Decomposing Path

The Nanosyntax of Directional Expressions

Marina Blagoeva Pantcheva

A thesis submitted for the degree Philosophiae Doctor

University of Tromsø

Faculty of Humanities, Social Sciences and Education

CASTL

May, 2011

Acknowledgments

When I told my father a couple of years ago that I got a PhD position at the University of Tromsø, first thing he did was to try to locate Tromsø on the world map. As it happens to many people who face the same task, he glided his finger along the Norwegian coastline, going north, and more north, and more north, passing the Polar Circle, and then even more north, while the expression on his face was changing from slightly amused to deeply worried. When his finger finally stopped its journey at the 69th parallel, he said: "This town is on the edge of the world! Be careful not to fall off."

This little Norwegian island on the edge of the world turned out to be a marvelously exciting, enriching and vibrant place to live. And, more importantly, it had CASTL — the Centre for Advanced Study in Theoretical Linguistics where I got friends for life, a husband, two kids, and, last, but surely not least, a Dissertation. The last feat required a great deal of knowledge and skills which I acquired thanks to so many people. It is these people that I wish to thank now.

First and foremost, I want to express my deep gratitude to my supervisor Peter Svenonius. There are so many things I want to thank him for that I really do not know where to begin. Let me start by thanking Peter for accepting into his Moving Right Along project a PhD student who knew nothing about generative grammar. I thank him for teaching me the things I know about it now. Peter is a great teacher, incredibly patient and always capable of explaining the most intricate linguistic issues, even to a beginner. I am also grateful to Peter for being such a devoted and supportive supervisor and for always finding time in his busy schedule to read my numerous drafts and meet me. Peter's astonishing knowledge of linguistics and his constructive and often critical comments (yet always presented with an amazing delicacy) improved this work greatly. Finally, I wish to thank Peter for being a wonderful friend in addition to being a terrific supervisor.

Second, I want to thank Pavel Caha, the person with whom I could discuss linguistic any time of the day. Pavel's huge linguistic knowledge, intelligence and insightful comments helped me clarify many questions I asked myself concerning syntax in general and Nanosyntax in particular.

I am also grateful to Michal Starke, Tarald Taraldsen and Gillian Ramchand for the inspiring seminars they held and the fruitful linguistic discussions (among all others).

I greatly acknowledge the feedback I got from linguists I met at conferences in Tromsø and abroad. Among others, I would like to thank Marcel den Dikken, Joost Zwarts, Sander Lestrade, Patrik Bye and all the participants of the Workshop on Locative Case in Nijmegen in 2008, where I presented the ideas developed in this thesis for the first time.

I would like to thank Klaus Abels for the exciting class in Mathematical Linguistics. This was the best term I had in Tromsø.

I want to thank all the people at CASTL for making it such a nice place to be, where both linguistics and friendships thrive. I am particularly grateful to CASTL's ex-director Curt Rice and its present director Marit Westergaard for creating such an outstanding working environment. I also thank the people who work(ed) at the the Faculty of Humanities, Social Sciences and Education and at the administration of CASTL for quickly and efficiently helping me solve administrative and practical problems. I want to especially mention Ståle Berglund, Christin Kristoffersen, Tore Benzt, Kaori Takamine, Jorun Nordmo, Elisabeth Eriksen and Jan Helge Bergheim.

The last five years of my life would have been much less exciting and enriching had I not shared them with my wonderful fellow PhD students: Monika Bader, Pavel Caha, Björn Lundquist, Kaori Takamine, Peter Muriungi, Zhenya Romanova, Yulia Rodina, Éva Dékány, Kristine Bentzen, Mai Tungseth, Nayouki Yamato, Dragana Šurkalović, Christine Østbø, Peter Jurgec, Andrea Márkus, Inna Tolskaya, Islam Youssef, Marleen van de Vate, Sandya Sundaresan, Rosmin Mathew, Pavel Iosad, Sylvia Blaho, Anna Wolleb, Alexander Pfaff, Helene Andreassen, and Violeta Martínez-Paricio.

The years at CASTL were great fun also because of the following colleagues: Christian Uffmann, Martin Krämer, Antonio Fábregas, Minjeong Son, Thomas McFadden and Irene Franco. Thank you for the nice time we spent together.

I greatly appreciate having the possibility of sharing an office with Kaori, Björn, and Éva. Having them as office buddies was a truly enjoyable experience.

I wish to thank my friends "outside linguistics," more than half of whom accidentally happen to be linguists too: Gillian, Björn, Monika, Lucius, Lucie, Yulia, Adnan, Kaori, Tom, Tanya Boteva, Jonas, Isabelle, Pierre, Anna-Lena, Gunnar, Klaus, Luisa. Thanks for the great picnics, pleasant trips and lovely dinners.

I owe a very special and very big thank to Karla. Thank you, Karla, for always finding time to visit us, for all the help with the kids and the household chores, and for driving Misha in your Golden Car.

I want to especially thank my soul sister Monika. It was so nice talking to somebody who was in the same situation as me. One "Oh, last week the kids were sick again" was enough for Monika to understand all my feelings in the tiniest detail.

As for people outside CASTL, I thank my friends back home for the nice time we had when I were back in Bulgaria: Maria, Joro, Ina, Momchil, Emma, Teddy, Elica, and Dani Molle.

I would have never coped without Pavel. I am eternally grateful to him for the sacrifices he made in order for me to finish this thesis. Enumerating here all the things he did for me would make this dissertation look tiny compared to its acknowledgments, so I will just say it in big letters: THANK YOU! I also thank my children Misha and Jana for being there and preventing me from becoming enslaved by my thesis. The numerous joys (and occasional worries) they brought into my life left no space (nor time) for dissertation panic or despair.

I owe thanks to my good old Mac for not completely crashing, despite being so overburdened that it would block about once per hour in the last months of thesis writing.

I am also very grateful (but don't know whom to thank) for the fact that there are no heat waves in Tromsø. Given that I feel sick when it is hotter than 25 °C, the non-winter season in Tromsø is cool enough for my brain to function. I fact, it was a marvelous experience to work until late in the "summer" and then bike home in the magic light of the Midnight Sun, full of admiration for the fantastic nature around.

Talking about the weather, the winter in Tromsø is actually not cold at all. Still, I truly missed the warmth of my wonderful family. I wish to thank my mother Parvaneh Danesh and my father Blagoy Pantchev for encouraging me to drop business and go into academia, for all the support and dedication, and for always being ready to travel so far north and take care of grandchildren and household. I thank my sister Mina and my brother-in-law Ventzi for the lovely holidays we spent together. Finally, I want to thank my parents for letting me go to Tromsø despite their anxiety. I dedicate this thesis to them.

Contents

List of Tables

Abstract

This thesis offers a morphosyntactic analysis of the expressions of directed motion cross-linguistically. I argue that the syntactic structure underlying directional expressions is richer than previously assumed and propose a decomposition of the commonly assumed Path head. The core idea is that the Path projection splits into several heads and different types of paths correspond to syntactic structures involving a different number of these heads.

The proposed Path decomposition is based on a cross-linguistic investigation of the morphological structure of directional expressions. The data show that there are languages where Source paths are built on top of Goal paths. In these languages, the Source expressions are formed by the addition of a special element to the Goal expression, for which there is evidence that it is an independent morpheme, thus excluding an accidental containment relationship. Similarly, there are languages where Route paths morphologically contain Source paths, and non-transitional and delimited paths are formed on the basis of the corresponding transitional path.

Following the cartographic approach, according to which the identification of a morpheme indicates the presence of an independent syntactic head corresponding to it, I propose a syntactic structure where Source paths are built on top of Goal paths by the addition of a dedicated syntactic head. Likewise, Route paths embed Source paths, and non-transitional and delimited paths embed the corresponding transitional path. This leads to a hierarchical sequence of heads of the shape: Place $<$ Goal $<$ Source $<$ Route $<$ {Scale, Bound[ed]}, where each head dominates the head to the left. The heads Scale and Bound can come on top of any other Path head, thus deriving non-transitional and delimited Goal, Source and Route paths, respectively. I also propose a semantic function for each of these heads.

Following Chomsky's (2001) Uniformity Principle, I assume that this syntactic structure is universal across languages, i.e., the syntactic structure of Source paths, for instance, contains the structure for Goal paths also in languages where there is no morphological containment relation between Source and Goal markers. Evidence for this comes from syncretism patterns and the way the structure is partitioned in various languages, as I highlight below.

I investigate the Spell-out of the decomposed Path structure and, following the Nanosyntax theory of grammar, I propose that morphemes lexicalize syntactic constituents of various sizes and configurations and that lexical insertion is governed by the Superset and Elsewhere Principles. Further, I adopt the idea of Spell-out driven movement, originally proposed by Starke (2011), according to which a lexical entry can trigger movement of a given constituent in order to create the right syntactic configuration for the insertion of this entry. I investigate in detail this type of movement triggered by lexicalization and explore what constraints apply to it. In doing this, I develop a precise lexicalization algorithm and test it against the spatial case system in Finnish.

The Spell-out model I adopt allows for a single morpheme to spell out multiple syntactic terminals. Combined with the fine-grained internal structure of Path, the model predicts the existence of various possibilities of partitioning the syntactic structure underlying a given path, depending on how many morphemes are employed and what portion of the sequence they spell out. I explore the possible partitionings and illustrate them with language data. In doing this, I identify the phenomenon of spurious syncretisms, where a given lexical item is used in the lexicalization of two or more types of path, crucially necessitating the use of a "supporting" lexical item to express the syntactically more complex one(s). Thus, apart from providing additional evidence for the decomposition of the Path head into several heads, the various partitionings of the Path *fseq* make it possible to offer a syntactic explanation for the observed spurious syncretisms.

Furthermore, the decomposed Path structure and the Spell-out model developed in this thesis lead to a prediction about possible and impossible syncretisms and lexicalization patterns. I test these predictions against the domain of syncretisms involving Location, Goal, Source and Route paths, using as a basis several typological studies. I reach the conclusion that the excluded syncretism patterns are indeed unattested, the apparent counterexamples being an instance of spurious syncretism.

Abbreviations

1 - First person
2 - Second person
3 - Third person
ABL - Ablative
ACC - Accusative
ADESS - Adessive
ALL - Allative
CL - Clitic
D - Declarative
DAT - Dative
DEF - Definite
DET - Determiner
DIST - Distal
EGR - Egressive
EL(AT) - Elative
ERG - Ergative
EXC - Exclusive
FIN - Finite
GEN - Genitive
ILL - Illative
IMP - Imperative
INC - Inclusive
INESS - Inessive
INSTR - Instrumental
LOC - Locative
MOT - Motative
NEG - Negation
NOM - Nominative
NON-TRANS - Non-transitional
NV - Negative verb
SG - Singular
PAST - Past
PERF - Perfect
PERL - Perlative
PL - Plural
POSS - Possessive
PRES - Present
PRET - Preterite
PROL - Prolative
PROG - Progressive
PRT - Particle
PRV - Perfective
PU - Unrestricted particle
PV - Verbal particle
SUB - Subitive
SUBJ - Subjunctive
SUP - Superessive
TERM - Terminative
TRANS - Transitional

Chapter 1

Introduction and outline of the thesis

1.1 Background and object of study

This thesis is concerned with the syntax, semantics and cross-linguistic typology of spatial expressions encoding motion, like the one illustrated in (1).

(1) The boy ran into the house.

It is a common view that such expressions encompass two dimensions, or components: a stative one, for which I adopt the term Location (also called Place, Configuration, Orientation, Localiser), and a dynamic one, for which I adopt the term Path (also called Direction, Mode, Modaliser) (see Bennet 1975, Jackendoff 1983, van Riemsdijk and Huybregts 2002, Kracht 2002, Creissels 2006, Zwarts 2008a, Svenonius 2010, den Dikken 2010, among others). The Location component involves the spatial relation between the object being localized and another, usually bigger object. The dynamic Path component is concerned with how an object in motion moves with respect to a stationary object. In the example in (1), the boy traverses a Path such that, at the beginning of the Path, he is not at the house and at the end of the Path he is inside the house. Thus, the type of Location is INTERIOR and the Path culminates at that location.

Motivated by the presence of these two components, van Riemsdijk (1990) proposed that that the syntactic structure underlying directional spatial expressions contains a stative head P_{Loc} (which I will call Place, adopting the terminology in Jackendoff 1983 and Svenonius 2010, inter alia), encoding the particular locative relationship, and a dynamic P_{Dir} head (Path in the terminology of Jackendoff 1983, Svenonius 2010) which expresses the particular type of movement. This assumption was further corroborated by the fact that many languages have directional expressions made out of two independent elements, where each element was taken to correspond to one of the two syntactic heads in the structure for Paths (cf., *in+to*).

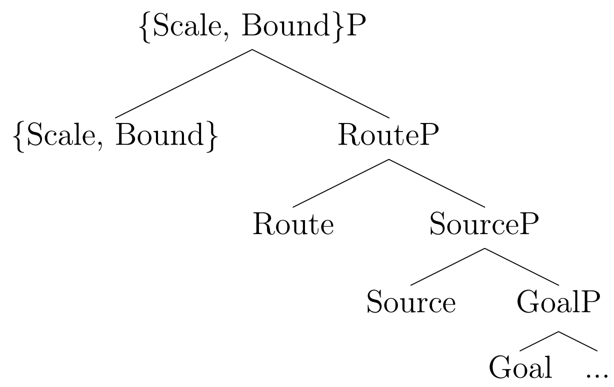
As the syntactic structure underlying directional expressions became more and more detailed, in accordance with the general trend towards finer-grained syntactic representations, the original [Path [Place]] structure of van Riemsdijk (1990) was enriched by the addition of a myriad of new projections. It is now a widely held view that the syntax of Paths involves many other heads than just Path and Place: Deg[ree], Asp[ect], Ax[ial]Part, Deix[is], etc. (argued for in the works of Koopman 2000, Svenonius 2010, den Dikken 2010). The Path head became just one of many other heads in the structure. Still, it remained the only head which hosts directional elements, no matter what type of directed motion they express — a Goal paths like *to the house*, or a Source path like *from the shop*, to mention a few types.

In this thesis, I put the Path head under the knife and cut it into smaller bits. The methodology I use is to first determine what kind of paths exist in Chapter 2. I argue for the recognition of eight distinct types of paths. To the best of my knowledge, this is the richest path typology proposed until now (cf., Jackendoff 1983, Piñón 1993, Mel'čuk 1994, Kracht 2002, Zwarts 2008a). I then investigate how languages express the various types of paths. In my investigation, I assume, following the general guideline of the cartographic framework (Rizzi 1997, Cinque 1999; 2005, Cinque and Rizzi 2008), that morphological complexity is indicative of syntactic complexity (Chapter 3). Thus, whenever we are able to isolate a morpheme which adds a given meaning to the expression it is a part of, this is an indication that the underlying syntactic structure contains an independent head corresponding to that meaning. In Chapter 4, I then turn to a study of the morphological composition of the various types of paths cross-linguistically. The conclusion I reach is that different paths are of different morphological complexity and, crucially, subject to a subset-superset relationship. The discovery of this fact provides the basis for my proposal.

1.2 Core proposal

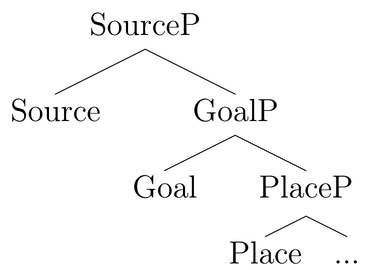
In few words, the main proposal of this thesis can be summarized as follows: The Path head is not atomic, it has a reacher structure than previously assumed. Specifically, I show that it can be maximally decomposed into the sequence of heads presented in (2), which I take to be universal across languages. Each head in the structure in (2) has a particular semantic function, which I discuss in Chapter 5.

(2)



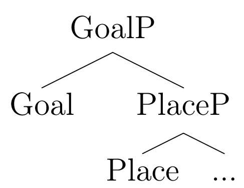
The various types of paths correspond to different syntactic structures. For instance, a Source path has the structure in (3).

(3)



While a Goal path has the structure in (4).

(4)



Thus, syntactically Source paths "contain" Goal paths. This containment relationship is reflected also in the morphological make-up of Source expressions in some languages, where the Source expression contains a morpheme marking a Goal path. A language which illustrates this phenomenon is Imbabura Quechua. There, the Goal marker *-man* is contained in the complex marker expressing Source *-man-da*, see (5).

(5) Goal and Source in Imbabura Quechua (data from Cole 1985:119)
  a. Utavalu-man ri-ni.
     Otavalo-ALL *go*-1
     'I go to Otavalo.' (Goal)
  b. Utavalu-manda shamu-ni.
     Otavalo-ABL *come*-1
     'I come from Otavalo.' (Source)

Similar morphological containment relationships hold for other paths, for example, non-transitional paths (*towards*), obtained by the application of the Scale head, contain the corresponding transitional paths (*to*), suggesting that the syntactic structure of the former is a superset of the syntactic structure of the latter. Likewise, Route paths (*via*) morphologically contain Source paths (*from*), which is also reflected by the structure in (2).

1.3 Theoretical apparatus

The assumption that the decomposed Path structure in (2) is universal raises the question of what happens in languages which have monomorphemic markers to express paths involving multiple heads, e.g., a language like Kham, where the apparently non-decomposable Source suffix *-ni* corresponds to the syntactic structure in (3) involving three heads.

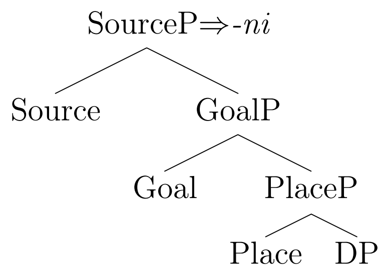
(6) Kham (Watters 2002)
  kuwa-ni hai-ke-o.
  well-ABL *pull.out*-PERF-3SG
  'He pulled him out of the well.'

To capture such mismatches between the number of morphemes in a Path expression and the number of syntactic terminals in the corresponding structure, I adopt the Nanosyntax framework developed at the University of Tromsø (Starke 2005-2009, Ramchand 2008b, Bašić 2007, Fábregas 2007, Abels and Muriungi 2008, Muriungi 2008, Lundquist 2008, Caha 2009b, Taraldsen 2010, Pantcheva 2010, for a representative collection of papers see Svenonius et al. 2009), which I present in Chapter 6. Nanosyntax assumes that the terminals in the syntactic representations are submorphemic, in fact, each terminal node represents a single feature.

These features are ordered in a universal hierarchy called the *functional sequence* (*fseq*). Thus, Nanosyntax fits naturally with the proposed fine-grained decomposition of the Path head, where the terminals are smaller than morphemes in many languages. Further, Nanosyntax assumes that a single morpheme can lexicalize syntactic structures comprising multiple terminals, thus allowing for a mismatch between the number of terminals and the number of morphemes in a Path expression.

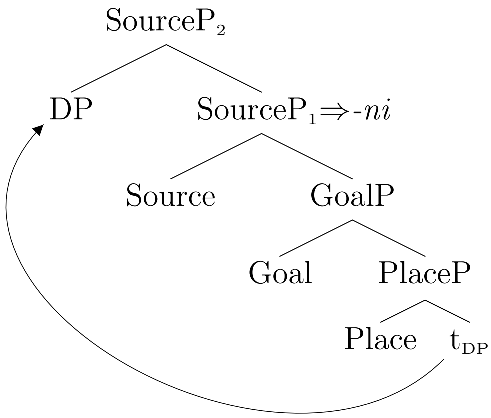
In more technical terms, the lexicalization of multiple terminals is achieved by assuming Phrasal Spell-out, an idea originally proposed by McCawley (1968), and adopted by syntacticians working within Nanosyntax (Starke 2009; 2011, Caha 2009a;b, Fábregas 2009) as well as in other frameworks (Weerman and Evers-Vermeul 2002, Neeleman and Szendrői 2007). In the Phrasal Spell-out system, lexicalization targets non-terminal nodes. A lexical entry can then be inserted straight into a phrasal node, thus expressing all the features contained in it, as I show in (7) taking as an example the Kham data in (6).

(7)



In addition to Phrasal Spell-out, I adopt an idea recently put forward in Starke (2011) and explored in more detail in Caha (2010b), according to which a lexical entry can trigger an evacuation movement of the syntactic node(s) which it cannot lexicalize. This movement creates the right syntactic configuration for the entry to be inserted. In addition, it creates new syntactic nodes — the nodes resulting from the adjunction of the evacuated material. As an example, take again the Kham Ablative suffix -*ni*, which spells out all the nodes in the structure in (7) without the DP. Consequently, the DP has to extract, so that -*ni* can be inserted at the phrasal SourceP node.

(8)



As a byproduct, the correct ordering of the elements is achieved — the DP is linearized before the suffix *-ni*.

Chapter 7 is devoted entirely to the investigation of Spell-out triggered movement. There, I present a detailed analysis of the lexicalization of different Paths in three languages (Karata, Uzbek and Finnish). I develop a precise Spell-out algorithm and show how it captures the intricacies of the spatial systems in these languages.

1.4 Predictions

The decomposition of the Path head and the Nanosyntax model of grammar that I adopt make a prediction regarding the syncretisms found among the various types of path expressions, a subject investigated in a number of recent works (Creissels 2006; 2008, Radkevich 2009, Nikitina 2009, Lestrade 2010). This thesis is a contribution to this topic, as it devotes Chapter 8 and Chapter 9 entirely to the study of possible and impossible syncretisms between Route, Source, Goal and Locative expressions.

The fine-grained Path structure allows us to capture the distinction between what I call a *spurious* syncretism and a *real* syncretism. Spurious syncretisms arise as the result of there being various possibilities to partition the structure. For instance, a Source phrase with the structure in (3) can be partitioned in four different ways, depending on how many morphemes the Source expression consists of and which heads these morphemes spell out. This is illustrated in (9), where m_1, m_2, and m_3, are variables over morphemes.

(9)

$$\begin{array}{ll}
 & \text{Source}\quad\text{Goal}\quad\text{Place} \\
\text{language A} & \underbrace{\hphantom{\text{Source}\quad\text{Goal}\quad\text{Place}}}_{\mathrm{m}_1} \\
\text{language B} & \underbrace{\hphantom{\text{Source}}}_{\mathrm{m}_1}\quad\underbrace{\hphantom{\text{Goal}\quad\text{Place}}}_{\mathrm{m}_2} \\
\text{language C} & \underbrace{\hphantom{\text{Source}}}_{\mathrm{m}_1}\quad\underbrace{\hphantom{\text{Goal}}}_{\mathrm{m}_2}\quad\underbrace{\hphantom{\text{Place}}}_{\mathrm{m}_3} \\
\text{language D} & \underbrace{\hphantom{\text{Source}\quad\text{Goal}}}_{\mathrm{m}_1}\quad\underbrace{\hphantom{\text{Place}}}_{\mathrm{m}_2}
\end{array}$$

In language B, the Source phrase is formed by a combination of two morphemes: m_1 which spells out the Source head and m_2 which lexicalizes the Place and Goal heads. Morpheme m_2 thus lexicalizes a Goal structure and can therefore express a Goal path. Importantly, it does not syncretize Goal and Source. It always spells out a Goal structure, even when it is part of a Source phrase. In other words, although m_2 participates in the Source expressions of language B, it is an unambiguously Goal morpheme and therefore it would be incorrect to classify it as a morpheme that is syncretic between Goal and Source. In Chapter 8, I investigate the various possible partitionings of the decomposed Path structure and come across many instances of morphemes that participate in more than one type of path. I call this phenomenon *spurious* syncretism, to distinguish it from real syncretism where a genuine ambiguity is involved.

Real syncretisms are the topic of Chapter 9. The Nanosyntax framework allows such syncretisms to be defined in terms of structural ambiguity — a lexical item can spell out a given constituent and any subconstituent of it (known as the Superset Principle). Combined with a principle which requires that the most highly specified entry is to be preferred (the Elsewhere Condition), the system prohibits syncretisms of the type ABA, that is, syncretisms of two categories across a distinct intervening category. This rules out syncretisms between the spatial roles Location and Source to the exclusion of Goal, Goal and Route to the exclusion of Source, and Location and Route to the exclusion of Goal and Source. In addition, I argue that a syncretism between Goal and Source is pragmatically excluded due to the specific semantics of the Goal and Source heads, proposed in Chapter 5. I then test the prediction against cross-lingustic data and conclude that the expected asymmetry in the distribution of the syncretism patterns across languages really exists, the apparent counterexamples being reanalyzed as instances of spurious syncretism.

1.5 How to read the thesis

This thesis is written as one coherent whole and is best read in its entirety. Nevertheless, I have attempted to enable selective reading and have organized the exposition in three main parts. Readers who want to learn about the syntax and semantics of the decomposed Path structure are invited to read Part I, where I develop the main idea of this thesis. Readers interested in Nanosyntax and Spell-out driven movement can read Part II. In this part, I present the Nanosyntax framework starting with a lay-out of the basic tenets of the theory and ending with a detailed exploration of the specifics of Spell-out. Hence, Part II can be read both by readers who are not well acquainted with Nanosyntax, as well as those who work within this framework. The third part is mostly oriented towards a cross-linguistic examination of lexicalization patterns and might be of interest to those readers who are involved in the study of syncretisms in the domain of spatial expressions.

Part I

Path expressions: typology, syntax, and semantics

Chapter 2

Types of paths

2.1 Introduction

Directional spatial expressions across languages express various kinds of motion. A couple of them are exemplified by the sentences below.

(1) a. The children walked along the river.
    b. The mosquito flew away from the lamp.
    c. The frog jumped into the lake.

The first example (1a) describes a motion proceeding along a trajectory which is roughly parallel to a given landmark, in this case the river. There is no specification of the starting point or the end-point of the journey. Nor do we have information about the direction of the movement — it could be away from the origin of the river towards its mouth, or the other way around.

The second example (1b), on the contrary, provides us with information about the direction of movement. It starts close to the landmark (the lamp), and proceeds in a manner such that the distance between the mosquito and the lamp increases. But we cannot identify the precise location of the starting point and the end-point of the movement although we do have some information about the starting point — we know that it is closer to the lamp than any subsequent point in the trajectory followed by the insect. Still, it could be, for instance, above the lamp or below it.

The third example (1c) conveys the direction of motion, too. Here we know that the movement of the frog is directed towards the lake. In addition, we can pin down the end-point of the movement: it is in the lake. However, the precise starting point remains vague, negatively defined as being not in the lake.

The established term for such movement trajectories is **path**. Thus, each of the prepositions in (1) encodes a given type of path. The entity which moves is commonly referred to as the **Figure** (*the children*, *the mosquito*, *the frog*), while the entity which is stationary and with respect to which the Figure moves or is located is called the **Ground** (*the river*, *the lamp*, *the lake*) (Talmy 2000). Other terms for Figure and Ground used in the literature on paths are **trajector** and **landmark**, respectively (Lakoff 1987, Langacker 1987).

Note that each of the paths in (1) relates to some location. For instance, in (1a) each of the points of the path are located *at the river*. In (1b), the location of the starting point of the path is not precisely defined, but we know that if the path is extended towards its beginning, then the starting point will end up being *at the lamp*. In (1c) the end-point of the path is *in the lake*.

Due to this relation between path and location, Jackendoff (1983) proposes that the conceptual structure of path-denoting phrases can be broken down into two ingredients — PATH and PLACE, the latter associated with the location. Formally, the conceptual structure underlying path expressions is respresented as shown below:

(2) $[_{\text{Path}}$ PATH-FUNCTION $[_{\text{Place}}$ PLACE-FUNCTION $[_{\text{Thing}}$ *y* $]]]$

The Path-functions can be TO, FROM and VIA, the Place-functions can be IN, ON, UNDER, etc. The THING is the reference object, or the Ground. A Place-function takes as an argument a THING and gives as an output a PLACE. The Path-function takes as an argument PLACE and returns a PATH. Below, I show how this multi-layered structure applies to the path expressions in (1).

(3) a. $[_{\text{Path}}$ VIA $[_{\text{Place}}$ AT $[_{\text{Thing}}$ *the river* $]]]$
b. $[_{\text{Path}}$ FROM $[_{\text{Place}}$ AT $[_{\text{Thing}}$ *the lamp* $]]]$
c. $[_{\text{Path}}$ TO $[_{\text{Place}}$ IN $[_{\text{Thing}}$ *the lake* $]]]$

Jackendoff further proposes a classification of paths. He suggests that there are three main types of paths. The first one is **bounded** paths. They include *source paths*, typically encoded by the English preposition *from*, and *goal paths*, for which the usual preposition is *to*. The characteristic property of bounded paths is that the PLACE is an extreme point of the path – either its beginning, as in Source paths, or its end, as in Goal paths. The sentence in (1c) provides an example of a bounded Goal path. The second type of paths is called **directions**. Directions, too, can be subdivided into two subtypes: *source directions* encoded, for instance, by *away from*, and *goal directions*, expressed by the preposition *towards*. The difference between bounded paths and directions is that, in the case of the latter, the PLACE is not a point of the path, but would be if the path were extended some unspecified distance. We find such a Source direction in our example in (1b). The last type of paths is **routes**, represented by the prepositions *along*, *through* and others. Here the PLACE falls on some intermediate points of the path and the extreme point are left unspecified. The path expression in (1a) belongs to this type. Jackendoff distinguishes thus five types of paths, which can be schematically represented as follows:

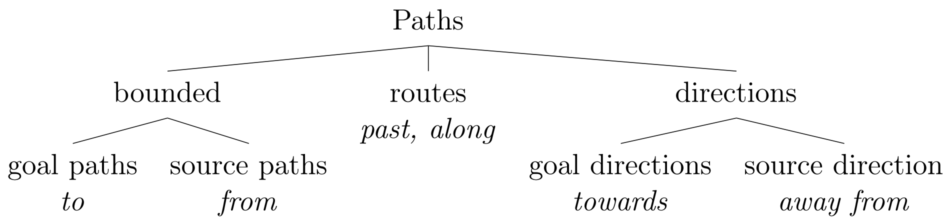


Figure 2.1: Jackendoff's (1983) typology of paths

In this chapter, I investigate the typology of paths. I propose that paths can be classified according to three properties: *transition*, *orientation*, and *delimitation*. There are paths with and without transition(s), paths with and without orientation, and paths with and without delimitation. The interaction of these properties leads to eight types of paths, as opposed to the five types proposed by Jackendoff (1983). The difference is due to (i) the additional property of delimitation, and (ii) a distinction I draw between two types of Route paths, while Jackendoff has only one.

2.2 Paths with transition

Let us begin with the last path expression in (1), repeated below as (4).

(4) The frog jumped into the lake.

The path expressed by the prepositional phrase is characterized by several properties. First, it has a direction, namely, it is oriented in the direction of the lake. The lake is thus the **Goal** of the movement of the frog. Second, the end-point of the path is defined as being in the lake. Third, the starting point of the path, although not precisely located, is not in the lake. According to Jackendoff's (1983) classification, the path in (4) is therefore a *bounded goal* path. Zwarts (2005; 2008a) calls such paths *non-cumulative* Goal paths and represents them graphically as in (5), where the plusses indicate location in the lake, and the minuses indicate location not in the lake. The points 0 and 1 mark the starting point and the end-point of the path, respectively.

(5) Goal path
$- - - - - + + + + +$
0 1 Zwarts (2008a)

As can be seen from the graphic representation in (5), the *into the lake* path has a two stage structure: the first stage is not located *in the lake*, while the second stage is located *in the lake*. The path thus contains a **transition** from one spatial domain to a complementary spatial domain. For this reason, I will call that types of paths **transitional**. The transitional path in (5) is in addition characterized by the fact that there is a locative condition on the end-point of the path, namely, it has to be in the lake.

We find the same type of transition in the path expressed in the following sentence.

(6) The frog jumped out of the lake.

This path is in a sense the opposite of the path expressed in (4). Here, the location *in the lake* is not the end-point of the movement of the frog, but its starting point. The lake is thus the **Source** of the motion. Interestingly, by pinning down the starting point of the path, we lose the precise definition of the end-point of the path. Now we know that the end-point is not in the lake, but a negative definition is again the only information we are left with. The Source path in (6) can be thus seen as the reverse of the Goal path in (5), as it includes a transition too, but, contrary to Goal paths, imposes a condition on the initial portion of the path. This kind of paths are visualized by Zwarts (2005; 2008a) as in (7).

(7) Source path
$+ + + + + - - - - -$
0 1 Zwarts (2008a)

There is no restriction that there be only one transition per path. Consider the following example.

(8) The boy ran past the tree.

The path represented by the directional expression in (8) has some intermediate points *at the tree*. The starting point and the end-point of the path though remain unknown. Such paths are called routes by Jackendoff (1983) and this is the term I will adopt.[1] According to Zwarts (2005; 2008a), such paths involve a condition on their middle part and can be graphically represented as follows.

(9) Route path
$- - - - + + + + - - - -$
0 1 Zwarts (2008a)

A comparison between (7) and (5), on the one hand, and (9), on the other hand, reveals one difference and one similarity. The difference is that in the denotation of Route paths, there are *two* transitions, while Goal and Source paths have exactly one. The similarity is that in all three kinds of paths, there is one unique positive phase – the portion of the path where the locative relationship between the Figure and the Ground obtains.

As a matter of fact, Route paths look as if they are composed of a Goal path concatenated with a Source path in this order.

(10) Route path

$$\underset{\text{Goal}}{\underset{0\qquad\qquad 1}{[- - - + + +]}}\frown\underset{\text{Source}}{\underset{0\qquad\qquad 1}{[+ + + - - -]}} = \underset{\text{Route}}{\underset{0\qquad\qquad\qquad\qquad 1}{[- - - + + + + - - - -]}}$$

Still, there is only one positive phase. Interestingly, it seems that no natural language preposition is composed from the concatenation of a Source path with a Goal path, which would result in two positive phases.

(11)

$${}^{*}\underset{\text{Source}}{\underset{0\qquad\qquad 1}{[+ + + - - -]}}\frown\underset{\text{Goal}}{\underset{0\qquad\qquad 1}{[- - - + + +]}} = \underset{\text{non-existing P}}{\underset{0\qquad\qquad\qquad\qquad 1}{[+ + + - - - - - + + +]}}$$

What would a preposition corresponding to the representation in (11) mean? Recall that the Route preposition *past* in (8) encodes a path traversed by the running boy where the boy is not at the tree initially,

[1]Sometimes the term *path preposition* is used to mean *route preposition*, particularly in grammar descriptions and computational literature. In the terminology adopted in this thesis, path prepositions is a cover term for all directional spatial prepositions (*onto*, *through*, *from*) and Route prepositions are just a subtype of path prepositions.

then is at the tree for some time and then isn't at the tree again. Let us imagine a preposition of the type in (11) and call it **tsap*, following the intuition that it is in a way the opposite of the Route preposition in (10). *The boy ran* ****tsap*** *the tree* should mean: the boy was first at the tree, then not at the tree and after that he was at the tree again (imagine a situation in which the boy ran away from the tree and then returned to the tree again). To the best of my knowledge, no language has such a "return" preposition. In Chapter 5, Section 5.5, I offer a suggestion why this should be so.

To sum up what has been said so far, I have discussed three types of transitional paths: Source paths, Goal paths and Route paths, which have in common the fact that in their denotation they have just one positive phase. When it comes to the number of transitions, Source and Goal paths have one transition. Route paths have two transitions which gave rise to the idea that they are "more complex" and composed out of a Goal path concatenated with a Source path in this order. Thus, in a way, the "mono-transitional" Source and Goal paths form a natural class to the exclusion of the "bi-transitional" Route paths, a difference which comes up again in Section 2.4.

2.3 Paths without transition

It is not always the case that the PLACE to which the path refers falls on the path. For instance, in *John ran towards the house*, the location *at the house* does not necessarily coincide with any of the points of the path, but would if the path were extended some unspecified distance. Jackendoff calls this class of paths *directions*. The example below illustrates the distinction between transitional paths and directions.

(12) a. John ran to the house. (*transitional path*)
b. John ran towards the house. (*direction*)
(Jackendoff 1983:165)

In (12a), John has reached the house, that is, the endpoint of John's path is *at the house*. In (12b), John probably hasn't reached the house, therefore, the location *at the house* is not a point on the path. However, it would be if the path were extended. Notice that the transitional path in (12a) and the "directional" path in (12b) have something in common; namely, they are both Goal-oriented, i.e., oriented towards reaching a final location.

Transitional Source paths also have corresponding Source-oriented directions, as shown below.

(13) a. John ran from the house. (*transitional path*)
b. John ran away from the house. (*direction*)
(Jackendoff 1983:165)

The directional expression in (13b) encodes the same type of path as the sentence in (1b) *The mosquito flew away from the lamp.* Here, the location *at the house* (or *at the lamp*) is not a point of the path, but would be if the path were extended towards its beginning.

Zwarts (2005; 2008a) discusses such types of paths and calls them *comparative* following the intuition that the distance to the reference object decreases/increases monotonically or, put informally, each consecutive location of the Figure is nearer to/further away from the Ground. Graphically, Zwarts (2008a) represents *towards*-paths as shown below, where the deeper shade of gray corresponds to a nearer location to the house.

(14) *towards*-path
+ + + + + + + + +
0 1 Zwarts (2008a)

The Source-oriented counterpart of the path in (14) is represented as follows, if we adopt Zwarts' visualization.

(15) *away from*-path
+ + + + + + + + +
0 1 Zwarts (2008a)

The Zwartsian graphic representation of the *towards* and *away from* paths in (15) and (14) involves plusses, which, in (5), (7) and (9), were employed to encode the fact that the Figure is located at the Ground. As suggested by Jackendoff (1983), however, the location to which a *towards* path and an *away from* path refers does not fall on the path. That is, in the case of the path expressed in *John ran towards the house*, John is not *at the house* at the end-point of the path p(1). He is, though, surely closer to the house at p(1) than he was at the beginning of the path, p(0). In order to reflect this fact, I suggest to graphically represent such kinds of paths as a sequence of minuses in order to indicate that at no point in the path, is the Figure located at the Ground. The representation for a *towards* and an *away from* path will then be as in (16) and

(17), respectively, where the deeper shade of gray on a minus indicates a greater distance from the Ground object.

(16) *towards*-path
— — — — — — — — — —
0 1

(17) *away from*-path
— — — — — — — — — —
0 1

I will call this type of paths **non-transitional**. The path is (16) is a non-transitional Goal path, and the path in (17) is a non-transitional Source path.

Apart from Goal and Source-oriented non-transitional paths, there are non-transitional paths that lack orientation. Such is the path in (18), repeated from (1a), which represents a non-transitional Route path.

(18) The children walked along the river.

The graphic representation of such a path will be the one in (19), as suggested by Zwarts (2008a), where every plus indicates a location at the river.

(19) *along*-Path
\+ + + + + + + + + +
0 1 Zwarts (2008a)

The reason for such a representation is that an *along*-path imposes the same locative condition on all the points of the path. Thus, any of the points in the path *along the river* are seen as being *at the river*.

2.4 Orientation of paths

In the previous sections, I discussed the division of paths according to the property of having at least one transition. As has already become apparent, paths differ also on the basis of their orientation. There are, on the one hand, **non-oriented** paths, namely Route paths, where there is no indication as to the direction of the movement. On the other hand, there are **oriented** paths, where we know in what direction the movement proceeds. The Source and Goal paths discussed above are examples of oriented paths. Oriented paths involve some asymmetry concerning the two extreme points of the path. For instance, in Goal paths, the end-point of the path is related to a particular location, while the precise location of the starting point is unknown. The reverse holds for Source paths. Route paths instantiate the non-oriented path type. The characteristic property of non-oriented (i.e., Route) paths is that both extreme points are equally defined. In transitional Route paths both the starting and the end-point are not located in the region the path relates to, recall (9). In non-transitional Route paths, both the starting point and the end-point are located in the region the path relates to, see (19).

Source and Goal are not the only orientations a path can have. Some other kinds of orientation we find across languages are up-down, hither-thither, and north-south.

(20) a. The alpinist climbed up.
b. They went north.

This thesis deals only with the Source-Goal orientation of paths. The reason for this is that the Source-Goal orientation appears to be more basic than the up-down, hither-thither, north-south orientation and is usually linguistically encoded in a different way. In English, for instance, one uses particles or adverbs to express orientation along the up-down, north-south, etc. axes, while Goal and Source orientation are encoded by prepositions. An even clearer illustration is provided by the Daghestanian language Tabasaran where the other orientation types are more complex than the Source-Goal orientation.

Like many other Daghestanian languages, Tabasaran has a very elaborate system of spatial cases (Spivak 1990). Those are presented in Table 2.1, which summarizes data from Magometov (1965), Hanmagomedov (1967), and Comrie and Polinsky (1998). Tabasaran has seven "locative series" markers, which encode locative relations like IN, BEHIND, UNDER, etc. These locative markers attach to an Ergative-marked noun. The Allative (Goal) marker *-na* and the Ablative (Source) marker *-an* attach to a noun suffixed by one of the locative series markers to produce complex directional expressions meaning *to under the mill* or *from the mountain*, see (21) and (22).

(21) räɣʸ-ni-kki-na
mill-ERG-UNDER-ALL
'to under the mill'

(22) daɣ-ǯi-l-an
mountain-ERG-ON-ABL
'from the mountain'

The data below shows how Tabasaran expresses up-down orientation,

	Series	Goal	Source
at	*-x^y*	*-x^y-na*	*-x^y-an*
in	*-'*	*-'-na*	*-'-an*
behind	*-q*	*-q-na*	*-q-an*
under	*-kki*	*-kki-na*	*-kk-an*
on	*-'il*	*-'in-na*[a]	*-l-an*
between	*-γ^y*	*-γ^y-na*	*-γ^y-an*
vertical attachment	*-k*	*-k-na*	*-k-an*

[a]The Allative of the ON-series is *-'in-na* rather than *'il-na* due to regressive assimilation (*in-na* < *il-na*).

Table 2.1: Spatial case system in Tabasaran

(23), and hither-thither orientation, (24) (data from Magometov 1965:119).[2]

(23) Up-down
   a. daɣ-ǯi-l-an-ɣina
   mountain-ERG-ON-ABL-*up*
   'from the mountain up(wards)'
   b. daɣ-ǯi-l-an-kkina
   mountain-ERG-ON-ABL-*down*
   'from the mountain down(wards)'

(24) Hither-thither
   a. daɣ-ǯi-l-an-mina
   mountain-ERG-ON-ABL-*hither*
   'from the mountain hither'
   b. daɣ-ǯi-l-an-tina
   mountain-ERG-ON-ABL-*thither*
   'from the mountain thither'

A morphological analysis of the up-down and hither-thither expressions shows that the Tabasaran orientation markers, attached to the Ablative form of the noun *mountain*, are not atomic. For instance, the marker *kkina* expressing downward orientation (see (23b)) is composed out of the UNDER-series marker *kki*, suffixed by the Allative (Goal) morpheme *-na*, thus deriving the meaning *to under*. It is basically the same complex suffix that is attached to the ergative marked noun *räɣ^y* 'mill' to derive

[2]Due to the ambiguity of the Russian translation, I do not know whether the up-down or hither-thither markers in Tabasaran are transitional or non-transitional. However, this does not bear on the point made here.

the expression *to under the mill* in (21). Hence, the *downward*-marker in Tabasaran is structurally different from the Goal and Source case endings, in that the latter are apparently non-decomposable, while the former is morphologically complex and contains the Goal morpheme. The same can be argued to hold of the other orientation markers in Tabasaran, all of which seem to contain the Allative ending *-na*.[3]

I suggest that this is an important fact, indicating that Goal and Source orientation are more "linguistically primitive" in the sense that they are encoded by monomorphemic elements, while the other orientation markers are semantically and morphologically composed of more basic elements and are hence structurally complex. Later, in Chapter 4, I will modify my statement, in that I will argue that Source markers are not as irreducible as suggested here, but can be shown to contain a Goal structure. Still, I suggest that Goal and Source are the basic orientations and, in the path typology developed in this chapter, I will abstract away from the up-down, hither-thither, and north-south orientations, which are derived by means of combining more primitive elements.

2.5 Delimited paths

There is one more type of paths which finds grammatical expression in many languages. This is the type of path encoded by the complex preposition *up to* in the English sentence in (25).

(25) The boy ran up to the house.

In (25), the boy traverses a path that is oriented towards the house and stops right before it. Following the terminology used in grammar descriptions, I will call this kind of paths **terminative**. The Terminative path in (25) is quite similar to the one we find in (26).

(26) The boy ran to the house.

Given the two differential properties of paths, that I have established so far – transition and orientation – the sentences in (25) and (26) come out as synonymous. The reason is that, in both cases, we have a transitional Goal path, that is, a path which leads from a location not at the house

[3] It is possible to also isolate the morpheme *-i-* in the composition of the orientation markers, assuming that it gets deleted for phonological reasons when combined with *kki-* 'under.' This does not change the argument made here, as, in this case again, the orientation marker contains the Allative morpheme.

to a location at the house. The meaning difference between the two sentences is indeed very subtle, yet clearly perceptible. In the case of *up to*, it is made explicit that the house is the limit of the boy's running.[4]

Terminative paths have received scarce attention from linguists. Kracht (2001; 2002) briefly discusses them and suggests that the contrast between terminative paths and "simple" transitional Goal paths is purely aspectual: they differ "in the strength of association with telicity." Thus, according to Kracht, both transitional and Terminative paths are telic, as also evidences by the time-adverbial test in (27), but Terminative paths have a stronger requirement on telicity.

(27) a. The boy ran up to the house in ten minutes/*for ten minutes.
b. The boy ran to the house in ten minutes/*for ten minutes.

Winter (2006) assumes a more formal approach to the problem. He tries to formalize the contrast between the two types of paths by suggesting that the key difference between them is the presence or lack of *closure*. Winter supports this idea by drawing a parallel between closure of paths and closure of adjectival scales. He builds on previous work by Rotstein and Winter (2004), where the authors test for closure of adjectival scales by application of the *almost*-modification test: closed-scale adjectives allow modification by *almost*, while open-scale adjectives do not, see (28) (examples from Rotstein and Winter 2004:265)

(28) a. The explanation is almost clear. (closed scale)
b. *The explanation is almost unclear. (open scale)

The application of the *almost*-test to paths is not trivial. The reason is that *almost*-modification of paths can give rise to two interpretations: one is the *counterfactual* interpretation, where the Figure almost started traversing the path, but never really initiated the motion. The other interpretation is called *scalar* and this is when the Figure started traversing the path and got very close to finishing it, but never reached the final point. According to Winter (2006), it is this second, scalar, interpreta-

[4]As pointed out by Peter Svenonius (p.c.), English *up to* is, as a matter of fact, ambiguous between a Terminative path and a simple (non-delimited) Goal path *to the house*, where the house is at a higher altitude than the boy at the beginning of the running event (imagine that the boy is at the foot of a hill when he starts running and the house is on top of the hill). I will be concerned only with the Terminative meaning of *up to* here, referring the reader to Svenonius (2010) for an analysis of the syntactic structure underlying the second reading.

tion, that indicates the presence of closure. He presents data from Hebrew and Dutch and the results show that Terminative paths are acceptable with the scalar interpretation of *almost* (as well as the counterfactual interpretation), while non-terminative transitional Goal paths allow only the counterfactual interpretation.

(29) Hebrew

a. dan kimʔat rac la'agam.
Dan almost ran to.the.lake
'Dan almost ran to the lake.' (counterfactual/?scalar)

b. dan kimʔat rac ʔad ha'agam.
Dan almost ran until the.lake
'Dan almost ran to the lake.' (counterfactual)
'Dan ran and almost reached the lake.' (scalar)

(30) Dutch

a. Dan rende bijna naar het meer.
Dan ran almost to the lake
'Dan almost ran to the lake.' (counterfactual)

b. Dan rende bijna tot het meer.
Dan ran almost until the lake
'Dan ran and almost reached the lake.' (scalar)

On the basis of this test, Winter proposes that the spatial path associated with prepositions like English *to*, Hebrew *le*, or Dutch *naar* is open. By contrast, the path associated with Hebrew *ʔad*, Dutch *tot* (and presumably English *up to*, although not specifically mentioned) is closed. The two types of paths are shown in Figure 2.2.

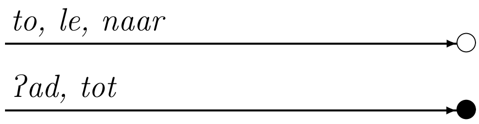


Figure 2.2: Open and closed paths (Winter 2006)

This is a somewhat surprising result and it is difficult to find independent motivation for it from the semantics of the prepositional phrases. What it means is that, in Goal paths like (*The boy ran*) *to the house*, the endpoint (the house) is not included in the path. This idea that *to*-paths are open goes against Zwarts' (2005) definition of Goal paths. According to Zwarts, the prepositional phrase *to the house* denotes the set of paths, such that there is an interval $I \subset [0,1]$, that includes the point 1 and that consists of all the indices $i \in [0,1]$ for which $p(i)$ is at the house. If we include in the semantics of the PP *to the house* the fact that it has to refer to an open path, we arrive at a contradiction: the PP *to the house* will then denote the set of paths, such that there is an interval $I \subset [0,1]$, that *includes the point 1 and excludes the point 1* and that consists of all the indices $i \in [0,1]$ for which $p(i)$ is at the house.

Although I reject the idea that non-terminative Goal paths do not include the location in their final point, I agree with Winter's intuition that the end-point of a Terminative path is more salient than the end-point of a non-terminative Goal path. In my view, the difference between the two types of paths is that Terminative paths explicitly state that the Ground is the boundary of the movement. Thus, in *The boy ran up to the house*, the boy runs as far as the house, that is, once he reaches it, he stops. In *The boy ran to the house*, the boy might stop at the outer wall of the house, as well as continue running along the wall, or even enter it. The same meaning difference can be observed for other languages. Consider, for instance, the Persian minimal pair in (31).

(31) a. be-r-im be park!
SUBJ-*go*-1PL *to park*
'Let's go to the park (and enter it)!'

b. be-r-im ta park!
SUBJ-*go*-1PL *until park*
'Let's walk as far as the park (and stop there)!'

I suggest that the difference between Terminative and non-terminative Goal paths is that Terminative paths set the end of the path at the first point where the location to which the path relates is reached. Non-terminative paths, by contrast, allow the path to "continue," while still being wholly contained in the location specified by the Ground. Graphically, we can reflect this distinction by including just one plus in the positive phase of a Terminative path, thus capturing the intuition that once the location is obtained, the path stops. The positive phase of non-terminative Goal paths, by contrast, contains a sequence of plusses, reflecting the fact that the path can "continue" within the location.

(32) *up to*-path
$- - - - - - - - - - - +$
0 1

(33) *to*-path (repeated from (5))
$- - - - - + + + + +$
0 1

The single plus in (32) renders the end-point of the Terminative path unique: this is the only point where the location specified by the Ground holds. This can be connected to Kracht's (2001, 2002) idea of a "strong association with telicity," since, in Terminative paths, the end-point stands out.

To sum up, I suggest that Terminative paths are delimited at the end-point, that is, they make explicit reference to the upper bound of the path. This is the result of the uniqueness of the end-point in a Terminative path which becomes accentuated by virtue of being the only positively located point.

So far, I have discussed only Goal-oriented delimited paths. However, knowing that Source paths are the opposite of Goal paths, we expect that there are "reversed Terminative paths" – Source paths that have a delimitation. This delimitation, however, will have to hold of the beginning of the Source path, because it is the positively located point. This will give rise to a path meaning *starting from* (as opposed to delimited Goal paths meaning *ending at*). A nice illustration of this type of path comes from the Permic languages. Alongside a "regular" Source case, which expresses motion away from the Ground, the languages from this branch have a special Egressive case, which, too, encodes a path leading away from the Ground, but there is the additional connotation that the Ground is the starting point for the motion (Csúcs 1998, Hausenberg 1998, Winkler 2001). I present here an example from the language Komi-Permyak, which has such an Egressive case, in addition to an Elative case (data from Lytkin 1962, my glossing)

(34) a. Cél^{j}ad^j lóktëni škóla-iš^j.
children come school-ELAT
'The children are coming from school.'
b. Volgograd-š^{j}an^j El^{j}ba vá-ëdz
Volgograd-EGR *Elba river*-TERM
'from Volgograd to Elba river'

On the basis of the function attributed to the Egressive case in the source cited above, I suggest that the Egressive case morpheme in (34b) marks a path beginning in Volgograd and sets this location as the lower bound of the movement. Graphically, then, this path can be represented as in (35), contrasting with the non-delimited Source path shown in (36) in that the positive phase contains just one point.

(35) *starting from*-path
$+ - - - - - - - - - -$
0 1

(36) *from*-path
$+ + + + + - - - - - -$
0 1

Summing up, Terminative and Egressive paths differ from their non-delimited counterparts in the number of plusses in their positive phase. The positive phase in these paths is either at the end or at the beginning of the path. Under this assumption, transitional Route paths are not expected to have a delimited counterpart. Recall that, in Route paths, the positive phase is in the middle of the path. Therefore, the extreme points 0 and 1 are not in a locative relation with the Ground, hence, the Ground cannot be set as the initial or final boundary for any of them. Even if the positive phase of a Route path contains just one plus as in (37), it will not be a positively defined *extreme* point and therefore it will not be interpreted as a limit for movement.

(37) $- - - - + - - - - - -$
0 1

A parallel reasoning leads to the conclusion that a Source path can be only lower bound and a Goal path can be only upper bound. That is, the limit for movement of a delimited Source path is its starting point, because the location holds of this point, and the limit for movement of a delimited Goal path is its end-point, as it is the "positively located" point. As a result, only transitional paths that have orientation can also have a boundary.

I labeled paths of the Terminative and Egressive type **delimited** path, contrasting them with the **non-delimited** Goal and Source paths expressed by the prepositions *to* and *from*.[5] Delimited paths are thus transitional paths that explicitly indicate a boundary of the path – the left boundary for Source-oriented paths, and the right boundary for Goal

[5]Given that delimited paths make reference to boundaries, a more appropriate term is probably **bounded** and **unbounded** paths (see Depraetere 1995 for a comprehensive discussion of (un)boundedness). These labels have been, however, used by linguists to refer to types of paths that are not Terminative or Egressive. For instance, Jackendoff (1983) uses the term *bounded* for the type of paths I call *transitional*. To avoid confusion, I adopt the term *delimited*.

oriented paths. Both delimited and non-delimited paths involve a transition from a positive to a negative phase or vice versa, but the positive phase in delimited paths involves just one point where the location holds, and this point is construed as the boundary. By contrast, the positive phase of non-delimited paths can contain a sequence of points where the locative relation between the Figure and the Ground obtains.

2.6 The two types of Route paths

As outlined above, Jackendoff (1983) argues for three major types of paths: *bounded paths*, *directions* and *routes*. The first two types are subdivided into *source* and *goal paths* and *source* and *goal directions*. From a Zwartsian perspective, which is also the view adopted in this thesis, the difference between a *goal path* and a *goal direction* is that the former encodes a transition, while the latter does not. The same distinction holds of *source paths* and *source directions*. The third type of paths encompasses *route* paths, like the ones encoded by the prepositions *past* and *along*.

As it stands, Jackendoff's typology blurs the difference between the paths expressed by these two preposition – they both fall under the type of *route paths* (see Figure 2.1 on p.13). They are, however, different, as also suggested by Zwarts. Specifically, a *past*-path contains transitions, while an *along*-path lacks transitions. This fact is further corroborated by the aspectual test involving temporal adverbials (Verkuyl 1972, Dowty 1979). When an atelic verb is combined with a transitional path PP, the resulting predicate is telic, hence compatible with the time-frame adverbial *in an hour*, (38). With a non-transitional path PP the predicate remains atelic, as non-transitional paths have no impact on the telicity of the verb. Therefore, the predicate will be compatible with the time-span adverbial *for an hour*, (39).

(38) a. The boy ran to the store in an hour.
b. *The boy ran to the store for an hour.

(39) a. *The boy ran towards the store in an hour.
b. The boy ran towards the store for an hour.

Applied to PPs headed by *past* and *along*, the temporal modification test shows that the former gives rise to telic predicates, (40), while the latter gives rise to atelic predicates, (41).

(40) a. The boy ran past the tree in one minute.
b. *The boy ran past the tree for one minute.[6]

(41) a. *The children walked along the river in an hour.
b. The children walked along the river for an hour.

As shown in the examples (38) to (41), the temporal modification test indicates that *past*-paths pattern with *bounded paths* (in Jackendoff's terminology) and *along*-paths pattern with *directions*. Translated into the terminology adopted in this thesis, *past*-paths pattern with *transitional* paths and *along*-paths pattern with *non-transitional paths*. This strongly suggest a further division of Jackendoff's *route paths* into "*transitional routes*" and "*non-transitional routes*." In this terminology, the path *past the tree* in (40) is a *transitional route path*. The path *along the river* in (41) is an *non-transitional route path*.

The proposed classification is very much in line with Piñón's (1993) path typology. Piñón argues extensively for the recognition of two types of Route paths – bounded and unbounded (in Piñón's terminology). He bases his proposal on the observation that some English Route prepositions are compatible with both *in an hour* and *for an hour* modification, as also noted by Declerck (1979).

(42) a. The insect crawled through the tube {for two hours / in two hours}.
b. Mary limped across the bridge {for ten minutes / in ten minutes}.

As evidenced by the results of the adverbial modification test in (38) and (39), time-frame adverbials are good with bounded (i.e., transitional) paths and time-span adverbials are good with unbounded (non-transitional) paths. According to this test, the prepositions in (42) can express both a transitional and a non-transitional Route path.

[5]This sentence is grammatical under an iterative reading where the boy runs a couple of times past the Ground and the whole macro-event lasts one minute (P. Svenonius, p.c.).

To recapitulate, I fully agree with Piñon in his claim that Route paths come in two varieties: transitional (bounded) Routes and non-transitional (unbounded) Routes. Transitional Route paths are those Route paths that have both their extreme points outside the reference location. Non-transitional Route paths are homogeneous with respect to the reference location, that is, each point of the path is in the same local configuration with the Ground as any other.

2.7 Classification of paths

So far, I have explored the types of paths and the properties that differentiate them. Now it is time to systematize them and I propose the classification of paths presented in Table 2.2.

		Oriented Goal	 Source	Non-oriented Route
With transition	Transitional	Cofinal *to X* −−−−++++ 0 1	Coinitial *from X* ++++−−−− 0 1	Transitive *past X* −−−+++−−− 0 1
	Delimited	Terminative *up to X* −−−−−−−+ 0 1	Egressive *starting from X* +−−−−−−− 0 1	
No transition	Non-transitional	Approximative *towards X* −−−−−−−−− 0 1	Recessive *away from X* −−−−−−−−− 0 1	Prolative *along X* +++++++++ 0 1

Table 2.2: Classification of paths

In Table 2.2, the paths are classified according to two main properties. The first main property is the *presence* or *lack of orientation*, that is, whether the path has an inherent direction or not. According to this property, Paths can be oriented or non-oriented. The oriented paths are subdivided into Source-oriented or Goal-oriented. Source paths can be seen as "reversed" Goal paths (and vice versa). This is illustrated in Figure 2.3.

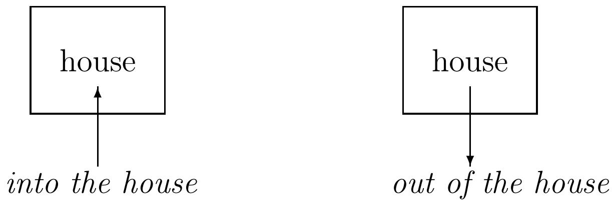


Figure 2.3: Source paths as reversed Goal paths

Unlike the oriented Goal and Source paths, the non-oriented (Route) paths have no inherent directionality and therefore they can be reversed without any meaning difference, as shown in Figure 2.4.

Figure 2.4: Reversibility of Route paths

The second main property reflected in Table 2.2 is the *presence* or *lack of transition(s)* in the denotation of the path. Paths that do not have transitions are *non-transitional paths*. Paths with transitions have two sub-types: *transitional* paths and *delimited* paths. The latter type applies only to oriented (Goal and Source) paths and involves paths with an explicit boundary. As already discussed in Section 2.5, Route paths do not have a delimited subtype, because they do not specify the location either of the starting point or of the endpoint (these points are only negatively defined as not being in a locative relation with the Ground). I suggested that as a result of this, the extreme points of Route paths cannot be set as the limit of movement, hence the non-existence of delimited Route paths.

To summarize, there are three major properties in the path classification – orientation, transition, and delimitation – and they lead to the following divisions:

(43) Divisions in the Path typology
  a. Orientation – there is a division between oriented (Goal and Source) and non-oriented (Route) paths.
  b. Transition – there is a division between paths with transition(s) and paths without transitions.
  c. Delimitation – Delimited Goal/Source paths are a sub-type of the oriented paths with transitions.

The interaction of the three characteristic properties of paths I propose leads to eight distinct types of paths. In order to be able to refer to each of them separately, I introduce the following terminology:

(44) Types of paths
- a. COINITIAL – transitional Source-oriented path, e.g., *from the house*
- b. EGRESSIVE – delimited Source-oriented path, e.g, *starting from the house*
- c. RECESSIVE – non-transitional Source-oriented path, e.g., *away from the house*
- d. COFINAL – transitional Goal-oriented path, e.g., *to the house*
- e. TERMINATIVE – delimited Goal-oriented path, e.g., *up to the house*
- f. APPROXIMATIVE – non-transitional Goal oriented path, e.g., *toward the house*
- g. TRANSITIVE – transitional Route path, e.g., *past the house*
- h. PROLATIVE – non-transitional Route path. e.g., *along the house*

The terms "coinitial" and "cofinal" are borrowed from Kracht (2002; 2007) and they correspond to two kind of *modes* that Kracht argues for. The term *mode* refers to the way the Figure moves with respect to a particular locative configuration. Kracht lists the following modes:

(45) Spatial modes Kracht (2002; 2007)
- a. COFINAL: The Figure moves into the configuration during the event time, e.g., *into the house*
- b. COINITIAL: The Figure moves from the configuration during the event time, e.g., *out of the house*
- c. APPROXIMATIVE: The Figure approaches the configuration during the event time, e.g., *towards the tunnel*
- d. RECESSIVE: The Figure moves away from the configuration during the event time, e.g., *away from the tunnel*
- e. TRANSITORY: The Figure moves in and again out of the configuration during the event time, e.g., *through the tunnel*
- f. STATIC: The Figure remains in the same configuration during the event time, e.g., *in the house*

It is easy to set the correspondence between these modes and some of the path types I suggest. However, there are a couple of path types that do not find a matching mode. For instance, Kracht does not acknowledge as a separate mode the Terminative, the Egressive and the Prolative. In this respect, my typology is better matched by the one proposed in Mel'čuk (1994). Mel'čuk includes in his enumeration of path types Terminative paths, alongside the path types that Kracht has. Still, neither Kracht (2002; 2007) nor Mel'čuk (1994) make a distinction between the two types of Route paths. Concerning Route paths, my path clasification shares features with Piñón's (1993) path typology, as he argues that two types of Route paths should be recognized. My classification is also reconcilable with Zwarts' (2008a) path types. The mapping to the corresponding terms is shown in Table 2.3.

Terminology in this thesis		Zwarts' (2008a) terminology	example
Transitional Goal/Source paths	→	Transitions	*from, to*
Non-transitional Goal/Source paths	→	Progressions	*towards*
Transitional Route paths	→	Cycles	*across*
Non-transitional Route paths	→	Continuations	*along*

Table 2.3: Path terminology used in Zwarts (2008a) and in this thesis

The difference between the path classification I propose and the one argued for by Zwarts is that Zwarts does not draw a distinction between Source and Goal orientation in the categories Progressions and Transitions. In the same vein, Piñón (1993) groups Source and Goal-oriented paths together.

As none of the path typologies proposed in the literature so far encompasses all the types of paths I believe exist, I adopt my own system of path classification encompassing the eight types of paths I present in Table 2.2. In Chapter 4, I explore the morphological expression of these eight types and show how each of the divisions I presented in (43) finds a morpho-syntactic reflex.

2.8 Conclusion

In this chapter, I explored the typology of paths. The purpose was to determine what kinds of paths are encoded as linguistic primitives and to decide the relevant properties that set them apart. I suggested that paths are to be classified according to three properties: orientation, transition and delimitation. This gives rise to eight types of paths in total. I showed how this path typology fits into existing classifications of paths, proposed by other researchers (Jackendoff 1983, Piñón 1993, Mel'čuk 1994, Zwarts 2005; 2008a, and Kracht 2002; 2007) and also discussed the points where it deviates from them.

Chapter 3

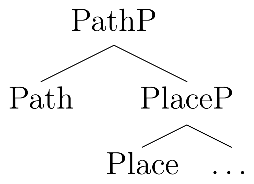
Background and theoretical assumptions

3.1 Introduction

In this chapter, I lay out the core background assumptions on the basis of which I develop the syntactic and semantic analyses of paths in Chapters 4 and 5, respectively. I first present the commonly assumed syntactic structure for directional phrases and, with this structure in hand, I present the view adopted in this thesis on the relationship between the morphological composition of an expression and the syntactic structure underlying it. In that, I am led by the general guideline of the cartographic framework (Cinque and Rizzi 2008), stating that each morpho-syntactic feature corresponds to a unique syntactic head (see also Kayne's 2005 suggestion to the same effect). I follow the same framework also with respect to other basic assumptions, namely, the universality of syntactic structure and the rigid Specifier-Head-Complement order (Cinque 2005).

3.2 Path, Place and the relation between syntax and morphology

The syntactic structure underlying directional spatial expressions has been commonly assumed to involve at least two projections: a Place projection encoding static location, and a Path projection, where we find directional markers (van Riemsdijk 1990, van Riemsdijk and Huybregts 2002, Koopman 2000, Svenonius 2010, den Dikken 2010). Thus, there is a general agreement that the minimal syntactic structure for directionals looks like the one in (1).[1]

(1)


This syntactic structure reflects Jackendoff's (1983) conceptual structure for spatial expressions, discussed in Chapter 2. The decomposition of directional phrases into two components mirrors their conceptual decomposition into a PATH component and a PLACE component.

The two syntactic positions in the structure in (1) have direct morphological counterparts in many languages, according to van Riemsdijk and Huybregts (2002). Svenonius (2010), too, discusses languages, where directional expressions involve two elements, each of which corresponds to one of the positions in the structure in (1). An example for such a language is Macedonian, which combines a directional preposition with a locative preposition in Goal expressions (Tomič 2006:85), see (2) (data provided by Eva Piperevska, p.c.).

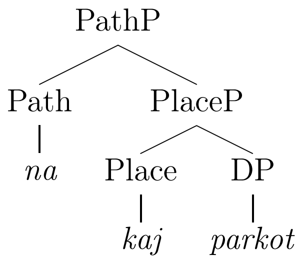
(2) a. Kaj parkot sum.
at park.DEF *be*.1SG
'I am at the park.'

b. Odam na-kaj parkot.
go.1SG *to-at park*
'I am going to the park.'

In the example in (2), the Goal expression is formed by adding the Dative preposition *na* to the general locative preposition *kaj*, resulting in a bimorphemic marker *na-kaj*. The preposition *na* in (2) can be then taken to lexicalize the Path head in (1), while the locative preposition *kaj* spells out the Place head.

[1]Authors vary in their terminology. For instance, van Riemsdijk and Huybregts (2002) use the labels Dir and Loc, while den Dikken (2010) uses P_{Dir} and P_{Loc}. In this thesis, I follow the terminology in Svenonius (2010) and use the labels Path and Place for the directional and locative heads, respectively.

(3)



The same mapping of morphemes onto syntactic structure can be found in languages where spatial expressions are formed by means of case affixes. Consider, for instance, the Daghestanian language Tsez, which combines a locative and a directional case affix, as shown in (4) (data from Comrie and Polinsky 1998:104).

(4) a. besuro-xo
fish-at
'at the fish'
b. besuro-xo-r
fish-at-to
'to the fish'

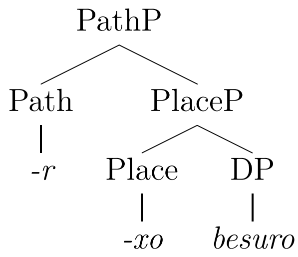
Commonly, it is assumed that the case suffixes in languages with spatial case systems lexicalize the same heads Path and Place which are spelled out by spatial prepositions in prepositional languages (van Riemsdijk and Huybregts 2002, Svenonius 2010, see also Asbury et al. 2007 who explicitly argue for this idea). Under this view, the bound morphemes *-xo* and *-r* in Tsez lexicalize Place and Path, respectively, just like their prepositional counterparts in Macedonian.[2] In (5), I present how the base syntactic structure of the Tsez Goal expression is lexicalized, assuming a Specifier-Head-Complement structure in line with Kayne (1994) and postponing the discussion of the linearization of the structure until Chapter 7, Section 7.2.

