The Intonational Phonology of Stockholm Swedish

Sara Myrberg
Abstract


This thesis develops the phonological model for the Stockholm Swedish intonation system. Though previous research provides a general model of this system, many phonological aspects of it have remained understudied. The intonational options that are available to speakers of Stockholm Swedish are discussed, and it is argued that Stockholm Swedish provides evidence for complex branching of phonological domains.

Specifically, it is argued that so called focal accents, which are referred to as (H)LH-accents in the present work, have essentially two different functions. First, they signal information structural categories such as focus. Second, they signal left edges of Intonation Phrases (IP). It is also argued that a wide range of options exist in the post-nuclear area. Six types of contours for such areas are distinguished, plus one additional rising contour when there are no post-nuclear accents.

Based on these findings, I present an account of the branching options for the phonological categories in the Stockholm Swedish prosodic hierarchy. I argue that there is evidence for recursive phonological structures in Stockholm Swedish, i.e. that a mother node and a daughter node can belong to the same phonological category. Also, Stockholm Swedish provides evidence for a distinction between prosodic coordination (equal sister nodes) and prosodic adjunction (unequal sister nodes). Prosodic structure is mapped onto syntactic structure via a set of variably ranked Optimality Theoretic constraints. The relation between phonological and syntactic structure shows that the phonology prefers prosodic coordination (equal sisters) over adjunction (unequal sisters).

The material for the study comprises a corpus of approximately 420 read sentences, which were specifically designed to test various phonological hypotheses, and approximately 17 minutes of uncontrolled speech.

Key words: Stockholm Swedish, intonation, phonology, boundary tones, focal accent, prosodic hierarchy, syntax–prosody interface, recursion.
Acknowledgements

First of all, I want to thank my supervisor, Tomas Riad. He gave me the opportunity to write a PhD thesis, and suggested that I do it within the field of intonational phonology. I really could not have had a better supervisor. I thank him for spending an immense amount of time discussing all kinds of issues with me, and for reading all my texts many times. Tomas will make you think that you can do whatever you set out to do. Additionally, he will plant ideas in your mind, which go slightly beyond your own ambition. This is a powerful combination, which has led me to take on many rewarding challenges.

I also thank my second supervisor, Cecilia Falk, for discussions and for reading various versions of this manuscript, especially the last two chapters very carefully, checking many, many parentheses.

Staffan Hellberg was an encouraging supervisor when I wrote my master’s thesis, and also helped me a lot when I started teaching at the department. He has answered a large number of my questions on Swedish phonology and syntax, as well as questions on a range of other topics.

During these years I have had interesting and helpful discussions with several different people in the department and other places. I am most grateful to all of these people. I would especially like to mention Gilbert Ambrazaitis, Gösta Bruce, Mattias Heldner, Merle Horne, Shinichiro Ishihara, Frank Kügler, Mikael Roll, Håkan Rosenqvist, Lisa Rudebeck, Dominika Skrzypek and Sonya Steblin-Kamenskaya. I also thank Carlos Gussenhoven and Yiya Chen for hosting me during my visit to the Netherlands in the spring of 2009.

I had much help from Yiya Chen and Staffan Hellberg at the colloquium in the finishing stages of writing my thesis. They both read my thesis very carefully and gave me many insightful comments.

I am very grateful to everyone who agreed to be recorded at different stages in my work, including Maria Bylin, Annika Johansson, Karin Milles, Olle Poignant, Lisa Rudebeck, Kristina Schött, Jeanna Wennerberg and Hanna Ögren.

For help with editing the thesis I am grateful to Pia Nordin.

I would also like to mention all the colleagues at the Department of Scandinavian Languages at Stockholm University for making my time as a PhD student enjoyable. Among these, I would especially like to thank Sara Van Meerbergen for being such a very good friend.

I gratefully acknowledge the Knut and Alice Wallenberg Foundation and the Swedish Academy for financing my position during these years, and the
Riksbankens Jubileumsfond for funding my visit to the Netherlands in the spring of 2009.

Lastly, I want to thank my friends and my family. Without the love and support from my parents, my brother, my grandmother and my late grandparents, there would be no thesis. Shin has made some important contributions to this thesis, but he has made even more important ones to other aspects of my life.

Stockholm, April 2010
Sara Myrberg
# Table of contents

1 Introduction ............................................................................................................. 15  
1.1 Aim and major claims .................................................................................. 15  
1.2 Thesis outline ............................................................................................... 16  
1.3 Theoretical background .............................................................................. 17  
1.4 Material ......................................................................................................... 19  

2 An outline of the Stockholm Swedish intonational phonology ......................... 22  
2.1 The tonal inventory of Stockholm Swedish ................................................. 22  
2.1.1 Previous research: lexical tones vs. prominence tones ......................... 25  
2.1.2 The present work: lexical tones vs. prominence tones ......................... 29  
2.1.3 Compounds ............................................................................................. 30  
2.2 The prosodic domains of Stockholm Swedish ............................................. 32  

3 Prominence level 2: the (H)LH-accent ................................................................. 37  
3.1 Head (H)LH-accents ..................................................................................... 38  
3.1.1 Focus ....................................................................................................... 40  
3.1.1.1 Expression and denotation focus ................................................... 40  
3.1.1.2 Pragmatic and semantic focus ...................................................... 41  
3.1.1.3 Open and closed focus .................................................................. 44  
3.1.1.4 Broad and narrow focus, focus projection .................................. 45  
3.1.2 Givenness and Second Occurrence Focus ............................................ 49  
3.1.3 Topic ....................................................................................................... 50  
3.1.4 Summary and a theoretical comment .................................................... 52  
3.2 Initiality (H)LH-accents .............................................................................. 53  
3.2.1 Realizational properties of initiality (H)LH-accents ......................... 55  
3.2.2 The distribution of initiality (H)LH-accents ......................................... 60  
3.2.2.1 Experiment 1 ............................................................................. 61  
3.2.2.2 Experiment 2 ............................................................................. 62  
3.2.2.3 Experiment 3 ............................................................................. 63  
3.2.2.4 Experiment 4 ............................................................................. 63  
3.2.2.5 Vicinity to a head (H)LH-accent ............................................. 64  
3.2.2.6 Absence of stressed material in Spec,CP position .................. 65  
3.2.2.7 Mirroring the syntactic structure .............................................. 66  
3.2.3 Previous analyses ................................................................................... 69  
3.2.4 The initiality (H)LH-accent as edge prominence .................................. 72  
3.2.4.1 The Phrase Edge Prominence constraint ................................ 73  
3.2.4.2 Satisfying the Phrase Edge Prominence constraint .................. 74  
3.2.4.3 Selecting an edge constituent ................................................... 75  
3.3 Summary ....................................................................................................... 76  

4 Prominence level 1: the HL-accent ................................................................ 78  
4.1 The distribution of HL accents .................................................................. 78  
4.1.1 Plateau formation as a means of identifying the HL-accent ............... 79  
4.1.2 Lexically stressed words that receive no HL-accent ......................... 81  
4.2 HL-accent boosting ..................................................................................... 83
Figures

Figure 1. The tonal inventory assumed for Stockholm Swedish in the present work. 23
Figure 2. The model of the tonal inventory as presented in Bruce (1977:50). 26
Figure 3. The tonal inventory assumed for Stockholm Swedish by the Lund Model. 27
Figure 4. The tonal inventory assumed for Stockholm Swedish by Riad (1998, 2006, 2009a) and Engstrand (1995, 1997). 28
Figure 5. The phonological hierarchy of Stockholm Swedish as assumed in this thesis, along with the tones they license. 33
Figure 6. A hierarchical view of the functions of (H)LH-accents, and the terminology used to describe them. 38
Figure 7. Illustration of an initiality (H)LH-accent in the sentence Dåliga gamla lagningar måste ÅT GÅRdas 'Bad old repairs must be attended to'. 54
Figure 8. Initiality accent on the accent 1 word förstörd 'broken', which is assigned a L*H accent. 55
Figure 9. Initiality accent on the compound övergångsperioden 'the transition period', which is assigned a H L*H accent. 56
Figure 10. Head (H)LH-accent marking narrow focus on the initial word dåliga 'bad'. 56
Figure 11. Assimilating initiality HL*H-accent on många 'many'. 57
Figure 12. Initiality accent on Maria, but the word många 'many' is not assigned an initiality accent here, since it is not phrase initial. 58
Figure 13. Illustration of an initiality (H)LH-accent in a narrow and high register, on många 'many'. 59
Figure 14. Illustration of a high realization of an accent 1 word. 59
Figure 15. Illustration of a high realization of an accent 2 word. 60
Figure 16. Illustration of plateau formation after the (H)LH-accented word även 'even'. 80
Figure 17. HL-accent boosting on ingen 'no'. 84
Figure 18. Boosting on the word bara 'only'. 85
Figure 19. (H)LH-accent on bara 'only' as well as on jag 'me'. 86
Figure 20. A HL-accent, but no boosting, on bara 'only'. 86
Figure 21. No HL-accent on bara 'only'. 86
Figure 22. HL-accent boosting on aldrig 'never'. 87
Figure 23. Initiality (H)LH-accent in a confirmation sentence with a two word object noun phrase in initial position. 91
Figure 24. Topic marking (H)LH-accent in a confirmation sentence with a two word object noun phrase in initial position. 91
Figure 25. A phrase with only HL-accent and no head (H) LH-accent: *Dom drabbar inte många olika slags växter* 'They don’t affect many kinds of plants' ........................................................................................................ 92

