrase (CP) is understood traditionally as a projection of a complementizer word, such as a subordinating conjunction:

(8)

C	Spec(AgrSP)	AgrS	Neg	T	Aux	Ptc	V	
että	*lapset*	*eivät*$_i$	*t*$_i$	*olisi*$_j$	*t*$_j$	*syöneet*$_k$	*t*$_k$	*makkaraa.*
that	child-PL-NOM	not-3PL		be-COND		eat-PASTPTC-PL		sausage-PAR

CP can also be a projection of a more abstract operator, such as a question operator, focus operator, etc.

(9) a. 'What would the children not have eaten?'

Question word *mitä* in Spec(CP).

Spec(CP)	Spec(AgrP)	AgrS	Neg	T	Aux	Ptc	V	
Mitä$_l$	*lapset*	*eivät*$_i$	*t*$_i$	*olisi*$_j$	*t*$_j$	*syöneet*$_k$	*t*$_k$	*t*$_l$
what-PAR	child-PL-NOM	not-3PL		be-COND		eat-PASTPTC-PL		

b. 'It is sausage that the children would not have eaten.'

(*Makkaraa* 'sausage' contrasted.)

Spec(CP)	Spec(AgrP)	AgrS	Neg	T	Aux	Ptc	V	
Makkaraa$_l$	*lapset*	*eivät*$_i$	*t*$_i$	*olisi*$_j$	*t*$_j$	*syöneet*$_k$	*t*$_k$	*t*$_l$
sausage-PAR	child-PL-NOM	neg-3PL		be-COND		eat-PASTPTC-PL		

c. 'It is not the case that children would have eaten sausage.'
(Negation strongly focused.)

Spec(CP)	Spec(AgrP)	AgrS	Neg	T	Aux	Ptc	V	
Eivät$_i$	*lapset*	t_i	t_i	*olisi*$_j$	t_j	*syöneet*$_k$	t_k	*makkaraa.*
not-3PL	child-PL-NOM			be-COND		eat-PASTPTC-PL		sausage-PAR

According to Maria Vilkuna (1989 etc.), the two initial positions of the Finnish finite sentence are reserved for a contrastively focused element (the first position) and the topic of the sentence (the second position). The topic of the sentence can be the first element if there is no contrastively focused element present. According to Holmberg and Nikanne (1994), the contrast position is the Spec(CP) position and the topic position is Spec(AgrSP).

	Information structure	Contrast	Topic					
	Syntactic structure	**Spec(CP)**	**Spec(AgrSP)**	**AgrS**	**T**	**Spec(VP)**	**V**	**Compl(VP)**
(10)	**Unmarked word order**		*Lapset*$_j$ child-PL-NOM	*söivät*$_i$ eat-PAST-3PL	t_i	t_j	t_i	*makkaraa* sausage-PAR
(11)	**Object focused, subject topic**	*Makkaraa*$_k$ sausage-PAR	*lapset*$_j$ child-PL-NOM	*söivät*$_i$ eat-PAST-3PL	t_i	t_j	t_i	t_k
(12)	**Subject focused, object topic**	*Lapset*$_j$ child-PL-NOM	*makkaraa*$_k$ sausage-PAR	*söivät*$_i$ eat-PAST-3PL	t_i	t_j	t_i	t_k
(13)	**Object topic**		*makkaraa*$_k$ sausage-PAR	*söivät*$_i$ eat-PAST-3PL	t_i	*Lapset* child-PL-NOM	t_i	t_k

According to Holmberg & Nikanne (1994, 2002), the expletive *sitä* (it-partitive) is a semantically empty topic place holder in colloquial language structures such as (11–12):

	Information structure	Contrast	Topic					
	Syntactic str.	**Spec(CP)**	**Spec(AgrSP)**	**AgrS**	**T**	**Spec(VP)**	**V**	**Compl(VP)**
(14)	**No topic**		*Sitä* EXPL	*söivät*$_i$ ate-3PL	t_i	*lapset*$_i$ Children	t_i	*makkaraa* sausage-PAR
(15)	**Subject strongly focused**	*Lapset*$_j$ eat-PAST-3PL	*Sitä* EXPL	*söivät*$_i$ eat-PAST-3PL	t_i	t_j	t_i	*makkaraa* sausage-PAR

As *sitä* occupies the Spec(AgrS) position, for instance (16) is not grammatical:

	Information structure	**Contrast**	**Topic**					
	Syntactic structure	**Spec(CP)**	**Spec(AgrSP)**	**AgrS**	**T**	**Spec(VP)**	**V**	**Compl(VP)**
(16)	**A full NP between verb and *sitä* is not allowed**		??*Sitä lapset*$_j$ EXPL child-PL-NOM	*söivät*$_i$ eat-PAST-3PL	t$_i$	t$_j$	t$_i$	*makkaraa* sausage-PAR

Hakulinen (1976a) discusses the word *sitä* and points out that the presence of *sitä* gives the sentence a particular emphatic meaning but she does not come up with any analysis. Anna Karhu (1994) has investigated the expletives in eastern dialects from a discourse point of view and has also noticed that the expletives often appear in the topic position.

Similar models based on functional categories have been suggested for many other languages besides Finnish, e.g. French (starting with Pollock 1989), Swedish (Holmberg & Platzack 1995), Italian (e.g. Cinque 1999), etc. The suggested sentence structures are very similar to that proposed for Finnish. The differences suggested for different languages have to do with the exact set and the mutual order of the categories.

8.2.2 Problems with the analysis

As is shown in the previous section, the theory based on functional categories can explain several morphological and syntactic phenomena. Despite its benefits, however, it also raises some problems especially when it is applied in a conceptual semantics framework.

A general problem with functional categories is that the definition of the syntactic constituent becomes unclear. Traditionally, a constituent is defined as a unit that moves as a whole, is deleted as a whole, etc. In addition, in the X'-theory, a constituent is a projection of its head. The constituents headed by functional categories are very different in nature from the old-fashioned constituents like NP, PP, AP, and AdvP. The functional categories C and I and their respective projections CP and IP in Chomsky (1986a) were a way to extend the X'-theory to cover the sentence. Before that, the sentence (S) was the only constituent that did not have a head and an X'-structure. The new constituents were, however, of a different nature than the traditional ones based on lexical categories. After 1986, the idea of functional categories has also been applied to non-finite categories such as NPs (or DPs). It has also complicated syntax, as it opens the door for syntacticians to assume new functional categories carrying semantic and pragmatic features. The theory of syntax should make a difference between the old fashioned constituents and functional categories.

The categories Neg, Aux, and V must always be raised from their original positions, and they never appear without morphological suffices AgrS, T or Ptc. The categories AgrS, T or Ptc on the other hand cannot appear alone. The "mirror image" effect is explained but it is difficult to justify a complicated model of constituent structure in which the head nodes of the lexical categories must always be moved out of their projections (the constituents of which they are the heads) while at the same time there are constituents headed by heads that never appear alone without a lexical category.

One motivation in generative grammar for analyzing the finite sentence as a constituent tree has been that, as well as assigning grammatical cases, the grammatical functions subject and object can be defined as positions in the constituent tree. As we have already discussed in Chapter 6, we cannot derive subjecthood or objecthood from the syntactic constituent structure. In Finnish, the predicate verb of a finite sentence agrees with the (nominative) subject, no matter where the subject is located. For instance in (29), the verb *syödä* 'eat' agrees with the subject *pojat* [boy-PL-NOM] despite the word order. Nor is there any reason to assume that the subject case (NOM) and object case (PAR or ACC) is assigned to any particular position:

(29) a. *Poja**t*** *söi**vät*** *makkara/makkaran*.
boy-PL-NOM eat-3PL sausage-PAR/ACC
'The boys ate (the) sausage.'

b. *Makkaraa/Makkaran* *söi**vät*** *poja**t***.
sausage-PAR/ACC eat-3PL boy-PL.NOM
'The (whole) sausage was eaten by the boys.'

c. *Poja**t*** *makkaraa/makkaran* *söi**vät***.
boy-PL-NOM sausage-PAR/ACC eat-PAST-3PL
'It was the boys who ate (the) sausage.'

8.3 A micro-modular analysis of finite sentence

8.3.1 A new look at the finite sentence of Finnish

In order to preserve the benefits of the previous models and to account for the challenges, I assume, following the methodological guidelines set out in Chapter 1 that the finite sentence structure should be analyzed as a combination of tiers (see Nikanne 2002, 2014, 2018).

We can avoid movement and a complicated constituent structure of functional categories by assuming that the morphological categories and lexical categories are in different tiers, different independent subsystems.

To begin with, we can take a new look at the maximal structure of the finite sentence suggested by Holmberg and al. (1993). The binary structure can be presented in a horizontal layout so that the maximal and middle nodes are "upstairs" and the terminal nodes "downstairs". As Figure 2 shows, the terminal nodes are linked to information structure, morphology, and lexical categories so that the intitial terminal positions are reserved for information structure and the morphological and functional heads such a way that the functional heads are alternately lexical and morphological.

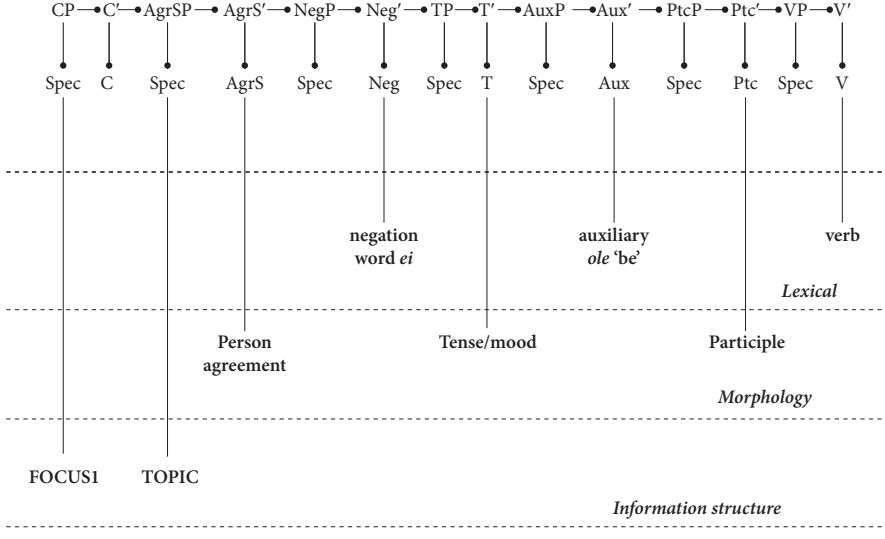


Figure 8-2 Information structure, morphology, and lexical categories in the Finnish finite sentence

The organization seems to be so regular that there is a good reason to assume that it is not a coincidence The spec-nodes are not reserved for any categories, except the sentence intitial ones, Spec(CP) and Spec(AgrSP). It certainly seems that it is possible to see the relationships between the information structure, morphological cateorgies and lexical categories in a more straightforward way if information structure, morphology, and word order are analyzed as separate tiers.

8.3.2 Finite sentence morphology

The **finite sentence morphological categories** (**fsm-categories**), AgrS, T, Ptc, and Pass, are hierarchically organized. The higher the morphological category is in the hierarchy, the higher it is in the order to select the most desired lexical categories (which is determined in another hierarchy).

Hierarchy of fsm-Categories
AgrS > T > Ptc > Pass

Passive is not a functional head in Holmberg & al's theory. Basically, a "passive phrase" could be added between PtcP and VP, following the same logic. Passive is however, an important part of the finite sentence morphology in Finnish. It has two parts: the passive marker (*ttA*, which undergoes phonological adaptation to its morpho-phonological context) next to the verb stem and the passive personal ending (*Vn*) in the position of AgrS-endings:

*laule-**ta-an*** [sing-**pass-pass**] 'it is sung'
*laule-**tt**-i-**in*** [sing-**pass**-PAST-**pass**] 'it was sung'
*laule-**tta**-isi-**in*** [sing-**pass**-COND-**pass**] 'it would be sung'
*laule-**tta**-ne-**en*** [sing-**pass**-POT-**pass**] 'it probably will be sung'

In the perfect and pluperfect tense, the passive marker is in the participial:

*on laule-**tt**-u* [be-3SG sing-**PASS**-PASTPTC] 'it has been sung'
*oli laule-**tt**-u* [be-PAST-3SG sing-**PASS**-PASTPTC] 'it had been sung'

The person of the auxiliary olla 'be' is traditionally analyzed as 3SG as 3SG is the neutral or default person in Finnish grammar. In colloquial Finnish, the perfect and pluperfect tenses do not always follow the pattern given above: it is common to double the passive morphology in the auxiliary: *ol-la-an teh-t-y* [be-PASS-PASS do-PASS-PASTPTC] 'it has been done.'

The **finite sentence lexical categories** (**fsl-categories**), Neg, Aux, and V, are also hierarchically organized. The higher the lexical category is in the hierarchy the more valuable it is from the point of view of morphological categories.

Hierarchy of fsl-Categories
Neg > Aux > V

The hierarchy of lexical and morphological categories corresponds to their order in the syntactic tree in the Holmberg & al's theory. The linking principles based on these hierarchies correspond to the head movement.

The morphological form follows from general principles.