[2]The morpheme status of *-r* is supported by the fact that the suffix *-r* systematically attaches to all the affixes of the remaining six locative series. Moreover, *-r* is also used as a Dative case suffix, that is, it functions independently as a separate morpheme which attaches straight to the noun, see (i) (Bokarev 1967d).

(i) besuro-r
fish-DAT

These two facts suggest that is is highly unlikely that that the *-xo-r* complex in (4b) is a non-decomposable Goal morpheme *-xor*, which accidentally has its initial part identical to the Locative affix.

(5)

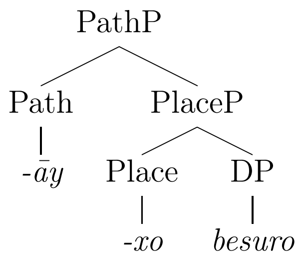


Note that the Path head is standardly assumed to be the host for directional elements expressing all kinds of paths. Thus, we find there, for example, both Goal-encoding morphemes and Source-encoding morphemes. The latter case is exemplified in (6), using data from the language Tsez again.

(6) besuro-x-āy[3]
fish-at-from
'from the fish'

The tree structure corresponding to the Tsez example in (6) is shown in (7). It is basically identical to the structure in (5), modulo the fact that there is a different morpheme hosted by the Path head.

(7)



To sum up, there is a general consensus that directional expressions are built on top of locative expressions by adding to the locative structure the directional head Path. In a language like Macedonian and Tsez this is morphologically transparent, as there are dedicated morphemes (*na*, *-r*, *-āy*) that lexicalize the Path head. This pattern is not limited to Macedonian and Tsez in particular. It is fairly common cross-linguistically and exhibited by genealogically diverse languages, as can be seen from Table 3.1.

Each of the directional morphemes presented in the data from Macedonian and Tsez, as well as in Table 3.1, is associated with a given property and contributes a certain meaning to the spatial expression. For instance, the stative morphemes (*kaj* in Macedonian, *-xo* in Tsez, *-o* in

[3]The vowel *o* drops regularly before another vowel (Comrie and Polinsky 1998).

Language	Genus	Location	Goal	Source	Reference
Garo	Baric	*-o*	*-o-na*	*-o-ni*	Burling (2003)
Estonian	Finnic	*-l*	*-l-le*[a]	*-l-t*	Viitso (1998)
Lezgian	Lezgic	*-q*^{h}	*-q*^{h}*-di*	*-q*^{h}*-aj*	Haspelmath (1993)
Mwotlap	Oceanic	*l(V)*	*a l(V)*	*m*^{w}*ε l(V)*	Crowley (2002a)
Yanesha	Arawakan	*-o*	*-o-net*	*-o-t*^{y}	Duff-Tripp (1997)

[a]According to the orthographical conventions in Estonian, the double *ll* of the Allative ending is written as a single *l*. Nevertheless, the Allative marker is morphologically decomposed as shown above (Anna Tamm, p.c.).

Table 3.1: Morphological containment of locative expressions inside directional expressions

Garo, *-l* in Estonian, etc.) express location and the "dynamic" goal and source morphemes (*na* in Macedonian, *-r* and *-āy* in Tsez, *-na* and *-ni* in Garo, etc.) express transition to or from this location. The stative and dynamic morphemes also correspond to a syntactic head in the structure (Place and Path). Hence, we can conjecture that the number of morphemes that constitute a given expression serves as an indicator of the number of heads present in the underlying syntactic structure. This idea is in line with Kayne's (2005) suggestion that each morphosyntactic feature should correspond to an independent syntactic head in the functional sequence. This is also a principle adopted in the cartographic framework (Cinque 1999, Rizzi 1997, inter alia), where authors are guided by the maxim "one (morphosyntactic) property – one feature – one head" (Cinque and Rizzi 2008). Thus, I assume that whenever we are able to isolate a morpheme which adds a given property (or meaning) to the expression it is a part of, this is an indication that the underlying syntactic structure contains an independent head corresponding to that property (and morpheme).

The assumed parallel between morphological composition and syntactic structure strongly suggests a theoretical framework which unifies morphology and syntax into one component of grammar (cf., Baker's 1985 Mirror Principle and his proposal to the same effect). I discuss this question in more details in Chapter 6, where I present one such theory.

Assuming two heads in the syntactic structure of directional expressions – Place and Path – presupposes also a semantic "decomposition" of directionals, as each of the heads in the syntactic structure is expected to have some semantic contribution. We find this concept developed in the work by Kracht (2002; 2007) and Zwarts (2005; 2008a). Kracht suggests that locative expressions universally contain two layers: one is called *configuration* and describes the way the Figure and the Ground are positioned with respect to each other, e.g., *in*, *under*, *above*, etc. The other layer specifies the *mode*, which describes the way in which the Figure moves with respect to the configuration (Kracht's modes are listed in (45), Chapter 2). These two layers can be easily mapped onto the syntactic structure, taking the Place head to contribute the configuration, and the Path head to contribute the mode (abstracting away from the STATIC mode).

Zwarts (2005; 2008a), too, proposes a semantics for directional preposition which relates paths to locations. More specifically, Source prepositions are the ones that include the starting point of a path, p(0), which can be either IN the reference object (for *out of*), ON the reference object (*off*), or AT the reference object (*from*). Goal prepositions, on the other hand, include the end point of the path, p(1), which is IN, ON, or AT the reference object (resulting in *into*, *onto* and *to*, respectively). Finally, Route prepositions (*through*, *across* and *past*) exclude both p(0) and p(1) and include the intermediate positions of the path p(i) being IN, ON, or AT the reference object. Notice that the prepositions *out of*, *into* and *through* share a property too, namely, they all relate to an "IN-location" with respect to the reference object. Table 3.2, which is adapted from Zwarts (2005:759), gives a more perspicuous overview of the decomposability of the prepositions discussed in this paragraph.

		IN	ON	AT
Source Ps	p(0)	*out of*	*off*	*from*
Goal Ps	p(1)	*into*	*onto*	*to*
Route Ps	p(i)	*through*	*across*	*past*

Table 3.2: Relation between paths and locations (Zwarts 2005)

The semantics proposed by Zwarts is clearly compositional and in line with a syntactic structure where a Path head dominates a Place projection. Thus, if we are to make the syntactic and semantic hypotheses converge, it will be fairly obvious to state that the Path head encodes Goal or Source, while the Place head below it expresses an IN, ON or AT relationship between the Figure and the Ground. Put in other words, the IN/ON/AT bit is the semantic contribution of the Place head, while the semantic content of the Path head specifies whether the locative condition encoded by the Place head holds of the starting point p(0), the end point p(1) of the path, or some intermediate point p(i) (Svenonius 2007).

To sum up the discussion so far, I presented the commonly assumed decomposition of directional spatial expression into a Path head dominating a Place head.[4] I showed evidence for this decomposition coming from the morphological make-up of directional expressions cross-linguistically and their associated semantics. Finally, I suggested that the presence of a morpheme in a given expression is an indication for the presence of a syntactic head corresponding to that morpheme in the structure underlying the expression.

3.3 Lexicalization of the structure

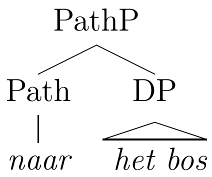
In the preceding section, I proposed that whenever we see two independent morphemes in a given expression, this indicates the existence of two heads in the syntactic structure, corresponding to each of the two morphemes. This mapping of morphological structure onto syntactic structure, however, raises one important question: what happens in languages where path expressions involve only one morpheme? Consider, for instance, the Dutch Goal expression in (8) featuring a so called strictly directional preposition (data from den Dikken 2010).

(8) naar het bos
to the woods

One way to deal with the mismatch between the number of morphemes in the expression in (8) and the number of heads in the structure in (1) is to assume that the syntactic structure for directional expressions in Dutch does not contain two heads – Path and Place – but just one head. This one head will then correspond to the single morpheme *naar*. Since *naar* is a strictly directional preposition, i.e., one that has only directional uses, this syntactic head will have to be the Path head, as shown in (9).

[4]These are not the only syntactic projections directional phrases consist of. Various other heads have been proposed. To name a few, Koopman (2000) argues for a Deg head, accommodating measure phrases; den Dikken (2010) proposes a Deix head for deictic elements; Svenonius (2006) proposes an AxPart for spatial elements that very often have nominal properties, like *front* in *in* **front** *of*.

(9)



This assumption has one disadvantage. If we assume that the structure of Dutch directionals differs from the structure of directionals in Macedonian and Tsez, we give up the idea of a universal syntactic structure underlying all natural languages. This goes against Chomsky's (2001) *Uniformity Principle.*

(10) *Uniformity Principle* (Chomsky 2001:2):
In the absence of compelling evidence to the contrary, assume languages to be uniform, with variety restricted to easily detectable properties of utterances.

It is therefore preferable to assume that, *in all languages*, the syntactic structure of directional expressions involves a Path projection taking as a complement a Place projection, even though in many languages this is not morphologically transparent. Thus, the Uniformity Principle prompts us to postulate that the syntactic structure of the Goal path expressed by the Dutch directional preposition *naar* involves the same heads Path and Place as the syntactic structure for the Macedonian and Tsez Goal paths expressed by *nakaj* and *xor*, respectively, despite the fact that in Dutch there are more syntactic heads (two) than morphemes (one). In fact, it has to be so, as Dutch was one of the languages which gave rise to the establishment of the structure in (1) on the basis of other syntactic phenomena like movement and incorporation (see the seminal works of Koopman 2000 and den Dikken 2010).

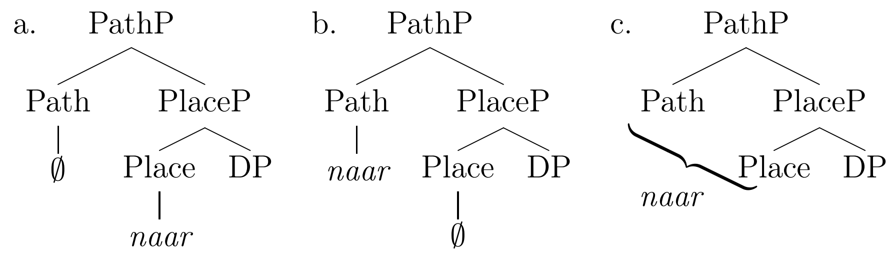
Such an approach is in line with the cartographic framework whose working hypothesis is that all languages share the same universal syntactic structure. Hence, whenever some language provides evidence for the existence of a particular head, then this head must be present in all other languages, even if they do not show direct evidence for its existence. As discussed in Cinque and Rizzi (2008), this hypothesis might turn out to be wrong, but it is the strongest hypothesis possible and therefore the one that should be pursued until evidence is found to the contrary.

The assumption that the structure underlying the Dutch *naar*-expressions involves the two heads Path and Place raises the question of how to deal with the aforementioned mismatch between the number of morphemes and the number of heads. There are three possibilities.

- Possibility 1: the preposition *naar* is merged under the Place head and the Path head is occupied by a silent directional preposition, as suggested in Koopman (2000).
- Possibility 2: the preposition *naar* is merged under the Path head and the Place head is occupied by a silent locative preposition, as suggested in den Dikken (2010).
- Possibility 3: the preposition *naar* spells out simultaneously the Path and the Place head.

The three possibilities are schematized in the tree structures below.

(11)



The first possibility depicted in (11a) is untenable, as it predicts that *naar* can also function as a locative preposition, contrary to the facts (see the discussion in den Dikken 2010). The second possibility in (11b) has also one weakness, namely, it requires the availability of a silent locative preposition. This locative preposition, however, never surfaces in the absence of a strictly directional preposition. It is therefore necessary to somehow restrict its syntactic distribution. As den Dikken concludes in an earlier version of his paper, it remains unclear how to achieve this.[5]

Given the problems encountered by the first two possibilities, the third approach, according to which *naar* lexicalizes both Path and Place, seems to be worth pursuing. It is also the approach adopted by Caha (2010a) for his analysis of the German strictly directional preposition *zu* 'to.' Thus, I assume that it is possible for one lexical item to lexicalize more than one head in the syntactic structure. This assumption has been made in a fair number of previous linguistic works, for example Williams (2003), Borer (2005a;b) and Ramchand (2008b), who implement it by using different theoretical apparatuses. How exactly this is achieved theoretically in this thesis is the topic of Chapters 6 and 7.

[5]Den Dikken's discussion concerns the strictly directional German preposition *aus* 'from', but the same problem arises in the analysis of Dutch *naar*.

3.4 Conclusion

Before concluding this chapter, let me summarize the main theoretical assumptions, which I will make use of in my investigation of the syntactic structure underlying the various types of path expressions.

- Assumption 1: The mapping between morphemes and syntactic terminals is one-to-many.
- Assumption 2: Syntactic structure is universal.
- Assumption 3: There is a rigid Specifier-Head-Complement order.

According to assumption 1, the identification of a morpheme in a given language suggests the presence of *one or more heads* in the syntactic structure which this morpheme lexicalizes. This entails that one syntactic head can be lexicalized by just one morpheme, but one morpheme can lexicalize many syntactic heads.

As stated in assumption 2, a syntactic head that is established on the basis of morphological data in a given language will be universally present in all languages, even those which do not offer morphological evidence for its existence. Thus I adopt the working hypothesis of the cartographic approach saying that all languages share the same underlying syntactic structure, a part of Universal Grammar.

Assumption 3 says that the only ordering found in human language is one where specifiers precede heads and heads precede complements, as argued for by Kayne (1994). All other orders are derived by movement.

In the next chapter, I investigate the morphological composition of path expression in a variety of languages, guided by the assumptions above. I develop the idea that the structure underlying directional expressions involves more heads than just Path (and Place) and suggest that different types of paths correspond to different syntactic structures.

Chapter 4

Decomposing Path

4.1 Introduction

In Chapter 2, I explored the question of how many kinds of spatial paths there are. This provides the theoretical base for my investigation of how these various types of paths are expressed cross-linguistically. For my purposes, I studied the grammar descriptions of 81 genealogically diverse languages.[1] The results of the typological study reveals that there is a certain hierarchy when it comes to the expression of paths. Namely, different paths are of different morphological complexity and, crucially, subject to a subset-superset relationship. For instance, in some languages, Source paths morphologically contain Goal paths, Route paths contain Source paths, and non-transitional paths contain the corresponding transitional paths. Interestingly, the reverse pattern appears to be non-existent. My findings were confirmed by data from languages which were not included in the initial sample.

Taking morphological complexity to be indicative of syntactic complexity, as suggested in Chapter 3, I propose a syntactic structure for directional expressions that can accommodate the linguistic facts. In a nutshell, I suggest that each of the distinctions in the path typology listed in (43), Chapter 2, is brought about by a special head in the syntactic structure underlying directional expressions. Consequently, I decompose the Path head which has been proposed to be present in the syntactic structure for directionals into five heads: Goal, Source, Route, Scale, and Bound.

[1] A list of the languages in the sample is presented in the Appendix.

4.2 Goal versus Source paths

One of the properties with respect to which paths differ is the orientation value they have. Paths can be Goal-oriented and Source-oriented. In the majority of languages these two kinds of paths are encoded by elements of equal complexity. For example, in Scottish Gaelic both the Goal and the Source marker are monomorphemic, see (1).

(1) Scottish Gaelic (MacAulay 1992)

a. gu bocsa
to box
'to (a) box'

b. bho bocsa
from box
'from (a) box'

In the languages in Table 3.1, both the Goal and Source paths are encoded by bi-morphemic markers consisting of a locative element and a directional element. This type has been already exemplified by Tsez, repeated below from (4b) and (6) in Chapter 3.

(2) a. besuro-xo-r
fish-at-to
'to the fish'

b. besuro-x-āy
fish-at-from
'from the fish'

There are, however, languages where the morphological equality between Goal and Source markers does not hold. One such language is Imbabura Quechua (Jake 1985, Cole 1985). Imbabura Quechua has a spatial case system with a Locative case, expressing static location, an Allative case, expressing Goal-oriented paths, and an Ablative case, expressing Source-oriented paths (data from Cole 1985:119).

(3) Imbabura Quechua

a. Utavalu-pi kawsa-ni.
Otavalo-LOC *live*-1
'I live in Otavalo.' (Location)

b. Utavalu-man ri-ni.
Otavalo-ALL *go*-1
'I go to Otavalo.' (Goal)

c. Utavalu-manda shamu-ni.
Otavalo-ABL *come*-1
'I come from Otavalo.' (Source)

The intriguing fact is that the Allative marker in Imbabura Quechua is *-man* (3b), while the Ablative marker is *-manda* (3c). On the face of it, it seems that the Ablative marker contains the Allative marker.

Another language which demonstrates a containment relationship between the Source marker and the Goal marker is the Daghestanian language Chamalal (Magomedbekova 1967b), as shown by the data below (my glossing).

(4) Chamalal (Gigalt dialect)

a. mik^{y}i-l-a
road-ON-LOC
'on the road' (Location)

b. mik^{y}i-l-u
road-ON-ALL
'onto the road' (Goal)

c. mik^{y}i-l-u-r
road-ON-ALL-ABL
'off the road' (Source)

As shown in Table 4.1, the Source marker is built by adding the morpheme *-r* to the Goal marker *-u* in each of the seven locative series in Chamalal.

	Series	Location	Goal	Source
in	-∅	-∅-*i*	-∅-*u*	-∅-*u*-*r*
at	-*x*	-*x*-*i*	-*x*-*u*	-*x*-*u*-*r*
inside	-λ	-λ-*i*	-λ-*u*	-λ-*u*-*r*
behind	-*n*	-*n*-*i*	-*n*-*u*	-*n*-*u*-*r*
under	-*kk*	-*kk*-*i*	-*kk*-*u*	-*kk*-*u*-*r*
on	-*l*	-*l*-*i*	-*l*-*u*	-*l*-*u*-*r*
vertical attachment	-*tʃ*	-*tʃ*-*i*	-*tʃ*-*u*	-*tʃ*-*u*-*r*

Table 4.1: Spatial case system in Chamalal (Magomedbekova 1967b)

It should be noted that the Goal morphemes *-man* in Quechua and *-u* in Chamalal are unambiguously directional, that is, they cannot be used in locative contexts. This excludes the possibility that the Source elements *-da* and *-r* are added to a stative Locative morpheme, as happens in Tsez and in the languages listed in Table 3.1.

The Source and Goal paths discussed so far are transitional paths like *to* and *from*. It is then a legitimate question whether such a containment relationship obtains between *non-transitional* Source and Goal paths (*away from* and *towards*). The answers is yes, and the evidence for this is provided by languages like Dime (Mulugeta 2008) and Bulgarian.

The Omotic language Dime, spoken in Ethiopia, has a directional marker *-bow* that, when attached to a noun marked by Comitative case, expresses direction towards the Ground (as described by Mulugeta 2008). In other words, *-bow* is a marker of a non-transitional Goal-oriented path. Interestingly, according to Mulugeta (2008), *away from*-paths (i.e., non-transitional Source paths) are expressed by adding the Ablative marker *-de* to a noun that is already marked by *-bow*. I reproduce here the examples he gives, where the proper noun Taddese is marked by the directional *-bow*, see (5a), and by the combination of *-bow* and the Ablative marker *-de*, see (5b) (data from Mulugeta 2008:58, the original translation provided by Mulugeta is preserved).

(5) a. šiftaye taddeseka-bow tiŋ-i-n.
Shiftaye Taddese.COM-DIR *go*-PERF-3
'Shiftaye went towards Taddese.'
b. šiftaye taddeseka-bow-de ʔád-i-n.
Shiftaye Taddese.COM-DIR-ABL *come*-PERF-3
'Shiftaye came from the place where Taddese is found.'

Thus, we can say that the Recessive (*away*) path is built on top of an Approximative (*towards*) path, by the addition of the Ablative *-de*.

Exactly the same pattern is replicated in the Slavic language Bulgarian. The Bulgarian preposition *kəm* is unambiguously directional and means 'towards, in the direction of'. Thus, the data in (6a) is an example for a non-transitional Goal path. A non-transitional Source path is expressed by adding the Source preposition *ot* to the preposition *kəm*, thus deriving the complex preposition *otkəm*, (6b).

(6) a. kəm kəshta-ta
towards house-DEF
'towards the house, in the direction of the house'
b. ot-kəm kəshta-ta
from-towards house-DEF
'from the direction of the house'

Again we find the Recessive (*away*) path preposition to morphologically contain the Approximative (*toward*) path preposition.

Table 4.2 summarizes all the languages where I have discovered a Source-Goal containment relationship. So far I haven't come across a language where the reversed relationship obtains, that is, where a Goal expression morphologically contains a Source expression.

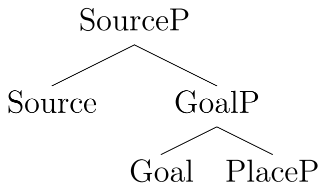
Language	Location	Goal	Source	Reference
Bulgarian	*pri*	*kəm*	*ot-kəm*	Pashov (1999)
Dime	*-se*	*-bow*	*-bow-de*	Mulugeta (2008)
Chamalal	*-i*	*-u*	*-u-r*	Magomedbekova (1967b)
Ingush	*-ğ*	*-ga*	*-ga-ra*	Nichols (1994)
Jingulu	*-mpili*	*-ŋka*	*-ŋka-mi*	Blake (1977)
Mansi	*-t*	*-n*	*-n-əl*	Keresztes (1998)
Quechua	*-pi*	*-man*	*-man-da*	Jake (1985), Cole (1985)
Uchumataqu	*-tá*	*-ki*	*-ki-stani*	Vellard (1967)

Table 4.2: Languages where the Source marker morphologically contains the Goal marker

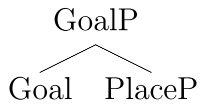
Importantly, some of the languages in Table 4.2 provide evidence that the element attaching to the Goal marker in the Source expression serves as an independent morpheme. For instance, *-stani* in Uchumataqu is used as Comitative suffix (Adelaar 2004). Likewise, in Mansi, the element *-l* is in fact the Instrumental case suffix and the reduced vowel ə can be shown to be inserted for phonological reasons (Keresztes 1998). Even more convincing are the cases of Bulgarian and Dime, where the morphemes *kəm* and *-de* by themselves express a Coinitial path (i.e., a transitional Source path *from*), but attach to the Approximative (*toward*) marker in Recessive (*away from*) expressions.

These facts suggest that the containment relationship obtaining between Source and Goal expressions, no matter whether transitional or not, is not accidental, since in many languages it is possible to identify the bit that is added to the Goal marker as an independent element. Therefore, I claim that the Source expressions in the languages in Table 4.2 are built on the basis of Goal expressions by adding a morpheme. Taking morphological complexity to be indicative of syntactic complexity, as argued in Chapter 3, I suggest that the morphemes attaching to the Goal expressions in Table 4.2 indicate the presence of an independent syntactic head corresponding to them. I therefore propose that the syntactic structure of Source expressions embeds the syntactic structure for Goal expressions, as illustrated in the tree diagram in (7).

(7) a. Source phrase:

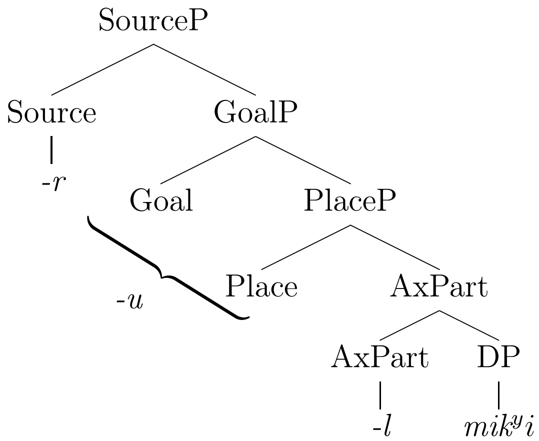


b. Goal phrase:



The structure in (7a) can be mapped onto the morphological composition of the Chamalal Source expression *mik^{y}i-l-u-r* ‘off the road’ (see (4c)) in the way depicted in (8). I assume that the series marker *-l* ‘ON’ lexicalizes the AxPart head proposed by Svenonius (2006), where one finds spatial elements encoding notions like EXTERIOR, INTERIOR, TOP, BOTTOM, etc. (see Muriungi 2006, Takamine 2006, Pantcheva 2006; 2008). In addition, I assume that a single morpheme can spell out more than one head in the syntactic strucure, as suggested in Chapter 3.[2]

(8)

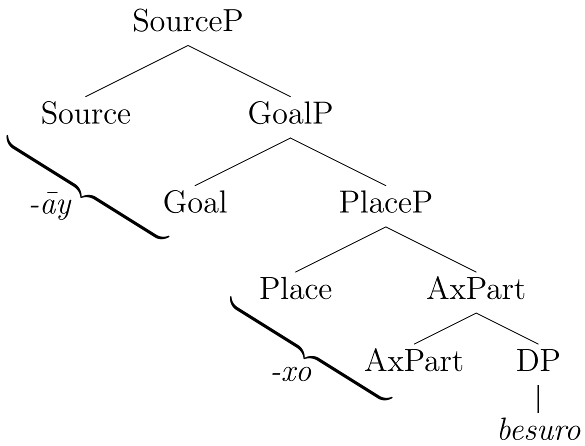


According to the hypothesis that languages share a universal syntactic structure, the structure in (7a) underlies Source expressions in all languages, even those where they are morphologically non-decomposable. That is, I propose that Source expressions are built on top of Goal expressions by the addition of a dedicated syntactic head also in languages like English, Scottish Gaelic and Tsez, where the containment relationship is not evident. The reason that the syntactic structure in these languages

[2]For the lexicalization of the Dime and Bulgarian Recessive expressions, see (32) in Chapter 5.

is not reflected by the morphological composition of the Source marker is that the Source marker lexicalizes both the Goal and the Source head. For an illustration, see the tree diagram in (9) showing the lexicalization of the structure in the Tsez Source expression *besuro-x-āy* (fish-AT-FROM) 'from the fish.'

(9)



The existence of a special Source head in the syntactic structure for Source expressions raises the question of what precisely the semantic function of this head is. I will not address this question here, but defer the discussion to the next chapter, which is entirely dedicated to establishing the semantics of each of the heads I am going to postulate in the current chapter.

4.3 Route paths versus Goal and Source paths

In the previous section, I showed that the split within the oriented paths into Source and Goal-oriented ones has a morpho-syntactic reflex. It is interesting to see whether the other divisions in the path typology also correlate with a difference in the morpho-syntactic structure of the corresponding directional phrases. In this section, I investigate the split between the non-oriented and oriented paths, or put differently, I compare Route paths on the one hand, with Goal and Source paths, on the other hand.

The first clue about the relationship between non-oriented and oriented paths comes from the Slovak language. In Slovak, Route phrases are formed by adding the preposition *po* to a PP expressing a Goal path (P. Caha, p.c.).

(10) Na Forum Romanum vstupujeme po-pod oblúk-∅
*On Forum Romanum.*ACC *enter.*1PL *po-under arch*-ACC
Tita.
of.Tito
'We entered the Forum Romanum by going under Tito's arch.'
(lit.: via under)

The following data shows that without the preposition *po*, the PP has a Goal reading.

(11) Slamu dal pod stôl-∅.
*hay put.*3SG *under table*-ACC
'He put the hay under the table.'

Thus, the data from Slovak suggests that Route paths are "bigger" than Goal paths in that the former morphologically contain the latter. Given that Source paths are also "bigger" than Goal paths, a legitimate question arises: Is there a relationship between Route and Source paths? As things stand now, we know that both Route and Source paths are formed on the basis of Goal paths. It is logically possible, though, that there is an ordering between Source and Route paths, too. At this point, the typological investigation of path expressions cross-linguistically meets its first impediment – many grammar descriptions do not mention Route paths. Since the current study relies heavily on written sources, it becomes quite difficult to determine in what ways Route paths relate to other paths in their morphological make-up.

Despite the scarcity of information, there are two languages that shed light on the topic. The first language is the Daghestanian language Akhvakh, described by Magomedbekova (1967a). Like other languages from the East Daghestanian group, Akhvakh has a rich spatial case system, like the ones already presented for the related languages Tabasaran (Table 2.1) and Chamalal (Table 4.1). The noteworthy fact is that Route paths are formed by the addition of the morpheme *-ne* to the Ablative (Source) case ending *-u*, thus deriving the complex Translative (Route) case ending *-u-ne*. Table 4.3 presents the case system in Akvakh, based on data in Magomedbekova (1967a).

The same phenomenon has been observed for the language Avar by a number of researchers: Uslar (1889), Charachidzé (1981), Blake (1994). In Avar, too, the Route case (called Perlative) is formed by suffixing the Ablative case marker with the element *-n*. The data is shown in Table 4.4.

The existence of an Ablative base for the Perlative form in Avar is

	Series	Location	Goal	Source	Route
on	*-g*	*-g-e*	*-g-a*	*-g-u*	*-g-u-ne*
at, near	*-x*	*-xar-i*	*-lir-a*	*-xar-u*	*-xar-u-ne*
at	*-q*	*-q-e*	*-q-a*	*-q-u*	*-q-u-ne*
in	*-l’*	*-l’-i*	*-l’-a*	*-l’-u*	*-l’-u-ne*
under	*-t°*	*-t°-i*	*-t°-a*	*-t°-u*	*-t°-u-ne*

Table 4.3: Spatial case system in Akhvakh (Magomedbekova 1967a)

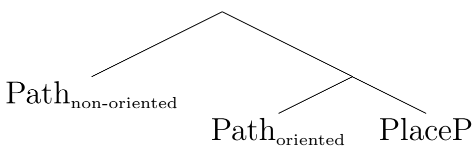
	Series	Location	Goal	Source	Route
on (top of)	*-da*	*-da*	*-d-e*	*-da-ssa*	*-da-ssa-n*
at	*-q*	*-q*	*-q-e*	*-q-a*	*-q-a-n*
under	*-ƛ’*	*-ƛ’*	*-ƛ’-e*	*-ƛ’-a*	*-ƛ’-a-n*
in, among	*-ƛ*	*-ƛ*	*-ƛ-e*	*-ƛ-a*	*-ƛ-a-n*
in a hollow object	-∅	-∅	*-∅-e*	*-∅-ssa*	*-∅-ssa-n*

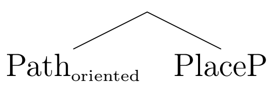
Table 4.4: Spatial case system in Avar (Blake 1994)

supported by the fact that the allomorph of the Ablative case is preserved in the Perlative case. That is, whenever the form of the Ablative suffix is *-ssa*, the Perlative is *-ssa-n*. And whenever the Ablative suffix is *-a*, the Perlative is *-a-n*. This excludes the possibility that the morphological containment relationship between the Route and the Source cases is a phonological accident and justifies the independent morpheme status of *-n*

So far, I presented data showing that (i) Route paths contain Goal paths (Slovak), and (ii) Route paths contain Source paths (Akhvakh and Avar). This provides us with an answer to the question of how the split between non-oriented and oriented paths is reflected in morpho-syntax – non-oriented paths are formed on the basis of oriented path by the addition of a special head. Hence, the syntactic structures corresponding to the two types of paths are as shown in (12), where non-oriented paths are built on top of oriented paths.

(12) a. Non-oriented paths b. Oriented paths

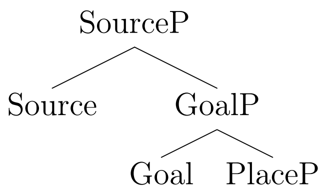




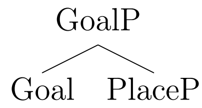
Recall from Section 4.2 that the oriented paths themselves split into Source and Goal paths, which are in a hierarchical relation – Source paths are built on top of Goal paths (see (13) repeated from (7)).

(13) Oriented paths

a. Source path



b. Goal path



The evidence for these structure comes from the morphological containment facts. This relation of morphological containment has several properties. It is:

- transitive – if A morphologically contains B and B morphologically contains C, then A contains C (for instance, in Avar, the Perlative case contains the Ablative and the Ablative contains the Locative, hence Perlative contains Locative)
- reflexive – A morphologically contains itself (for instance, the Allative contains the Allative)
- antisymmetric – if A morphologically contains B and A is distinct from B, then B does not morphologically contain A (for instance, in Chamalal the Ablative contains the Allative, but the Allative does not contain the Ablative)

Let “>” represent the transitive, reflexive, and antisymmetric relationship of morphological containment. We have already established the following pairs.

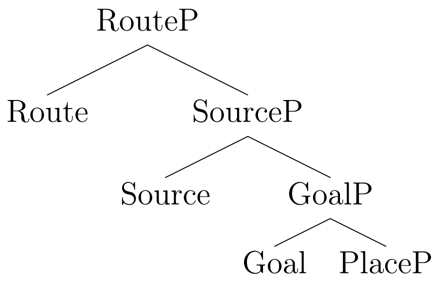
(14) a. Source path > Goal path
b. Route path > Goal path
c. Route path > Source path

The pairs in (14) give rise to the following linear order:

(15) Route path > Source path > Goal path

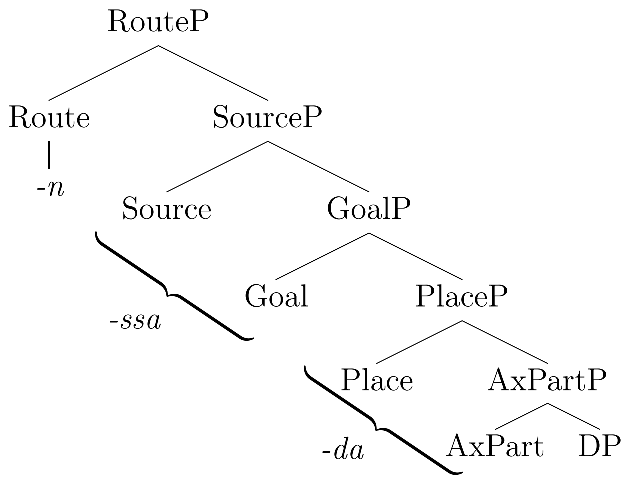
Translated into syntactic structure, this order gives us the following tree:

(16)



I suggest that this is the structure universally underlying Route expressions. Applied to the Avar data, the morphemes map onto syntactic terminals in the following way (taking as an example the AT-series marked by *-da*).

(17)



Summing up, I have reached the conclusion that there is a linear ordering between Goal, Source and Route paths on the basis of the relation of morphological containment. This ordering corresponds to an increasing complexity in the syntactic structure underlying these path expressions. Goal paths are the minimal element, or put informally, the most "simple" paths, Source paths are formed by the addition of a Source head, and finally, Route paths are the most complex ones, as they are built on top of Source paths by the addition of a Route head, whose semantics I discuss in Chapter 5, Section 5.5.

4.4 Transitional versus non-transitional paths

It is a very common phenomenon cross-linguistically that non-transitional paths, like the one expressed by the English preposition *towards*, are more complex than the corresponding paths expressing transition, like the English Goal path expressed by *to*. This can be illustrated by a morphological analysis of the English prepositions just mentioned: *to* and *towards*. The first one (*to*) is clearly contained in the second one (*to-wards*). Furthermore, we encounter the morpheme *-wards* in other English spatial elements, for example *outwards*, *inwards*, etc. The contribution of *-wards* in all cases appears to be the same: *towards* means "in the direction of," *outwards* means "in direction (away) from inside." On semantic grounds then, the role of *-wards* seems to be to turn a transitional path into a non-transitional path, preserving the orientation of the path.

The same phenomenon is observed for a number of other languages. For instance, Tabasaran and Avar have special morphemes that attach to a noun marked by the Allative and the Ablative case, which results in a non-transitional Goal-oriented (*towards*) and a non-transitional Source oriented (*away from*) path, respectively. The morphological structure of non-transitional Goal (Approximative) and Source (Recessive) paths in these two Daghestanian languages is demonstrated in the tables below. Table 4.5 shows how Approximative and Recessive paths are constructed in Avar for the ON-series, Table 4.6 shows how they are expressed in Tabasaran for the IN-series.

	Goal	Source
Trans	*-de*	*-da-ssa*
Non-trans	*-de-ɣun*	*-da-ssa-ɣun*

Table 4.5: Transitional and non-transitional paths in Avar (Uslar 1889)

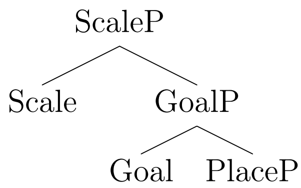
	Goal	Source
Trans	*'-na*	*'-an*
Non-trans	*'-na-di*	*'-an-di*

Table 4.6: Transitional and non-transitional paths in Tabasaran (Hanmagomedov 1967)

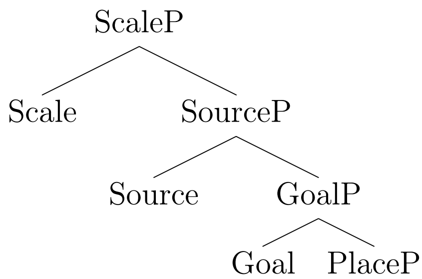
Tabasaran and Avar clearly illustrate that non-transitional Goal and Source paths are built on top of the corresponding transitional paths. Drawing a parallel between oriented paths (Goal and Source) and non-oriented paths (Route), one would expect that non-transitional Route (Prolative) paths, too, are formed on the basis of transitional Route (Transitive) paths. Regrettably, the language sample used in this study provides no such data. This might be an accidental gap. Alternatively, there are such languages but since Route paths are not routinely included in grammars, the data is inaccessible. Nevertheless, in Chapter 9, Section 9.3.2, I discuss data from English which indirectly confirms the hypothesis that Prolative paths contain Transitive paths.

When it comes to the syntactic structure underlying non-transitional path expressions, I assume the same strategy as before and suggest that non-transitional paths embed the corresponding transitional paths. Thus, I argue for the existence of a special Scale head that comes on top of any transitional path structure and turns it into a non-transitional path.

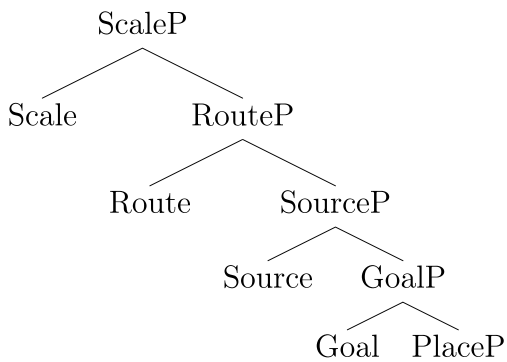
(18) a. Non-transitional Goal (Approximative) paths



b. Non-transitional Source (Recessive) paths

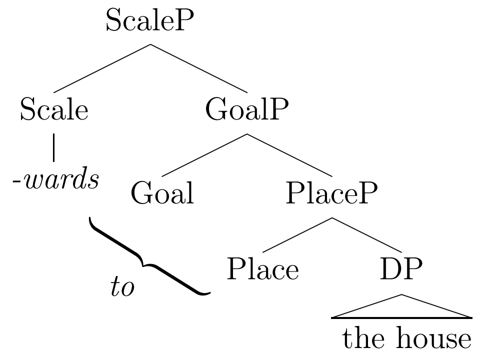


c. Non-transitional Route (Prolative) paths

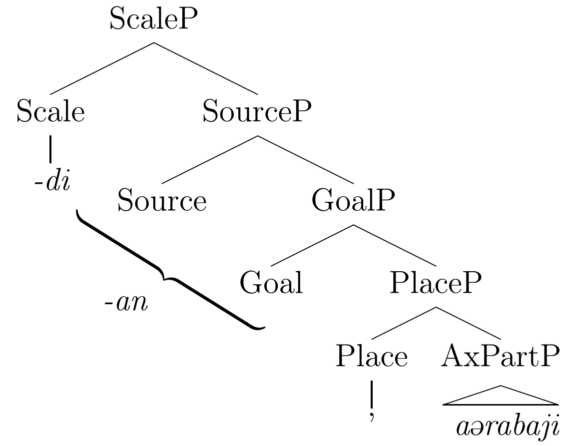


The English morpheme *-wards*, as well as the morphemes *-ɣun* and *-di* in Avar and Tabasaran, respectively, are then lexicalizations of the Scale head I propose, as shown below for the Approximative English expression *towards the house* and the Recessive Tabasaran expression *aərabaji'-an-di* (cart.ERG.IN-ABL-SCALE[3]) 'in direction out of the cart.'

(19) a.



b.



Thus, again I reached the conclusion that one of the distinctions in the path typology is reflected in the syntactic structure by the presence of a dedicated head. Specifically, the division between transitional and non-transitional paths is due to the Scale head which is part of the syntax of the latter. The Scale head thus takes as a complement a transitional path structure (GoalP, SourceP or RouteP) and derives the corresponding non-transitional path. The discussion of the exact semantic function of the proposed Scale head is taken up in Chapter 5, Section 5.6.

4.5 Delimited and non-delimited paths

In this section, I turn to the last distinction in the path typology — the split between delimited paths, i.e., paths that, apart from expressing a

[3] I gloss the morpheme *-di* SCALE for reasons I lay out in Chapter 5

transition, also set one of the extreme points as the limit for movement (e.g., an *up to* path), and non-delimited paths, i.e., paths that do not impose such a condition on their extreme points (e.g., a *to* path). I will follow the same approach I have followed until now in that I examine the morphological make-up of these types of paths and try to establish a one-way morphological containment relationship.

Recall that delimited paths split into two types: (i) the so-called Terminative paths, which are delimited at the end-point p(1), e.g., the path expressed in *The boy ran up to the house*, where the boy runs as far as the house and stops at it, and (ii) the so-called Egressive paths, which are delimited at the starting point p(0), e.g., the path expressed in *The boy ran starting from the house*. Terminative paths differ from non-delimited Goal-oriented (Cofinal) paths in that they explicitly set the location to which the path relates as the upper boundary for movement. Similarly, Egressive paths paths differ from non-delimited Source-oriented (Coinitial) paths in that they set the location as the lower boundary for movement. In Table 4.7, I present the four types of paths mentioned in this paragraph in order to remind the reader of the terminology used in the thesis and give an overview of the relationship between them.

	Goal-oriented	Source-oriented
Non-delimited	Cofinal (*to*)	Coinitial (*from*)
Delimited	Terminative (*up to*)	Egressive (*starting from*)

Table 4.7: Delimited and non-delimited paths

As we can see from Table 4.7, Terminative and Cofinal paths, while sharing the property of being Goal-oriented, differ from each other in that the former are delimited and the latter are not. Likewise, Egressive and Coinitial paths are both Source-oriented but are distinguished by the lack of delimitation for the latter type of paths. Terminative and Egressive paths differ from each other in their orientation. In what follows, I investigate the question whether these distinctions have a morphological reflex.

Let us begin the investigation with Terminative paths. In many languages, Terminative paths are formed on the basis of non-delimited transitional Goal paths (Cofinal paths), as can be already seen from the composition of the English Terminative expression *up to*, which contains the Cofinal preposition *to*. Other examples come from Basque, (20), and the Finnic language Veps, (21).

(20) Basque (Ibarretxe-Antuñano 2004)

a. etxe-ra
house-ALL
'to the house'

b. etxe-raino
house-TERM
'up to the house'

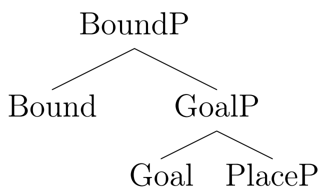
(21) Veps (Zajtseva 1981)

a. mec-ha
forest-ALL
'to the forest'

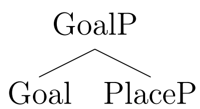
b. mec-hasei
forest-TERM
'up to the forest'

The data in (20)-(21) reveals that both in Basque and in Veps the Terminative case suffix is complex and consists of the Goal suffix (Allative *-ra* in Basque, Illative *-ha* in Veps) and a "delimiting" morpheme (*-ino* in Basque, *-sei* in Veps). Since I assume that the identification of a morpheme indicates the presence of at least one syntactic head in the structure which corresponds to the morpheme, it follows that Terminative paths are built on top of Cofinal paths by the addition of a special syntactic head, which I label Bound.

(22) a. Delimited Goal (Terminative) paths

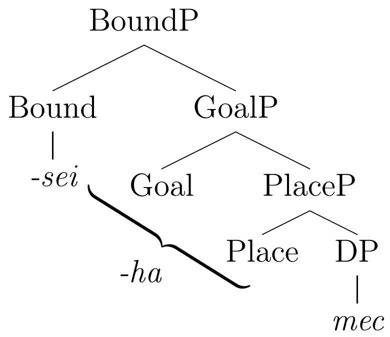


b. Non-delimited Goal (Cofinal) paths



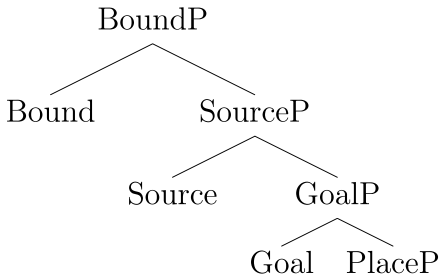
The lexicalization of the structure for a Terminative path is presented in (23), taking as an example the Veps expression in (21b).

(23)

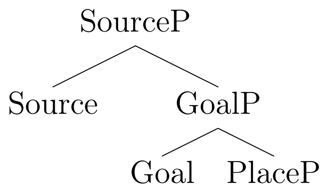


If it is indeed the case that the Goal-oriented delimited paths (i.e., Terminative paths) are derived on the basis of Cofinal paths by the addition of a special head Bound, then we expect this Bound head to be operative also in Source-oriented delimited paths. In other words, the syntactic structure of Egressive paths should be the one presented in (24), where the delimited Source path embeds the non-delimited Source path.

(24) a. Delimited Source (Egressive) paths



b. Non-delimited Source (Coinitial) paths



The structure in (24a) in turn suggests that there could be languages where the syntactic containment relationship is also morphologically transparent. This is indeed what happens in Udmurt, where the Egressive case ending *-i̮śen* morphologically contains the Elative case *i̮ś*, marking Coinitial paths.

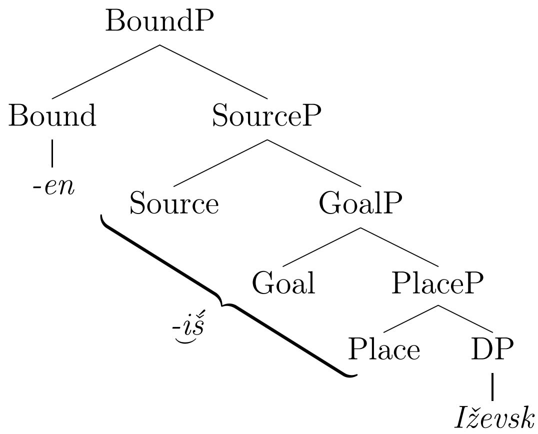
(25) Udmurt (Winkler 2001)

a. anaj gurt-i͜ś pot-i-z.
mother *village*-EL *leave*-PRET-3SG
'Mother came out of the village.'

b. Ižkar-i͜śen Moskva-oź pojesdn-en mi͜n-i.
Iževsk-EGR *Moscow*-TERM *train*-INSTR *go*-PRET.1SG
'I went by train from Iževsk to Moscow.'

This containment relationship in Udmurt is not accidental, as the various allomorphs of the Egressive case (*-i͜śen, -śen, -la-i͜śen*) correspond to the different allomorphs of the Elative case (*-i͜ś, -ś, -la-i͜ś*). I present the way the Egressive structure is spelled out in Udmurt in (26).

(26)



In sum, I propose that delimited Goal and Source paths involve a special head, which I label Bound, that takes as a complement the corresponding non-delimited path. I discuss the semantics of the Bound head in Chapter 5, Section 5.7.

4.6 Conclusion

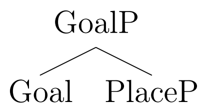
In this chapter, I established that in some languages:

- Source paths morphologically contain Goal paths.
- Route paths morphologically contain Source paths.
- Non-transitional paths morphologically contain the corresponding transitional path.

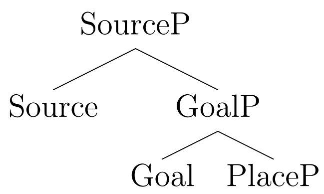
- Delimited paths morphologically contain the corresponding non-delimited path.

The morphological composition of path expressions cross-linguistically and the assumption that morphological complexity indicates syntactic complexity led me to propose that the Path head is not a unique projection hosting directional elements, but should be decomposed into several heads. Thus, I proposed that the syntactic structure of paths varies depending on whether we have a Goal-oriented path, a Source-oriented path, or a non-oriented (Route) path. The corresponding structures are shown below.

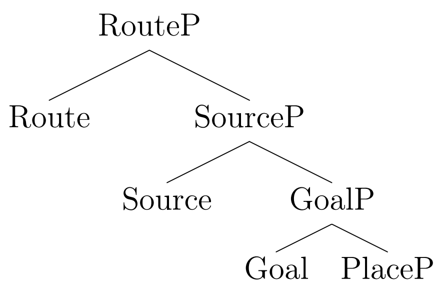
(27) a. Goal paths



b. Source paths

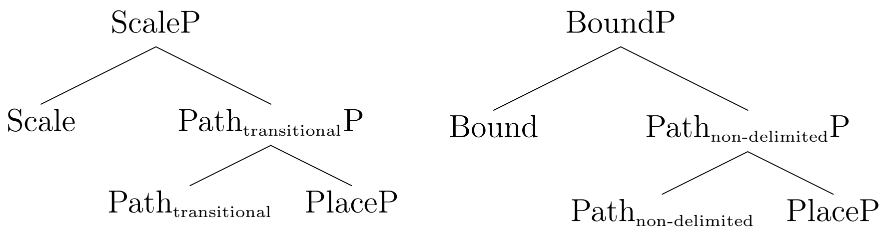


c. Route paths



Similarly, the syntactic structure for non-transitional paths embeds transitional paths, and the structure for delimited paths embeds the non-delimited paths.

(28) a. Non-transitional paths b. Delimited paths



I take these structures to be universal across languages, although in many languages the real number of heads in the structure is obscured by lexicalization. Thus, Source paths are built on top of Goal paths in all languages – even in those where this in not morphologically transparent. Likewise, Route paths are universally built on top of Source paths, non-transitional paths on top of transitional paths, and delimited paths on top of non-delimited paths.

A potential alternative to the multi-layered syntactic structures underlying the various types of paths is to assume that Path is a single head with a complex feature content and that morphemes lexicalize (sub-head) features instead of syntactic terminals. To my mind, this view just shifts the complexity of the structure to a different level. The subset-superset relationships between the various types of paths will still hold, but at the sub-terminal level. Given that we independently need to assume the operations which generate syntactic trees, it seems more parsimonious to avoid the need of operations that organize features into complex terminals, which then are merged together to build syntactic trees.

The consequence of my proposal is that, with the exception of Goal paths, directional expressions consist of more than a unique Path head and a locative projection. The Path projection comprises up to five distinct heads and in the following chapter, I address the question of what the semantic contribution of each of these heads is.

Chapter 5

Decomposed Path semantics

5.1 Introduction

In the preceding chapter, I argued for a decomposition of the Path projection in the syntactic structure of directional expressions into multiple heads, whose number varies depending on what type of path the structure expresses. I proposed the existence of a Goal, a Source, a Route, a Scale, and a Bound head. The evidence for the existence of these heads came from the morphological composition of the respective directional expressions. In this chapter, I substantiate the proposal by suggesting a particular semantic function for each of these heads, thus motivating their existence from the point of view of compositional semantics.

5.2 The semantics of Place

While decomposing the Path head, I have greatly simplified the way I represent its complement, namely, the Place projection. The label "Place," in fact, stands for a myriad of heads, each of which has its share in the compositional meaning of the entire locative phrase. I will not go into details here, as they are not of great significance for the proposal developed in this thesis, but just briefly discuss the topic.

The semantics of locative phrases is a well studied topic. They are commonly analyzed in terms of **regions** (Wunderlich 1991, Herweg and Wunderlich 1991, Nam 1995, Kracht 2002; 2008, Svenonius 2008). Regions are modeled as contiguous sets of points in space. For instance, Wunderlich (1991) defines a function p, which gives for each Ground object the set of points it occupies (its *eigenspace*). In addition, Wunderlich defines a family of functions that give for each Ground object a set of surrounding or neighboring regions. For instance, EXT[v] is the external region of the Ground object (marked by v), while INT[v] is the internal region of the Ground object. Interior location is then defined as in (1), where u stands for the Figure and v stands for the Ground:

(1) $<\mathrm{u,v}> \in ||\mathrm{in}||$ iff $\mathrm{p[u]} \subseteq \mathrm{INT[v]}$

In prose, u is in(side) v, iff the eigenspace of u is a subset of the region internal to v. This is a simplified formalization of interior location, as the use of the preposition *in* in English (and its counterparts in other languages, see Levinson and Meira 2003) is not limited to configurations where the Ground object properly contains the Figure. For instance, in some cases, an apple is judged to be *in the bowl* even if it is wholly above the top rim of the bowl (e.g., on top of a pile of apples). I will not go into details about how this meaning extension can be explained and resolved, as this will lead me too far astray, and I refer the interested reader to Herskovits (1986), Feist (2000) and Zwarts (2008b).

Zwarts (1997) and Zwarts and Winter (2000) note that locative phrases can be modified by measure phrases, as for example in *ten meters above the roof*. For that reason they propose to analyze them in terms of **vector spaces**. Thus, a locative phrase like *above the roof* is associated with the set of vectors which start from the roof and point upwards. The modified phrase *ten meters above the roof* then simply denotes the intersection between two sets — the set of all the vectors that have their starting point at the roof and point upwards and the set of all vectors that are ten meters long. Thus, for a simple (unmodified) locative phrase, Zwarts and Winter (2000) define the following functions:

(2) a. *loc* – assigns to the Ground the set of points it occupies (i.e., its *eigenspace*)
b. P – assigns to the set of points occupied by the Ground a set of vectors
c. loc^{-} – assigns to the set of vectors a set of points, that is, turns the set of vectors back into a region.

Svenonius (2008) shows how this semantic analysis of locative phrases can be implemented in syntax and discusses what bits of information each of the different projections it consist of adds to the structure. I refer the interested reader to the works cited and will restrain myself from an exhaustive discussion, as the main contribution of this thesis lies elsewhere. As to the semantics of locative phrases, I assume that they denote regions, which is what both approaches agree on at the end of the day.

5.3 The semantics of Goal

In this subsection, I turn to the semantic contribution of the Goal head. The Goal head takes as a complement a stative Place projection, just like the Path head in the generally accepted structure [Path [Place]]. It is therefore worth investigating what semantics has been proposed for the Path head in the literature.

The are several approaches to Path semantics. According to the mereological approach, paths are seen as part structures (Krifka 1998, Piñón 1993). Kracht (2002; 2008) analyzes them as spatiotemporal entities. Finally, there is a family of approaches that treat paths as atemporal sequences of locations (Wunderlich 1991, Herweg and Wunderlich 1991), regions (Nam 1995), or vectors (Zwarts 2005).

Yet another approach is taken in Fong (1997). Fong proposes that directional predications are not necessarily related to movement in space only. They can apply to various types of ordered structures, as for example, static orders with no temporal reference (see (3)), or aspectual (temporal) orders (see the Finnish example in (4)).

(3) a bridge out of San Francisco (Fong 1997:2)

(4) Finnish (Fong 1997:26)

a. Tuovi unohti kirja-n auto-on.
Tuovi forgot.3SG *book*-ACC *car*-ILL
'Tuovi forgot the book in the car.'
(lit. Tuovi forgot the book into the car)

b. Tuovi löysi kirja-n laatiko-sta.
Tuovi found.3SG *book*-ACC *box*-ELA
'Tuovi found the book in the box.'
(lit. Tuovi found the book out of the box)

To account for this, Fong develops a very abstract semantics for directionals. She posits a diphasic structure for the objects and events they operate on and suggests that directional phrases are sensitive to the linear ordering of these phases. Diphasic means roughly that there is a transition from a phase of not-p (¬p) to a phase where p holds (or vice versa) and it is monotone, that is, once p is obtained, there cannot be a development back to ¬p. The semantic interpretation of a directional expression is dependent on the phase in which its truth is evaluated. Thus, Illative (i.e., *into*) predicates take as interval the monotone development from ¬p to p, where the truth of the predicate LOC-IN(a,b) is evaluated in the second phase. Elative (i.e., *out of*) predicates take the same diphasic interval, however the truth of LOC-IN(a,b) is evaluated in the first phase. In this way, Fong can account for the use of directional cases in Finnish in non-motion contexts. The difference between Finnish and English directionals is that Finnish directional cases encode phasal transitions, but not necessarily spatial transitions, while English directional PPs always define spatial transitions.

I agree with Fong's proposal that directional prepositions, like *into* and *out of*, involve a transition. I therefore suggest that the semantic contribution of the Goal head is to encode **transition** from one region to another. This proposal is further motivated by the fact that Goal paths have a two-stage structure: a negative phase and a positive phase where the locative relation between Figure and Ground obtains (see (5), repeated from (5), Chapter 1).

(5) Goal paths
$- - - - - + + + + +$
0 1 Zwarts (2008a)

This suggestion is also compatible with analyses developed by Wunderlich (1991), Zwarts (2005; 2008a) and Kracht (2008), who have transitions as part of the (Goal and Source) path semantics in one way or another. Wunderlich (1991), for instance, introduces a CHANGE predicate constant, which expresses transition from one region to another. This CHANGE predicate is part of the general scheme for directional prepositions proposed by Wunderlich.

(6) λv, λu CHANGE(D, LOC(u, R[v])) (Wunderlich 1991:603)

In (6), D specifies some dimension in which the transition takes place. In the first phase of D, LOC(u, R[v]) is false, and in the second phase of D, LOC(u, R[v]) is true. D is very often a temporal dimension that is mapped onto a spatial dimension, e.g., in *Mary ran into the room.* D can be, nevertheless, spatial only, as in *It is raining into the room.* When D is temporal, then CHANGE[D, ϕ] becomes equivalent to Dowty's (1979) BECOME operator.

(7) [BECOME ϕ] is true at an interval I iff (i) there is an interval J containing the lower bound of I such that $\neg\phi$ is true at J, (ii) there is an interval K containing the upper bound of I such that ϕ

is true at K ..., there is no non-empty interval I' such that $I' \subset I$ and conditions (i) and (ii) hold for I' as well as I.

Thus, with the help of a CHANGE or a BECOME operator, we can capture the semantics of the Goal head. It will then encode a single punctual transition from a phase where a particular locative relation does not hold to a phase where it holds.

To sum up, the semantic content of the Goal head is that of transition to the spatial region encoded by the Place projection in its complement. The location denoted by PlaceP consequently holds of the end-point p(1) of the Goal path.

5.4 The semantics of Source

Let us now turn to the semantics of the Source head. Recall that Goal and Source paths group together to the exclusion of Route paths by the property of being mono-transitional (i.e., they both contain *one* transition). As I proposed in Section 4.2, in syntax, the Source head takes as a complement a Goal phrase. The Goal head already expresses a transition, therefore, the semantics of the Source head cannot be that of a transition, as that would lead to a path with two transitions, and this is not a Source path.

As discussed in Chapter 2, Section 2.7, Goal paths and Source paths are constructed in the same way, but are the mirror images of each other. In other words, Source paths can be seen as the opposite of Goal paths (as also suggested in Zwarts 2005; 2008a). Therefore, I propose that the Source head is the locus of a semantic **reversal operation**. Thus, the Source head just reverses the orientation of the path provided by the [Goal [Place]] configuration keeping all other things equal. More precisely, the Source head assigns to each point i in the interval [0,1] the position that is assigned to $1-i$ in the denotation of the Goal path, where 0 and 1 represent the starting point and the end-point of the path, respectively. Thus, the starting point p(0) in the Source path will be assigned the position of the end-point p(1) in the Goal path. Likewise, p(1) in the Source path will be assigned the position of p(0) in the Goal path. The result is that the positively located end-point in the Goal path becomes the starting point of the Source path. In this way, the spatial domain encoded by the Place head will hold of the first phase of the Source path, leading to a path of the type $+++---$.

The reversal encoded by the Source head resembles a negation function. In this sense, my proposal is similar to the treatment of Source phrases by Arsenjević (2006) who analyses the so-called Source modifiers (for instance Slavic spatial prefixes like *iz-* 'from') as being more complex than Goal modifiers and crucially involving negation of Goals. In the same line, Svenonius (2009b) suggests that English Source particles like *out* and *off* are endowed by the feature *neg*, accounting for the observation that they license NPIs, which otherwise occur in the scope of negation. The same idea is also expressed by Dirr (1905), cited in Kurbanov (1990), and in the Tabasaran grammar by Magometov (1965). These authors suggest that the special element *ud-*, which attaches to locative-directional verbal prefixes to derive source-oriented prefixes in Tabasaran, is a "negative particle" (Dirr 1905) or an element related to negative particles (Magometov 1965).

In sum, I suggest that Source paths are semantically more complex than Goal paths in that the former involve an additional reversal operation. One could, however, imagine the opposite scenario where Goal paths are built on top of Source paths. This raises the question of whether the greater complexity of Source paths is accidental or it is conditioned by some factors, possibly lying outside the domain of syntax proper. In the following paragraphs, I develop a tentative suggestion that the more complex syntax and semantics of Source paths reflects a general property of human cognition.

My proposal consists in relating the greater complexity of Source paths to the so called Goal bias, established by Lakusta (2005), Lakusta and Landau (2005), Assadollahi et al. (2006), inter alia. The Goal bias is the term for the natural preference to encode end-points (Goals) over starting points (Sources) in the representations of events. Thus, both children and adults prefer to linguistically express Goals over Sources when describing motion events, change of state events, change of possession events, etc. This perceptual and attentional asymmetry is reflected, in addition, in language acquisition (see Lakusta and Landau 2005 and references therein). On the basis of experimental data, Lakusta and Landau conclude that the Goal bias is a conceptual one and suggest that it also influences the grammar.

A possible way in which the Goal bias is reflected by the grammar can be found in Ikegami's (1982) "Goal over Source principle." The formulation of this principle is motivated by Ikegami's observation that languages are not symmetrically organized with respect to the notions Source and Goal. An example of this asymmetry is the fact that Source markers are consistently a marked term in relation to the Goal marker, e.g., the Goal reading of the English adverbs *here* and *there* does not require special marking, while the Source reading requires the preposition *from* (*from here* and *from there*).[1] The Goal-Source asymmetry in grammar has also been observed by Levin (1993) who notices that some verbs take a Source argument only in the presence of a Goal argument.

(8) a. The witch turned him from a prince into a frog.
b. The witch turned him into a frog.
c. *The witch turned him from a prince.

My suggestion is that Source paths are construed as more complex than Goal paths (and not the other way around) because of this Goal-Source asymmetry in the cognitive system. In other words, Goal paths, which are the preferred choice in describing a motion event, correspond to a simpler syntactic and semantic structure. Source paths, which are apparently conceptually more complex, correspond to richer syntactic and semantic structure. From this proposal it follows that the Goal bias is in fact hardwired in the grammar in that it is reflected by distinct structures for the two kinds of paths (see, however, Gehrke 2008 for the opposite view).

5.5 The semantics of Route

In this subsection, I turn to non-oriented paths, derived in syntax by adding a Route head on top of the Source path structure. A Source path is, as already discussed, mono-transitional and has its first phase as the positive phase.

(9) Source path
+ + + + + − − − − −
0 1 Zwarts (2008a)

Route paths are bi-transitional and they have the positive phase "in the middle," that is, the locative relation between the Figure and the Ground holds of some intermediate points of the path. On the basis of these observations, I suggest that the Route head is another transitional head which encodes a transition to a positive phase. Applied to a Source path,

[1] Interestingly, Ikegami includes in his discussion of the markedness of Source the adversative prefix *un-*, suggesting that a verb like *bind* is related to the notion of Goal, while *un-bind* is related to the notion of Source. This is in line with the proposal that the notion of Source includes a reversal semantics.

the Route head leads to a path that has the following shape:

(10) Route path
$- - - - + + + + - - - - -$
0 1 Zwarts (2008a)

The whole computation is represented in (11), step by step.

(11) The syntactic and semantic derivation of a Route path

a. [Place ...]
b. merger of Goal →
c. [Goal [Place ...]] representing a path of the shape $---+++$
d. merger of Source →
e. [Source [Goal [Place ...]]] → reversal of Goal path → $+++---$
f. merger of Route →
g. [Route [Source [Goal [Place ...]]]] → adding a second transition → $---+++---$

This particular proposal for Routes reflects the bi-transitional character of bounded Route paths: the first transition — from the positive (middle) phase to the negative (final) phase — is contributed by the [Source [Goal Place]] structure; the second transition — from the negative (first) phase to the positive (middle) phase — is the contribution of the Route head.

If [Route [Source [Goal [Place ...]]]] is the right universal syntax-semantic structure for paths, we have a possible explanation for the nonexistence of "return prepositions" such as **tsap* in (11), Chapter 2, which are supposed to be of the shape $+++---+++$. In a *past* Route path, the location to which the path relates holds of the middle (positive) part of the path. The first transition, contributed by the Route head, is from a negative to a positive phase, just like in a Goal path. The second transition is from a positive to a negative phase, just like in a Source path. Thus, as already discussed in Chapter 2, a *past* Route path can be seen as the concatenation of a Goal path with a Source path. In syntax this is reflected by the Route head encoding a transition to a positive phase, like a Goal head, and taking as a complement a Source phrase.

In a **tsap*-path, the location to which the path relates holds of the beginning and the end of the path and the middle portion of the path is a negative phase. The first transition in a **tsap*-path is therefore from a positive to a negative phase, just like in a Source path. The second transition is from a negative to a positive phase, just like in a Goal path. What we then need, in order to derive such a path, is that the Route head encodes a transition to a negative phase and takes as a complement a Goal path. The Route head, however, encodes a transition to a positive phase, hence it cannot apply directly to GoalP, as the semantic computation of the structure [Route [GoalP]] will fail.

The question then boils down to why there is no transitional head in addition to the transitional heads Goal and Route that, unlike Goal and Route, encodes a transition to a negative phase and hence can take as a complement a Goal structure. Under the view developed in this thesis, a transition of the type $+{+}{+}{-}{-}{-}$ is a *derived* transition, the result of reversing a Goal-type transition to a positive phase $-{-}{-}{+}{+}{+}$. This implies that transitions to a positive phase are in a sense "more basic," which is, in fact, expected given the Goal bias discussed in the preceding section. Thus, I propose that the lack of a transitional head encoding transition to a negative phase by itself is due to the derived status of such a transition, obtainable only by reversing a Goal-type transition.

Note that even if we add another reversing head on top of the Route head in the structure [Route [Source [Goal [Place ...]]]], we will not derive a **tsap*-path of the shape $+{+}{+}{-}{-}{-}{+}{+}{+}$. The result will be again a *past*-path $-{-}{-}{+}{+}{+}{-}{-}{-}$. The semantics I proposed for the reversing Source head is that it assigns to each point i in the interval [0,1] the position that is assigned to $1{-}i$ in the denotation of the path in the complement position, i.e., the Goal path. When we apply this reversal operation to a Route path $-{-}{-}{+}{+}{+}{-}{-}{-}$, what we get is the following: the starting point 0 of the reversed Route path will be assigned the position assigned to the endpoint 1 of the non-reversed Route path (taking $i = 0$, $1 - 0 = 1$), that is, a minus value. The endpoint 1 of the reversed Route path will be assigned the position assigned to the starting point 0 in the non-reversed Route path (taking $i = 1$, $1 - 1 = 0$), that is, a minus value again. Hence, a reversed Route path will begin and end with a negative phase, just like a non-reversed Route path and, crucially, will not lead to a path of the shape $+{+}{+}{-}{-}{-}{+}{+}{+}$.

Before concluding this section, let me say a couple of words about a prediction made by the Route structure defended here regarding the conceptual bias to encode certain types of paths over others. Recall that at the end of the preceding section, I suggested that there is a correlation between the preference for Goal paths over Source paths and the greater complexity of the syntax-semantic structure underlying the latter. If this is correct, then we expect that the even greater complexity of Route paths will correlate with a disinclination to use Route paths compared to both Source and Goal paths. Indeed, the psycholinguistic study of Stefanowitsch and Rohde (2004) shows that Source PPs, although less frequent than Goal PPs in motion event representations, still occur more often than Route PPs (called trajectory in their terminology). Thus, if the suggested correlation holds, then this can be seen as indirect evidence for the proposal that Route paths are built on top of Source paths.