Figure 26. Visualization of how the categorical difference between prominence level 1 and 2 relate to degree of perceived prominence. .................................. 97

Figure 27. The typology of post-nuclear areas containing post-nuclear HL-accent. ............................................................................................ 100

Figure 28. Representation of internal post-nuclear area................................ 101

Figure 29. Representation of external post-nuclear area.......................... 101

Figure 30. An internal post-nuclear area in combination with a L% boundary tone, illustrating a typical pattern for a declarative sentence. ................. 103

Figure 31. A very crisp high plateau that connects the last H tone of the (H) LH-accent with the first post-nuclear HL-accent. ................................. 103

Figure 32. A sloping plateau between the head (H) LH-accented word and the first post-nuclear accent ................................................................. 104

Figure 33. Phrase final rise due to a H% in an internal post-nuclear area, in a question................................................................. 105

Figure 34. An external low post-nuclear area. ........................................ 106

Figure 35. External low area with H% boundary tone. .......................... 107

Figure 36. Three sequential IPs .............................................................. 107

Figure 37. An external low post-nuclear area that is separated from the rest of the phrase by a pause. ................................................................. 108

Figure 38. A high post-nuclear area with a L%. .................................... 109

Figure 39. A high post-nuclear area with a H% .................................... 109

Figure 40. The typology of post-nuclear areas that lack post-nuclear HL-accent. ............................................................................................ 110

Figure 41. Phrase final rise due to a (H) LH-accent which is adjacent to a H% boundary tone and merges with this H%. .................................................. 111

Figure 42. An external high post-nuclear area without post-nuclear accents. ...... 112

Figure 43. A phrase final rise due to an external low post-nuclear area. ........ 113

Figure 44. Representation of the prosodic pattern in (96)a. .................... 125

Figure 45. Representation of the prosodic pattern in (96)b. .................... 127

Figure 46. Representation of the prosodic pattern in (96)c..................... 128

Figure 47. Representation of the prosodic pattern in (96)d..................... 129

Figure 48. Representation of the prosodic pattern in (96)e..................... 131

Figure 49. Representation of the prosodic pattern in (96)f, alternative 1. ... 132

Figure 50. Representation of the prosodic pattern in (96)f, alternative 2. ... 132

Figure 51. Representation of the pattern in (96)g. ................................. 133

Figure 52. Representation of the prosodic pattern in (96)c, alternative 2...... 134

Figure 53. Diagram over the constraints assumed in this thesis and their rankings................................................................. 142

Figure 54. Diagram over the constraints assumed in this thesis and their rankings................................................................. 159

Figure 55. The tonal inventory assumed for Stockholm Swedish in the present work................................................................. 162
Figure 56. The phonological hierarchy of Stockholm Swedish as assumed in this thesis, along with the tones they license. 163
Figure 57. The typology of post-nuclear areas containing post-nuclear HL-accents. 164
Figure 58. The typology of post-nuclear areas that lack HL-accents. 165
Tableaus

Tableau 1. Syntactic coordination ................................................................. 144
Tableau 2. A CP structure embedded to the left in a bigger CP structure, with two candidates .................................................................................. 146
Tableau 3. A CP structure embedded to the left in a bigger CP structure, with four candidates ................................................................. 147
Tableau 4. A CP structure embedded to the right in a bigger CP structure. ........ 148
Tableau 5. Strict ranking DepSynPros >> ALIGNL IP,CP ALIGNL PP,CP ........... 154
Tableau 6. Initial embedding with narrow focus ......................................... 157

Tables

Table 1. Overview of the material used in the thesis ..................................... 20
In terms of intonation, Stockholm Swedish is certainly the Swedish dialect that has been most extensively studied. Perhaps the most well known property of the intonation system of Stockholm Swedish is its *word accents*, a binary lexical tonal distinction. Such word accents exist in a large part of the Scandinavian language area, but not in most other Germanic languages.\(^1\)

In addition to the word accents, it has been assumed that Stockholm Swedish has two separate tonal *prominence levels*, which are used to highlight words in speech. The lower of the prominence levels has been called *accented* and the higher one *focused*. This assumption has been around at least since Bruce (1977), and has been followed within most subsequent work on Swedish. The lower prominence level (*accented*) has mostly been assumed to be the realization of the lexical word accents. Thus, these tones are taken to express the word accent distinction, and it has been assumed that this is their most important, or even their only, function. The higher prominence level (*focused*) has been assumed to consist of the lexical word accent tonal sequence, followed by an additional high tone, the *focal tone*. It is commonly assumed that the main purpose of this focal tone is to mark the *focus* of the phrase (cf. among others Bruce 1977, 1998, Heldner 2001, Hansson 2003, Ambrazaitis 2009 as well as Riad 1998, 2006 and Engstrand 1995, 1997).

However, despite the fact that a general description of the Stockholm Swedish intonation system has been around for some time, many questions still remain to be answered. In particular, there has been more emphasis on phonetics than phonology in much work on Stockholm Swedish intonation. As a result, many phonological aspects of this intonation system are still not well understood.

1.1 Aim and major claims

One general aim of this thesis is to provide a comprehensive phonological model for the intonation system of Stockholm Swedish. The hypotheses presented in this thesis are a first step towards the ideal goal of accounting for the structural relationship between all structurally different intonation contours in Stockholm Swedish, across speakers and speech styles. The

\(^1\) However, cf. e.g. Gussenhoven and Van der Vliet (1999), Gussenhoven (2000) for description of a binary lexical tonal contrast in some Dutch dialects.
question of the distribution of the different patterns between speakers and speech styles is left aside here.

In addition, the thesis aims to apply current phonological hypotheses and theories to the intonation system of Stockholm Swedish.

The first part of the aim is pursued in Chapters 3, 4, and 5. The second part of the aim is pursued in Chapters 6 and 7. (1)a–f presents the major claims that will be put forward in this thesis.

(1)  

(a) The so-called focal accent, which will be referred to here as the (H)LH-accent, should be divided into two groups, the head (H)LH-accent, which marks different types of focus (including the notion contrastive topic, cf., the definition by Krifka 2007, 2008) and the initiality (H)LH-accent, which marks left boundaries. (Chapter 3)

(b) The word accent tones, here referred to as HL-accents, can be boosted in some contexts. Also, they can be used as nuclear contours when the content of a phrase is given. This suggests that they may have a more complex function in the intonation system than only signaling the distinction between accent 1 and accent 2. (Chapter 4)

(c) The range of options for post-nuclear areas and boundary tones in Stockholm Swedish is larger than previous research has revealed. (Chapter 5)

(d) Stockholm Swedish provides evidence that the phonological domains which govern intonational phenomena branch in complex ways. This makes it possible to distinguish prosodic coordination (equal sister nodes) from prosodic adjunction (unequal sister nodes). (Chapter 6)

(e) Evidence for such branching is easier to recognize in Stockholm Swedish than in other Germanic languages. This is because left as well as right edges have categorical phonological markers, heads can be categorically distinguished from non-heads, and the location of phonological heads can be distinguished from the location of the boundary tone. (Chapter 6)

(f) Constraints on phonological structure make reference to prosodic adjunction (unequal sisters), which is avoided in favor of coordination (equal sisters). This is formulated in the OT-constraint *ADJUNCTION, which replaces both NONRECURSIVITY and EXHAUSTIVITY in the present analysis (Chapter 7)

1.2 Thesis outline

The thesis is structured as follows. In Chapter 2, the tonal representations of the pitch accents in Stockholm Swedish are presented. The assumptions made in this section are largely based on the results from previous studies, most notably those by Gösta Bruce (1977, 1982, 1987, 1994, 1998, 2005, 2007) and the studies that were made within the Lund model of Swedish intonation (see e.g. Heldner 2001 and Hansson 2003 for summaries and more
information about this research). However, the model presented here also adopts some assumptions from work by Riad (e.g. 1998, 2006, 2009a). Thus, it does not completely correspond to any single one of the previously suggested models. In Chapter 2, I also give a brief introduction to the prosodic domains I shall assume for Stockholm Swedish throughout the thesis.

Chapter 3 discusses the highest prominence level, which I shall term prominence level 2. I argue that the accent which expresses this contour, the (H)LH-accent, has essentially two different functions. It is both the head of Phonological Phrases (PP), and it signals initiality in Intonation Phrases (IP).

Chapter 4 discusses the function of the lower level of tonal prominence, which I shall term prominence level 1. This type of tonal prominence occurs on most lexically stressed words and is realized with a HL-accent in Stockholm Swedish. I show that one HL-accent in a phrase can be boosted so that it is higher than the preceding accent. I also argue that it can be used in the nuclear position of phrases, where it is associated with givenness.