Linking between fsm- and fsl-categories

A. *Each fsl-category must always be selected by at least one fsm-category.*
B. *Fsm-categories select a maximal number of morphological fs-morphological categories from left to right according to the lexical and morphological hierarchies, with exceptions (i) and (ii).*

   (i) *Neg can only be selected by AgrS*
   (ii) *Ptc can only select V*

Finite sentence morphology does not, however, consist only of finite sentence morphological categories. The categories must have values. Traditionally, finite sentence morphology has been divided into such categories as voice, tense, mood,

person and number. Thus, T must be present tense, past tense, conditional mood, imperative mood, or potential mood. AgrS must have a person and a number or it may be passive. These values are called φ-features in generative grammar. I will call them **finite features**.

In the same vein as that in which we have treated thematic features in Chapter 3 and temporal structure in Chapter 4, and as the phonological features are treated in phonology, the finite features are organized in a constituent structure as follows:

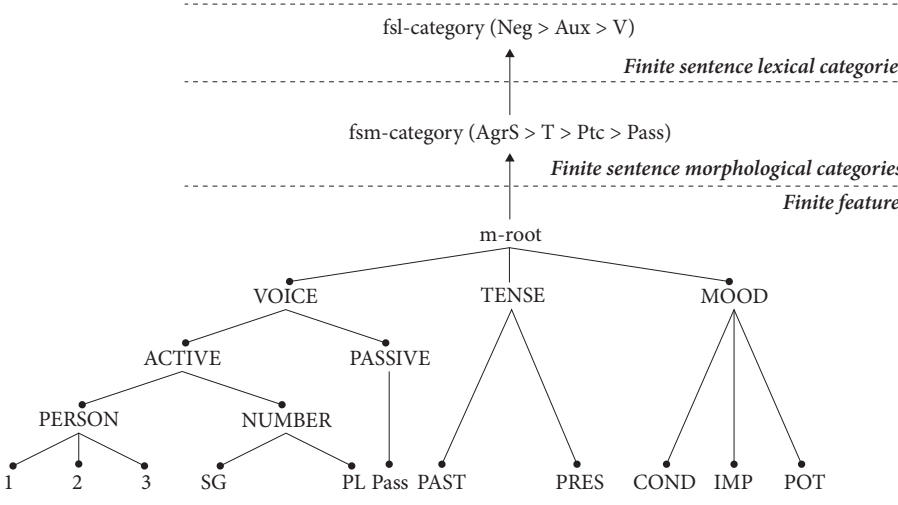


Figure 8-3 Finite sentence morphology in Finnish (pass = passive, pres = present tense, cond = conditional mood, imp = imperative mood, pot = potential mood)

The fsm-categories can have different values, i.e. they can carry a part of the constituent tree in Figure 3. The possible cateogries of AgrS, T, and Ptc are circled in Figure 4:

As Figure 4 shows, the categories AgrS and T do not share any values but Ptc can carry a part of the values of AgrS, namely number and passive, as well as a part of the values of T, namely past or present.[1] The person values can only be carried by AgrS and the mood values only by T. The main principle is that the branches in the fs-morphological constituent structure must be interpreted as "pick only one," with the

1. Ptc may carry the value present only in a very literary style. An example of this is sentence (i), taken from the Apostolic Creed:

(i) – *ja* [Jeesus Kristus] ***on*** *sieltä* ***tuleva*** *tuomitsemaan*
– and [Jesus Christ] **is** there-ABL **come-PRESPTC** judge-3INF-ILL
eläviä *ja* *kuolleita*
living-PAR and dead-PAR
'– and from there He [Jesus Christ] will come again to judge the living and the dead.'

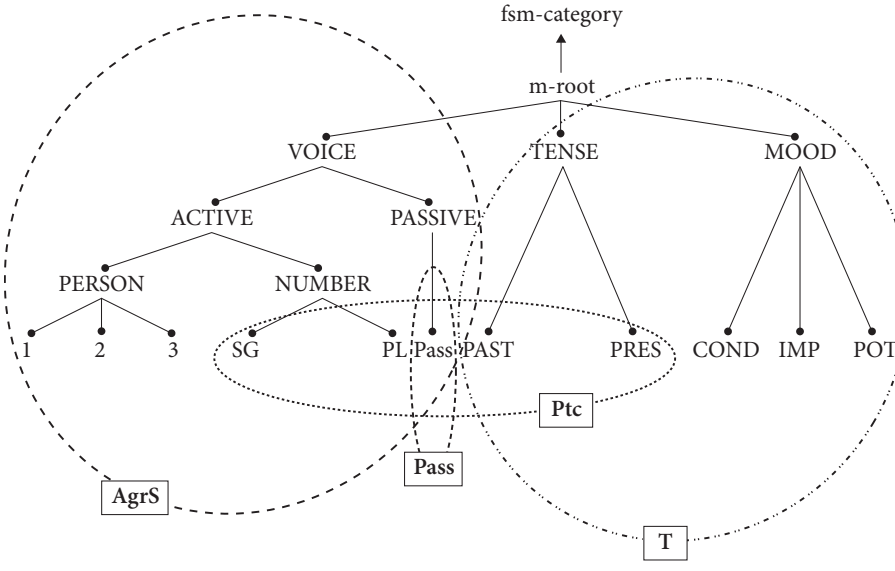


Figure 8-4 The possible finite features of the fsm-categories AgrS, T, Ptc, and Pass in Finnish

excpetion that VOICE can co-occur wth TENSE and MOOD and PERSON can co-occur with NUMBER. We can formulate this into a prinicple of Finnish grammar:

Co-occurrence of finite features in Finnish
The sisters of the finite feature constituent structure cannot co-occur in the same finite sentence, except (i) and (ii).
(i) *VOICE, TENSE, and MOOD can co-occur with one another.*
(ii) *PERSON can co-occur with NUMBER.*

We should keep in mind that the finite sentence is a whole, and one finite sentence can only express one set of finite features (as represented in Figure 3). There is only one set of fsm-categories per finite sentence, and therefore we can say that the finiteness of the finite sentence is based on the morphology. The only exception to this is TENSE, which we will discuss shortly To keep this in mind, I will mark the set of fsm-categories that belong to the same finite sentence with brackets and the subscript index **fs** ("finite sentence").

The principle of the unity of the finite sentence can be formulated as follows:

Finite sentence as a unit (in Finnish grammar)
In a finite sentence, there can not be more than one instance of each finite feature. The only exception is TENSE of which there can be two instances.

The combination of copula and the present participle is interpreted as the future tense. Because this use of the present participial is stylistically highly marked, I will not discuss it further.

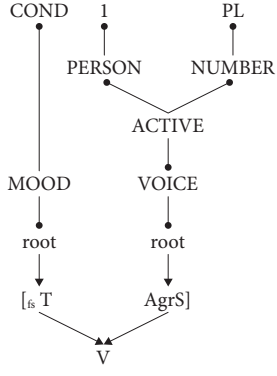
The perfect and pluperfect tense can be described as having two instances of tense: one in the auxiliary and another one in the participle. This is an exception to the main principle that each finite feature cannot be expressed more than once.

In Holmberg & al's theory, the functional heads AgrS and T were supposed to always be present in a finite sentence in Finnish. We must add this principle in the present system. In addition, the lexical category V is always present in a finite sentence. The principle is as follows:

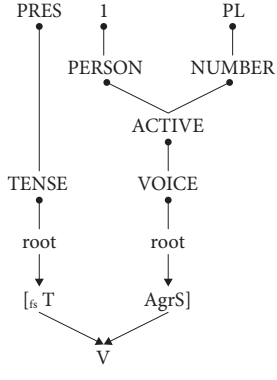
Obligatory categories in the Finnish finite sentence
The fsm-categories AgrS and T as well as the fsl-category V are obligatory in a finite sentence.

Here is an example of the system. The example in (17) *söisimme* [eat-COND-1PL] 'we would eat' and *syömme* [eat-1PL] 'we eat' can be analyzed as follows:

(17) a. *söisimme*
eat-COND-1PL
'we would eat'

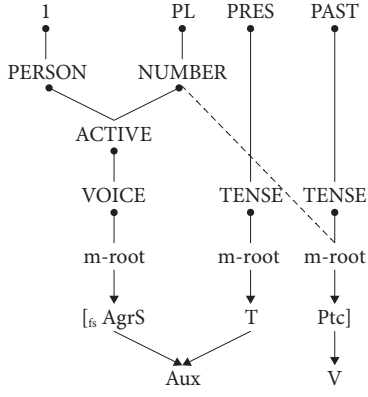


b. *syömme*
eat-1PL
'we eat'

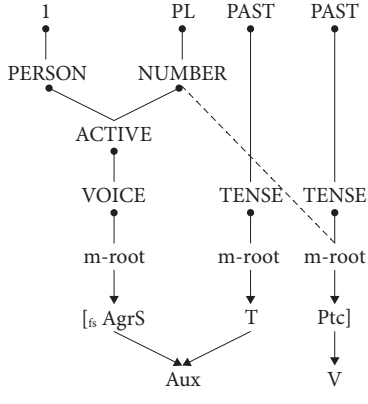


The perfect and pluperfect tenses can be analyzed as follows:

(18) a. *olemme syöneet*
be-3PL eat-PASTPTC-PL
'we have eaten'



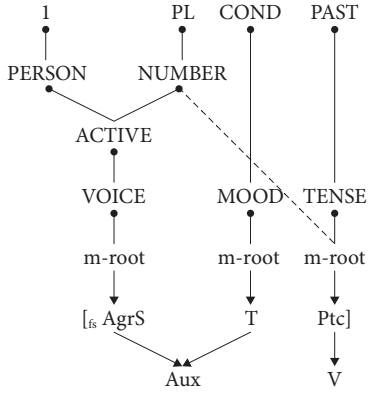
b. *olimme syöneet*
be-PAST-3PL eat-PASTPTC-PL
'we had eaten'



The participles used in the finite sentence are in the same number (SG or PL) as the whole finite sentence morphology. This agreement can be described as feature spreading. The feature spreading is marked by dashed constituent lines. The spreading lines are linked directly to the m-root: the participial forms are just agreeing with the number of the finite sentence. The primary expression of number is in the morphological form of the negaton word.

As discussed earlier, Finnish morpho-syntax is peculiar in the way that the finite features tense and mood cannot co-occur in the same finite verb: the fsm-category T expresses either mood or tense but not both. There is however, a solution: the participle. If tense and mood co-occur, the mood is expressed by fsm-category T that selects Aux and and tense by fsm-category Ptc that selects V, for instance as in (19).

(19) *olisimme* *syöneet*
be-COND-1PL eat-PASTPTC-PL
'we would have eaten'



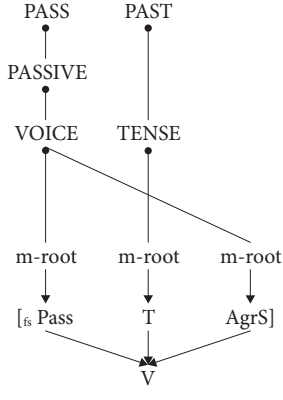
In this way, both tense and mood can be expressed in the same finite sentence even though they do not have room in the same verb form.

Another morphological peculiarity in Finnish is that passive is expressed by two endings: the passive marker and the passive personal suffix. For instance:

(20) *syö-t-i-in*
eat-PASS-PAST-PASS
'it was eaten'

I suggest the following solution:

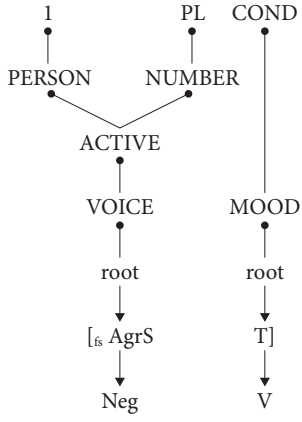
(21)



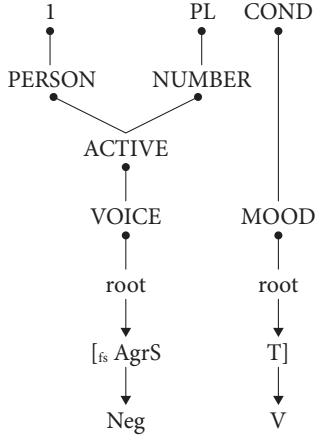
The solution in (20) is rather obvious in a "nonlinear" morphology like the present approach. The node VOICE is shared by the m-roots of the fsm-categories Pass and AgrS. Hakulinen and Karlsson (1979) suggest that passive is "the fourth person." The motivation is that the passive form has a person suffix, i.e. AgrS. In the present approach, it is not necessary to assume a fourth person. The passive is just linked to the fsm-category AgrS, in addition to the fsm-category Pass, and the passive voice is expressed in two fsm-categories.

The negation word ei is selected by the fsm-category AgrS. The mood or the tense are then expressed by the verb:

(22) a. *emme söisi*
not-1PL eat-COND
'we would not eat'



b. *emme syö*
not-1PL eat
'we do not eat'



We need to stipulate an exception to the system. But this stipulation is something that any system – known so far – must make. There is a third peculiarity in Finnish: if the finite sentence has a negation word, the verb or the auxiliary appears in the participial form in the past tense. The auxiliary is in the participial form in the pluperfect as the pluperfect (normally) consists of an auxiliary in the past tense plus the verb in a past participial form:

(23) a. *Poika ei syönyt kalaa.*
boy-NOM not-3SG eat-PASTPTC fish-PAR
'The boy did not eat fish.'
(Negation and past tense: V in a participial form.)

b. *Pojat eivät syöneet kalaa.*
Boy-PL-NOM not-3PL eat-PASTPTC fish-PAR
'The boys did not eat fish.'
(Negation and perfect tense: Aux appears in a participial form.)

c. *Pojat eivät olleet syöneet kalaa.*
boy-PL not-PL be eat-PASTPTC-PL fish-PAR
'The boys had not eaten fish.'
(Negation and pluperfect tense: Aux appears in a participial form.)