5.6 The semantics of non-transitional paths

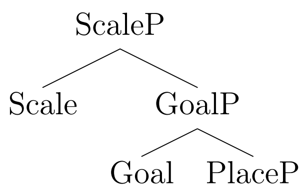
In this section, I turn to non-transitional paths and investigate the semantic contribution of the Scale head I proposed in Chapter 4, Section 4.4. In order to remind the reader of the terminology, I present an overview of the transitional and non-transitional paths in Table 5.1, repeating the relevant rows from Table 2.2.

	Goal	Source	Route
Transitional	Cofinal *to X* −−−−++++ 0 1	Coinitial *from X* ++++−−−− 0 1	Transitive *past X* −−−+++−−− 0 1
Non-transitional	Approximative *towards X* −−−−−−−−−− 0 1	Recessive *away from X* −−−−−−−−−− 0 1	Prolative *along X* ++++++++++ 0 1

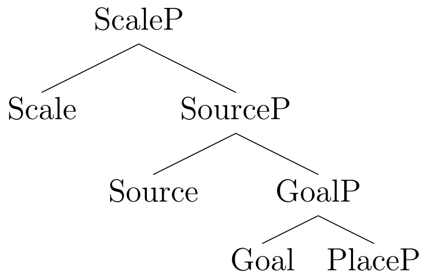
Table 5.1: Transitional and non-transitional paths

In the preceding chapter, I proposed that, syntactically, non-transitional Goal, Source and Route paths are derived on the basis of the corresponding transitional path by the addition of a Scale head, as shown in (12).

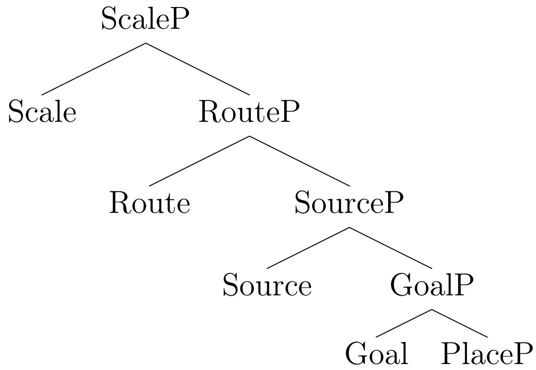
(12) a. Non-transitional Goal (Approximative) paths



b. Non-transitional Source (Recessive) paths



c. Non-transitional Route (Prolative) paths



I labeled this head Scale, because, in the case of oriented (Goal and Source) non-transitional paths, it imposes a specific ordering on the points of the path in its complement. More specifically, Approximative paths are such that at each subsequent point in the interval [0,1] the Figure is closer to the Ground. Recessive paths are the mirror image of Approximative paths, such that at each subsequent point in the interval [0,1], the Figure is farther away from the Ground. I suggested that graphically Approximative and Recessive paths are represented as a sequence of minuses, where the darker shade of the minus reflects a greater distance to the location denoted by PlaceP (see the last row in Table 5.1).

In the case of Prolative paths, the Scale head applies to a bi-transitional path structure to return a sequence of points where the location encoded by PlaceP holds of each of the points in the newly derived path. Thus, Prolative paths are different from Approximative and Recessive paths in that the former contain just plusses (i.e., at each point the locative relation between the Figure and the Ground holds), while the latter two contain just minuses (i.e., at no point in the path does the locative relation encoded by PlaceP hold). Semantically then, when applying to a Transitive path, the Scale head has to pick out (an interval from) the positive phase of the path in its complement, so that the result is a path made just out of plusses. Conversely, when applying to Coinitial and Cofinal paths, the Scale head has to pick out (an interval from) the negative phase, so that we get a path containing just minuses.

Before phrasing this idea in more formal terms, let me introduce an "auxiliary" function VAL which assigns the values 1 and 0 to the points in the path, depending on whether they are positively or negatively located, viz., depending on whether the location denoted by PlaceP holds, or does not hold of the point $\mathrm{p}(i)$, respectively.

(13) a. Let $\textsc{Val}(\mathrm{p}(i))=1$ iff $\mathrm{p}(i)$ is a positively located point.
b. Let $\textsc{Val}(\mathrm{p}(i))=0$ iff $\mathrm{p}(i)$ is a negatively located point.

With the function VAL in hand, I propose the following semantics for the Scale head.

(14) The Scale head is a function from a path p to a path p′ which picks out the unique interval I, for which
a. if $\mathrm{p}(0)$ is negative, then $\mathrm{p}'(1)=\mathrm{p}(i_{\mathrm{n}})$, such that $\textsc{Val}(\mathrm{p}(i_{\mathrm{n}}))\neq\textsc{Val}(\mathrm{p}(i_{\mathrm{n+1}}))$
b. if $\mathrm{p}(1)$ is negative, then $\mathrm{p}'(0)=\mathrm{p}(i_{\mathrm{n}})$, such that $\textsc{Val}(\mathrm{p}(i_{\mathrm{n}}))\neq\textsc{Val}(\mathrm{p}(i_{\mathrm{n-1}}))$

What (14) says in prose is that the Scale head selects a portion from the path in its complement such that it is to the left and to the right of the transition and this portion corresponds to the new path. The transition is defined in (14) as the point where the value at a point i_{n} is different from the value of the next point $i_{\mathrm{n+1}}$, or the preceding point $i_{\mathrm{n-1}}$. Note that, in this way, the Scale head also cuts out the transition itself, thus capturing the fact that Approximative, Recessive and Prolative paths do not involve any transition.

Let us now discuss in more detail precisely what intervals the Scale head picks out when operating on the various kinds of transitional paths. Starting with Cofinal (Goal) paths, we have to apply the rule in (14a), because $\mathrm{p}(0)$ is negative in these paths. The new path p′ will be such that its end-point, $\mathrm{p}'(1)$, will be the last point before the transition, that is the point $\mathrm{p}(i_{\mathrm{n}})$ which has a different value from the point right after it $\mathrm{p}(i_{\mathrm{n+1}})$. Thus, the interval picked out by the Scale head will be entirely in the negative phase of the Cofinal path, either a sub-interval of it, or the whole negative phase, as shown in (15a).

When the path on which the Scale head operates is a Coinitial (Source) path, the rule in (14b) is the relevant one, as Coinitial paths have the end-point p(1) as the negative point. In the new path p′, the starting point p′(0) will be the first point after the transition, that is the point p(i_n) which has a different value from the point before it p(i_{n-1}). Thus, again the interval selected by the Scale head will lie entirely in the negative phase, as shown in (15b).

Finally, when applying to Route paths, both rules in (14a) and (14b) are relevant, as Route paths have both extreme points defined as negative location. This means that the interval picked out by the Scale head has to be both to the left and to the right of the transitions. The unique interval which matches these conditions is the positive phase of the Route path, as it both precedes and follows a transition. Thus, the end-point p′(1) of the derived Prolative path will be the last point in the positive phase and the starting point p′(0) will be the first point of the positive phase of the Transitive path, as shown in (15c).

(15)
a. Scale applied to a GoalP $\boxed{-----}+++++$
$0 \quad\quad i_5\, i_6 \quad\quad 1$

b. Scale applied to a SourceP $+++++\boxed{-----}$
$0 \quad\quad i_5\, i_6 \quad\quad 1$

c. Scale applied to a RouteP $---\boxed{++++}---$
$0 \quad i_3\, i_4 \quad\quad i_7\, i_8 \quad 1$

Note, however that the shape of the non-transitional paths suggested in (15) fits only with the graphic representation of non-transitional Route paths, like the one encoded by the English preposition *along*, which are construed as a sequence of points at each of which the location encoded by PlaceP holds (see (16), repeated from (19), Chapter 2).

(16) *along*-Path
\+ + + + + + + + + +
0 1 Zwarts (2008a)

When it comes to non-transitional Goal and Source paths, they are not only a sequence of points at which the Figure is not at the Ground, but there is in addition an ordering between these points such that the distance between the Figure and the Ground decreases or increases. This necessitates yet another add-on to the semantics of the Scale head. What I suggest is that the Scale head maps the picked out negative interval on a gradient closeness scale, such that the “closer” a point was to the positively located extreme point in the original path p, the closer the Figure is located to the Ground at that point. In more technical terms, the ordering of the points is defined as follows.

(17) a. if p(1) is positive, then for each pair p′ (*i*) and p′ (*j*), if *i*<*j*, then at p′ (*j*) the Figure is closer to the Ground than at p′ (*i*).
b. if p(0) is positive, then for each pair p′ (*i*) and p′ (*j*), if *i*<*j*, then at p′ (*i*) the Figure is closer to the Ground than at p′ (*j*).

The condition in (17a) gives us an Approximative path of the shape in (18).

(18) – – – – – – – – –
0 1

While the condition in (18b) derives a Recessive path, shown in (19).

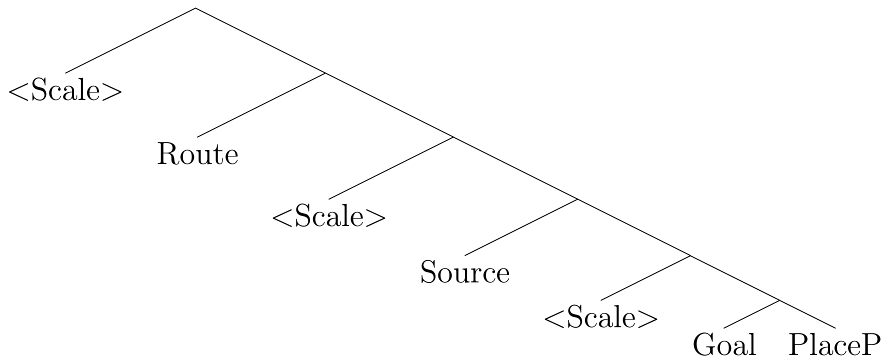
(19) – – – – – – – – –
0 1

Note that, in the case of a Prolative path, derived on the basis of a Transitive path by the application of the Scale head, the conditions in (17) do not play a role. The reason is that the extreme points of a Transitive path are negatively defined. Since the antecedents in the material implications in (17) are therefore false, no inference can be made concerning the consequents. This means that we do know know anything as to the comparative distance between the Figure and the Ground at the points p(*i*) or p(*j*). That is, the Figure can be equidistant from the Ground at p(*i*) and p(*j*), or closer to the Ground at one of the two points or the other. This is a welcome result, given that a path like *along the river* does not necessarily involve points where the distance between the Figure and the river is constant or increases/decreases monotonically. As discussed by (Zwarts 2005:752), at some of the points, the Figure can be farther away from the river than at others, but the path still counts as an *along*-path.

Let us now turn to the position of the Scale head in the sequence of syntactic heads. As shown in (12), it can appear on top of a Goal, a Source or a Route head and the question is how to capture its varying positioning. One way is to assume that there is a functional sequence in the sense of Cinque (1999), where heads are arranged in a rigid hierarchical order. The Scale head will then have a fixed position above the Route projection. This will give the hierarchy in (12c) as the full-blown structure. However, this is the structure for a non-transitional Route path. In order to explain how non-transitional Source and Goal paths come to be, one will have to assume that certain projections from the "middle" of the structure can be missing. Thus, a non-transitional Source (Recessive) path will be basically part of the same functional sequence, but, crucially, the Route projection will be absent. Similarly, a non-transitional Goal (Approximative) path will be represented by a syntactic structure where the Route and the Source projections are not there.

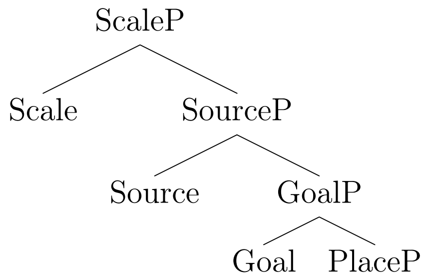
Another way to deal with the placement of the Scale head in the structure is to assume that Scale does not have a fixed position in the functional sequence but can appear anywhere, as long as its complement is a kind of a path: a RouteP, a SourceP, or a GoalP. In this way Scale will resemble Cinque's (1999) Neg head, which, too, can appear in different positions in the functional sequence. This assumption entails that Scale can appear *between* Source and Goal and *between* Route and Source. The possible positions for Scale are given in the structure in (20).

(20)

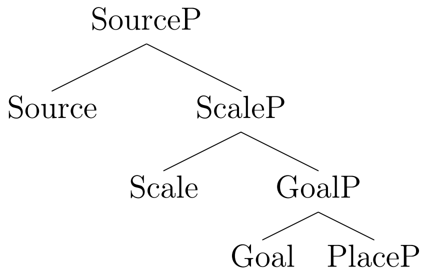


The consequence of a multiple positioning of the Scale head is that now we have *two ways* to construct a Recessive path. Consider the following two scenarios.

(21) **Non-transitional Coinitial path**: We first construct a Cofinal path, then apply the reversing Source head to get a Coinitial path and then apply the Scale head to get a Recessive path.



(22) **Reversed Approximative path**: We first construct a Cofinal path, then apply the Scale head to get an Approximative path and then apply the reversing Source head to get a Recessive path.



The two structures underlying a Recessive path will have the same semantics. In the first case, (21), the Scale head applies to a Coinitial path and picks out an interval from the negative phase, and, for each pair p(i) and p(j), if i<j, the location of the Figure at p(i) will be closer to the Ground than at p(j) (see the rules in (14b) and (17b)). This leads to a path with the following graphic representation.

(23)

In the second case, (22), the Scale head applies to a Cofinal path to derive an Approximative path in a way analogical to the one just described for Coinitial path (but by applying the rules in (14a) and (17a)). The reversing Source head then operates not on a transitional Cofinal path (as discussed in Section 5.4), but on an Approximative path of the shape in (24).

(24)

0 l k 1

5m 3m

Applying the Source head to the path in (24) will derive the path represented in (23). Recall that the Source head assigns to each point i in the output path p′ the position at point $1-i$ in the input path p. Let p′(i) be the third point in the output path. It will be then assigned the position at point $1-i$ in the Approximative path in (24), that is, the position at the third last point, called p(k) for short. Similarly, let p′(j) be the third last point in the output path p′. It will be assigned the position at the third point in the input path, called p(l) for short.

(25) a. p(k) $\rightarrow$ p′(i)
b. p(l) $\rightarrow$ p′(j)

To make things less abstract, suppose that, at p(l) the Figure is 5 meters away from the Ground and, at p(k), it is 3 meters away from the Ground. Then, in the reversed path in (26), at p′(i) the Figure will be 3 meters away from the Ground and, at p′(j), it will be 5 meters away from the Ground. In other words, the distance between the Figure and the Ground will be getting *bigger* the closer we are to p(1) and the thus derived path will have the following shape.

(26) – – – – – – – – – – –
0 i j 1
3m 5m

To sum up, both scenarios in (21) and (22) lead to a Recessive path of the same type and the question is which of the two possible solutions to the positioning of the Scale head is the correct one, the missing heads solution or the varying positioning of Scale solution.

The empirical data suggests that the second solution is on the right track, as it correctly captures the variation in the morphological expression of Recessive paths. Both strategies in (21) and (22) are represented in the languages of the world.

There are languages where Recessive paths are built by having the Scale head apply to an already constructed Coinitial path. Such languages are Tabasaran, where this head is lexicalized by the morpheme -*di*, and Avar, where Scale is spelled out by the morpheme -*ɣun*, as shown in (27) and (28), respectively.

(27) Tabasaran (Hanmagomedov 1967)

a. aərabaji-'-na
cart.ERG-IN-ALL
'into the cart'
(Cofinal)

b. aərabaji-'-na-di
cart.ERG-IN-ALL-SCALE
'towards the cart'
(Approximative)

c. aərabaji-'-an
cart.ERG-IN-ABL
'out of the cart'
(Coinitial)

d. aərabaji-'-an-di
cart.ERG-IN-ABL-SCALE
'away from the cart'
(Recessive)

(28) Avar (Uslar 1889)

a. wáccass-de
brother.ERG-ON.ALL
'onto the brother'
(Cofinal)

b. wáccass-de-ɣun
brother.ERG-ON.ALL-SCALE
'towards the brother'
(Approximative)

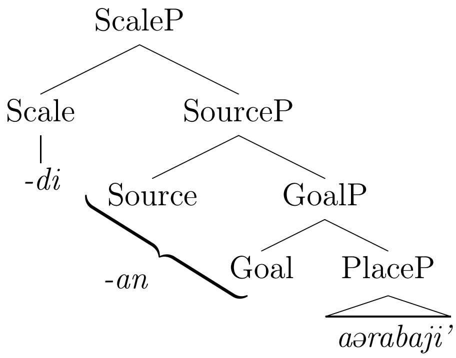
c. wáccass-da-ssa
brother.ERG-ON-ABL
'from the brother'
(Coinitial)

d. wáccass-da-ssa-ɣun
brother.ERG-ON-ABL-SCALE
'away from the brother'
(Recessive)

The a-examples in (27) and (28) show a transitional Goal path. The b-examples illustrate how the addition of the morpheme *-di* and *-ɣun* to the transitional Goal path derives an Approximative path. The c-examples represent a transitional Source (Coinitial) path. And, finally, the d-examples show that Recessive paths are built by adding the same "Scale" morpheme *-di* and *ɣun* to the Coinitial path — the case we are interested in here.

Note that, while the Scale, Allative and Locative morphemes in the Tabasaran examples in (27) spell out one head each, the Ablative case suffix *-an* spells out two heads — Goal and Source. This is a possibility I discussed in Chapter 3, Section 3.3, where I suggested the need of a theory which allows a single morpheme to spell out multiple heads. Similarly, in Avar, the Ablative *-ssa* lexicalizes both Goal and Source. As to the Avar Allative *-de*, one can in principle assume that it, too, lexicalizes two heads — Place and Goal, However, the composition of the Allative in the other locative series in Avar (see Table 4.4) rather suggests that *-de* is a bimorphemic marker *-da-e*, where the vowel /a/ does not surface because of the following /e/. Below, I present the syntactic structure underlying the Tabasaran Recessive expression and its lexicalization (postponing the discussion of the precise linearization of the elements until Chapter 7, Section 7.2).

(29)



The second possible way to construct a Recessive path, shown in (22), is found in languages like Dime and Bulgarian, where the Source head applies to a pre-constructed Approximative path. For an illustration, see the data in (30) and (31), repeated from Chapter 4, (5) and (6), respectively.

(30) a. šiftaye taddeseka-bow tiŋ-i-n.
Shiftaye taddese.COM-DIR *go*-PERF-3
'Shiftaye went towards Taddese.'

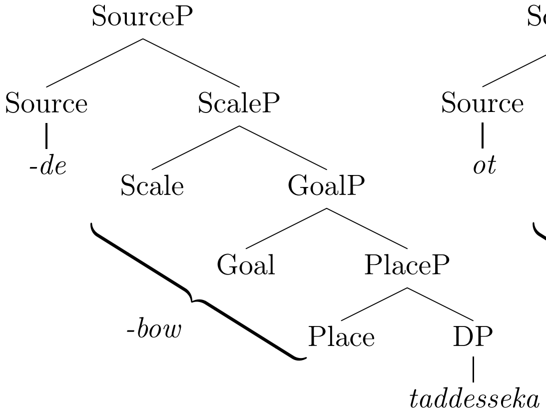
b. šiftaye taddeseka-bow-de ʔád-i-n.
Shiftaye taddese.COM-DIR-ABL *come*-PERF-3
'Shiftaye came from the place where Taddese is found.'

(31) a. kəm kəshta-ta
towards house-DEF
'towards the house, in the direction of the house'

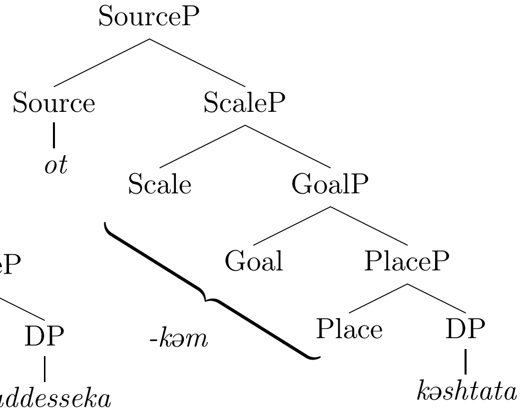
b. ot-kəm kəshta-ta
from-towards house-DEF
'from the direction of the house'

Here, again, we have an instance of one morpheme spelling out multiple heads, namely, the approximative -*bow* and *kəm*, which lexicalize Place, Goal and Scale. In (32), I illustrate how the base structure is lexicalized in Dime and Bulgarian, again deferring the discussion of the linearization to Section 7.2.

(32) a. Dime



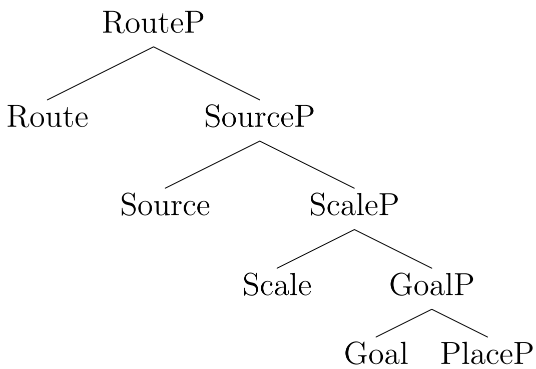
b. Bulgarian



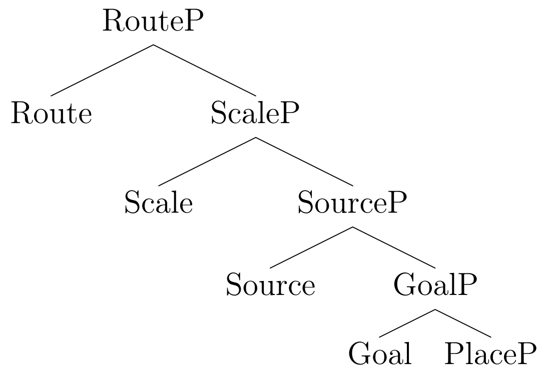
To recapitulate, the hypothesis that the Scale head can appear in one of several positions in the functional sequence makes the correct prediction that Recessive paths can be constructed in two ways: as non-transitional Coinitial paths (Tabasaran, Avar) and as reversed Approximative paths (Dime, Bulgarian).

When it comes to the structure of non-transitional Route paths, there are three possible positions for the Scale head in the sequence of heads – between Goal and Source, between Source and Route and above Route. The respective structures are shown in (33a-c).

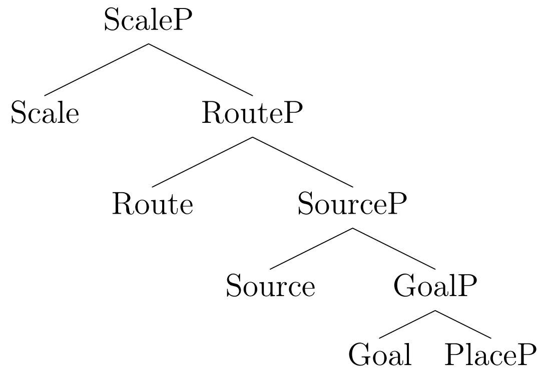
(33) a.



b.



c.



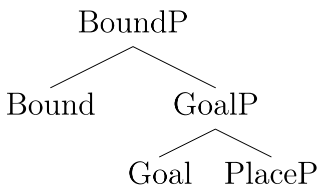
From the three structures above only the one in (33c) is semantically computable. Recall from Section 5.5 that the Route head encodes a transition to a positive phase. In (33a) and (33b), however, the Route head takes as a complement a Recessive path, which has no such positive phase (see the graphic representation of Recessive paths in Table 5.1). For that reason, the semantic computation of (33a-b) will fail. Hence, the only way to construct a Prolative path is the one in (33c), where first the Route head applies to a Coinitial path, whose first phase is positive, and the Scale head subsequently applies to the Transitive path.

To sum up this section, I suggested that the semantic role of the Scale head is to pick out a unique interval from the path structure below it, such that it is to the left and to the right of the transition(s). In addition, it imposes an order in the selected interval such that, at the points "closer" to the positive extreme points (1 for Goal paths and 0 for Source paths), the Figure is closer to the Ground than at the points "farther away" from the positive extreme point. Since the extreme points in Route paths are not positive, there is no mapping on a closeness scale in non-transitional Route paths.

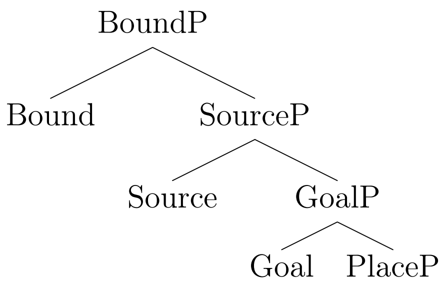
5.7 The semantics of delimited paths

I now turn to the semantic function of the last head I proposed in the decomposed Path structure — the Bound head which is part of the syntax of Goal and Source-oriented delimited paths (see the structures in (34), repeated from Chapter 4).

(34) a. Delimited Goal (Terminative) paths



b. Delimited Source (Egressive) paths



As discussed in Chapter 2, delimited paths split into Goal-oriented delimited paths, which I called Terminative, and Source-oriented delimited path, which I labeled Egressive. The two kinds of delimited paths contrasted with Cofinal and Coinitial paths in that delimited paths set the location denoted by PlaceP as the limit of movement (see Table 4.7 for an overview over the four kinds of paths). The minimal pair in (35), repeated from (25) and (26), Section 2.5, illustrates the difference between a Terminative and a Cofinal path.

(35) a. The boy ran up to the house. (Terminative path)
b. The boy ran to the house. (Cofinal path)

As I suggested in Chapter 2, the difference in the meaning between the two sentences is that, in (35a), the boy runs as far as the house, that is, once he reaches it, he stops, whereas in (35b), the boy can continue along a path that is contained within the location. I proposed that the distinction between the two types of paths is that the Terminative one involves just one point (more precisely, the end-point) where the locative relation between the Figure and the Ground holds, hence the interpretation that the location is the limit for the movement along the path. The positive phase of Cofinal paths, by contrast, can contain a whole sequence of positive locations, therefore there is no such effect. Below, I present the graphic representation of the paths in (35a) and (35b), repeated from Chapter 2, Section 4.7.

(36) Terminative path

$- - - - - - - - - - +$

0 1

(37) Cofinal path

$- - - - - + + + + +$

0 1

The Source-oriented Egressive paths are the mirror image of Terminative paths, i.e., paths where the location specified by the Ground is true only of the starting point of the path (see (38)), thus contrasting with Coinitial paths (see (39)).

(38) Egressive path

$+ - - - - - - - - - -$

0 1

(39) Coinitial path

$+ + + + + - - - - - -$

0 1

If this suggestion is on the right track, then the semantic function of the Bound head is to "cut away" all but one point from the positive phase of the path in its complement. In other words, I suggest that the Bound head picks out an interval from the path structure it applies to which contains the negative phase and one point from the positive phase. This can be formalized as follows.

(40) The Bound head is a function from a path p to a path p′ which picks out an interval I, for which

a. if p(1) is positive, then $p'(1)=p(i_n)$, such that $\textsc{Val}(p(i_n)) \neq \textsc{Val}(p(i_{n\text{-}1}))$

b. if p(0) is positive, then $p'(0)=p(i_n)$, such that $\textsc{Val}(p(i_n)) \neq \textsc{Val}(p(i_{n+1}))$

What (40) says in simple words is that, in the case of Goal paths, where the end-point p(1) is positive, the Bound head selects an interval whose end-point is the first point after the transition. In this way, we ensure that the end-point in the new path is a positively defined point and that it is unique. Similarly, in Source paths, where the starting point p(0) is positive, the picked out interval begins with the last point before the transition, thus leading to a path which begins with a unique positive point, followed by a transition to a negative phase. Graphically, the selected intervals can be represented as follows:[2]

(41)

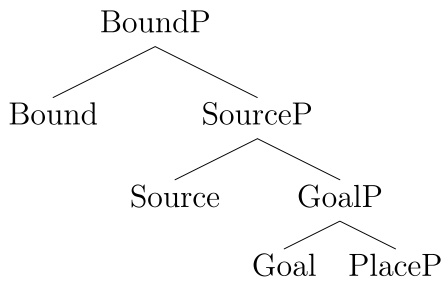
a. Bound applied to a GoalP $\boxed{-----+}++++$
$0 \quad i_5\, i_6 \quad 1$

b. Bound applied to a SourceP $++++\boxed{+-----}$
$0 \quad i_5\, i_6 \quad 1$

According to (40), the Bound head does not operate on Route paths, which have both p(0) and p(1) negatively defined. This correctly captures the fact that there are no delimited counterparts to Route paths, as discussed in Chapter 2, Section 4.7.

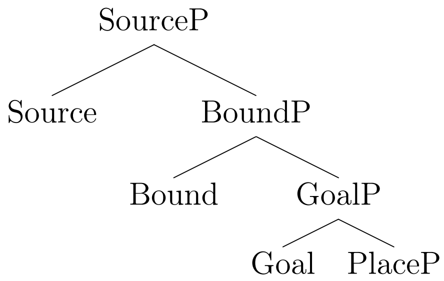
Before concluding this section, one more remark is in order. Assuming that the Bound head does not have a fixed position in the Path *fseq* just like the Scale head, there are two possibles ways to construct an Egressive path. Those are presented in (42) and (43) below:

(42) **Delimited Coinitial path**: We first construct a Cofinal path, then apply the reversing Source head to get a Coinitial path and then apply the Bound head to get an Egressive path.



[2]According to the formulation in (40), it is left unspecified whether the whole negative phase is included in p′, as shown in (41), or just a part of it. In both cases p′ will be a delimited path.

(43) **Reversed Terminative path**: We first construct a Cofinal path, then apply the Bound head to get a Terminative path and then apply the reversing Source head to get an Egressive path.



We already saw an example of the Egressive path built according to the strategy in (42). The example was provided by the Permic language Udmurt in Chapter 4, Section 4.5, where the Egressive marker morphologically contained the Coinitial Elative case marker. I repeat the data below.

(44) Udmurt (Winkler 2001)

a. anaj gurt-iś́ pot-i-z.
mother *village*-EL *leave*-PRET-3SG
'Mother came out of the village.'

b. Ižkar-iśen Moskva-oź́ pojesdn-en min-i.
Iževsk-EGR *Moscow*-TERM *train*-INSTR *go*-PRET.1SG
'I went by train from Iževsk to Moscow.'

So far I haven't encountered a language which forms Egressive paths according to the scenario in (43). This is not surprising given that Egressive paths seem to be rather rare in the languages of the world. In any case, the lack of data does not disconfirm the hypothesis developed here.

5.8 Conclusion

In this chapter, I discussed how the meaning of each of the paths presented in Chapter 2 can be compositionally derived in the decomposed path structure I argued for in Chapter 4. I discussed each of the heads claimed to be part of the structure underlying directional expressions and proposed the following semantics:

- The Place projection encodes a spatial region.
- The Goal head encodes transition to the spatial region denoted by PlaceP
- The Source head is the locus of a semantic reversal operation which reverses the orientation of the Goal path in its complement position.
- The Route head introduces a second transition to the first (positive) phase of the Source path below it.
- The Scale head picks out a unique interval from the path structure below it, such that it is to the left and to the right of the transition(s). In addition, it imposes an order in the selected interval such that the "closer" a point is to the positive extreme points, the shorter the distance between the Figure and the Ground is at that point.
- The Bound head picks out an interval from the path structure below it which ends or begins with a unique positive point. This positively located extreme point of the path is interpreted as the limit for movement.

I also discussed the positioning of the five "Path-heads" in a binary branching syntactic structure. I suggested that the Route, Source, Goal and Place heads are rigidly ordered in the syntactic hierarchy, while the Scale and Bound heads do not have a fixed position. Schematically, the relations between the various kinds of paths can be represented as shown in Figure 5.1, where $\longrightarrow$ stands for the relation morphological containment or syntactic dominance. Figure 5.1 also reflects the semantic compositionality of the various kinds of paths, for instance, Prolative paths are compositionally derived from Transitive paths, which are derived from Coinitial paths, etc. The arrow connecting Egressive and Terminative paths is put in brackets, as there is no linguistic evidence confirming this relation, however, it is predicted to be possible by the system.

$$\begin{array}{ccccccc}
 & & \text{Egressive} & (\longrightarrow) & \text{Terminative} & & \\
 & & \downarrow & & \downarrow & & \\
\text{Transitive} & \longrightarrow & \text{Coinitial} & \longrightarrow & \text{Cofinal} & \longrightarrow & \text{Location} \\
\uparrow & & \uparrow & & \uparrow & & \\
\text{Prolative} & & \text{Recessive} & \longrightarrow & \text{Approximative} & &
\end{array}$$

Figure 5.1: The relation of syntactic dominance between the various types of paths

In the next chapter, I address the question of how the Path structure I propose is lexicalized. I discuss the apparent mismatch in various languages between the number of heads in the structure and the number of morphemes that spell them out, which has come up already at a couple of occasions. Consequently, I adopt and present the Nanosyntatic view on syntax developed in Tromsø (Starke 2005-2009, Caha 2009b, Svenonius et al. 2009) and show how this new approach to language structure sheds light on various phenomena within the realm of directional expressions.

Part II

The Nanosyntax theory of grammar

Chapter 6

Lexicalization of the structure

6.1 Introduction

So far, I have extensively argued for a universal hierarchy of paths, as described in Chapters 4 and 5. I claimed that each path is associated with a specific syntactic structure and decomposed the Path projection proposed in the literature into several smaller heads. In my investigation, I was led by the assumption, laid out in Chapter 3, according to which each morphosyntactic feature corresponds to an independent syntactic head in the functional sequence (Kayne 2005). As a consequence, I assumed that the number of morphemes which constitute a given spatial expression can be taken as an indication of how many terminals are contained in the syntactic structure underlying this spatial expression. In other words, I suggested that whenever we see that a given spatial marker consists of more than one morpheme, this means that the corresponding syntactic structure contains more than one terminal. I illustrate this assumption on Lak (Daghestanian), see the example in (1).

(1) Lak (Murkelinskij 1967)

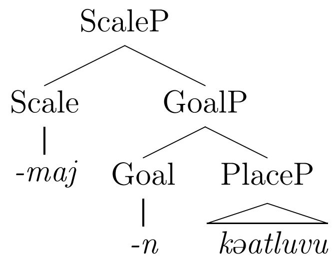
a. kəat-lu-vu
house-ERG-INESS
'in the house'

b. kəat-lu-vu-n
house-ERG-INESS-ALL
'into the house'

c. kəat-lu-vu-n-maj
house-ERG-INESS-ALL-SCALE
'towards (the inside of) the house'

In Lak, the Approximative marker *-n-maj* in (1c) is morphologically complex — it contains the morpheme *-maj* plus the Allative morpheme *-n* — and attaches to the Inessive morpheme *-vu*. Thus, according to the assumption about the correspondence between morphemes and terminals, the syntactic structure lexicalized by the Approximative marker has to involve (at least) two terminals: one for the morpheme *-n* and one for the morpheme *-maj*. For this reason (albeit based on data from other languages), I proposed in Chapter 4 that the "dynamic portion" of the syntactic structure for Approximative expressions contains two heads: Scale and Goal. Each of these heads is spelled out by one of the morphemes which make up the Approximative marker: *-n* and *-maj*.

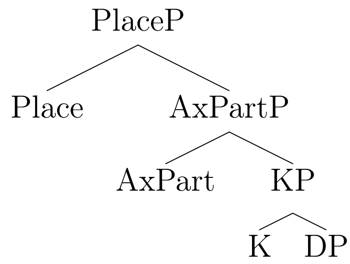
(2)



In the tree diagram in (2), the terminals Scale and Goal correspond to a unique morpheme and we have thus a one-to-one mapping between the morphological composition of the Approximative marker and the syntactic structure. The picture is, nevertheless, rarely so neat and this is so because a monomorphemic expression can also stand for a syntactic structure that contains more than one terminal (recall the case of Dutch *naar* discussed in Chapter 3, Section 3.3).

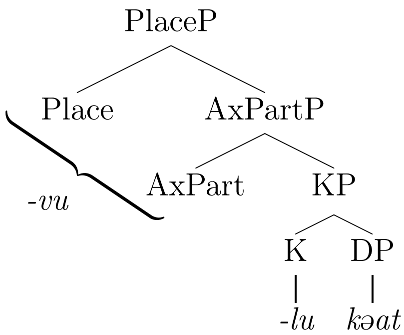
An illustration of such a one-morpheme/multiple-terminals correspondence can be found in Lak again, once we zoom in on the locative portion of the spatial expression in (1). As proposed by Svenonius (2006), locative expressions contain a Place head dominating an AxPart head where one finds spatial elements encoding notions like EXTERIOR, INTERIOR, TOP, BOTTOM, etc. (see also Muriungi 2006, Takamine 2006, Pantcheva 2006; 2008). The AxPart head in its turn takes a K[ase]P as a complement. The minimal syntactic structure of locatives is therefore as shown in (3).

(3)



The locative Lak expression (see (1a)) contains two morphemes: the Ergative marker *-lu* and the Inessive marker *-vu*. Assuming that the Ergative marker is the lexicalization of the K[ase] head, the Inessive morpheme is left to stand for both the Place head and the AxPart head.

(4)



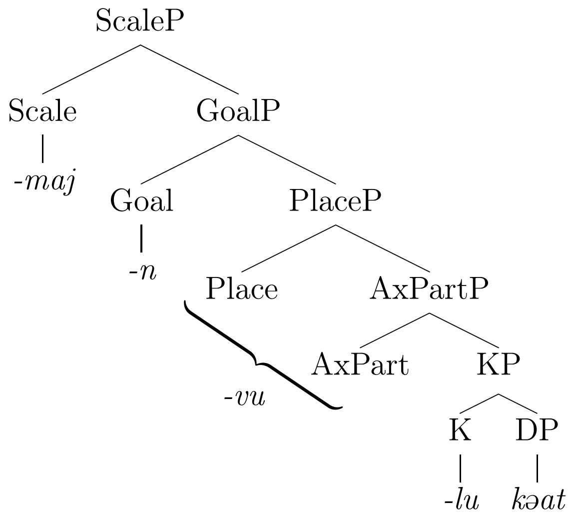
This suggestion is supported also by the semantics of the Inessive marker, which has a stative meaning and encodes the notion of INTERIOR as opposed to other Lak stative morphemes that encode spatial relations like ON, UNDER, etc. (see Table 6.1).

	Location	Goal	Source	Route	Approximative
in	*-vu*	*-vu-n*	*-v-a(tu)*	*-vu-x*	*-vu-n-maj*
on	*-j*	*-j-n*	*-j-a(tu)*	*-j-x*	*-j-n-maj*
behind	*-x*	*-xu-n*	*-x-a(tu)*	*-xu-x*	*-xu-n-maj*
under	*-lu*	*-lu-n*	*-l-a(tu)*	*-lu-x*	*-lu-n-maj*
at	*-č'a*	*-č'a-n*	*-č'-a(tu)*	*-č'a-x*	*-č'a-n-maj*
by	*-c'*	*-c'u-n*	*-c'-a(tu)*	*-c'u-x*	*-c'u-n-maj*

Table 6.1: Spatial case system in Lak (Zhirkov 1955)

To sum up, the Lak Approximative expression in (1c) is taken to illustrate the fact that morphemes can correspond to unique terminals in the syntactic structure (the morphemes *-lu*, *-n*, and *-maj*), as well as to multiple terminals (as in the case of *-vu*).

(5)

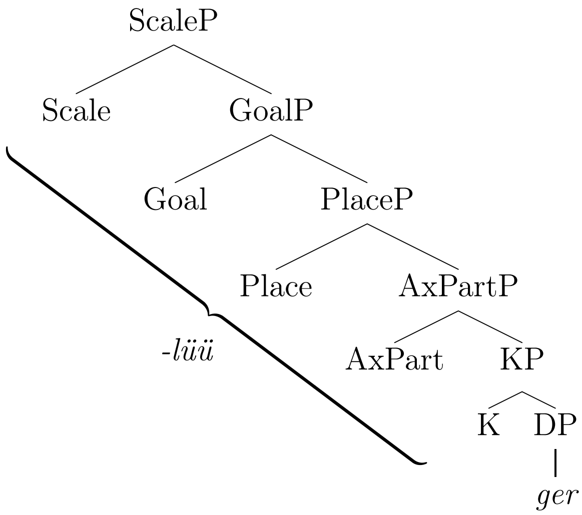


Consequently, one can expect to find a language where Approximative expressions are derived from the combination of five independent morphemes, each of which corresponding to a unique terminal in the structure in (5). Similarly, there should be languages where all the five terminals in the structure are spelled out by a single morpheme. While I have not encountered a language exemplifying the former scenario, the latter case is found in the Mongolic language Ordos (data from Georg 2003).

(6) ger-lüü
house-towards
'towards the house'

The Ordos marker *-lüü* is apparently mono-morphemic, which means that it has to stand for all the five terminal nodes in the syntactic structure for an Approximative path. Thus, morphologically, Ordos merges together all five syntactic heads Scale, Goal, Place, AxPart and K, three of which are expressed separately in Lak.

(7)



To conclude, the Path head universally decomposes into several terminals. In some languages each terminal corresponds to one morpheme in the path expression. In other languages, a single morpheme appears in expressions whose syntactic structure contains multiple terminals. As I mentioned in Chapter 3, this one-to-many relationship between the number of morphemes and the number of syntactic terminals strongly suggests a theory of Spell-out that allows for one morpheme to lexicalize multiple terminals. I explore this topic in the remainder of this chapter, starting with an investigation of two alternative views, which I then reject.

6.2 Capturing the mismatch

The first alternative solution which aims to capture the mismatch between the number of morphemes that constitute a given expression and the number of terminals in its underlying syntactic structure is found in the theory of Distributed Morphology (DM). The DM framework differs from Nanosyntax in the some basic assumptions, for instance, in DM lexical insertion is limited to terminal nodes. Further, Distributed Morphology does not assume a one-to-one feature/terminal correspondence. Nevertheless, in certain cases the number of terminals which need to be lexicalized exceeds the number of lexical entries (called Vocabulary Items in DM) which actually spell them out. DM deals with these cases by invoking the operation of *Fusion* (Halle and Marantz 1993; 1994). Fusion is an operation that applies after syntax and precedes Spell-out. What it does is to take two sister nodes that have only grammatical features (and no phonological content), and fuse them into a single terminal node, which inherits the features of the original nodes. A single morpheme can then spell out this newly derived terminal node. The operation can be repeated multiple times, hence a terminal resulting from the fusion of two nodes can be itself fused with another node. There is no limit on how many nodes can be fused into one terminal and we can imagine a node like the one in (8), which has been created by the Fusion of K with AxPart, followed by Fusion with Place, followed by Fusion with Goal, and finally with Scale. The Ordos Approximative marker *-lüü* can then be inserted at this terminal.

(8) [Scale, Goal, Place, AxPart, K] ↔ *-lüü*

The operation of Fusion, however, in some cases leads to the so-called *Fusion paradox*, first identified in Chung (2007:fn. 22), and also discussed in Caha (2009b) and Radkevich (2009). The paradox consists in the fact that Fusion, on the one hand, precedes lexical insertion, but on the other hand, it is triggered by the availability of an appropriate portmanteau lexical item in the lexicon, which expresses the features of the fused nodes.

Finnish spatial morphology can be used to illustrate this paradox. Finnish has two Goal cases: an Allative case, marked by the morphologically complex ending *-l-le*, and an Illative case, marked by the portmanteau suffix *-h(V)n*, see the examples below.[1]

(9) Finnish Allative and Illative cases (Karlsson 1999)

a. kato-l-le
roof-ALL
'onto the roof'

b. kato-on
roof-ILL
'into the roof'

Assuming that the morpheme *-l* spells out the AxPart head, the lexicalization of an Allative phrase has to involve the Fusion of the Place and Goal heads into a new node, shown in (10a), which is then lexicalized by *-le*, see (10b).

(10) a. [Goal Goal Place] ⇒ [Goal, Place]

[1] For a justification of this decomposition and a detailed analysis of the Finnish spatial case system, see Section 7.6 in Chapter 7.

b. [Goal, Place] $\leftrightarrow$ *-le*

In the case of the portmanteau Illative morpheme, which stands for all the three heads AxPart, Place and Goal, Fusion has to fuse the nodes AxPart, Goal and Place together, as shown in (11a), so that the insertion of *-(h)Vn* can take place under the thus derived terminal, see (11b).

(11) a. Goal $\Rightarrow$ [Goal, Place, AxPart]

Goal Place

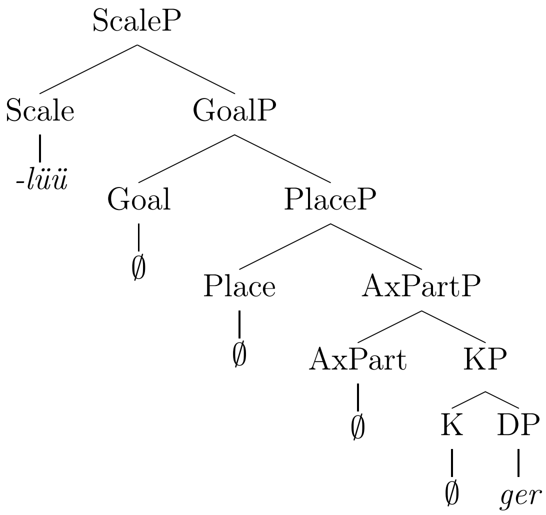
Place AxPart

b. [Goal, Place, AxPart] $\leftrightarrow$ *-h(V)n*

Note that, while Fusion applies to all the three heads in (11), it does not apply to the AxPart head in the case of *-l-le*. Hence, Fusion has to somehow "know" that the lexicon contains an appropriate portmanteau morpheme for the Illative phrase before it applies to the AxPart head in the syntactic structure. The same kind of "knowledge" will prevent Fusion from applying to AxPart in the Allative phrase. Given that Fusion precedes lexical insertion, however, it is not expected to know in advance what matching lexical items there are in the lexicon and this is what constitutes the paradox.

An alternative to the Fusion solution of Distributed Morphology, still keeping the idea that lexical insertion is limited to terminal nodes and that each feature corresponds to a terminal, is to assume the availability of silent morphemes à la Kayne (2004; 2008). Thus, we can assume that the Ordos morpheme *-lüü* is inserted under one of the five syntactic heads constituting an Approximative expression, say Scale, and all the remaining four heads are spelled out by phonologically null morphemes.

(12)



The disadvantage of this solution lies in the fact that the distribution of the postulated null morphemes in (12) has to be somehow restricted to the cases when Scale is lexicalized by *-lüü*, because they do not seem to occur otherwise. For instance, a Locative phrase in Ordos is always marked by *-tU* or *-dU* (Georg 2003), while one would expect null marking to be available too.

Another example of the need to synchronize the co-occurrence of null morphemes with a particular overt morpheme can be found in the Andic language Bagvalal (Gudava 1967a). Like the vast majority of Daghestanian languages, Bagvalal has the so-called locative series expressing various spatial configurations. In Table 6.2, I present two of them, which are relevant for the present discussion.

	Series	Location	Goal	Source
in	*-i*	*-i*	*-i*	*-i-ss*
on	*-a*	*-a*	*-a-r*	*-a-ss*

Table 6.2: The IN and ON series in Bagvalal (Gudava 1967a)

While a Goal expression in the Bagvalal ON-series is marked by the morpheme *-r*, no overt Goal morpheme is present in the IN-series. Expressions involving *-i* are therefore syncretic between Location and Goal (see (13a) and compare to the unambiguous examples of the ON-series in (14), data from Gudava 1967a).

(13) a. beq'-i
barn-LOC/GOAL
'in the barn' or 'into the barn' (Location/Goal)

b. beq'-i-ss
barn-LOC/GOAL-SOURCE
'out of the barn' (Source)

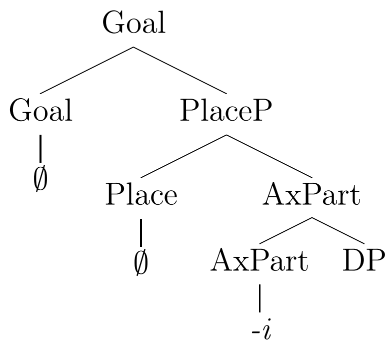
(14) a. am-a
roof-LOC
'on the roof' (Location)

b. am-a-r
roof-LOC-GOAL
'onto the roof' (Goal)

c. am-a-ss
roof-LOC-SOURCE
'off the roof' (Source)

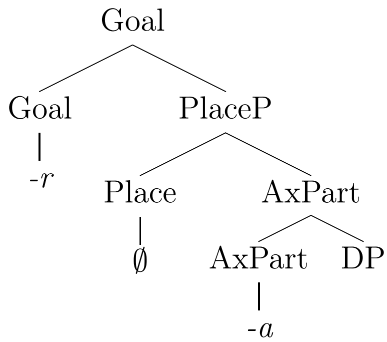
Given that the series markers -*i* and -*a* carry spatial concepts which are commonly taken to be expressed by AxPart morphemes (Svenonius 2006), it is reasonable to assume that -*i* and -*a* spell out the AxPart head. Consequently, the Place head must be lexicalized by a null morpheme. Further, another null morpheme has to lexicalize the Goal head, when AxPart is spelled out by -*i*, see (15).

(15)



When AxPart is spelled out by -*a*, however, the overt Goal morpheme -*r* is inserted at the Goal head, see (16).

(16)



This raises the issue of how to make certain that the overt Goal morpheme *-r* in (16) does not attach to the *-i* marker of the IN-series. Similarly, we need to rule out the converse scenario where the null Goal morpheme of (15) appears with the *-a* marker of the ON-series. In other words, as Starke (2011) puts it, "the 'null morpheme' approach needs to be supplemented by a mechanism which ensures that the right (null) morphemes occur with the right overt morpheme."

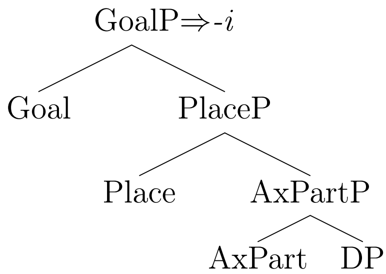
The third conceivable solution to the mismatch between the number of morphemes and the number of syntactic terminals present in the structure is to adopt the view that one lexical item can lexicalize multiple terminals in the syntactic tree. In more technical terms, we can assume that lexical entries can be inserted not only at terminal nodes, but also at phrasal nodes.

(17) *Phrasal Spell-out*:
Lexical insertion can target phrasal nodes.

Phrasal Spell-out is, in fact, a rather old idea originating from the generative semantics theory, where it was proposed by McCawley (1968). More recently, it has been adopted by Weerman and Evers-Vermeul (2002) to account for many properties of Dutch and English pronouns. Similarly, Neeleman and Szendrői (2007) show that Phrasal Spell-out explains the cross-linguistic distribution of pro drop.

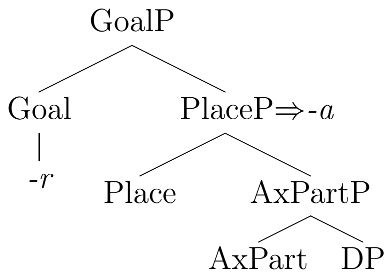
Allowing for morphemes to be inserted straight into phrasal nodes obviates the need for a null Goal morpheme in the IN-series, as well as of the null Place morpheme. We can now simply assume that *-i* has the features Goal, Place, and AxPart and can be inserted at the GoalP node, as indicated in (18).

(18)



Suppose now that the morpheme -*a* does not have a Goal feature, but just Place and AxPart. The Goal head will then be spelled out by a separate morpheme which has the Goal feature. We can assume that -*r* is such a morpheme.

(19)



Apart from dispensing with the null Goal and Locative morphemes, the two lexicalization diagrams presented above also provide a possible explanation for why there is no Goal morpheme in the IN-series, (18), but there is a Goal morpheme -*r* in the ON-series, (19). This is the result of the assumed feature specification of the entries for -*i* and -*a*: the former has the feature Goal, while the latter lacks it and therefore cannot express a Goal phrase by itself.

Before concluding this section, I would like to draw the reader's attention to the fact that, in addition to Goal of motion, -*i* also expresses Location, as shown in example (13a). Thus, the lexical item -*i* should be able to lexicalize two distinct phrasal nodes: GoalP (in a Goal expression) and PlaceP (when used in a Locative expression). Hence, we need to build into the lexicalization procedure a mechanism to capture syncretisms. The lexicalization model which thus emerges from the discussion must have the following properties:

- First, it has to allow for a single morpheme to lexicalize multiple terminals (Phrasal Spell-out)
- Second, it has to allow for a given morpheme to lexicalize more than one syntactic structure.

A syntactic framework which meets these requirements is Nanosyntax—a model of grammar developed at the University of Tromsø (Starke 2005-2009, Ramchand 2008b, Bašić 2007, Fábregas 2007, Abels and Muriungi 2008, Muriungi 2008, Lundquist 2008, Caha 2009b, Taraldsen 2010, Pantcheva 2010, for a representative collection of papers see Svenonius et al. 2009). Apart from incorporating the properties listed under the bullet points above, Nanosyntax also conforms with other assumptions I made in Chapter 3, for instance the fine-grained decomposition of syntactic structure, as well as the tight connection between syntax and morphology. In the next section, I present the basic tenets of the Nanosyntax theory of grammar, which I will eventually adopt.

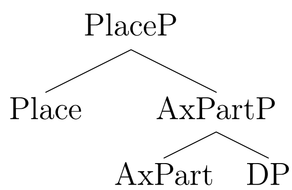
6.3 Nanosyntax

The distinguishing feature of Nanosyntax is that syntactic terminals are very "small," hence the *nano* bit in the name of the framework. In fact, each terminal corresponds to a unique feature. These features are ordered in a universal hierarchy called the *functional sequence*. Nanosyntax thus falls within the cartographic approach and follows its maxim "one morphosyntactic property – one feature – one head," discussed in Chapter 3.

6.3.1 The relationship between morphology and syntax

Syntax builds structure by taking the atomic features and arranging them by Merge into syntactic structures which comply with the hierarchical order determined by the functional sequence. Under the Nanosyntax view of grammar adopted here, morphemes are just the reflection of how chunks of these syntactic structures are stored in the lexicon. For instance, suppose that syntax combines the atomic features Place and AxPart into the structure in (20):

(20)



This structure can be stored in the lexicon as a unit, which is paired with a phonological exponent (and optionally also conceptual content, as discussed under (25)). This unit, let us label it *a*, will then represent a morpheme and its lexical entry will be of the following shape:

(21) *a* ⇔ </phonological content/, PlaceP, (conceptual content)>.

Place AxPartP

AxPart

The morpheme *a* is a portmanteau morpheme which expresses location as well as a spatial configuration. An example of such a morpheme is the Bagvalal series marker -*a* presented in (14a) in the preceding section, repeated in (22) (data from Gudava 1967c).

(22) a. am-a
roof-LOC
'on the roof'

The lexical entry of -*a* has the following shape:

(23) -*a* ⇔ </a/, PlaceP , ON>

Place AxPartP

AxPart

Other languages might not store the structure [$_{\text{PlaceP}}$ Place [$_{\text{AxPartP}}$ AxPart]] as one unit in the lexicon, but store just [Place] and just [AxPart]. Each of the two structures will be paired with phonological content and such languages will have two morphemes: one for Place and one for AxPart. This scenario is found in Chamalal, presented in Table 4.1 in Chapter 4, where there is a Locative suffix -*i* which attaches to the series markers. I repeat in Table 6.3 the relevant columns from Table 4.1.

Taking as an example the series marker -*n* (BEHIND), we can assume that its lexical entry contains the information given in (24).

(24) -*n* ⇔ </n/, AxPart, BEHIND>.

We can also assume that the lexical entry for the Locative suffix is the one in (25).

(25) -*i* ⇔ </i/, Place>

The reason why the entry for -*i* in (25) has no conceptual content is because it is not associated with the type of "encyclopedic" information

	Series	Location
in	-∅	-∅-*i*
at	-*x*	-*x*-*i*
inside	-λ	-λ-*i*
behind	-*n*	-*n*-*i*
under	-*kk*	-*kk*-*i*
on	-*l*	-*l*-*i*
vertical attachment	-*tʃ*	-*tʃ*-*i*

Table 6.3: Locative case in Chamalal (Magomedbekova 1967b)

that distinguishes a *cat* from a *dog* or *top* from *bottom.* The morpheme -*i* carries only "formal semantic" information, like, for example, STATIVE SPATIAL RELATION, which comes from the semantic contribution of the head(s) in the syntactic structure stored in the entry.

The two morphemes -*n* and -*i* in Chamalal then combine to lexicalize the Locative Plural structure, as shown in the fourth row of Table 6.3.

Thus, under the Nanosyntax view on grammar, morphemes are pieces of syntactic structure stored in the lexicon and combined with phonological (and conceptual) content. Thus, syntax directly determines the "shape" of a morpheme, i.e., what features it has and how they are ordered geometrically. As a result, only morphemes whose structures are derivable by syntax can exist.

Syntax is also responsible for the way morphemes combine with each other to build "morpheme complexes" like the Locative marker in the Chamalal BEHIND-series. More precisely, the reason we get the combination DP-*n*-*i* and not *DP-*i*-*n* is because the AxPart projection is closer to the noun than the Place projection in the syntactic structure in (20) (see Svenonius 2006). The same effect can be observed in the Lak Approximative morpheme complex -*lu-vu-n-maj* (recall the example in (1c)), where the Kase morpheme -*lu* is closest to the noun, followed by the series marker -*vu*, the Goal morpheme -*n*, and the Scale morpheme -*maj*, thus mirroring the syntactic structure [Scale [Goal [Place [AxPart [K DP]]]]].

The fact that the morphological composition of an expression reflects the syntactic structure underlying it has been stated as a principle by Baker (1985) in the formulation below:

(26) *The Mirror Principle* (Baker 1985)
Morphological derivations must directly reflect syntactic derivations (and vice versa).

According to Baker, the parallel between syntactic and morphological derivations strongly suggests a theoretical framework where both morphological and syntactic processes take place in a single module of the grammar. In the same vein, Lieber (1992) argues for reducing morphology to syntax thus eliminating the morphological component assumed by some scholars (e.g., Ackema and Neeleman 2007), where processes like word formation take place. Instead, Lieber attempts to derive the properties of complex words from principles independently needed in syntax. The nanosyntactic framework adopted here follows this line of research and advances towards a unification of syntax and morphology, since, under this view, the shape of morphemes and the way they combine into words and then phrases are directly determined by syntax.

6.3.2 Spell-out of syntactic structure

Recall from the preceding subsection that the lexicon is simply a list of entries where fragments of syntactic trees are combined with a phonological representation and a conceptual content. The Spell-out procedure can then be defined as a replacement of a piece of the syntactic tree by a lexical entry from the lexicon, thus supplying the syntactic structure with the phonological and conceptual content of the entry. In choosing the appropriate lexical entry, Spell-out is thus concerned with whether it has a matching syntactic specification, i.e., whether the syntactic structure stored in the lexical entry matches the syntactic structure the entry replaces. Matching can be defined as identity for the purposes of this section, but I will be refining the definition in the course of the discussion, the final version being presented in (13), Section 7.3, Chapter 7.

(27) A lexical entry matches a node if the syntactic tree in its specification is identical to the node.

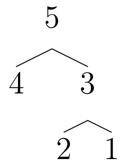
Apart from matching the syntactic structure of the entry to the syntactic structure to be replaced, the Spell-out procedure also chooses from various allomorphs, as proposed by Bye and Svenonius (2011). For instance, when spelling out the D head in English indefinites, Spell-out chooses between *a* and *an* depending on whether the noun it dominates begins with a consonant (*a pear*) or a vowel (*an apple*). For this reason, Bye and Svenonius (2011) suggest that Spell-out consists of two components: a syntactic component, which they call L-Match, and a phonological component called Insert. L-Match precedes Insert and is concerned with choosing the lexical item(s) that can replace a given syntactic structure, without being sensitive to phonological information. Insert operates on the output of L-Match and picks out the allomorphs depending on the phonological environment. Since I deal only with the syntax of path expressions in this thesis, I will leave aside the phonological aspect, thus narrowing the discussion of lexicalization only to the matching component of Spell-out. In other words, I will be concerned only with that aspect of lexicalization which involves searching and finding of matching lexical entries.

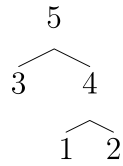
Given that the syntactic tree stored in a lexical entry can involve multiple terminals arranged in a tree structure, a lexical entry can be used to replace, or spell out, a syntactic structure that contains multiple terminals. A natural way to implement this idea technically is to assume that lexical entries can be inserted at phrasal nodes. A lexical items whose lexically stored tree contains a phrasal node XP can be thus inserted into an XP node in the syntactic structure (Starke 2009, Caha 2009a;b, Fábregas 2009, among others).[2]

The adoption of Phrasal Spell-out eliminates the asymmetry between terminal and phrasal nodes. Both types of nodes are subject to lexical insertion. When it comes to the succession in which the nodes are targeted by Spell-out, I take lexicalization to proceed bottom-up, as also assumed in other frameworks — see, for instance, Bobalijk's (2000) argument for root-outwards vocabulary insertion within the theory of Distributed Morphology. With these two assumptions concerning lexicalization — Phrasal Spell-out and bottom-up Spell-out — lexical insertion can target the syntactic nodes in two possible successions, presented in (28) and (29). (The abstract labels of the nodes reflect the order in which they are targeted by lexical insertion and I will not specify at this point the

[2]Alternative ways to lexicalize multiple terminals have been proposed. One is based on the idea of morphemes "spanning" a stretch of the syntactic tree, originally proposed by Williams (2003) and also adopted in some nanosyntactic works, e.g., Abels and Muriungi (2008), Taraldsen (2010), Bye and Svenonius (2011). Another way is by using some form of movement, or Re-merge as in Borer (2005a;b) and also Ramchand (2008b) who implements it in a nanosyntactic analysis of the verbal phrase. Under the "spanning" and "multi-attachment" views, lexical items are specified for the dominance relations between the features only and carry no information about the particular geometric configuration of these features with respect to each other. In this thesis, I adopt the mechanism of phrasal Spell-out as it most compatible with the idea that lexical entries can contain whole syntactic phrases where complex structural relations obtain.

real labels reflecting headedness.)

(28) 

(29) 

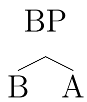
Technically, nodes which are at the same level could be lexicalized in two possible orders: left-to-right as in (28), or right-to-left, as in (29). Both orders are compatible with a bottom-up Spell-out, since in both (28) and (29) the (higher) mother nodes are lexicalized after their (lower) daughter nodes. I will nevertheless assume the right-to-left order in (28), because it is the one compatible with my following two assumptions about Spell-out, to which I turn below. I will then come back to the lexicalization succession in (28) and discuss how it follows from these assumptions.

The next assumption concerning the lexicalization of syntactic structure is that it proceeds in a cyclic fashion such that each step of external Merge defines a cycle (Caha 2010b). In other words, the lexicon is accessed every time a new feature is added to the derivation.

(30) There is a round of lexical access after each External Merge operation.

Let us now examine the lexicalization of an abstract syntactic structure, where I use the letters A, B, and C to stand both for features and for the nodes in the tree.

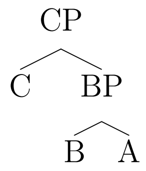
The first operation in the derivation is the External Merge of feature A with feature B to create node BP. This is the first cycle in the derivation.[3]

(31) 

According to (30), this is followed by a round of lexicalization, where the lexicon is inspected for lexical entries which match the nodes created in this cycle, more precisely nodes A, B and BP. The next operation is the Merge of feature C to the derivation.

[3]It is in principle possible that A constitutes a cycle by itself. But if we take a cycle to be defined by External Merge, which joins two syntactic objects to create a new one (Chomsky 2001:3, Adger 2003:54), the first cycle in the derivation will include A, B and the new syntactic object BP.

(32)



Since this is an External Merge, a new round of Spell-out is triggered. The structure in (32) is thus shipped to the lexicon for the search for items which can lexicalize it. At this point the question arises whether the nodes A, B and BP, which were spelled out in the previous cycle, are inspected for lexicalization again. A "fresh Spell-out" strategy would entail that the lexicalization procedure starts from the very bottom and nodes A, B and BP are inspected for lexicalization again (and again and again; in fact, A, B and BP will be targeted by lexicalization as many times as External Merge applies). The alternative is that the lexicalization keeps track of the previous cycles of Spell-out and targets only the nodes in the new cycle. The answer has been suggested by Starke (2011) who investigates this question and argues on the basis of idioms that Spell-out must "remember" the outcome of previous Spell-out operations.

Adopting Starke's proposal, I suggest that the lexicalization operation inspects only the nodes in the second cycle — C and CP. Importantly, the Spell-out of node BP, which is to the right of node C, happened in the previous cycle. In other words, BP is targeted by lexicalization before C because BP is in an earlier cycle. This suggests a right-to-left lexicalization order of the nodes BP and C. Similarly, node CP will be lexicalized before the node to its left which will be created when a new feature, say D, is merged in the next cycle.

Note also that the bottom-up Spell-out, too, follows to a certain extent from the assumption about cycles—since each Merge of a new feature triggers lexicalization, lexicalization tracks the growth of the syntactic tree from its bottom to its top.

The only nodes that remain not ordered are the lowest A and B nodes, where a left-to-right lexicalization does not clash with the assumption about cycles, because there is no preceding cycle (see fn. 3). Given that lexicalization goes right-to-left at the higher levels, I will assume that the same order holds of the two lowest nodes for the sake of uniformity. Similarly, within a cycle itself, Spell-out could proceed top-down or bottom-up. For the sake of uniformity again, I will assume that lexicalization is bottom-up also within a cycle. In sum, I opt for a consistently bottom-up right-to-left Spell-out order in (28) both between cycles (as a consequence of my assumptions about cyclic Spell-out) and within a single cycle (for the purpose of uniformity).

My last assumption about the basics of the Spell-out procedure concerns non-lexicalized features. I assume that each feature in a given cycle has to be lexicalized before the derivation can proceed to the next cycle. If there is a feature left unexpressed, the derivation crashes. This requirement is based on a principle called *Exhaustive lexicalization* which has been proposed by Ramchand (2008a) and Fábregas (2007). The content of this principle is that syntactic structures that contain non-lexicalized features are ill-formed. Since I assume that this principle should hold at the end of each cycle, I adopt it in the following formulation:

(33) *Cyclic Exhaustive Lexicalization*:
Every syntactic feature must be lexicalized at the end of a cycle.

Let us now go back to the structure in (32) and examine how it can be spelled out. Assuming that the nodes BP and CP are the result of external Merge, once the derivation reaches these nodes, the syntactic structure built up to that point will be shipped to the lexicon to be spelled out.

As already mentioned in the beginning of the section, Spell-out involves finding a matching lexical entry for the syntactic structure to be lexicalized and inserting it at the relevant node. To illustrate, suppose that we have the following lexical entries in the lexicon (from now on I will use italic small letters *a, b, c*, etc. to represent lexical entries, and capital letters A, B, C, etc. to stand for features and/or nodes in the syntactic tree):

(34) a. $a \Leftrightarrow </\mathrm{a}/, \mathrm{A}>$

b. $b \Leftrightarrow </\mathrm{b}/, \mathrm{B}>$

c. $c \Leftrightarrow </\mathrm{c}/,$ BP $>$
B A

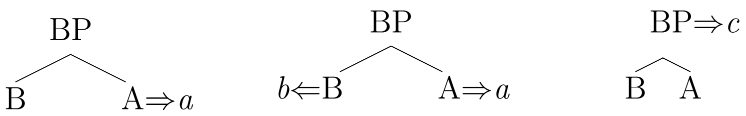
d. $d \Leftrightarrow </\mathrm{d}/, \mathrm{C}>$

e. $e \Leftrightarrow </\mathrm{e}/,$ CP $>$
C BP
B A

The very first stage of the derivation is to Merge A with B thus deriving node BP. The structure immediately becomes target of lexicalization, since every external Merge operation triggers a round of lexical access. The lexicalization procedure, starting from the rightmost bottom element, according to the assumption, attempts lexical insertion at node A. There is a matching lexical entry *a* and it gets inserted, see (35a). The next target is node B where the matching item *b* becomes inserted, (35b). Finally, lexicalization turns to node BP, which is spelled out by the matching item *c*, (35c).