In Chapter 5, I outline the options that seem to be available for the post-nuclear area of the phrase (i.e. the area following the IP head). This area includes both the boundary tones and the stretch of speech between the nuclear accent and the phrase boundary.

Chapter 6 presents an account of the possible branching of PPs and IPs in Stockholm Swedish, based on the findings in previous chapters. I argue that there is evidence for recursive prosodic structures in Stockholm Swedish and for a distinction between prosodic coordination (equal sisters) and prosodic adjunction (unequal sisters).

In chapter 7, I relate the prosodic structures outlined in chapter 6 to the syntactic structure, via a set of Optimality Theoretic constraints. I argue that Stockholm Swedish presents evidence that phonology prefers prosodic coordination (equal sisters) over adjunction (unequal sisters).

1.3 Theoretical background

This section gives a short outline of some theoretical concepts which the thesis builds on, and of how these ideas are applied in the thesis. Specific details of my theoretical standpoints will be provided throughout the thesis.

Key ideas to the view of intonation adopted here are provided by the Autosegmental-Metrical theory. This theory holds that intonation is the result of interpolation between abstract tonal targets, which may be specified as either high (H) or low (L). I shall refer to such targets as tones. The H and L tones are located on a separate tier in the phonological structure, on

---

2 The alternative to this is modeling the intonation as tonal movements. See Cruttenden (1997) for an overview and more references to this type of research. I shall not discuss these frameworks further.
which they are linearly organized and separated from the rest of the phono-
logical structure.

The tonal targets are abstract phonological entities, and the fact that a
target is specified as H or L does not entail any information of the exact
pitch value with which it will be realized. Instead, the phonetic realization of
tonal targets is determined by *scaling*. Scaling is orthogonal to the H or L
value of tones, and is determined by many different factors, such as the
position in the utterance, the emotional state of the speaker or the degree of
emphasis put on some given word. See Ladd (1996, 2008) and Gussenhoven
(2004) for a more detailed discussion and historical perspective on this
framework.

In addition to being linearly organized, the tones on the tonal tier are also
hierarchically related. This relation is modeled under the assumption that
tones are licensed by a set of hierarchically ordered phonological domains, a
Prosodic Hierarchy (e.g. Nespor and Vogel 1986, Selkirk 1986). The
concept of a prosodic hierarchy originates in the observation that the distri-
bution of phonological phenomena cannot be described by referring only to
morpho-syntactic domains. This means that there is no one-to-one relation
between the domains of morpho-syntax and those of phonology. Section 6.1
provides a fuller overview of and references to this theoretical framework.
The prosodic domains of Stockholm Swedish are outlined in Chapter 2. In
Chapter 6, the two highest domains, the PP and the IP are discussed in detail.

Even though no complete isomorphy exists, it is a well observed tendency
that the domains of morpho-syntax and those of phonology do often cor-
relate. This correlation has been described in terms of an interface between
the phonology and the morpho-syntax. The exact nature of this interface has
been intensely discussed in the literature and is still not fully understood.

In Chapter 7, I shall follow several other researchers in describing this in-
terface in terms of an Optimality Theoretic (OT) grammar (among many
others, see Truckenbrodt 1999, Selkirk 2000, Féry and Samek-Lodovici
2009). I introduce the basic idea of Optimality Theory and its application to
the syntax–phonology interface in 7.1. I mainly use constraints which have
already been suggested in the literature to account for the relation between
phonology and syntax. In addition I argue that Stockholm Swedish gives
evidence for another constraint *ADJUNCTION*. This constraint builds on the
idea of Compound Prosodic Domains (CPD) by Ladd (1996, 2008), and I
argue that it can replace previously suggested constraints that ban recursion
in phonology (cf. the Strict Layering Hypothesis (SLH) from Selkirk
suggested by e.g. Selkirk 1995b, Truckenbrodt 1999).

Throughout this work, I will also need to make reference to a number of
syntactic and information structural notions. As for the syntactic structure, I
follow several other researchers working on the syntax–prosody interface in
assuming a generative syntactic framework. I also follow these researchers in assuming that some aspects of information structure are included in the syntactic representation that the phonology has access to (see e.g. Rooth 1992, Selkirk 1995a, Truckenbrodt 1999, Schwarzchild 1999, Féry and Samek-Lodovici 2006). The discussion of the syntax–prosody interface in Chapter 7 is restricted to looking at how CP-structures in the syntactic structure are aligned with prosodic domains, whereas CP-internal structure is largely left aside. A CP corresponds roughly to a clause in traditional grammatical terms (cf. e.g. Platzack 1998 for a discussion of CPs in Swedish).

For information structural notions, I shall mainly refer to Krifka (2007, 2008), who presents a comprehensive overview of different information structural notions that have been assumed to be relevant for the syntax–prosody interface. This will be discussed in section 3.1.

1.4 Material

The material used for this thesis is a collection of data from various sources. This collection includes both controlled and uncontrolled speech, and read and unread speech. In total, the material comprises a corpus of approximately 420 sentences which were selected to test various aspects of the Stockholm Swedish intonation system, and which were read by different native speakers. Sometimes a context question was used, and sometimes a short text would be used as a context to trigger a certain reading. These recordings were made using an Edirol R-09 recorder, in a quiet room with me and the speaker present, and analysed in Praat (Boersma and Weenik). The corpus also contains approximately 17 minutes of uncontrolled read and unread speech which was analyzed with respect to various different questions and hypotheses. The uncontrolled material is taken mainly from Swedish radio, from an audio book, and from a production by a Swedish comedian who is making a prank call to a receptionist. The collection of data is occasionally complemented with native language intuition. The use of native language intuition is restricted to relatively simple and clear cases. The thesis was read in whole by three other native Swedish speakers, who shared the intuitions reported here. Table 1 presents an overview of all the material used in the thesis. Some parts of the material will not be explicitly referred to in the thesis, but have been used only as reference material. This is marked as reference in Table 1.

The corpus was collected in several steps. In each step, new material was added, simultaneously answering one set of hypotheses or questions and raising new ones. In this way, the analysis of different aspects of the intonation system proceeded.

The decision of what type of data should be used and how much data might be needed was made successively for each new step in the collection of the material. The corpus presented in Table 1 is a result of this process.
Table 1. Overview of the material used in the thesis.

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Referred to in section</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment 1</td>
<td>120 sentences</td>
<td>3.2.2, Chapters 6, 7</td>
<td>Studies how syntactic structure, sentence length and information structure affect phonological phrasing of subjects in spec-CP position (roughly the position before the finite verb in a Swedish main clause).</td>
</tr>
<tr>
<td>Experiment 2</td>
<td>36 sentences</td>
<td>3.2.2, Chapters 6, 7</td>
<td>Studies the phrasing of (adverbial) subclauses in spec-CP position.</td>
</tr>
<tr>
<td>Experiment 3</td>
<td>51 sentences</td>
<td>3.2.2, Chapters 6, 7</td>
<td>Tests whether initiality (H)LH-accents appear in the spec-CP position, and if they associate with secondary stresses in compounds.</td>
</tr>
<tr>
<td>Experiment 4</td>
<td>6 sentences</td>
<td>3.2.2, Chapters 6, 7</td>
<td>Illustrates the phonological phrasing of embedded clauses with main clause word order vs. embedded clauses with embedded clause word order.</td>
</tr>
<tr>
<td>Experiment 5</td>
<td>96 sentences</td>
<td>4.3.1.1, reference</td>
<td>Tests boundary insertion and phonological phrasing in different syntactic and information structural conditions.</td>
</tr>
<tr>
<td>Experiment 6</td>
<td>10 sentences</td>
<td>4.2</td>
<td>Illustrates HL-accent boosting in pre-nuclear position.</td>
</tr>
<tr>
<td>Test recordings</td>
<td>approx. 100 sentences</td>
<td>Chapter 3, reference</td>
<td>Various informal recordings with speakers of Stockholm Swedish, checking phrasing in different conditions, and eliciting different boundary tones. These recordings were carried out with different speakers and at different times.</td>
</tr>
<tr>
<td>Audio book</td>
<td>approx. 4 minutes</td>
<td>Chapters 3, 4, 5, 6, 7</td>
<td>An excerpt from the audio book The incredible Mitford Sisters, written by the Swedish author Cecilia Hagen. The reader is a trained actress.</td>
</tr>
<tr>
<td>Interview</td>
<td>approx. 4 minutes</td>
<td>Chapters 5, 6, 7</td>
<td>A radio interview between a radio host and an expert on gardening. They are both used to speaking on radio.</td>
</tr>
<tr>
<td>Prank call</td>
<td>approx. 3 minutes</td>
<td>Chapters 5, 6, 7</td>
<td>A prank call. A male Stockholm Swedish comedian calls a non-suspecting hotel receptionist to book rooms for characters from a children’s book.</td>
</tr>
<tr>
<td>Radio show</td>
<td>approx. 3 minutes</td>
<td>reference, mainly Chapter 5</td>
<td>An excerpt from a radio show sent late in the evening. The host is a young Stockholm Swedish male speaker.</td>
</tr>
<tr>
<td>Kids</td>
<td>approx. 3 minutes</td>
<td>reference, mainly Chapter 5</td>
<td>Three children, 4, 9, and 11 years old, are playing with a video camera. They are making a movie and are discussing the plot.</td>
</tr>
</tbody>
</table>
It will become clear throughout the thesis that each of the hypotheses and arguments presented is empirically supported by a relatively small amount of data. Instead, however, answers to many different questions are given. The fact that these answers amount to a coherent system, will be seen as a general support of the individual arguments. However, as will be clear throughout the thesis, many aspects of the model outlined here also need to be studied experimentally before they can be confirmed.