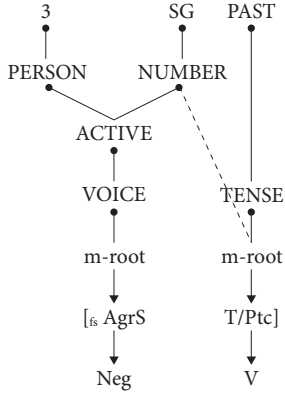
This exception can tentatively be formalized as follows (i.e. the past tense morphology of Aux or V is replaced by the participial form in the presence of Neg).

Past tense in the negative sentence in Finnish
If the fs-morphological category AgrS selects Neg, then the value PAST *of the fs-morphological category T appears as past participle.*

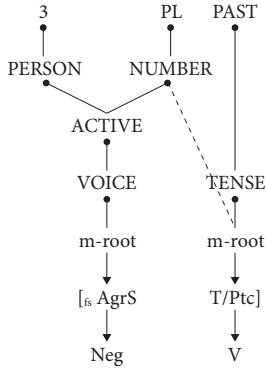
Thus, the fsm-category that selects the verb in (23a) and the auxiliary in (23b, c) is functionally T but it appears as a participial. The participial form is able to express tense, and Finnish grammar takes advantage of this property in the perfect and pluperfect tense. Why the (simple) past tense is expressed in negative sentences using a participial form, seems to be just a strange detail of Finnish grammar. What we know, however, is that this is made possible by the facts (i) that a particple *can* be selected by tense and that (ii) the person and number select the negation word when they can.

For instance the finite forms in (23) can be described as in (24):

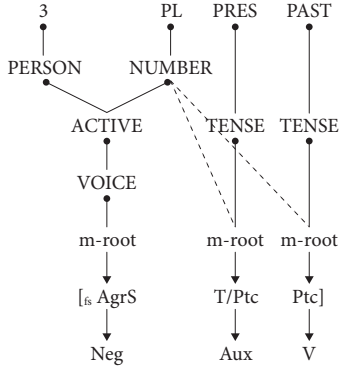
(24) a. *ei syönyt*
not-3SG eat-PASTPTC
'(she/he/it) did not eat'



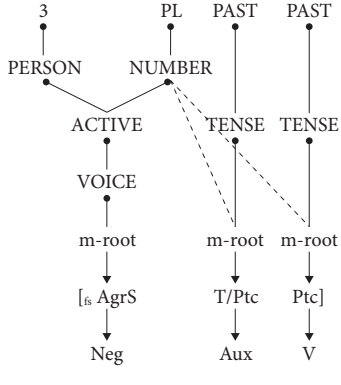
b. *eivät syöneet*
not-3PL eat-PASTPTC-PL
'(they) did not eat'



c. *eivät ole syöneet*
not-PL be eat-PASTPTC-PL
'(they) have not eaten'



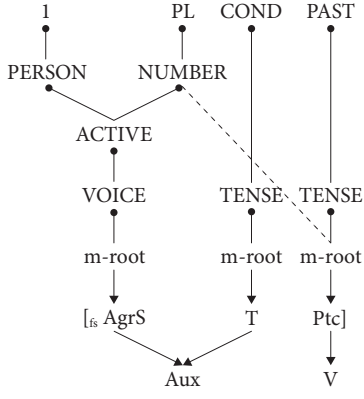
d. *eivät olleet syöneet*
not-PL3 be-PASTPTC-PL eat-PASTPTC-PL
'(they) had not eaten'



The fact that tense is expressed by a participle in negative sentences is marked as T/Ptc, which should be understood to mean that T is replaced by Ptc.

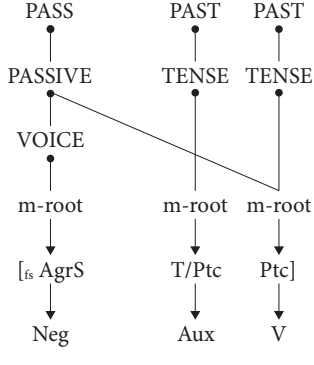
When it comes to the ability of the participle form to express tense, Finnish grammar also makes use of it when the T is selected by MOOD. Here for instance is the past tense (or perfect tense, if you like) the conditional mood (Example (18) is repeated here as (25)):

(25) *olisimme* *syöneet*
be-COND-3PL eat-PASTPTC-3PL
'we would have eaten'

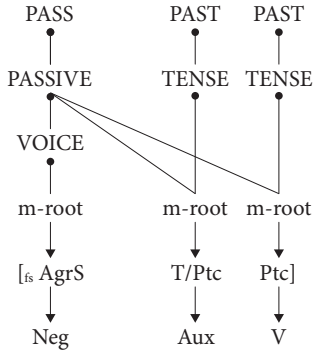


The pluperfect of negative sentences in Standard Finnish has a passive marker only in the participial form of the V (26a). In colloquial Finnish, however, it is very common to have the passive marker both in the participial form of the auxiliary and the participial form of the verb. (School teachers tend to have a hard time trying to make children use the Standard Finnish form, and even educated adult writers often use the colloquial form.)

(26) a. *ei* *ollut* *syöty*
not be-PASTPTC eat-PASS-PASTPTC
'it had not been eaten'



b. *ei* *oltu* *syöty* (colloquial)
not be-PASS-PASTPTC eat-PASS-PTC
'it had not been eaten'



In the light of the present nonlinear micro-modular approach, it is easy to understand why the colloquial form (26b) is so appealing: the passive is spread across the whole finite sentence, just as in the present and the simple past tense. The Standard Finnish form has to be learned separately as skipping the category T/Ptc is somewhat unnatural.

8.3.3 Word order and information structure in tiers

Dividing functional categories into two tiers leaves the determination of **word order** open. The very basic property of word order is that words are organized in a linear order. The null-hypothesis, which I am assuming is, thus, a simple linear order of positions:

Word order tier

0 – · – · ◆ 1 – · – · ◆ 2 – · – · ◆ 3 – · – · ◆ 4 – · – · ◆ 5 – · – · ◆ …

The dashed and dotted line with a ball on one end indicates preceeding: 0 precedes 1, 1 precedes 2, and so on. Note that the linear order is an asymmetric relation: if A precedes B, then B does not precede A. It also has a direction: if A precedes B and B precedes C, then A precedes C. The notation indicates this asymmetry and direction.

The importance of the linear order in a modular model of grammar has lately been emphasized by Sadock (2012: 111–113). The technical difference between the word-order tier suggested above and Sadock's model is that Sadock suggests that linear order is a either uniformly left or right branching tree structure, which leads to an unambiguous linear order of the terminal nodes. The word-order tier above is one step simpler, as the relation "precede" simply states the linear order. We will see how far we can get with this null-hypothesis.

As the formation of the word order is as simple as can be, there is not much else to add to it. The word order tier is, however, functionally extremely important. As we saw in the discussion on the theory by Holmberg & al., the information structure categories TOPIC and FOCUS1 have their designated positions Spec(CP) and Spec(AgrSP). According to Vilkuna (1989), the word order of Finnish is based on categories such as CONTRAST (our FOCUS1) and TOPIC, so in Finnish, the information structure must be linked to the word order tier. Morover, the word inflected in the AgrS-morphology occupies the AgrS-position. In the present approach, we have replaced the tree structure and its multiple functional heads with a multi-tiered system of finite sentence morphology and a simple word order. – As a rule of thumb, the word-order tier positions correspond to the first positions in the tree based on functional heads as follows: 0 is more or less the same as Spec(CP), 1 corresponds to C, 2 to Spec(AgrSP), and 3 to AgrS. The functional tree structure is no longer needed, but the present system has preserved its positive qualities.

The designated positions of the information structure cateogories and the AgrS can be found in the word order tier:

Fixed links between information structure and word-order in Finnish
FOCUS1 always selects word order position 0 and TOPIC always selects position 2.

The position of the word inflected in the AgrS-morphology can be formulated as follows:

Fixed link between fsm-category AgrS and word-order in Finnish
AgrS always selects word order position 3.

The question words such as *mikä* 'what,' *kuka* 'who,' *miten* 'how,' *millloin* 'when,' etc. are linked to position 0. One interpretation is, naturally, that a question word has a contrastive focus as it represents the missing piece of information that is the focus of the question sentence.

Position 1 is needed for an expletive in certain structures, when the information structure must be made visible (Nikanne forthc.). We will discuss the information structure in more detail in the section *Sentence initial positions in Finnish proverbs* below.

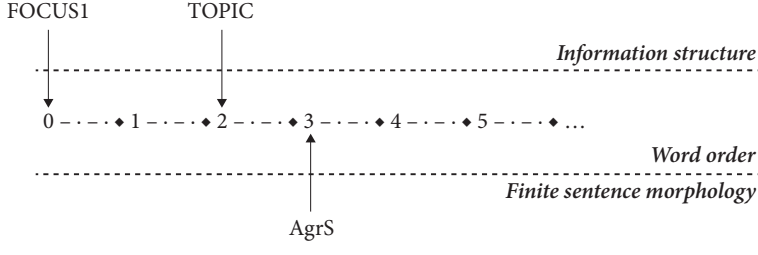


Figure 8-5 The fixed links between the word order tier, information structure, and finite sentence morphology in Finnish.

The morphological category AgrS is tied to position 3 but positions 4, 5, etc. form a hierarchy from smaller to larger numbers. The morphological categories have the right to pick the higher position according to the morphological hierarchy.

If Neg and Aux are not present, T and Agr appear as inflectional categories of V, and they are located in position 3 as in (27). Ptc has the right to position 4 if Neg is not present and T is in position 3 together with AgrS, as illustrated in (28). If all the fs-lexical categories (Neg, Aux and V) are present, T (here: conditional mood) is in position 4 and Ptc (here past participial plural) in position 5, which is the case in (29):

(27) 'Children would play.'

0	**1**	**2**	**3**	**4**	**5**
		Lapset	*leikk-isi-vät*		
		child-PL-NOM	play-COND-3PL		

(28) 'Children would have played'

0	**1**	***2***	***3***	***4***	**5**
		Lapset	*ol-isi-vat*	*leikki-nee-t*	
		child-PL-NOM	have-COND-3PL	play-PASTPTC-PL	

(29) 'Children would not have played'

0	***1***	***2***	***3***	***4***	**5**
		Lapset	*ei-vät*	*ol-isi*	*leikki-nee-t*
		child-PL-NOM	not-3PL	be-COND	play-PASTPTC-PL

One major issue that I leave for further research is the word order position of such sentence adverbs as *aina* 'always,' koskaan 'ever,' *varmaan* 'certainly, for sure,' etc. They may be added between the numbered positions, and their position in the sentence with respect to other elements can vary, e.g.:

(30) 'Children would *certainly* not have played in the yard./Children would not *always* have played in the yard.'

a. *Lapset* *eivät* *olisi* *leikkineet*
child-PL-NOM not-3PL be-COND play-PASTPTC-PL
varmaan/aina *pihalla.*
certainly/always yard-ADE

b. *Lapset eivät* ***varmaan/aina*** *olisi leikkineet pihalla.*

c. *Lapset* ***varmaan/aina*** *eivät olisi leikkineet pihalla.*

d. ***Varmaan/aina*** *lapset eivät olisi leikkineet pihalla.*

Anders Holmberg (p.c.) has pointed out to me that sentence adverbs can be understood as forming a tier of their own as they have mutual scope relations that are reflected in their mutual linear order (see Holmberg & al. 1993: 194–200).

The description above represents the basic word order in Finnish. There are moreover several conventionalized constructions that are interesting. Holmberg & Nikanne (2008) point out for instance [*NP/AP se ole- NP-kin*]. (*ole-* 'be,' *-kin* 'too'.)

(31) a. ***Uskovainenhan*** ***se*** ***olen*** *minä**kin*** –
Religious-person-NOM-CL it-NOM be-1SG I-NOM-CL –
jonkinlainen *ainakin.*
some-kind-NOM at-least
'I am also a religious person – at least some kind of one.'
(koti.japo.fi/~hakuja/uskovainen.htm – downloaded 28.8.2007)

b. ***Ihminen*** ***se*** ***olen*** *minä**kin*** *siinä*
human-being-NOM it-NOM be-1SG I-NOM-CL there
missä *muutkin–*
where others-CL
'I am a human being just like everyone else'
(tess.vuodatus.net/synd/atomfeed – 28.8.2007)

Constructions are fragments of structure with a more or less fixed morpho-syntactic form and lexical elements. They typically have a wholistic semantic interpretation that cannot be predicted from itheir syntactic, lexical, or morphological parts. E.g. the constructions in (31) have restricted syntactic and lexical structure, and are used for particular discourse purposes. (On the treatment of constructions in conceptual semantics, see e.g. Nikanne 2005a, 2005b.)

8.3.4 Consequences of the suggested analysis

The suggested shift from one complicated syntactic constituent tree with functional heads to a system with several simple tiers has consequences, which I will list briefly here:

Consequence 1: Constiuents – "back to basics"
One consequence of the system has to do with constituents. As argued above, the constituents headed by functional categories are quite different in nature than the "traditional" constituents such as NP, NP, PP, AP, AdvP. The system abandons the functional constituents CP, AgrSP, NegP, TP, AuxP, PtcP, VP as unnecessary. There seems to be no need for "functional constituents". We can make the syntax simpler by assuming a linear word order structure plus some fixed links to it. The system does not abandon the constituent structure completely. The old

fashioned constituents are still valid, and the theory of constituency describes and explains their internal structure. In finite sentences they can be linked to the word order positions.