(35) First cycle

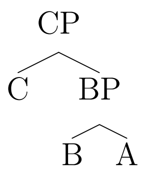
a. Step 1 b. Step 2 c. Step 3



Note that, at the second stage of derivation, (35b), the syntactic structure is pronounced as /b/+/a/. At the third stage (35c), however, the same syntactic structure is pronounced as /c/. This is so because once we insert *c* in node BP, it overrides all previously inserted lexical material at the lower nodes. As a consequence, the *a* and *b* morphemes "disappear."[4]

Once the lexicalization of node BP has been accomplished, the derivation can continue by an external Merge of C to derive the phrasal node CP. This results in the structure in (28), repeated below.

(36)

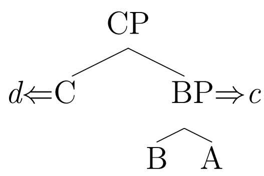


At this stage, another round of lexical insertion takes place. Consequently, the lexical item in (34d) is inserted under node C, which is followed by an insertion of the entry in (34e) straight into the phrasal node CP. This is depicted in (37a) and (37b), respectively.

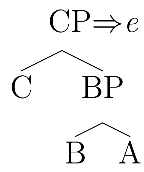
[4]To be more precise, I assume that insertion at the phrasal node overrides the previously inserted phonological material, but has to preserve the conceptual content of the items inserted in the daughter nodes. In other words, overriding can happen only when the conceptual contents of the overriding item and the overridden items match.

(37) Second cycle

a. Step 4



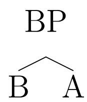
b. Step 5

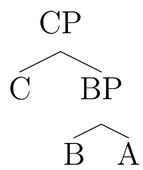


As already mentioned, I assume that the lexicalization “remembers” the outcomes of the previous cycles and hence does not need to spell out nodes A, B and BP in (37) again.

The insertion of the entry *e* at node CP at the stage depicted in (37b) overrides the items *d* and *c* and the structure is pronounced as /e/ instead of as /d/+/c/.

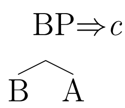
An interesting question is what would happen if the lexicon did not have all the five lexical entries in (34), but just some of them. Consider first the combination of morphemes in (38), where the lexical entries that spell out just terminal nodes are left out.

(38) a. $c \Leftrightarrow$ </c/,  >

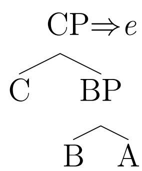
b. $e \Leftrightarrow$ </e/,  >

As things stand now, no lexical insertion will take place at steps 1, 2 and 4 because I assumed that matching requires identity and no lexical entry in (38) contains a tree structure that is identical to the targeted node. The structure can be nevertheless lexicalized at both the first and the second cycle by inserting *c* at node BP and *e* at node CP, as shown in (39).

(39) a. First cycle



b. Second cycle



The lexicalization is successful because the entry *c* contains all the features of the first cycle and the entry *e* contains all the features of the second cycle. As a result, *Cyclic Exhaustive Lexicalization* will be obeyed since, at each cycle, all the features expressed in the syntactic tree are lexicalized. The reason for this is that the syntactic features A, B, and C are all included in the lexical entries.

Let us now consider a case in which the lexicon does not have the “phrasal” entries *c* and *e*, but just the “terminal” entries *a*, *b*, and *d*.

(40) a. $a \Leftrightarrow$ </a/, A>

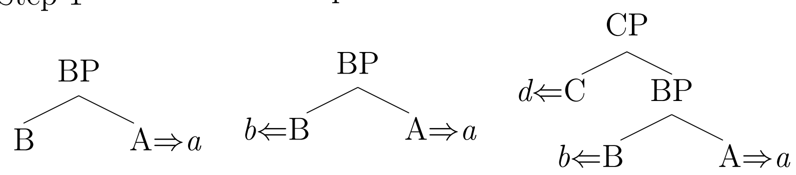
b. $b \Leftrightarrow$ </b/, B>

c. $d \Leftrightarrow$ </d/, C>

The way the lexicalization will proceed is to insert *a* at node A and *b* at node B in the first cycle, see (41a-b). In the second cycle, *d* will be inserted at node C, as shown in (41c).

(41) First cycle c. Second cycle

a. Step 1 b. Step 2



In (41), *Cyclic Exhaustive Lexicalization* is satisfied again, although the nodes BP and CP are not specifically listed in the lexical entries. This is so because the nodes BP and CP do not represent syntactic features distinct from A, B, and C.

The lexicalization scenarios in (39) and (41) depict two different ways to spell out a given node in compliance with *Cyclic Exhaustive Lexicalization*. For example, at node BP, *Cyclic Exhaustive Lexicalization* can be satisfied by inserting lexical entries at each terminal (see (41b)) or by inserting a lexical entry straight into a phrasal node (see (39a)).[5]

We can then state the condition for when a node counts as successfully spelled out (that is, in accordance with *Cyclic Exhaustive Lexicalization*)

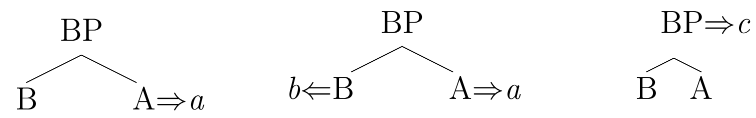
[5]Naturally, a combination of the two strategies is also viable. Thus, the structure in (32) can also be spelled out as /d/+/c/ in a language which lacks the “phrasal” entry *e*, but has the “phrasal” entry *c* and the “terminal” entry *d*.

as in (42).

(42) A node X is successfully lexicalized if
 a. a lexical entry is inserted at X, or
 b. the daughters of X are lexicalized.

A node X can thus be successfully lexicalized *directly* in the case of (42a), or *by inheritance*, in the case of (42b). The condition in (42) has one important implication for the case in (35), repeated below as (43).

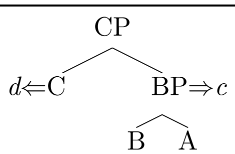
(43) First cycle
 a. Step 1 b. Step 2 c. Step 3



At the stage depicted in (43b), the lexicalization procedure has inserted *a* under node A and *b* under node B. Then, lexicalization turns to the next node BP, which does count as successfully lexicalized, since all the features contained in that node are lexicalized. Nevertheless, the lexicalization procedure searches the lexicon for a matching lexical entry *c* and, in case there is one, inserts it straight into the phrasal node BP, as shown in (43c). The question is: Why is it necessary to perform a search for an item able to spell out node BP in one go, given that all the features in the cycle are expressed (i.e., *Cyclic Exhaustive Lexicalization* is satisfied). The derivation can continue without inserting *c* into node BP, as it does in languages which lexicalize the structure as *a*+*b* for lack of an item *c*.

This question uncovers an important aspect of the Spell-out model I assume, which I consider necessary to emphasize: lexicalization is attempted at *every node*. In other words, the lexicalization procedure "blindly" proceeds up the syntactic tree trying to match lexical material to each node, and does not care whether the targeted node is already lexicalized by inheritance. Consequently, if lexical insertion can happen at a phrasal node, then it will. The effect of this can be seen in languages which, apart from *a* and *b*, have the item *c*. Then *c* will be inserted at

(i)



node BP, even though it is already lexicalized by inheritance. Famously, *went* will be used instead of **go-ed* and *worse* will be used instead of *bad-er. This phenomenon is often referred to in the literature as *blocking* (for instance, Andrews' 1990 *Morphological Blocking Principle*, Posers' 1992 *Phrasal blocking*, and Kiparsky's 2005 blocking mechanism). Blocking in general alludes to cases where the existence of a portmanteau morpheme blocks the occurrence of a sequence of morphemes. The Phrasal Spell-out system derives many instances of blocking effects, as lexical items which lexicalize a phrasal node are inserted later than the "smaller" lexical items which lexicalize terminals and thus override them. This has been formulated as the *Biggest wins* theorem in Starke (2009), Caha (2009b) and Taraldsen (2010). Muriungi (2009) labels it the *Union Mechanism* with different formulation but to the same effect.

6.4 The *Superset Principle*

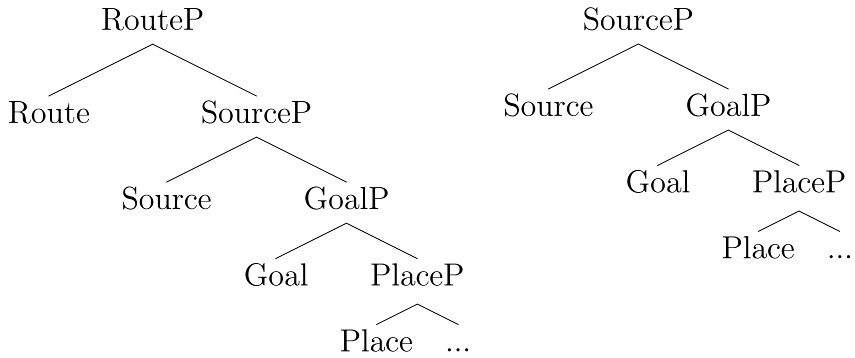
In the preceding section, I defined Spell-out as the insertion into the syntactic structure of a matching lexical item, that is, a lexical item whose entry contains an identical syntactic structure. The phenomenon of syncretism, however, suggests that the requirement of identity between syntactic structure and the lexically stored tree is too restrictive.

Consider, for instance, the following Hindi data (fieldwork notes collected by Peter Svenonius and Minjeong Son).

(44) baccaa kaar-ke saamne-see calaa.
child *car*-GEN *front*-ABL *walk*.PERF
(i) 'The child walked via in front of the car.'
(ii) 'The child walked from in front of the car.'

The example above is ambiguous between a Route path reading and a Source path reading. In Chapter 4, I argued that Route paths and Source paths have different underlying syntactic representations, shown in (45).

(45) a. Route path b. Source path



What this means for the Hindi Ablative marker *-see* in (44) is that it is used to lexicalize two different structures: (45a) when it gives rise to a Route reading, and (45b) when it has a Source path interpretation. Importantly, the two structures in question are in a superset-subset relationship – the syntactic features which make up a Source expression are a proper subset of the syntactic feature in a Route expression. Similar cases of syncretisms have been successfully modeled in the framework of Distributive Morphology by assuming underspecification of lexical items, formulated as the *Subset Principle*.

(46) *The Subset Principle* (Halle 1997)
The phonological exponent of a vocabulary item is inserted into a morpheme in the terminal string if the item matches all or a subset of the grammatical features specified in the terminal morpheme. Insertion does not take place if the vocabulary item contains features not present in the morpheme.[6]

Put in simple words, the *Subset Principle* says that a lexical item lexicalizes a terminal in the syntactic tree if the feature specification of the item is a subset of the features expressed in the terminal. This presupposes that one terminal contains more than one feature, contrary to the assumption. Further, lexical insertion is restricted only to terminals, while I have adopted the idea that insertion can also target phrasal nodes. One would therefore need to reformulate the *Subset Principle* so that the domain for lexical insertion is augmented to include phrasal nodes. Nevertheless, one big conflict remains: the *Subset Principle* allows features in the syntactic tree to remain unexpressed. This goes against the *Cyclic Exhaustive Lexicalization* principle presented in (33), which requires that

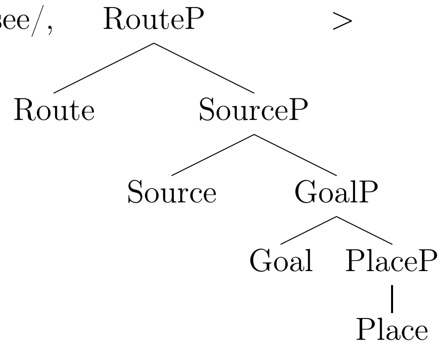
[6]The term *morpheme* in DM is used to mean "terminal node."

each syntactic feature in the tree should be expressed (at the end of a cycle). Thus, if we want to capture the Hindi data following the same idea that there is a subset-superset relations between syncretic morphemes (and structures), while at the same time keeping the assumptions about Phrasal Spell-out, it is necessary to change the idea behind the *Subset Principle* so that the lexical items are overspecified in order for all syntactic features in the tree to be realized. The result is called the *Superset Principle* and it is formulated as a condition on matching.

(47) *The Superset Principle* (Starke 2009, Caha 2009b):
A vocabulary item matches a node if its lexical entry is specified for a constituent containing that node.

Thus, matching now requires that the syntactic tree stored in a lexical item is identical to or bigger than the node it is inserted into. Given that the structure of Route paths is bigger than the structure of Source paths, as argued in Chapter 4, the tree stored in the lexical entry of the Hindi Ablative *-see* should be specified for the bigger Route structure. This will make it possible that it is also used to lexicalize the smaller Source structure.

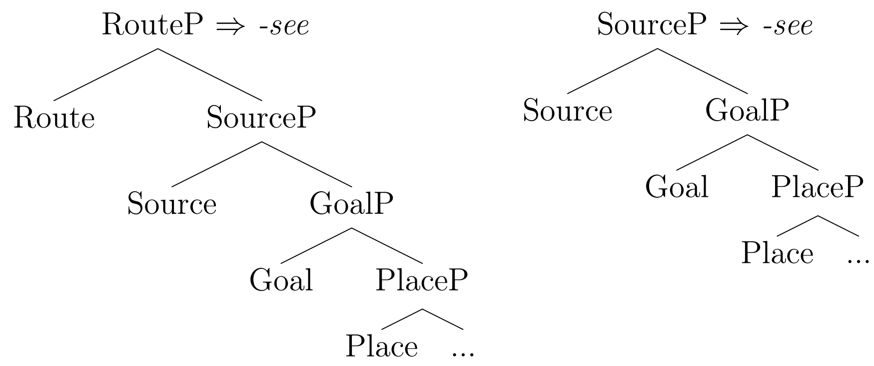
(48) Lexical entry for Hindi Ablative *-see* (under the *Superset Principle*):
-see ⇔ </see/,



>

With this specification, *-see* can spell out both structures in (45), as shown below.

(49) a. Route path b. Source path



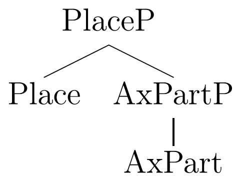
In the case of a Route phrase, (49a), *-see* is inserted into a node which is identical to the syntactic structure of the lexical entry (48) (ignoring the complement of Place for now). In the case of a Source path, *-see* spells out a sub-constituent of the syntactic tree it is specified for, thus leaving the Route feature "unused." In other words, the syncretism of Route=Source syncretism in Hindi comes out because the *Superset Principle* allows a given lexical entry to lexicalize syntactic structures that are identical to or smaller than the structure it is specified for, crucially restricting unexpressed features to the lexical entry, and expressing all the features in the syntactic tree.

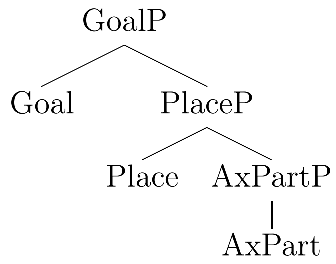
Before concluding this section, let me go back to a case of syncretism I presented in the beginning of this chapter and show how the current system deals with it. Recall from Section 6.2, that the series markers *-i* 'IN' and *-a* 'ON' in the Daghestanian language Bagvalal express both a spatial configuration and Location. In addition, *-i* expresses also Goal of motion (see the data below, repeated from (13a) and (14a)).

(50) beq'-i
barn-LOC/GOAL
'in the barn' or 'into the barn'

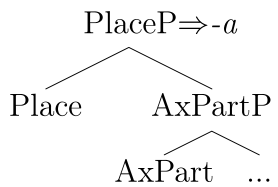
(51) am-a
roof-LOC
'on the roof'

The ability of *-i* and *-a* to express a spatial configuration and Location by themselves suggests that they are specified for both the AxPart and Place features. In addition, the entry for *-i* must have a Goal feature, as it is used also in Goal expression. The lexical entries I therefore suggest are presented in (52) and (53).

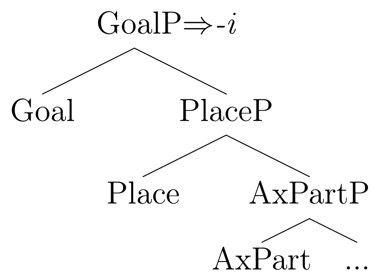
(52) a. -*a* ⇔ </a/,  , ON >

b. -*i* ⇔ </i/,  , IN >

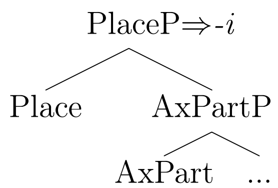
Thus, when expressing a Locative structure, -*a* makes use of its full lexical specification and lexicalizes a node that is identical to the tree fragment stored in the entry.

(53) 

The entry for -*i* is “bigger” than the entry for -*a*—it contains a Goal head in addition, and therefore -*i* can lexicalize a Goal structure.

(54) 

By the *Superset Principle*, -*i* can also lexicalize a PlaceP node, leaving its Goal feature “unused.”

(55) 

Note that, due to the specification in (52a), the series marker -*a* cannot be used to Spell-out a Goal structure—it does not contain a Goal feature and by the *Superset Principle* it cannot be inserted at GoalP. The Bagvalal case syncretism thus provides a strong argument for the adoption of the *Superset Principle* (and *Exhaustive Lexicalization*, which goes together with it). Consider what will happen if we import the *Subset Principle* into the Phrasal Spell-out model (and consequently restate it to hold of Phrasal Spell-out plus drop the requirement that each feature is to be lexicalized). The entries for -*a* and -*i* that we then need to assume have to be *underspecified*, see (56) and (57).

(56) a. -*a* ⇔ </a/, [PlaceP Place [AxPartP AxPart]], ON >

b. -*i* ⇔ </i/, [PlaceP Place [AxPartP AxPart]], IN >

Both entries can be inserted at PlaceP, spelling out a Locative phrase. The series marker -*i* can also be inserted at GoalP, because it is specified for a *subset* of the features contained in the tree. The crucial question is: how do we prevent -*a* from being inserted at GoalP? Since the entry for -*a* contains the same subset of features like -*i*, it should be equally eligible for insertion at GoalP.[7]

As far as I can see, the only way to capture the data without assuming Superset, is to posit a silent Goal morpheme and restrict it contextually to -*i* 'IN' – an option I explored and rejected in Section 6.2, since it necessitates the development of a mechanisms which ensures that the right null morphemes occur with the right overt morphemes.

[7] It should be highlighted that the impossibility of applying the *Subset Principle* to the Bagvalal case discussed here is because the *Subset Principle* is not compatible with a Phrasal Spell-out model. In the framework of DM, the Bagvalal Location/Goal syncretism in the IN-series and the lack of it in the ON-series can be captured by assuming that *to* and *in* undergo Fusion, but *to* and *on* do not. This, in turn, leads to the same Fusion paradox I presented in Section 6.2.

6.5 The *Elsewhere condition*

In the preceding section, I showed how the Superset Principle can capture syncretisms by allowing a given morpheme to lexicalize a structure which is identical to or contained in the lexically stored tree of the morpheme's lexical entry. This relaxation of the matching condition leads to the occurrence of situations where more than one lexical item is eligible to spell out a given syntactic node. Consider, for instance, the case of the Avar Source marker *-ssa*, which I discussed in Chapter 4. To refresh the memory of the reader, I repeat the spatial markers of Avar for the ON-series below (for a full overview of all Avar locative series, see Table 4.4).

Series	Location	Goal	Source	Route
on (top of)	*-da*	*-d-e*	*-da-ssa*	*-da-ssa-n*

Table 6.4: The ON-series in Avar (Blake 1994)

As suggested in Chapter 4, Section 4.3 (see (17) in the relevant chapter), the Source marker *-ssa* lexicalizes both the Goal and the Source heads. The lexical entry of *-ssa* is therefore as in (57).

(57) Lexical entry for Avar Ablative *-ssa*:
-ssa ⇔ </ssa/, SourceP >
Source GoalP
Goal

According to the *Superset Principle* in (47), *-ssa* can spell out a Source, as well as a Goal structure, when combined with a Locative marker lexicalizing Place. The reason is that both structures are contained in the tree stored in the lexical entry for *-ssa*. This does not happen, though. Goal expressions are lexicalized by the morphemes *-da*+*-e* (pronounced as /de/), as shown below.

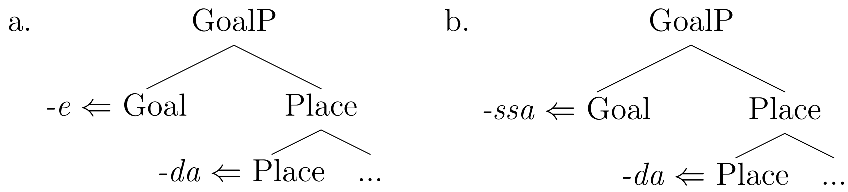
(58) wácc-ass-de
wácc-ass-da-e
brother-ERG-ON-TO
'onto the brother' (data from Uslar 1889)

The question is why Avar prefers to use the Allative suffix *-e* to lexicalize the Goal structure and not the Ablative suffix -*ssa*.

Let us first see what the lexical entry for the Allative -*e* could be. It attaches to a Locative marked DP (just like the Ablative -*ssa*), hence, it does not spell out the Place head. It does not have a Source semantics, hence it is not specified for the Source feature either. The result is a lexical entry of the shape in (59), which spells out just the Goal head.

(59) Lexical entry for Avar Alative -*e*: -*e* ⇔ </e/, Goal>

The two possible ways to lexicalize a Goal structure are then shown in the tree diagrams in (60).

(60)


In the first case, the Allative marker is inserted under the Goal head, (60a). In the second case, the Goal head is lexicalized by the Ablative marker, (60b), an option made available by the *Superset Principle*. The preferred lexicalization is the one in (60a), as shown by the data in (58).

Note that the Allative entry in (59) is a perfect match for the Goal head in (60). The Ablative entry -*ssa* in (57) is, on the contrary, "bigger" than the structure it lexicalizes in (60b) as a result of which the Source feature on -*ssa* remains unused. The observation is, therefore, that the Spell-out procedure chooses to insert the lexical entry that leaves the least number of "unused" features.

This conclusion can be formalized in the form of the following rule:

(61) When two lexical entries meet the conditions for insertion in a given node, the item with the fewest features not contained in the node gets inserted.

The same idea has been more concisely formulated in Taraldsen (2010) as the *Minimize Underattachment* constraint, the term "underattachment" referring to the cases when a lexical entry fails to lexicalize the full-size structure it is specified for.

As a matter of fact, the generalization in (61) follows from a more general principle, namely, the *Elsewhere Condition* of Kiparsky (1973), shown below (Starke 2009, Caha 2009b, Pantcheva 2010).

(62) *Elsewhere Condition* (Kiparsky 1973:94)
Two adjacent rules of the form
$A \longrightarrow B \ / \ P\_\_\_Q$
$C \longrightarrow D \ / \ R\_\_\_S$
are disjunctively ordered if and only if:

a. the set of strings that fit PAQ is a subset of the set of strings that fit RCS, and
b. the structural changes of the two rules are either identical or incompatible.

Put informally, the *Elsewhere Condition* says that whenever we have two rules—one which applies in a more *general* case, and the other which applies in a more *specific* case—the specific rule blocks the general rule from application.

An alternative way to formulate the same condition is provided by Neeleman and Szendrői (2007).

(63) *Elsewhere Principle* (Neeleman and Szendrői 2007)
Let R_1 and R_2 be competing rules that have D_1 and D_2 as their respective domains of application. If D_1 is a proper subset of D_2, then R_1 blocks the application of R_2 in D_1.

The generalization in (61) is simply an implication of the *Elsewhere Condition*. Consider again the Avar Source and Goal markers. The Ablative *-ssa* can spell out a Source structure and a Goal structure. The Allative *-e* can spell out just a Goal structure. The domain of application of the Allative marker is hence a proper subset of the domain of application of the Ablative marker. Therefore, by virtue of (63), the Allative marker wins the competition for insertion in a Goal structure.

To summarize, in this subsection, I presented a case where two lexical items compete to lexicalize a given structure and demonstrated how the competition is regulated by the *Elsewhere Condition* of Kiparsky (1973), which enforces the choice of the more highly specified lexical item.

6.6 Conclusion

In this chapter, I presented a model of Spell out which allows one morpheme to spell out one or more terminals in the syntactic structure. I presented the main principles and assumptions governing the lexicalization, which I repeat below.

(64) The shape of the lexical entries is <phonology, syntactic tree, conceptual content>

(65) *Cyclic Spell-out*:
Each step of External Merge is followed by lexical access. There is no lexicalization cycle after Internal Merge.

(66) *Cyclic Exhaustive Lexicalization*:
Every syntactic feature must be lexicalized at the end of a cycle.

(67) *Bottom-up Phrasal Spell-out*:
Lexicalization proceeds right-to-left bottom-up starting from the lowest node in the current cycle. Lexicalization targets both terminal and non-terminal nodes.

(68) *The Superset Principle* (Starke 2009, Caha 2009b):
A vocabulary item matches a node if its lexical entry is specified for a constituent containing that node.

(69) *The Elsewhere Condition* (reformulated from Kiparsky 1973)
When two lexical entries meet the conditions for insertion in a given node, the item with the fewest features not contained in the node gets inserted.

In the model, adopted here, lexical entries are pieces of syntactic structures which are combined with a phonological representation and a conceptual content, as stated in (64). All but the syntactic component of an entry can be missing. Lexical items which are not associated with encyclopedic information (e.g., functional morphemes) lack conceptual content. Phonologically null morphemes lack phonological representation.

According to (65), the lexicon is accessed after each External Merge operation but not after Internal Merge. Thus every External Merge defines a lexicalization cycle. As a consequence, the nodes derived by movement become target to lexical insertion only after External Merge has applied. For a successful lexicalization it is necessary that every feature (i.e., terminal) in the syntactic tree be lexicalized at the end of the cycle, as stated in (66). If this is not the case, the derivation crashes.

The nodes in the syntactic structure are targeted by lexicalization in a right-to-left bottom-up succession and lexicalization is attempted at *each* node, alternating two terminals with one non-terminal node. The lexicalization operation consists in matching and inserting lexical entries at the nodes of the syntactic tree thus replacing the node with the phonological and conceptual content of the entry, under the condition that the syntactic structure stored in the entry contains the syntactic structure of the targeted node. When there are more than one matching item, the one which has the smallest number of superfluous features is chosen.

Many of the assumptions made here are shared with other frameworks, perhaps most prominently Distributed Morphology (Halle and Marantz 1993; 1994). For instance, in both frameworks, syntax operates on abstract features to combine them into syntactic trees. Unlike DM, however, in Nanosyntax these features are not pre-packaged into bundles. Consequently, each syntactic terminal represents a unique feature.

A further similarity between the two frameworks lies in the information stored in the lexical items. Both frameworks assume that lexical items are stored in the lexicon as a pairing of a phonemic string (phonological exponent) and a set of formal features (see, for example, Halle 1997 and Harley and Noyer 1999). The Nanosyntactic lexicon, nevertheless, differs from the lexicon assumed in DM in two ways. First, the nanosyntactic lexical entries can also contain a conceptual component alongside the formal features. Second, in Nanosyntax, the grammatical features are organized in a binary branching tree structure, while in DM features are grouped into bundles. When it comes to the first point, the two frameworks start to converge, since some scholars working in the DM tradition now assume that root vocabulary items are specified for both content and grammatical features (e.g., Siddiqi 2006). The second point, however, still holds.

Other concepts shared by both Nanosyntax and DM are Late insertion and Cyclicity of insertion, i.e., the idea that lexical items are inserted into the syntactic structure once its derivation has been completed and that this happens in cycles. Thus, both frameworks assume that lexicalization of the structure is a post-syntactic operation. Still, the view on lexicalization adopted here diverges from DM's view. Following one of the main tenets of Nanosyntax, I assume that lexical insertion can target phrasal nodes. The domain for lexical insertion assumed in DM is, on the contrary, limited to terminal nodes only, thus necessitating a special morphological operation called Fusion, whose role is to "fuse" two or more features into one terminal, whenever we have a given lexical entry spell out what seems like two (or more) terminals. This in turn leads to the *Fusion paradox* pointed out by Chung (2007) and illustrated in Section 6.2 of this chapter. Put briefly, the Fusion paradox is caused by the fact that the morphological operation Fusion applies only in the presence of a lexical entry which can spell out the fused nodes, yet the lexicon is not accessed before all syntactic and morphological operations (like Fusion) are performed.

Finally, perhaps the most conspicuous difference between the two frameworks concerns the tolerance towards unexpressed features. Working with underspecification of lexical entries, DM assumes that it is acceptable to leave features unexpressed in the syntactic structure, while all features of the lexical entries have to be expressed. Nanosyntax assumes the exact opposite: every feature in the syntactic tree has to be expressed (formulated as the *Cyclic Exhaustive lexicalization*) and the features which are allowed to remain unexpressed are the ones of the lexical entry. As a result, the lexical entries are overspecified in Nanosyntax.

This chapter focusses mostly on the system of assumptions ruling the lexicalization of structure and contains little real language data. In the following chapter, by contrast, I present a detailed investigation of the spatial morphology in several languages (Karata, Uzbek, and Finnish) and show the importance of each of the assumptions made. In addition, I develop a novel idea originally proposed by Starke (2011) that the particular shape of the lexical entries can give rise to a syntactic movement in order to create the right configuration for Spell-out. I show how this Spell-out triggered movement delivers the suffixal ordering or spatial markers in the languages examined and successfully captures an interesting case of allomorphy in Finnish.

Chapter 7

Spell-out driven movement

7.1 Introduction

In Chapter 6, I presented the Nanosyntax framework and outlined in abstract terms how the processing of Spell-out works and what principles regulate the competition for lexical insertion. The aim of this chapter is twofold: first, it deals with the question of how the syntactic structure is linearized and develops the idea that the movements required to obtain the suffixal ordering of spatial markers (and suffixes in general) under a universal Specifier-Head-Complement template (Kayne 1994, Cinque 2009) are the result of the particular shape of the lexical entries stored in the lexicon. In this, I follow a proposal made by Starke (2011) and developed in more detail in Caha (2010b) that movement can be triggered by the need to create the right configuration for Spell-out. The second aim of this chapter is to test empirically the Spell-out model presented in Chapter 6 and the Spell-out driven movement suggested in the present chapter. For this purpose, I explore the spatial case system of several languages and investigate the ways the system captures phenomena like portmanteau morphology and syncretisms.

7.2 Linearization

As already mentioned in Chapter 3, I assume, following Kayne (1994) and work in cartography (Rizzi 1997, Cinque 1999; 2005; 2009), that syntactic structure is universally ordered such that heads are to the left of their complements and specifiers are to the left of their heads. When it comes to the way the syntactic nodes are linearized, I assume Kayne's *Linear Correspondence Axiom*, given below:

(1) *Linear Correspondence Axiom* (LCA) (Kayne 1994):
If a non-terminal X asymmetrically c-commands a non-terminal Y, then all terminal nodes dominated by X will precede all terminal nodes dominated by Y.

Asymmetric c-command means that X c-commands Y, but Y does not c-command X. The c-command relation is defined as in (2).

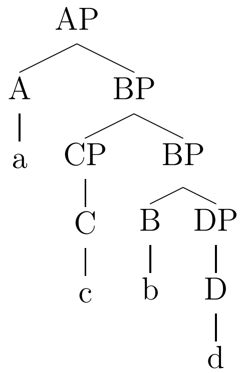
(2) *C-command* (Kayne 1994:16):
X c-commands Y iff X and Y are categories and X excludes Y and every category that dominates X dominates Y.

Exclusion, in its turn, is defined as in (3).

(3) *Exclusion* (Chomsky 1986:9):
X excludes Y if no segment of X dominates Y.

As an illustration of how the LCA works, take the structure in (4), where the projection CP has adjoined to the projection BP, which results in BP being a category with two segments (May 1985, Chomsky 1986).

(4)



In (4), CP c-commands BP because:

1. CP and BP are categories
2. No segment of CP dominates BP, hence CP excludes BP
3. Every category that dominates CP also dominates BP (for instance AP)

BP, however, does not c-command CP because it does not exclude it (there is one segment of BP dominating CP). Hence, CP asymmetrically c-commands BP and by the LCA whatever is dominated by CP will precede whatever is dominated by CP, that is, c will precede both b and d at Spell-out.

Other asymmetric c-command relations in (4) are: A asymmetrically c-commands CP, B, DP and D. Thus a will precede b, c, and d. B asymmetrically c-commands D, therefore b will precede d. Knowing that c precedes both b and d, the result is that the terminal nodes will be linearized as a-c-b-d.

The formulation of LCA in (1) allows only for a linearization of the *terminal nodes* in the syntactic structure. If lexical items are taken to also spell out non-terminal nodes, as I have assumed, it becomes necessary to reformulate the LCA, so that it is stated over both terminal and phrasal nodes. I will therefore adopt the following version of LCA:

(5) *Linear Correspondence Axiom* (Phrasal Spell-out formulation):
If a non-terminal X asymmetrically c-commands a non-terminal Y, then whatever spells out X precedes whatever spells out Y.

With the modification in (5), the asymmetric c-command relation is mapped onto a linear order of non-terminal nodes and thus becomes applicable in the Phrasal Spell-out system adopted here. In what follows, I explore how exactly this happens.

7.3 Spell-out driven movement

As a first example, I take the spatial case system of the Daghestanian language Karata (Magomedbekova 1971). Karata has six series: *-ṭ‘* ON, *-ṭ‘’* UNDER, *-č* AT, *-l‘* INSIDE, *-a* VERTICAL ATTACHMENT, and -∅ IN, AMONG.[1] It has a Locative suffix with four allomorphs *-i*, *-a*, *-o* and -∅. The choice of a particular Locative allomorph depends on the series marker it attaches to, for instance, *-a* goes with *-ṭ‘* and *-ṭ‘’*, *-o* goes with *č*. There is an Allative suffix *-r* attaching to the Locative marker, and an Elative suffix *-gal* syncretic between Source and Route, which attaches to the Locative marker, too. Although the number of allomorphs of the Locative case is only less by two than the total number of spatial series, Magomedbekova draws a morpheme boundary between the series marker and the Locative ending. Taking her analysis for granted, I therefore suggest that the lexical specifications associated with the entries of the

[1]The distinction between *-t’* and *-t‘’* lies in the “strength” of the consonant — *-ṭ‘* is the lax variant and *-ṭ‘’* is the tense variant of the lateral affricate (represented as *-кьI* and *-кь*, respectively, in the Russian orthography).

Locative, Allative and Elative morphemes are as presented in (6):[2]

- The locative morpheme lexicalizes the Place head – (6a-d).
- The Allative morpheme *-r* lexicalizes Goal – (6b).
- The Elative morpheme *-gal* lexicalizes Source and Goal when it is used as a Source marker – (6c) – and Route, Source and Goal when it is used as a Route marker – (6d).
- The series markers *-ṭ‘*, *-ṭ‘’*, *-č*, etc. lexicalize the AxPart head – (6a-d).

(6) a.

Place	AxPart	DP
-a	*-ṭ‘*	

b.

Goal	Place	AxPart	DP
-r	*-a*	*-ṭ‘*	

c.

$\underbrace{\text{Source Goal}}_{\textit{-gal}}$	Place	AxPart	DP
	-a	*-ṭ‘*	

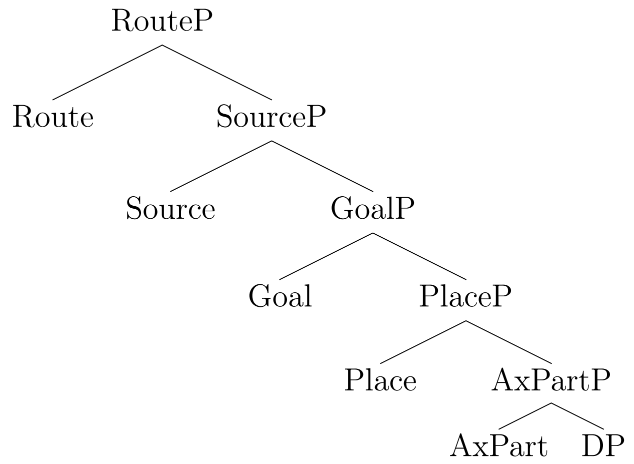
d.

$\underbrace{\text{Route Source Goal}}_{\textit{-gal}}$	Place	AxPart	DP
	-a	*-ṭ‘*	

In what follows I will run the lexicalization of the spatial cases in Karata, going step by step through the derivation of the “biggest” Route structure, whose underlying structure is the following (as argued for in Chapter 4):

[2]Note that in the schematization in (6), the morphemes are presented in reverse order.

(7)



As an example, I will take the ON-series, illustrated below on the noun *bajdan* 'square' (data from Magomedbekova 1971:73).

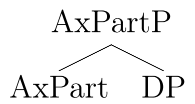
(8) a. bajdan-ṭ'-a
square-ON-LOC
'on the square'

b. bajdan-ṭ'-a-r
square-ON-LOC-GOAL
'to the square'

c. bajdan-ṭ'-a-gal
square-ON-LOC-ROUTE
'from/through the square'

At the very first stage of the derivation, we have an AxPart externally merged with a DP. This step is immediately followed by lexical access according to the assumption of cyclic Spell-out (recall (65) in Chapter 6).

(9)



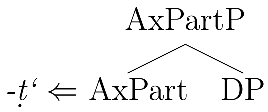
The lexicalization procedure first spells out the DP node as *bajdan* 'square.' I will remain agnostic about precisely which node in the extended nominal projection the entry *bajdan* lexicalizes, as I would like to focus on the spatial portion of the functional sequence. For the same reason, I will not be marking the lexical material inserted in the complement of prepositional phrases in the diagrams in the following chapters.

The next node in line is AxPart and the lexicalization procedure searches for an entry in the lexicon which can lexicalize it. As suggested above, the series marker -*ṭ‘* lexicalizes the AxPart head, thus a plausible assumption is that its lexical entry has the following shape:

(10) -*ṭ‘* ⇔ </ṭ‘/, AxPart, ON>

In (10), it is assumed that the entry for -*ṭ‘*, which spells out the single feature AxPart, is specified for a structure consisting of just the head AxPart. Under this assumption, which I will revise slightly later, the AxPart node is lexicalized as in (11).

(11)

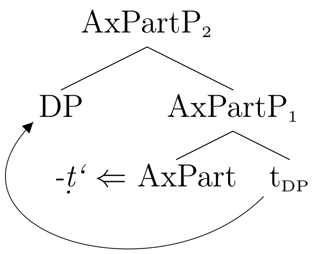


As Spell-out proceeds bottom-up alternating terminal and non-terminal nodes, the next node which becomes the target for insertion is the root node, AxPartP. The lexicalization procedure now searches the lexicon to find a lexical item that can be inserted straight into AxPartP. There is no such matching item in the lexicon which would spell out AxPart together with DP, so nothing is inserted.

The outcome of Spell-out at this stage is that each feature in the syntactic structure is realized at the end of the cycle, in conformity with the *Cyclic Exhaustive Lexicalization* requirement in (33), Chapter 6.

Let us now turn to the linearization of the elements in the structure. As is evident from (8), the DP in Karata precedes the series marker, hence, the DP must asymmetrically c-command the AxPart head, according to the LCA. This can be achieved if the DP raises above the AxPartP node, as in the diagram below.

(12)



The movement of the DP in (12) creates an adjunction structure yielding a two-segment category. In order to facilitate the discussion, I will annotate the lowest segment of a category by a subscript 1 (e.g., AxPartP_1), and the higher segments by a subscript 2, 3, etc. (e.g., AxPartP_2). In this new structure, DP c-commands AxPart, but AxPart does not c-command DP. The asymmetric c-command relation between DP and AxPart is converted into a precedence relation and the structure can be linearized.

A potential drawback faced by this derivation is the lack of an apparent trigger for the movement in (12) apart from the need to obtain the correct word order. The Phrasal Spell-out system offers a possible answer to the question what causes the DP to move in (12). The solution builds on the idea of Starke (2011) that (this type of) movement is driven by the need to spell out (see also Caha 2010b who explores the same idea in the domain of case marking). What we need is to revise the requirement on matching, plus change the shape of the lexical entry for *-ṭ‘*.

Assume, first, that the matching procedure ignores traces (Caha 2009b), which leads to the following reformulation of the definition in (47), Chapter 6, Section 6.4.

(13) A vocabulary item matches a node if its lexical entry is specified for a constituent containing that node, *ignoring traces*ß.

Assume, in addition, that the lexical entry for *-ṭ‘*, is not the one in (10), but the one in (14), where *-ṭ‘* is specified both for the AxPart head and its projection.

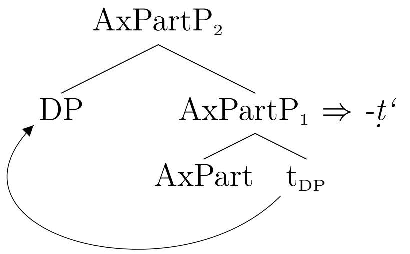
(14) *-ṭ‘* ⇔ </ṭ‘/, AxPartP , ON>
                          |
                       AxPart

Let us now run the derivation using the entry in (14). The first step is again the Merge of AxPart and DP.

(15)
        AxPartP
       /   \
   AxPart   DP

Starting from the rightmost bottom-most element, the first two steps in the lexicalization procedure are identical to the ones described for (11): first it spells out the DP and then turns to the AxPart node. The lexical item in (14) matches this node by virtue of the *Superset Principle* — its entry is specified for a structure that contains this node — and it is chosen for insertion. Proceeding up the tree, the Spell-out operation then tries to lexicalize the next node AxPartP. This time there is a potential matching lexical entry, the same morpheme *-ṭ‘*, which could now make use of its full lexical specification. However, *-ṭ‘* is not a perfect match for the AxPartP node, as it does not contain the DP node. In order for matching to obtain, the DP has to move out and leave a trace, which will be ignored for the purposes of matching.

(16)



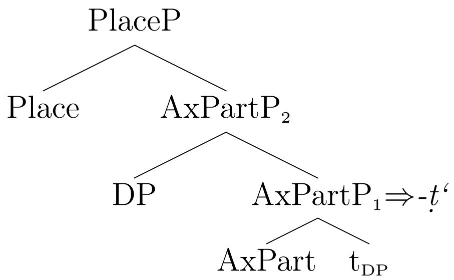
The diagram in (16) differs from the one in (12) in that the series marker -*ṭ‘* is inserted at a phrasal node instead of a terminal. The linearization of the elements comes out crucially the same: the DP in (16) c-commands AxPartP, but AxPartP does not c-command DP because it does not exclude it. Consequently, the lexical material lexicalizing DP precedes the lexical material lexicalizing AxPartP and -*ṭ‘* correctly comes out as suffixal.

The attractiveness of this proposal is that now we have a trigger for the movement in (16). As the lexicalization proceeds from node to node and tries to match a lexical item at each step, once it hits the non-terminal AxPartP, it will match the entry in (14) and this will cause the movement of the DP so that the right constituency is achieved. In other words, the evacuation of the DP is a Spell-out driven movement caused by the Spell-out procedure lexicalizing the non-terminal AxPartP node with the entry in (14). Thus, the trigger for the movement lies in the shape of the lexical entry for -*ṭ‘*: it stores the structure of AxPartP, but importantly without the DP.

Note that the Spell-out driven movement in (16) is not triggered by the need to lexicalize all the features present in the tree. The requirement of *Cyclic Exhaustive Lexicalization* is met both in (11) and in (16). Thus, if the entry for -*ṭ‘* were specified only for the AxPart head, as in (10), then Spell-out would occur without any movement and the AxPartP node would be lexicalized by inheritance instead of directly. The derivation in (16) presupposes that direct lexicalization with movement is preferred to lexicalization by inheritance but without movement. This is reminiscent of the discussion in the final paragraph of Section 6.3.2, Chapter 6, where I suggested that the preference of direct lexicalization over lexicalization by inheritance captures the fact that portmanteau morphemes (e.g.,*went*) block analytical expressions which express the same features and concept (e.g., *go-ed). Thus, here we have the same principle, with the additional twist of Spell-out driven movement: the lexicalization procedure tries to match lexical material to each syntactic node in the tree and if there is a potential match that requires the evacuation of non-matching features, the evacuation will take place.

Let us now continue with the derivation of a Karata Place phrase, whose structure is derived by merging the Place head to the tree in (16).

(17)

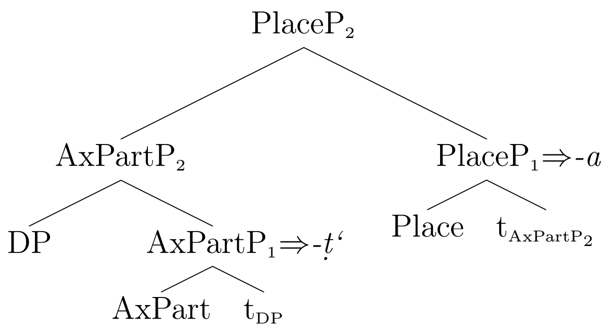


The Place marker -*a* is suffixal and attaches to a noun marked by one of the series markers. Applying the same strategy as for the series marker *ṭ‘*, we can assume that -*a* triggers a movement of AxPartP to a position from which it asymmetrically c-commands it. The shape of the structure stored in the entry for -*a* will therefore have to be the following (I list -*i*, -*o* and -∅ as allomorphs of -*a*):

(18) -*a* ⇔ </a, i, o, ∅/, PlaceP >
|
Place

Proceeding again node by node up the tree, the lexicalization procedure first targets the Place head in (17). The entry for -*a* is chosen for insertion, as it matches Place by the *Superset Principle*, i.e., -*a* is specified for a structure which contains this constituent. At the next step, the node PlaceP is subject to lexicalization and the entry -*a* is chosen again, since it is a match again, this time using its full specification. In order for the right configuration for Spell-out to be achieved, AxPartP_2 has to move away, adjoining to PlaceP, as shown in (19).

(19)



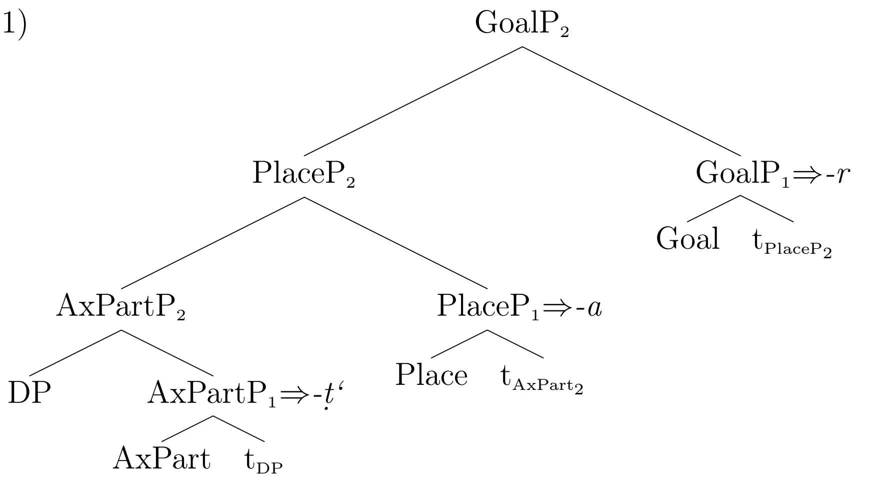
In the tree in (19), DP asymmetrically c-commands AxPartP and AxPartP asymmetrically c-commands PlaceP. As a result, whatever spells out DP will precede whatever spells out AxPartP and whatever spells out AxPartP will precede whatever spells out PlaceP, thus leading to the correct linearization DP-*ṭ‘-a*.

The same strategy can be used also in the derivation of the Goal expression *bajdan-ṭ‘-a-r*. What we need is to assume that the Goal suffix -*r* is specified in the way shown in (20).

(20) -*r* ⇔ </r/, GoalP >
|
Goal

The Spell-out of GoalP by -*r* will trigger an evacuation movement of the complement of Goal, leading to the structure in (21).

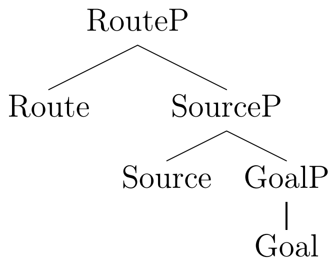
(21)



Thus, the reverse ordering of the morphemes in the Karata Locative and Goal expressions comes about as the result of successive roll-up movements triggered by the shape of the lexical entries.

The derivation becomes different when we reach the Source and Route heads, lexicalized by the morpheme -*gal*. Similarly to the Goal suffix -*r*, -*gal* attaches to a noun marked by the Locative case. But unlike -*r*, -*gal* corresponds to more than one feature, more precisely, the features Goal, Source, and Route. The entry for -*gal* must therefore have the following shape.

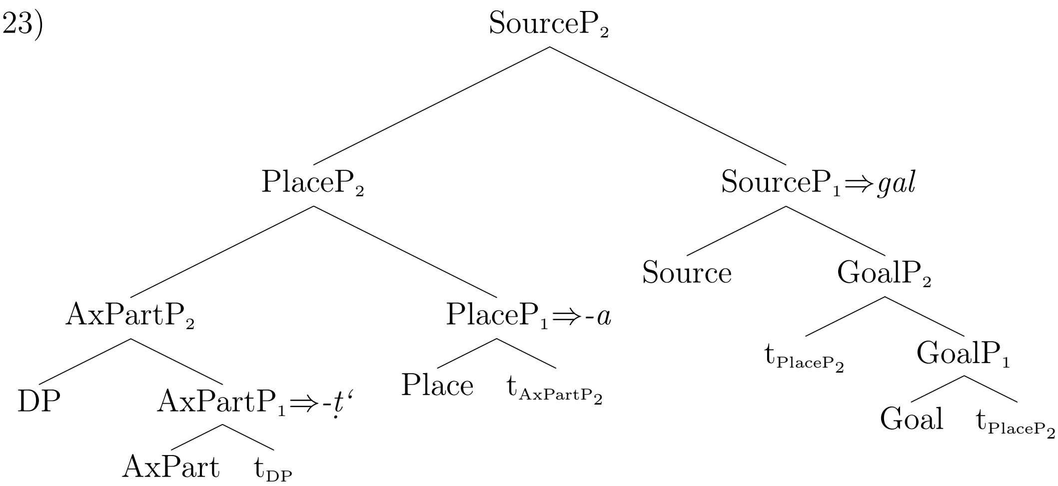
(22) -*gal*, ⇔ </gal/,



>

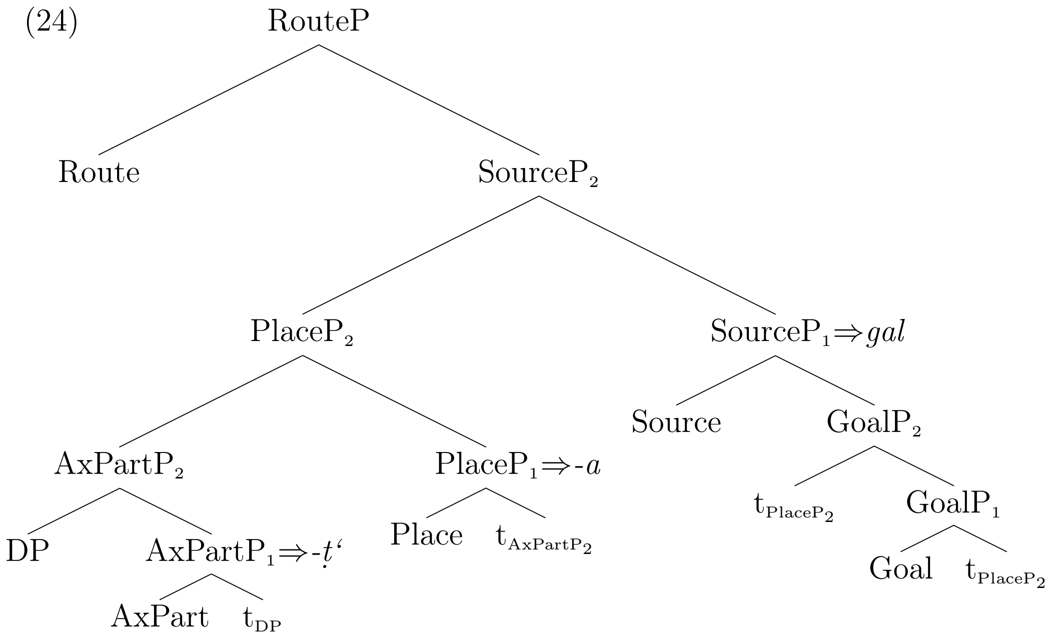
Such an entry can be used for the lexicalization of a Source expression by virtue of the *Superset Principle*. Leaving aside the category/segment distinction for now, the entry in (22) is a match for the SourceP node provided PlaceP_2 moves out. (Note that *-gal* is a match also for the GoalP node, but loses the competition to the more highly specified entry *-r*.)

(23)



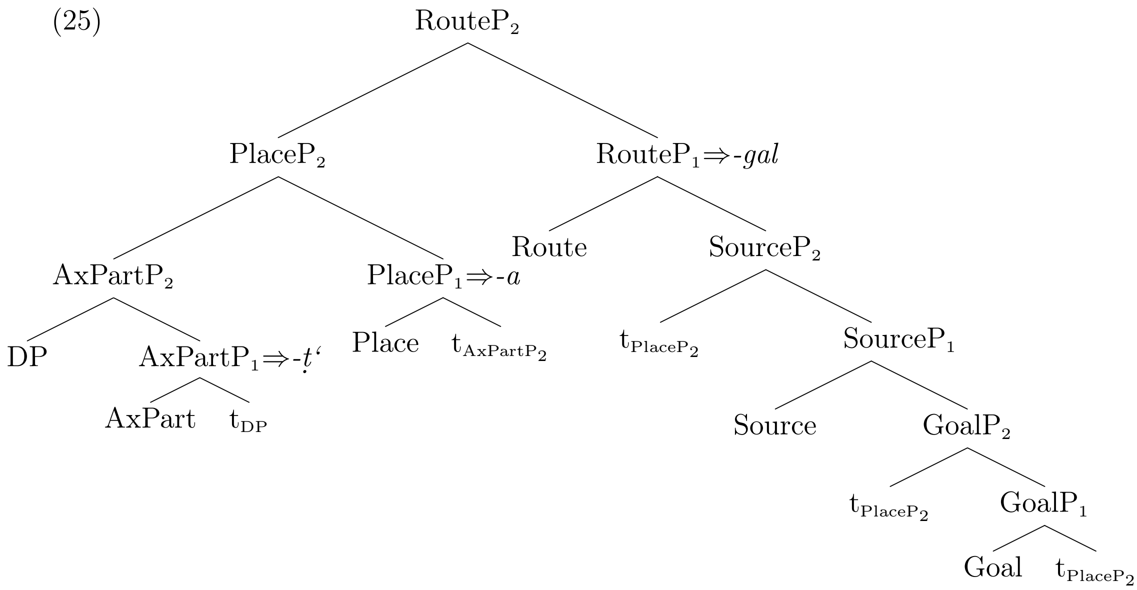
Finally, I turn to the “biggest” structure of Route paths, derived by the Merge of Route on top of SourceP.

(24)



Starting again from the lowest node in the cycle, the lexicalization first targets the Route head, matched by *-gal* by the *Superset Principle.* Then it inspects the RouteP node, which *-gal* matches again (abstracting away from the two-segmental nature of the categories GoalP and SourceP), but PlaceP_2 has to evacuate. The evacuation movement takes place and *-gal* is inserted at RouteP_1, overriding the material inserted below. Thus, the entry *-gal* triggers a successive-cyclic movement of PlaceP_2 within its own projection line.

(25)



To sum up, the idea of a Spell-out driven movement provides us with a tool to capture the linearization of suffixes. The Karata spatial markers come out as suffixal because of the particular configuration of the trees stored in their entries. The entries trigger evacuation movements of the nodes which obstruct matching. These evacuation movements are instantiated in two ways: one way is a roll-up movement which takes place at the "border" between two lexical entries, e.g., the movement triggered by the Goal entry *-r* and the Locative entry *-a*. The other way is a successive-cyclic movement triggered by a lexical item within its own projection line, e.g., the movement triggered by the morpheme *-gal*, which covers a span in the structure consisting of more than one feature: Goal, Source and Route.

7.4 Elaborating Spell-out driven movement

The derivation of Karata spatial expressions raises a number of questions regarding the nature of the proposed Spell-out driven movement. In this section, I discuss in more detail the exact mechanics of Spell-out driven movement. I address three questions, which can be summarized as When? Where? and What? Specifically, the questions are: (i) when exactly does the Spell-out driven movement happen in the cyclic lexicalization model assumed here, (ii) what is the landing site for the evacuated material, and (iii) what restrictions are there on the nature of the evacuated constituent(s)? I explore these issues in Section 7.4.1, 7.4.2 and 7.4.3, respectively.

7.4.1 Timing of Spell-out driven movement

The Spell-out driven movement proposed in the preceding section has two effects. First it creates the right syntactic configuration for the insertion of a particular lexical entry. Second, it creates new nodes in the syntactic structure — the higher segments of the categories to which the evacuated material adjoins. The discussion presented in this section is prompted by the assumption that these new nodes are subject to lexicalization. The motivation for this assumption is purely empirical: if the nodes created by Spell-out triggered movement are subject to lexicalization, then we can capture an interesting and intricate case of allomorphy in Finnish. I present this case in Section 7.6, where I show how the lexicalization of the Finnish Illative phrase by the portmanteau suffix *-h(V)n* can be accounted for if we assume that it lexicalizes such a node derived by

Spell-out triggered movement.

Assuming that the nodes derived by Spell-out triggered movement are to be lexicalized just like any other nodes in the syntactic tree, I will now investigate how this idea can be made compatible with the adopted model of cyclic Spell-out.

Recall that the lexicon is accessed multiple times in the course of the derivation, more precisely, after each addition of a new feature (External Merge), as schematized in (26).

(26)
$$\begin{tikzcd}
\text{External Merge} \arrow[rr, bend left] & & \text{Lexical access} \arrow[ll, bend left]
\end{tikzcd}$$

The Spell-out driven movement does not add a feature. It is simply an evacuation movement of already merged features triggered by the need to create the right syntactic environment for a given entry to match. There is therefore no reason to assume that the lexicon is immediately accessed after this operation. If there is no lexical access after Spell-out driven movement, it should take place before the External Merge operation in the cyclic model in (26). Thus, I assume that Spell-out driven movement (Internal Merge) is followed by the addition of a feature to the derivation (External Merge), which is then followed by lexical access.

(27)
$$\begin{tikzcd}
\text{External Merge} \arrow[dr, bend left] & \\
& \text{Lexical access} \arrow[dl, bend left] \\
\text{(Internal Merge)} \arrow[uu, bend left] &
\end{tikzcd}$$

The schematization of a cycle proposed in (27) maintains the idea that lexical access happens only after a new feature has been introduced to the derivation. At the same time, it encodes the fact that Spell-out triggered movement is instigated only after the lexicon has been consulted, that is, when a lexical item is chosen which would match only if movement takes place.

The operation of Internal Merge is not an obligatory step in a cycle and I have marked this optionality by putting it in parentheses. The reason is that no movement takes place when there is a one-to-one matching item in the lexicon.

With the revised architectural scheme of a cycle presented in (27), I turn to the question of how to implement it in the lexicalization algorythm in a way such that the nodes derived by Internal Merge are spelled out. To give a short preview, incorporating the step of Internal Merge into the cyclic Spell-out system will lead to the conclusion that the Spell-out driven movement triggered by the matching of a lexical item in a given cycle actually happens in the *next* cycle, a view espoused also in Caha (2010b). I detail the reasoning below.

Consider the lexical entries in (28) and the structure in (29).

(28) a. $a \Leftrightarrow$ </a/, A>
b. $b \Leftrightarrow$ </b/, [BP B] >

(29) [BP B A]

The first cycle in the derivation begins with the External Merge of A and B. (As already stated in Chapter 6, fn. 3, I assume that A does not constitute a cycle by itself, following the definition of Merge in Chomsky 2001:3 and Adger 2003:54). According to the assumption in Chapter 6, Section 6.3.2, the lexicalization proceeds right-to-left and bottom-up within a cycle (as well as between cycles). Therefore, the first node to be lexicalized in this first cycle is A. The entry a is a match for that node. The next node in line is B, which, according to the *Superset Principle*, is matched by b, since B is a subconstituent of the structure b is specified for. Finally, b is matched to the BP node, see (30).

(30) [BP⇒b b⇐B A⇒a]

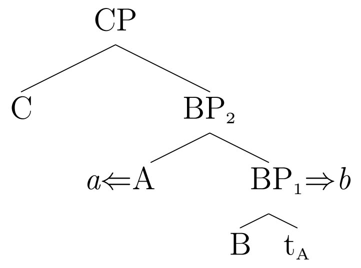
In order to spell out BP by b, an evacuation of A takes place and the node BP_2 is created.

(31) [BP_2 a⇐A [BP_1⇒b B t_A]]

The movement of A to BP_2 is an Internal Merge operation, therefore it is not followed by a step of lexicalization.

The next time the lexicon is accessed is when a new feature, say C, is added to the derivation.

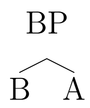
(32)



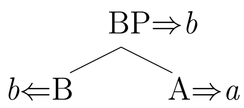
Since the Merge of C is an External Merge operation, there is a round of lexical access. As I already mentioned in the introduction to this subsection, there is empirical evidence in favor of the idea that the nodes derived by Spell-out driven movement are subject to lexicalization. Node BP_2 should then be a target for lexicalization, just like the nodes C and CP resulting from External Merge. According to the assumption made in Chapter 6, Section 6.3.2, the lexicalization procedure targets only the nodes in the current cycle and does not "look inside" the preceding cycles, which have already been spelled out. Therefore, we need to assume that the BP_2 node is part of the *second cycle*. This, in turn, necessitates that the movement of A to BP_2, which creates the BP_2 node and which is triggered by the matching of *b* to the BP node in the first cycle, actually takes place in the second cycle. To illustrate this more clearly, I present a scheme of the operations applying in Cycle 1 and Cycle 2 in (33).

(33) a. **Cycle 1**

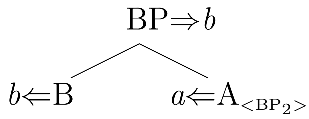
(i) Merge A and B (External Merge)



(ii) Match A, B and BP (Lexical access)

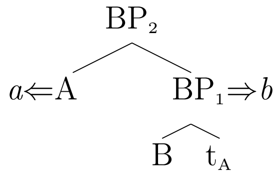


(iii) Mark A for extraction

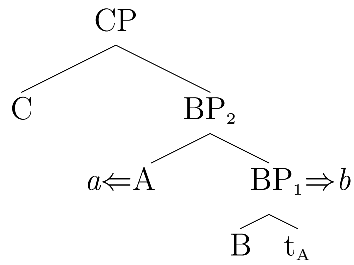


b. **Cycle 2**

(i) Extract A (Internal Merge)



(ii) Merge C (External Merge)

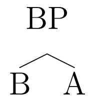


(iii) Match BP_2, C and CP (Lexical access)

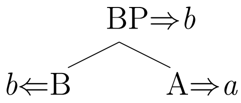
The alternative, where the evacuation movement of A takes place in the same cycle where it has been triggered (i.e., in the first cycle), leads to a failure to lexicalize the BP_2 node under the present set of assumptions. The reason is that the BP_2 node is created in the first cycle, and would not be accessed by the lexicalization round triggered in the second cycle, if it sees only the nodes in the second cycle. At the same time, the movement creating the BP_2 node in the first cycle would follow the lexicalization round of the first cycle, hence the first lexicalization round could not target BP_2. This is represented schematically in (34).

(34) a. **Cycle 1**

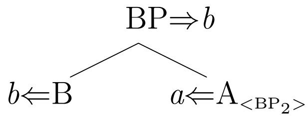
(i) Merge A and B (External Merge)



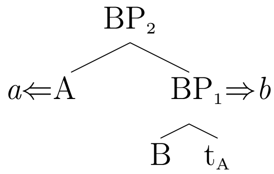
(ii) Match A, B and BP (Lexical access)



(iii) Mark A for extraction

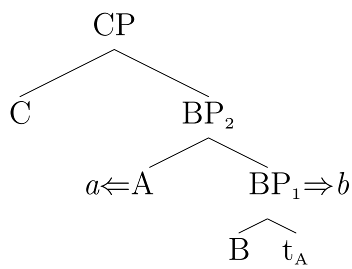


(iv) Extract A (Internal Merge)



b. **Cycle 2**

(i) Merge C (External Merge)



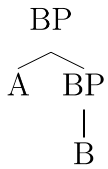
(ii) Match C and CP (Lexical access)

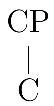
Hence, a cycle begins with a (potentially vacuous) step of Internal Merge and ends with lexicalization (see (33b)). Apart from allowing for the Spell-out of the nodes derived by Internal Merge, this model also has the advantage that the syntactic module, where Internal and External Merge are performed, is accessed just once in a cycle.

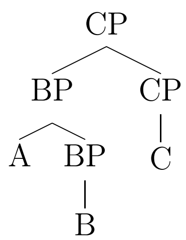
Note that, in the second cycle of the derivation depicted in (33b), I have assumed that node A is not inspected for lexicalization. This assumption is motivated by Starke's (2011) proposal that the system remembers the outcomes of previous matching procedures. Since A has already been matched by *a* in the first cycle, there is no need to perform a new search. As far as I can see, nothing hinges on this assumption. No matter whether the lexicalization procedure matches *a* to A again in the second cycle, or just skips A, the outcome is the same.

The idea that Spell-out movement triggered in one cycle actually happens in the next cycle raises an interesting question regarding the final cycle in a derivation. Put briefly, the question arises because of the possibility of triggering movement which would happen after the final External Merge operation has taken place. The node created by this movement will therefore not be followed by External Merge. Hence, no more lexical access can take place. As a result, this node cannot be lexicalized.

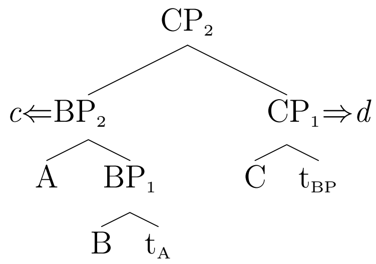
For a more detailed description of this hypothetical scenario, assume the lexical entries *c* and *d* with the lexical specifications in (35), and the phrase marker in (36).

(35) a. *c* ⇔ </c/,  >

b. *d* ⇔ </d/,  >

c. *e* ⇔ </e/,  >

(36)



The matching of *d* to node CP_1 in cycle X will trigger an evacuation of BP at cycle X+1. Suppose now that this is the end of the derivation, that is, no new morphosyntactic features are added to the tree. Will node CP_2 then be subject to lexical insertion? If yes, then the phrase marker in (36) will be spelled out as *e*, because the matching entry in (35c) will be inserted at CP_2. If not, then it will be spelled out as c+d.

The data necessary to decide which of the two predictions is the correct one lies beyond the empirical domain of this thesis, which focuses on the lower portion of the PP. The derivation of a PP does not end with any of the heads Goal, Source, or Route. There is still more structure above them, for instance, a little *p* head introducing the Figure (Romanova 2007), or DegP hosting measure phrases (Svenonius 2010, den Dikken 2010). Furthermore, a PP by itself presumably cannot constitute an utterance, assuming that sentences consisting of just one PP are cases of ellipsis. Therefore, one would have to look at the syntax of clausal structures expecting to find (or not find) a difference in their lexicalization depending on whether the derivation ends with the clause, or not (i.e., the clause is embedded). The examination of such data would lead me too far astray from the main research topic and I will therefore not investigate it here. Still, it is worth mentioning that a plausible hypothesis is to assume the availability of an abstract termination symbol of the type suggested by Kayne (1994:Ch.4), which is merged at the end of the derivation and which allows or disallows (depending on the empirical evidence) one more lexicalization round.

7.4.2 The landing site of evacuated material

Now I turn to the questions concerning the adjunction site for the nodes evacuated due to the need to spell out. Under the view that adjunction can target any phrasal node, it stands to reason to assume the following two possible constraints on the landing sites of the obstructing projections:

(37) a. *Extension Condition*: The evacuated material has to adjoin to the root node of the tree in the workspace.

b. *Shortest Move*: The evacuated material has to adjoin right above the node where matching takes place.

The first adjunction site obeys the *Extension Condition* of Chomsky (1995:190) according to which syntactic operations apply to the root of the tree. The second adjunction site complies with the *Shortest Move* constraint of Chomsky (1995:90), which requires that movement should be as short as possible. The precise formulation of *Shortest Move* which I present above differs from the one in Chomsky (1995:90), Zwart (1996:307), and Richards (2001:97), where *Shortest Move* is phrased as a ban on a movement of α across a potential landing site for α. The reason I use the term *Shortest Move* in (37b) is because, assuming that lowering operations are not available for Spell-out driven movement, the shortest possible movement of an obstructing node will place it just above the node where the lexical item triggering the movement is to be inserted.