In the following chapters, I shall assume that the material covers most of the variation that can be found in Stockholm Swedish. Again, the fact that the patterns found here amount to a coherent model, might be seen as an indication that the material is in fact relatively complete. However, there is of course no way of actually confirming that new patterns would not have appeared if more data had been added. Therefore, the results of this thesis should be taken as a step in the process which will ultimately result in the articulation of a complete and coherent model of the intonation system of Stockholm Swedish.

As is clear from Table 1, the material comes from several different speech styles and from several different speakers. This is an advantage because it allows many different patterns to be covered, even though all patterns may not be found in all speech styles, or be used by all speakers. It will be assumed here that all possible intonation patterns which occur in Stockholm Swedish are structurally related, independent of speaker or speech style.

The disadvantage of using many different types of data in the way that has been done here, is of course that the model itself does not say much about the distribution of the intonation patterns in terms of speaker or speech style. It should be stressed, however, that this does not imply or predict that there are no regular or interesting variations between speakers or between different speech styles. On the contrary, I hope that by identifying different intonational patterns and by structurally relating them to each other, the model will help specify questions about the distribution of the different patterns.

In different sections of the thesis, some parts of the material are used more than others, as indicated in Table 1. However, I do not restrict my discussion of the material in the different sections. Instead I shall refer freely to the different parts of the material, wherever they have something interesting to add to the discussion, and independent of what the original purpose was when the material was collected. This treatment of the material is one important step in making sure that the conclusions drawn from the different parts of the material are coherent.
2 An outline of the Stockholm Swedish intonational phonology

This chapter presents an outline of the phonology of the Stockholm Swedish intonation system. Section 2.1 introduces the inventory of tonal contours in Stockholm Swedish, and compares the representations assumed here to previous models. Section 2.2 introduces the levels of the prosodic hierarchy which will be assumed in the present work. More elaborate support and arguments for the assumptions and claims I make in this chapter will emerge from the data and discussions in the following chapters, where different aspects of the model are discussed in detail.

2.1 The tonal inventory of Stockholm Swedish

This section introduces the inventory of tonal contours in Stockholm Swedish, focusing on those contours which associate with stressed syllables. I first present the representations which will be assumed in the present work. In section 2.1.1 I compare these representations to the representations assumed in the Lund model and in the accounts by Riad (1998, 2006, 2009a) and Engstrand (1995, 1997). In section 2.1.2, I discuss the relation between lexical tones versus prominence tones. This distinction has been widely discussed in the previous literature, but will receive relatively little attention in the present work. In section 2.1.3, I discuss the tonal structure of compounds.

Stockholm Swedish is usually described as having two tonally distinct degrees of prominence. A word in a sentence can be assigned one of these prominence levels, but may also lack a tonal contour completely.

Like most other Swedish and Norwegian dialects, Stockholm Swedish also has a binary lexical word accent contrast, which divides lexical items into two groups based on their tonal behavior. The word accents are commonly termed accent 1 and accent 2.

3 In addition to these tonal contours, Stockholm Swedish also has two boundary tones, which associate with right edges of prosodic constituents. These are introduced in section 2.2

4 Another pair of terms which is often used is acute and grave accent. Acute accent refers to accent 1, whereas grave accent refers to accent 2. In the literature, the word accent contrast has often been illustrated with the example anden ‘the duck’ with accent 1 (acute accent) or anden ‘the spirit/the ghost’ with accent 2 (grave accent). These two words are identical in terms of their segmental structure and word stress placement, but they have different word accents. It should be noted, however, that the words are also different in terms of their
Because there are two different word accents and two prominence levels, Stockholm Swedish has four tonal configurations that mark prominence. These are given in Figure 1.

<table>
<thead>
<tr>
<th></th>
<th>Prominence level 1</th>
<th>Prominence level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accent 1</td>
<td>H L*</td>
<td>L* H</td>
</tr>
<tr>
<td>Accent 2</td>
<td>H* L</td>
<td>H* L H</td>
</tr>
</tbody>
</table>

Figure 1. The tonal inventory assumed for Stockholm Swedish in the present work. The asterisks mark tones that are associated to the vowel of the stressed syllable.

I shall refer to the lowest degree of tonal prominence as *prominence level 1*. A word with prominence level 1 is assigned a HL-contour independently of whether it has accent 1 or 2. The difference between the word accents is a matter of timing. An accent 2 H*L is timed so as to fall on the stressed syllable, whereas an accent 1 HL* is timed so as to fall before the stressed syllable (Bruce 1977). Throughout this thesis I refer to words with prominence level 1 in Stockholm Swedish as *HL-accented*. In the literature on Swedish intonation, words which are assigned this level of prominence are commonly termed *accented*, but I shall not use this term, in order to avoid confusion with other types of accenting.

I shall refer to the highest level of tonal prominence as *prominence level 2*. A word with prominence level 2 is assigned a H*LH contour if it has accent 2, and a L*H contour if it has accent 1. Throughout this thesis I refer to such words as *(H)LH-accented*. In the literature on Swedish intonation such words are commonly called *focused*. Here I reserve the term *focus* for the information structural notion *focus*, to be discussed in section 3.1. One reason not to use the term *focus* to refer directly to the intonation contour, is that the (H)LH-accent can have other functions than signaling focus, as later sections will show.

The terms HL-accented and (H)LH-accented denote the realization of the prominence levels in Stockholm Swedish. It should be noted that they are independent of the word accent distinction and that they include the contours of both accent 2 and accent 1.

The difference between the two tonal prominence levels and the two word accents can be illustrated with neutral declarative sentences. (2) and (3) illustrate the difference between prominence level 1 and 2 for accent 2 morphological structure, and therefore are not actually a very illustrative example of the lexical status of the word accents. In *anden* ‘the duck’ with accent 1 the stem is monosyllabic, whereas in *anden* ‘the spirit/the ghost’ with accent 2 the stem is bisyllabic, thus *and-en* vs. *ande-n*. (Tomas Riad p.c.).
words, using the accent 2 word såpa ‘soap’. In Figure 1 this is the difference represented in the bottom row. The pragmatic context for the sentences in (2) and (3) is indicated by the context questions given for each example.

In these examples, and wherever necessary henceforth in this thesis, I shall use a superscripted ‘2’ to mark the main stress on an accent 2 word. A superscripted ‘1’ marks the main stress of an accent 1 word. Also, in these examples and henceforth in the thesis, a syllable which has a prominence level 2 accent will be written in capitals. A schematic contour for each example is given above each sentence.

(2)  A: Vad fanns det i hinken?
     ‘What was there in the bucket?’
     B: Det fanns ²SÅpa i hinken.
        H*LH HL*
        ‘There was soap in the bucket.’

(3)  A: Vad fanns det för såpa i hinken?
     ‘What kind of soap was there in the bucket?’
     B: Det fanns ²BILlig ²såpa i hinken.
        H*LH  H*L  HL*
        ‘There was cheap soap in the bucket’

In (2), the denotation of the accent 2 word ²såpa ‘soap’ is the information asked for in the question. Therefore, this word receives a (H)LH-accent, which is realized as a tonal fall on the stressed syllable, followed by a rise which normally occurs on the following syllable (cf. Bruce 1987).

In (3), the denotation of the accent 2 word ²billig ‘cheap’ is the information asked for in the question. Thus, this word carries the (H)LH-accent. ²Såpa is now given information because it is already mentioned in the question. Therefore it is HL-accented. This accent is realized as a simple fall beginning on the stressed syllable. In summary then, the difference between an accent 2 word with prominence level 1 and one with accent 2 is that there is an additional H tone on the prominence level 2 word as compared to the prominence level 1 word.

I now move on to illustrate the tonal contours of accent 1 words, which are represented in the top row in Figure 1. In (4) and (5), the word ¹vatten ‘water’ is used to illustrate the difference between prominence level 1 and 2 in accent 1 words.

(4)  A: Vad fanns det i hinken?
     ‘What was there in the bucket?’

5 In chapter 3, I shall make a distinction between head (H)LH-accents (3.1) and initiality (H)LH-accents (3.2). Syllables that have a head (H)LH-accent will be marked with capitals, but syllables with initiality (H)LH-accents will not, since these have different functions.
B: Det fanns 1VATten i 1hinken
L*H         HL*
‘There was water in the bucket’

(5) A: Vad fanns det för vatten i hinken?
‘What kind of water was there in the bucket?’

B: Det fanns 1RENT 1vatten i 1hinken.
L*H       HL*  HL*
‘There was clean water in the bucket’

In (4) 1vatten ‘water’ denotes the information that is asked for, and receives a (H)LH-accent, which is realized as a tonal rise on the stressed syllable. The tonal rise described as L*H is functionally parallel to the rise in the accent 2 H*LH accent (cf. Bruce 1977).