Consequence 2: Finite sentence morphology without movements
The system does not involve any movements in order to form or check the morphological form of the finite sentence lexical categories. The consequence is that morphology is treated in a separate sub-system, which is actually is rather a traditional idea (for the most advanced description of the morphological system of Finnish, see Karlsson 1983). Morphology does not need to be incorporated in the syntactic constituent structure in order for the theory to deal with cross-linguistic tendencies when it comes to finite sentence structure. We can treat words as words and morphological forms as morphological forms. In this respect, the suggested approach has similar goals to e.g. Richard Hudson's word grammar (see e.g. Hudson 1990, 2007).

Consequence 3: Word order tier as the glue between information structure and fs-morphology
The word order tier – as simple as it is – is the tier that relates the finite sentence morphology and information structure in Finnish. I am not assuming that the links are universal, even though the micro-modular network is made out of the same ingredients. In some languages, e.g. English, the linking between word order and the GF-system may be stronger than in Finnish, and the subject may have a fixed link to a certain word order position.

8.4 Sentence initial positions in Finnish proverbs

8.4.1 Proverbs as data

In order to show how the present approach to finite sentence works in practice, I will analyze the sentence initial positions 0–3 of some Finnish proverbs. In particular, I will show what the word order status of the word *se* 'it-NOM' is in the finite sentence. In addition to testing the micro-modular theory, the methodological point is to show that proverbs are an interesting data source that can be used in syntactic research.

There are several reasons for choosing proverbs as the data for syntactic analysis:

1. Proverbs are repeated in almost the same form but there is still plenty of variation. In this way, we can use a corpus and still have minimal pairs.
2. The same syntactic patterns are repeated by different speakers, and written down by different collectors.

3. Variation in word order, use of expletives, argument structure, lexicon and morphology has not been discussed by folklorists but it is most interesting for syntactic analysis.
4. Proverb sentences are relatively independent of context.
5. Proverbs are collected from different Finnish dialect areas, and the dialectal variation can be taken into account.
6. Proverb collections are relatively large and well classified, and often in digital form.

My data is collected from the proverb database of the Institute of the Languages of Finland. This database can be found on the Internet web site http://kaino.kotus.fi/korpus/sp/meta/sp_coll_rdf.xml. One can search for data by using one or several search words, also using wildcards. One can also define the distance between the searched words from 0 to 4 words. I have searched data using the search word *se*. My data consists of over 10 000 proverb files containing the word *se* [it-NOM]

The data in the database were collected in the 1930's in the following municipalities in Finland: Alatornio, Eno, Evijärvi, Hailuoto, Hausjärvi, Isokyrö, Joutseno, Juva, Kalanti, Kiuruvesi, Kivennapa, Kuhmoinen, Kurkijoki, Laukaa, Loimaa, Nivala, Nummi, Paltamo, Pälkäne, Riistavesi, Rovaniemi, Ruovesi, Tyrvää, Ulvila, Valkeala, presented in the following map. The map is taken from Kettunen (1940a), and the municipalities representing western and eastern dialects are marked on the map in figure 8-6:

The whole datbase consists of 85 974 data files. Each data file includes the proverb itself, a word-by-word translation into standard Finnish, the name of the municipality, the name of the collector, and the year when the proverb was written down. For instance:

(32) a. **Kattoo kun lehemä uutta konttija**. [Proverb]
Katsoo kuin lehmä uutta konttia. [Standrardization]
(Hailuoto, N. Rantasuo, 1933) [Municipality, collector, year]

As most readers are unlikely to be familiar with the Finnish language, I will add an English gloss and translation, as shown in (32b):

(32) b. **Kattoo kun lehemä uutta konttija**.
Katsoo kuin lehmä
look-3SG like cow
uutta konttia.
new-PAR knapsack-PAR
'Looks like a cow looks at a new knapsack.'
(Hailuoto, N. Rantasuo, 1933)

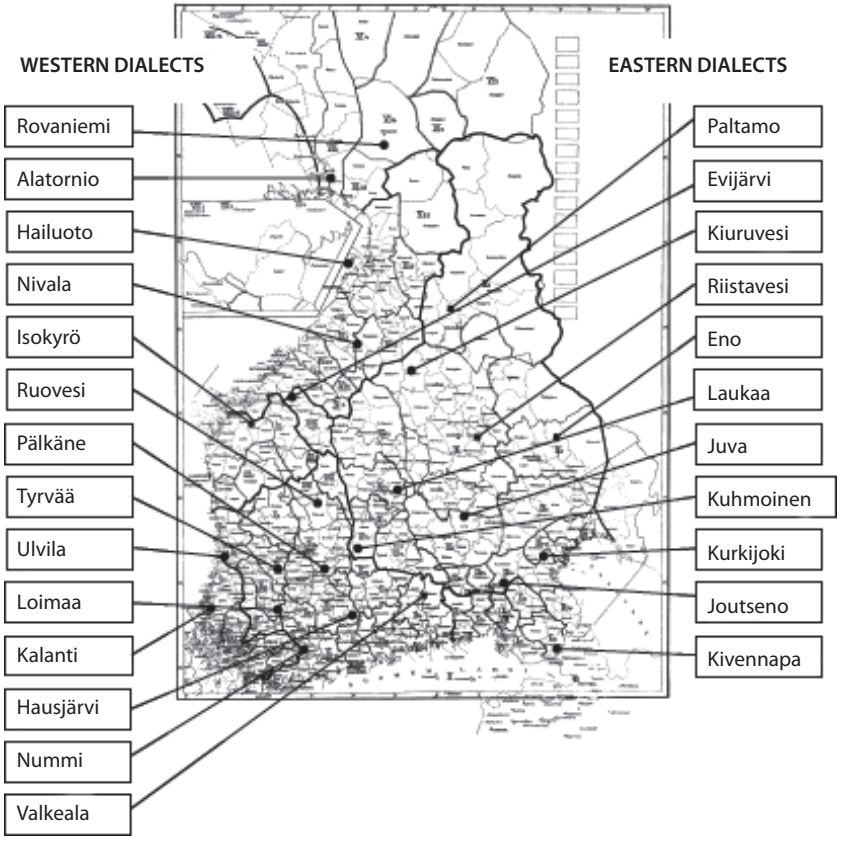


Figure 8-6 Municipalities in the proverb database of the Institute of the Languages of Finland

8.4.2 Syntactic variation in proverbs

The proverb collection is a database that allows searches based on different features, such as word combinations. This makes it a useful tool for a syntactician. Here is an example of variation in the same proverb within the same dialect. The proverb "Who would raise the cat's tail if it does not do it itself" is used when someone has said how good he or she is or what good he or she has done. Such behavior goes against the traditional requirement of modesty (i.e. that one is not supposed to praise oneself).

(33) Variation in one proverb in one municipality (Kalanti)

a. **Kukast kissa hännä nosta ete it nost**.
Kukas kissan hännän nostaa, ellei itse nosta.
Who-CL cat-GEN tail-ACC raise-3SG, if-not itself raise-NEGF
(Kalanti, A. Laaksonen, 1931)

b. **Kukast kissa hännä nosta jolle kis ite.**
Kukas kissan hännän nostaa, jollei kissa itse.
Who-CL cat-GEN tail-ACC raise-3SG, if-not cat itself.
(Kalanti, K. Suominen, 1931)

c. **Kukas kati hännä nosta ete ite.**
Kukas katin hännän nostaa ellei itse.
Who-CL cat-GEN tail-ACC raise-3SG, if-not itself.
(Kalanti, V. Tähtinen, 1931)

d. **Kukas kati hännän nosta, jos ei katt ite.**
Kukas katin hännän nostaa, jos ei katti itse.
Who-CL cat-GEN tail-ACC raise-3SG, if not cat itself.
(Kalanti, Em. Tamminen, 1931)

e. **Kukas koera hännä nosta jolle se sitä ite nost.**
Kukas koiran hännän nostaa, jollei se sitä itse nosta.
Who-CL dog-GEN tail-ACC raise-3SG, if-not cat itself.
Tarkoitta itseänsä kehuva ihmistä.
['Means a person who is praising him/herself'] (Kalanti, F. Tanner, 1931)

f. **Kukast kati hännä nosta, jolte se stää ite nost.**
Kukas katin hännän nostaa, jollei se sitä
Who-CL cat-GEN tail-ACC raise-3SG, if-not it
itse nosta.
itself raise-NEGF. (Kalanti, A. Virtanen, 1931)

g. **Kukast kati hännä nosta, jolte katt ite.**
Kukas katin hännän nostaa, jos ei katti itse.
Who-CL cat-GEN tail-ACC raise-3SG, if-not cat-NOM itself.
(Kalanti, A. Widberg, 1931)

We can see that the proverb varies in the following ways:

The clitic in the sentence initial interrogative word:

- *kuka-**st*** (a, b, f, g)
- *kuka-**s*** (c, d, e)

Lexical choice of the animal whose tail is raised:

- *katt* 'cat' (c, d, f, g)
- *kis(sa)* 'cat' (a, b)
- *koera* 'dog' (e).

The meaning 'if not' has several wordings:

- *jolle* (b, e)
- *jolte* (f, g)

– *ete* (a, c)
– *jos ei* (d)

The subject argument in the subordinate clause (the 'cat'):

– repetition of the noun (b, d, g).
– pronoun *se* 'it' (e, f).
– dropping the subject argument (a, c).

The object argument of the subordinate clause (the 'tail'):

– dropping the object argument (a, b, c, d, g).
– pronoun *se* 'it' in the partitive case: *sitä, stää* (e, f).

Repetition of the verb 'raise':

– dropped (b, c, d, g).
– repeated (a, e, f).

This proverb is common in Finland. Just to show that the different repetitions written down by collectors are different, here are all 51 repetitions that I could find of this particular proverb in the whole database:

(34) 1. **Kuka kissanhännän pystöön nostaa jos ei kissa itte**.
Kuka kissan hännän pystyyn nostaa, jos ei kissa itse.
Who cat-GEN tail-ACC up-ILL raise-3SG, if not cat itself.
(Hailuoto, A. Piekkola, 1933)

2. **Kukas se kissan hännän nostaa, jossei kissa itte**.
Kukas se kissan hännän nostaa, jos ei kissa itse.
Who-CL it cat-GEN tail-ACC raise-3SG, if-not cat itself.
(Hailuoto, N. Rantasuo, 1933)

3. **Kukapa se kissan hännän pystöön nostaa kun ei kissa ite.**
Kukapa se kissan hännän pystyyn nostaa kun ei
Who-CL it cat-GEN tail-ACC up raise-3SG, when not
kissa itse. (Hailuoto, I. Trupukka, 1933)
cat itself.

4. **Kukas kissan hännän nostaa jollei itse**.
Kukas kissan hännän nostaa, jollei itse.
Who-CL cat-GEN tail-ACC raise-3SG, if-not itself.
(Hausjärvi, K. Ledig, 1936–37)

5. **Kukas kissan hännän nostaa jonsei se itte.**
   Kukas kissan hännän nostaa jos ei
   Who-CL cat-GEN tail-ACC raise-3SG if-not
   se itse. (Hausjärvi, O. Lindroos, 1936–37)
   it itself.

6. **Kukas kissan hännän nostaa jos ei itte.**
   Kukas kissan hännän nostaa, jos
   Who-CL cat-GEN tail-ACC raise-3SG, if
   ei itse. (Hausjärvi, Hilma Sykäri, 1935)
   not itself.

7. **Kukas sen kissah hännän nostaa, josei kissa itte.**
   Kukas sen kissan hännän nostaa, jos ei kissa itse.
   Who-CL it cat-GEN tail-ACC raise-3SG, if-not cat itself.
   (Hausjärvi, M. Ylinen, 1936–37)

8. **Kukas kissa hännä nostuaa, jos ei kissa isse.**
   Kukas kissan hännän nostaa, jos ei kissa itse.
   Who-CL cat-GEN tail-ACC raise-3SG, if not cat itself.
   Sanotaan itserakkaasta ihmisestä. (Joutseno, A. Pekurinen, 1932)

9. **Kuka se kissahännä aijall nostua, jos ei kissa isse?**
   Kuka sen kissan hännän aidalle nostaa,
   Who-CL it(-GEN) cat-GEN-tail-ACC fence-ALL raise-3SG if
   jos ei kissa itse. (Joutseno, H. Lampinen, 1932)
   not cat itself.

10. **Kuka sen koeran hännän aajalle nostaa, jos ei koera ite.**
    Kuka sen koiran hännän aidalle nostaa, jos ei
    Who-CL it-GEN dog-GEN tail-ACC fence-ALL raise-3SG, if not
    koira itse. (Juva, H. Karjalainen, 1932)
    dog itself.

11. **Kukast kissa hännä nosta ete it nost.**
    Kukas kissan hännän nostaa, ellei itse nosta.
    Who-CL cat-GEN tail-ACC raise-3SG, if-not itself raise-NEGF
    (Kalanti, A. Laaksonen, 1931)

12. **Kukast kissa hännä nosta jolle kis ite.**
    Kukas kissan hännän nostaa, jollei
    Who-CL cat-GEN tail-ACC raise-3SG, if-not
    kissa itse. (Kalanti, K. Suominen, 1931)
    cat itself.