In the derivations presented until now, the Spell-out driven movement satisfies both constraints simultaneously, as adjunction to the root node is at the same time the shortest move possible. However, as the tree structures become larger and the derivations more complicated, it becomes possible to tease apart the two potential landing sites. As far as I can see, the availability of multiple adjunction sites leads to the necessity of performing parallel derivations and choosing the optimal one. In order to avoid such parallel derivations, I suggest in this section that the number of landing sites should be restricted to one and assume that the Spell-out triggered movement obeys *Shortest Move*.

In order to illustrate what type of problems arise if more than one landing site is available, I present here a hypothetical case, asking the reader to bear with me through a rather complicated derivation.

Consider again the lexical entries *a* and *b* and the abstract structure in (39), repeated from (30).

(38) a. $a \Leftrightarrow </a/, \mathrm{A} >$

b. $b \Leftrightarrow </b/,$ BP $>$

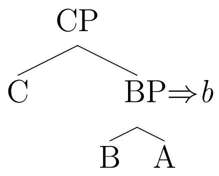
B A

(39) BP⇒b

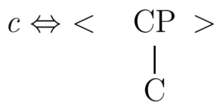
b⇐B A⇒a

Next we merge C and assume the entry in (41).

(40)

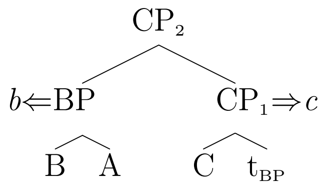


(41)



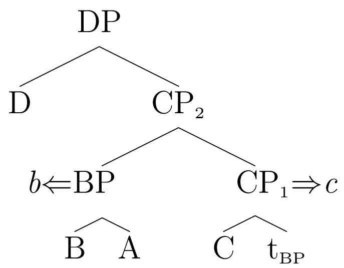
The item c triggers an evacuation movement of BP in the next cycle. Now c can be inserted at the CP node.

(42)

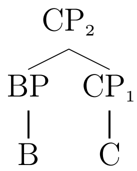


Note that at this stage, the CP_2 node is still not lexicalized, as it is part of the next cycle. Suppose now that we merge a head D to derive the structure in (43).

(43)



Since this is an external Merge, it will trigger a round of lexicalization, with the first node to be lexicalized being CP_2 (assuming that BP is skipped by virtue of already having been lexicalized in the previous cycle). Suppose now that there are entries d and e in the lexicon with the following specifications:

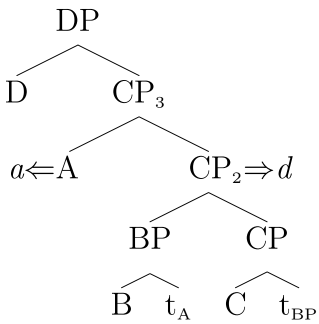
(44) a. $d \Leftrightarrow <$  $>$

b. $e \Leftrightarrow <$  $>$

The entry d matches the CP_2 node if A evacuates. There are two possible adjunction sites where A would not be "in the way": (i) between CP_2 and DP, in which case the Spell-out triggered movement will satisfy the *Shortest Move* requirement, but violate the *Extension Condition*, and (ii) above DP, in which case the *Extension Condition* will be obeyed, but not *Shortest Move* (assuming that adjunction to CP_2 is possible).

Suppose that both options are available, that is, A can adjoin either to DP or to CP_2. Let us then assume that A adjoins to CP_2 yielding the structure below.[3]

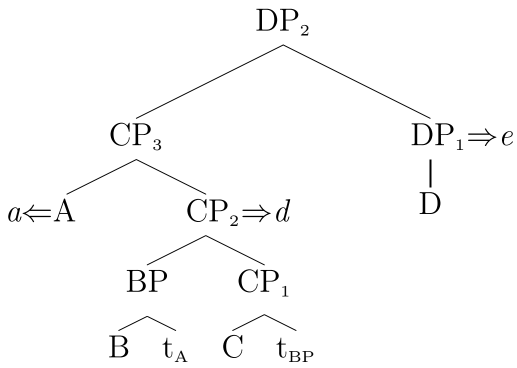
(45)



In (45), A has adjoined right above the node where matching takes place (*Shortest Move*) thus making it possible for d to spell out the node CP_2. The next node in line is D, which can be spelled out by e, since its entry contains the D head. Then, the DP node becomes a target for lexicalization and e is inserted again, this time using its full specification and triggering an evacuation movement of the CP_3 complement.

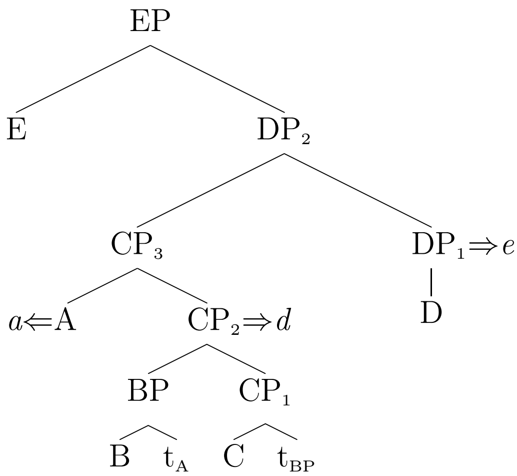
[3]In this, I also assume that subextraction from a left branch is a legitimate operation, see Corver (1990) and Bošković (2005) for relevant discussion.

(46)



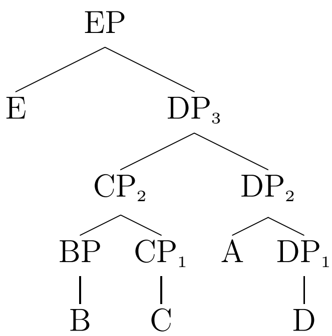
The final step in this thought experiment is the Merge of a head E, which starts a new cycle.

(47)



Suppose now there is an entry *f* with the specification in (48).

(48) $f \Leftrightarrow <$



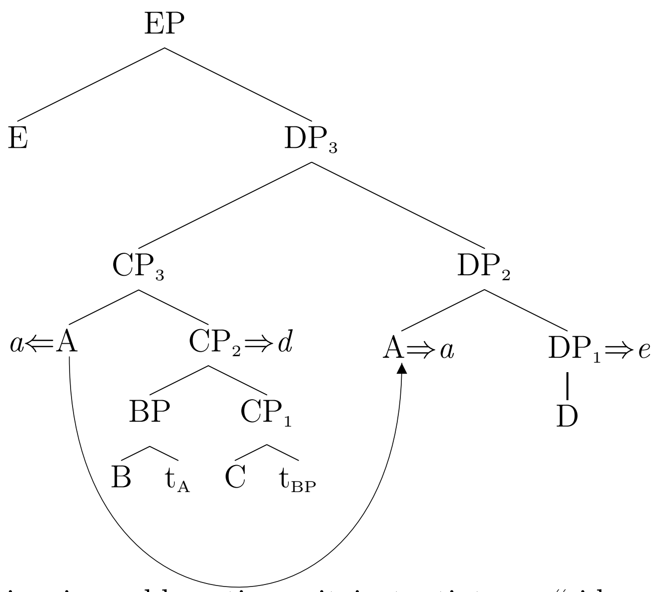
$>$

The hypothetical entry *f* is a possible lexical item, because it can be generated by syntax. More precisely, this would have been the syntactic structure generated if A had adjoined to the root node in (43) and CP_2 had adjoined to DP_2. Given the assumption that adjunction to the root node is available, the tree stored in (48) is a licit syntactic structure. It can be therefore paired with phonological content, stored in the lexicon and used for lexicalization (provided, of course, that it can be learned).

The entry *f* is eligible for insertion at the EP node but only if A had been adjoined to DP in the *previous cycle*. There is, however, no way for the system to know in advance what head will be merged to DP in the next cycle, so that it chooses the suitable landing site for A.

Note that the adoption of Spell-out triggered movement does not circumvent the problem. Imagine that, by moving A, syntax creates the right configuration of nodes for *f* to be inserted at EP, ignoring for now the segment/category distinction. The trigger would be the same as the one I suggested for the movement of DP to AxPartP in the Karata spatial expressions (see the diagram in (16)): movement is induced so that a node can be spelled out by a particular lexical entry. In order to create a matching configuration, A will then have to adjoin to DP_1, as shown in (49).

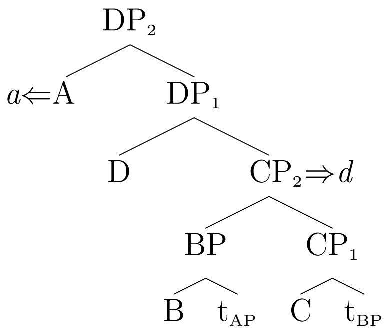
(49)



This operation is problematic as it instantiates a “sideways movement,” where A does not move to a c-commanding position, contra the proposal in Rizzi (1986), Chomsky (1995). I therefore assume that it is unavailable.

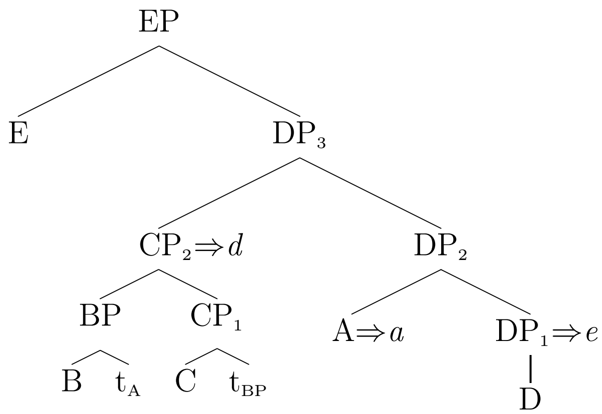
The same complication arises if we assume that, in the cycle when the structure in (43) is to be spelled out, the landing site of A is above DP (*Extension Condition*). This will create the following structure.

(50)



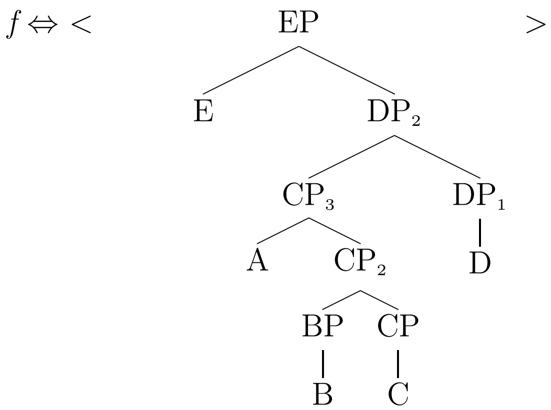
The insertion of e at the DP node will trigger movement of CP_2. Then E is merged, see (51).

(51)



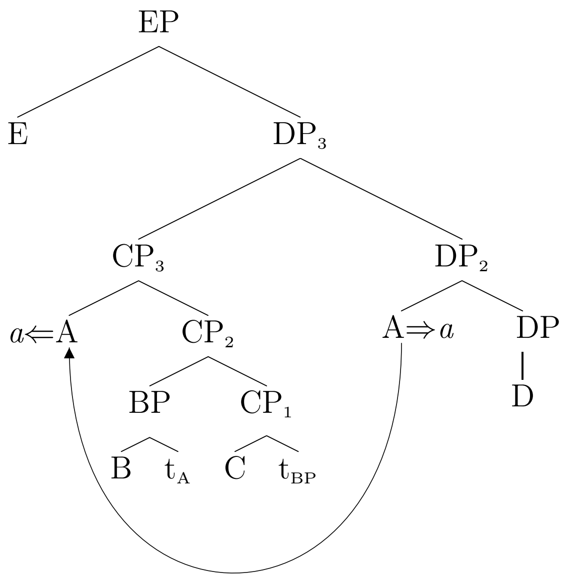
The same problem arises again if we assume that the entry for f contains the tree in (52), which can be generated if A adjoins to the node CP_2 (*Shortest Move*).

(52)



Again, either the system must have known about the Merge of E and the existence of f in the previous cycle, so that it could make the right move, or A has to undergo sideways movement to adjoin to CP_2 (see (53)), which I assumed to be prohibited (following Rizzi 1986 and Chomsky 1995).

(53)



One potential solution is to allow for there to be multiple parallel derivations with the lexicon as a filter. Under this view, the derivation will branch once the lexicalization procedure reaches the node CP_2 (if not even before that). In possible derivation #1, the movement of A triggered by the insertion of *d* at CP_2 will adjoin A to DP. In possible derivation #2, A will be adjoined between CP_2 and DP. At the later point when the item *f* is to be inserted into EP, the incompatible derivation will be filtered out. I am reluctant to adopt this solution, as it is based on a "*global comparison*" approach where multiple derivations are processed in a parallel fashion and the optimal one is chosen at the end. Although assumed in some frameworks, for instance Optimality Theory (McCarthy and Prince 1995, Prince and Smolensky 2004), researchers following the Minimalist Program and related frameworks usually reject this approach because of its high computational costs (Chomsky 1998, Collins 1997, Yang 1997).

The alternative solution, which I pursue here, is to eliminate one of the possible adjunction sites for Spell-out triggered movement so that no choices need to be made. I will therefore assume that Spell-out driven movement obeys the *Shortest Move* requirement. In this, I follow the proposal put forward in Chomsky (1993), according to which the *Extension Condition* does not apply in cases of adjunction.

7.4.3 Backtracking

Until now, all the instances of Spell-out triggered movement involved cases when a single obstructing constituent had to move out so that the right configuration for Spell-out is created. There are, however, cases when more than one constituent is in the way. One such case is presented by the lexicalization of a Source expression in Uzbek (and many related Turkic languages).

Uzbek has three spatial cases (Boeschoten 1998): Locative (expressing static location), Dative (marking Goal of motion as well as indirect objects), and Ablative (expressing Source). The corresponding morphemes are given in (54), where I label the Dative case Allative to stress its Goal function.[4]

(54) a. Locative: *-Dȧ*
b. Allative: *-Gȧ*
c. Ablative: *-Dȧ-n*

As can be seen from (54c), the Ablative marker is bi-morphemic. It consists of the Locative morpheme *-Dȧ* and the morpheme *-n*. We can then assume that the morphemes in (54) are mapped to the syntactic structure of spatial expressions in the following way:[5]

- The Locative morpheme *-Dȧ* lexicalizes the Place head – (55a,c).
- The Allative morpheme *-Gȧ* lexicalizes the Goal and Place heads – (55b).
- The Ablative morpheme *-n* lexicalizes the Source and Goal heads – (55c).

[4]As I suggest in Chapter 10, Section 10.3, Uzbek (and numerous other languages that use the Dative case to express goal of motion) does have an Allative case, but it happens to be syncretic with the Dative.

[5]In order to keep the discussion simple, I leave aside the AxPart projection and focus on the Place, Goal and Source heads. The complete derivation will include an initial cycle where AxPart and DP are merged. I assume that the AxPart head is included in the specification of the Locative and the Allative morphemes and can be lexicalized by them together with Place, and Place plus Goal, respectively.

(55) a. $\underset{\textit{-Dȧ}}{\text{Place}}$ DP

b. $\underbrace{\text{Goal Place}}_{\textit{-Gȧ}}$ DP

c. $\underbrace{\text{Source Goal}}_{\textit{-n}}$ $\underset{\textit{-Dȧ}}{\text{Place}}$ DP

Given that the Locative, Allative and Ablative markers are suffixal, we can assume for them similar entries as for the spatial ending in Karata, namely, entries which contain phrasal nodes and trigger movements.

(56) Locative suffix:
-Dȧ ⇔ </Dȧ/, [$_{\text{PlaceP}}$ Place] >

(57) Allative suffix:
-Gȧ ⇔ </Gȧ/, [$_{\text{GoalP}}$ Goal [$_{\text{PlaceP}}$ Place]] >

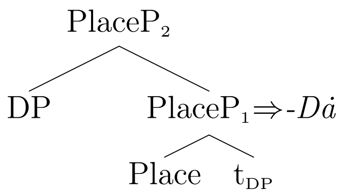
(58) Ablative suffix:
-n ⇔ </n/, [$_{\text{SourceP}}$ Source [$_{\text{GoalP}}$ Goal]] >

The lexicalization of a locative structure will then proceed as follows. Leaving aside AxPartP for the sake of simplicity, the derivation begins with the Merge of Place and DP.

(59) [$_{\text{PlaceP}}$ Place DP]

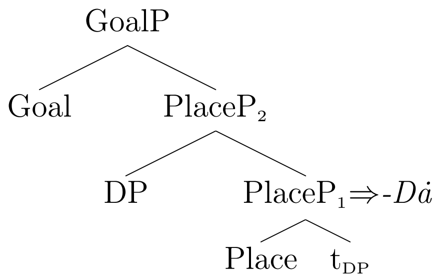
There are two entries which can spell out the PlaceP node: the Locative morpheme -*Dȧ* in (56) and the Allative morpheme -*Gȧ* in (57). The suffix -*Dȧ* wins the competition by the *Elsewhere Principle* (it is a better match) and triggers a movement of DP to PlaceP_2. The DP is accordingly linearized before -*Dȧ*.

(60)



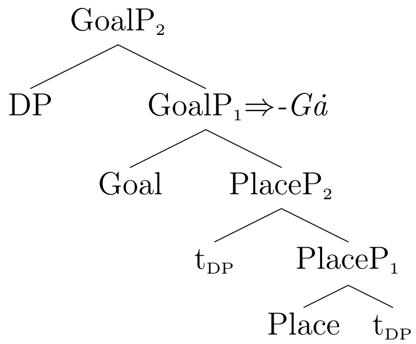
Next, the Goal head is merged into the structure, yielding (61).

(61)



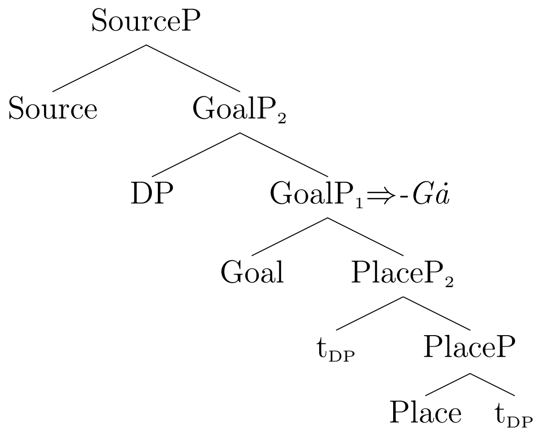
There are again two entries which can be inserted at the GoalP phrase (still abstracting away from the category/segment distinction): the entry -*Gȧ* in (57) and the entry -*n* in (58). The Goal entry would trigger an evacuation of the DP, the Source entry would trigger evacuation of the entire PlaceP_2. The Goal entry is chosen over the Source entry by virtue of being a better match (it does not contain the superfluous Source feature), see (62).

(62)



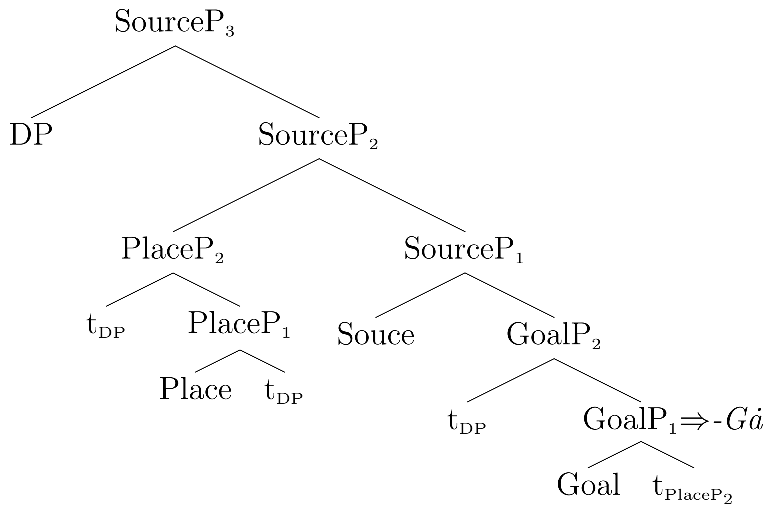
Finally, the Source head is merged, leading to the structure in (63).

(63)



The Ablative entry (58) can be inserted at the SourceP node, crucially necessitating *two* obstructing nodes to move away: the PlaceP$_2$ node and the DP node adjoined to GoalP$_2$. Let us then see what happens if two movements indeed take place: first PlaceP$_2$ and then DP, yielding the structure in (64).

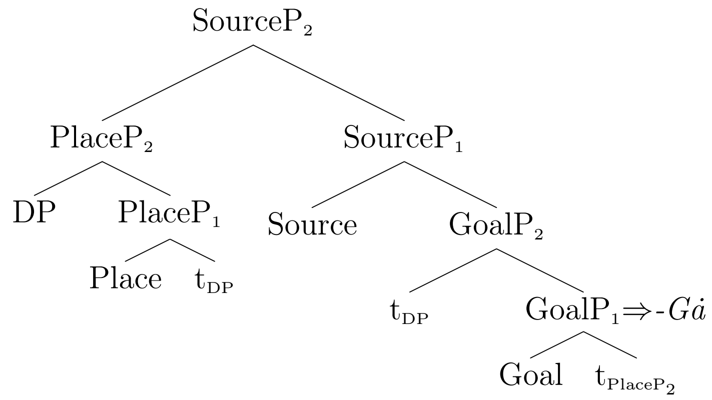
(64)



The result is a structure which cannot be linearized by the LCA: DP and PlaceP asymmetrically c-command each other. Hence, assuming that linearization is governed by the LCA, this is cannot be the structure underlying the Uzbek Source phrase. The same problem arises if we assume that the DP moves first, followed by the evacuation of PlaceP$_2$.

Empirically, we know that the DP precedes the Locative marker, and the Locative marker precedes the Ablative. The LCA then enforces a structure of a Source phrase like the one in (65).

(65)



So, the question is what went wrong with the derivation of SourceP and why did we end up with the non-linearizeable syntactic representation in (64)?

Plausibly the answer is not in the number of movements that had to take place — two instead of one. If a lexical entry can trigger one evacuation movement, then it should also be able to trigger two. Restricting the number of Spell-out triggered movements per item seems to me ungrounded.

A comparison between the structure in (65) and the one in (64) reveals the most likely answer. In (64), the DP and the PlaceP are two separate constituents, each of which undergoes a movement by itself. In (65), however, the DP and PlaceP_2 form one constituent, suggesting that the evacuation movement has displaced the entire constituent. Guided by this observation, I would like to suggest, following Cinque (2005), that the problem lies in the fact that one of the two movements triggered in (64) is a movement that does not contain the head noun. More precisely, the problematic movement is of PlaceP_2 as it contains only a *trace* of the DP. As Cinque (2005) suggests, word order movements within the extended nominal projection are restricted by the requirement that the moved constituent contains the NP.

(66) Restriction on movement (Cinque 2005:321)
Neither head movement nor movement of a phrase not containing the (overt) NP is possible.

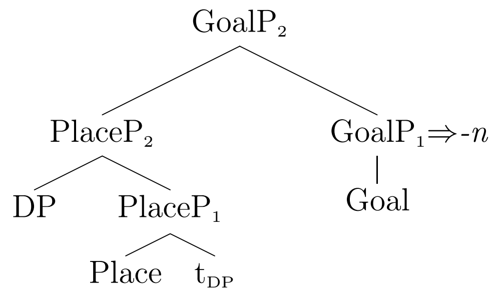
This restriction has been productive in accounting for the attested and unattested orderings of the nominal modifiers Demonstrative, Numeral, and Adjective with respect to each other and the NP. Assuming that the heads Place, Goal, Source, and Route are part of the extended projection of the noun (an assumption dating back to Grimshaw 1991, who suggest that P is part of the extended NP, for a more modern cartographic representation see, for instance, Bye and Svenonius 2011:ex.(6)), it is logical to expect that the restriction on movement in (66) applies also to the word order movements within the structures discussed in this thesis.

Thus, I propose that the requirement that each moved constituent contains the head noun extends also to the spatial structures explored here. The impossibility of performing two evacuation movements in (64) is due to a violation of this requirement. Namely, PlaceP$_2$ does not contain the head noun.

How does the system then derive a Source phrase? By the time when Source is merged in (63), the DP has already extracted from PlaceP$_2$ due to the insertion of -*Gá* at GoalP. By what mechanism then does the structure in (65) arise?

There are two conceivable solutions. The first one is to let the system compute all possible derivations from a given numeration and then compare them so that the most optimal is chosen. In the pool of possible derivations there is one where PlaceP and DP move as one constituent after the Goal head is merged. Specifically, this is the way the derivation would have proceeded if the Source entry -*n* were chosen for insertion at the GoalP node. In other words, when the Goal head is merged, the derivation line branches: there are two possible continuations of the derivation: D$_1$ where the sole DP evacuates and the Goal entry is chosen for insertion at GoalP$_1$ (diagrammed in (62)), and D$_2$ where PlaceP$_2$ is evacuated and the Source entry is inserted at GoalP$_1$, see (67).

(67)



Computing now two derivations instead of one,[6] the derivation continues with the Merge of the Source head. The only entry specified for the Source feature is -*n*, so it will be chosen for insertion in both D$_1$ and D$_2$. In D$_1$ two evacuation movements will be triggered, leading to a failure to

[6] In fact, at least four, as the derivation will have already branched once at the PlaceP node, where two entries match — the Allative and the Locative. In fact, since branching can potentially occur every time the lexicon is accessed, the number of possible derivation grows at an exponential rate.

linearize the structure. In D_2, the movement triggered by the Spell-out of node SourceP by *-n* will displace DP and PlaceP together, preserving the asymmetric c-command relation between DP and PlaceP. When at the end of the day the system determines the optimal derivation, D_2 is selected over D_1.

As already mentioned in Section 7.4.2, such a system is computationally costly, because there is a huge number of parallel derivations to be executed and compared *globally*. As argued for by Collins (1997) and Yang (1997), global comparisons render the derivations intractable and I am therefore reluctant to adopt this solution.

An alternative solution involving no global comparison is to allow the system to retreat to the last step in the derivation when PlaceP_2 contains the DP and from that point on follow a derivation path where they are moved as one inseparable unit. The rationale behind it is the following: at a certain stage of the derivation two nodes are marked for extraction: DP and PlaceP_2. The latter cannot be moved, though, because it does not contain the DP. Importantly, the DP has to evacuate just like PlaceP_2, so a way out is to move it together with PlaceP_2. The system therefore backtracks to the point where PlaceP_2 and DP form one constituent. For this purpose the system must remember the path traversed by the derivation so that it is possible to reconstruct it to the relevant step, that is, to the step of lexical access after the Goal head is merged. Although this introduces some complexity, there is still a unique derivational path to be traversed, albeit one with a step-back. Crucially no parallel derivations have to be considered as in the global approach.

In more technical terms, the backtrack algorithm can be designed in the following way: assuming that each of the syntactic operations in (27) (Internal Merge, External Merge, Lexical access) marks a step in the derivation, at the step when the lexicon produces the item *-n* as the matching entry for the SourceP node, the derivation cannot continue due to the impossibility of evacuating the PlaceP_2 constituent without the DP being contained in it. The impossibility of moving a node marked for extraction triggers backtracking. The system thus retreats to the last step of the derivation where the node marked for extraction can be legitimately extracted (i.e., where PlaceP_2 and DP form one constituent). This is the step at which the lexicon is consulted right after the Merge of Goal. In the schematic sequence of operations in Figure 7.1, this step is marked as number 8, starting the count from the Merge of DP and AxPart. The impossibility of continuing the derivation is represented by the symbol "!" and the backtracking is marked as an arrow to Step 8 —

the last stage in the derivation when DP and PlaceP are a constituent.

Figure 7.1: Backtracking scheme in Uzbek Ablative expressions

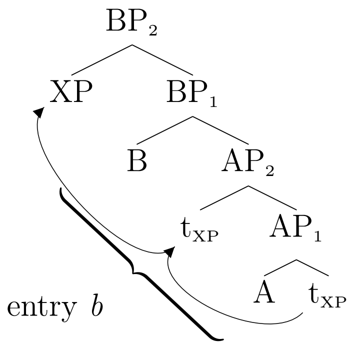
8 Choose -*Gȧ* → 9 Move DP → 10 Merge Source → 11 Choose -*n* → 12 !

8 Choose -*n* → 9 Move PlaceP_2 → 10 Merge Source → 11 Choose -*n* → 12 Move PlaceP_2

Back at Step 8, the system pursues an alternative way to lexicalize node GoalP such that it obviates the need to extract DP from PlaceP_2. Specifically, it chooses the rejected competitor -*n*, since -*n* triggers a movement of the entire PlaceP_2 node, thus leading to a successful derivation in the steps to follow. In the theoretical case where there is more than one alternative to pursue, I suggest that the choice of alternative entries is determined by a ranking imposed by the *Elsewhere Principle*: the fewer unused features an item would leave, the higher its position on the list of alternatives is.

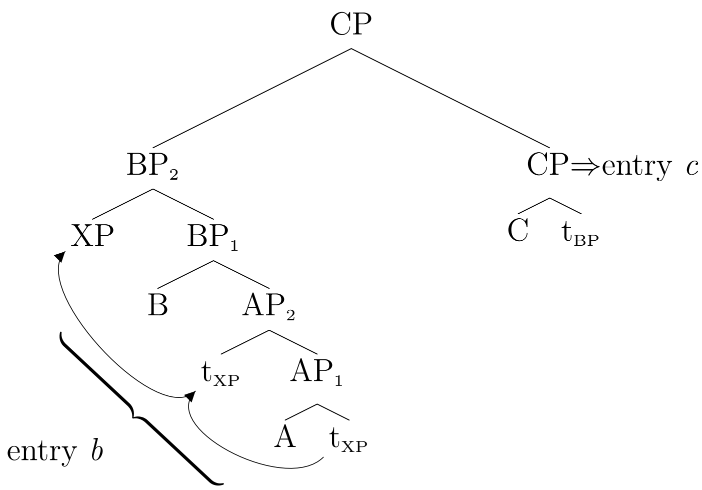
Such cases of backtracking occur typically whenever we have two structures in a subset-superset relation and the smaller structure is spelled out by a portmanteau, while the bigger structure is spelled out analytically by a sequence of morphemes. Importantly, the last one of the sequence of morphemes has to be a portmanteau itself and its feature specification has to partially overlap with the features of the portmanteau spelling out the smaller structure. The reason for the backtracking is the different types of movement triggered by the portmanteau and the non-portmanteau morphemes. As already pointed out at the end of Section 7.3, portmanteau entries trigger a cyclic movement of an XP within the structure they span (within the spatial *fseq*, XP=DP, or a projection containing the DP).

(68)



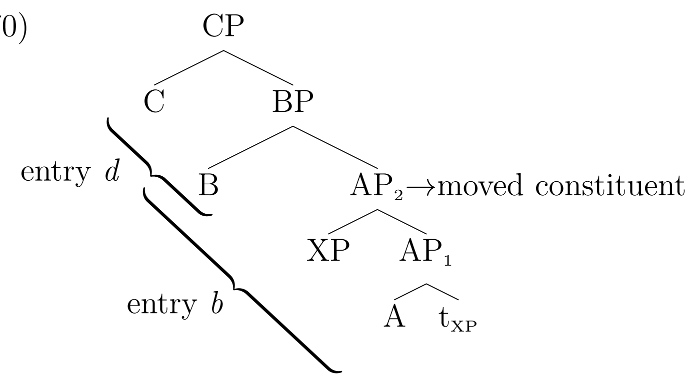
Analytic expressions involve roll-up movements of XP *plus pied-piped material*. Such roll-up movements occur at the border between two morphemes.

(69)



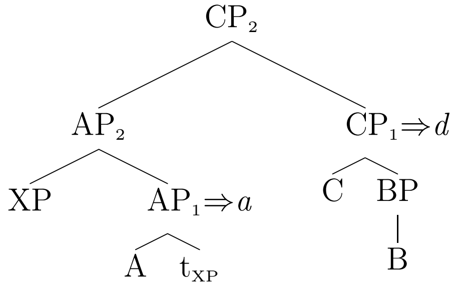
If the system needs to spell out the CP node in (69) by an entry *d* which has both the feature C and B (i.e., overlaps with entry *b*), it will need to backtrack to the stage when XP and AP form one constituent and then move them together.

(70)



Note that, if there is an entry *a* which matches AP without leaving unused features, it will be used to spell out the displaced AP.

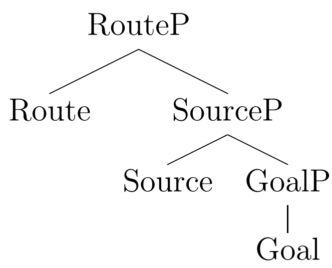
(71)



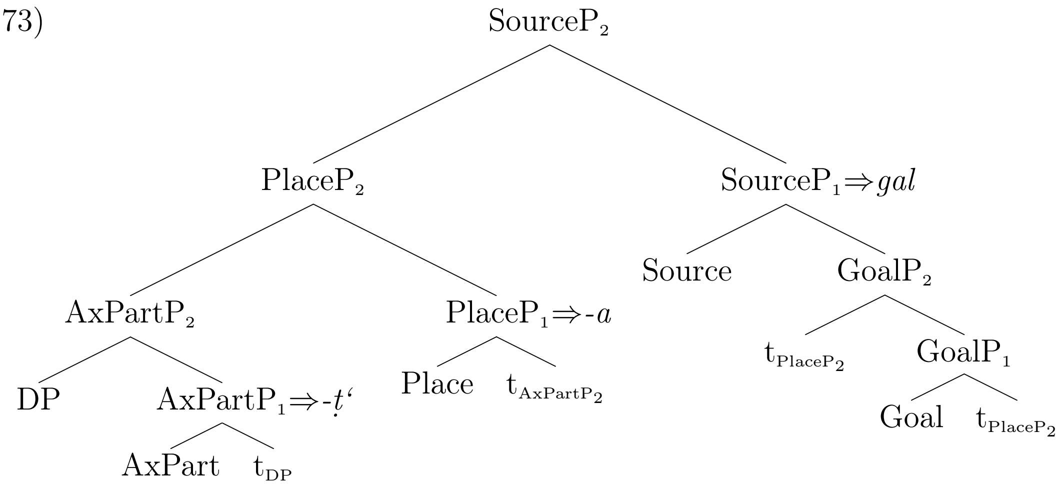
As a result, the structure it (71) will be spelled out by *a+d* and not as *b+d*. This is the reason why the Uzbek Source marker is stacked to the Locative suffix (*-Dȧ-n*) and not to the Allative suffix (**-Gȧ-n*). Descriptively, it looks as if the *-n* has to realize its lowest feature. A requirement to that effect has been proposed by Abels and Muriungi (2008) and adopted by Caha (2009b) and Pantcheva (2010) under the name of *The Anchor Condition*. With the current technology of Spell-out driven movement and backtracking, the Uzbek data are captured without the need to adopt this restriction.

7.5 Segment-matching versus category-matching

Until now, I have been ignoring the segment/category distinction within the lexical entries, allowing for an entry of the sort in (72) (repeated from (22) in Section 7.3) to spell out the SourceP$_1$ node in the structure in (73), despite the fact that the GoalP category contains two segments ((73) is repeated from (23) in Section 7.3).

(72) Entry for Karata Ablative suffix:
-gal ⇔ </gal/,  >

(73)



In this section, I take up the question whether lexical items contain information only about categories, or whether segments matter too for matching purposes. On the *segment-matching* view, the lexical entries contain information about the exact geometry of the structure they can replace, including the number of segments a category consists of. On the less rigid *category-matching* view, only categories need to be listed in the lexical entries.

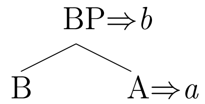
7.5.1 Category matching

Let us first suppose that vocabulary items are specified only for what heads and maximal projections they can lexicalize and do not store information about how many segments a category consists of.[7] Hence, the shape of the abstract lexical entries that I use to illustrate various derivations will be as follows:

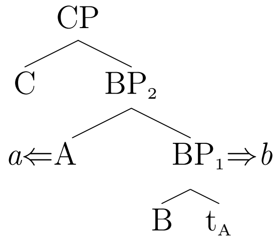
(74) a. *a* ⇔ </a/, A>
b. *b* ⇔ </b/, [BP B] >
c. *c* ⇔ </c/, [CP C [BP B]] >

[7]To conform with this assumption, the matching of items should be stated only over categories, that is, an item will match the syntactic structure if it contains a superset of the categories listed in the syntactic structure, in the same geometrical configuration.

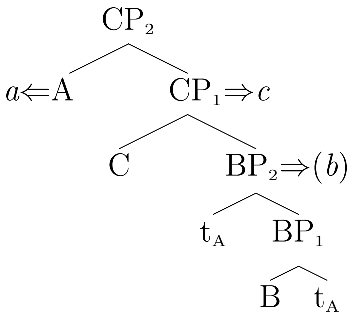
Exploring again a hypothetical abstract derivation, let us start the first cycle by the Merge of B and A. The structure is sent to the lexicon for Spell-out and the lexicon produces the items *a* as a match for node A, and item *b* as a match for node BP. The node A is then marked for extraction in the next cycle as a result of the matching of *b* to BP.

(75)


The next cycle starts with syntax first moving the nodes that are marked for extraction, that is A to BP_2, and then merging C.

(76)


The lowest unmatched node in this new cycle is BP_2 and it is therefore the first node to be inspected for lexicalization. There are two lexical entries which match: *b* and *c*. The one which wins is *b*, since it contains no superfluous features. As a result, node A is marked for extraction to a position just above BP_2. Finally, node CP is spelled out by *c*, and this time A is marked for extraction to a node just above CP_1. Note that the BP_2 node in (76) is spelled out by *b* at an intermediate stage, before the insertion of *c* at CP overrides it. This is marked by putting parentheses around the entry *b* at the BP_2 node.

(77)


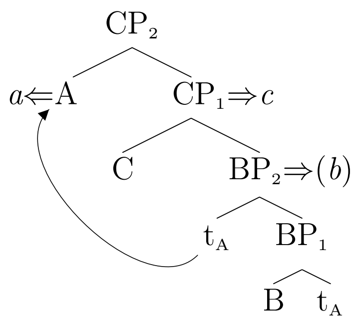
The derivation in (77) contains an interesting case of "double evacuation" which node A has to undergo. In the second cycle of the derivation, A is marked for extraction twice: once by *b* matching BP_2 and once by

c matching CP. The question is how this double movement happens in cycle 3 — does A first adjoin to BP_2 and then to CP_1, or does it move in one fell swoop to CP_1?

The answer depends on the order in which syntax executes the Spell-out triggered movements once the matching process is accomplished. Since lexicalization proceeds bottom-up, the node A is first marked for extraction to BP_3 and then marked once again for extraction to CP_2. If syntax performs the movements starting from the first one chronologically, then A will first move to BP_3, and then to CP_2. If syntax, on the contrary, starts with the last one, then A will move to CP_2 and, assuming that lowering is not possible, the movement to BP_3 will not be performed at all.

Computationally it is more economical to take a shortcut and move A straight to CP_2 — this is just one movement instead of two and, in addition, it obviates the creation of yet another segment in the BP category.

(78)



Furthermore, such an assumption is confirmed by the empirical case of the Finnish Ablative morpheme *-tA*, which I discuss towards the end of Section 7.6. Therefore, I adopt the idea that, whenever more than one movement is necessitated by the need to spell out the structure, syntax performs them starting from the last one.

The technical implementation of this idea depends on whether we have one node which has been marked for extraction more than once (as in the abstract scenario above), or there are two or more distinct nodes marked for extraction (as in the Finnish scenario presented in the next section).

In the first case, when one node is marked for extraction twice or more, I will assume that the later marking cancels out the earlier one. More precisely, if node A is marked as $A_{<BP_3>}$ at the stage when b is matched to BP_2, and then A is marked as $A_{<CP_2>}$ when c is matched to CP, the index $_{<CP_2>}$ simply replaces the index $_{<BP_3>}$. As a result, syntax “sees” only the index $_{<\mathrm{CP}_2>}$ and consequently moves A straight to CP_2.

In the second case, when multiple nodes are marked for extraction (the case of Finnish), the reversed chronology of movements can be achieved if we assume that syntax proceeds top-down when inspecting which nodes are to be evacuated. In a bottom-up lexicalization system, the higher nodes in the tree will be marked for extraction later than the lower ones. If syntax then evacuates the nodes working from the top of the tree downwards, the node that was marked for extraction last will be moved first, and so on. The result is that the movements will be performed in an order opposite to the order in which they were triggered.

7.5.2 Segment matching

Let us now suppose that segments are included in the computation of matching and assume the following abstract entries:

(79) a. $a \Leftrightarrow$ </a/, A>

b. $b \Leftrightarrow$ </b/, BP >
| B

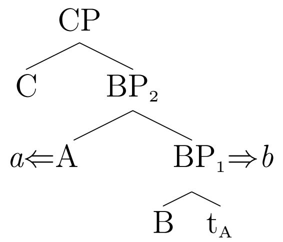
c. $c \Leftrightarrow$ </c/, CP >
C BP_2
| BP_1
| B

Starting again with the Merge of A and B, the structure is shipped to the lexicon for the regular check. The entry a matches node A, b is a match for node BP and A is marked for evacuation in the next cycle.

(80) BP$\Rightarrow b$
B A$\Rightarrow a$

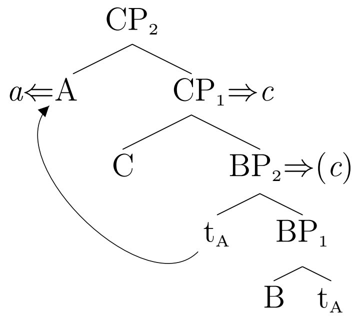
In the next cycle, first the movement of A takes place, followed by the Merge of C.

(81)



Node BP_2 is now the target for lexicalization and there is just one lexical entry which matches — the entry *c*. It triggers the evacuation of A. Finally, *c* lexicalizes the CP node triggering a second evacuation of A to CP_2.

(82)

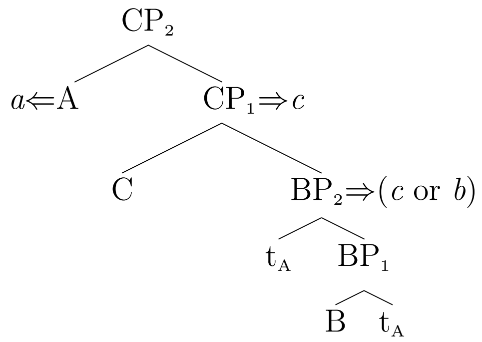


Note that, under segment-matching, all Spell-out triggered movements are encoded in the lexical entries. For instance, the entry *c* contains the landing sites for all the movements that A has to undergo prior to adjoining to the root node, hence the two-segmental BP category in its specification.

7.5.3 Segment versus category matching

The abstract structures examined in the preceding two sections make different predictions under the assumed lexical entries. More precisely, the BP_2 node is spelled out by the "bigger" entry *c* under segment-matching and by the "smaller" entry *b* under category-matching. I illustrate this in the diagram in (83), which conflates the trees in (77) and (82).

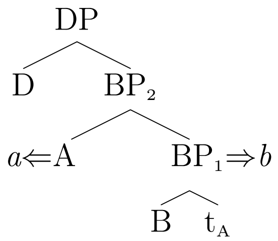
(83)



This difference does not surface because the entry inserted at BP_2 is overriden by the insertion of *c* at CP_1 in both cases. It is, however, possible to come up with a scenario where the difference comes to light, for instance in the case of the Finnish Adessive expression, which I discuss in Section 7.6. The Finnish Allative shows that the empirically correct prediction is that BP_2 is spelled out by the smaller entry *b*. As a consequence, in order to make segment-matching deliver the right results, it becomes necessary to include one more segment of the BP category in the entry for *b* in (79b). In what follows I present this scenario in detail. The point I would like to make is that both views can lead to empirically correct results, provided we assume suitable lexical entries. In the absence of empirical evidence, the choice between category-matching and segment-matching then needs to be made on the basis of other considerations. I then opt for category-matching, which is the view involving less complex lexical entries,

Suppose that, instead of the head C, we merge the head D to the structure in (81) (=(76)) and assume the entry in (85).

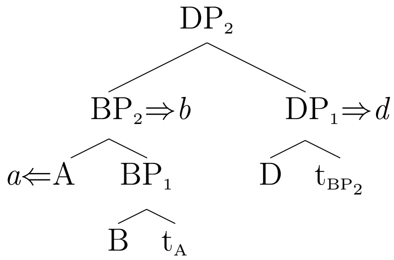
(84)



(85) $d \Leftrightarrow$ < /d/, $\begin{array}{c}\mathrm{DP}\\ | \\ \mathrm{D}\end{array}$ >

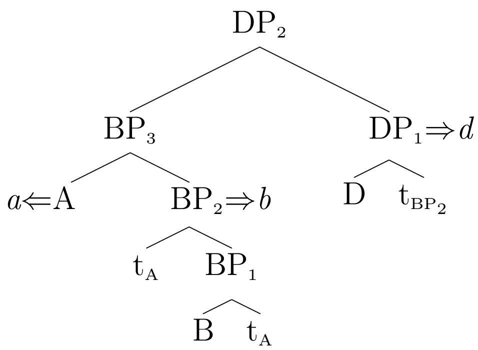
Keeping the entries *a* and *b*, assumed in (74), under the category-matching view, lexicalization first targets BP_2 and chooses *b* for insertion, marking A for extraction to BP_3. Then node DP is spelled out by *d*, resulting in the evacuation of BP_2. Syntax then first performs the movement of BP_2 to DP_2.

(86)



Then A is adjoined to BP_2. Note that this operation involves an adjunction within a complex specifier, a movement which is not generally assumed to be available. There is however nothing in the Spell-out model developed here which would prohibit it, since I assume, following Chomsky (1995), that the *Extension Condition* does not apply in the cases of adjunction.

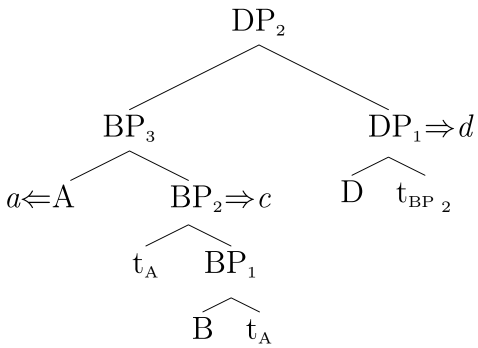
(87)



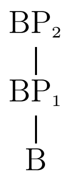
Note that the node BP_2 is spelled out by b, which wins over c by the *Elsewhere Principle*, thus leading to a pronunciation of entire structure as a+b+d.

Under the segment-matching view and with the entries in (79), lexicalization again first targets the BP_2 node, this time choosing c for spelling it out as the only matching entry.

(88)



The structure will therefore be pronounced as $a+c+d$. This is an empirically wrong result, as shown by the Finnish data discussed in the next section. Therefore, as already announced in the introduction to this subsection, we need to assume an entry b with a *two*-segmental BP category in order to make b spell out BP_2 under the segment-matching view, see (89).

(89) $b \Leftrightarrow$ </b/,  >

This entry will be the one used for lexicalizing the BP_2 node, as it contains all the segments which the BP category consists of, and it is also the entry preferred over c by virtue of being a better match.

In sum, segment-matching and category-matching can both deliver the right results and the issue of which one is to be adopted is reduced more or less to the question of where we want to have a greater complexity: in the shape of lexical entries (as with segment-matching, where lexical entries contain multi-segmental categories) or in the computation of derivation (as with category-matching, where the burden falls on computation by necessitating quite a few evacuation movements, as I show in the next section).

My decision is to assume simpler lexical entries and a computation involving lots of movements. In this, I am guided by the common conception in the field that storage space is costly and computation is cheap. Thus, I adopt the category-matching view and proceed to the next section, where I present a detailed derivation of the Finnish Locative, Goal and Source phrases.

7.6 Finnish - The Grand Finale

Finnish is a very good language to finish with, not only because it is homophonous to the verb, but also because its spatial system contains wonderful twists and turns. It has a revealing case of allomorphy in one of the two spatial series, the portmanteau morpheme *-(h)Vn*, which I have already mentioned in the context of timing of Spell-out driven movement. Furthermore, Finnish provides us with a rare scenario of double evacuation movement, which, as mentioned in Section 7.5, suggests that the execution of Spell-out driven movements happens in an order opposite to the order of their triggering. Finally, Finnish features a valuable empirical counterpart to the abstract structures in (87) and (88), showing that the former one reflects the correct lexicalization, that is, that the "smaller" entry indeed lexicalizes the counterpart of the BP_2 node in Finnish.

Before running a detailed derivation and lexicalization of all Finnish spatial expressions, I will summarize the principles and assumptions discussed in this chapter.

(90)
a. The linearization of syntactic structure is governed by the LCA (Kayne 1994).

b. The shape of a lexical entry can trigger movement of a syntactic constituent such that the right configuration for insertion is created (Spell-out triggered movement) (Starke 2011).

c. The moved constituent must contain the head noun (Cinque 2005) .

d. The moved constituent adjoins right above the node where insertion takes place (*Shortest Move*).

e. The Spell-out triggered movement in one cycle takes place in the next cycle.

f. The order in which syntax performs the Spell-out triggered movements is opposite to the order in which they are triggered.

g. Lexical entries store information only about heads and phrases, but not about segments (category-matching).

The assumptions listed under (90d-f) were made to a great extent due to the empirical evidence provided by the Finnish spatial morphology. In this chapter, I show how they deliver the right results and why the alternative assumptions do not.

The Finnish spatial system is presented in Table 7.1 and illustrated on the noun *talo* 'house.'

Series		Location	Goal	Source
in	*-s*	*-ssa* (*talo-ssa*)	*-(h)Vn* (*talo-on*)	*-sta* (*talo-sta*)
on	*-l*	*-lla* (*talo-lla*)	*-lle* (*talo-lle*)	*-lta* (*talo-lta*)

Table 7.1: Spatial case system in Finnish (Sulkala and Karjalainen 1992)

The spatial case morphemes in Finnish can in fact be seen as compositional with the important exception of *-(h)Vn*. Comrie (1999) suggests that Finnish has two "series markers:" *-s* 'IN' and *-l* 'ON.' These series markers combine with the Locative ending *-CA* to express Location (where C copies the preceding consonant and the vowel A is subject to vowel harmony). To express Goal, the marker *-Ce* attaches to the series marker, and to express Source, the series marker combines with the suffix *-tA*. Table 7.2 presents the decomposition of the Finnish spatial cases.

Series		Location	Goal	Source
in	*-s*	*-s-CA*	*-(h)Vn*	*-s-tA*
on	*-l*	*-l-CA*	*-l-Ce*	*-l-tA*

Table 7.2: Decomposition of spatial cases in Finnish

The morphemes in Table 7.2 can be mapped to the syntactic structure of spatial expressions in the following way:

- The series markers *-l* and *-s* lexicalize the AxPart head – (91a-b, d).
- The locative morpheme *-CA* lexicalizes the Place head – (91a).
- The morpheme *-Ce* lexicalizes Goal and Place – (91b).

- The Illative morpheme *-(h)Vn* lexicalizes AxPart, Place, and Goal – (91c).
- The morpheme *-tA* lexicalizes Source, Goal, and Place – (91d).

(91) a. $\underset{\textit{-CA}}{\underset{|}{\text{Place}}}\quad \underset{\textit{-l/-s}}{\underset{|}{\text{AxPart}}}\quad \text{DP}$

b. $\underbrace{\text{Goal}\qquad\quad \text{Place}}_{\textit{-Ce}}\quad \underset{\textit{-l}}{\underset{|}{\text{AxPart}}}\quad \text{DP}$

c. $\underbrace{\text{Goal}\quad \text{Place}\quad \text{AxPart}}_{\textit{-(h)Vn}}\quad \text{DP}$

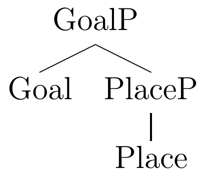
d. $\underbrace{\text{Source}\quad \text{Goal}\quad \text{Place}}_{\textit{-tA}}\quad \underset{\textit{-l/-s}}{\underset{|}{\text{AxPart}}}\quad \text{DP}$

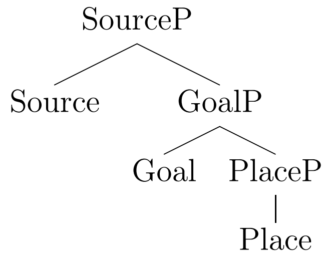
I therefore assume the following entries for the Finnish spatial morphemes, adhering to the category-matching view:

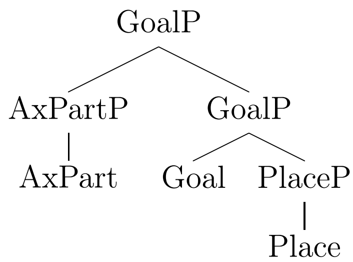
(92) Series marker *-l*:
$\textit{-l} \Leftrightarrow <\text{/l/},\ \begin{array}{c}\text{AxPartP}\\ |\\ \text{AxPart}\end{array},\ \textsc{on}>$

(93) Series marker *-s*:
$\textit{-s} \Leftrightarrow <\text{/s/},\ \begin{array}{c}\text{AxPartP}\\ |\\ \text{AxPart}\end{array},\ \textsc{in}>$

(94) Locative marker *-CA*:
$\textit{-CA} \Leftrightarrow <\text{/CA/},\ \begin{array}{c}\text{PlaceP}\\ |\\ \text{Place}\end{array}>$

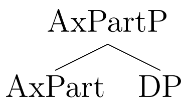
(95) Goal marker -*Ce*:
-*Ce* ⇔ </Ce/,  >

(96) Source marker -*tA*:
-*tA* ⇔ </tA/,  >

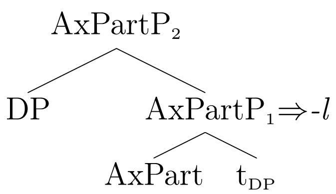
(97) Illative marker -*(h)Vn*:
-*(h)Vn* ⇔ </(h)Vn/,  , IN>

Let us first examine the derivation of the "biggest" Source expression in the ON-series, which involves the lexical entries -*l*, -*CA*, -*Ce*, and -*tA*.[8]

The first step is the Merge of AxPart and DP.

(98) 

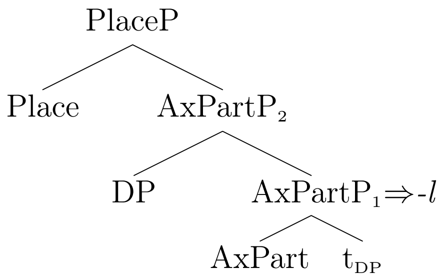
The lexicon is consulted and the item -*l* in (92) is chosen for insertion. This triggers a movement of DP to AxPartP$_2$ as the first step in the next cycle.

(99) 

[8]I assume that -*s* and -*(h)Vn* are not considered by Spell-out for the Adessive, Allative and Ablative expressions, because they are associated with a different conceptual content, namely, the notion of interior.

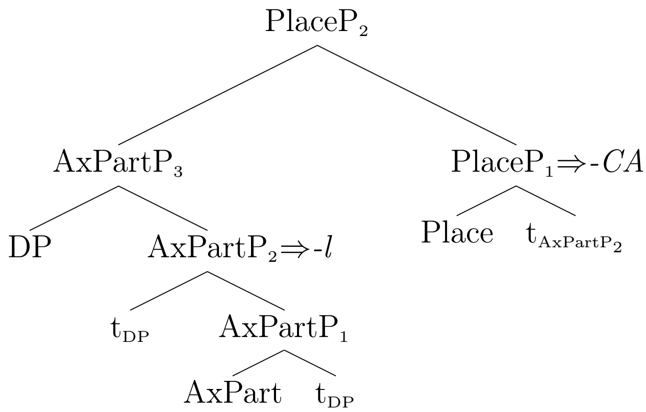
Afterwards, the Place head is merged and the structure is shipped to the lexicon for the search for matching items.

(100)



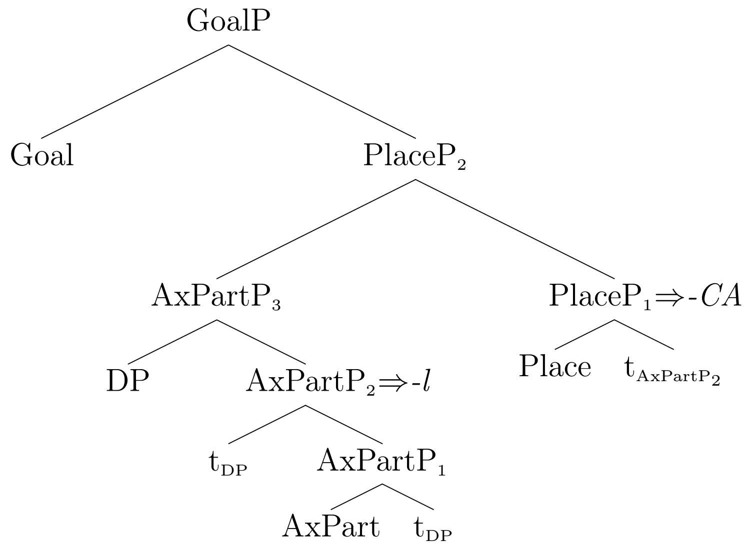
The first node in the new cycle for which the lexicalization procedure searches for a match in the lexicon is $AxPartP_2$ (assuming that the DP has been spelled out in a previous cycle and the system remembers the outcome). The series marker -*l* is chosen as a match and consequently DP is marked for extraction to $AxPartP_3$ in the next cycle. The second node to be lexicalized is Place. The Locative entry in (94) and the Goal entry in (95) match it by the *Superset Principle* and the entry -*CA* is chosen by virtue of having fewer superfluous features. Next, PlaceP is inspected for lexicalization. The entries -*CA* and -*Ce* match this node, too. Again -*CA* wins the competition and triggers an evacuation of $AxPartP_2$. Hence the next cycle begins with two movements: $AxPartP_2$ adjoins to $PlaceP_1$ and then DP adjoins to $AxPartP_2$ within the specifier of PlaceP. As already discussed below the example in (86), I assume the movement of DP to $AxPartP_3$ to be available, as there is nothing in the system of assumptions that would exlude it.

(101)



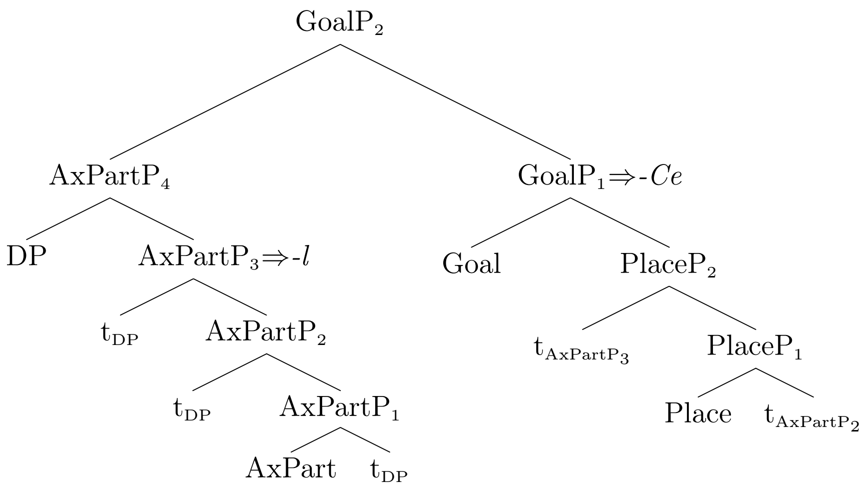
Next, the Goal head is merged.

(102)



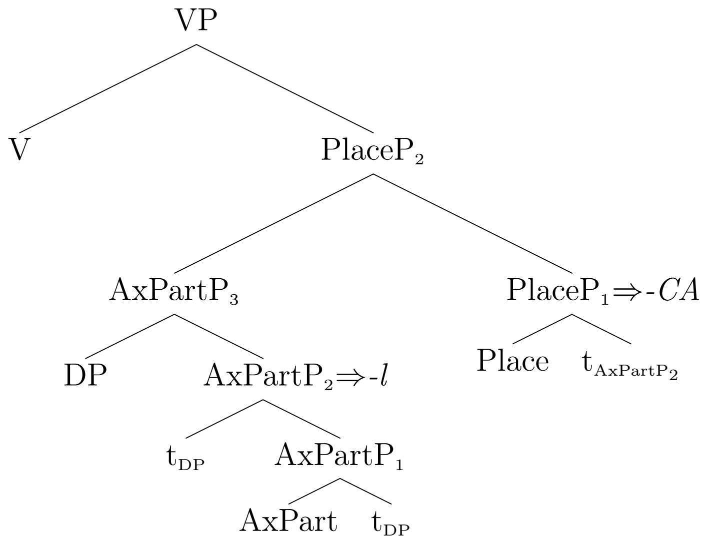
The first node targeted by lexicalization is AxPartP$_3$. This is so because this node is created as the result of the Spell-out triggered movement which has taken place in the current cycle. Thus, AxPartP$_3$ has not been inspected for lexicalization previously. The series marker -*l* matches AxPartP$_3$, triggering adjunction to AxPartP$_4$, i.e., to a position right above the node where insertion takes place. Then, PlaceP$_2$ is inspected for matching items. The Locative marker -*CA* and the Goal marker -*Ce* are chosen as matching entries and -*CA* wins by the *Elsewhere Principle.* As a result, the AxPartP$_3$ node adjoined to it is marked for extraction to a position right above PlaceP$_2$. Then the Goal head is targeted by lexicalization. There are two matching items: the Goal marker -*Ce* in (95), and the Source marker -*tA* in (96). The winner is -*Ce* by the *Elsewhere Principle.* Finally, the phrasal node GoalP is targeted and -*Ce* is chosen over -*tA* again. Subsequently, AxPartP$_3$ is marked for extraction to GoalP$_2$. The insertion of -*Ce* at GoalP$_1$ overrides the Locative marker -*CA* inserted at PlaceP$_2$.

(103)



Note that the PlaceP$_2$ node is predicted to be "temporarily" lexicalized by -*CA*, before the insertion of -*Ce* at GoalP$_1$ takes place. This lexicalization of PlaceP$_2$ can in fact be made visible, if this node becomes embedded under a different projection, for instance a verbal head.

(104)

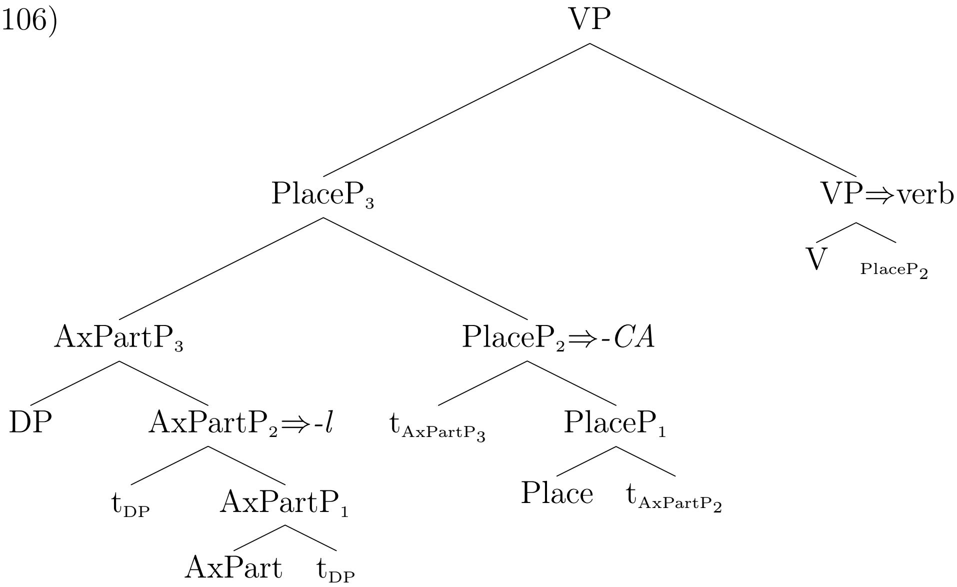


Suppose, for the sake of the argument, that there is a verbal entry with the shape in (105).

(105) verb ⇔ < VP >
|
V

The lexicalization of the structure will proceed in the following way (to keep the discussion simpler, I will leave aside the step of the lexicalization dealing with the AxPartP_3 node). As already discussed in the paragraph preceding (104), the PlaceP_2 node is matched by both -*CA* and -*Ce* and the former entry is chosen by the *Elsewhere Principle*, triggering evacuation of AxPartP_3 to PlaceP_3. The verbal entry in (105) matches the VP node and triggers evacuation of the entire PlaceP_2.

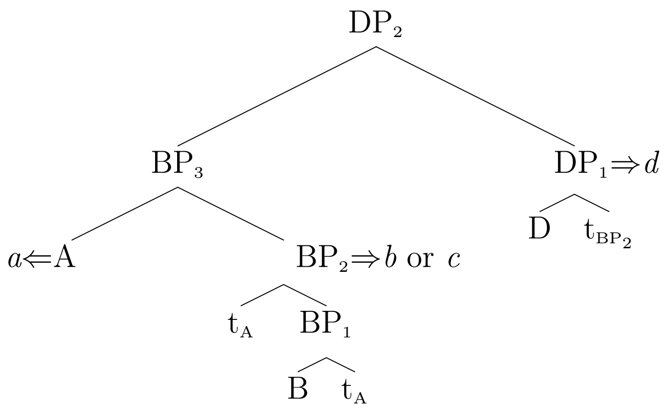
(106)



This time, due to the verbal material dominating it, -*CA* will not be overridden by another morpheme (assuming that the Finnish verbs do not lexicalize heads from the spatial domain, but see Chapter 8 for a discussion of languages where this happens).

The structure in (106) is the previously advertised real language scenario corresponding to the abstract structures in (87) and (88) discussed in Section 7.5 and repeated below.

(107)

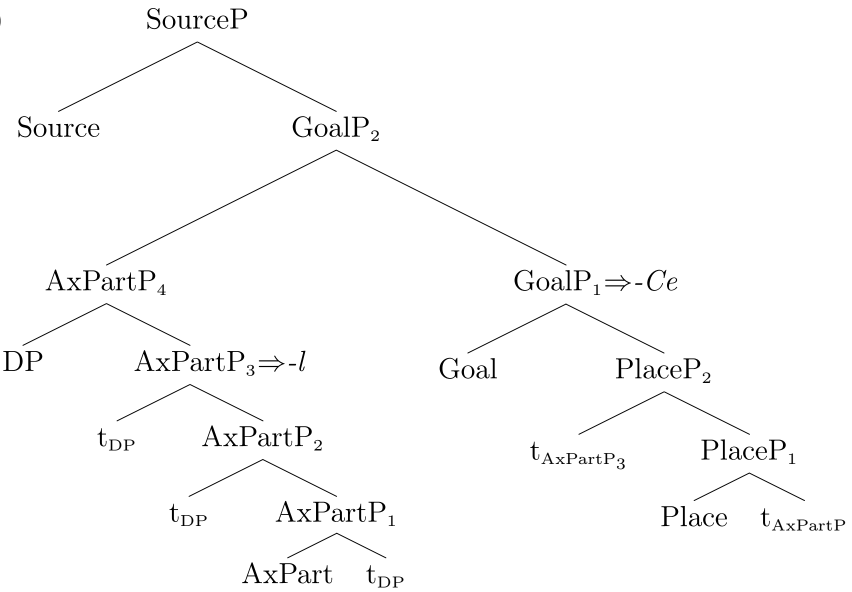


The question raised in connection to this diagram was what lexicalized the BP_2 node (corresponding to the PlaceP_2 node in (106)): the smaller entry *b* or the bigger entry *c*? Assuming that the smaller Locative marker -*CA* is *b* in (74b) and the bigger Goal marker -*Ce* is *c* in (74c), Finnish shows that the correct answer is *b*.

Back to the derivation of the Finnish Ablative structure, the next cycle begins with two Spell-out driven movements: $\mathrm{AxPartP}_3$ to GoalP_2 and DP to $\mathrm{AxPartP}_4$, as shown in the diagram in (103). The adjunction of $\mathrm{AxPartP}_3$ to a node right above PlaceP_2, which is supposed to take place after moving $\mathrm{AxPartP}_3$ to GoalP_2, does not happen, as this instantiates lowering from GoalP_2.