In (5), 1rent ‘clean’ denotes the information that is asked for and receives the (H)LH-accent. The word 1vatten now denotes given information. Therefore it is not marked with prominence level 2. Instead, it receives the lower prominence level and has a HL-accent which is realized as a tonal fall beginning slightly before the stressed syllable. A HL-accented accent 1 word then, is characterized by a tonal fall, whereas a (H)LH-accented accent 1 word is characterized by a tonal rise on the stressed syllable.

As can be seen from the illustrations in (2)–(5), the interpolation between the last H of the (H)LH-accent and a following HL-accent forms a plateau. This type of plateau formation can cover rather long stretches of speech, as illustrated in (6), where there are (H)LH-accents both on the initial word, and on the word which corresponds to the wh-constituent of the question. The initial (H)LH-accent is an initiality accent, to be described in section 3.2

(6) A: Vad hade hunden som den kunde leka med?
‘What did the dog have that it could play with?’

B: 1Hunden hade en 2NALle som den kunde 2leka med.
L*H    H*LH  H*L
‘The dog had a teddy bear that it could play with.’

Bruce (1987) shows that such plateaus tend to be sloping when their length increases.6

2.1.1 Previous research: lexical tones vs. prominence tones

The previous section introduced the tonal representations which are assumed in the present work. This section compares these representations to the ones

6 To my knowledge, Bruce (1987) is the only systematic study of the realization of this type of plateau.
which have been assumed in previous work, beginning with the Lund model and moving on the the accounts by Riad (1998, 2006, 2009a) and Engstrand (1995, 1997)

In the previous section, I talked of *sequences* of tones, and I used the terms *HL-accent* and *(H)LH-accent* to denote these sequences. This is not really a standard way of thinking of the tonal inventory of Stockholm Swedish. In previous research, a clear distinction has usually been made between tones that have a primarily *lexical* function and tones that have a primarily *prominence lending* function.

In the model by Bruce (1977) the last H of the *(H)LH*-sequence is assumed to be a prominence tone, whereas the HL-part is assumed to be due to the word accent contrast. This is illustrated in Figure 2, from Bruce (1977:50).

Figure 2. The model of the tonal inventory as presented in Bruce (1977:50) (reprinted with permission). A HLH contour is assumed for both accent 1 (top line) and accent 2 (bottom line). The difference between the word accents is the timing of the tonal contour in relation to the segmental string (middle line, V=vowel, C=consonant, V=stressed vowel C:=long consonant).

The model in Figure 2 yields the tonal inventory presented in Figure 3. This inventory is the one assumed by proponents of the Lund model (see e.g. Bruce 1998, Heldner 2001, Hansson 2003, Ambrazaitis 2009), and is also the one assumed by Gussenhoven (2004) and Gussenhoven and Bruce (1999).

In this model, the only difference between accent 1 and accent 2 is the *timing* of the tonal sequence. This is indicated with the asterisk on the left-most H in the accent 2 sequences, and on the L in the accent 1 sequences. Except for the placement of the asterisk, the tonal contours are the same for accent 1 and accent 2. For prominence level 1, the tonal sequence is HL, and for prominence level 2 it is the same HL contour plus a H prominence tone.
Figure 3. The tonal inventory assumed for Stockholm Swedish by the Lund Model. The difference between accent 1 and accent 2 is the timing of the tonal contour in relation to a stressed syllable. Notationally, this model distinguishes accent 1 from accent 2 through the placement of the asterisk, which marks the tone that is temporally aligned with the stressed syllable.

Thus, the only prominence tone in Stockholm Swedish is H, and the only lexical tones are HL. In accent 2 words, the first H in the HL(+H) sequence is aligned with the main stress of the word, whereas in an accent 1 word, it is the L of the HL(+H) sequence that is aligned with the main stress of the word. Thus, in accent 1 words with initial stress, the first H will occur outside the word, and is assumed to be truncated utterance initially (Bruce 1977, Gussenhoven 2004). The alignment of the contour is due to the word accent distinction and is independent of the prominence level.7

The model by Riad (1998, 2004, 2009a) also makes a clear distinction between lexical tones and prominence tones. In this model, the distinction between accent 1 and accent 2 is not a question of timing. Instead, all accent 2 words are marked in the lexicon with a H tone, which is absent on accent 1 words. The presence vs. absence of this H in the lexical representation causes a tonal difference between accent 1 and 2 on both prominence levels. Thus, the difference between the word accents under this view is a question of the amount of tonal material which is present in the lexical representation of a word.

The prominence tone in Riad’s model is a sequence of LH. This tonal sequence is realized on all words which have the higher prominence level.

---

7 As is evident from a comparison between Figure 3 and Figure 1, the model used in the present work differs from the Lund model in assuming no H initially in the accent 1 sequence for prominence level 2. The reason why it has been removed here is that it is not stable in the material I present in the thesis. Thus, assuming such a H would result in unintuitive annotations of the tonal contours. However, as pointed out to me by Gösta Bruce (p.c.), the model used here needs some additional assumption in order to make a tonal distinction between a compound with prominence level 2, such as "MellanMålen ‘the snacks’ from a phrase with a HL-accented accent 2 word followed by a (H)LH–accented accent 1 word, such as "mellan ‘between the meals’. These two utterances are clearly audibly distinct. I return to this distinction in 2.1.3. The issue of the initial H in accent 1 has been extensively discussed in previous research. For the purposes of the present work, suffice it to say that there is some disagreement on this point, and that, so far, no solution has been presented which has been generally accepted in the research community. Unfortunately, a truly satisfactory solution cannot be provided here either. This issue will, however, not have any major impact on the analyses presented here, and therefore, will not receive too much attention here.
Thus, for accent 2, the realization of prominence level 2 is H+LH, whereas for accent 1 it is Ø+LH. A similar argument is presented by Engstrand (1995, 1997). The tonal sequences predicted by these two models are given in Figure 4.

<table>
<thead>
<tr>
<th></th>
<th>Prominence level 1</th>
<th>Prominence level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accent 1</td>
<td>L or Ø</td>
<td>L* H</td>
</tr>
<tr>
<td>Accent 2</td>
<td>H*</td>
<td>H* + L  H</td>
</tr>
</tbody>
</table>

Figure 4. The tonal inventory assumed for Stockholm Swedish by Riad (1998, 2006, 2009a) and Engstrand (1995, 1997). The difference between accent 1 and accent 2 is the presence of a lexical H tone in accent 2 words, and the lack thereof in accent 1 words.

According to Riad’s model, the L*H sequence associates directly with the lexically stressed syllable in accent 1 words. In accent 2 words, however, a lexical H tone occupies the stressed syllable. Therefore, the L*H sequence cannot associate there. If there is only one stress in an accent 2 word, the LH sequence simply follows the lexical H, without being associated with any specific syllable. This assumption is supported by data showing that the last high in (H)LH-accents may vary in terms of timing (e.g. Bruce 1987). In compounds and any other words which have a secondary stressed syllable, the L*H sequence associates with the secondary stress. Therefore, in words with more than one stress, the two peaks of the accent 2 sequence may be several syllables apart (see discussion in 2.1.3).

Riad’s (1998, 2004, 2009a) model gives neat predictions for the typological description of the word accents in Scandinavia. Also, it accounts for how the word accent distinction is stored in the lexicon (Riad 2009a). Cf., however, the studies by Lahiri et al. (2005) who argue that accent 1 is the marked variant.

However, Riad (1998, 2006, 2009a) forces some inconvenient analyses in terms of the prominence level 1 sequences in the Stockholm variety. The default HL-sequence which appears on accent 2 words in prominence level 1 must be analyzed as a combination between the lexical H-tone and the L*-part of the L*H prominence tones. The parallel analysis for accent 1 words gives the prediction that there is at most a L* tone, which is not preceded by any phonological H tone. This predicts that the HL-fall would be less stable in accent 1 than in accent 2. The results of this thesis, provide no evidence that this is true, however. There appears to be plateau formation between a (H)LH-accent and the HL-accent of an accent 1 word as well as between a (H)LH-accent and a HL-accent on an accent 2 word, (2)–(5). Also, both accent 1 and accent 2 words display a difference between HL-accented and unaccented. In lexicalized phrases and in many verb phrases, only the last
word receives tonal prominence, whereas the other words are not given any
tonal prominence at all (cf. among others Anward and Linell 1976, and Frid
2003:30). There is no difference between accent 1 and 2 with respect to
these types of phrases, see discussion in Chapter 4.

For these reasons I assume a tonal HL-fall for prominence level 1 on ac-
cent 1 words as well as on accent 2 words. Further investigations are needed
before the exact relation between lexical and post-lexical tonal material can
be completely understood.