13. **Kukas kati hännä nosta ete ite.**
    Kukas katin hännän nostaa ellei itse.
    Who-CL cat-GEN tail-ACC raise-3SG, if-not itself.
    (Kalanti, V. Tähtinen, 1931)

14. **Kukas kati hännän nosta, jos ei katt ite**.
Kukas katin hännän nostaa, jos ei
Who-CL cat-GEN tail-ACC raise-3SG, if not
katti itse. (Kalanti, Em. Tamminen, 1931)
cat itself.

15. **Kukas koera hännä nosta jolle se sitä ite nost**.
Kukas koiran hännän nostaa, jollei se sitä itse nosta.
Who-CL dog-GEN tail-ACC raise-3SG, if-not cat itself.
Tarkoitta itseänsä kehuva ihmistä.
['Means a person who is praising him/herself'] (Kalanti, F. Tanner, 1931)

16. **Kukast kati hännä nosta, jolte se stää ite nost**.
Kukas katin hännän nostaa, jollei se sitä itse nosta.
Who-CL cat-GEN tail-ACC raise-3SG, if-not it itself raise-NEGF.
(Kalanti, A. Virtanen, 1931)

17. **Kukast kati hännä nosta, jolte katt ite**.
Kukas katin hännän nostaa, jos ei katti itse.
Who-CL cat-GEN tail-ACC raise-3SG, if-not cat itself.
(Kalanti, A. Widberg, 1931)

18. **Kukas se kissalt hännän nostaa jos ei kissa itse**.
Kukas se kissalta hännän nostaa, jos ei kissa itse.
Who-CL cat-ABL tail-ACC raise-3SG if not cat itself.
Sanont. itsekehujasta.
[Said of a self-praiser.] (Kivennapa, J. Kähönen, 1932)

19. **Kukas sen kissan hännän nostaa jos ei kissa itse**.
Kukas sen kissan hännän nostaa, jos ei kissa itse.
Who-CL it-GEN cat-GEN tail-ACC raise-3SG, if not cat itself.
Kehuskelijasta.
['On a person who is bragging.'] (Kurkijoki, T. Heinonen, 1932)

20. **Kukas sen koera hännä aijalle nostaa muut ku ite**.
Kukas sen koiran hännän aidalle nostaa muut
Who-CL it-GEN dog-GEN tail-ACC fence-ALL raise-3SG, other-PL
kuin itse. (Laukaa, S. Leinonen, 1936–37)
than itself.

21. **Kukapa sen koerrah hännä aejalle nostaa jos sei se ite**.
Kukapa sen koiran hännän aidalle nostaa, jos ei
Who-CL it-GEN dog-GEN tail-ACC fence-ALL raise-3SG, if not
se itse.
it itself.
Hänen täytyy itse kiittää itseään.
['S/he must thank her/himself'] (Laukaa, H. Majanen, 1936–37)

22. **Kukas se koerra hännä aejalle nostaa jossei koerra ite.**
Kukas sen koiran hännän aidalle nostaa, jos ei
Who-CL it(-GEN) dog-GEN tail-ACC fence-ALL raise-3SG if-not
koira itse. (Laukaa, L. Leinonen, 1932)
dog itself.

23. **Kukapa sen koera hännä aejalle nosta jos ee koera ite.**
Kukapa sen koiran hännän aidalle nostaa, jos ei
Who-CL it-GEN dog-GEN tail-ACC fence-ALL raise-3SG, if not
koira itse. (Laukaa, M. Mäkinen, 1932)
dog itself.

24. **Kukas muut sen koerrah hännä aijjalle nostas, jos ei ite.**
Kukas muut sen koiran hännän aidalle
Who-CL other-PL it-GEN dog-GEN tail-ACC fence-ALL
nostaisi, jos ei itse. (Laukaa, J. G. Oksanen, 1932)
raise-COND-3SG, if not itself.

25. **Kuka koiran hännä aijalle nostaa jossei koira ite.**
Kuka koiran hännän aidalle nostaa, jos ei koira itse.
Who dog-GEN tail-ACC fence-ALL raise-3SG, if-not dog itself.
(Laukaa, V. Sillman, 1932)

26. **Kukapa sen koiranhännän aijalle nostaa jos ei koira ite.**
Kukapa sen koiranhännän aidalle nostaa, jos ei
Who-CL it-GEN dog-GEN-tail-ACC fence-ALL raise-3SG, if-not
koira itse. (Laukaa, K. Vatiainen 1936-, K. Vatiainen 1936–37)
dog itself.

27. **Kukas koeran hännän nostaa, jos ei se itte sitä keikauta.**
Kukas koiran hännän nostaa, jos ei se itse
Who-CL dog-GEN tail-ACC raise-3SG, if not it itself
sitä keikauta.
it-PAR swing-NEGF.
Sanotaan itsensä kehumisesta.
[Said about praising oneself.] (Loimaa, S. Sulkanen, 1933)

28. **Kukas koeran hännän nostaa jollei se itte sitä keikauta.**
Kukas koiran hännän nostaa, jollei se itse
Who-CL dog-GEN tail-ACC raise-3SG, if-not it itself
sitä keikauta.
it-PAR swing-NEGF.
Loimaalainen.
['From Loimaa.'] (Loimaa, U. Järveläinen, 1933)

29. **Kukas koeran häntää nostaa jos ei hän stää itte keikauta**.
Kukas koiran häntää nostaa, jos ei hän sitä
Who-CL dog-GEN tail-PAR raise-3SG, if not s/he it-PAR
itse keikauta. (Loimaa, A. Jaakkola, 1933)
itself swing-NEGF.

30. **Kukas koeran häntää nostaa jolei se itte sitä heilauta**.
Kukas koiran häntää nostaa, jollei se itse
Who-CL dog-GEN tail-PAR raise-3SG, if-not it itself
sitä heilauta. (Loimaa, S. Helmi, 1933)
it-PAR swing-NEGF.

31. **Kukas sen koeran hännä nostaa jollei koera itte**.
Kukas sen koiran hännän nostaa, jollei koira itse.
Who-CL it-GENN dog-GEN tail-ACC raise-3SG, if-not dog itself.
Sanotaan kun joku kehuu kovasti itseään.
['Is said when someone is praising him/herself a lot.']
(Loimaa, W. Salonen, 1933)

32. **Kukas kissan hännän nostaa, jolsei itte**.
Kukas kissan hännän nostaa, jos ei itse.
Who-CL cat-GEN tail-ACC raise-3SG, if-not itself.
(Loimaa, M. Ylijoki, 1933)

33. **Kukas koiran hännän nostaa jollei sitä itte keikauta**.
Kukas koiran hännän nostaa, jollei sitä
Who-CL dog-GEN tail-ACC raise-3SG, if-not it-PAR
itse keikauta. (Loimaa, U. Leimu, 1933)
itself swing-NEGF.

34. **Kukas koiran hännän nostaa jolei itse**.
Kukas koiran hännän nostaa,
Who-CL dog-GEN tail-ACC raise-3SG,
jollei itse. (Loimaa, V. Kankaanranta, 1933)
if-not itself.

35. **Kukas koiran hännän nostaa, jollei sitä itse keikauta**.
Kukas koiran hännän nostaa, jollei sitä
Who-CL dog-GEN tail-ACC raise-3SG, if-not it-PAR
itse keikauta. (Loimaa, H. Lepistö, 1933)
itself swing-NEGF.

36. **Kukas koiran hännän nostaa, jossei se itte sitä keikauta**.
Kukas koiran hännän nostaa, jos ei se itse
Who-CL dog-GEN tail-ACC raise-3SG, if-not it it-PAR
sitä keikauta. (Loimaa, P. Tuominen, 1933)
itself swing-NEGF.

37. **Kukas koiran hännän airalle nostaa jollei se itte.**
Kukas koiran hännän aidalle nostaa, jollei se itse.
Who-CL dog-GEN tail-ACC fence-ALL raise-3SG, if-not it itself.
(Pälkä, A. Laine,)

38. **Kukas koirrah hännän airallen nostaa, jollei koirra itte.**
Kukas koiran hännän aidalle nostaa, jos ei
Who-CL dog-GEN tail-ACC fence-ALL raise-3SG, if-not
koira itse.
dog itself.
Sanotaan itseänsäkehuvalle.
['Said to a person who is praising him/herself.'] (Pälkä, T. Inkilä,)

39. **Kukas koiran hännän ailalle nostaa.**
Kukas koiran hännän aidalle nostaa.
Who-CL dog-GEN tail-ACC fence-ALL raise-3SG.
Itseensä kiittää.
['Thanks her/himself.'] (Pälkä, A. Jokinen,)

40. **Kukas kissah hännän nostaa, jonsei itte.**
Kukas kissan hännän nostaa, jos ei itse.
Who-CL cat-GEN tail-ACC raise-3SG, if-not itself.
(Pälkä, E. Mikkola,)

41. **Kukas koirah hännän airalle nostaa, jossei koira itte.**
Kukas koiran hännän aidalle nostaa, jos ei
Who-CL dog-GEN tail-ACC dench-ALL raise-3SG, if-not
koira itse.
dog itself.
Sanotaan itsensä kiittäjälle.
['Said to a person who thanks her/himself.'] (Pälkä, K. Lassila,)

42. **Kukas koirah häntää nostaa jossei koira itte.**
Kukas koiran häntää nostaa, jos ei
Who-CL dog-GEN tail-PAR raise-3SG, if not
koira itse. (Pälkä, S. Korppoo,)
dog itself.

43. **Kukas koiranhännän airalle nostaa jossei koira itte.**
Kukas koiranhännän aidalle nostaa, jos ei
Who-CL dog-GEN-tail-ACC fence-ALL raise-3SG, if-not
koira itse. (Pälkä, S. Korppoo,)
dog itself.

44. **Kuka se koiran hännän nostaa, jos ei koira itte.**
Kuka se koiran hännän nostaa, jos ei koira itse.
Who-CL it dog-GEN tail-ACC raise-3SG, if not dog itself.
(Rovaniemi, A. Hanni, 1933)

45. **Kukas se kissan hännän nostaa jos ei kissa itse**.
Kukas se kissan hännän nostaa, jos ei
Who-CL it cat-GEN tail-ACC raise-3SG, if not
kissa itse. (Rovaniemi, V. Nuotio, 1933)
cat itself.

46. **Kukas se koirah hännän nostaa, jos ei koira ite**.
Kukas se koiran hännän nostaa, jos ei
Who-CL it dog-GEN tail-ACC raise-3SG, if not
koira itse. (Rovaniemi, S. Rasila, 1932)
dog itself.

47. **Kukas koirran hännän nostaa jollei hän sitä itte keikauta**.
Kukas koiran hännän nostaa, jollei hän sitä
Who-CL dog-GEN tail-ACC raise-3SG, if-not s/he it-PAR
itse keikauta. (Tyrvää, F. Törmä, 1933)
itself swing-NEGF.

48. **Kukas koiran hännän nostaa, ellei sitä itte keikauta**.
Kukas koiran hännän nostaa, ellei sitä
Who-CL dog-GEN tail-ACC raise-3SG, if-not it-PAR
itse keikauta. (Tyrvää, H. Eskola, 1933)
itself swing-NEGF.

49. **Kukas koira hännä nostaa jolsei koira itte**.
Kukas koiran hännän nostaa, jos ei
Who-CL dog-GEN tail-ACC raise-3SG, if-not
koira itse. (Ulvila, H. Huhtala, 1933)
dog itself.

50. **Kukas kissa hännä nostaa, jolsei se itte**.
Kukas kissan hännän nostaa, jos ei
Who-CL cat-GEN tail-ACC raise-3SG, if-not
se itse. (Ulvila, A. Loimaranta, 1933)
it itself.

51. **Kukas muut kissan häntää nostaa jollei se itse**.
Kukas muu kissan häntää nostaa, jollei
Who-CL else cat-GEN tail-PAR raise-3SG, if-not
se itse. (Valkeala, M. Rantala, 1932)
it itself.

The variation of the whole data is very much the same as in the data collected in one municipality (Kalanti). As Oksana Petrova (2011) has shown it is not necessary to assume that an idiom (proverbs are idioms) has a basic form. If we wanted to give

a generalization of the proverb in (33), it could look like (34). The notation used in (34) should be interpreted as follows: **boldface** = obligatory element, underline = most typical choice of options, {…} = morphological, lexical or syntactic alternatives.

(34) **WH-WORD {*kuka*}-**(CLITIC {*s, pA, st*}) (EXPLETIVE {*se*}) (PRON [*muu* 'else,' *muut* 'else-PL'}) (**N$_i$** {*kissa* 'cat,' *koira* 'dog'}-{GEN, ABL} **N$_j$** {*häntä* 'tail'}-{ACC, PAR} DIRECTION {*aidalle* 'fence-ALL,' *pystyyn* 'up-ILL'} **V** {*nostaa* 'raise'}-(CON)-**3SG CONJUNCTION** {*jos* 'if,' *kun* 'when'} **NEGATION WORD** {*ei*}

{ **N**$_i$ {*kissa* 'cat,' *koira* 'dog'}-NOM REFL {*itse* 'self'} (PRON$_i$) (PRON$_j$-PAR)
REFL {itse 'self'} **V** {*nosta* 'raise,' *keikauta* 'swing'...}- NEGF }

8.4.3 The functions of the word *se* 'it-NOM' in proverbs

Now we can look at the word *se* in the proverb data. It has the following functions:

1. Pronoun
2. Definiteness marker
3. Pseudoarticle
4. Expletive

The examples of these different kinds of function are in (35)–(43).