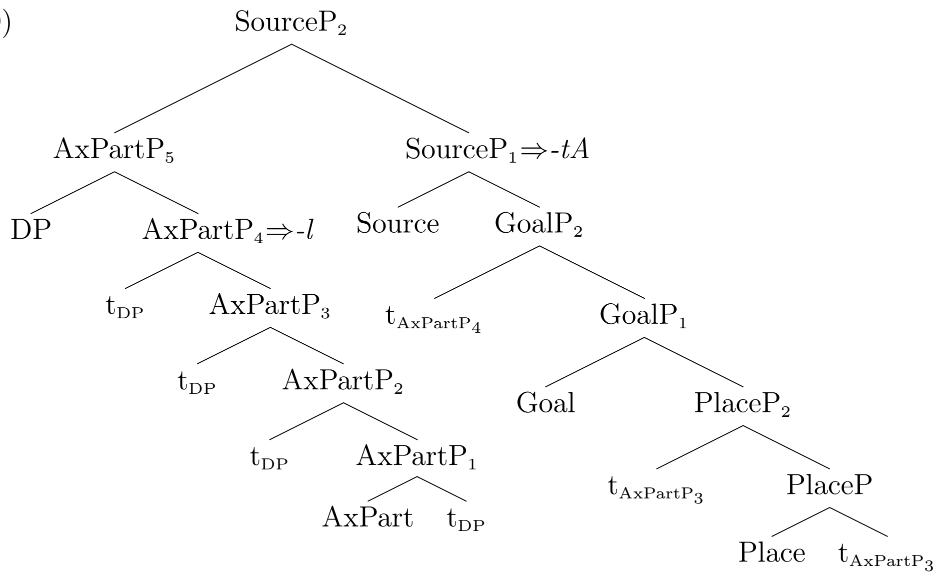
After these movements take place, the next head, Source, is merged, see (108).

(108)



The nodes to be lexicalized are the following. First, $\mathrm{AxPartP}_4$ is spelled out by -*l*, marking the DP to extract to $\mathrm{AxPartP}_5$. Then GoalP_2, matched by -*Ce* and by the Source marker -*tA*, is lexicalized by -*Ce* triggering movement of $\mathrm{AxPartP}_4$ to GoalP_3. The Source head is lexicalized by -*tA* and, finally, the SourceP node is spelled out by -*tA*, triggering movement of $\mathrm{AxPartP}_4$ to $\mathrm{SourceP}_2$ and overriding -*tA* inserted at the Source head and -*Ce* inserted at GoalP_2, see (109).

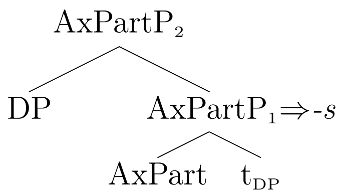
(109)



With this the derivation of the Source expression in the ON-series is completed.

Let us now turn to the lexicalization of the Source case in the IN-series. The derivation starts again with the Merge of DP and AxPart. There are two items which contain the category AxPart and which are associated with the concept of interiority: *-s* and *-(h)Vn*. The two entries therefore compete and *-s* wins by the *Elsewhere Principle* and spells out AxPartP$_1$, triggering movement of DP.

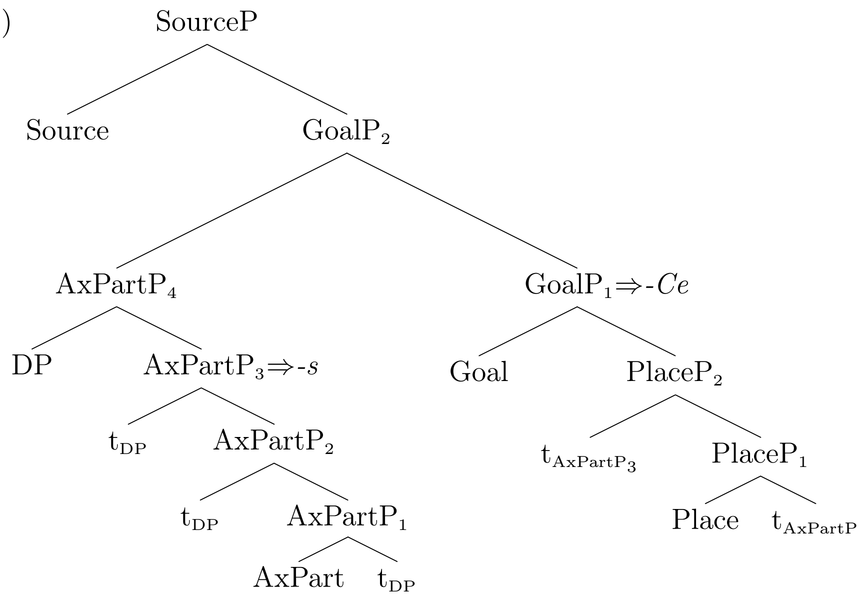
(110)



The derivation then proceeds in a way parallel to the one described for the ON-series, with the only difference that, *-(h)Vn* also competes with *-CA* and *-Ce* for insertion at Place, PlaceP$_1$, PlaceP$_2$, Goal and GoalP$_1$. In each case, it loses because it has more superfluous features.

The situation becomes different once we merge the Source head and create the GoalP$_2$ node by the evacuation movements triggered in the preceding cycle, see (111).

(111)



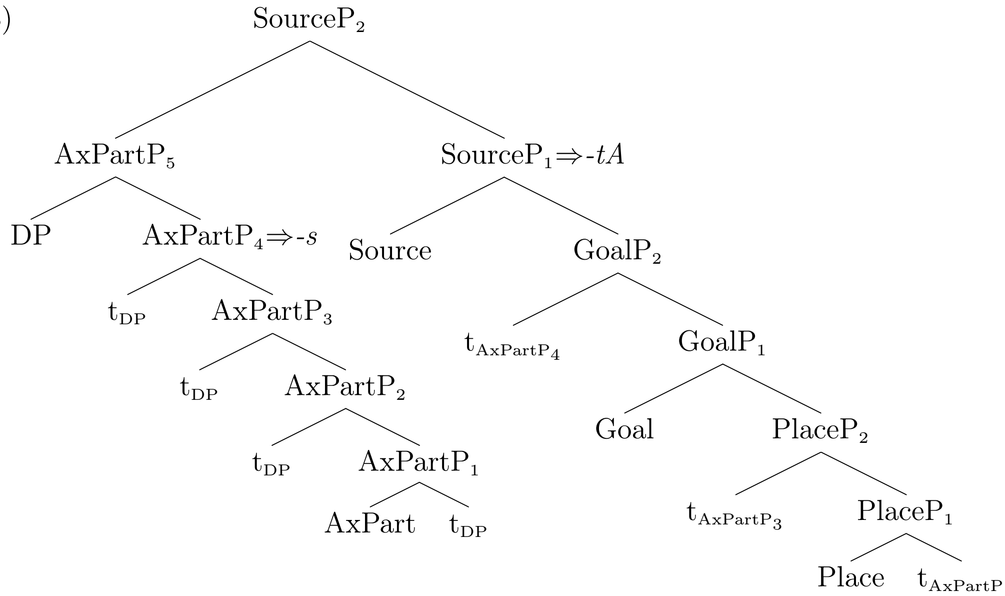
The first node to be lexicalized is AxPartP$_4$, spelled out by *-s* thus triggering evacuation of DP to AxPartP$_5$. The next node is GoalP$_2$. The entry *-(h)Vn* is an almost perfect match — it spells out the entire structure without the DP. Interestingly, the Goal marker *-Ce* can also be inserted at GoalP$_2$ (triggering evacuation of AxPartP$_4$) and thus competes with *-(h)Vn*. Since there is a tie (both entries leave zero unused features), the decision of which one to be used has to be regulated by some other principle than the *Elsewhere Principle*. A comparison between the two possible lexicalizations of the GoalP$_2$ shows that the Spell-out by *-h(V)n* leads to an expression involving fewer morphemes (*-h(V)n*) than the Spell-out by *-Ce* (*-s* and *-Ce*). This result can be captures if we assume a principle enforcing the use of as few lexical entries as possible for the Spell-out of a given syntactic structure. A principle to this effect is the *Economy of Derivation* requirement of Emonds (1994) and the *Minimize Exponence* principle of Siddiqi (2006). I present here the latter.

(112) *Minimize exponence* (Siddiqi 2006:14):
The most economical derivation will be the one that maximally realizes all the formal features of the derivation with the fewest morphemes.

The adoption of this principle delivers the right result. Since *-(h)Vn* realizes more features than *-Ce*, *-(h)Vn* is chosen to spell out GoalP$_2$, thus triggering an evacuation of the DP to a position right above GoalP$_2$.

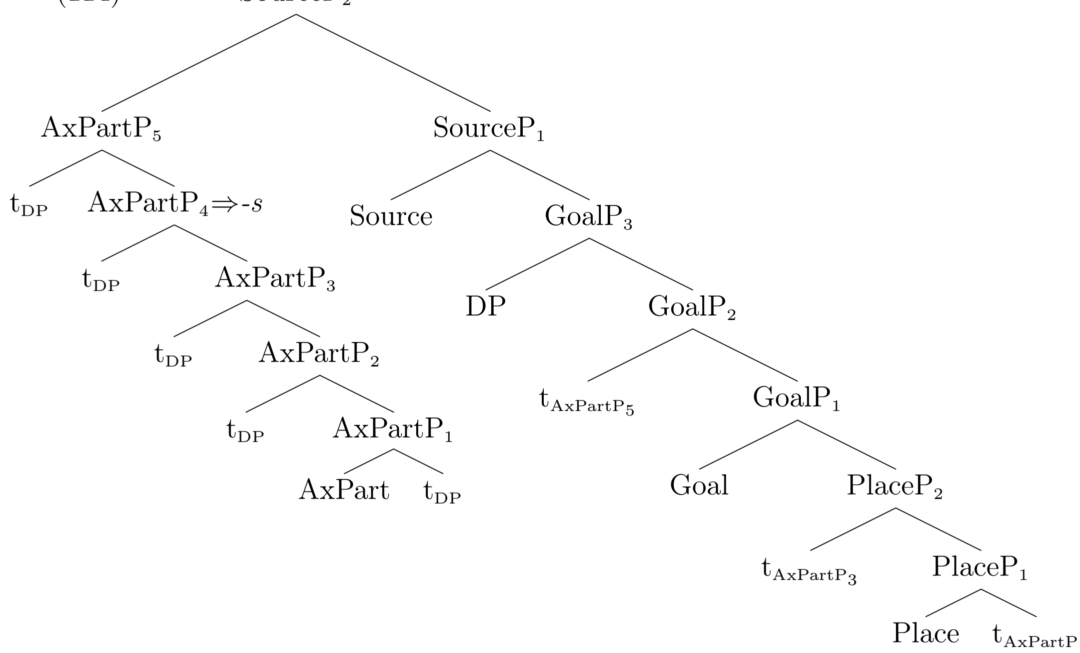
This is however an intermediate stage of the lexicalization, since there are two more nodes to be spelled out — Source and SourceP. The Spell-out of SourceP by *-tA* triggers movement of the entire AxPart_4 to the root node. This is the last movement triggered by Spell-out, hence the first one to be performed by syntax. Moving $\mathrm{AxPartP}_4$ to $\mathrm{SourceP}_2$ will raise also the DP contained in it, hence the movement of DP to a position right above GoalP_2 triggered by *-h(V)n*'s matching of GoalP_2 will not take place, because it is a downward movement. Finally, the first movement triggered by the Spell-out procedure in this cycle, namely the adjunction of DP to $\mathrm{AxPartP}_4$ will take place and the resulting structure will be the one in (113).

(113)



Importantly, the Finnish Ablative expression can be derived only if we assume that the order in which syntax performs the Spell-out triggered movements is opposite to the order in which they are triggered. Consider what would happen if we assumed the opposite: as lexicalization proceeds bottom-up in the tree, first DP will be marked for extraction to $\mathrm{AxPartP}_5$, then the same DP will be marked for extraction to GoalP_3, crucially escaping from $\mathrm{AxPartP}_5$, and finally $\mathrm{AxPartP}_5$ will be marked for extraction to $\mathrm{SourceP}_2$. If the movements take place is the same order, the last movement of $\mathrm{AxPartP}_5$ will displace a constituent which does not contain the DP, contrary to the assumption in (66).

(114)

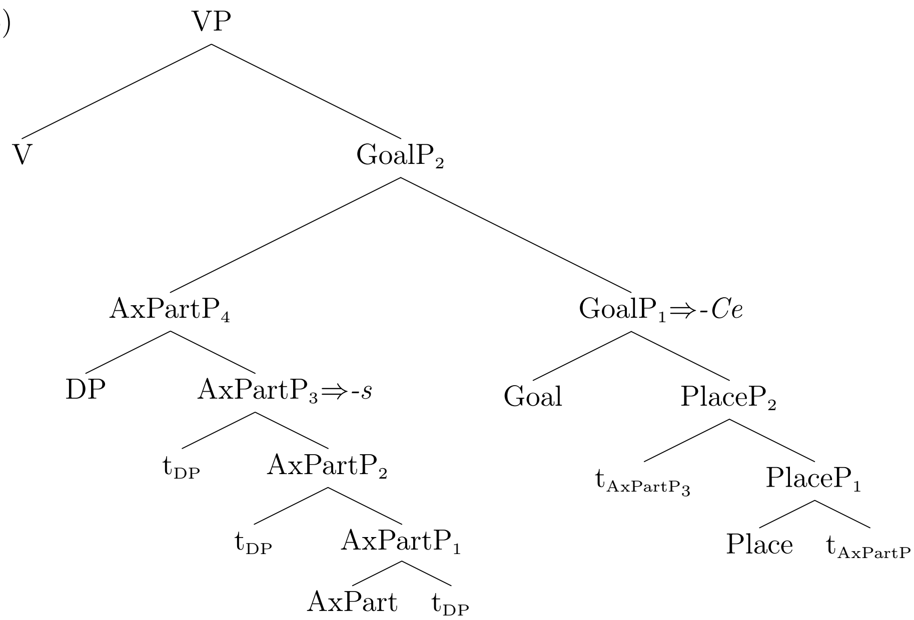


That this violation of the restriction on movement leads to incorrect results is clear from the wrong linearization of the nodes in (114): the AxPartP category precedes the DP, because the former asymmetrically c-commands the latter. Even more problematic, the entry *-tA* in fact does not match the SourceP$_1$ node anymore, due to the DP placed in the specifier of GoalP. As a consequence, *-tA* cannot be inserted. Note that the DP-to-GoalP$_3$ movement takes place in cycle X+1, *after -tA* was matched with SourceP$_1$ in cycle X. SourceP$_1$ is therefore inaccessible for lexicalization anymore and the occurred mismatch cannot be repaired.

In conclusion, as mentioned in the final paragraph of Section 7.5.1, the lexicalization of the Ablative expression in the Finnish IN-series can be successfully captured by the system of assumptions in (90) only if we assume also (90f).

Let us now focus on the GoalP$_2$ node in the structure in (113). Just like in the case of the Source expression in the ON-series, the entry matching the GoalP$_2$ node does not surface once all the morphemes are inserted into the nodes of the syntactic structure, because it is overridden by *-tA* at the SourceP$_1$ node. Still, the lexicalization of GoalP$_2$ by *-(h)Vn* can be made visible if we use the same trick as in (106) and embed it under a verbal head.

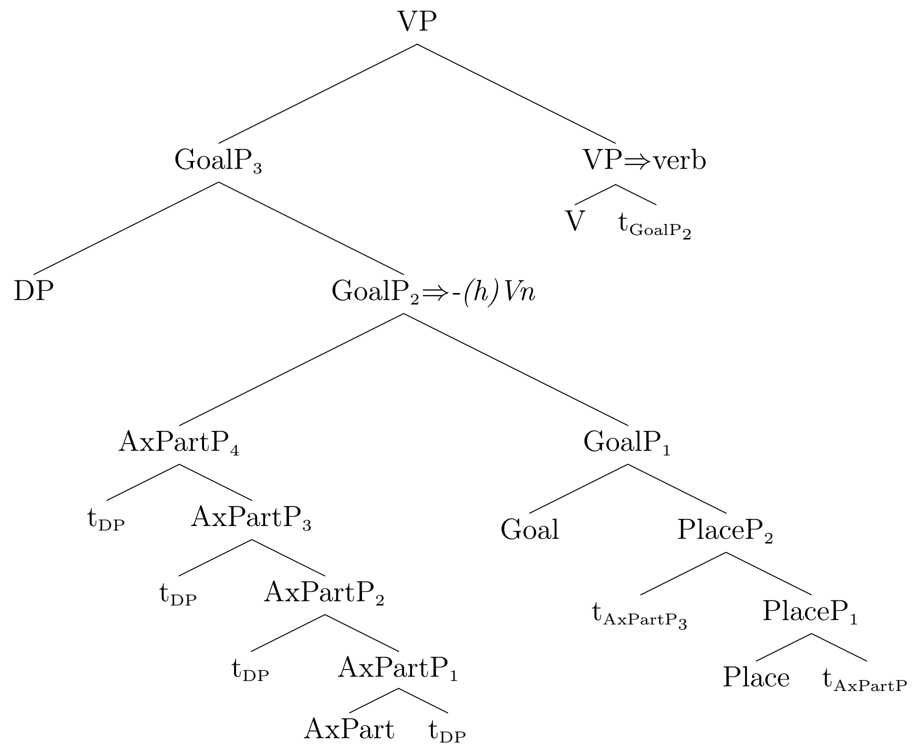
(115)



(116) verb ⇔ < VP >
|
V

Assuming again a verbal entry which triggers movement (see (116)), the lexicalization procedure will first target AxPartP$_4$, triggering a movement of DP to AxPartP$_5$. Then it will inspect the GoalP$_2$ node, where the entry -*(h)Vn* will trigger a movement of DP to GoalP$_3$. And, finally, the Spell-out of VP by the verb will displace the entire GoalP$_2$ phrase. In syntax, first GoalP$_2$ will raise to VP, then DP to GoalP$_3$ and the first movement DP-to-AxPartP$_5$ will not take place, since it is downwards.

(117)



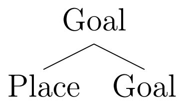
In such case, -*(h)Vn* will lexicalize GoalP_2 and will not be overridden by the lexical material inserted at the higher verbal node. As a result, the lexicalization of the GoalP_2 node derived by the Spell-out driven movements of AxPartP_3 becomes visible and lends support to the idea that such nodes do indeed get lexicalized. This, in its turn, suggests that the cycle scheme presented in (33b) during the discussion of the timing of Spell-out driven movement in Section 7.4.1, where a cycle begins with a step of Internal Merge gives the correct results empirically.

7.7 Conclusion

The main goal of this chapter was to articulate in detail the workings of the Spell-out system described in Chapter 6 and test it against the empirical domain of the spatial expressions in the languages Karata, Uzbek and Finnish. I adopted the idea originally proposed by Starke (2011) that evacuation movements can be triggered in order for the lexicalization of a given node to take place. This allowed me to account for the linearization of the elements making up the spatial expressions in the abovementioned languages, all of which feature suffixal markers.

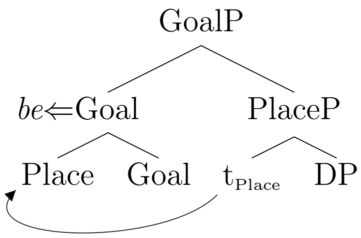
This, of course, raises the question of how the system deals with prepositional languages and, in particular, with spatial prepositions that lexicalize more than one head in the syntactic structure. A solution to this question has been offered by Caha (2010b) who proposes that the entries for prepositions lack maximal projections. Consequently, prepositions cannot lexicalize phrasal nodes and therefore do not induce an evacuation of the DP, which would result in a *post*position. As an example, take the Persian Goal preposition *be* in (118), and assume that it has the entry in (119).

(118) be mædræsse
to school
'to (the) school'

(119) *be* ⇔ </be/, 

>

Caha suggests that instead of forcing a phrasal movement of the DP, the entry in (119) leads to a structure which is traditionally taken to be the result of head movement. The preposition *be* is then inserted at the complex Goal head, see (120).

(120) 

Thus, the difference between prepositional and postpositional languages lies not in the setting of a given parameter, but in the variation of the lexical inventory.

The Phrasal Spell-out system developed in this part of the thesis and the decomposed Path structure argued for in the first part make certain predictions as to the possible make-up of spatial expressions in general and the types of syncretisms one expects to find cross-linguistically. This is the topic of the next two chapters, where I investigate a number of languages and show how attested and non-attested syncretisms and lexicalization patterns can be accounted for by the system.

Part III

Syncretisms and partitioning of the syntactic structure

Chapter 8

Partitioning of the structure and spurious syncretisms

8.1 Introduction

In the first part of this thesis, I argued for a particular decomposition of the Path projection into five distinct heads: Goal $<$ Source $<$ Route $<$ {Scale, Bound[ed]}. I suggested that the various path expressions correspond to different syntactic structures involving different number of these heads and proposed a certain semantic function for each head. In the second part of the thesis, adopting the Nanosyntax framework, I explored how these structures are lexicalized in a Phrasal Spell-out system. I focussed on the lexicalization of the spatial expressions in the languages Karata, Uzbek and Finnish, running a detailed step-by-step lexicalization for each expression.

Because of the rather fine-grained structure of path expressions, especially of the "bigger" Route and Source paths, combined with the possibility that lexical items lexicalize more than one syntactic head, the system predicts that there should be various ways in which a given path expression can be spelled out across languages. For instance, there exist many ways in which a Route expression can be "partitioned" depending on how many lexical items (morphemes) are needed to construct it and where exactly the cut between those lexical items is.

The various types of partitioning of the structure is the topic of this last part of the thesis. This time, I adopt a broader perspective, as enforced by the subject, and instead of focusing on the spatial system of one language, I take a cross-linguistic view. In investigating the lexicalization patterns of paths cross-linguistically, I explore two topics: (i) what is the role of other categories in the Spell-out of the spatial structure and (ii) what various types of syncretism patterns are predicted to exist (and not exist) by the theory. I deal with the first question in Chapter 8, where I show that, in many languages, the structure underlying directional expression is lexicalized by the joint collaboration of adpositional and verbal elements, as also suggested in Son and Svenonius (2008). This leads to a phenomenon which I label *spurious synctretism* to distinguish it from "real" syncretism. In Chapter 9, I investigate the question of what real syncretisms are expected to be possible and impossible and discuss some cases of putative counterexamples.

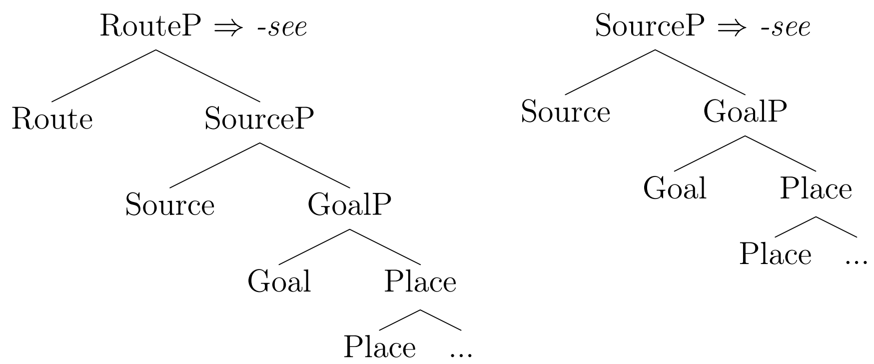
8.2 Real and spurious syncretisms

In Chapter 6, Section 6.4, I discussed the Hindi Ablative marker *-see* which syncretizes Route and Source paths, see (1), repeated from (44) in Chapter 6.

(1) baccaa kaar-ke saamne-see calaa.
child *car*-GEN *front*-ABL *walk*.PERF
(i) 'The child walked via in front of the car.' (Route)
(ii) 'The child walked from in front of the car. (Source)'

As suggested there, the ambiguity of the Hindi *-see* is due to the fact that it spells out two distinct structures — a SourceP and a RouteP — which is made possible by the *Superset Principle*.

(2) a. Route path b. Source path



A closely related language, Persian, is also said to have that type of ambiguous marker: the preposition *æz* translated as 'from.' The preposition *æz* participates in both Route and Source path expressions. In

Route expressions, however, it is used only in combination with the verbs *gozœshtœn* 'to go/pass by' or *rœd shodœn* 'to pass by" (Mahootian 1997:166).

(3) a. Bæchche æz baq gozæsht.
child from garden pass.3SG
'The child went via the garden.'
b. Bæchche æz pol ræd shod.
child from bridge pass became.3SG
'The child passed by the bridge.'

When combined with any other motion verb, an *œz*-PP gives rise only to a Source interpretation and never to a Route interpretation.

(4) Bæchche æz baq doid.
child from garden ran
'The child ran from the garden'
*'The child ran via the garden.'

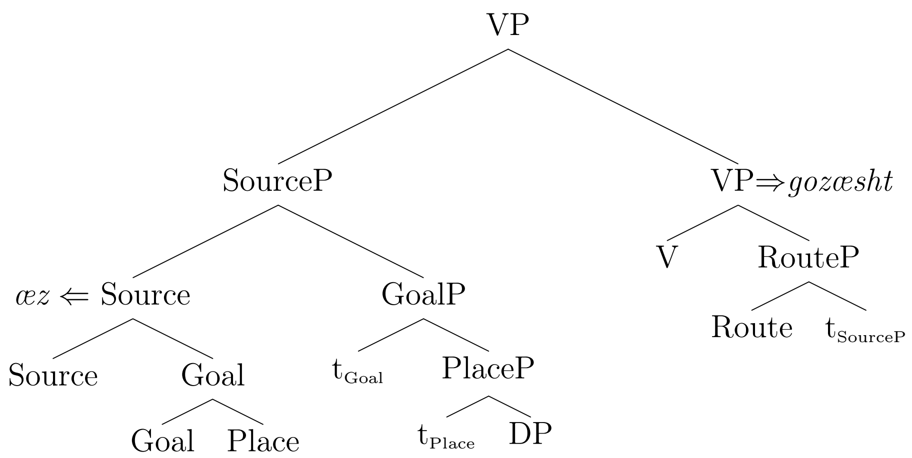
It is obvious that the Persian facts are quite different from the Hindi facts in the sense that, in Persian, the Route meaning of the preposition *œz* requires a particular "Route-verb," while, in Hindi, the Route meaning of *-see* is available with a rather unrestricted set of manner of motion verbs. More precisely, Persian does not allow a Route interpretation of an *œz*-PP with any other verb than the two verbs in (3), while Hindi allows a Route interpretation of *-see* with, for instance, verbs like *walk* and *fly* (see the examples in (1) and (5), respectively).[1]

(5) ciRijaa Jhiil-ke upar-see uRi.
bird lake-GEN *above*-ABL *flew*
(i) 'The bird flew via above the lake.' (Route)
(ii) 'The bird flew from above the lake.' (Source) (fieldnotes)

[1]Note that, in this respect, Hindi, which is commonly characterized as a verb-framed language in Talmy's (2000) typology, does not behave like such, since it encodes the path on the case ending (i.e., on the satellite) rather than on the verb (see also Narasimhan 2008 for a discussion of the mixed properties of Hindi). Persian, which in many respects behaves like a satellite-framed language (Feiz 2007), in this particular case shows properties of a verb-framed language, as the Route path meaning component is supplied by the verbs translating as *pass*. These mixed properties of Hindi and Persian lend support to a more fine-grained typology of verb and satellite-framed languages in the spirit of Beavers et al. (2010).

The fact that an *æz*-expression in Persian has a Source interpretation with any other verb but the two *pass*-verbs in (3) leads to the conclusion that the Persian *æz* is not really ambiguous between Route and Source, but expresses Source only. The question is then what makes the Route meaning in (3) possible. As the Route interpretation is available only in the presence of one of the two "Route verbs," it is logical to hypothesize that the verbs *gozæshtæn* 'to pass' and *ræd shodæn* 'to pass by' lexicalize the bit of syntactic structure that is necessary for a Source path to become a Route path. In other words, I suggest that *gozæshtæn* and *ræd shodæn* spell out not only the verbal portion of the functional sequence, subsumed here under the label VP, but also the Route head, thus leaving the SourceP in the complement position to be lexicalized by the Source preposition *æz*.[2]

(6)



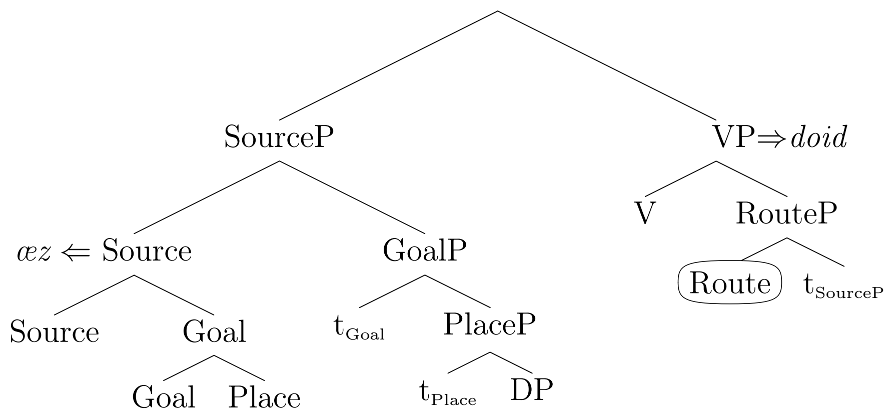
In (6), the verb *gozæshtæn* lexicalizes a constituent containing both the VP and the Route head. The preposition *æz* spells out the complex Source head formed by the head-adjunction of the Place and Goal heads to it, as proposed in Chapter 7.

Such an analysis captures the fact that Persian verbs that do not belong to the set of "Route verbs" cannot express Route of motion with an *æz*-PP. The reason lies in the *Exhaustive Lexicalization Principle* presented in (33), Chapter 6, which states that each syntactic feature has to be lexicalized. This is exemplified below by the manner of motion verb *doidæn* 'run,' which, I propose, does not have the feature <Route>. This

[2]For a fine-grained decomposition of the VP, see Ramchand (2008b) who proposes that events contain three subevents (*init*, *proc* and *res*), each corresponding to a distinct head in the verbal projection. In this chapter, I will collapse *init*, *proc* and *res* under the label V, since the focus of this thesis is on Path expressions.

leads to a failure to lexicalize the Route head in (7) and, for that reason, the Route reading for (4) is unavailable.

(7)



To sum up, in Persian Route expressions, representatives of two categories collaborate to lexicalize a given syntactic structure: because there is no adposition that is specified in the lexicon as big enough to spell out a Route phrase, a special Route verb lexicalizes the Route head, along with the heads it lexicalizes in the verbal domain (cf. the analysis in Son and Svenonius 2008). The structure below the Route head, i.e., the Source phrase, is then lexicalized by the Source preposition *æz*, available in Persian. On the face of it, it then appears that Persian *æz* syncretizes a Route and a Source path, but in reality, it always only spells out a Source structure and the Route=Source syncretism is spurious.

The distinction between real and spurious syncretisms is that real syncretisms involve lexical items that are used to spell out two, or more, distinct structures. For instance, as shown in (2), Hindi *-see* is used to lexicalize a Route structure (involving four heads) and a Source structure (involving three heads), thus leading to a real ambiguity. Spurious syncretisms involve a lexical item that spells out one and the same structure whithin two or more distinct structures. For instance, the Persian preposition *æz* always spells out a Source structure. In the proposed decomposition of paths, the Source structure is part of a Source expression (in fact, identical to it) and also a proper part of a Route expression. In the case of a Source expression the preposition *æz* itself spells out the entire structure. In the case of a Route path, *æz* again spells out a Source structure and the remaining Route head is lexicalized by a special verb. Therefore, *æz* is not really ambiguous between Route and Source — it always spells out a Source structure, and the Route meaning in the case of Route paths comes from the special verbs' ability to lexicalize this head. Finally, languages that do not exhibit syncretisms have lexical items which are tailor-made for each of the syntactic structures corresponding to the different types of paths. I illustrate schematically the three distinctions in (8)-(10), taking as an example the case of Route and Source paths in Hindi, Persian and English.

(8) Hindi (real syncretism)

$$\underbrace{\text{V}}_{\text{verb}}\ \underbrace{\text{Route Source Goal Place}}_{\textit{see}}\quad \text{Route path}$$

$$\underbrace{\text{V}}_{\text{verb}}\ \underbrace{\text{Source Goal Place}}_{\textit{see}}\quad \text{Source path}$$

(9) Persian (spurious syncretism)

$$\underbrace{\text{V Route}}_{\text{verb}}\ \underbrace{\text{Source Goal Place}}_{\textit{æz}}\quad \text{Route path}$$

$$\underbrace{\text{V}}_{\text{verb}}\ \underbrace{\text{Source Goal Place}}_{\textit{æz}}\quad \text{Source path}$$

(10) English (no syncretism)

$$\underbrace{\text{V}}_{\text{verb}}\ \underbrace{\text{Route Source Goal Place}}_{\textit{via}}\quad \text{Route path}$$

$$\underbrace{\text{V}}_{\text{verb}}\ \underbrace{\text{Source Goal Place}}_{\textit{from}}\quad \text{Source path}$$

As can be seen from the schematization above, “real” syncretisms involve a *structural ambiguity* (see (8)). Spuriously syncretic formatives are, on the contrary, unambiguous. They always spell out the same structure, and their multiple functions results from the fact that they appear in different syntactic contexts (see (9)).

8.3 Lexicalization patterns

8.3.1 Lexicalizing Route paths

The model developed in this thesis predicts the existence of other ways to partition Route paths. Consider the following sentences which involve trajectories traversing a Ground, thus representing a type of Route paths.

(11) Finnish, Finnic, Sulkala and Karjalainen (1992)
Pojat joksevat talo-n edi-tse.
*boys run.*3PL *house*-GEN *front*-PROL
'The boys are running across in front of the house.'

(12) Tabasaran, Daghestanian, Magometov (1965) (my glossing)
Izu ulṭurčᵒəunuza niri-ll-an.
*I jump.over river.*ERG-SUP-ABL
'I jumped across the river.'

(13) Kayardild, Tangkic, Evans (1995)
Kamar-ra ngudi-ja katharr-ir jirrka-an-kir!
stone-NOM *throw*-IMP *river*-ALL *north*-FROM-ALL
'Throw the stone from the north across the river!'

(14) Czech, Slavic (P. Caha, p.c.)
Kluci pro-běhli před dom-em.
boys via-ran in.front.of house-INSTR
'The boys ran across in front of the house.'

Focusing on the different case marking that the languages in (11)-(14) make use of in these Route expressions, we can observe a fairly big range of choices. Finnish employs the Prolative case, which is a case designated to the expression of Routes. Tabasaran makes use of the Ablative case, which typically expresses Sources. Kayardild marks the Ground DP by the Allative case — a case that otherwise denotes Goals. Finally, in Czech we have a combination of a preposition and a Ground DP marked by Instrumental. The same expression is also used to mark Location, as shown in (15).

(15) Kluci stáli před dom-em.
boys stood in.front.of house-INS
'The boys stood in front of the house.' (P. Caha, p.c.)

The data is summarized in the following Table 8.1.

Language	The expression used for Route	The expression is prototypically used for
Finnish	Prolative DP	Route paths
Tabasaran	Ablative DP	Source paths
Kayardild	Allative DP	Goal paths
Czech	P+Instrumental DP	Location[3]

Table 8.1: Cases used by languages to express a Route path "across"

The legitimate question is whether we are dealing here with real or spurious syncretisms, that is, whether the Ablative in Tabasaran, for instance, is really ambiguous between a Source and a Route path or whether it can lexicalize only a Source structure, like the Persian *æz*, leaving the Route head to be spelled out by some other lexical item.

Let us start with Czech, which employs a locative phrase in expressions of Location and Route paths. We are looking for a clue whether something other than the expression consisting of a preposition and an Instrumental-DP brings about the Route reading, just like in Persian. The data in (16) reveals that this is indeed the case.

(16) Czech, P. Caha, p.c.

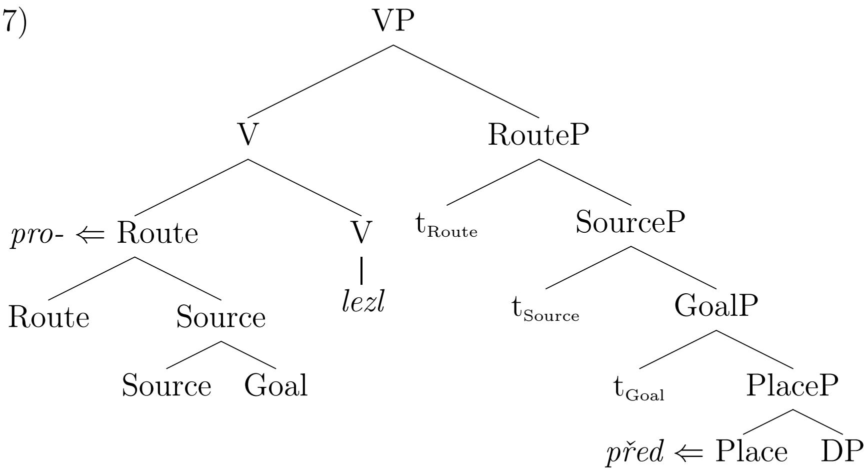
a. Had pro-lezl před vchod-em.
snake via-crawled in.front.of entrance-INSTR
'The snake crawled via in front of the entrance.' (Route)

b. Had lezl před vchod-em.
snake crawled in.front.of entrance-INSTR
'The snake crawled in front of the entrance.' (Locative)

In (16), the a-example bears a Route meaning and consists of a *pro*-prefixed verb combined with a locative phrase. The b-example has an unprefixed verb combined with a locative phrase, and the only available interpretation is the locative one. Thus, a logical conclusion is that *pro*-lexicalizes the heads that are between the verb and the Place projection in a Route structure, as depicted in the tree diagram below.

[3] The Czech Instrumental case by itself, of course, prototypically marks instruments. The point I would like to make here is that the combination of a spatial preposition and an Instrumental-marked DP is used to express Location as well as in expressions of Route paths.

(17)



So, in Czech we have an instance of a spurious syncretism: although we have the same combination P+DP-INSTR in expressions of Location and Route path, it cannot express both notions. I suggest that P+DP-INSTR is locative only and, in the case of Route paths, it needs the support of a special prefix that lexicalizes the Goal, Source and Route heads. The Czech prefix *pro-* thus lexicalizes a portion of the spatial domain below the verb and raises to adjoin to the verb. This is in line with analyses where Slavic lexical prefixes spell out prepositional material in the complement of the verb, as in, for instance, Svenonius (2004) and Asbury et al. (2007).

Let us now have a look at the other languages in the data set. I turn to the Tabasaran Route=Source syncretism and take some more data under investigation in order to see whether something other than the Ablative case triggers the Route reading, that is, lexicalizes the Route head.

Consider the data below.

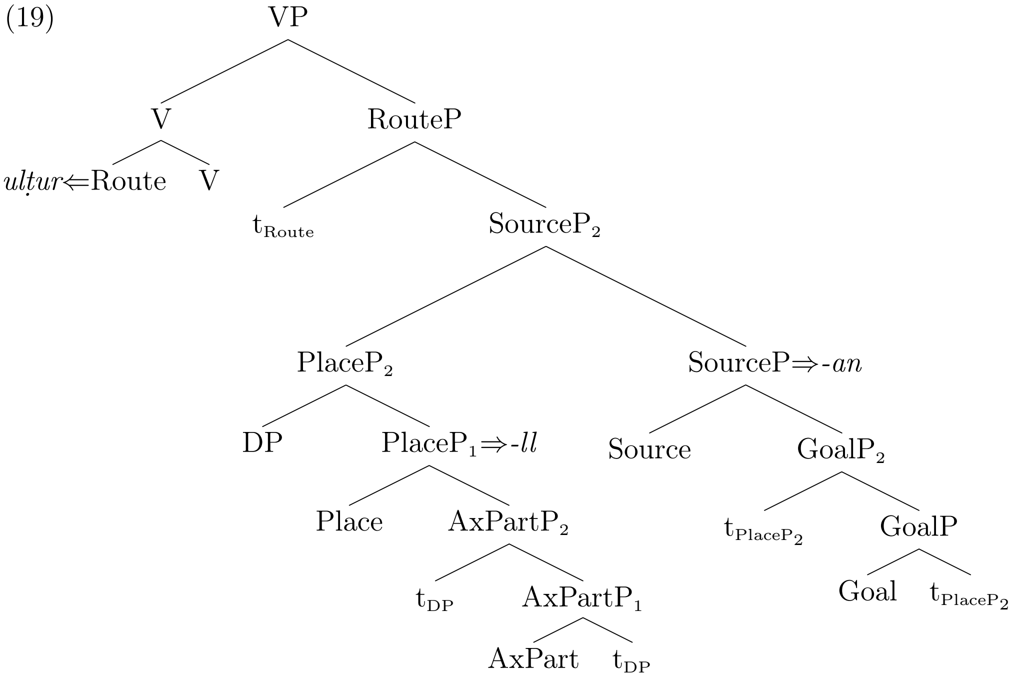
(18) Tabasaran, Magometov (1965) (my glossing)

a. Izu ulṭurč°əunuza qəan-di-ll-an.
I *jump.over* *stone*-ERG-SUP-ABL
'I jumped over the stone.'

b. Izu qəirč°əunuza qəan-di-ll-an.
I *jump* *stone*-ERG-SUP-ABL
'I jumped off the stone.'

In this minimal pair, the a-example expresses a Route path, while the b-example expresses a Source path. A comparison between the two reveals that the two sentences differ with respect to the prefix attached to the verb. Specifically, the verb in the Route expression is prefixed by *ulṭur-*, which I gloss as 'via,' while the verb in the Source expression is prefixed by a different affix *qəir-*, the meaning of which is not given in Magometov's grammar and is impossible to determine precisely due to insufficient data. Crucially, the verb in the Route expression in (12) also bears the prefix *ulṭur-*. It is then highly probable that the prefix *ulṭur-* is the element that turns a Source expression into a Route expression by lexicalizing the Route head. The tree diagram below represents the proposed lexicalization of the example in (12), where the morpheme *-ll* spells out the PlaceP node including the AxPart projection, triggering cyclic movement of the DP within this structure. The Source morpheme *-an* spells out the SourceP node including the Goal projection, thus triggering cyclic movement of the PlaceP_2 projection, Finally, the Route prefix *ulṭur-* spells out the Route head and adjoins to the verb. (I have simplified the structure by not depicting the movements of the DP to PlaceP_3 and PlaceP_4 triggered by the insertion of *-ll* into the highest PlaceP node at the cycles when the Goal and Source heads are merged.)

(19)



As can be seen from the spell-out of the Route structure in (19), the Tabasaran Route=Source syncretism is a spurious one, too. The Tabasaran Ablative case marker cannot express a Route path. It can lexicalize the structure only up to the Source head, and therefore, in Route phrases, we need a special prefix to lexicalize the Route head.

Let us now have a look at Kayardild. Considering the fact that neither in Czech nor in Tabasaran are we dealing with a real ambiguity, we can ask whether the Kayardild Allative case in (13) really syncretizes Route and Goal. It is plausible that the Allative lexicalizes Goal only and the Route meaning comes from the verb. Consider the data in (20) from Evans (1995:150).

(20)	Kurrka-tha	nga-ku-l-da	natha-r	nga-ku-lu-wan-jir!
	take-IMP	1-INC-PL-NOM	*camp*-ALL	1-INC-PL-POSS-ALL

‘Let’s take (it) to our camp!’

If the Allative case were ambiguous between Route and Goal, then the example in (20) would have a second interpretation ‘Let’s take it via our camp!’ There is no indication of this interpretation being available in Evans (1995). If the hypothesis about the spurious Goal=Route syncretism of the Allative is correct, then the prediction is that there is no Route interpretation of (20). Since I have no access to such data nor to native speakers of Kayardild, the hypothesis remains to be checked. In case it is correct, then the verb translated as *throw* in (13) lexicalizes the Route and Source heads, which the Allative case fails to lexicalize.

To sum up, I discussed the lexicalization of Route paths in several languages and showed how the syntactic structure of Routes can be sliced up in different portions, each of which is lexicalized by a separate lexical item. Leaving aside the AxPart head for the reason that none of the languages discussed has a morpheme border between Place and AxPart, the situation can be summarized like this:

(21)

	V	Route	Source	Goal	Place
Finnish	verb	PROL			
Persian	verb		*æz*		
Tabasaran	verb	*ulṭur*	ABL		SUP
Kayardild	verb			ALL	
Czech	verb	*pro*			P+INSTR

In Finnish, the Prolative marker covers the whole structure up to the Route head. In Persian, two special "Route verbs" lexicalize the Route head (together with the verbal phrase) and the remaining portion of the structure is lexicalized by a Source preposition. In Tabasaran, the Ablative marker spells out the structure from the Goal head to the Source head, leaving the Route head to be lexicalized by the prefix *ulṭur-*. In Kayardild, the Allative marker goes up to the Goal head, and the verb has to lexicalize the Route and Source heads. Finally, in Czech, the prefix *pro-* lexicalizes Route, Source, Goal and the rest of the structure is spelled out as a locative expression.

The lexicalizations shown in (21) are just a few examples of the logically possible lexicalizations of the structure. I will give here three more examples. The first one comes from Slovak and has been already presented in Chapter 4, Section 4.3. In Slovak, Route expressions contain a special preposition that combines with a GoalP, see (22) repeated from (10) in Chapter 4 (data from P. Caha, p.c.).

(22) Na Forum Roman-um vstupujeme po-pod oblúk-∅
On Forum Romanum-ACC *enter*.1PL *po-under arch*-ACC
Tita.
of.Tito
'We entered Forum Romanum via under Tito's arch.'

The following data, repeated from (11) in Chapter 4 shows that without the preposition *po*, the PP has a Goal reading.

(23) Slamu dal pod stôl-∅.
hay put.3SG *under table*-ACC
'He put the hay under the table.'

The second example comes from Yukatek Maya. Yukatek Maya is a "radically verb-framed" language, where the two spatial prepositions *ich* 'in' and *ti'* 'at' express exclusively Locations and never encode paths (Bohnemeyer and Stolz 2006).

(24) Le=kàaro=o' ti'=yàan ich le=kàaha=o'
DET=*cart*=DIST PREP=*exist*.3SG *in* DET=*box*=DIST
'The cart, it is in the box.'

This means that no spatial preposition lexicalizes heads higher than the Place head, because, if it could do so, then, contrary to the facts, it would be able to participate in path expressions in combination with manner of motion verbs without the support of special "path-verbs." In the Route expression in (25), we have such a path-verb combined with a locative expression, and I suggest that the verb lexicalizes the heads from Route to Goal (data from Bohnemeyer in prep).

(25) Le=ríiyo=o' h-máan ich le=bàaye=o'.
DET=*river*=DIST PRV-*pass*.3SG *in* DET=*valley*=DIST
'The river, it passed through the valley.'

The third example comes from the language Tetun Dili, spoken in East Timor. Like many other Austronesian languages, Tetun Dili makes use of verb serialization for the expression of directed motion, combining verbs that express manner of motion (*walk, run*) with verbs expressing path (*enter, exit*). The example of a Route expression in (26) features a manner of motion verb and a path-verb translating as *cross* and does not involve any P element (data from Hajek 2006:244).

(26) ami lao esik ponti.
1PL.EXC *walk cross bridge*
'We walked across the bridge.'

I therefore suggest that, in addition to lexicalizing a verbal projection, the path-verb *esik* 'to cross' lexicalizes all the heads in the Path domain down to the DP (cf., the analysis of Svenonius and Son 2009, who propose that the verb *go* lexicalizes a P node in Tetun Dili).

The lexicalizations in Slovak, Yukatek Maya and Tetun Dili can then be represented as follows:

(27)

<table>
<tr><th></th><th>V</th><th>Route</th><th>Source</th><th>Goal</th><th>Place</th></tr>
<tr><td>Slovak</td><td>verb</td><td colspan="2">po</td><td colspan="2">P+ACC</td></tr>
<tr><td>Yukatek Maya</td><td colspan="4">verb</td><td>ich</td></tr>
<tr><td>Tetun Dili</td><td colspan="5">verb</td></tr>
</table>

The stretch between V and Place can be carved up in eight other ways depending on how many morpheme borders the Route expression contains and where the "cuts" fall.[4] This is schematized in Table 8.2, where the vertical lines mark morpheme borders.

[4]If we include the AxPart head in the picture, the number of remaining possible partitionings rises to thirty two.

<table>
<tr><th></th><th>V</th><th></th><th>Route</th><th></th><th>Source</th><th></th><th>Goal</th><th></th><th>Place</th><th></th></tr>
<tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Tetun Dili</td></tr>
<tr><td>2</td><td></td><td>|</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Finnish</td></tr>
<tr><td>3</td><td></td><td></td><td></td><td>|</td><td></td><td></td><td></td><td></td><td></td><td>Persian</td></tr>
<tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td>|</td><td></td><td></td><td></td><td>Kayardild</td></tr>
<tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>|</td><td></td><td>Yukatek</td></tr>
<tr><td>6</td><td></td><td>|</td><td></td><td></td><td></td><td>|</td><td></td><td></td><td></td><td>Slovak</td></tr>
<tr><td>7</td><td></td><td>|</td><td></td><td></td><td></td><td></td><td></td><td>|</td><td></td><td>Czech</td></tr>
<tr><td>8</td><td></td><td>|</td><td></td><td>|</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>9</td><td></td><td></td><td></td><td>|</td><td></td><td>|</td><td></td><td></td><td></td><td></td></tr>
<tr><td>10</td><td></td><td></td><td></td><td>|</td><td></td><td></td><td></td><td>|</td><td></td><td></td></tr>
<tr><td>11</td><td></td><td></td><td></td><td></td><td></td><td>|</td><td></td><td>|</td><td></td><td></td></tr>
<tr><td>12</td><td></td><td>|</td><td></td><td>|</td><td></td><td></td><td></td><td>|</td><td></td><td>Tabasaran</td></tr>
<tr><td>13</td><td></td><td>|</td><td></td><td>|</td><td></td><td>|</td><td></td><td></td><td></td><td></td></tr>
<tr><td>14</td><td></td><td>|</td><td></td><td></td><td></td><td>|</td><td></td><td>|</td><td></td><td></td></tr>
<tr><td>15</td><td></td><td></td><td></td><td>|</td><td></td><td>|</td><td></td><td>|</td><td></td><td></td></tr>
<tr><td>16</td><td></td><td>|</td><td></td><td>|</td><td></td><td>|</td><td></td><td>|</td><td></td><td></td></tr>
</table>

Table 8.2: Possible partitionings of a Route structure

The first row represents a lexicalization pattern where the verb and all the spatial heads in the P domain are spelled out by one lexical item. This partitioning type is common among languages with verb serialization, where directed motion is typically expressed by a combination of two or more verbs, the last one of which is usually a path-verb. I suggest that the path-verb covers the entire stretch from V to Place. The next four rows represent a partitioning of the Route structure which involves just one morpheme border. The rows from 6 to 11 represent partitionings which involve two cuts. Such languages are harder to find and are represented here by Czech and Slovak. Even more difficult to find are languages which slice the structure into three pieces (type 12-15). The only one I have come across so far is Tabasaran (type 12). I still have not found a language making the maximal possible number of cuts (type 16). Nevertheless, despite the lack of languages representing certain partitioning types, there are at least eight possible partitionings that are predicted to be possible and are attested. The fine-grained syntactic structure of Route expressions argued for in this thesis provides us with a tool to handle these diverse lexicalization patterns of Route expressions across languages. The same strategy can be applied also to the other two types of paths, which I analyze in the subsequent sections.

8.3.2 Lexicalizing Source paths

Let us now turn to the lexicalization of Source paths cross-linguistically. There are in total eight logically possible ways to partition the syntactic structure, as shown in Table 8.3, where I mark the border between morphemes by a vertical line and again exclude the AxPart head from the picture.

<table>
<tr><th></th><th>V</th><th></th><th>Source</th><th></th><th>Goal</th><th></th><th>Place</th><th></th></tr>
<tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Mandarin</td></tr>
<tr><td>2</td><td></td><td>|</td><td></td><td></td><td></td><td></td><td></td><td>English</td></tr>
<tr><td>3</td><td></td><td></td><td></td><td>|</td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td>|</td><td></td><td>Yukatek</td></tr>
<tr><td>5</td><td></td><td>|</td><td></td><td>|</td><td></td><td></td><td></td><td>Laz</td></tr>
<tr><td>6</td><td></td><td>|</td><td></td><td></td><td></td><td>|</td><td></td><td>Lezgian</td></tr>
<tr><td>7</td><td></td><td></td><td></td><td>|</td><td></td><td>|</td><td></td><td></td></tr>
<tr><td>8</td><td></td><td>|</td><td></td><td>|</td><td></td><td>|</td><td></td><td>Hua?</td></tr>
</table>

Table 8.3: Possible partitionings of a Source structure

The first lexicalization possibility is found in Mandarin Chinese (data from Chen and Guo 2009:1751).

(28) Wǒ pǎo chū le chúfáng.
I run exit PERF *kitchen*
'I ran out of the kitchen.'

The Mandarin Source expression in (28) contains a manner of motion verb *pǎo* 'run' combined with the path-verb *chū* 'exit' and no adpositional element. I therefore suggest that the path-verb *chū* lexicalizes the whole stretch from Source to Place, thus taking directly a DP as a complement.

The second lexicalization possibility is represented by English.

(29) He ran from the house.

In (29), the verb *run* combines with a Source phrase where the Source, Goal and Place heads are lexicalized by the preposition *from* (recall the schematization in (10)).

I have not encountered an example of the third lexicalization pattern. This would be a language where certain "Source-verbs" combine with Goal complements to form Source expressions.

Yukatek Maya is a plausible candidate for a language that spells out the Source structure according to the scenario in row 4, since its spatial PPs express only Location, as claimed in Bohnemeyer and Stolz (2006). Indeed, Source paths are encoded exclusively in the verb (Bohnemeyer and Báez 2008). In the following example, the Source meaning is contributed by the verb, which combines with a locative expression.

(30) e=kàaro=o' h-hòok ich le=kàaha=o'.
DET=*cart*=DIST PRV-*exit*.3SG *in* DET=*box*=DIST
'The cart, it exited (lit. in) the box.'

Consequently, the verb translated as 'exit' in Yukatek Maya spells out the Source and Goal heads in the syntactic structure leaving the Place head to be lexicalized by the locative preposition *ich* 'in.'

An example of the fifth lexicalization pattern is found in the Kartvelian language Laz. Laz has two spatial cases: the null-marked Locative with the phonologically null exponent -∅, (31), and the Motative case, whose ending is -*şa*. The latter is used both in Goal and Source expressions, see (32) (data from Broschart and Dawuda 1999).

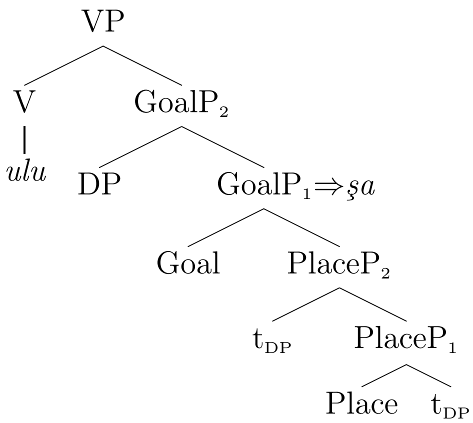
(31) Peteri livadi-∅ on.
Peter *garden*-LOC COPULA.3SG
'Peter is in the garden.'

(32) a. Peteri oxori-şa ulu-n.
Peter *home*-MOT *go*-3.SG.PRES
'Peter goes home.'
b. Peteri oxori-şa mulu-n.
Peter *home*-MOT *come*-3SG.PRES
'Peter comes from home.'

The data in (32) arouses suspicion, as a comparison between the Goal and the Source examples shows that in the latter there is a morpheme *m*- prefixed to the verb. Thus, it is conceivable that the Motative in Laz expresses Goal only and a Source expression needs an additional prefix. In other words, the examples in (32) give grounds for an investigation of the question whether the alleged Goal=Source syncretism in Laz in not a spurious one. Indeed, according to the data elicited in Kutscher (2001; 2010), the only possible reading of an *unprefixed* verb taking a Motative DP is one of Goal of motion, and never Source of motion.

(33) Oxori-şa ulu-n.
house-MOT *go*-3SG.PRES
'S/he goes into the house.'
*'S/he goes out of the house.' (Kutscher 2010)

Kutscher (2010) attributes the Goal interpretation for the sentence in (33) to the preference for Goal paths described in various studies (Lakusta 2005, Lakusta and Landau 2005, among others). The interpretation of the sentence in (33) as Goal-directed rather than Source-directed, however, appears not to be a matter of preference. As stated by Kutscher (2010:15), native speakers "negate the possibility of interpreting the utterance [in (33)] as expressing a movement away from the house" suggesting that the Source reading is not simply dispreferred but rather unavailable. This strongly suggests that the Motative case ending *-şa* expresses Goal paths only, that is, it spells out the structure as high as the GoalP, as shown in the diagrams below corresponding to the example in (33). Given the null phonology of the Locative suffix, it is impossible to decide on the basis of the available data whether the Motative suffix is stacked on the Locative suffix, or is attached directly to the noun thus "overriding" the null Locative morpheme. In (34), I assume that *-şa* covers both the Place and Goal heads. Still, an entry for *-şa* specified for just the Goal feature is possible, leading to a roll-up derivation type.

(34)


The hypothesis that the Motative suffix lexicalizes the Goal head finds further support in the fact that when the verb translating as *go* combines with a Locative-marked DP, the Goal reading is ungrammatical (data from Kutscher 2001:170).

(35) a. Neǩna-şa b-ulu-r.
door-MOT 1SG-*go*-1SG.PRES
'I go to the door'
b. *Neǩna-∅ b-ulu-r.
door-LOC 1SG-*go*-1SG.PRES

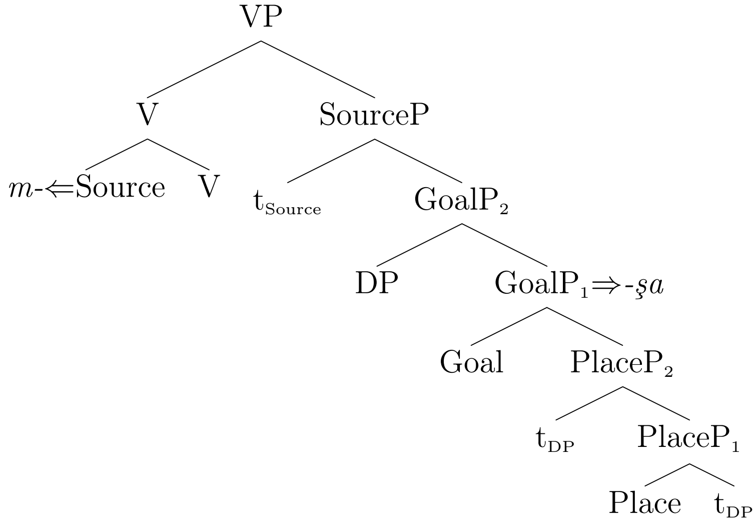
The reason is a violation of *Exhaustive lexicalization*, as the Goal head remains unlexicalized.[5]

To recapitulate, the data suggests that the Motative case in Laz unambiguously marks Goals. In the Source expression in (32b), repeated in (36) below, the Source meaning is contributed by the prefix *m-* on the verb. I propose that the prefix *m-* spells out the Source head in Laz. Hence, this is an example of a partitioning of the structure according to type 5 in Table 8.3.[6]

(36) Peteri oxori-şa mulu-n.
Peter home-MOT *come*-PRES
'Peter comes from home.'

The tree diagram for the Laz data in (36) is as follows:

(37)



[5]Note that Laz has a null morpheme to mark Location (Broschart and Dawuda 1999, Kutscher 2001), but does not have a null morpheme to mark Goals. If it did, then the example in (35) would have been grammatical.

[6]If we assume that the entry for *-şa* is specified only for the Goal feature, then Laz will have a the partitioning pattern presented in row 7 of Table 8.3.

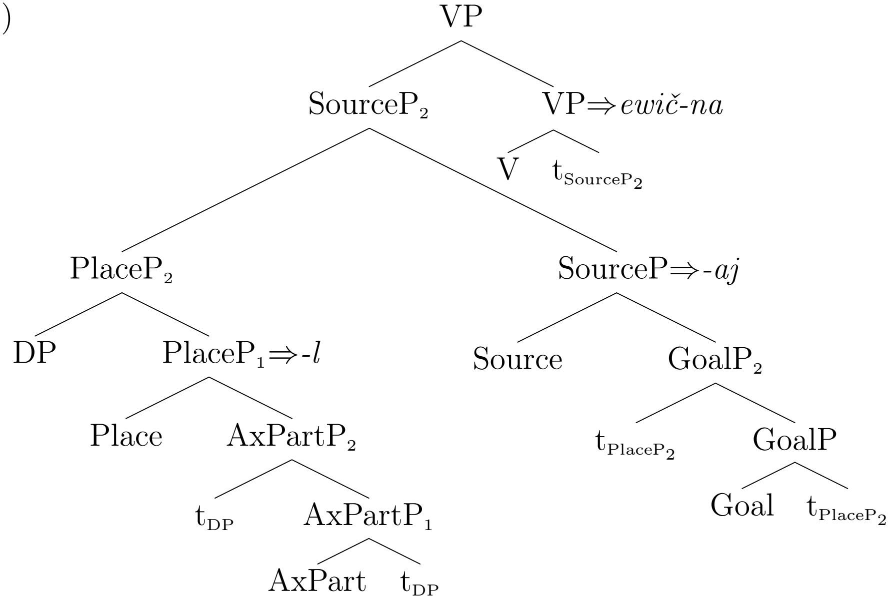
The fifth lexicalization pattern can be found in the language Lezgian, where the Source suffix *-aj* is stacked on top of the locative structure. I illustrate this in (38), taking as an example the ON-series. The example in (38a) shows that the suffix *-l* expresses Location, the data in (38b) exemplifies the addition of the Source ending *-aj* to the locative structure in order to express Source of motion (data from Haspelmath 1993, my glossing).

(38) a. Čur.a-l wad jac amiq'-na.
pasture.ERG-ON *five oxen stay*-PAST
'Five oxen were still on the pasture.'

b. Nurali buba balk'an.di-l-aj ewič-na.
Nurali father horse.ERG-ON-SOURCE *descend*-PAST
'Father Nurali got off the horse.'

The tree diagram corresponding to the example in (38b) is shown in (39).

(39)



Until now, I have not come across the lexicalization pattern presented in row 7 of Table 8.3 (but see fn. 6 in the current chapter).

Finally, a probable candidate for the lexicalization presented in the last row in Table 8.3 is the Papuan language Hua. According to Kibrik (2002:49), Hua has two locative suffixes: *vi'* 'in', and *-ro'* 'at.' In Goal expressions, the morpheme *-ga* is added to the locative suffixes deriving *vin-ga* and *ro-ga*. In Source expressions, the morpheme *-ri* is attached to the Goal marker thus forming *vin-ga-ri'* and *ro-ga-ri'*. My uncertainty as to whether Hua indeed exemplifies pattern number 8 stems from the fact that Haiman (1980) differs in his analysis of the Hua spatial morphemes and suggests that the presence of the morpheme *-ga* is only optional in Source expressions, as shown in (40) (my glossing).

(40) zu-ro(-ga)-ri' oe.
work-AT-TO-FROM *come*.1SG
'I have come from work.' (Haiman 1980:234)

The lexicalizations presented in this section can be summed up in the following way (assuming that the analysis of Kibrik 2002 for Hua is correct).

(41)

<table>
<tr><th></th><th>V</th><th>Source</th><th>Goal</th><th>Place</th></tr>
<tr><td>Mandarin</td><td colspan="4">verb</td></tr>
<tr><td>English</td><td>verb</td><td colspan="3">from</td></tr>
<tr><td>Yukatek Maya</td><td colspan="3">verb</td><td>ich</td></tr>
<tr><td>Laz</td><td>verb</td><td>m-</td><td colspan="2">MOT</td></tr>
<tr><td>Lezgian</td><td>verb</td><td colspan="2">-aj</td><td>-l</td></tr>
<tr><td>Hua</td><td>verb</td><td>-ri'</td><td>-ga</td><td>-ro'</td></tr>
</table>

8.3.3 Lexicalizing Goal paths

Let us now proceed to the lexicalization of the last structure left to discuss — a Goal path. There are four general strategies to spell out such a path, shown in Table 8.4.

Let us start with the first lexicalization strategy, where the verb spells out the heads in the adpositional domain. As already mentioned, this patterns is common in serial verb languages. I provide here an example from Thai, taken from Zlatev and Yangklang (2004:163).

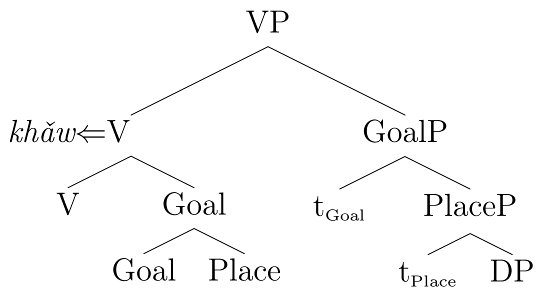
(42) chán khǎw hɔ̂ɔŋ.
I enter room
'I went into the room.'

	V		Goal		Place	
1						Thai
2		|				Evenki
3				|		Yukatek
4		|		|		Tobati

Table 8.4: Possible partitionings of a Goal structure

The path-verb *khăw* 'to enter,' which in example (42) appears on its own, lexicalizes the Goal and Place projections, in addition to the verbal projection.

(43)

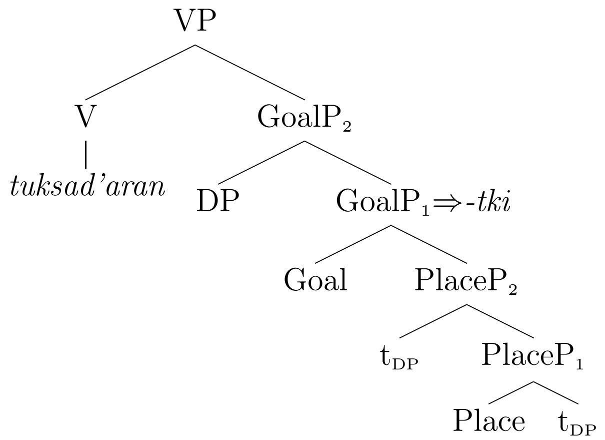


The second lexicalization strategy is exemplified by Evenki (data from Nedjalkov 1997:170).

(44) Bejumimni hokto-tki tuksa-d'ara-n.
hunter *road*-ALL *run*-PRES-3SG
'The hunter is running to(wards) the road.'

In Evenki, the Allative ending *-tki* spells out the Place and Goal heads, as shown in (45).

(45)

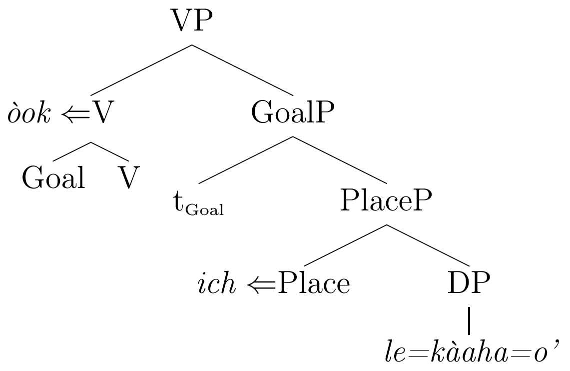


The third lexicalization strategy — the one where a verb takes a locative expression — can be found in numerous languages where the path is encoded on the verb rather than on the adpositional phrase. Not surprisingly, this is also the lexicalization strategy used in Yukatek Maya. As we already know, the verb in Yukatek Maya encodes the path, thus a Goal expression consists of a "Goal-verb" plus a locative phrase (data from Bohnemeyer and Báez 2008).

(46) Le=kàaro=o' h-òok ich le=kàaha=o'.
DET=*cart*=DIST PRV-*enter*.3SG *in* DET=*box*=DIST
'The cart, it entered (lit. in) the box.'

The corresponding tree diagram in shown in (47) (see also the analysis of Goal expressions in Son and Svenonius 2008).