2.1.2 The present work: lexical tones vs. prominence tones

As explained in the previous section, previous work on Stockholm Swedish
intonation has generally made a clear distinction between tones which origi-
nate in the lexicon, whose primary function it is to signal the word accent
distinction, and tones which do not originate in the lexicon, and whose pri-
mary function is to signal prominence. This distinction is not reflected in the
choice of terminology in the present work, neither when talking of HL-ac-
cents versus (H)LH-accents or when talking of prominence level 1 versus
prominence level 2. The reason for this is that it is not of any great
importance to the discussions in this thesis.

The distinction between tones which primarily signal word accents and
tones that are prominence lending has, rightfully, received a lot of attention
in previous research and has led to interesting insights into the intonation
system of Stockholm Swedish and other Scandinavian dialects. However, I
believe that temporarily looking away from that distinction will help gain
some insights about sentence level Stockholm Swedish intonation. In this
work, therefore, I turn the center of attention away from the distinction
between lexical vs. post-lexical tones. As implied by the terms HL-accents
vs. (H)LH-accents, I treat sequences of tones which appear together as
phonological objects, not paying too much attention to the internal structure
of these tonal sequences.

However, it is important to note that the approach to the intonation system
presented in this thesis is not in conflict with the distinction between lexical
and post-lexical tones. The tonal sequences should be assumed to have an in-
ternal structure, and elegant accounts of this internal structure can be reached
under the assumption that this structure involves a difference between lexical
word accent tones and post-lexical intonational tones. This has been illu-
strated in previous research (Bruce 1977, Engstrand 1995, 1997, Riad 1998,

I hypothesize, however, that tonal sequences might develop a separate
behavior as a group of tones. Thus, a lexical tone need not necessarily
behave exactly the same way when it occurs alone as when it occurs together
with a post-lexical prominence tone. This motivates looking at tones both as
separate tones with different functions and as whole sequences. The contri-
bution of this thesis is to look at tonal sequences as wholes. Quite clearly, there are many unresolved issues concerning the internal structure of the tonal sequences. It is also still unclear what parts of these sequences are represented in the lexicon and what the nature of this representation is. Even though these are interesting questions indeed, they are not immediately relevant to the discussions in this thesis.

2.1.3 Compounds
This section arrives at the tonal representation which will be used in this thesis for words which contain more than one stressed morpheme. In Stockholm Swedish, all words which contain more than one stressed morpheme, such as compounds and words with certain derivational affixes, receive accent 2. The assignment of accent 2 in this type of words is independent of any word accent specification on individual morphemes in the word. The prominence level 2 accent 2 contour behaves slightly different in these words as compared to other words. (The prominence level 1 accent 2 contour is H*L, however, and it behaves just like in any other accent 2 word.) Specifically, the first H* in the H*LH-sequence is realized on the initial stressed syllable in the word (the primary stress), whereas the last LH appears on the last stressed syllable in the word (the secondary stress). Between the two H tones there is a low tonal floor. In compounds, then, it seems that both the initial H and the L are associated. (Bruce 1998:106, 38, 68, Riad 1998, 2006). Two alternative representations of this contour are given in (7) and (8)


\[
\text{SOM\text{m}mar\text{led}ig\text{E}ten} \\
\text{H*H} \quad \text{L*H} \\
\text{‘the summer holiday’}
\]


\[
\text{SOM\text{m}mar\text{led}ig\text{E}ten} \\
\text{H*H} \quad \text{L*H} \\
\text{‘the summer holiday’}
\]

The first H, which is associated with the primary stress, is followed by a tonal fall. This fall is followed by a low, flat floor which stretches all the way to the secondary stress. The floor is equally flat independently of whether it stretches across stressed syllables or not. Thus, in a compound, only the initial and the final stressed syllable are given any tonal realization.
In (7) and (8), as well as henceforth in the thesis, a superscripted 2 marks the primary stress in a compound or any other word with accent 2. A subscripted 2 marks additional lexical stresses in the word. The rightmost subscripted 2 in a word is the secondary stress. When a word which has both primary and secondary stress has prominence level 2, both the primary and the secondary stress will be indicated with capitals.

Within the Lund model, the tonal sequence on a Stockholm Swedish word with more than one stressed syllable is transcribed as H*L L*H, as in (7). The first starred tone associates with the primary stress, whereas the second starred tone associates with the secondary stress (Bruce 1998:106,138,168). Riad (1998, 2006), however, assumes that there is only one L, which is associated with the secondary stress and spreads leftwards, as in (8). The Lund model forces an additional L in the representation of prominence level 2 in words with two stresses as opposed to words with two stresses (H*L L*H versus H*LH). Riad’s account, however, assumes only an additional association of the L in the prominence level 2 sequence. (H*LH versus H*LH). Here I shall assume the representation from Riad (1998, 2006).

This assumption allows a representational difference between a compound and a two word phrase with an accent 1 word + and accent 2 word, where the first word is HL-accented and the second word is (H)LH-accented. As mentioned in footnote 7, there is an audible difference between two word phrases and compounds (Bruce 1977:50–53, 1998:106,139). This difference is illustrated in (9)a versus b and (10)a versus b, with an example from Bruce (1998:139). Under the assumption that the accent 2 prominence level 1 contour is H*L, and the accent 1 prominence level 1 contour is L*H, as I assume here, these two structures will receive the same representation (H*L + L*H), which is a problem since they are audibly different.

(9) Tonal representation of a compound versus a two word phrase in the Lund model (Bruce 1998:106, 139).

a) ²MELlan²MÅlen
   *between-meals.DEF ‘the snacks’
   H*L L*H

b) ²mellan ¹MÅlen
   *between meals.DEF ‘between the meals’
   H*L HL*H

(10) Tonal representation of a compound versus a two word phrase in the model assumed here (using the compound representation from Riad 1998, 2006 in a, and the accent 2 prominence level 1 representation from the Lund model in b).

a) ²MELlan²MÅlen
   *between-meals.DEF ‘the snacks’
   H*↓ L*H
b) mellan MÅlen
between meals.DEF ‘between the meals’
H*L L*H

However, with the assumption of the tonal representation from Riad for words with more than one stress, there will be a difference in representation between the compound and the two word phrase. This difference amounts to whether there are two L tones which are connected by interpolation (which is the case in the two word phrase) or whether there is one L tone which spreads leftwards (which is the case in the compound). I thus assume that the audible difference between the compound and the two word phrase is due to the leftward spreading of the associated L in the compound, as opposed to the interpolation between the accent 2 H*L and the accent 1 L*H sequence in the two word phrase.

Though this solution provides a representational difference between the structures in (9)a and (10)a versus (9)b and (10)b, a number of problems remain to be solved. First, the status of the L tone remains unclear. Under the assumptions in (10), it seems that the L tone belongs both to the prominence level 1 and to the prominence level 2 sequence. Second, it is unclear exactly how interpolation and spreading would cause the audible distinction between the a and b examples.

As said in footnote 7, the presence of the H tone in the accent 1 prominence level 2 sequence has been widely discussed, and no analysis has been suggested which has been generally accepted by researchers working on different aspects of Swedish intonation and word accent. It is beyond the scope of the present work to provide such an analysis, and the absence of such an analysis will not have any major consequences for the present work. Therefore this question is left for future research. Thus, in the remainder of the thesis, compounds and other words with more than one stressed syllable will be tonally transcribed with H* L*H, where the H* is associated with the primary stress and the L*H is associated with the secondary stress.

2.2 The prosodic domains of Stockholm Swedish

In line with the theory of the prosodic hierarchy, it will be assumed in this work that the tonal sequences presented in section 2.1 are licensed by different prosodic categories (e.g. Selkirk 1986, Nespor & Vogel 1986, but see section 1.3 and 6.1 for further references and a more extensive discussion of prosodic hierarchy theory). This section introduces the categories in the prosodic hierarchy which will be assumed here. An example sentence is provided in Figure 5. Subsequently, the categories are introduced one by one, beginning from the top of the hierarchy.

The theory of the prosodic hierarchy assumes that phonological rules apply within phonological domains, and not within syntactic or morpho-
logical domains. Thus, a set of phonological constituents is assumed, which explains the distribution of phonological phenomena. Phonological phenomena can refer to one edge of a phonological domain, or they may constitute the head of some domain. There is an interface between the phonological domains and the morpho-syntax. This interface ensures that there is some correspondence between the phonological and the morpho-syntactic domains, but it also allows for non-isomorphism. In Chapter 7, we return to the interface between the syntax and the highest domains of the hierarchy in Stockholm Swedish.

The phonological constituents I assume for Stockholm Swedish are presented in Figure 5.