8.4.3.1 *Pronoun*

In Examples (35) and (36), *se* is a typical pronoun that refers to another NP:

(35) **Ei köyhyys ole mikhään ilo, mutta minua se vain niin naurattaa**.
Ei köyhyys ole mikään ilo, mutta minua se
not-3SG poverty-NOM be-NEGF any joy-NOM, but I-PAR it
vain niin naurattaa.
only so make-laugh-3SG
'Poverty is no joy but it just makes me laugh.' (Alatornio, E. Angeria, 1933)

(36) **Jolla pirtti on, siltä se pallaa**.
Jolla pirtti on, siltä se palaa.
rel-pron house-NOM be-3SG, it-ABL it-NOM burn-3SG
'The one who has a house may lose it when it burns.' (Pälkä, E. Mikkola,)

The word *se* in (35) refers to *köyhyys* 'poverty' and in (36) *se* refers to *pirtti* 'house'. In (36) the se in the ablative case (*siltä*) referes to the NP *jolta* 'the one'.

8.4.3.2 *Definiteness marker*

Finnish does not have a definite article, but determinative pronouns may be used as definiteness markers. This is typical especially if the definite NP is modified by a relative clause. As (37) shows, if the pronoun (or sometimes another pro-element) is used to mark the definiteness (*se kivi* 'the stone'), the NP does not have to be next to the relative clause:

(37) **Kyllä se kivi kastuu johon kaikki sylykevät.**
Kyllä se kivi kastuu, johon kaikki
yes it-NOM stone become-wet-3SG rel-pron-ILL everyone-NOM
sylkevät.
spit-3PL
'That stone will get wet onto which everyone spits.'
(Alatornio, A. Niemi, 1933)

8.4.3.3 *Pseudoarticle*

It is typical of proverbs that *se* is used like a definiteness marker even though the NP it is not definite. For instance, the 'old person' (*vanha*) in (38) and the 'ox' (*härkä*) in (39) have never mentioned before. The function of the pseudoarticle is to express the fact that the sentence is a generalization.

(38) **Tallelha se vanha pannoo, vua se ei muista.**
Tallellehan se vanha panee, vaan se
safe-ALL-CLITIC it-NOM old-NOM put-3SG but it-NOM
ei muista.
not-3SG remember-NEGFORM
'[An] old [person] puts things in a safe place but does not remember [where].' (Kurkijoki, V. Pipatti, 1932)

(39) **Sitä se härkä syöpi jota se vettääki.**
Sitä se härkä syöpi, jota se vetääkin.
it-PAR it-NOM eat-3SG rel-pron-PAR it-NOM drag-3SG-CL
'An ox eats what it drags.' (Hailuoto, S. Kleemola, 1933)

8.4.3.4 *Expletive*

The word *se* can be used as an expletive that marks its position as empty in order to show that the word before it has a strong focus (FOCUS1). In the rest of this chapter, we will concentrate on the expletive use of *se*:

(40) **Turhaa soon rumihillen veisata ei se stä kuule.**
Turhaa se on ruumiille veisata, ei se
pointless-PAR it-is dead-body-ALL sing-INF1, NEG-3SG it

sitä kuule.
it-PAR hear-NEGF

It is pointless to sing to a dead body, it does not hear it.
(Isokyrö, H. Liimakka, 1934)

(41) **Kyllä se on turhaa rumihille veisata, ei se sitä kuule**.
Kyllä se on turhaa ruumiille veisata, ei
yes it-NOM be-3SG pointless-PAR dead-body-ALL sing-INF, NEG-3SG
se sitä kuule.
it it-PAR hear-NEGF
'It is pointless to sing to a dead body, it does not hear it.'
(Isokyrö, A. Penttilä, 1934)

(42) **Snustahan seon tullu tökerösormi kun on peokalo keskellä kämmentä**.
Sinustahan se on tullut se tökerösormi,
you-ELA-CLITIC it-NOM be-3SG become-PASTPTC clumsy-finger-NOM
kun on peukalo keskellä kämmentä.
as be-3SG thumb-NOM in-the-middle-ADE palm-PAR
'You have indeed become a clumsy-finger as you have your thumb in the middle of your palm.' (Paltamo, E. Karppinen, 1933)

(43) **Se koira se kiljasee johon karttu käypi**.
Se koira se kiljaisee, johon karttu käypi.
it-NOM dog it-NOM scream-3SG, rel-pron-ILL beater-NOM hit-3SG
'That dog screams that gets hit by the beater.' (Nivala, O. Pajukoski, 1933)

8.4.4 A closer look at the expletive *se*

Finnish has two expletives based on the word *se*: *se* 'it-NOM' and *sitä* 'it-PAR.' The latter has been discussed earlier in this chapter. According to Holmberg and Nikanne (1994, 2001, 2008) it is a place holder in the Spec(AgrSP) position, in our terms position 2. The example in (44) is a typical example of the expletive *sitä* used in the same proverb: the sentence starting with sitä is a generic one. The topic position is occupied by an empty placeholder.

(44) **Vaihtelevvoa se on ihmiselämä: sitä joutuu millon kurjuuvvesta orjuuteen, millon orjuuvvesta kurjuuteen**.
Vaihtelevaa se on ihmiselämä: sitä joutuu
Varying-PAR it-NOM be-3SG human-life-NOM: **it-PAR** must-go-3SG
milloin kurjuudesta orjuuteen, milloin orjuudesta kurjuuteen.
when misery-ELA slavery-ILL when slavery-ELA misery-ILL.
'Human life is full of changes: sometimes one gets from misery to slavery and sometimes from slavery to misery.' (Paltamo, Matti Lehtola, 1935)

Typical examples of *se* as an expletive can be found in sentences (45)–(47).

(45) **Sinustahan seon tullu tökerösormi kun on peokalo keskellä kämmentä**.
Sinustahan se on tullut se tökerösormi,
you-ELA-CLITIC it-NOM be-3SG become-PASTPTC clumsy-finger-NOM
kun on peukalo keskellä kämmentä.
as be-3SG thumb-NOM in-the-middle-ADE palm-PAR
'You have indeed become a clumsy-finger as you have your thumb in the middle of your palm.' (Paltamo, E. Karppinen, 1933)

In (45), the expletive is in the construction X-ELA *tule-* Y-NOM ('from X comes Y', i.e.' X becomes Y'). The sentence without *se* (sinusta on tullut tökerösormi [you-ELA be-3SG come-PASTPTC clumsyfinger-NOM) has a complete argument structure, i.e. all the parts required by the construction. Therefore the word *se* cannot be linked to any argument. Its function is to show that the word *sinustahan* is in position 0 and carries a strong focus.

In (46) and (47), the expletive *se* is used in an "evaluative expression" construction as discussed in Chapter 6.

(46) **Turhaa soon rumihillen veisata ei se stä kuule**.
Turhaa se on ruumiille veisata, ei se
pointless-PAR it-is dead-body-ALL sing-INF1, NEG-3SG it
sitä kuule.
it-PAR hear-NEGF
It is completely pointless to sing to a dead body, it does not hear it.
(Isokyrö, H. Liimakka, 1934)

(47) **Kyllä se on turhaa rumihille veisata, ei se sitä kuule**.
Kyllä se on turhaa ruumiille veisata, ei
yes it-NOM be-3SG pointless-PAR dead-body-ALL sing-INF, NEG-3SG
se sitä kuule.
it it-PAR hear-NEGF
'It is pointless to sing to a dead body, it cannot hear it.'
(Isokyrö, A. Penttilä, 1934)

There is no room for a nominative NP in the syntactic form of the construction, which is as follows:

[NP-GEN *olla*-3SG [$_{AP}$…[A-PAR]] […V-1INF…]]

The expletive *se* shows that the adjective *turhaa* 'pointless-PAR' is in position 0 and carries a strong focus.

In Examples (45)–(47), the expletive *se* is between the verb or auxiliary with the AgrS-morphology (position 2) and the strongly focused word (position 0). However, we cannot tell whether the position is 1 or 2:

(48)	**0**	**1**	**2**	**3**	
	(FOCUS1)		**(TOPIC)**	**(AgrS)**	
	Sinusta	(se?)	(se?)	*on*	*tullu tökerösormi*
	you			be-3SG	
	Vaihtelevoa	(se?)	(se?)	*on*	*ihmiselämä*
	varying-PAR			be-3SG	
	Turhaa	(se?)	(se?)	*on*	*ruumiille veisata*
	pointless			be-3SG	
	Kyllä	(se?)	(se?)	*on*	*turhaa rumihille veisata*
	yes			be-3SG	

Next we will go through the proverb data for the use of *se* to find out which position it occupies.

We can start by looking at the different repetitions of the same proverb. A proverb that is common in different dialect areas and often has the expletive se is *Se koira älähtää, johon kalikka kalahtaa* 'that dog makes a sound that the beater hits.' The proverb is used to mean that the person who reacts first or most strongly to an accusation of wrongdoing is the one who is guilty.

Sentences in (49) are examples of the proverb without expletive. The word *se* is a definiteness marker, and the NP *se koira* 'the/that dog' is in the topic position (position 2):

(49) **Se koira älähtää johonka karttu koskee!**
Se koira älähtää, johonka karttu koskee!
it-NOM dog-NOM make-sound-3SG, rel-pron-ILL beater-NOM hit-3SG
'That dog makes sound that the beater hits.' (Alatornio, A. Anundi, 1933)

Municipality	**0**	**1**	**2**	**3**	
Alatornio			Se koira	älähtää	johonka karttu koskee!
Eno, Ilomantsi			Se koira	älähtää	mihin kalikka kalahtaa.
Hausjärvi			Se koira	kiljasee	kehenkä kalikka sattuu.
Kivennapa			Se koira	älähtää	kehe karttu kolahtaa.

The examples in (50) have both the expletive *se* and the clitic *hAn*

(50) **Se koiraha se älähtää kehe karttu kolahtaa**.
Se koirahan se älähtää, kehen
it-NOM dog-CL it-NOM make-sound-3SG, rel-pron-ILL
karttu kolahtaa.
beater-NOM strike-3SG
'That dog makes sound on which the beater strikes.'
(Kivennapa, E. Heikkinen, 1932)

As Hakulinen (1976b) points out, the clitic *hAn* is always attached to the first phrase of the sentence. This phrase typically also carries the strong focus, and according to Holmberg & al. (1993), the clitic *hAn* is in the C-position (or position 1). The examples in Table (51) are organized according to this assumption.

(51) Examples of se koirahan se älähtää… [it-NOM dog-NOM it-NOM make-sound-3SG…] organized according to the assumption put forward by Holmberg & al. (1993).

Municip	**0**	**1**	**2**	**3**	
	'the dog'	CL	EXPL	V-3SG	RELATIVE CLAUSE
Juva	Se koera	ha	se	äläht	kehe kalikka kalaht.
Kiuruvesi	Se koera	han	se	älähtää	johonka kalikka sattuu.
Kivennapa	Se koira	ha	se	älähtää	kehe karttu kolahtaa.
Kurkijoki	Se koira	ha	se	ulahtaa,	mihi se kalikka kolahtaa.
Kurkijoki	Se koira	ha	se	älähteä	mihi kalikka kolahtoa.
Kurkijoki	Se koira	ha	se	älähtiä,	mihi kalikka kalahtua.
Riistavesi	Se koera	haan	se	älähtää,	johon kalikka kolahtaa.

However, there are other alternatives, given in (52):

(52)

	0	**1**	**2**	**3**	
ALTERNATIVE A: *hAn* in position 1, *se* in topic position 2	se koira	han	se	äläht	kehe kalikka kalaht.
ALTERNATIVE B: *hAn* in position 0 with NP, *se* in position 1	se koirahan	se		äläht	kehe kalikka kalaht.
ALTERNATIVE C: *hAn* in position 0 with NP, *se* in topic position 2	se koirahan		se	äläht	kehe kalikka kalaht.

I will argue for alternative B: the clitic *hAn* is placed in the same position as the NP to which it is attached and the expletive se is in position 1. For that we need a proverb that has more word order variation.