(47)



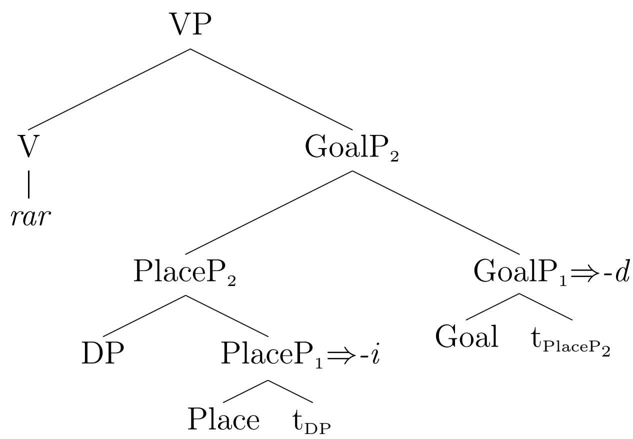
Finally, a language exemplifying the fourth lexicalization pattern, where there is a morpheme border both to the left and to the right of Goal, is the Austronesian language Tobati. In Tobati, the Allative suffix *-d* is stacked onto the Locative *-i* (data from Donohue 2002:199-200).

(48) a. Ntric tad-i nanac.
1SG *sea*-LOC *swim*.PL
'They are swimming in the sea.'

b. Nyiu tad-i-d rar.
coconut sea-LOC-ALL *fell*
'The coconut fell into the sea.'

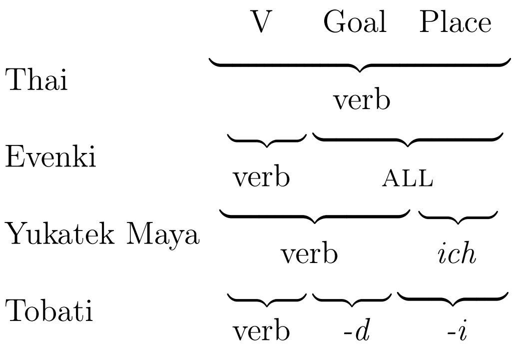
The structure for the Tobati example in (48b) is presented below.

(49)



To sum up, I discussed various ways in which languages partition the structure underlying Goal paths when they spell it out. The situation can be summarized as follows.

(50)



8.4 Conclusion

In this chapter, I discussed two important issues related to the way the fine-grained syntactic structure I proposed for directional expressions can be lexicalized: spurious syncretisms and the partitioning of syntactic structure.

The term *spurious syncretism* refers to cases when one particular lexical item lexicalizes the same piece of structure in the syntactic structures underlying different directional expressions, leaving the non-lexicalized head(s) to be spelled out by other "supporting" lexical items. On the face of it, it then appears that this lexical item is ambiguous between two (or more) notions. However, the ambiguity is not real, since at least one of these notions is expressed only with the help of a "supporting" element. By contrast, a *real syncretism* arises when one and the same morpheme lexicalizes two distinct structures in a superset-subset relationship.

An interesting question is how this "syncretism typology" relates to Talmy's (2000) typology dividing languages into satellite-framed and verb-framed depending on which element encodes the notion of path. The short answer is that there is no one-to-one correspondence between the two typologies. Both types of syncretisms can occur in a satellite-framed language, that is, a language where the path is encoded by some satellite of the verb (preposition, particle, case affix): real syncretisms arise if there is a satellite that spells out more than one structure, and spurious syncretisms arise if the "supporting" element is a satellite as well, e.g., a verbal prefix or a preposition. Regarding verb-framed languages, the only type of syncretism I have encountered until now is spurious syncretisms, still the model predicts the possibility of there being verbs that are structurally ambiguous. In sum, no clear parallel can be drawn between Talmy's typology and the distinction between real and spurious syncretisms.

The collaboration between the spatial markers and the "supporting" elements motivated a more detailed analysis of how the syntactic structure can be partitioned to be spelled out by various elements. I presented data from a number of languages, each of which represents a particular type of partitioning, and showed how the syntactic structure is lexicalized in order for the partitioning in question to obtain. The various types of partitioning present independent evidence for the decomposed Path structure, in addition to the evidence coming from the morphological composition of individual spatial markers.

Chapter 9

Syncretisms

9.1 Introduction

In the preceding chapter, I explored the ways in which the structure underlying Goal, Source and Route expressions can be partitioned among various elements, sometimes giving rise to a phenomenon I dubbed *spurious syncretism*. I discussed the difference between real and spurious syncretisms, which can be summarized as follows: real syncretisms arise when a given lexical item *a* spells out two or more distinct syntactic structures; spurious syncretisms involve a lexical item *a* which always lexicalizes the same syntactic structure, the impression of ambiguity is caused by the fact that this syntactic structure can be part of a bigger structure where the heads not lexicalized by *a* are lexicalized by a different entry *b*.

Traditionally, syncretism is understood as the failure of a given formative to make a morphosyntactic distinction (Spencer 1991, Baerman et al. 2005). An example for such a lack of distinction can be found in Georgian, which, according to Creissels (2008), syncretizes Location and Goal of motion.

<table>
<tr><th></th><th>IN</th><th>AT</th></tr>
<tr><td>Location</td><td rowspan="2">-ši</td><td rowspan="2">-tan</td></tr>
<tr><td>Goal</td></tr>
<tr><td>Source</td><td>-dan</td><td>-gan</td></tr>
</table>

Table 9.1: Locative=Goal syncretism in Georgian (Creissels 2008)

Table 9.1 suggests that the formatives *-tan* and *-ši* (called secondary case-endings in Vogt 1971) are used to express both Location and Goal of motion. Thus, they fail to make a syntactically relevant distinction, which results in a mismatch between syntax and morphology. According to the definition of syncretism in Baerman et al. (2005:2), this is a run-of-the-mill example of syncretism.

The definition of syncretism I proposed in Chapter 8 as an instance of *structural ambiguity*, however, raises the question whether the Inessive=Illative and Adessive=Allative syncretism in Georgian is real. More precisely, the question is whether *-ši* and *-tan* can express both Location and Goal of motion *by themselves*. Put alternatively, we need to know whether they can spell out both a Goal and a Locative structure. If they do not, then there is no syncretism. If they do, then the Location/Goal ambiguity should arise in the same context, i.e., in a combination with the same verb, in a fashion analogous to the Hindi example in (44) in Chapter 6.

Unfortunately, the data I was able to find does not give a clear answer to this question. In Hewitt (1995), *-ši* and *-tan* are translated as 'in' and 'at, by', respectively, and no mention is made as to their use in Goal-of-motion context. Vogt (1971) provides ample data of the sort given in (1) and (2),[1] but gives no example which would be ambiguous between a locative and a Goal reading.

(1) a. kalak-ši vcxovrob.
town-ŠI *live*
'I live in the town.'
b. kalak-ši mivdavar.
town-ŠI go.PAST
'I went to the town.'

(2) a. čems megobar-tan viq'avi.
I.GEN *friend*-TAN *was*
'I was at my friend's place.'
b. čems megobar-tan mivedi.
I.GEN *friend*-TAN *go*.PERF
'I have gone to my friend's place.'

From the Georgian data above, it can be concluded that the Locative interpretation of *-ši* and *-tan* is available with stative verbs like *live* and *be*, and the Goal interpretation is available with inherently directed verbs like *go*. However, this is not a suitable test-case for a true syncretism,

[1] Vogt does not provide glosses for the examples and I have restrained from glossing *-tan* and *-ši* in order to remain neutral as to their function.

since it is possible that *-tan* and *-ši* are purely Locative case suffixes and the Goal reading in the b-examples is the result of the motion verb *go* lexicalizing the Goal head. In order to probe into the potential Location=Goal syncretism, it is necessary to create an ambiguous sentence of the sort found in English (see (3)).

(3) The mouse ran under the table. (Location or Goal)

The case of the Georgian endings *-ši* and *-tan* raises a more general worry about the approach to syncretisms found in grammar descriptions. Very often it is the case that both spurious and real instances of syncretisms are subsumed under the label "syncretism." As a result, works in theoretical linguistics drawing data from such grammars take cases of what might well be spurious syncretisms to involve truly syncretic lexical entries.

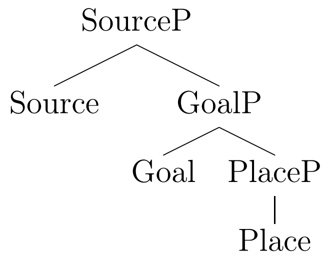
The concern raised above will come up again and again throughout this chapter, since I will be dealing with cross-linguistic investigations of the syncretisms found within the spatial domain. The goal of this chapter is to show which syncretism patterns are predicted to be impossible and which ones are expected to exist by the decomposed Path structure proposed in Part I and the Spell-out system developed in Part II. After doing that, I discuss a couple of counterexamples and show that they could well be instances of spurious syncretisms. Finally, I turn to an interesting instance of a syncretism predicted to be impossible found in English and shown how it can be explained away.

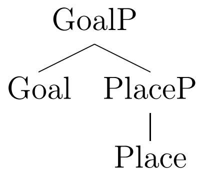
9.2 Possible and impossible syncretisms

9.2.1 *ABA

This subsection puts forward the view that syncretisms in the spatial domain can target only *adjacent* heads in the syntactic structure — an idea elaborated in detail by Caha (2008), who draws inspiration from Bobaljik's (2007) investigation of comparative suppletion across languages and Michal Starke's unpublished work on *-ed*/*-en* allomorphy in English. Using the syntactic structure for Location, Goal and Source phrases which I argued for in Chapter 4, I will reproduce the reasoning for why this should be the case.

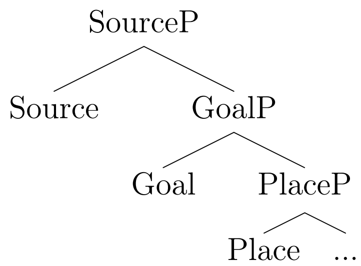
Let us assume the hypothetical lexical entries in (4).

(4) a. $a \Leftrightarrow <$  $>$

b. $b \Leftrightarrow <$  $>$

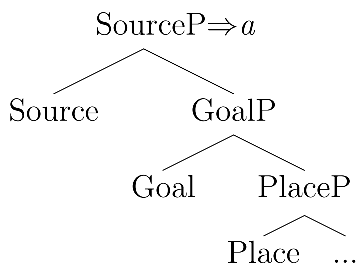
Consider now how a language with such entries lexicalizes a Source phrase, which has the structure in (5).

(5)



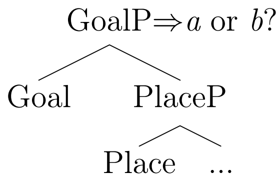
There is only one lexical entry which is eligible for insertion at the SourceP node — the entry *a* — because it is the only entry which is specified for a constituent containing that node.

(6)



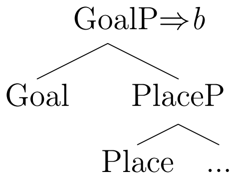
Turning now to a Goal phrase, there are now two items which can be used to spell it out: *a* and *b*.

(7)



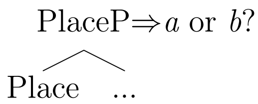
Both *a* and *b* contain GoalP in their lexical specification. The *Elsewhere Principle* enforces the use of the more highly specified entry, in this case, of the entry *b*, which is a better match.

(8)



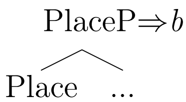
The same competition between *a* and *b* arises for the lexicalization of a Locative phrase, since they both contain PlaceP.

(9)



The winner is again *b*, because it contains fewer superfluous features (one) than *a* (two).

(10)



The result is a paradigm of the shape *abb*, where *a* spells out the biggest Source structure and *b* spells out both the intermediate-sized Goal structure and the smallest Locative structure. Importantly, *a* cannot be used to lexicalize the smallest Locative structure because it loses the competition with *b* by the *Elsewhere Principle.*

This is the gist of the *ABA generalization of Bobaljik (2007). The *ABA generalization states that it is not attested among languages that a structure [X [Y [Z]]] is lexicalized by using A, [Y [Z]] is lexicalized by using B, and [Z] is lexicalized by using A again. As explained by Caha (2008) in nanosyntactic terms, the reason is that whatever lexical item is used for the lexicalization of the intermediate-sized structure, the same item will be used for the smallest structure by virtue of the Elsewhere Principle, thus leading to a pattern ABB.

The restriction that syncretisms target adjacent heads predicts the impossibility of a lexical entry to syncretize (i) Location and Source across a Goal head, (ii) Location and Route across the heads Goal and Source, and (iii) Goal and Route across a Source head. This is a prediction to which I will come back in Section 9.2.3

9.2.2 *A&¬A

Let us now turn to one more syncretism which I suggest is not expected to be found across languages. Consider first the lexical entries in (11).

(11) a. $b \Leftrightarrow <$ [SourceP Source [GoalP Goal [PlaceP Place]]] $>$

b. $a \Leftrightarrow <$ [PlaceP Place] $>$

The way a language with such entries will lexicalize a Locative phrase is by using the "perfect match" *a*.

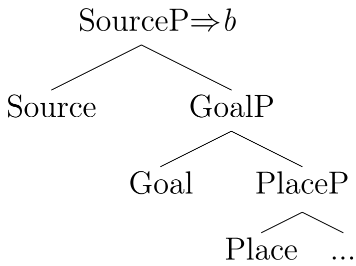
(12) [PlaceP⇒*a* Place ...]

The Goal expression can be spelled out only by *b*, since *a* does not have the feature <Goal>.

(13) [GoalP⇒*b* Goal [PlaceP Place ...]]

The same entry *b* will also be the only match for a Source phrase.

(14)



Under the Path decomposition analysis argued for in this thesis, and the semantics proposed for the Path heads in Chapter 5, the Source head is the locus of a reversal operation which applies to the Goal phrase. Thus, in a sense, a Source path is the "opposite" (or the negation) of a Goal path. This means that a language with a Goal=Source syncretism has one spatial marker that expresses a certain meaning and its exact opposite. I suggest that from a pragmatic point of view it is unacceptable to have such a "contradictory" lexical item.[2] Therefore, we would expect that the Goal=Source syncretism is unattested, although it is grammatical. Notice that this does not exclude the possibility that a *given lexical item a* includes the features <Source> and <Goal> in its feature specification. As long as there is a disambiguating (i.e., more highly specified) lexical item *b* that limits the use of *a* to one of the spatial roles only, the item *a* is not used in a contradictory way.

To conclude, the semantic contribution of the heads in the decomposed Path structure I propose is such that a syncretism pattern where Goal and Source paths are expressed by the same marker is expected to be non-existent due to a pragmatic constraint enforcing disambiguation.

9.2.3 Syncretism typology

The restrictions on syncretisms discussed in the preceding two sections significantly reduce the number of potentially possible syncretism patterns among the expressions of Location, Goal, Source and Route. More precisely, out of the 15 logically possible syncretisms, only 4 are allowed

[2] There are potential counterexamples, for example those verbs that have both an ornative and a privative meaning like *seed*, *trim*, etc.

(i) a. seed the grapes = remove seeds from the grapes
 b. seed the lawn = put seeds in the lawn

Buck (1997) investigates that type of verbs in English and convincingly argues that they do not express opposite meanings. Hence, these verbs are not an example of contradictory lexical items.

by the system.

Type 1	Location≠Goal≠Source≠Route
Type 2	Location≠Goal≠Source=Route
Type 3	Location=Goal≠Source≠Route
Type 4	Location=Goal≠Source=Route

Table 9.2: Possible syncretisms

The syncretisms which are predicted to be impossible are presented in Table 9.3. The rightmost column gives the reason why the relevant syncretism pattern is excluded. In order to unambiguously refer to the various types of syncretism patterns in the upcoming discussion, I continue the numbering from Table 9.2.

Type 5	*Location=Source≠Goal≠Route	*ABA
Type 6	*Location=Source≠Goal=Route	*ABA
Type 7	*Location≠Source≠Goal=Route	*ABA
Type 8	*Location=Route=Goal≠Source	*ABA
Type 9	*Location=Route=Source≠Goal	*ABA
Type 10	*Location=Route≠Goal≠Source	*ABA
Type 11	*Location=Route≠Goal=Source	*ABA and *A&¬A
Type 12	*Location≠Goal=Source=Route	*A&¬A
Type 13	*Location≠Goal=Source≠Route	*A&¬A
Type 14	*Location=Goal=Source≠Route	*A&¬A
Type 15	*Location=Goal=Source=Route	*A&¬A

Table 9.3: Impossible syncretisms

The syncretism typology in Tables 9.2 and 9.3 in fact presents a very simplified picture of the conceivable lexicalization patterns. Taking as an example the first three spatial roles in Type 1, a Location≠Goal≠Source "syncretism" can be instantiated in various ways, depending on what lexical items and combinations of lexical items a languages uses (see Table 9.4).

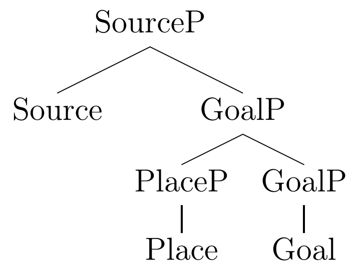
All lexicalization patterns in Table 9.4 instantiate a syncretism pattern where the notion of Location is expressed *differently* from the notion of Goal of motion, which in turn is expressed *differently* from the notion of Source of motion. The common feature between all these languages is that they all have three distinct morphemes *a*, *b* and *c*, which can spell out the Location, Goal and Source structures either by themselves

Location	Goal	Source	Example
a	b	c	English: *at*, *to*, *from*
a	$a+b$	$a+c$	Estonian: *-l*, *-l-le*, *l-t* (Viitso 1998)
a	b	$b+c$	Quechua: *-pi*, *-man*, *-man-da* (Cole 1985)
a	b	$a+c$	Uzbek: *-Dȧ*, *-Gȧ*, *-Dȧ-n* (Boeschoten 1998)

Table 9.4: Possible instantiations of an L≠G≠S syncretism

or in combination with each other. Similar versatility also holds of the other possible syncretism patterns, see Pantcheva (2010) for a discussion of some of them.

The inclusion of the different *combinations* of lexical items into the picture combined with the (to my mind just) assumption that a combination $a+b$ represents a distinct lexicalization from a lexicalization by only a, raises the question whether some of the impossible syncretism patterns predicted to be impossible do not become possible. Imagine a language which has the following two lexical items:

(15) a. $a \Leftrightarrow <$  $>$

b. $b \Leftrightarrow <$  $>$

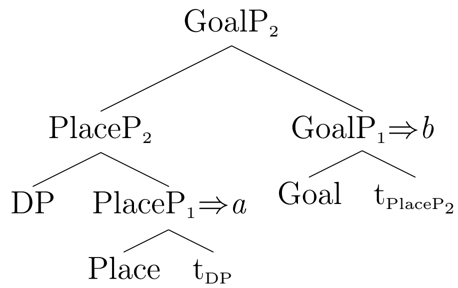
On the face of it, we can expect that this language will use a to lexicalize Location, since no other lexical item has the relevant feature <Place>. The structure for Goal path will be lexicalized by a combination of a and b (triggering a roll-up movement) and the structure for Source structure will be lexicalized by a again, because it is the only entry which has the Source feature. The obtained pattern will be the one in (16), suspiciously resembling the prohibited *ABA pattern.

(16)

Location	Goal	Source
a	$a+b$	a

A detailed derivation shows, though, that the lexicalization pattern in (16) is impossible under the Spell-out system adopted here. Consider the stage of derivation when b is matched to GoalP.

(17)



At the next cycle, which begins with the evacuation movement of PlaceP_2, GoalP_2 is targeted for lexicalization. Consequently the lexical item a is chosen as a match for GoalP_2 thus overriding the combination $a+b$. In other words, the lexicalization of a Goal phrase as $a+b$ never surfaces since it is overridden by a at the next stage. In fact, a language with the lexical items in (15) is predicted to be impossible by the *A&¬A constraint, because all spatial roles will end up being lexicalized by a.

The aim of the discussion above is to illustrate the fact that once all possible lexicalization patterns are taken into account, the picture becomes very complicated. Still, I would like to maintain that the impossible syncretism patterns in Table 9.3 remain impossible, despite the numerous ways in which they could be instantiated, since it appears that the Spell-out system adopted here excludes any lexicalization pattern that would correspond to a forbidden syncretism pattern.

9.3 Typological studies: testing the predictions about syncretisms

In the preceding section, I suggested that there are only four possible syncretism patterns involving the notions of Location, Goal, Source and Route. Such a claim should be empirically verifiable in that one expects to find them all across the languages of the world. In reality, it turns out that the confirmation of this hypothesis requires a great deal of fieldwork, because such data can hardly be retrieved from grammar descriptions. First, reference grammars rarely present the expressions of directed motion in a detailed enough way. Consequently, it becomes impossible to determine whether a syncretism is real or spurious, as I already demonstrated for the case of Georgian in the introduction to this chapter. Second, the expressions of Route of motion are often straight out omitted from grammar descriptions, thus leading to a partial information as to the syncretisms involving Route.

The other side of the coin is that syncretisms that are predicted to be impossible are claimed to exist, again without data being presented which would exclude a spurious syncretism.

By and large, linguistic studies dealing with the expression of the spatial roles Location, Goal and Source (among other thematic roles) confirm the asymmetry in the distribution of the logically possible syncretism patterns among languages. This asymmetry has been stated most concisely by Andrews (1985), who discusses the distribution of the syncretism patterns involving Location, Goal and Source cross-linguistically. According to this author, there is a clear skewing in favor of some patterns, while others seem to be unattested.

> A particularly interesting tendency [...] is for certain groups of notions but not others to be expressed by the same marker in many different languages. Thus sometimes one finds the same NP-marker coding the Locative, Goal and Source roles [...], sometimes one finds Locative and Goal expressed by the same marker, with a different one for Source [...], and sometimes, as in Warlpiri, different markers are used for all three locative roles. But one doesn't seem to find one marker used for Locative and Source, with a second for Goal; or one for Source and Goal, with a different for Locative.
>
> (Andrews 1985:97)

Thus, leaving aside the notion of Route, Andrews states the syncretism patterns Location=Source≠Goal (Type 5-6) and the pattern Location≠Goal=Source (Type 11-13) do not seem to be found (in compliance with the predictions), while there is a general trend towards the syncretisms Location≠Goal≠Source (Type 1-2), Location=Goal≠Source (Type 3-4), and Location=Goal=Source (Type 14-15). The last one conflicts with the prediction of this thesis and I will come back to it shortly.

The same observation has been made in other works where the topic of syncretisms within the spatial domain is being discussed (Creissels

2006; 2008, Radkevich 2009, Nikitina 2009, Lestrade 2010). Various typological studies dealing with these three spatial roles also show that the general tendency supports the predictions. I briefly review these studies here.

Blake (1977)

Blake (1977) examines the syncretism tendencies against a sample of Australian languages. In Appendix I, Blake lists the case forms for 115 Australian languages. Of those, 85 languages are listed as having all three spatial cases: Locative (encoding Location), Allative (encoding Goal of motion), and Ablative (encoding Source of motion). A survey of these 85 languages reveals that 91% (77 languages) have a special form for each spatial case, that is, follow the pattern Location≠Goal≠Source. Nine percent (8 languages) have one shared case affix for Locative and Allative and a separate one for Ablative, exemplifying the syncretism pattern Location=Goal≠Source. No language from this sample exhibits the syncretism patterns Location=Goal=Source, Location≠Goal=Source or Location=Source≠Goal, thus complying with all the predictions made.

Noonan (2008)

The tendency for languages to lexicalize Location, Goal and Source of motion according to the patterns in Table 9.2 finds further support in the typological study conducted by Noonan (2008). He examines the overall patterns of syncretism in 76 Tibeto-Burman languages. The results show a very robust Locative=Allative syncretism (44 languages): 58% of the examined Tibeto-Burman languages pattern according to the type Location=Goal≠Source. The pattern Location≠Goal≠Source is represented by 25 languages (33%). However, four percent (3 languages) are claimed to use the same marker for all three functions, thus exemplifying the type Location=Goal=Source. Further, two languages (2,5%) exhibit the pattern Location≠Goal=Source and two languages (2,5%) follow the pattern Location=Source≠Goal, which goes against the predictions of the theory. In sum, five languages challenge the *A¬A constraint, which has a pragmatic motivation, and two languages go against the *ABA constraint, for which there is a structural explanations. Unfortunately, Noonan (2008) does not give the names of the languages in question and this hinders further investigation of the syncretism patterns in these languages, which could turn out to be spurious.

Pantcheva (2010)

In Pantcheva (2010), I report the study of 53 languages comprising 22 genera (which in their turn represent 14 language families), as well as two language isolates. The results are the following: 28 of the languages examined follow the pattern Location≠Goal≠Source, which constitutes 53%. The pattern Location=Goal≠Source is represented by 34% of the languages. No language exhibits either of the patterns Location=Source≠Goal or Location≠Goal=Source. Finally, thirteen percent of the languages in the sample have one unique spatial marker that is used in the expression of all three spatial roles (pattern Location=Goal=Source).

Rice and Kabata (2007)

The typological study in Rice and Kabata (2007) takes a different perspective on the syncretism patterns, but still allows one to state some generalizations. Rice and Kabata take as a starting point the Allative marker (regardless of whether it is a case affix or an adposition) and examine what other functions it can have (for example, Locative, Ablative, Purposive, Benefactive, etc.). They examine the models of Allative syncretisms in 44 genealogically diverse languages. The upshot is that ten languages (23%) use the same marker for Allative and Locative (pattern Location=Goal≠Source). Five languages (11%) use the same marker for the Allative, Locative and Ablative functions, thus exhibiting the pattern Location=Goal=Source.

The remaining 29 languages (66%) are the ones where the Allative marker is syncretic neither with Locative nor with Ablative. Since this study of syncretism patterns aims to answer the question which functions the Allative marker can express other than the Allative, no information can be retrieved as to whether Locative and Ablative can be syncretic to the exclusion of the Allative, that is, Location=Source≠Goal. Similarly, nothing can be said about languages in the sample that follow the pattern Location≠Goal≠Source. Therefore, no conclusion can be drawn concerning the distribution of the 29 remaining languages between the patterns Location≠Goal≠Source and Location=Source≠Goal. Nevertheless, in the sample of Rice and Kabata (2007), there is not a single language that uses the Allative marker to express also the Ablative function, but has a separate Locative marker (i.e., the pattern Location≠Goal=Source).

Table 9.5 summarizes the cross-linguistic lexicalization patterns, arranged according to their frequency. The numbers in the brackets show the actual number of languages: the first number is the number of languages that are claimed to have the relevant pattern, the second number is the total number of languages included in the respective sample.

	Blake (1977)	Noonan (2008)	Pantcheva (2010)	Rice and Kabata (2007)
L≠G≠S	91% (77/85)	33% (25/76)	53% (28/53)	—
L=G≠S	9% (8/85)	58% (44/76)	34% (18/53)	23% (10/44)
L=G=S	0% (0/85)	4% (3/76)	13% (7/53)	11% (5/44)
L=S≠G	0% (0/85)	2,5% (2/76)	0% (0/53)	—
L≠G=S	0% (0/85)	2,5% (2/76)	0% (0/53)	0% (0/44)

Table 9.5: Pattern of syncretism for the lexicalization of Location, Goal, and Source

The proposed distinction between real and spurious syncretism raises the question of how many of the syncretism cases in Table 9.5 involve truly ambiguous spatial markers. A closer inspection reveals that many of them turn out to be spurious. For instance, Pantcheva (2010) includes Classical Tibetan in the group of languages with a Location=Goal≠Source syncretisms, as suggested in DeLancey (2003). However, Beyer (1992:268) states that, although Classical Tibetan uses "the same locus particles with verbs of location and verbs of motion[, t]here is no confusion because, of course, the verbs are different." Given that the interpretation of a noun marked by *-la* (general location) or *-na* (interior location) in Classical Tibetan is always disambiguated by the verbs, as suggested by Beyer, it is more plausible that we are dealing with a case of spurious syncretism rather than a real one.

Similarly, all of the Location=Goal=Source syncretisms that I have been able to check turn out to be spurious. To give a few examples, Rice and Kabata (2007) present Tagalog as a language where the unique spatial marker *sa* carries a Locative, an Allative and an Ablative function. While it is true that *sa*-phrases participate in expressions of Location, Goal and Source, they by no means do that alone. According to Schachter and Otanes (1972:260), Source expressions are built of a noun marked by *sa* combined with one of the following verbs or adverbs: *buhat*, *galing*, *mula* or *tubo*, all translated as 'from.' The fact that a supporting *from*-morpheme is needed in order to construct a Source expression suggests that the Goal=Source syncretisms in Talagog is spurious. Concerning the Locative=Goal syncretism in Tagalog, there is evidence that it is a real one, since "[i]n a sentence with a verbal predicate, a *sa* phrase is sometimes ambiguously interpretable as a locative adverb or a directional complement" (Schachter and Otanes 1972:450). In sum, Tagalog rather represents a Location=Goal≠Source syncretisms, if we take syncretism to be an instance of structural ambiguity.

Similarly, Pantcheva (2010) takes the Tibeto-Burman language Lahu to have a Location=Goal=Source syncretisms, since it has several noun particles of general locative meaning that are neutral with respect to directionality. However, their interpretation depends on the built in semantic features of the clause's verb. Consider, for instance, how the directional interpretation of a phrase marked by the postposition *-lo* (attaching to inanimate Grounds) is determined by the verb it is combined with (data from Matisoff 2003:216, the original glossing represented).

(18) a. há-qō lo mɨ chĕ ve.
cave *sit* PROG PU
'He is sitting in the cave.' (Location)

b. há-qō lo lòʔ e ò.
cave *enter* PV PV
'He has already gone into the cave.' (Goal)

c. há-q̄o lo tɔ̆ʔ e ò.
cave *emerge* PV PV
'He has already come out of the cave.' (Source)

As Matisoff (1973:162) puts it, "[w]hether a [N+*lo*] is to be translated as 'to/towards/into N,' or 'in/at N,' or 'from/out of/away from N' depends entirely on the semantics of the clause's main verb." Such dependence is characteristic of spurious syncretisms where the verb lexicalizes the projections which come on top of the Place head in Goal and Source expressions.

To summarize, many of the alleged syncretisms in Table 9.5 turn out to be spurious upon closer inspection, that is, they require the support of an additional element in order to express Goal and Source paths. As far as I was able to determine, in none of the languages included in Rice & Kabata's and Pantcheva's samples is there a real Goal=Source syncretism. Regarding languages with a Location=Goal=Source syncretism, I suggest that such languages have, in fact, a unique spatial marker with a *default locative* interpretation. In order for this marker to acquire a Source or a Goal meaning, it has to occur with the right verb. Similar observations have been made also for other languages, not included in the samples, e.g., the Bantu language Tswana (Creissels

2006), Yukatek Maya (Bohnemeyer and Stolz 2006), etc. The examples of Location=Goal=Source syncretisms which I encountered most often feature pairs where the same (locative) morpheme appears in combinations with verbs translated as *come* and *go*. Such verbs are not well suited for testing real syncretisms. Many languages have pseudo-deictic and non-deictic verbs *come* and *go* which have the property of being inherently Goal-oriented and Source-oriented, respectively (Ricca 1993). Under the current account, an inherently Goal-oriented verb which takes a locative phrase as a complement lexicalizes the Goal head, and an inherently Source-oriented verb lexicalized the Source and Goal heads.

9.3.1 The possible patterns of syncretisms: some examples

As discussed in Section 9.2.3, there are only four syncretism patterns that are predicted to be possible by the model developed in this thesis, see Table 9.6, repeated from Table 9.2. In this section, I present a couple of languages which instantiate the possible syncretism patterns. In doing this, I focus mainly, but not exclusively, on the general topological notions AT, ON, IN and leave aside the more complex projective terms like UNDER, BEHIND, AMONG (see Levinson and Meira 2003, Zwarts 2008a for a hierarchy of spatial terms).[3]

Type 1	Location≠Goal≠Source≠Route
Type 2	Location≠Goal≠Source=Route
Type 3	Location=Goal≠Source≠Route
Type 4	Location=Goal≠Source=Route

Table 9.6: Possible syncretisms (repeated from Table 9.2)

The first type of syncretism is found in English, where the prepositions *at, to, from* and *via* give rise to different spatial interpretations, even when combined with the same verb.

(19) a. I ran at the stadium. (Location)
b. I ran to the stadium. (Goal)

[3]It should be noted that very often a given language instantiates more than one syncretism pattern. For instance, the English canonical spatial expressions (*at, to, from*) instantiate Location≠Goal≠Source, while the spatially more descriptive prepositions *under*, *behind*, etc., show a Location=Goal≠Source syncretism (Jackendoff 1983).

c. I ran from the stadium. (Source)
d. I ran via the stadium. (Route)

The second type of syncretism has already been illustrated by the Hindi Ablative marker *-see*, which syncretizes Source and Route, as I showed in Chapters 6 and 8 (I repeat the data in (22)). In order to lexicalize a Goal phrase, Hindi uses the Dative marker *-koo* and for a Locative phrase it uses one of the locative markers *-mee* 'in' or *-par* 'on' (data from Narasimhan 2008).

(20) a. kamree-mee
room-LOC
'in the room'(Location)
b. pharsh-par
floor-LOC
'on the floor' (Location)

(21) meez-koo
table-DAT
'to the table'(Goal)

(22) a. baccaa kaar-ke saamne-see calaa.
child *car*-GEN *front*-ABL *walk*.PERF
'The child walked from/via in front of the car.'(Source or Route)
b. ciRijaa Jhiil-ke upar-see uRi.
bird *lake*-GEN *above*-ABL *flew*
'The bird flew from/via above the lake.' (Source or Route)

Other languages which have been claimed to have a Source=Route syncretism, but no Location=Goal or Goal=Source syncretism are Qiang, Tibeto-Burman (LaPolla 2003), Karata, Daghestanian (Magomedbekova 1971), Basque, isolate (Hualde and de Urbina 2003), and Marathi, Indo-Iranian (Pandharipande 1997). Unfortunately, the data presented in the sources cited does not allow to determine whether the Source=Route syncretism in these languages is real or spurious.

Turning now to the third type of possible syncretism, it turns out to be surprisingly rare to come across an undoubtedly real Location=Goal syncretism of the sort found with the English projective prepositions *under, behind* and others (see Jackendoff 1983 and example (3) in the current chapter). Although the results from the typological studies presented in Section 9.3 show that this is the second most common syncretism pattern cross-linguistically, it is very difficult to determine which languages have a *real* Location=Goal syncretism (as opposed to a spurious one). As I already complained, the main problem is the lack of data, since grammar description generally do not take into consideration the possibility of there being a spurious syncretism.

A good candidate for such a syncretism is Tagalog, as suggested by the fact that a phrase marked by the spatial preposition *sa* can be ambiguously interpretable as a locative adverb or a directional complement (Schachter and Otanes 1972:450). Another language where this syncretism type is found is French, see the data in (23).

(23) French (data from Nikitina 2009, confirmed by M. Starke, p.c.)

a. J'ai couru au stade.
I.have run at/to.the stadium
'I ran at the stadium' (Location)
'I ran to the stadium' (Goal)

b. J'ai couru du stade.
I.have run from.the stadium
'I ran from the stadium' (Source)

Finally, let us turn to the last syncretism type Location=Goal≠Source=Route. A language with this pattern would have one spatial marker which is ambiguous between Location and Goal of motion, as in French, and a second marker ambiguous between Source and Route, as in Hindi. Until now, I have not been able to find a good example of such a syncretism type, for there is a double impediment. First, the information provided in grammars about Route expressions is very sparse. Second, the usual issue with the lack of information about whether a given syncretism is real or spurious obtains. Good candidates for such a pattern seem to be the Caucasian languages Godoberi (Gudava 1967c), Bagvalal (Gudava 1967a), Tindi (Gudava 1967d), Hunzib (Bokarev 1967b) and Bezhta (Bokarev and Madieva 1967). Many Caucasian lanugages are claimed to have a Source=Route syncretism in Vinogradov (1967), and all the abovementioned languages are in addition claimed to have a Location=Goal syncretism. This hypothesis remains to be confirmed.

9.3.2 The impossible patterns of syncretisms: some counterexamples

In Section 9.2, I suggested that there are two general types of syncretisms that are predicted by the model to be impossible. One is the *ABA-type of syncretism, where two heads are syncretic across another. The other type is a syncretism of Goal and Source, i.e., a syncretism involving two "opposite" notions. This section is devoted to the discussion of some languages which have been claimed to exhibit a prohibited syncretism pattern. I will show that these syncretisms are more correctly analyzed as spurious.

Starting with the Goal=Source syncretism, Laz is a language which has been reported to have a spatial marker ambiguous between the two notions (Broschart and Dawuda 1999). As I showed in Chapter 8, Section 8.3.2, basing the discussion on data from Kutscher (2001; 2010), the Goal=Source syncretism in Laz is more correctly analyzed as a spurious syncretism. Further, in the beginning of the current section, I discussed the question of how real the Location=Goal=Source syncretisms reported in Rice and Kabata (2007) and Pantcheva (2010) are. I showed that a closer inspection of Tagalog and Lahu reveals that at least the Goal=Source part of the pattern is a spurious syncretism, conforming to the pragmatic constraint *A&¬A suggested in Section 9.2.2. I reached the same conclusion when I investigated the sample of "Goal/Source indifferent languages" presented in Wälchli and Zuñiga (2006), where we find languages like Lahu and Yukatek Maya with a spurious (Loc=)Goal=Source syncretism. In sum, I can say that so far I have not come across any convincing case of a real Goal=Source syncretism.

Let us now turn to the *ABA-type of syncretism. Abstracting away from the Route expressions, for which very little is said in the literature on syncretisms, the prohibited syncretisms are the ones where Location and Source are expressed by the same marker to the exclusion of Goal.

There are several languages which have been claimed to exhibit this syncretism pattern: Veps (Radkevich 2009), Dinka (Creissels 2008, Nikitina 2009, Lestrade 2010), Nivkh (Nikitina 2009, Radkevich 2009, Lestrade 2010), Kanuri and Old Georgian (Creissels 2008, Lestrade 2010), Iraqw (Creissels 2006, Lestrade 2010), and Nukuoro (Lestrade 2010). I discuss them briefly below.

The alleged Location=Source syncretism in Veps is rather a terminological issue stemming from the particular labeling of two spatial cases: Addesive-Ablative and Inessive-Elative. Despite their names (which reflect a diachronic development), these two cases have purely locative functions. The Source expressions in Veps are formed by adding a dedicated morpheme *-pei*, to an Addesive-Ablative or Inessive-Elative marked noun (Zajtseva 1981). Below, I give an example of an Adessive-Ablative marked noun and show how the corresponding Source phrase is formed.

(24) Veps (Zajtseva 1981, my glossing)

a. käde-s
hand-INESS.ELAT
'in the hand' (Locative only)

b. käde-s-pei
hand-INESS.ELAT-FROM
'out of the hand' (Source only)

The cases of Dinka and Nivkh have a greater potential of being real counterexamples, however, the available data does not provide clear evidence for such a claim. Consider the Dinka data in (25).

(25) Dinka (Andersen 2002)

a. Myè̤et̪ à̰-tɔ̤̀ mɛ̤́ɛɛc.
food D-*be.present* *fire*.INESS
'The food is on the fire.' (Location)

b. Rɛ̤̀ɛc à̰-mṳ̀ul bè̤y mɛ̤́ɛɛc.
fish D-*crawl* *out*.ALL *fire*.ABL
'The fish is crawling out from the fire.' (Source)

The form of the noun *mɛ̤́ɛɛc* 'fire.INESS/ABL' is indeed identical in both sentences. The sentence in (25b), however, suggests that we need the support of a special Allative-marked particle *bè̤y* to get the Source reading. *Mɛ̤́ɛɛc* by itself seems not to be enough. This casts doubts on the claim that the Locative form in Dinka can be also used to express a Source path. The doubts are reinforced by the data in (26).

(26) Dinka (Nebel 1948)

a. Ɣɛk atɔ luɛk.
cattle *is* *byre*.LOC
'The cattle is in the byre.' (Location)

b. Weŋ aci riŋ luɛk.
cow PAST *run* *byre*.LOC
'The cow ran into the byre.' (Goal)

If Dinka really had a Location=Source syncretism, then the expected interpretation of the sentence in (26b) would be Source-directional and not Goal-directional, contrary to the fact.

A similar suspicion can be raised regarding the Location=Source syncretism in Nivkh. The only data on Nivkh that I found is also that cited by Nikitina, taken from Gruzdeva (1998) (see (27)). As the data shows, the Source reading of a locative expression is available when the verb encodes a Source path (e.g., *come out*).

(27) Nivkh (Gruzdeva 1998)

a. T'ivlaŋ čag-ux ŋat'x-Ø vezla-d.
cold *water*-LOC/ABL *foot*-NOM *cramp*-FIN
'[I] have a cramp in [my] foot in the cold water.'

b. Umgu-Ø n'o-x p'u-d'.
woman-NOM *barn*-LOC/ABL *come.out*-FIN
'A woman came out from the barn.'

In sum, it is debatable whether Dinka and Nivkh really exhibit the syncretism pattern Location=Source≠Goal. On the basis of the data in (25)-(27), I suggest that they do not, although they do use the same case marker in expressions of Location and Source. The Source expressions, however, take more than just the case ending, for instance a Source-encoding verb or a particle. The lack of a Location/Source ambiguous example and the apparent need of a supporting element suggest that the Location=Source syncretisms in Nivkh and Dinka are spurious.

The same lack of convincing data marks the other languages mentioned as having a Location=Source≠Goal syncretisms. In the Kanuri grammar of Hutchison (1981), I found both Locative and Source expressions where the same postposition *lán* marks the Ground DP. However, they feature different verbs: non-motion verbs (*work, live*) in locative contexts and directed motion verbs (mostly *leave* and *come*) in Source contexts. Thus, it is plausible that *lán* is a purely locative postposition and the Source reading is due to the directed-motion verbs lexicalizing the Source and Goal heads. This proposal is strongly supported by the fact that the only interpretation of a noun marked by *lán* in non-verbal contexts is the locative one (Hutchison 1981:176).

The Old Georgian, Iraqw and Nukuoro examples provided in Lestrade (2010) do not contain data where a spatial expression is ambiguously interpreted as expressing Location or Source of motion either. Rather, the examples feature different verbs and/or additional particles in the Source expressions. Consider, for instance, the example below taken from Lestrade (2010:102)

(28) Nukuoro (Lestrade 2010, citing Ross Clark, p.c.)

a. Kai kilaateu ka teletele ai i te moana.
and they PAST *sail.sail* PRT *on the sea*
'And they kept sailing on the open sea.' (Location)

b. Ka hulo kee i Kapingamaalangi.
PAST *go*.PL *away from K.*
'[They] left Kapingamarangi.' (Source)

c. Ka lava ka hulo ki Luuku ma Motolako.
PAST *finish* PAST *go*.PL *to L. and M.*
'Then they went to Truk and the Mortlocks.' (Goal)

While it is true that the same preposition *i* is used in both Locative, (28a), and Source expressions, (28b), it is not excluded that the particle *kee* translated as 'away' present only in (28b) is the lexical item that lexicalizes the Goal and Source heads. If this is so, then the Nukuoro Location=Source syncretism is a spurious one.

The last potentially real Location=Source≠Goal syncretism that I have come across in my investigations is found in North Sámi. Northern Sami has an Illative (Goal) case and a Locative case. The latter is said to syncretize Inessive and Elative (i.e., Location and Source). In the Locative singular, marked by *-s(t)*, the Inessive-Elative syncretism is seen as an accidental homophony resulting from the phonological development of the Proto-Sámi Inessive and Elative endings **-snē* and **-stē*, respectively. The merger of the two cases arose due to an apocope followed by a devoicing and desonorization of the *n* in the Inessive (**-snē* > **-sn* > **-sn̥* >**-st*) (Sammallahti 1998:66). The problem is that the Inessive-Elative syncretism has been extended to other parts of the grammar. For instance, the morphological opposition between Inessive and Elative was lost also in the plural paradigm and with spatial adverbs and postpositions by analogy to the singular paradigm and crucially not because of a phonologically conditioned development (Sammallahti 1998, Hansson 2007). Thus, North Sámi presents a real challenge to the account developed in this thesis, which bans such a syncretism.

Svenonius (2009a) conducts a thorough investigation of the North Sámi Locative case, collecting rich data involving Locative and Source expressions. The detailed data analysis he performs shows that the Source reading is available whenever the Locative is not and, importantly, requires the presence of an additional element encoding transition in some way: a Goal expression, or an Aktionsart operator, like the 'subitive' *l* presented in (29b).

(29) North Sámi Locative (data from Svenonius 2009a)

a. Joavnna viegai viesus.
Jon ran house.LOC
'Jon ran in the house.' (Locative)

b. Joavnna viehka-l-ii viesus.
Jon *run*-SUB-PAST *house*.LOC
'Jon suddenly ran off from the house.' (Source)

Svenonius then develops a fine-grained semantic and syntactic analysis for the English and North Sámi Source expressions, showing that they are in fact very different. Importantly, he concludes that the North Sámi Locative phrase always spells out a PlaceP, even in Source expressions, thus making the Location=Source syncretism in North Sámi a spurious one.

The last potential counterexample I will discuss is an *ABA-type of syncretism found in English involving the spatial roles Location and Route. In what follows, I will argue that the Location/Route ambiguity actually does not involve a syncretism at all.

In his paper on spatial prepositions in English, (Svenonius 2010) establishes the class of so called *PathPlace* prepositions, listed in (30).

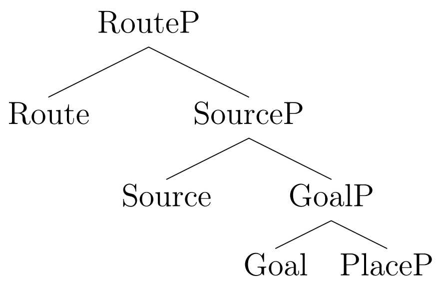
(30) PathPlace prepositions: *around*, *through*, *across*, *along*, *over*, *under*

The reason for the label "PathPlace" is that these preposition combine properties of Path prepositions with properties of Place prepositions. More precisely, they can be used both in Route-path and in Locative contexts, see (31a) and (31b), respectively. It is then conceivable that the PathPlace prepositions can lexicalize a Route projection and a Place projection.

(31) a. We walked through the forest. (Route path)
b. The pencil is all the way through the cushion. (Location)

It is important that the only path which *through* and the other PathPlace prepositions can express are Route paths and no other. Given that in the Path decomposition I proposed, the heads Place and Route are separated by the Goal and Source heads (see (32)), it is expected that the intermediate Goal and Source structures are also lexicalized by *through*. This is clearly a bad prediction. First, because it is not true, see (33). Second, because I argued in Section 9.2.2 that a Goal=Source syncretism is impossible.

(32) The syntactic structure of a transitional (bounded) Route path



(33) a. We walked into the forest. (Goal)
b. We walked out of the forest. (Source)

The problem can be resolved once we look more carefully at the PathPlace prepositions and the kind of Route path and Location they denote. In what follows, I argue that PathPlace preposition in fact do not lexicalize PlaceP even on the static reading and the locative interpretation they receive comes from elsewhere.

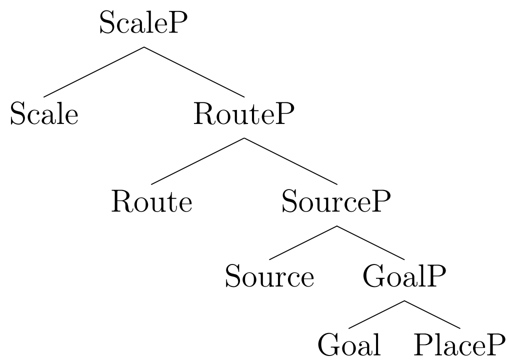
The first important observation is that the PathPlace class contains prepositions which can express an *non-transitional* (*unbounded*) *Route path*, either as the only path they express (like *along*, see (34)), or together with a transitional (bounded) Route path (see (35), data from Piñón 1993).

(34) We walked along the river {for an hour, *in an hour}.

(35) a. The insect crawled through the tunnel {in two hours, for two hours}.
b. Mary limped across the bridge {for ten minutes, in ten minutes}.

In order to remind the reader, I present the structure of a non-transitional Route path below, repeating it from (18c) in Chapter 4. It is the same as the structure of a transitional Route paths (see (32)), plus the additional Scale head on top.

(36) Non-transitional (unbounded) Route path



Thus, all PathPlace preposition can spell out the structure in (36).

The second important observation pertains to the type of Location expressed by the members of this preposition class. Consider the data in (37) taken from Svenonius (2010).

(37) a. The pencil is all the way through the cushion.
b. There is a fence around the house.
c. We found a log across the stream.
d. The cloth lay over the table.

The locative interpretations of the English sentences above are "paraphrasable as 'occupying the whole of a path'—for example, a pencil which is through a cushion occupies the whole of the path which goes through that cushion" (Svenonius 2010). Svenonius calls this type of location *extended location*.

In sum, all PathPlace prepositions denote non-transitional Route paths and the Location they express is an extended Location. The issue which arises is what syntactic structure underlies the extended Locations.

Recall from Chapter 2 that non-transitional Route paths impose the same locative condition on all the points of the path. For instance, any of the points in the path *along the river* in (34) are seen as being at the river (Zwarts 2008a).

(38) *along*-Path
+ + + + + + + + +
0 1 Zwarts (2008a)

Hence, a non-transitional Route path is more like a stative location than a dynamic path involving change. A non-transitional Route marker is, however, different from a simple locative marker in that the non-transitional Route path picks out a contiguous sequence of points in the vector space, while the latter picks out one or more points, which are not necessarily contiguous. Therefore, I suggest that non-transitional Routes *are* in fact extended Locations, although they contain path structure.

The equation of non-transitional Route paths with extended Locations removes the problem posed by the Route=Location syncretism to the exclusion of Goal and Source. Since non-transitional Route paths and extended Locations are the same thing and correspond to the same syntactic structure in (36), then any preposition which can express the former can also express the latter. Further, there is the prediction that prepositions that denote only transitional Route paths cannot be interpreted as extended Locations. The reason is that such prepositions are lexically specified to spell out the structure in (32) and consequently cannot lexicalize the Scale head. This prediction is obeyed by the English preposition *past* which expresses a transitional Route path only and consequently has no extended Location reading.

The proposal that non-transitional Route paths and extended Locations correspond to the same syntactic structure predicts that any language with a non-transitional Route path will allow a static reading for it of the type found in the English examples in (37). This prediction seems to be borne out, with the additional peculiarity that many languages cannot express extended Location by using copula verbs like *to be*, but need a (fictive) motion verb (translating as *go*), or posture verbs (*lie, stand*, etc.) in such constructions. Consider, for instance, the Norwegian examples below (provided by Tarald Taraldsen, p.c.).

(39) a. Bro-en går over elv-en.
bridge-DEF *goes over river*-DEF
'The bridge is/goes over the river.'

b. Stokk-en ligger over elv-en.
log-DEF *lies over river*-DEF
'The log is across the river.'

Thus, in English, the copula *to be* can mediate the mapping of the extended Location (or non-transitional Route path) onto the extent of the Figure (cf., Gawron 2006). In Norwegian, this mapping requires verbs like *go* and *lie*, which presumably serve the same purpose as the English copula, given the lack of an event reading in (39).

9.4 Conclusion

In this chapter, I analyzed the logically possible syncretism patterns involving the spatial roles Location, Goal, Source and Route. I argued, following Bobaljik (2007) and Caha (2008), that syncretisms are restricted to targeting only structurally adjacent heads. In this way I eliminated six syncretism patterns (Type 5-11) in Table 9.3. I also suggested that a Goal=Source syncretism should be impossible, although the two heads are adjacent, because of the specific semantics I proposed for the Source head. This excluded four more syncretism patterns (Type 12-15).

I tested the predictions against cross-linguistic data. I performed a typological investigation, which by and large confirmed the predictions: very few languages are claimed to exhibit the forbidden syncretism patterns. The results of the typological survey, however, were not as neat as desired, since a couple of languages, although very few in number, were claimed to exhibit impossible syncretisms. Upon a closer data analysis, I suggested, however, that these syncretisms were not real, because they did not involve genuinely ambiguous spatial markers.

The important result of the investigation in this chapter is that there undoubtedly are cases of real Location=Goal and Source=Route syncretisms, while no convincing instances of the Goal=Source and *ABA-type of syncretisms were found. This asymmetry in the syncretisms distribution across languages lends support to the decomposed Path structure I defend, as it reflects the adjacency relation between the various Path heads and can be connected to their semantics.

Chapter 10

Conclusion

10.1 Introduction

In the past decade, linguistic research has taken a big interest in the syntax and semantics of directed spatial expressions, resulting in a multitude of scientific studies: papers (van Riemsdijk and Huybregts 2002, Kracht 2002, Zwarts 2005; 2008a), doctoral dissertations (Asbury 2008, Gehrke 2008, Lestrade 2010, Radkevich 2010), and specialized volumes (Svenonius and Pantcheva 2006, Asbury et al. 2008, van der Auwera 2010, Cinque and Rizzi 2010), containing influential papers on the topic (Koopman 2000, republished in Cinque and Rizzi 2010, Svenonius 2006, den Dikken 2010, to mention some of them). The present work is a contribution to this recent body of publications. It follows the trend towards finer-grained syntactic representations and decomposes the Path head into several projections.

In addition to articulating the internal structure of Path, this dissertation contributes to the development of the Nanosyntax model of grammar (Starke 2005-2009, Ramchand 2008b, Bašić 2007, Fábregas 2007, Abels and Muriungi 2008, Muriungi 2008, Lundquist 2008, Caha 2009b, Taraldsen 2010, Pantcheva 2010, for a representative collection of papers see Svenonius et al. 2009). This is the framework I adopt to deal with the highly fine-grained internal structure of Path and in doing this I develop a detailed Spell-out algorithm compatible with the main tenets of the theory.

The main ideas of this thesis are summarized in this chapter. At the end of it, I discuss some topics for future research, emanating from the particular proposals made in the dissertation.

10.2 Summary of the thesis

I start my investigation of the internal structure of Path by exploring in **Chapter 2** what kinds of spatial paths are found in languages worldwide, with the aim to establish the core properties that distinguish them from each other. I suggest that there are three such properties: orientation, transition and delimitation.

The first property leads to a classification of paths into *non-oriented* and *oriented*. Non-oriented paths, usually referred to as *Route* paths (VIA), have no inherent directionality. Oriented paths involve directionality, which is the result of there being an asymmetry between the two extreme points of the path — a particular location holds of one of the extremes and does not hold of the other. Depending on which one of the extreme points is subject to a particular locative condition, we distinguish *Goal* paths (TO), where the location holds of the endpoint, and *Source* paths (FROM), where the location holds of the starting point.

The next property, transition, reflects the fact that some paths have a two or three-stage structure, which contains "positive phases" (where a certain location holds) and "negative phases" (where the location does not hold). The term transition refers to the passage from one phase of the path to the next phase. I called paths with transitions *transitional* paths. Transitional Goal paths (TO) are paths where there is a transition between the first, negative, phase of the path to the second, positive, phase of the path. Transitional Source paths (FROM) are the reverse of transitional Goal paths: the first phase is positive and there is a transition to the second, negative, phase. Finally, transitional Route paths (VIA) involve two transitions and the phase "in the middle" is the positive phase.

Paths without transition are *non-transitional* paths. Non-transitional Goal paths (TOWARDS) thus have no transition between a negative and a positive stage, but still involve an asymmetry in the location of their extreme points, such that the endpoint is nearer to the location than the starting point. The reverse holds of non-transitional Source paths (AWAY FROM). Finally, non-transitional Route paths (ALONG) impose the same locative condition on all points of the path.

The last property, delimitation, applies only to transitional oriented paths and indicates a boundary of the path: an upper bound for delimited Goal paths (UP TO) and a lower bound for Source paths (STARTING FROM).

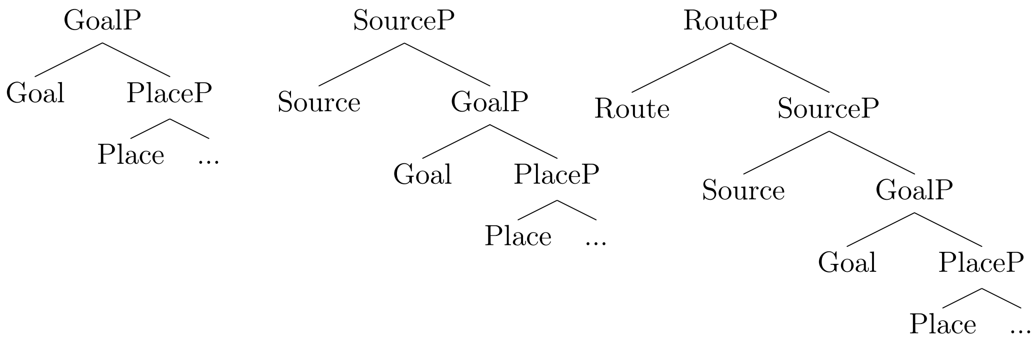
In **Chapter 3**, I lay out the basic theoretical assumptions concerning syntax and morphology and the relationship between the two. Following work on cartography (Cinque 1999, Rizzi 1997) and Nanosyntax (Starke

2005-2009, Caha 2009b), I assume that each morpheme corresponds to at least one terminal head in the syntactic structure, but possibly more than one. Thus, the identification of a morpheme in a given language is evidence for the presence of a corresponding syntactic head. Further, following Chomsky (2001), I assume that all languages share the same underlying syntactic structure. As a consequence, once the existence of a terminal X has been established for one language on the basis of the morphological data provided by this language, the result carries over to all other languages. The X projection becomes universally present, also in those languages which do not provide morphological evidence for its existence. Finally, I assume, following Kayne (1994), that the syntactic structure is universally ordered such that specifiers precede heads and heads precede complements. All other orders are derived by movement.

Having examined what types of paths there are in Chapter 2 and guided by the system of assumptions made in Chapter 3, I proceed to **Chapter 4** where I investigate how they are expressed in various languages. The data analysis leads to a novel generalization: each of the divisions in the path typology is brought about by a special head in the syntactic structure underlying the various directional expressions. The establishment of each syntactic head is motivated by the morphological composition of the examined directional expressions. For instance, in a number of languages Source paths are built on top of Goal paths. This is achieved by the addition of a special element, for which there is evidence that it is an independent morpheme, thus excluding an accidental containment relationship. Similarly, there are languages where Route paths are formed on the basis of Source paths, and non-transitional and delimited paths are formed on the basis of the corresponding bounded path.

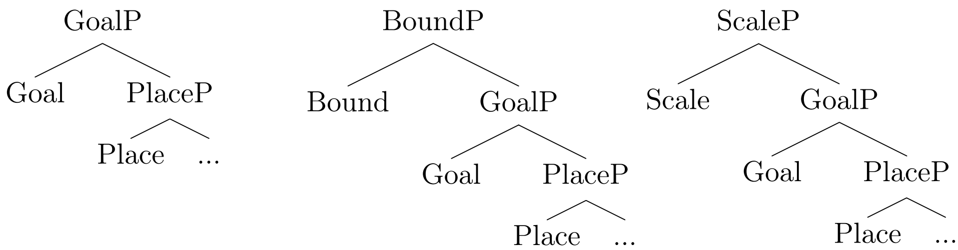
The result from the data investigation leads me to propose that the Path head is not a unique projection hosting all kinds of directional elements, no matter what path they express, but can be decomposed into several heads: Place, Goal, Source, Route, Scale, and Bound[ed]. On the basis of the morphological analysis, I suggest that the Place, Goal, Source and Route heads are rigidly ordered in the syntactic hierarchy such that the Route head dominates a SourceP, the Source head dominates a GoalP and the Goal head takes as a complement a Place projection. I argue that each type of path corresponds to a particular syntactic structure.

(1) a. Goal path b. Source path c. Route path



The Scale and Bound heads, on the contrary, do not have a fixed position and can appear on top of any other Path head, thus deriving non-transitional and delimited Goal, Source and Route paths, respectively. As an example, I present in (2) the structures underlying a non-transitional and a delimited Goal path.

(2) a. Goal path b. Delimited Goal c. Non-transitional Goal



Since I assume that the decomposed Path structure is universal, it applies also in languages where there is no morphological containment relationship between the various kinds of path expressions.

Chapter 5 deals with the semantic function of each of the heads I propose and lends further support to the universality of the Path structure, as it accounts for the semantic compositionality of paths cross-linguistically. I suggest that the semantic contribution of the Goal head is to denote transition to the spatial region encoded by the static locative projection in its complement. The Source head is the locus of a reversal operation, which reverses the orientation of the Goal path in its complement position. The Route head introduces a second transition to the first (positive) phase of the Source path below it. The Scale head picks out an interval from the path structure below it, which is to the left and to the right of the transition. Consequently, when applying to a

Route path, the selected interval consists of the positive phase, where the locative relationship with the Ground holds. When applying to a Goal and Source path, the selected interval contains only "negatively located" points, that is, points where the locative relationship with the Ground does not hold. In addition, the Scale head imposes an order in the selected negative interval such that the "closer" a point has been to the positive extreme point in the original Goal or Source path, the shorter the distance between the Figure and the Ground is at that point. Finally, the Bound head picks out an interval from the path structure to which it applies such that this interval falls in the negative phase and ends or begins with a unique positive point to derive delimited Goal or Source paths, respectively. This unique positively located extreme point of the path is interpreted as the limit for movement.

In **Chapter 6**, I address the question of how the fine-grained Path structure I propose is lexicalized. I discuss the apparent mismatch in various languages between the number of heads in the structure and the number of morphemes that spell them out. I adopt and present the Nanosyntax theory of grammar and show how this approach to language captures the lexicalization of the proposed syntactic structure. I assume the model of cyclic Phrasal Spell-out proposed by Starke (2005-2009) where lexicalization targets both terminal and non-terminal nodes and proceeds bottom-up. Its cyclic nature is a consequence of the assumption that the lexicon is consulted after each External Merge operation. By contrast, there is no lexical access after an Internal Merge operation. In addition, I adopt the requirement that every feature in a cycle has to be lexicalized before the derivation can proceed to the next cycle, thus adapting the *Exhaustive Lexicalization* principle of Ramchand (2008a) to a cyclic Spell-out system.

In Nanosyntax, lexical entries store fragments of syntactic trees (as well as phonological and conceptual information). These lexically stored trees are matched to the nodes in the syntactic tree which are to be lexicalized. The match need not be perfect in order for a lexical entry to be eligible for insertion: it is enough that the node to be lexicalized is a sub-constituent of the lexically stored tree, formulated as the *Superset Principle* (Starke 2005-2009, Caha 2009b). Thus, the tree stored in a lexical entry can be bigger than the syntactic structure this entry lexicalizes. This opens the possibility for the existence of multiple entries that match a given node, because there can be many entries whose lexically stored trees contain this node as a sub-constituent. The competition between them is resolved by the *Elsewhere Condition* (Kiparsky 1973), which requires the most specific item to be chosen. Thus, when two or more items compete for insertion at a given node, the one which wins is the one that leaves the least number of unused features.

In **Chapter 7**, I elaborate on the lexicalization of syntactic structure and test the system against empirical data from three languages: Karata, Uzbek and Finnish. I adopt the idea of Spell-out driven movement, originally proposed by Starke (2011), according to which a lexical entry whose lexically stored tree is not a good match for a given node can trigger an evacuation movement of the obstructing material in order to create the right configuration for matching and subsequently lexical insertion. To allow for this possibility, I assume, following Caha (2009b), that traces are ignored for the purposes of matching.

In addition to creating the right configuration for lexicalization, the Spell-out driven movement creates new nodes in the syntactic structure — the higher segmental nodes resulting from the adjunction of the extracted material to the category which is being lexicalized. Allowing for these nodes to be targeted by lexical insertion has beneficial effects, as it makes it possible to account for the allomorphy found in Finnish Goal expressions on a purely syntactic basis. The implementation of this idea in the system of assumptions made in Chapter 6 motivates the proposal that the Spell-out driven movement triggered in a given cycle takes place in the next cycle. As regards the specific shape of the lexical entries, I assume that their lexically stored trees need not contain information about the exact number of segments a category consists of. The lexical entries store information only about categories.

In the remainder of the chapter, I conduct a detailed investigation of what constraints apply to the movement triggered by the need to spell out and argue for a number of restrictions. First, I suggest, following the insights in Cinque (2005), that the constituent that extracts in order to make the matching of a given node possible must contain the head noun. Second, regarding the landing site for the evacuated material, I assume *Shortest move* — the moved material adjoins right above the node where insertion takes place. Finally, I assume that when more than one movement is necessitated by the need to spell out, syntax performs them in an order opposite to the order in which they are triggered. At the end of the chapter, I run a detailed lexicalization of the spatial expression in Finnish and show how the assumed model accounts for its intricacies.

The lexicalization model developed in Chapters 6 and 7 allows for a single morpheme to spell out one or more syntactic terminals. Combined with the fine-grained internal structure of Path argued for in Chapter

4, this predicts various possibilities to "partition" the syntactic structure underlying a given path, depending on how many morphemes are employed and which particular heads they spell out. Thus, for example, a Source structure can be spelled out by a single lexical entry in one language, but by two entries in another language. Moreover, languages that have bi-morphemic Source expressions can place the "cut" differently. For instance, one language can have a morpheme border between the heads Place and Goal, while another can have a morpheme border between Goal and Source. In **Chapter 8**, I lay out all 28 logically possible partitionings of Route, Source and Goal paths predicted to exist and present real language data that exemplify eighteen partitioning types. Despite the lack of data exemplifying the remaining ten possible partitionings, the eighteen attested partitioning types provide additional evidence for the decomposition of the Path head into several heads and the proposal that each kind of path is associated with a unique syntactic structure.

In Chapter 8, I also discuss the phenomenon of *spurious syncretism*, which arises in some languages due to the particular partitionings of paths they employ. Informally put, spurious syncretisms involve two (or more) structures in a subset-superset relationship, where the smaller structure is lexicalized by a given entry *a*, and the bigger structure is lexicalized by a combination of the same entry *a* plus a "supporting" entry *b*. On the face of it, it then appears that the lexical item *a* is ambiguous between two (or more) notions. However, the ambiguity is not real, since one of these notions is expressed with the help of the "supporting" element *b*. I analyze several cases of spurious syncretisms and show that, in many languages, the structure underlying directional expressions is lexicalized by the joint collaboration of adpositional and verbal elements, which leads to such spurious syncretism and reflects the various ways to partition the structure.

Real syncretisms are the topic of **Chapter 9**. Real syncretisms involve two (or more) structures in a subset-superset relationship, where the smaller structure is lexicalized by an entry *a* and, importantly, *a* also spells out the bigger structure without the support of other entries. This is possible by virtue of the *Superset Principle* which allows for a given lexical item to lexicalize structures that are as big as or smaller than the syntactic tree stored in its entry. In this chapter, I analyze the logically possible syncretisms involving the spatial roles Location, Goal, Source, and Route. I propose two constraints on syncretisms: one motivated by the particular semantics of the heads I assume, the other resulting from the lexicalization model applied to the suggested syntactic structure for paths.

The first restriction disfavors a syncretism between the spatial roles Goal and Source. The justification behind it is that these two paths are construed as exact opposites of each other — Source paths are derived by the application of a reversal operation to a Goal path. I then suggest that it is pragmatically unacceptable that a given lexical item expresses two opposite notions.

The second constraint, which has a syntactic rationale, states that syncretisms are restricted to structurally adjacent heads, thus banning a paradigm of the type ABA, where a lexical item A spells out a given structure [X [Y [Z]]], B spells out a smaller structure [Y [Z]], and A again spells out the smallest structure [Z] (Bobaljik 2007, Caha 2009b). The *ABA constraint prohibits syncretisms of Location and Source to the exclusion of Goal (Location=Source≠Goal), Location and Route to the exclusion of Goal and Source (Location=Route≠Goal & Source), and Goal and Route to the exclusion of Source (Goal=Route≠Source).

The rest of the chapter focuses on testing the predictions. I first examine several typological studies and conclude that there is indeed an asymmetry in the cross-linguistic distribution of syncretism patterns, such that the ones predicted to be possible are common, while the ones predicted to be impossible are very rare, arguably non-existent. I then present some languages which instantiate the syncretism patterns predicted to be possible. Afterwards, I turn to the impossible syncretisms and discuss languages which have been claimed to have them. Upon a closer data analysis, I conclude that the offending syncretisms are not real but spurious, since they all seem to require a supporting element to express one of the spatial roles.