The highest domain in the prosodic hierarchy assumed here is the Intonation Phrase, (IP). This level often, but not always, corresponds to a clause. On its left as well as its right edge, the IP is characterized by tonal events. The left edge of the IP is marked with a level 2 prominence, i.e. a (H)LH-
accent. This prominence occurs on the leftmost stressed syllable in the IP. Thus, if the first stressed word in an IP has accent 1, it receives a \( L^*H \) contour and if it is an accent 2 word it receives a \( H^*LH \)-contour. In Figure 5 there is such an accent on the accent 2 word första ‘first’. I shall refer to such IP initial prominences as \textit{initiality (H)LH-accents} (IA).\(^8\) Initiality accents are presented in section 3.2. On the right edge of the IP, there is a boundary tone, which is marked in Figure 5 as \( L^% \). An IP can end with either high or low pitch, which is represented as a difference between a high (\( H^% \)) and a low (\( L^% \)) boundary tone. All boundary tones are marked with \%. In a declarative sentence the boundary tone is often \( L^% \), whereas the \( H^% \) can be used to mark continuation. The right edge of IPs is discussed in Chapter 5. The IP presumably also has a head. I assume that the head of an IP is the final (rightmost) PP head which is directly dominated by that IP. It is unclear at this point whether there are any phonetic correlates of the IP head, i.e. if the head of the IP, as defined here, is in any way phonetically different from other head (H)LH-accents in the IP. Throughout this work I will leave this question open for future research to answer. Henceforth I shall refer to the head of IP as the \textit{nuclear accent} and to the areas preceding and following that accent as the \textit{pre-} and \textit{post-nuclear area} respectively (cf. Chapter 5).

Below the IP is the \textit{Phonological Phrase}, (PP). Since PP is below IP, there can be several PPs within one IP. The head of a PP is a prominence level 2-accent, i.e. a (H)LH-accent. Henceforth I shall refer to the head of PP as the \textit{head (H)LH-accent} (HA), and to the area preceding and following this accent as the \textit{pre-} and \textit{post-head} areas respectively. The PP head often occurs on a \textit{focused} constituent (focus here including the notion \textit{contrastive topic}, see section 3.1 where I define focus according to Krifka 2007, 2008). If a focused constituent consists of several words, it is the last HL-accented word of this constituent which is assigned the prominence level 2 accent (see 3.1). Therefore, in a default case, the head of a PP is assigned to the final HL-accented syllable in a PP. In some cases, however, the PP head is forced leftwards in the phrase. This can happen e.g. with narrow focus, as discussed in 6.3.2 and 7.3.4. See section 3.1 for a review of PP head placement. Before and after the head, there may be prominence level 1 accents. There are no boundary tones on either edge of the PP.

I assume that \textit{downdrift} applies within the PP as well as within the IP. This means that the pitch span is successively lowered throughout the phrase. At the left edge of every PP and IP the downdrift is reset, which means that the first peak of the PP or IP is higher than the last peak of the preceding PP or IP (note however, that the head of PP is not subject to downdrift, but is realized higher than the pre-head peaks, e.g. Bruce 1982:53 f.).

\(^8\) Note that initiality accents are reduced to HL-accents in a number of contexts. In this particular context it is not obligatory (see section 3.2).
Below the PP is the Accent Phrase, henceforth AP. The AP has a prominence level 1 accent, i.e. a HL-accent, as its head. For each HL-accent I shall assume that there is an AP. As with PPs, there is no independent evidence for the edges of APs. Therefore I assume that the AP boundaries occur at the same place as Prosodic Word boundaries (see below). HL-accents occur on most stressed words. However, they can also fail to appear, e.g. on verbs and some content words in lexicalized phrases. In such cases, a whole sequence of lexically stressed words form one AP. See chapter 4 for a discussion of the distribution of HL-accents.

Below the AP is the Prosodic Word, henceforth PW. The head of the PW is a lexical stress. Importantly, not all lexical stresses have a HL-accent, as was already mentioned, and as will be described in Chapter 4. This fact motivates separating the presence of lexical stresses and the presence of HL-accents. The edges of prosodic words can be recognized with the help of syllable boundaries. According to Riad (2009b), the syllable onset principle applies within, but not across prosodic words in Stockholm Swedish. This can be tested with morpheme boundaries within a word, where one morpheme ends with a consonant and the following morpheme begins with a vowel. The syllable onset principle demands that a consonant should be syllabified together with a following vowel. In Stockholm Swedish, the syllable onset principle fails to apply across a morpheme boundary if both morphemes are stressed. Thus, in compounds, and any other words with two stressed morphemes, the syllable onset principle is violated. This can be illustrated with the compound *mat-*olja ‘cooking oil’ (11)a. The syllable onset principle predicts the syllabification ma.tol.ja. However, the syllable boundary does not cross the PW boundaries, thus mat.ol.ja, as in (11)b.

(11) Matolja ‘cooking oil’: morphological structure vs. syllabification

a) Morphological structure:  
\[ ^2 \text{mat-} ^2 \text{olja} \]

b) Syllabification:  
\[ ^2 \text{mat} . ^2 \text{ol} . ^2 \text{j} . ^2 \text{a} (\ ^2 \text{ma} . ^2 \text{tol} . ^2 \text{ja}) \]

---

9 The AP as described here is close to the Prosodic Word in the Lund model. Here I reserve the term Prosodic word for non-tonal processes, which are arguably separate from the HL-accenting. The Lund model has no domain (other than the syllable) which can account for non-tonal prosodic phenomena. According to the Lund model a new prosodic word begins on a syllable which has a HL-accent, and continues until the next HL-accent. This means that the prosodic words are not aligned with word boundaries. In the present model such an assumption would be problematic since boundaries of other domains could not be aligned with the AP boundaries.

10 The term lexical is used in this thesis in several different contexts. It is used with stress and word accent to denote properties of individual morphemes. The use of lexical in lexicalized phrases is simply adopted from the authors Anward and Linell (1976), and when speaking of post-lexical processes I intend to denote such processes that apply productively on phonological structures of some kind. Thus, I make some general distinction between the lexicon and the morpho-syntax. However, no specific theory of the lexicon is adopted for the purposes of the present work.
However, the word *fånig* ‘foolish, silly’, which has only one stress on its first syllable, is syllabified as *få.nig* (12)b, even though the morphological structure is *fån-ig* ‘fool-ish’ (12)a. This is because the adjective suffix *-ig* is not stressed and does not form a separate PW. Instead *-ig* is incorporated into the preceding PW.

(12) *Fånig* ‘fool-ish, morphological structure vs. syllabification

a) Morphological structure:    fån-ig

b) Syllabification:     få.nig (*fån.ig*)

It should be noted, however, that the description of the prosodic word as a domain headed by one lexical stress is most likely not entirely satisfactory. At some level in the prosodic hierarchy compounds must also form a phonological domain, in order to account for the behavior of tonal phenomena within compounds. A range of questions remain concerning the relation between the AP and the PW level. However, they will have no major impact on the discussions in this work and will be left for future research. I refer to Riad (2009b) for a more extensive discussion on the PW in Stockholm Swedish.
3 Prominence level 2: the (H)LH-accent

This chapter is about the highest tonal prominence level in Stockholm Swedish, *prominence level 2*. I assume that this prominence level is expressed with a H*LH contour in accent 2 words and a L*H contour in accent 1 words (Chapter 2, Figure 1). Whenever the word accent distinction is irrelevant for the discussion, I use the term *(H)LH-accents* to denote the contour that is used to realize prominence level 2 in Stockholm Swedish.

In section 3.1, I discuss cases where *(H)LH-accent* mark some type of information structural category. This section shows that Swedish is similar to other Germanic languages in its use of tonal prominence. It contains a review of different types of information structure that have been distinguished in previous literature. Each English example is accompanied by a Swedish example illustrating the parallel between English and Swedish pitch accent distribution. The accents discussed in section 3.1 will be termed *head *(H)LH-accents* (HA). Head *(H)LH-accents* are heads of Phonological Phrases (PP). They appear on the *final* (rightmost) HL-accented word of a focused constituent. Usually, the edge of the PP is placed right after the head.11

In section 3.2, I develop the argument that *(H)LH-accents* also appear at the left edges of Intonation Phrases (IP). By increasing the prominence on the initial (leftmost) stress in the phrase, these accents mark left edges of IPs. I call *(H)LH-accents* that have this function *initiality *(H)LH-accents* (IA). Section 3.2 contains a discussion of the phonological properties of initiality *(H)LH-accents*, and presents the results from a number of recordings which reveal some of their distributional properties.

It can be noted that the two sections of this chapter are somewhat different in nature. Section 3.1 is mainly a review of previous research. Section 3.2, however, presents new data and arguments.

Figure 6 gives an overview of the functions of *(H)LH-accents*. Note that the term *(H)LH-accent* includes both head and initiality accents.

*(H)LH-accents* have been termed *focal accents* in much previous research.12 This use of the term focal accent is not adopted in the present work. Though there is a well attested relationship between focus and promi-

---

11 However, see the discussion around Figure 49 in Chapter 6 and Tableau 5 in Chapter 7, illustrating how a narrow focus can force the PP to assign its head to a non-final stress.

12 For discussion on focal accents and the terminology around it see e.g. Bruce (1998), Helder (2001), Hansson (2003) and Ambrazaitis (2009) for Swedish, and Fretheim (1990), Nilsen (1992), Kristoffersen (2000) and Abrahamsen (2003) for Norwegian. See also chapter 2 for a more extensive review of these and other works.
Prominence level 2, realized with a (H)LH-accent in Stockholm Swedish

initiality (H)LH-accent           head (H)LH-accent

head (H)LH-accent  marking focus in a topic constituent
(head (H)LH-accent marking focus in a comment constituent
(contrastive topic)

Figure 6. A hierarchical view of the functions of (H)LH-accent, and the terminology used to describe them.