There are many data files of the Eastern Finnish proverb *Sattuu vahinko viisaallekin, tyhmällä se on aina toisessa kädessä* [happen-3SG accident-NOM wise-ALL-CL, stupid-ADE it-NOM be-3SG always other-INE hand-INE] 'An accident may happen to a wise (person), too, but a stupid (person) has it always in his other hand.' (In other words, everyone can make a mistake, but there are some people who make them all the time.) In (53), there are examples of this proverb without expletive:

(53) a. **Vahinko tulloo viisaallekkii vae tuhmallon aena toesessa käessä**.
Vahinko tulee viisaallekin vain tuhmalla on aina
accident come-3SG wise-CL but stupid-ADE is always
toisessa kädessä.
other-INE hand-INE (Kiuruvesi, A. Pennanen, 1932)

b. **Tulloo vahinko viisallei, tuhmalla toesessa käessä**.
Tulee vahinko viisaallekin, tuhmalla
come-3SG accident wise-CL, stupid-ADE
toisessa kädessä.
other-INE hand-INE. (Kiuruvesi, A. Niskanen, 1932)

c. **Vahinko käyvvöö viisaallekkii, tuhmal se onkii toises kääijs**.
Vahinko käy viisaallekin, tuhmalla se onkin
accident happens wise-CL, stupid-ADE it is-CL
toisessa kädessä.
other-INE hand-INE (Kivennapa, J. Kähönen, 1932)

d. **Vahinko käyvvöö viisaallekkii, tuhmal se onnoi toises kääjes**.
Vahinko käy viisaallekin, tuhmalla se onkin
accident happen-3SG wise-CL, stupid-ADE it is-CL
toisessa kädessä.
other-INE hand-INE (Kivennapa, J. Kähönen, 1932)

e. **Tulloo vahinko viisaalkii tuhmal on toises kääjes**.
Tulee vahinko viisaallekin, tuhmalla on
come-3SG accident wise-CL, stupid-ADE is
toisessa kädessä.
other-INE hand-INE (Kivennapa, J. Soponen, 1932)

The topic is in position 2 and the strongly focused element in position 0, as shown in (54):

(54)

Municipality	**0**	**1**	**2**	**3**	
Kivennapa			*Vahinko* accident	*käyvvöö* happen-3SG	*viisaallekkii* wise-ALL-CL
Kivennapa	*Tulloo* happen-3SG		*vahinko* accident		*viisaalkii* wise-ALL-3SG

In (55), there are examples with the expletive *se*:

(55) a. **Vahinko se tuloo viisaallennii tuhmalla soun toisessa käissä**.
Vahinko se tulee viisaallekin, tuhmalla se on
accident EXPL come-3SG wise-ALL-CL, stupid-ADE it is
toisessa kädessä.
other-INE hand-INE (Eno, A. Heiskanen,)

b. **Vahinko se tulloo viisoallehhi, tyhmällä se on ainai toisessa käissä**.
Vahinko se tulee viisaallekin, tyhmällä se on
accident EXPL come-3SG wise-ALL-CL, stupid-ADE it is
ainakin toisessa kädessä.
always-CL other-INE hand-INE (Paltamo, Matti Lehtola, 1933–34)

c. **Sattuu se vahinko viisaallekkii, tyhmällä se on toisessa käissä**.
Sattuu se vahinko viisaallekin, tyhmällä se on
happen-CL EXPL accident wise-ALL-CL, stupid-ADE it is
toisessa kädessä.
other-INE hand-INE (Eno, T. Räty)

d. **Tulloo se vahinko viisaallekki, tollolla se onni toesessa käessä**.
Tuleehan se vahinko viisaallekin, tollolla se onkin
come EXPL accident wise-ALL-CL, stupid-ADE it is-CL
toisessa kädessä.
other-INE hand-INE (Paltamo, H. J. Keränen, 1933)

e. **Sattuu se vahinko viisaallekin, tuhmalla soon toesessa käessä**.
Sattuu se vahinko viisaallekin, tuhmalla se on
come-3SG EXPL accident wise-ALL-CL, stipid-ADE it is
toisessa kädessä.
other-INE hand-INE (Juva, H. Karjalainen, 1932)

f. **Käyp se vahinko viisaallekkii, tuhmal se on toises kääjes**.
Käypi se vahinko viisaallekin, tuhmalla se on
happen-3SG EXPL accident wise-ALL-CL, stupid-ADE it is
toisessa kädessä.
other-INE hand-INE (Kivennapa, A. Paavolainen, 1932)

If the topic is in position 2 and the strongly focused element in position 0, the natural position for the expletive *se* is 1, as shown in Table (56). The word order in (56) is the same as in the examples in (55). There is only one position between the strongly focused element and the expletive *se*.

(56)

Municipality	**0**	**1**	**2**	**3**
Eno	*Sattuu* happen-3SG	*se*	*vahinko* accident-NOM	*viisaallekkii* wise-ALL-CL
Paltamo	*tulloo* come-3SG	*se*	*vahinko* accident-NOM	*viisaallekki* wise-ALL-CL

I suggest, that if *se* is in position 1 in these sentences, for the sake of simplicity, it is also in position 1 in the examples in (55a) and (55b), as shown in Table (57):

(57)

Municipality	0	1	2	3	
Paltamo	*vahinko* accident	*se*		*tulloo* come-3SG	*visoallehhi* wise-ALL-CL
Eno	*Vahinko* accident	*se*		*tuloo* come-3SG	*viisaallennii* wise-ALL-CL

The clitic *hAn* occurs in the same proverb with a focused predicate verb and expletive se in Examples (58). The topic in (58a) is *niin* 'so' and *lumet'* snow-PL' in (58b):

(58) a. **Sattuuha se niinnii käämää, että lehmäe kuoloo**.
Sattuuhan se niinkin käymään, että
happen-3SG-CL EXPL so-CL happen-INF3-ILL, that
lehmäkin kuolee.
cow-CL die-3SG
'It may also happen that the cow dies.' (Kiuruvesi, M. Jauhiainen, 1932)

b. **Sehänse lumet sulloo, joka ne on laettanuttii**.
Sehän se lumet sulaa, joka ne
it-CL EXPL snow-PL-ACC melt-3SG, rel-pron-NOM them-ACC
on laittanutkin.
be-3SG set-PASTPTC-CL
'The one who has set the snow, will melt it.' (Riistavesi, H. Räsänen, 1932)

The analysis of these sentences is in Table (59):

(59)

0	1	2	3	
satuuha happen-3SG-CL	*se* EXPL	*niinnii* so-CL		*käämään että lehmäe kuoloo* happen-INF3-ILL that cow-NOM-CL die-3SG
sehän *it-NOM-CL*	*se* *EXPL*	*lumet* *snow-PL-ACC*	*sulloo* melt-3SG	*joka ne on laettanuttii* rel-pron-NOM they-ACC set-PASTPTC-CL

Thus, the clitic *hAn* cannot be in position 1, as that is occupied by the expletive *se*. The expletive *se* cannot be in position 2 as that is occupied by another element. The whole word forms *sattuuhan* [happen-3SG-CL] and *sehän* [it-NOM-CL] are in the same position. Intuitively, this is a natural analysis, as the word form with the stem, affixes and clitics forms one phonological unit when it comes e.g. to word stress and vowel harmony.

The analysis of (58a) in (59) states that the adverbial *niinkin* [so-CL] 'so too' is the topic of the sentence and that the finite verb with the emphasizing clitic *hAn, sattuuhan* [happen-3SG-CL], carries the strong contrastive focus of the sentence.

The strong focus on the predicate verb focuses on the semantic meaning of the verb. The verb *sattua* 'happen, take place, occur' means that something unpredictable happens – by chance or by accident. The sentence, thus, emphasizes the unpredictability of life. The word *niin* 'so' is a pro-element that refers to the subordinate sentence 'that a/the cow dies.'

The Finnish clitic *kin* that is attached to niin in (58a) may be confusing for readers without prior knowledge of the Finnish language. *Kin* has many uses (see e.g. Vilkuna 1984, Vilppula 1984). In (58a), *kin* means something like 'even': 'It can happen **even so**, that a/the cow dies.' The clitic *kin* is very common, and it is used in different ways in Examples (58a) in *lehmäe* [cow-CL] 'even the cow' and in (58b) in *laettanuttii* [set/put-CL]. The phonological form of the clitic varies in different dialects.

8.4.5 Expletive se and focus carrying pronoun *se*

Often proverbs have two *se*-words, for instance in the following 'That one laughs best who laughs last':

(60) a. **Se se vasta oekein naaraa, joka viimmeks naaraa**.
Se se vasta oikein nauraa, joka viimeksi nauraa.
it-NOM it-NOM really laugh-3SG, rel-pron last laugh-3SG
(Laukaa, J. G. Oksanen, 1932)

b. **Se se paraiten nauraa joka viimmeks nauraa**
Se se parhaiten nauraa, joka
it-NOM it-NOM best laugh-3SG, rel-pron
viimeksi nauraa. (Eno, O. Härkönen,)
last laugh-3SG

c. **Se se parhaiten nauraa, joka viimeksi nauraa**.
Se se parhaiten nauraa, joka viimeksi nauraa.
it-NOM it-NOM best laugh-3SG, rel-pron last laugh-3SG
(Rovaniemi, A. Hanni, 1933)

d. **Se se nauraa joka viimeksi nauraa**.
Se se nauraa, joka viimeksi nauraa.
it-NOM it-NOM laugh-3SG, rel-pron last laugh-3SG
(Rovaniemi, Y. A. Saraniemi, 1932–193)

Here are examples of other proverbs with *se se*:

(61) a. **Se se mies on joka paikkansa pitää**.
Se se mies on, joka
it-NOM it-NOM man be-3SG, rel-pron-NOM
paikkansa pitää.
position-ACC-PX3 keep-3SG
'THAT is a man who keeps his position.' (Hausjärvi, O. Sirpoma, 1936–37)

b. **Se se vasta oikee vale on, jota kaekki uskoo**.
Se se vasta oikea valhe on, jota
it-NOM it-NOM after-all real-NOM lie-NOM be-3SG, rel-pron-PAR
kaikki uskoo.
everyone-NOM believe-3SG
'THAT is a real lie which everyone believes.' (Juva, F. J. Holopainen, 1932)

(62) **Kissasta jos karhu tulisi se se vasta peto oisi**
Kissasta jos karhu tulisi, se se vasta
cat-ELA if bear-NOM become-COND-3SG it-NOM it-NOM actually
peto olisi.
beast-NOM be-COND-3SG
'If a cat became a bear that would actually be a real beast.' (Eno, O. Härkönen,)

(63) **Se se lutteet rassaa sano ämmä kum pirtti palo**.
"Se se luteet rassaa", sanoi
It-NOM it-NOM bed-bug-PL-ACC destroy-3SG say-PST-3SG
ämmä, kun pirtti paloi.
old-woman-NOM when house-NOM burn-PST-3SG
'THAT destroys the bed-bugs, said the grandma when the [her] house burned down.' (Pälkä, S. Korppoo,)

The first *se* is a pronoun that refers forward to the relative clause in (60) and (61), backwards to 'cat/bear' in (62), and outside of the text to the fire taking place in the fictive speech event in (63). According to these examples, too, the expletive *se* is in position 1. The focus carrying pronoun *se* is in position 0, as shown in Table (64):

(64)

0	**1**	**2**	**3**
Se	*se*	*mies*	*on*
PRON	EXPL	man-NOM	be-3SG
Se	*se*	*vale*	*on*
PRON	EXPL	lie-NOM	be-3SG
Se	*se*	*luteet*	rassaa
PRON	EXPL	bed-bug-ACC	destroy-3SG
Se	*se*	*peto*	*olisi*
PRON	EXPL	beast-NOM	be-COND-3SG

In (65), there are more examples of the same sort: a construction from Nivala municipality:

(65) a. **Ei se mies joka tappelun alottaa, vain se se mies joka tappelun lopettaa.**
Ei se mies, joka tappelun aloittaa, vain
not-3SG it-NOM man-NOM rel-pron-NOM fight-ACC start-3SG, but
se se mies, joka tappelun lopettaa.
it-NOM it-NOM man rel-pron-NOM fight-ACC end-3SG
'That is not a man who starts the fight, but THAT is a man who ends the fight.' (Nivala, J. Peräaho, 1933)

b. **Ei se mies joka viran saa vain se se mies joka viran pittää.**
Ei se mies, joka viran saa, vain
not-3SG it-NOM man-NOM, rel-pron-NOM office-ACC get-3SG, but
se se mies, joka viran pitää.
it-NOM it-NOM man, rel-pron-NOM office-ACC keep-3SG
'That is not a man who gets a job, THAT is a man who keeps the job.' (Nivala, J. Peräaho, 1933)

c. **Ei se narri joka toista narraa, vain se se narri joka ihtijään narrata antaa.**
Ei se narri, joka toista narraa,
not-3SG it fool-NOM, rel-pron-NOM other-PAR make-fool-3SG,
vain se se narri, joka itseään
but it-NOM it-NOM fool-NOM, rel-pron-NOM himself-PAR
narrata antaa.
make-fool-INF1 let-3SG
'That is not a fool who makes fool of other people, but THAT is a fool who lets [someone] make a fool of himself.' (Nivala, J. Peräaho, 1933)

d. **Ei se vielä oo tyhymä joka maasa myö, vain se se tyhymä, joka siemenesä syö.**
Ei se vielä ole tyhmä, joka maansa
not-3SG it yet be-NEGF stupid rel-pron-NOM land-ACC-Pc3
myö, vain se se tyhmä, joka
sell-3SG but it-NOM it-NOM stupid-NOM, rel-pron-NOM
siemenensä syö.
seed-ACC eat-3SG
'That person is not stupid who sells his land, but THAT person is stupid who eats his seeds.' (Nivala, J. Peräaho, 1933)

e. **Ei se tarvitse mies olla joka voitolla pärijää, mutta se se mies on, joka koppaa tekkee, tappaa ja siltikin pärijää.**
Ei se tarvitse mies olla, joka voitolla
not-3SG it must-EGF man-NOM be-INF1, rel-pron profit-ADE

pärjää, mutta se se mies on, joka
get-by-3SG, but it-NOM it-NOM man be-3SG, rel-pron-NOM

koppaa tekee, tappaa ja siltikin pärjää.
basket-PAR make-3SG kill-3SG and still-CL get-by-3SG

'That does not have to be a man who gets by with a profit, but THAT is a man who makes baskets, kills and still gets by.'

(Nivala, R. Takalo, 1933)

The analysis of the first word order positions of the examples in (65) is in Table (66). The pattern is the same as in Table (64): the pronoun is in position 0 and carries strong focus. The second *se* is an expletive sitting in position 1:

(66)

0	**1**	**2**	**3**
Se	*se*	*mies*	*on*
PRON	EXPL	man	is
Se	*se*	*narri*	
PRON	EXPL	fool	
Se	*se*	*tyhmä*	
PRON	EXPL	stupid	

Note that these words *mies* 'man,' *narri* 'fool,' tyhmä 'stupid' have been mentioned in the first clause of the proverb ('It is not **a man/fool/stupid**, who…') So, even though these words are predicate nouns, they are the topics of the latter clause, and sitting in position 2. The proverb construction allows leaving out the finite verb from the latter clause (the one with *se se*). In (64e) the finite verb with AgrS morphology (*on* 'be-3SG') is present and fills position 3. Again, the only position which the expletive *se* can occuppy is position 1.