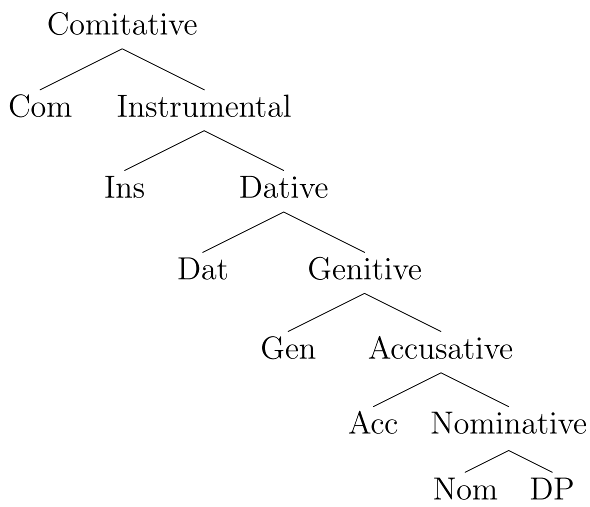
10.3 Directions for future research

This dissertation aims to develop an empirically well-grounded and theoretically solid account for the diversity of directional spatial expressions across languages. Still, some issues were inevitably left open. In this section, I briefly present three topics for future research.

The first topic relates to the necessity for a strong empirical confirmation of the predictions discussed in Part III. In Chapter 8, I lay out the 28 possible partitionings of paths allowed by the model, but provide real language data for only 18 of them. Similarly, in Chapter 9, I discuss the four syncretisms patterns predicted to be available, but do not illustrate one of them (Location=Goal≠Source=Route). The finding of language data which exemplify all the possible lexicalization and syncretism patterns will provide important support for the ideas in this thesis. As I see it, it will require extensive fieldwork, since grammar descriptions hardly ever include Route paths in the presentation of directional expressions and rarely control for spurious syncretisms.

The second topic for future research emerging from the ideas in this thesis concerns the incorporation of the suggested Path hierarchy into the Case hierarchy proposed by Caha (2009b). In his doctoral dissertation, Caha (2009b) convincingly argues for a decomposition of case into a fixed hierarchy of universal features, where each feature corresponds to a terminal node in a syntactic tree. The individual cases correspond to phrasal constituents built out of these terminals, as presented in (3).[1]

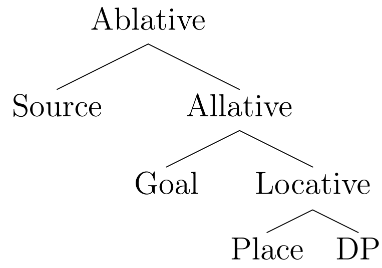
(3) The Case hierarchy (Caha 2009b)



Paths are often expressed by case marking across languages. Translating the Path hierarchy into a hierarchy of spatial cases, delivers the structure in (4), where I use the labels Ablative, Allative and Locative to refer to cases marking Source, Goal and Location in general.

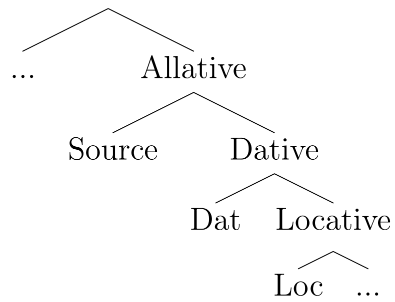
[1] Caha (2009b) labels the individual features A, B, C, etc. For ease of exposition, I label them here Nom, Acc, Gen, etc. to facilitate the association of a given feature to the case it yields.

(4) The Spatial Case hierarchy



Conceivably, the two hierarchies belong to the same functional sequence (*fseq*). This motivates an attempt to merge them together. The *ABA generalization, according to which syncretisms target adjacent heads, provides a useful tool to determine the positioning of the spatial cases among the case projections in Caha's hierarchy (in fact, this is one of the strategies used by Caha to establish the sequence in (3)). For instance, the syncretism between the Dative and the Allative is very widespread cross-linguistically. In fact, often grammars do not list the Allative as a separate case but attribute the Goal function to the Dative. A Dative=Allative syncretism is found in many Caucasian languages (Tsez, Khvarshi, Avar, Lak), Turkic languages (Uzbek, Turkish), Quechua, Tamil, Cebaara, Armenian, Finish, Itelmen, Chukchi, and others. The Dative case is also often syncretic with the Locative: this happens in Japanese, Tshangla, Latin, and other languages. One can even find languages, where the two syncretisms occur simultaneously — the Mongolic languages which are claimed to have a Locative=Dative=Allative syncretism (Janhunen 2003). Thus, it is a likely hypothesis that the place of the Dative in the case-*fseq* is between the Locative and the Allative.

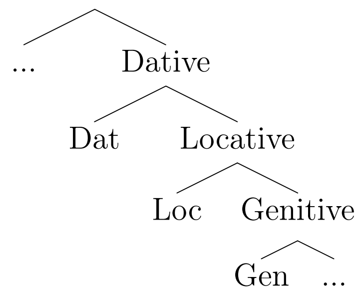
(5)



The hierarchy in (5) suggests that if a language has a Locative=Allative syncretism, then the Dative should also be syncretic with the Locative/Allative.[2] In addition, one expects to find languages where the Allative is built on the basis of the Dative by the addition of an independent morpheme. A potential example of such a language is Bidubi (Blake 1977), where the Dative case ending *-ku* is contained in the Allative ending *-kutu*.

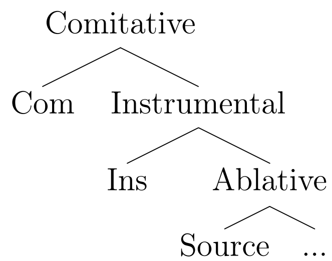
Apart from the Locative=Dative syncretism mentioned in the preceding paragraph, another syncretism involving the Locative is the Locative=Genitive syncretisms found in Tschangla, Latin, Sanskrit and Baagangji, among other languages. This suggests a positioning of the Locative between the Dative and the Genitive projections, as depicted in (6).

(6)



Regarding the position of the Ablative case in the extended case hierarchy, the rather common Ablative=Instrumental syncretism (Creissels 2008, Noonan and Mihas 2010) suggests that the Ablative and the Instrumental are adjacent projections in the case *fseq*. Further, given that many languages syncretize Instrumental and Comitative to the exclusion of the Ablative, the *ABA constrains requires that the Ablative does not intervene between the two projections. Hence, we can hypothesize that the position of the Ablative is below the Instrumental, as shown in (7).

(7)

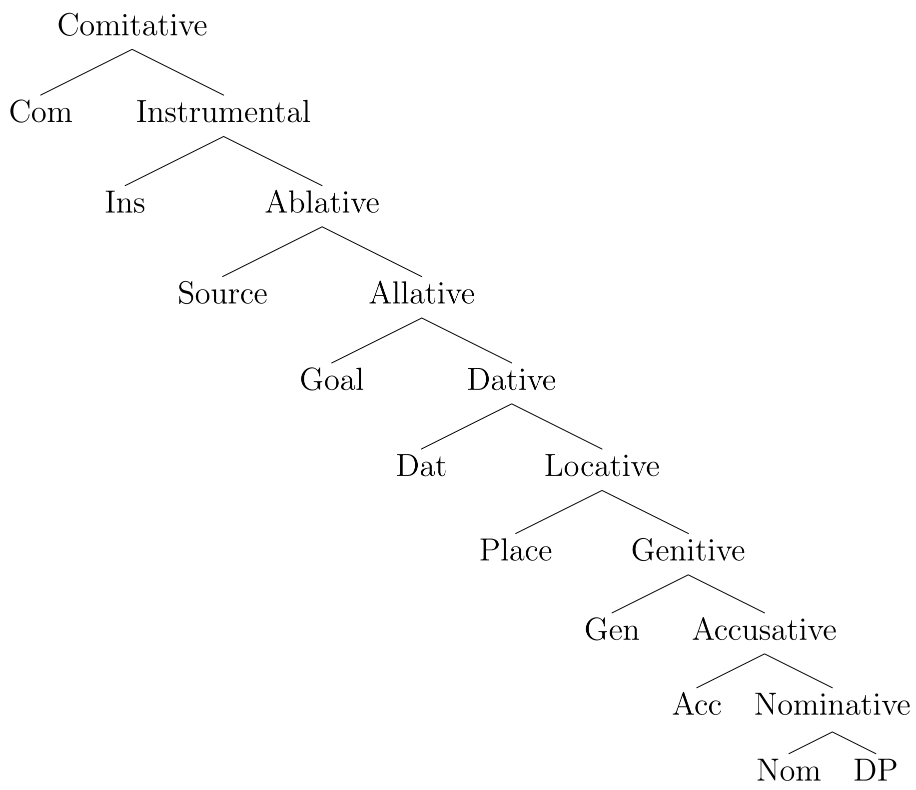


The extended case hierarchy which emerges once we merge Caha's case

[2]A different implication has been proposes by Blansitt (1988), according to whom if the Dative is syncretic to the Locative, then so must be the Allative, suggesting that the Allative is to be placed between the Locative and the Dative. To the extent that I have been able to check the data examined by Blansitt, the generalization does not hold once spurious syncretisms are excluded.

decomposition with the decomposed Path is presented in (8).

(8) The Extended Case hierarchy



The confirmation of the structure in (8) requires an in-depth study of the above-mentioned syncretisms aiming their verification, as well as an investigation of other syncretisms the spatial cases participate in. If correct, the Extended Case hierarchy raises a lot of questions, two of which I formulate below.

- How do we capture the meaning distinctions in spatial cases expressing the same general type of path? For instance, many languages have an Illative case (TO IN) and an Allative case (TO AT), but so far I have not found evidence for one of the two cases being "bigger" than the other. It is then conceivable that the difference in the meaning is encoded lower down in the structure, e.g., in the AxPart head.

- What implication does the Extended Case hierarchy have for languages that use spatial prepositions? Caha (2009b) demonstrates that the Case hierarchy accounts for the cross-linguistic variation in the amount of case marking: if a language has case marking for a case X, then it will use case marking for all cases which are lower than X on the hierarchy and prepositions for the ones that are higher. Hence, if a language has a Source preposition, then we predict that it cannot use case marking to express Comitative.

The third class of issues which opens a whole new research venue pertains to the Spell-out driven movement I adopted in the development of the detailed lexicalization algorithm within the Nanosyntax theory. In particular, it would be interesting to set the Spell-out driven movements against the background of the "classical" (feature-driven) movements (like *wh*-movement, for example) and explore the question of how to distinguish them from each other. A potential line of research one can pursue stems from a suggestion, made by Starke (2011). Starke proposes that *wh*-movement is universal, i.e., applies in all languages, but Spell-out driven movement is "parametric" in that it is contingent on the lexical resources of a given language. Whether the *wh*-movement is overt or covert, however, depends on the particular size of the trees stored in the *wh*-entries of the language. Needless to say, I leave this topic for future research.

Appendix: Language sample and references

Altaic (genus given in parentheses)	
Nanai (Tungusic)	Avrorin (1968)
Ulcha (Tungusic)	Sunik (1968)
Chuvash (Turkic)	Clark (1998)
Turkish (Turkic)	Göksel and Kerslake (2005)
Uzbek (Turkic)	Boeschoten (1998)
Buryat (Mongolic)	Skribnik (2003)
Dagur (Mongolic)	Tsumagari (2003)
Kalmuck (Mongolic)	Bläsing (2003)
Khalkha (Mongolic)	Svantesson (2003)
Ordos (Mongolic)	Georg (2003)

Arawakan	
Yanesha (Arawakan)	Duff-Tripp (1997)

Austronesian	
Iaai (Oceanic)	Lynch (2002a)
Jabêm (Oceanic)	Ross (2002b)
Kaulong (Oceanic)	Ross (2002c)
Longgu (Oceanic)	Hill (2002)
Mwotlap (Oceanic)	Crowley (2002a)
Niuafoʻou (Oceanic)	Early (2002)
Raga (Oceanic)	Crowley (2002b)
Sye (Oceanic)	Crowley (2002c)
Tobati (Oceanic)	Donohue (2002)
Xârâcùù (Oceanic)	Lynch (2002b)
ʻAlaʻala (Oceanic)	Ross (2002a)

Cholon	
Cholon (Cholon)	Adelaar (2004)

Chukotko-Kamchatkan	
Itelmen (Southern Chukotko-Kamchatkan)	Volodin and Žukova (1968)
Chukchi (Northern Chukotko-Kamchatkan)	Skorik (1968)

Dravidian	
Telugu (South-Central Dravidian)	Krishnamurti (1998)
Gonḍi (South-Central Dravidian)	Steever (1998)

Jivaroan	
Jivaroan (Jivaroan)	Juank (1982)

Indo-European	
Breton (Celtic)	Ternes (1992)
Scottish Gaelic (Celtic)	MacAulay (1992)

Mayan	
Yukatek Maya (Mayan)	Bohnemeyer and Stolz (2006)

Nakh-Dagestanian	
Akhvakh (Avar-Andic-Tsezic)	Magomedbekova (1967a)
Avar (Avar-Andic-Tsezic)	Charachidzé (1981)
Bagvalal (Avar-Andic-Tsezic)	Gudava (1967a)
Bezhta (Avar-Andic-Tsezic)	Bokarev and Madieva (1967)
Botlikh (Avar-Andic-Tsezic)	Gudava (1967b)
Chamalal (Avar-Andic-Tsezic)	Magomedbekova (1967b)
Godoberi (Avar-Andic-Tsezic)	Gudava (1967c)
Hinukh (Avar-Andic-Tsezic)	Bokarev (1967a)
Hunzib (Avar-Andic-Tsezic)	Bokarev (1967b)
Karata (Avar-Andic-Tsezic)	Magomedbekova (1971)
Khvarshi (Avar-Andic-Tsezic)	Bokarev (1967c)
Tindi (Avar-Andic-Tsezic)	Gudava (1967d)
Tsez (Avar-Andic-Tsezic)	Comrie and Polinsky (1998)
Icari Dargwa (Lak-Dargwa)	Sumbatova and Mulatov (2003)
Lak (Lak-Dargwa)	Zhirkov (1955)
Archi (Lezgic)	Haidakov (1967)
Khinalug (Lezgic)	Desheriev (1967)
Lezgian (Lezgic)	Haspelmath (1993)
Rutul (Lezgic)	Djeitanishvili (1967)
Tabasaran (Lezgic)	Magometov (1965)
Udin (Lezgic)	Panchvidze and Djeirashvili (1967)

Niger-Congo	
Zulu (Bantu)	Taylor (1996)
Wan (Mande)	Nikitina (2009)

Nivkh	
Nivkh (Nivkh)	Gruzdeva (1998)

Quechuan	
Quechua (Quechuan)	Cole (1985), Jake (1985)

Sino-Tibetan	
Garo (Baric)	Burling (2003)
Chantyal (Bodic)	Noonan (2003a)
Kham (Bodic)	Watters (2002)
Nar-Phu (Bodic)	Noonan (2003b)
Classical Tibetan (Bodic)	Beyer (1992)
Tshangla (Bodic)	Andvik (2003)
Cogtse-Gyarong (rGyalrong)	Nagano (2003)
Hakha Lai (Kuki-Chin)	Peterson (2003)
Akha (Lolo-Burmese)	Hanssson (2003)
Burmese (Lolo-Burmese)	Wheatley (2003)
Lahu (Lolo-Burmese)	Matisoff (1973)
Qiang (Qiangic)	LaPolla (2003)

Uralic	
Estonian (Finnic)	Viitso (1998)
Finnish (Finnic)	Sulkala and Karjalainen (1992)
Mari (Finnic)	Kangasmaa-Minn (1998)
Mordva (Finnic)	Zaicz (1998)
Permyak (Finnic)	Lytkin (1962), Riese (1998)
Komi (Finnic)	Hausenberg (1998)
Veps (Finnic)	Zajtseva (1981), Tikka (1992)
Khanty (Ugric)	Abondolo (1998)
Mansi (Ugric)	Keresztes (1998)
Nenets (Samoyedic)	Salminen (1998)

Uru-Chipaya	
Uru (Uru-Chipaya)	Vellard (1967)

Isolates	
Basque	Hualde and de Urbina (2003)
	Ibarretxe-Antuñano (2004)
Mapudungun	Adelaar (2004)
	Wälchli and Zuñiga (2006)

Bibliography

Abels, Klaus and Peter Kinyua Muriungi. 2008. The focus marker in Kĩĩtharaka: Syntax and semantics. *Lingua* 118 5: 687–731.

Abondolo, Daniel. 1998. Khanty. In *The Uralic Languages*, edited by Daniel Abondolo, Routledge Language Family Descriptions, pp. 358–386. Routledge, London and New York.

Ackema, Peter and Ad Neeleman. 2007. Morphology ≠ syntax. In *The Oxford Handbook of Linguistic Interfaces*, edited by Gillian Ramchand and Charles Reiss. Oxford University Press, Oxford.

Adelaar, Willem F. H. with the collaboration of Pieter C. Muysken. 2004. *The Languages of the Andes*. Cambridge Language Surveys. Cambridge University Press, Cambridge.

Adger, David. 2003. *Core Syntax: A Minimalist Approach*. Oxford University Press, Oxford.

Andersen, Torben. 2002. Case inflection and nominal head marking in Dinka. *Journal of African Languages and Linguistics* 23 1: 1–30.

Andrews, Avery. 1985. The major functions of the noun phrase. In *Language Typology and Syntactic Description*, edited by Timothy Shopen, vol. 1, pp. 62–154. Cambridge University Press, Cambridge.

Andrews, Avery. 1990. Unification and morphological blocking. *Natural Language & Linguistic Theory* 8 4: 507–557.

Andvik, Erik. 2003. Tshangla. In *The Sino-Tibetan Languages*, edited by Graham Thurgood and Randy J. LaPolla, pp. 439–455. Routledge, London and New York.

Arsenjević, Boban. 2006. *Inner Aspect and Telicity: The Decompositional Nature of Eventualities at the Syntax-Semantics Interface*. Ph.D. thesis, Leiden University.

Asbury, Anna. 2008. *The Morphosyntax of Case and Adpositions*. Ph.D. thesis, Utrecht University, Utrecht.

Asbury, Anna, Jakub Dotlačil, Berit Gehrke, and Rick Nouwen (eds.). 2008. *Syntax and Semantics of Spatial P*. No. 120 in Linguistik Aktuell. John Benjamins, Amsterdam and Philadelphia.

Asbury, Anna, Berit Gehrke, and Veronika Hegedűs. 2007. One size fits all: Prefixes, particles, adpositions and cases as members of the category P. In *UiL OTS Yearbook 2006*, edited by Cem Keskin, pp. 1–17.

Assadollahi, Ramin, Wilhelm Geuder, and Matthias Weisgerber. 2006. 'Convergent' vs. 'divergent' verbs and the asymmetry between source and goal. Paper presented at *Sinn und Bedeutung 11* in Barcelona, September 2006.

van der Auwera, Johan (ed.). 2010. *Linguistics: Special Issue on Spatial Case*, vol. 48. Mouton de Gruyter, Berlin/New York.

Avrorin, V. A. 1968. *Нанайский язык* [The Nanai language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 5, pp. 129–148. Наука [Nauka], Moscow.

Baerman, Matthew, Dunstan Brown, and Greville G. Corbett. 2005. *The Syntax-Morphology Interface: A Study of Syncretism*, vol. 109 of *Cambridge Studies in Linguistics*. Cambridge University Press, Cambridge.

Baker, Mark. 1985. The Mirror Principle and morphosyntactic explanation. *Linguistic Inquiry* 16 3: 373–415.

Bašić, Monika. 2007. Serbian Ps with and without *iz* and the Superset Principle. In *Tromsø Working Papers on Language and Linguistics: Nordlyd 34.2,* Special issue on Space, Motion, and Result, edited by Monika Bašić, Marina Pantcheva, Minjeong Son, and Peter Svenonius, pp. 300–319. University of Tromsø, Tromsø. CASTL, Tromsø. Available at http://www.ub.uit.no/baser/nordlyd/.

Beavers, John, Beth Levin, and Shiao Wie Tham. 2010. The typology of motion expressions revisited. *Journal of Linguistics* 46: 331–377.

Bennet, David C. 1975. *Spatial and temporal uses of English prepositions: An essay in stratificational semantics*, vol. 17 of *Longman Linguistic Library*. Longman, London.

Beyer, Stephan V. 1992. *The Classical Tibetan Language*. SUNY Series in Buddhist Studies. State University of New York Press.

Blake, Barry J. 1977. *Case Marking in Australian Languages*. No. 23 in Linguistic Series. Australian Institute of Aboriginal Studies, Canberra.

Blake, Barry J. 1994. *Case*. Cambridge University Press, Cambridge, second edn.

Blansitt, Edward L. 1988. Datives and allatives. In *Studies in Syntactic Typology*, edited by Michael Hammond, Edith Moravcsik, and Jessika R. Wirth, vol. 17 of *Studies in Languages*, pp. 173–191. John Benjamins, Amsterdam/Philadelphia.

Bläsing, Uwe. 2003. Kalmuck. In *The Mongolic Languages*, edited by

Juha Janhunen, Routledge Language Family Series, pp. 229–247. Routledge, London and New York.

Bobaljik, Jonathan. 2000. The ins and outs of contextual allomorphy. In *University of Maryland Working Papers in Linguistics*, edited by Kleanthes K. Grohmann and Caro Struijke, vol. 10, pp. 35–71.

Bobaljik, Jonathan. 2007. On comparative suppletion. Ms., University of Connecticut.

Boeschoten, Hendrik. 1998. Uzbek. In *The Turkic Languages*, edited by Lars Johanson and Éva Ágnes Csató, Routledge Language Family Descriptions, pp. 357–378. Routledge, London and New York.

Bohnemeyer, Jürgen. in prep. When going means becoming gone: Framing motion as state change in Yukatek. Available at http://www.acsu.buffalo.edu/∼jb77/CoL_model_chapter_yuk.pdf.

Bohnemeyer, Jürgen and Gabriela Pérez Báez. 2008. Object to path in Mesoamerica: Semantic composition of locative and motion descriptions in Yucatec Maya and Juchitán Zapotec. In *Memoria del IX Encuentro Internacional De Lingüística En El Noroeste*, vol. 2, pp. 269–284. Editorial UniSon, Hermosillo, Sonora, Mexico.

Bohnemeyer, Jürgen and Christel Stolz. 2006. Spatial reference in Yukatek Maya: A survey. In *Grammars of Space*, edited by Stephen C. Levinson and David P. Wilkins, pp. 273–310. Cambridge University Press, Cambridge.

Bokarev, Evgenij A. 1967a. *Гинухский язык* [The Hinukh language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 436–454. Наука [Nauka], Moscow.

Bokarev, Evgenij A. 1967b. *Гунзибский язык* [The Hunzib language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 472–487. Наука [Nauka], Moscow.

Bokarev, Evgenij A. 1967c. *Хваршинский язык* [The Khvarshi language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 421–435. Наука [Nauka], Moscow.

Bokarev, Evgenij A. 1967d. *Цезкий язык* [The Tzes language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 337–349. Наука [Nauka], Moscow.

Bokarev, Evgenij A. and I. G. Madieva. 1967. *Бежитинский язык* [The Bezhta language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 455–471.

Наука [Nauka], Moscow.

Borer, Hagit. 2005a. *In Name Only (Structuring Sense, vol. I)*. Oxford University Press, New York.

Borer, Hagit. 2005b. *The Normal Course of Events (Structuring Sense, vol. II)*. Oxford University Press, New York.

Bošković, Željko. 2005. On the locality of left branch extraction and the structure of NP. *Studia Linguistica* 59 1: 1–45.

Broschart, Jürgen and Carmen Dawuda. 1999. Beyond nouns and verbs: A typological study in lexical categorization. *Arbeiten des Sonderforschungsbereichs 282 "Theorie des Lexikons"* 113.

Buck, Rosemary A. 1997. Words that are their opposites: Noun to verb conversion in English. *Word* 48 1: 1–14.

Burling, Robbins. 2003. Garo. In *The Sino-Tibetan Languages*, edited by Graham Thurgood and Randy J. LaPolla, pp. 387–400. Routledge, London and New York.

Bye, Patrik and Peter Svenonius. 2011. Non-concatenative morphology as epiphenomenon. To appear in *The Morphology and Phonology of Exponence*, edited by Jochen Trommer, available at http://ling.auf.net/lingBuzz/001099.

Caha, Pavel. 2008. The case hierarchy as functional sequence. In *Scales*, edited by Marc Richards and Andrej L. Malchukov, no. 86 in Linguistische Arbeits Berichte, pp. 247–276. University of Leipzig, Leipzig.

Caha, Pavel. 2009a. Classical Armenian declension. In *Nordlyd 36.1: Special issue on Nanosyntax*, edited by Peter Svenonius, Gillian Ramchand, Michal Starke, and Knut Tarald Taraldsen, pp. 77–112. University of Tromsø, Tromsø. Available at www.ub.uit.no/munin/nordlyd/.

Caha, Pavel. 2009b. *The Nanosyntax of Case*. Ph.D. thesis, University of Tromsø.

Caha, Pavel. 2010a. The German locative-directional alternation: A peeling account. *Journal of Comparative Germanic Linguistics* 13 3: 179–223.

Caha, Pavel. 2010b. The parameters of case marking and spell-out driven movement. In *Linguistic Variation Yearbook 2010*, edited by Jeroen Van Craenenbroeck. John Benjamins.

Charachidzé, Georges. 1981. *Grammaire de la langue Avar*, vol. 38 of *Documents de linguistique quantitative*. Éditions Jean-Favard, Paris.

Chen, Lian and Jiansheng Guo. 2009. Motion events in chinese novels: Evidence for an equipollently-framed language. *Journal of Pragmatics* 41 9: 1749–1766.

Chomsky, Noam. 1986. *Barriers*. MIT Press, Cambridge, Massachusetts.

Chomsky, Noam. 1993. A minimalist program for linguistic theory. In *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, edited by Kenneth Hale and Samuel Jay Keyser, pp. 1–52. MIT Press, Cambridge, Massachusetts.

Chomsky, Noam. 1995. *The Minimalist Program*. Current Studies in Linguistics, Cambridge, Massachusetts (CSLing); 28. MIT Press, Cambridge, Massachusetts.

Chomsky, Noam. 1998. Minimalist inquiries: The framework. *MIT Occasional Papers in Linguistics* 15: 1–56.

Chomsky, Noam. 2001. Derivation by phase. In *Ken Hale: A Life in Language*, edited by Michael Kenstowicz, pp. 1–52. MIT Press, Cambridge, Massachusetts.

Chung, Inkie. 2007. Suppletive negation in Korean and Distributed Morphology. *Lingua* 117 1: 95–148.

Cinque, Guglielmo. 1999. *Adverbs and Functional Heads: A Cross-Linguistic Perspective*. Oxford University Press, New York.

Cinque, Guglielmo. 2005. Deriving Greenberg's Universal 20 and its exceptions. *Linguistic Inquiry* 36 3: 315–332.

Cinque, Guglielmo. 2009. The fundamental left-right asymmetry of natural languages. In *Universals of Language Today*, edited by Sergio Scalise, Elisabetta Magni, and Antonietta Bisetto, vol. 76 of *Studies in Natural Language and Linguistic Theory*, pp. 165–184. Springer Netherlands.

Cinque, Guglielmo and Luigi Rizzi. 2008. The cartography of syntactic structures. In *STiL (Studies in Linguistics). CISCL working papers on language and cognition*, edited by Vincenzo Moscati, vol. 2, pp. 43–59. University of Siena, Siena.

Cinque, Guglielmo and Luigi Rizzi (eds.). 2010. *The Cartography of Syntactic Structure, vol. 6*. Oxford University Press, Oxford.

Clark, Larry. 1998. Chuvash. In *The Turkic Languages*, edited by Lars Johanson and Éva Ágnes Csató, Routledge Language Family Descriptions, pp. 434–452. Routledge, London and New York.

Cole, Peter. 1985. *Imbabura Quechua*. Croom Helm, London.

Collins, Chris. 1997. *Local economy*. No. 29 in Linguistic Inquiry Monographs. MIT Press, Cambridge, Massachusetts.

Comrie, Bernard. 1999. Spatial cases in Daghestanian languages. *Sprachtypologie und Universalienforschung* 52 2: 108–117.

Comrie, Bernard and Maria Polinsky. 1998. The great Daghestanian case hoax. In *Case, Typology and Grammar: In honor of Barry J. Blake*, edited by Anna Siewierska and Jae Jung Song, pp. 95–114.

John Benjamins, Amsterdam.

Corver, Norbert. 1990. *The Syntax of Left Branch Extractions*. Ph.D. thesis, University of Tilburg.

Creissels, Denis. 2006. Encoding the distinction between location, source and destination: a typological study. In *Space in Languages*, edited by Maya Hickmann and Stéphane Robert, Typological Studies in Language, Vol. 66, pp. 19–28. John Benjamins, Amsterdam/Philadelphia.

Creissels, Denis. 2008. Spatial cases. In *The Oxford Handbook of Case*, edited by Andrej Malchukov and Andrew Spencer, pp. 609–625. Oxford University Press, New York.

Crowley, Terry. 2002a. Mwotlap. In *The Oceanic Languages*, edited by John Lynch, Malcolm Ross, and Terry Crowley, Curzon Language Family Series, pp. 587–598. Curzon, Richmond, Surrey.

Crowley, Terry. 2002b. Raga. In *The Oceanic Languages*, edited by John Lynch, Malcolm Ross, and Terry Crowley, Curzon Language Family Series, pp. 626–637. Curzon, Richmond, Surrey.

Crowley, Terry. 2002c. Sye. In *The Oceanic Languages*, edited by John Lynch, Malcolm Ross, and Terry Crowley, Curzon Language Family Series, pp. 694–722. Curzon, Richmond, Surrey.

Csúcs, Sándor. 1998. Udmurt. In *The Uralic Languages*, edited by Daniel Abondolo, Routledge Language Family Descriptions, pp. 276–304. Routledge, London and New York.

Declerck, Renaat. 1979. Aspect and the bounded/unbounded (telic/atelic) distinction. *Linguistics* 17 9/10: 761–794.

DeLancey, Scott. 2003. Classical Tibetan. In *The Sino-Tibetan Languages*, edited by Graham Thurgood and Randy J. LaPolla, pp. 255–269. Routledge, London and New York.

Depraetere, Ilse. 1995. (Un)boundedness and (a)telicity. *Linguistics and Philosophy* 18 2: 1–19.

Desheriev, Yu. D. 1967. *Шиналугский язык* [The Khinalug language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 659–675. Наука [Nauka], Moscow.

Den Dikken, Marcel. 2010. On the functional structure of locative and directional PPs. In *The Cartography of Syntactic Structure, vol. 6*, edited by Guglielmo Cinque and Luigi Rizzi, pp. 74–126. Oxford University Press, New York.

Dirr, A. 1905. *Грамматический очерк табасаранского языка [A Grammar Sketch of Tabasaran]*. SMOMPK, Tiflis.

Djeitanishvili, E. F. 1967. *Рутульский язык* [The Rutul language]. In

Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 580–590. Наука [Nauka], Moscow.

Donohue, Mark. 2002. Tobati. In *The Oceanic Languages*, edited by John Lynch, Malcolm Ross, and Terry Crowley, Curzon Language Family Series, pp. 186–203. Curzon, Richmond, Surrey.

Dowty, David R. 1979. *Word Meaning and Montague Grammar: The Semantics of Verbs and Times in Generative Semantics and in Montague's PTQ*. Reidel, Dordrecht.

Duff-Tripp, Martha. 1997. *Gramática del idioma Yanesha'*, vol. 47 of *Serie Lingüística Peruana*. Instituto Lingüístico de Verano, Lima.

Early, Robert. 2002. Niuafo'ou. In *The Oceanic Languages*, edited by John Lynch, Malcolm Ross, and Terry Crowley, Curzon Language Family Series, pp. 848–864. Curzon, Richmond, Surrey.

Emonds, Joseph E. 1994. Two principles of economy. In *Paths towards Universal Grammar: Studies in Honor of Richard S. Kayne*, edited by Luigi Rizzi Guglielmo Cinque, Jean-Yves Pollock and Raffaella Zanuttini, pp. 155–172. Georgetown University Press.

Evans, Nicholas. 1995. *A Grammar of Kayardild*. Mouton de Gruyter, Berlin.

Fábregas, Antonio. 2007. The Exhaustive Lexicalization Principle. In *Tromsø Working Papers on Language and Linguistics: Nordlyd 34.2,* Special issue on Space, Motion, and Result, edited by Monika Bašić, Marina Pantcheva, Minjeong Son, and Peter Svenonius, pp. 165–199. University of Tromsø, Tromsø. CASTL, Tromsø. Available at http://www.ub.uit.no/baser/nordlyd/.

Fábregas, Antonio. 2009. An argument for phrasal spell-out: Indefinites and interrogatives in Spanish. In *Nordlyd 36.1: Special issue on Nanosyntax*, edited by Peter Svenonius, Gillian Ramchand, Michal Starke, and Knut Tarald Taraldsen, pp. 129–168. University of Tromsø, Tromsø. Available at www.ub.uit.no/munin/nordlyd/.

Feist, Michele I. 2000. *On In and On: An Investigation into the Linguistic Encoding of Spatial Scenes*. Ph.D. thesis, Northwestern University, Evanston, Illinois.

Feiz, Parastou. 2007. *The Expression and Conceptualization of Motion Through Space and Manner of Motion in Persian and English: A Comparative Analysis*. Ph.D. thesis, The Pennsylvania State University.

Fong, Vivianne. 1997. *The Order of Things. What Syntactic Locatives Denote*. Ph.D. thesis, Stanford University.

Gawron, Jean Mark. 2006. Generalized paths. In *Proceedings of the 15th*

Conference on Semantics and Linguistic Theory (SALT-XV), Ithaca, New York. Cornell University, Department of Linguistics. CLC Publications.

Gehrke, Berit. 2008. *Ps in motion: On the Semantics and Syntax of P Elements and Motion Events*. Ph.D. thesis, Utrecht University, Utrecht.

Georg, Stefan. 2003. Ordos. In *The Mongolic Languages*, edited by Juha Janhunen, Routledge Language Family Series, pp. 193–209. Routledge, London and New York.

Göksel, Aslı and Cecilia Kerslake. 2005. *Turkish: A Comprehensive Grammar*. Routeledge, London and New York.

Grimshaw, Jane. 1991. Extended projections. Ms. Brandeis University.

Gruzdeva, Ekaterina. 1998. *Nivkh*, vol. 111 of *Languages of the World*. Lincom Europa, Munich.

Gudava, T.E. 1967a. *Багвалинский язык* [The Bagvalal language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 351–367. Наука [Nauka], Moscow.

Gudava, T.E. 1967b. *Ботлишский язык* [The Botlikh language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 293–306. Наука [Nauka], Moscow.

Gudava, T.E. 1967c. *Годоберинкий язык* [The Godoberi language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 307–321. Наука [Nauka], Moscow.

Gudava, T.E. 1967d. *Тиндинский язык* [The Tindi language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 368–383ß. Наука [Nauka], Moscow.

Haidakov, S. M. 1967. *Арчинский язык* [The Archi language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 608–626. Наука [Nauka], Moscow.

Haiman, John. 1980. *Hua: A Papuan Language of the Eastern Highlands of New Guinea*. No. 5 in Studies in Language Companion Series. John Benjamins.

Hajek, John. 2006. Serial verbs in Tetun Dili. In *Serial Verbs Constructions: A Cross-Linguistic Typology*, edited by Alexandra Y. Aikhenvald and Robert M. W. Dixon, Explorations in Linguistic Typology, pp. 239–253. Oxford University Press, Oxford.

Halle, Morris. 1997. Impoverishment and fission. In *Papers at the Interface*, edited by Benjamin Bruening, Yoonjung Kang, and Martha

McGinnis, no. 30 in MITWPL, pp. 425–449. MIT, Cambridge, MA.

Halle, Morris and Alec Marantz. 1993. Distributed Morphology and the pieces of inflection. In *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, edited by Kenneth Hale and Samuel Jay Keyser, pp. 111–176. MIT Press, Cambridge, Massachusetts.

Halle, Morris and Alec Marantz. 1994. Some key features of Distributed Morphology. In *MIT Working Papers in Linguistics*, edited by Andrew Carnie and Heidi Harley (with Tony Bures), vol. 21, pp. 275–288. MIT Press, Cambridge, Massachusetts.

Hanmagomedov, B. G.-K. 1967. *Табасаранский язык* [The Tabasaran language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 545–561. Наука [Nauka], Moscow.

Hansson, Gunnar Oláfur. 2007. Productive syncretisms in Saami inflectional morphology. In *Saami Linguistics*, edited by Ida Toivonen and Diane Carlita Nelson, pp. 91–135. John Benjamins, Amsterdam and Philadelphia.

Hanssson, Inga-Lill. 2003. Akha. In *The Sino-Tibetan Languages*, edited by Graham Thurgood and Randy J. LaPolla, pp. 236–2251. Routledge, London and New York.

Harley, Heidi and Rolf Noyer. 1999. State-of-the-article: Distributed morphology. *GLOT International* 4 4: 3–9.

Haspelmath, Martin. 1993. *A Grammar of Lezgian.* No. 9 in Mouton Grammar Library. Mouton de Gruyter, Berlin.

Hausenberg, Anu-Reet. 1998. Komi. In *The Uralic Languages*, edited by Daniel Abondolo, Routledge Language Family Descriptions, pp. 305–326. Routledge, London and New York.

Herskovits, Annette. 1986. *Language and Spatial Cognition: An Interdisciplinary Study of the Prepositions in English.* Cambridge University Press, London and New York.

Herweg, Michael and Dieter Wunderlich. 1991. Lokale und Direktionale. In *Semantik*, edited by Arnim von Stechow and Dieter Wunderlich, pp. 758–785. Walter de Gruyter, Berlin/New York.

Hewitt, George B. 1995. *Georgian: A Structural Reference Grammar*. John Benjamins, Amsterdam.

Hill, Deborah. 2002. Longgu. In *The Oceanic Languages*, edited by John Lynch, Malcolm Ross, and Terry Crowley, Curzon Language Family Series, pp. 538–561. Curzon, Richmond, Surrey.

Hualde, José Ignacio and Jon Ortiz de Urbina (eds.). 2003. *A Grammar* *of Basque*. Mouton de Gruyter, Berlin/New York.

Hutchison, John P. 1981. *The Kanuri Language: A Reference Grammar*. African studies program, University of Wisconsin, Madison.

Ibarretxe-Antuñano, Iraide. 2004. Polysemy in Basque locational cases. *Belgian Journal of Linguistics* 18 1: 271–298.

Ikegami, Yoshihiko. 1982. Source vs. goal: A case of linguistic dissymmetry. In *Language and Cognitive Styles*, edited by Richard Hoops and Yvan Lebrun, no. 11 in Neurolinguistics, pp. 292–308. Swets and Zeitlinger B.V., Lisse, The Netherlands.

Jackendoff, Ray. 1983. *Semantics and Cognition*. MIT Press, Cambridge, Massachusetts.

Jake, Janice L. 1985. *Grammatical relationships in Imbabura Quechua*. Garland, New York.

Janhunen, Juha (ed.). 2003. *The Mongolic Languages*. Routledge Language Family Series. Routledge, London and New York.

Juank, Aijíu. 1982. *Ajumatsatai yatsuchi: Manual de aprendizaje de la lengua shuar*, vol. 1. Mundo Shuar, Ecuador.

Kangasmaa-Minn, Eeva. 1998. Mari. In *The Uralic Languages*, edited by Daniel Abondolo, Routledge Language Family Descriptions, pp. 219–248. Routledge, London and New York.

Karlsson, Fred. 1999. *Finnish: An Essential Grammar*. Routledge, London and New york.

Kayne, Richard S. 1994. *The Antisymmetry of Syntax*. MIT Press, Cambridge, Massachusetts.

Kayne, Richard S. 2004. Here and there. In *Lexique, Syntaxe et Lexique-Grammaire/Syntax, Lexis & Lexicon-Grammar: Papers in Honor of Maurice Gross*, edited by C. Leclère, E. Laporte, M. Piot, and M. Silberztein, pp. 253–275. John Benjamins, Amsterdam.

Kayne, Richard S. 2005. Some notes on comparative syntax, with special reference to English and French. In *The Oxford Handbook of Comparative Syntax*, edited by Richard S. Kayne and Guglielmo Cinque, pp. 3–69. Oxford University Press, New York.

Kayne, Richard S. 2008. Comparative syntax and the lexicon. DIUG lecture, University of Groningen, December 9/10, 2008. Available at *http://www.let.rug.nl/zwart/diug/docs/kaynediug.pdf.*

Keresztes, László. 1998. Mansi. In *The Uralic Languages*, edited by Daniel Abondolo, Routledge Language Family Descriptions, pp. 387–427. Routledge, London and New York.

Kibrik, Aleksandr E. 2002. Nominal inflection galore: Daghestanian, with side glances at Europe and the world. In *Noun Phrase Structure in the*

Languages of Europe, edited by Frans Plank, pp. 37–112. Mouton de Gryuter, Berlin.

Kiparsky, Paul. 1973. 'Elsewhere' in phonology. In *A Festschrift for Morris Halle*, edited by Paul Kiparsky and Steven Anderson, pp. 93–106. Holt, Rinehart and Winston, New York.

Kiparsky, Paul. 2005. Blocking and periphrasis in inflectional paradigms. In *Yearbook of Morphology 2004*, edited by Geert E. Booij and Jaap van Marie, pp. 113–135. Springer, Dordrecht.

Koopman, Hilda. 2000. Prepositions, postpositions, circumpositions, and particles. In *The Syntax of Specifiers and Heads*, edited by Hilda Koopman, pp. 204–260. Routledge, London.

Kracht, Marcus. 2001. The structure of local cases and its relevance for the study of Uralic languages. In *Proceedings of the IX. Congress of Fenno-Ugrists*. Tartu.

Kracht, Marcus. 2002. On the semantics of locatives. *Linguistics and Philosophy* 25: 157–232.

Kracht, Marcus. 2007. Language and space. Ms. UCLA.

Kracht, Marcus. 2008. The fine structure of spatial expressions. In *Syntax and Semantics of Spatial P*, edited by Anna Asbury, Jakub Dotlačil, Berit Gehrke, and Rick Nouwen, no. 120 in Linguistik Aktuell, pp. 35–62. John Benjamins, Amsterdam and Philadelphia.

Krifka, Manfred. 1998. The origins of telicity. In *Events and Grammar*, edited by Susan Rothstein, pp. 197–235. Kluwer, Dordrecht.

Krishnamurti, Bhadriraju. 1998. Telugu. In *The Dravidian Languages*, edited by Sanford B. Steever, Routledge Language Family Descriptions, pp. 203–240. Routledge, London and New York.

Kurbanov, K. K. 1990. Способы выражения пространственных отношений в табасаранском языке [The ways of expressing spatial relations in Tabasaran]. In *Выражение пространственных отношений в языках Дагестана [The Expression of Spatial Relations in the Daghestanian Languages]*, edited by E. V. Spivak, pp. 113–122. АН СССР [Academy of Science USSR], Махачкала [Mahachkala].

Kutscher, Silvia. 2001. *Nomen und nominalen Syntagma im Lasischen: Eine deskriptive Analyse des Dialekts von Ardeşen*. Lincom Europa, Munich.

Kutscher, Silvia. 2010. When 'towards' means 'away from': The case of directional-ablative syncretism in the Ardesen-variety of Laz (South-Caucasian). *Sprachtypologie und Universalienforschung* 63 2: 252–271.

Lakoff, George. 1987. *Women, fire, and dangerous things: what categories reveal about the mind*. University of Chicago Press, Chicago, Ill.

Lakusta, Laura. 2005. *Source and Goal Asymmetry in Non-linguistic Motion Event Representations*. Ph.D. thesis, Johns Hopkins University, Maryland.

Lakusta, Laura and Barbara Landau. 2005. Starting at the end: The importance of goals in spatial language. *Cognition* 96: 1–33.

Langacker, Ronald W. 1987. *Foundations of Cognitive Grammar*, vol. 1: Theoretical Prerequisites. Stanford University Press, Stanford.

LaPolla, Randy J. 2003. Qiang. In *The Sino-Tibetan Languages*, edited by Graham Thurgood and Randy J. LaPolla, pp. 573–587. Routledge, London and New York.

Lestrade, Sander. 2010. *The Space of Case*. Ph.D. thesis, Radboud University, Nijmegen.

Levin, Beth. 1993. *English Verb Classes and Alternations: A Preliminary Investigation*. University of Chicago Press, Chicago, Ill.

Levinson, Stephen and Sérgio Meira. 2003. 'Natural concepts' in the spatial topological domain — adpositional meanings in crosslinguistic perspective: an exercise in semantic typology. *Language* 79 3: 484–516.

Lieber, Rochelle. 1992. *Deconstructing Morphology: Word Formation in Syntactic Theory*. University of Chicago Press, Chicago.

Lundquist, Björn. 2008. *Nominalizations and Participles in Swedish*. Ph.D. thesis, University of Tromsø.

Lynch, David. 2002a. Iaai. In *The Oceanic Languages*, edited by John Lynch, Malcolm Ross, and Terry Crowley, Curzon Language Family Series, pp. 776–791. Curzon, Richmond, Surrey.

Lynch, David. 2002b. Xârâcùù. In *The Oceanic Languages*, edited by John Lynch, Malcolm Ross, and Terry Crowley, Curzon Language Family Series, pp. 765–775. Curzon, Richmond, Surrey.

Lytkin, V. I. (ed.). 1962. *Коми-Пермяцкий язык: введение, фонетика, лексика и морфология [The Komi-Permyak Language: Introduction, Phonetics, Lexis and Morphology]*. Komi-Permyackoe Knizhnoe Izdatel'stvo, Kudymkar.

MacAulay, Donald. 1992. The Scottish Gaelic language. In *The Celtic Languages*, edited by Donald Macaulay, Cambridge Languages Surveys, pp. 137–248. Cambridge University Press, Cambridge.

Magomedbekova, Zagidad. 1967a. *Ахвахский язык: грамматический анализ, тексты, словарь [The Akhvakh Language: Grammatical Analysis, Texts, Dictionary]*. Мецниереба [Mecniereba], Tbilisi.

Magomedbekova, Zagidad. 1967b. *Чамалинский язык* [The Chamalal language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 384–402. Наука

[Nauka], Moscow.

Magomedbekova, Zagidad. 1971. *Каратинский язык: граматицеский анализ, тексты, словарь [The Karata Language: Grammar Analysis, Texts, Glossary]*. Мецниереба [Mecniereba], Tbilisi.

Magometov, Aleksandr Arnarovich. 1965. *Табасаранский язык: исследование и тексты [The Tabasaran Language: Investigation and Texts]*. Мецниереба [Mecniereba], Tbilisi.

Mahootian, Shahrzad. 1997. *Persian*. Routledge, London.

Matisoff, James A. 1973. *The Grammar of Lahu*. University of California Press, Berkeley.

Matisoff, James A. 2003. Lahu. In *The Sino-Tibetan Languages*, edited by Graham Thurgood and Randy J. LaPolla, pp. 208–221. Routledge, London and New York.

May, Robert. 1985. *Logical form: its structure and derivation*. Linguistic inquiry monographs; 12. MIT Press, Cambridge, Massachusetts.

McCarthy, John and Alan Prince. 1995. Faithfulness and reduplicative identity. In *Papers in Optimality Theory*, edited by Jill Beckman, Laura Wals-Dickie, and Suzanne Urbanczyk, pp. 249–384. Amherst University, Massachusetts.

McCawley, James D. 1968. Lexical insertion in a transformational grammar without Deep Structure. In *Papers from the fourth regional meeting of the Chicago Linguistic Society*, edited by B. J Darden, C.-J. N. Bayley, and A. Davidson, pp. 71–80. University of Chicago, Chicago.

Mel'čuk, Igor' Aleksandrovič. 1994. *Cours de moprhologie générale*, vol. II: Significations morphologiques. Les presses de l'université de Montréal, Montreal.

Mulugeta, Seyoum. 2008. *A Grammar of Dime*. Ph.D. thesis, University of Utrecht.

Muriungi, Peter Kinyua. 2006. Categorizing Adpositions in Kîîtharaka. In *Tromsø Working Papers on Language and Linguistics: Nordlyd 33.1, special issue on Adpositions*, edited by Peter Svenonius, pp. 26–48. University of Tromsø, Tromsø.

Muriungi, Peter Kinyua. 2008. *Phrasal movement inside Bantu verbs: Deriving affix scope and order in Kîîtharaka*. Ph.D. thesis, University of Tromsø.

Muriungi, Peter Kinyua. 2009. The Union Spell-out Mechanism. In *Nordlyd 36.1: Special issue on Nanosyntax*, edited by Peter Svenonius, Gillian Ramchand, Michal Starke, and Knut Tarald Taraldsen, pp. 191–205. University of Tromsø, Tromsø. Available at www.ub.uit.no/munin/nordlyd/.

Murkelinskij, G.B. 1967. *Лакский язык* [The Lak language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 488–507. Наука [Nauka], Moscow.

Nagano, Yasuhiko. 2003. Cogtse Gyarong. In *The Sino-Tibetan Languages*, edited by Graham Thurgood and Randy J. LaPolla, pp. 469–489. Routledge, London and New York.

Nam, Seungho. 1995. *The Semantics of Locative Prepositional Phrases in English*. Ph.D. thesis, UCLA.

Narasimhan, Bhuvana. 2008. Motion events and the lexicon: A case study of Hindi. *Lingua* 113: 123–160.

Nebel, A. 1948. *Dinka Grammar (Rek-Malual dialect) with texts and vocabulary*. Instituto Missioni Africane, Verona.

Nedjalkov, Igor. 1997. *Evenki*. Routledge, London and New York.

Neeleman, Ad and Kriszta Szendrői. 2007. Radical pro-drop and the morphology of pronouns. *Linguistic Inquiry* 38 4: 671–714.

Nichols, Johanna. 1994. Ingush. In *North East Caucasian Languages, Part 2*, edited by Rieks Smeets, vol. 4 of *The Indigenous Languages of the Caucasus*. Caravan books, Delmar, New York.

Nikitina, Tatiana. 2009. Subcategorization pattern and lexical meaning of motion verbs: A study of the Source/Goal ambiguity. *Linguistics* 47 5: 1113–1141.

Noonan, Michael. 2003a. Motion events in Chantyal. In *Motion, Direction and Location in Languages*, edited by Erin Shay and Uwe Siebert, pp. 211–234. John Benjamins, Amsterdam/Philadelphia.

Noonan, Michael. 2003b. Nar-Phu. In *The Sino-Tibetan Languages*, edited by Graham Thurgood and Randy J. LaPolla, pp. 336–352. Routledge, London and New York.

Noonan, Michael. 2008. Patterns of development, patterns of syncretism of relational morphology in the Bodic languages. In *The Role of Semantics and Pragmatics in the Development of Case*, edited by Jóhanna Barðdal and Shobhana Cheliah, pp. 261–281. John Benjamins, Amsterdam.

Noonan, Michael and Elena Mihas. 2010. Areal dimensions in case syncretism: Ablatives and genitives. Unpublished manuscript, downloadable at https://pantherfile.uwm.edu/noonan/www/Ablatives%26Genitives.pdf.

Panchvidze, B. H. and E. F. Djeirashvili. 1967. *Удинский язык* [The Udin language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 4, pp. 676–687. Наука [Nauka], Moscow.

Pandharipande, Rajeshwari. 1997. *Marathi*. Routledge, London.

Pantcheva, Marina. 2006. Persian preposition classes. In *Tromsø Working Papers on Language and Linguistics: Nordlyd 33.1, special issue on Adpositions*, edited by Peter Svenonius, pp. 1–25. University of Tromsø, Tromsø.

Pantcheva, Marina. 2008. The Place of PLACE in Persian. In *Syntax and Semantics of Spatial P*, edited by Anna Asbury, Jakub Dotlačil, Berit Gehrke, and Rick Nouwen, no. 120 in Linguistik Aktuell, pp. 305–330. John Benjamins.

Pantcheva, Marina. 2010. The syntactic structure of Locations, Goals and Sources. *Linguistics* 48: 1043–1082.

Pashov, Petâr. 1999. *Българска граматика [A Grammar of Bulgarian]*. Hermes, Plovdiv.

Peterson, David A. 2003. Hakha Lai. In *The Sino-Tibetan Languages*, edited by Graham Thurgood and Randy J. LaPolla, pp. 409–426. Routledge, London and New York.

Piñón, Christopher J. 1993. Paths and their names. In *Papers from the 29th Regional Meeting of the Chicago Linguistic Society*, edited by Katharine Beals, Gina Cooke, David Kathman, Sotaro Kita, Karl-Erik McCullough, and David Testen, vol. 2, pp. 287–303. CLS, Chicago.

Poser, William J. 1992. Blocking of phrasal constructions by lexical items. In *Lexical Matters*, edited by Ivan A. Sag and Anna Szabolcsi, pp. 111–130. Center for Study of Language & Information, Stanford, CA.

Prince, Alan and Paul Smolensky. 2004. *Optimality Theory: Constraint Interaction in Generative Grammar*. Blackwell, Malden, Massachusetts.

Radkevich, Nina. 2009. Vocabulary insertion and the geometry of local cases. Available at http://ling.auf.net/lingBuzz/000958.

Radkevich, Nina. 2010. *On Location: The Structure of Case and Adpositions*. Ph.D. thesis, University of Connecticut.

Ramchand, Gillian. 2008a. Lexical items in complex predications: Selection as underassociation. In *Tromsø Working Papers on Language and Linguistics: Nordlyd 35.1, special issue on Complex Predication*, edited by Peter Svenonius and Inna Tolskaya, pp. 115–141. University of Tromsø, Tromsø.

Ramchand, Gillian. 2008b. *Verb Meaning and the Lexicon: A First Phase Syntax*. Cambridge University Press.

Ricca, Davide. 1993. *I verbi deittici di moviento in Europa: Una ricerca interlinguistica*. La Nuova Italia, Firenze.

Rice, Sally and Kaori Kabata. 2007. Crosslinguistic grammaticalization patterns of the ALLATIVE. *Linguistic Typology* 11: 451–514.

Richards, Norvin. 2001. *Movement in Language: Interactions and Architectures*. Oxford University Press, Oxford.

van Riemsdijk, Henk. 1990. Functional prepositions. In *Unity in Diversity*, edited by H. Pinkster and I. Genée, pp. 229–241. Foris, Dordrecht.

van Riemsdijk, Henk and Riny Huybregts. 2002. Location and locality. In *Progress in Grammar: Articles at the 20th Anniversary of the Comparison of Grammatical Models Group in Tilburg*, edited by Marc van Oostendorp and Elena Anagnostopoulou, pp. 1–23. Meertens Instituut, Amsterdam.

Riese, Timothy. 1998. Permian. In *The Uralic Languages*, edited by Daniel Abondolo, Routledge Language Family Descriptions, pp. 249–275. Routledge, London and New York.

Rizzi, Luigi. 1986. On chain formation in the syntax of pronominal clitics. In *Syntax and Semantics*, edited by Hagit Borer, vol. 19, pp. 65–96. Academic Press, New york.

Rizzi, Luigi. 1997. The fine structure of the left periphery. In *Elements of Grammar: Handbook in Generative Syntax*, edited by Liliane Haegeman, pp. 281–337. Kluwer, Dordrecht.

Romanova, Eugenia. 2007. *Constructing Perfectivity in Russian*. Ph.D. thesis, University of Tromsø.

Ross, Malcolm. 2002a. ‘Ala‘ala. In *The Oceanic Languages*, edited by John Lynch, Malcolm Ross, and Terry Crowley, Curzon Language Family Series, pp. 347–361. Curzon, Richmond, Surrey.

Ross, Malcolm. 2002b. Jabêm. In *The Oceanic Languages*, edited by John Lynch, Malcolm Ross, and Terry Crowley, Curzon Language Family Series, pp. 270–296. Curzon, Richmond, Surrey.

Ross, Malcolm. 2002c. Kaulong. In *The Oceanic Languages*, edited by John Lynch, Malcolm Ross, and Terry Crowley, Curzon Language Family Series, pp. 387–409. Curzon, Richmond, Surrey.

Rotstein, Carmen and Yoad Winter. 2004. Total adjectives vs. partial adjectives: Scale structure and higher-order modifiers. *Natural Language Semantics* 12: 259–288.

Salminen, Tapani. 1998. Nenets. In *The Uralic Languages*, edited by Daniel Abondolo, Routledge Language Family Descriptions, pp. 516–547. Routledge, London and New York.

Sammallahti, Pekka. 1998. *The Saami Languages: An Introduction*. Davvi Girji OS, Kárásjohka.

Schachter, Paul and Fe T. Otanes. 1972. *Tagalog Reference Grammar*.

University of California Press, Berkeley.

Siddiqi, Daniel. 2006. *Minimize Exponence: Economy Effects of the Morphosyntactic Component of the Grammar*. Ph.D. thesis, University of Arizona.

Skorik, P. J. 1968. *Чукотский язык* [The Chukchi language]. In *Языки народов СССР [The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 5, pp. 248–270. Наука [Nauka], Moscow.

Skribnik, Elena. 2003. Buryat. In *The Mongolic Languages*, edited by Juha Janhunen, Routledge Language Family Series, pp. 102–128. Routledge, London and New York.

Son, Minjeong and Peter Svenonius. 2008. Microparameters of cross-linguistic variation: Directed motion and resultatives. In *Proccedings of the 27th West Coast Conference on Formal Linguistics*, edited by Natasha Abner and Jason Bishop, pp. 388–396. Cascadilla, Somerville, Ma.

Spencer, Andrew. 1991. *Morphological Theory: An Introduction to Word Structure in Generative Grammar*. Blackwell, Oxford.

Spivak, E. V. (ed.). 1990. *Выражение пространственных отношений в языках Дагестана [The expression of spatial relations in the Daghestanian languages]*. АН СССР [Academy of Science USSR], Махачкала [Mahachkala].

Starke, Michal. 2005-2009. Nanosyntax. Class lectures, CASTL, University of Tromsø.

Starke, Michal. 2009. A short primer to a new approach to language. In *Nordlyd 36.1: Special issue on Nanosyntax*, edited by Peter Svenonius, Gillian Ramchand, Michal Starke, and Knut Tarald Taraldsen, pp. 1–6. University of Tromsø, Tromsø. Available at www.ub.uit.no/munin/nordlyd/.

Starke, Michal. 2011. Towards elegant parameters: Language variation reduces to the size of lexically stored trees. Transcipt from a talk at Barcelona Workshop on Linguistic Variation in the Minimalist Framework. Available at http://ling.auf.net/lingBuzz/001183.

Steever, Sanford B. 1998. Goṇḍi. In *The Dravidian Languages*, edited by Sanford B. Steever, Routledge Language Family Descriptions, pp. 270–297. Routledge, London and New York.

Stefanowitsch, Anatol and Ada Rohde. 2004. The goal bias in the encoding of motion events. In *Motivation in Grammar*, edited by Klaus-Uwe Panther and Günter Radden, pp. 249–268. Mouton de Gruyter, Berlin and New York.

Sulkala, Helena and Merja Karjalainen. 1992. *Finnish*. Routledge, London.

Sumbatova, Nina R. and Rasul O. Mulatov. 2003. *A Grammar of Icari Dargwa*. 92. Lincom Europa, Munich.

Sunik, O. P. 1968. *Ульский язык* [The Ulcha language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 5, pp. 149–171. Наука [Nauka], Moscow.

Svantesson, Jan-Olof. 2003. Khalkha. In *The Mongolic Languages*, edited by Juha Janhunen, Routledge Language Family Series, pp. 154–176. Routledge, London and New York.

Svenonius, Peter. 2004. Slavic prefixes inside and outside VP. In *Nordlyd 32.2: Special issue on Slavic prefixes*, edited by Peter Svenonius, pp. 205–253. University of Tromsø, Tromsø. Available at www.ub.uit.no/munin/nordlyd/.

Svenonius, Peter. 2006. The emergence of Axial Parts. In *Tromsø Working Papers on Language and Linguistics: Nordlyd 33.1, special issue on Adpositions*, edited by Peter Svenonius, pp. 49–77. University of Tromsø, Tromsø.

Svenonius, Peter. 2007. Scaling Right Along seminar. Class lecture, March 20, 2007, CASTL, University of Tromsø.

Svenonius, Peter. 2008. Projections of P. In *Syntax and Semantics of Spatial P*, edited by Anna Asbury, Jakub Dotlačil, Berit Gehrke, and Rick Nouwen, no. 120 in Linguistik Aktuell, pp. 63–84. John Benjamins, Amsterdam and Philadelphia.

Svenonius, Peter. 2009a. Location and Source in North Sámi. Talk given at Arctic Languages: Syntax, Morphology, and Lexicon, September 24-26, 2009, University of Tromsø, September.

Svenonius, Peter. 2009b. Space Seminar. Class lectures, CASTL, University of Tromsø.

Svenonius, Peter. 2010. Spatial prepositions in English. In *The Cartography of Syntactic Structure, vol. 6*, edited by Guglielmo Cinque and Luigi Rizzi, pp. 127–160. Oxford University Press, Oxford. Prepublication draft available at http://ling.auf.net/lingBuzz/000001.

Svenonius, Peter and Marina Pantcheva (eds.). 2006. *Tromsø Working Papers on Language and Linguistics: Nordlyd 33, special issue on Adpositions*. University of Tromsø, Tromsø.

Svenonius, Peter, Gillian Ramchand, Michal Starke, and Knut Tarald Taraldsen (eds.). 2009. *Nordlyd 36.1: Special issue on Nanosyntax*. University of Tromsø, Tromsø. Available at www.ub.uit.no/munin/nordlyd/.

Svenonius, Peter and Minjeong Son. 2009. Directed manner of motion in verb serialization: A comparative study of Indonesian/Malay and Tetun Dili. Talk presented at the International Symposium on Malay/Indonesian Linguistics XIII, held in Senggigi, Lombok, Indonesia, June 6-7.

Takamine, Kaori. 2006. The Axial Part Phrase in Japanese. In *Tromsø Working Papers on Language and Linguistics: Nordlyd 33.1, special issue on Adpositions*, edited by Peter Svenonius, pp. 78–97. University of Tromsø, Tromsø.

Talmy, Leonard. 2000. *Toward a Cognitive Semantics: Concept Structuring Systems*, vol. I. MIT Press, Cambridge, Massachusetts.

Taraldsen, Knut Tarald. 2010. The nanosyntax of Nguni noun class prefixes and concords. *Lingua* 120: 1522–1548.

Taylor, John R. 1996. The syntax and semantics of locativized nouns in Zulu. In *The Construal of Space in Language and Thought*, edited by Martin Pütz and René Dirven, pp. 287–305. Mouton de Gruyter, Berlin/New York.

Ternes, Elmar. 1992. The Breton language. In *The Celtic Languages*, edited by Donald Macaulay, Cambridge Language Surveys, pp. 371–452. Cambridge University Press, Cambridge.

Tikka, Toivo. 1992. *Vepsän suffiksoituneet postpositiot. Kieliopillisiin sijoihin liittyvä suffiksoituminen [Agglutinating postpositions in Veps. Suffixation to grammatical cases]*. No. 22 in Studia Uralica Upsaliensia. Uppsala Universitet, Uppsala.

Tomič, Olga Mišeska. 2006. *Balkan Sprachbund: Morpho-Syntactic Features*. Springer, Dordrecht.

Tsumagari, Toshiro. 2003. Dagur. In *The Mongolic Languages*, edited by Juha Janhunen, Routledge Language Family Series, pp. 129–153. Routledge, London and New York.

Uslar, P.K. 1889. *Аварскій языкъ [The Avar Language]*. Этнографія Кавказа [The ethnography of Caucasus]. TipografIja Kancel'arIi Glavnonachal'stvujushtago grazhdanskoju chastIju na Kavkaze, Tbilisi.

Vellard, Jahen A. 1967. *Contribución al estudo de la lengua Uru*. Universidad de Buenos Aires, Facultad de Filisofía y Letras, Buenos Aires.

Verkuyl, Henk J. 1972. *On the Compositional Nature of the Aspects*. Reidel, Dordrecht.

Viitso, Tiit-Rein. 1998. Estonian. In *The Uralic Languages*, edited by Daniel Abondolo, Routledge Language Family Descriptions, pp. 115–148. Routledge, London and New York.

Vinogradov, V.V. (ed.). 1967. Языки народов СССР *[The Languages* *of the Peoples of the USSR]*, vol. 4. Наука [Nauka], Moscow.

Vogt, Hans. 1971. *Grammaire de la langue géorgienne*. Universitetsforlaget, Oslo.

Volodin, Alexander. P. and A. N. Žukova. 1968. *Ительменский язык* [The Itelmen language]. In Языки народов СССР *[The Languages of the Peoples of the USSR]*, edited by V.V. Vinogradov, vol. 5, pp. 334–351. Наука [Nauka], Moscow.

Wälchli, Bernard and Fernando Zuñiga. 2006. Source-goal (in)difference and the typology of motion events in the clause. *Sprachtypologie und Universalienforschung* 59 3: 284–303.

Watters, E., David. 2002. *A Grammar of Kham*. Cambridge University Press, Cambridge.

Weerman, Fred and Jacqueline Evers-Vermeul. 2002. Pronouns and case. *Lingua* 112: 301–338.

Wheatley, Julian K. 2003. Burmese. In *The Sino-Tibetan Languages*, edited by Graham Thurgood and Randy J. LaPolla, pp. 195–207. Routledge, London and New York.

Williams, Edwin. 2003. *Representation Theory*. MIT Press, Cambridge,.

Winkler, Eberhard. 2001. *Udmurt*, vol. 212 of *Languages of the World*. Lincom Europa, Munich.

Winter, Yoad. 2006. Closure and telicity across categories. In *Proceedings of Semantic and Linguistic Theory XVI*, edited by Christopher Tancredi, Makoto Kanazawa, Ikumi Imani, and Kiyomi Kusumoto. CLC Publications, Fort Washington, PA.

Wunderlich, Dieter. 1991. How do prepositional phrases fit into compositional syntax and semantics? *Linguistics* 29: 591–621.

Yang, Charles. 1997. *Minimal Computation: Derivation of Syntactic Structures*. Master's thesis, MIT, Cambridge, Massachusetts.

Zaicz, Gábor. 1998. Mordva. In *The Uralic Languages*, edited by Daniel Abondolo, Routledge Language Family Descriptions, pp. 185–218. Routledge, London and New York.

Zajtseva, Maria. 1981. *Грамматика вепсского языка: фонетика и морфологиа [A Grammar of the Veps Language: Phonetics and Morphology]*. Наука [Nauka], Leningrad.

Zhirkov, L. I. 1955. *Лакский язык: фонетика и морфологиа [The Lak Language: Phonetics and Morphology]*. Издател'ство Академии Наук СССР [Publishing House of the SSSR Academy of Science], Moskow.

Zlatev, Jordan and Peerapat Yangklang. 2004. A third way to travel: The place of Thai in motion event typology. In *Relating Events in Narrative: Typological and contextual perspective*, edited by Sven Strömqvist and Ludo Verhoeven, vol. 2, pp. 159–190. Lawrence Erlbaum, Mahwah, New Jersey.

Zwart, C. Jan-Wouter. 1996. "Shortest Move" versus "Fewer Steps". In *Minimal Ideas. Syntactic Studies in the Minimalist Framework*, edited by W. Abraham, S.D. Epstein, H. Thráinsson, and C.J.W. Zwart, no. 12 in Linguistik Aktuell, pp. 305–327. John Benjamins, Amsterdam and Philadelphia.

Zwarts, Joost. 1997. Vectors as relative positions: A compositional semantics of modified PPs. *Journal of Semantics* 14: 57–86.

Zwarts, Joost. 2005. Prepositional aspect and the algebra of paths. *Linguistics and Philosophy* 28: 739–779.

Zwarts, Joost. 2008a. Aspect of a typology of direction. In *Theoretical and Crosslinguistic Approaches to the Semantics of Aspects*, edited by Susan Rothstein, pp. 79–106. John Benjamins, Amsterdam.

Zwarts, Joost. 2008b. Priorities in the production of prepositions. In *Syntax and Semantics of Spatial P*, edited by Anna Asbury, Jakub Dotlačil, Berit Gehrke, and Rick Nouwen, no. 120 in Linguistik Aktuell, pp. 85–102. John Benjamins, Amsterdam and Philadelphia.

Zwarts, Joost and Yoad Winter. 2000. Vector space semantics: A model-theoretic analysis of locative prepositions. *Journal of Logic, Language, and Information* 9: 169–211.