8.4.6 Problematic topics

The word order analysis has been shown to work nicely so far. The examples in (67) are, however, problematic. (The proverbs in (67) are fictive quotes by a fictive romani person: the word *hai* 'hey, hi' at the beginning of the quote in the proverb indicates that the speaker is a romani person. In Finnish folklore, the romani people are creative speakers who can talk their way out of trouble by making the listener confused. In (67), the excuse following the conjunction *mutta* 'but' is complete nonsense – but it sounds valid.)

(67) a. **Hai kyllähä <u>se</u> meijänkin pojasta suutar tulis mutta se ei saa pysymää sitä pikilankaa sen sian karva nenässä.**
Hai, kyllähän se meidänkin pojasta suutari
Hey, yes-CL it our-CL boy-ELA shoemaker
tulisi, mutta se ei saa pysymään
become-COND-3SG but it NEG get-NEGF stay-INF3-ILL it-PAR
sitä pikilankaa sen siankarvan nenässä.
cobbler's-wax-PAR it-GEN pig hair-GEN tip.
'Hey, our boy would become a shoemaker, too, but he cannot get the cobbler's sewing wax to stay on the tip of the pig's hair.'
(Laukaa, Vieno Sillman, 1932)

b. **Hae kyllähä <u>siitä</u> meijänni pojasta suutar tulis mutta ku se ei soa pysymää sitä sijakarvoa pikilangan päässä.**
Hai kyllähän siitä meidänkin pojasta
Hey, yes-CL it-ELA our-CL boy-ELA
suutari tulisi,
shoemaker become-COND-3SG
mutta kun se ei saa pysymään sitä siankarvaa pikilangan päässä.
…
'Hey, our boy would become a shoemaker, too, but he cannot get the pighair to stay on the tip of the pighair.' (Laukaa, K. Vatiainen, 1932)

The examples in (67) are not problematic when it comes to the position of the expletive se: the Example (67a), in which the expletive *se* occurs, strengthens the analysis that the epletive *se* is in position 1. The problematic phrase is the subject NP *suutar* 'shoe maker,' as shown in Table (68):

(68)

0	**1**	**2**	**?**	**3**
kyllähä	*se*	*meiänki pojasta*	*suutar*	*tulis*
PRON	EXPL	our-CL boy-ELA	shoemaker-NOM	*become-COND-3SG*
kyllähä		*siitä meiänki pojasta*	*suutar*	*tulis*
PRON		that our-CL boy-ELA	shoemaker-NOM	*become-COND-3SG*

According to the analysis argued for in this chapter, the word *kyllähä* 'yes-CL' in which the emphasizing clitic *hAn* is attached to the emphasizing word, *kyllä* (which also means 'yes') is in position 0. However, it is not as clear what the topic of the sentence is. The phrase 'our boy' seems to be the topic: if we think in terms of the theme-rheme analysis, 'our boy' is the theme. The phrase 'shoemaker' is the rheme, but the word order is natural only if the shoe maker is something that "has been discussed" in the fictive context of the proverb, so if we think in terms of the division known vs. new information, it is known.

One possibility is that the the information structure categories may be analyzed as features, such as theme vs. rheme, known vs. new, etc. So, for instance in (67), the first topic, the elative case phrase *siitä meidänkin pojasta* [that-ELA our-GEN-CL boy-ELA] has features [known, theme]. The second topic, the subject phrase *suutar* [shoemaker-NOM] has features [known, rheme]. The word-order tier positions could also possibly be divided into constituents under strictly defined conditions. However, I will leave this analysis to future research.

8.4.7 The position of the expletive *se* in the light of the whole proverb data

Single examples are often ambiguous but an analysis of several repetitions of the same proverb shows that the position of the expletive *se* is position 1 as it is in accord with the whole data. Representative examples are collected in Table (69).

(69)

0 (**Foc1**)	**1** (“C”)	**2** (**Topic**)	**3** (**AgrS**)
Kukas who-CL	*se* EXPL	*kissan hännän* cat-GEN tail-ACC	*nostaa* raise-3SG
Se koira(han) it dog(-CLITIC)	*se* EXPL		*älähtää* make-noise-3SG
Sattuu happen-3SG	*se* EXPL	*vahinko* accident	
Vahinko accident	se EXPL		*sattuu* happen3SG
Se it	*se* EXPL	*parhaiten* best	 laugh-3SG
Se it	*se* EXPL	*luteet* bed-bug-PL	*rassaa* destroy-3SG
Se it	*se* EXPL	*mies* man	*on* is
sattuuhan happen-3SG-CL	*se* EXPL	*niinkin* *so-CL*	
sehän it-NOM-CL	*se* EXPL	*lumet* snow-PL-ACC	sulloo melt-3SG
Kyllähä yes-CL	*se* EXPL	*meijänki pojasta* our-CL boy-ELA	…

8.5 Summary

In this chapter, we have analyzed the finite sentence in Finnish according to the methodolical guidelines discussed in Chapter 1. We have ended up with an analysis

in which the finite morphological categories (AgrS, T, Ptc, and Pass) are in a separate tier from the lexical categories (Neg, Aux and V) The "finiteness" of the finite sentence is based on the morphology. In the same way as the f-chain functions are selected by thematic features, the morphological categories are selected by finite features (φ-features) that are organized as a constituent structure. The constituent structure of the finite features suggested in this chapter is very traditional: the root node (m-root) is divided into three constituents: voice, tense, and mood. Voice, in turn is divided into active and passive. The node active is divided into number and person. We discussed how in Finnish the finite sentence morphological categories are selected by different combinations of finite features. In other languages the inventory of lexical and morphological categories along with the finite features, as well as the linking between the different tiers may be partly different. As the organization of the finite morphology is rather similar to traditional grammars that have been used in different languages, one could assume that it works to a large extent in the analysis of other languages, too.

We have also discussed word order and its relation to information structure and finite sentence morphology. The linear order is based on the relation "preceeds," which is an asymmetric relation between two elements. In the discussion on the basic word order of the finite sentence in Finnish, the suggestion is that the initial positions of the finite sentence are linked to the information structure functions FOCUS1 and TOPIC (following Vilkuna 1989) and that (following Holmberg & Nikanne 2001, etc.) the morphological category AgrS is tied to a particular position. This system was tested using a large corpus of Finnish proverbs.

PART IV

Conclusion

CHAPTER 9

Conclusion

The micro-modular approach introduced in this book follows the principles given in Chapter 1. The approach is based on a complex network of extremely simple micro-modules. The linguistic analysis based mostly on the Finnish language shows that the approach gives us a new perspective both on the Finnish language and the methodology of grammatical studies. In this chapter, the properties of the approach are discussed both from a technical and a methodological point of view.

9.1 The main properties of the micro-modular approach

Tiernet strictly follows the methodological guidelines discussed in Chapter 1. The result of this is the micro-modular approach sketched in this book. The guidelines are partly based on general and widely accepted scientific methodology, such as Occam's Razor (e.g. the guidelines *Analytical approach, Simple formation of modules*, and *Regularities before irregularities*). The guideline *Formal approach* is based on the background assumption that language is a system, which is typical of all structuralist theories of language, including (different approaches to) generative grammar. The guideline *Importance of linking* is based on the background assumption that language (like the rest of the human mind) is modular.

9.2 Tiernet as a cognitively oriented approach to language

In Chapter 1, the goal of Conceptual Semantics was defined as an integrated theory of the human mind and of language as a part of it. It is fair to ask how the micro-modular approach takes us closer to that goal. In this section, I will try to answer this question.

The theory is based on analysis of linguistic data, not on psycholinguistic experiments. Therefore, I cannot claim that Tiernet is a psycholinguistic theory as such. However, for the researcher to analyze the psycholinguistic data from the point of view of the language system, experimental research needs to be based

on an analytical approach to language. This is the role of the present approach in cognitively oriented linguistics. In order to come up with precise hypotheses about linguistic structure and meaning for experimental studies, an analytical model of language is a necessity.

One could ask whether any evidence provided by experimental research would count as counter evidence for the present model. When it comes to the architecture of the model, the answer is no. The idea of the micro-modular approach is to find the "smallest" subsystems of the language system and study how they are linked together. Experimental research into language typically studies language processing and Tiernet is not a theory of processing. If the model is given a psychological interpretation, it should be understood as a theory of the underlying system that enables processing to take place. The psychological interpretation of the model is, thus, the same as that which Chomsky (1965) gives to generative grammar. However, the descriptions are explicit and analytical, and can be used to describe the categories that play a more direct role in language processing.

The methodology outlined in this book does not aim exclusively to be a cognitive model of language. It can equally be applied to other purposes in which an analysis of linguistic structure and meaning is required. The methodological guidelines – *formal approach, analytical organization, regularities before irregularities* – discussed in Chapter 1 are relevant for any kind of scientific work on the language system. Even the question of modularity can be seen as a methodological one: in a micro-modular approach it is a part of the analytical approach itself. In a modular approach the guidelines *simple formation of modules* and *importance of linking* are common sense: in order to see what the ingredients of the system really are, an analytical approach to modules is required, and in order to study how the system works as a whole, the links between modules must be studied carefully.

One may also see the Tiernet approach as a part of traditional linguistics, a model of the parts of the language system and their mutual relations without relating the system specifically to psychology or anything else. Then we could change the research goal slightly:

Research goals: *Integrated theory of human understanding and of language as a part of it.*

By replacing *human mind* with *human understanding* we shift the focus slightly away from individual psychology to a more general idea of human understanding. Needless to say, the goal is still to come up with a model that can be integrated with other domains of the human understanding.

9.3 A new perspective on familiar phenomena

The chapters above have shown that a micro-modular network model and an analytical methodology is a useful tool for describing any linguistic phenomena. Small sub-parts, i.e. micro-modules, of the traditional parts of grammar (syntax, morphology, phonology, semantics, etc.) are linked to each other directly, and therefore the methodology reveals new ways of seeing the linguistic system as a whole and new ways of analyzing traditional problems such as the finite verb morophology of Finnish discussed in Chapter 8.

One of the most widely discussed topics among grammarians is the status and nature of the lexicon. It has been suggested here that the linguistic system may use three "symbolic" modules – the lexicon, morphology, and constructions – that link together fragments of representation of the basic micro-modules. I have suggested different symbolic modules instead of one because it is a consequence of the logic of the methodology. Even if there were one larger "lexical" module, it would need to be divided into smaller sub-modules because constructions use lexical and morphological items as building blocks.

The internal structure of lexical items has led to the theoretical concept of the *legal fragment*, which is a useful tool for understanding lexical items. This is one of the points made in Chapter 6. Legal fragments are such fragments of representation that can form a part of a well-formed representation. A legal fragment that is not a well-formed concept as such and must be complemented by other legal fragments that together form a well-formed representation. This is basically what linguistic valence – or dependence – is all about. Seen from the perspective of the micro-modular network, valence is a side-effect of the formation principles of the micro-representations.

9.4 Challenges for the future: Language specific analyses

This book introduces the methodological guidelines for a micro-modular model of conceptual semantics. Even though there are concrete suggestions about how to analyze certain phenomena in the Finnish and English languages, the focus has been on the methodology. The challenge in the future will be to apply this methodology to an increasing number of linguistic phenomena in different languages, to compare languages, and develop the analysis and the theory further. At the same time, we can hope to discover interesting new regularities and irregularities in languages.

Abbreviations

Case forms

NOM	Nominative
ACC	Accusative
GEN	Genitive
PAR	Partitive
INE	Inessive
ELA	Elative
ILL	Illative
ADE	Adessive
ABL	Ablative
ALL	Allative
ESS	Essive
TRA	Translative
COM	Comitative
INS	Instructive
ABE	Abessive

Number

PL	Plural
SG	Singular

Possessive suffixes

PX1SG	First person singular possessive suffix
PX2SG	Second person singular possessive suffix
PX3	Third person possessive suffix
PX1PL	First person plural possessive suffix
PX2PL	Second person plural possessive suffixPerson
1SG	First person singular
2SG	Second person singular
3SG	Third person singular
1PL	First person plural
2PL	Second person plural
3PL	Third person plural

Mood

COND	Conditional
IMP	Imperative
POT	Potential

Tense

PAST	Past
PRES	Present

Participial forms

PASTPTC	Past participle
PRESPTC	Present participle

Infinitive forms

1INF	First infinitive
2INF	Second infinitive
3INF	Third infinitive

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Construction index

Subject index

In this book, the micro-modular approach known as Tiernet within Conceptual Semantics is introduced. Constructions make up an important part in the approach, but in this approach constructions are considered to be exceptions, licensed links between micro-modules, one of the kinds of symbolic modules in the approach. Similar to construction grammar approaches, the micro-modular approach takes a solid interest in the 'periphery' and thus also studies irregular linking principles like constructions.

The book details particulars in the development of generative grammar and the relation of Conceptual Semantics to this development, and then introduces the micro-modular approach and shows its usefulness for the description of language generally by not only using examples from English, but also, and in particular, by applying the micro-modular approach of Conceptual Semantics to data from Finnish.

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