Prominence level 2 in Norwegian as well as in Swedish intonation research, signaling focus is not the only function of the (H)LH-accent. Therefore, using the term focal accent to denote all (H)LH-accents becomes unclear in a number of contexts. Also, it confuses the separation of the tonal prominence marking contour from pragmatic focus. In the present model, the term focal accent most closely corresponds to (focus marking) head (H)LH-accent.13

I shall use the term prominence level 2 accents to denote all (H)LH-accents (including initiality as well as head (H)LH-accents) and the correspondents of (H)LH-accents in other Swedish and Norwegian dialects and varieties. This is because the tonal realization of prominence level 2 varies throughout the dialect area (cf. e.g. Bruce and Gårding 1978, Riad 1998, 2006, Bruce 2005, 2007 for a discussion and more references). I assume that the division of the (H)LH-accent into subgroups would carry over to prominence level 2 accents in other dialects as well. However, it remains a question for future research to confirm or reject this hypothesis.

3.1 Head (H)LH-accent

It is well known from previous research that the prominence level 2 accent is used to mark focus. It is also well known that given material is deprived of prominence level 2 accents (cf. Bruce 1977, 2005, 2007, Heldner 2001, Hansson 2003 on Swedish, and Fretheim 1990, Nilsen 1992, Kristoffersen 2000, Abrahamsen 2003 among others, on Norwegian). It is also known that

13 It may be noted, however, that under Krifkas definition of focus, all the uses of head (H)LH-accents could, in some way or other, be described as marking some type of focus.
a sentence generally has one prominence level 2-accent, which is assigned to the last (rightmost) stressed word. This led Bruce (1977) to call it a *sentence accent*, a term which was subsequently replaced by the now frequently used term *focal accent*. Several aspects of this accent have been studied since it was described by Bruce (1977) (Chapter 2).

However, none of the previous works known to me discusses the distribution of (H)LH-accent(s) in relation to the large body of literature that is available on pitch accent placement in other Germanic languages such as English, German and Dutch (see e.g. Selkirk 1984, 1995a, 2000, Cinque 1993, Féry 1993, Gussenhoven 1992, 2004, 2007, Féry and Samek-Lodovici 2006). This section aims to provide such a discussion. As one might have expected, it turns out that where authors have claimed to hear a strong pitch accent in other Germanic languages, there is generally a (H)LH-accent in Stockholm Swedish.

This section provides examples from the literature on pitch accent placement in Germanic languages (English examples are used, but some reference is also made to literature on German and Dutch). For every example a Swedish parallel is given, and the placement of head (H)LH-accent(s) is indicated with capitals.

I shall need to refer to a number of notions relating to the information structure of utterances. These notions include *focus* (and different types of it), *givenness*, *topic* and *comment*. Even though head (H)LH-accent(s) are not directly tied to any one particular type of information structural (nor syntactic) category, there are strong correspondences between head (H)LH-accent(s) and such categories. These notions have been extensively discussed in the literature and have also been given a wide variety of different definitions. For the sake of clarity, I shall use these terms in the sense of Krifka (2007, 2008).

However, the general conclusion drawn in this section is in principle compatible with several models of information structure, and is not limited to that of Krifka (2007, 2008). In that sense, it is not really crucial to my argument which model is adopted. Instead, what is important here, is that the examples used in the discussions on pitch accent distribution in Germanic languages have parallels in Stockholm Swedish, and that the factors which govern pitch accent distribution in other Germanic languages play a similar role for the placement of head (H)LH-accent(s) in Stockholm Swedish.

The data presented in this section is subsumed under the theoretical assumption that the head (H)LH-accent is the head of the *Phonological Phrase* (PP) (2.2, Chapter 6). This level corresponds roughly to the *Major Phrase* in the sense of Selkirk (1995a, 2000), to the *phonological phrase* in the sense

---

14 Cf. however the distribution of initiality (H)LH-accent(s) which are not governed by such factors, 3.2.
of Truckenbrodt (1999) and Féry and Samek-Lodovici (2006), and to the intermediate phrase in the sense of Beckman and Ayers (1994).

I will discuss focus, givenness and topic and comment in that order. After introducing each notion (mostly according to Krifka 2007, 2008), I review some examples which have been discussed in the literature. Each example is followed by a Swedish translation that illustrates the placement of (H)LH-accent(s).

3.1.1 Focus

For Krifka (2007, 2008) “focus indicates the presence of alternatives that are relevant for the interpretation of linguistic structures”. His definition of focus is formulated as in (13) (Krifka 2008:248). Definitions of focus along similar lines can be found in work within the framework of Alternative semantics (Rooth 1992).

(13) A property F of an expression α is a Focus property iff F signals (a) that alternatives of (parts of) the expression α or (b) alternatives of the denotation of (parts of) α are relevant for the interpretation of α.

3.1.1.1 Expression and denotation focus

The definition in (13) implies a distinction between what Krifka calls expression focus, (13)a, and denotation focus, (13)b.

Expression focus refers to focus of some aspect of the linguistic expression, such as the choice of words, or pronunciation. Such focus is often used for corrections.

Denotation focus refers to focus of the denotation of a linguistic expression. Thus, denotation focus on some linguistic expression signals that this expression refers to one alternative out of a set of alternatives. Krifka notes that the alternatives must be of the same type and that the alternative set may be restricted by the context of the utterance. He also notes that only meaningful units can be in focus.

An extreme case of a ‘meaningful unit’ in focus is when the truth value of the proposition is in focus. This is called verum focus and can be signaled with a pitch accent on an auxiliary, as in (14) (Krifka 2008:257). A Swedish translation of this sentence is given in (15)a. Henceforth I shall give double translations wherever needed. One translation is made word by word, and is marked with italics. An idiomatic sentence in English whose meaning roughly corresponds to the Swedish version is written within single citation marks.

As seen in (15)a, the corresponding Swedish sentence lacks auxiliaries altogether, and the verum focus is signaled by a (H)LH-accent on the sentence adverb visst ‘certainly’. It is also possible in Swedish to signal verum focus with an accent on an auxiliary. However, since Swedish lacks a corre-
respondence to the English auxiliary do, some other auxiliary is needed, as in (15)b, where a temporal auxiliary is (H)LH-accented with verum focus effect.

(14) She DOES like broccoli.

(15) a) Hon gillar VISST broccoli
   She likes certainly broccoli.
   ‘She does like broccoli’
   
   b) A: Hon har aldrig kört bil, eller hur?
   She has never driven car, or?
   ‘She never drove, did she?’
   B: Jo, hon HAR kört bil.
   Yes, she has driven car.
   ‘Yes, she did drive’

3.1.1.2 Pragmatic and semantic focus

Further, Krifka distinguishes pragmatic focus and semantic focus. This distinction refers to whether the placement of focus changes the truth conditions of the utterance or not.

Pragmatic focus is focus that does not affect the truth conditions of the sentence. Pragmatic focus can be subdivided into several different uses. One use of pragmatic focus is found in the answer of a wh-question. In such answers, focus is on the constituent which corresponds to the wh-constituent in the question. Such question–answer pairs have often been used in the literature to illustrate the placement of pitch accents under different information structural and syntactic conditions.

(16) a) A: What did Peter steal?
   B: Peter stole [the COOkie].
   
   b) A: Who stole the cookie?
   B: [PEter] stole the cookie.

(17) a) A: Vad stal Peter?
   what stole Peter
   B: Peter stal [KAkan].
   Peter stole cookie.DEF
   
   b) A: Vem stal kakan?
   who stole cookie.DEF
   B: [PEter] stal kakan.
   Peter stole cookie.DEF

Roughly, the focus in (16)a indicates that out of a set of alternatives of things that Peter might have stolen, it was the cookie that he stole. In (16)b, the focus indicates that out of a set of alternatives of people who might have
stolen the cookie, it was Peter who did so. This type of focus is pragmatic because the truth conditions of the answers do not change depending on the question. All that changes is how the truth conditions are construed. Thus, in (16) it remains true that Peter stole the cookie independently of whether the question and the focus marking is that in a or b. For Krifka, the type of focusing found in question–answer pairs like these play an important role in discourse structuring. He assumes that this type of focusing accommodates meanings of implicitly asked questions:

[All cases of so-called ‘presentational’ or ‘information’ focus which is claimed to express the most important part of the utterance, or what is new in the utterance, can be subsumed under the use of alternatives to indicate covert questions suggested by the context. [Krifka 2008:251]

In (18), questions like What happened?, What was there? and What did she do? are implied, and for Krifka these implicit questions explain the foci on the second clauses (2008:251). As seen in (19), the Swedish examples are parallel in this case too.

(18) a) And then something strange happened. [A meteorite fell down].
   b) Once upon a time, there was [a princess].
   c) Mary sat down at her desk. She [took out a pile of notes].

(19) a) Och sen hände något märkligt. [En meteorit föll ner].
   b) Det var en gång för länge sedan, [en prinsessa].
   c) Mary satte sig vid skrivbordet. Hon [tog fram en hög med anteckningar].

Pragmatic focus may also be used to correct or confirm some information. This is illustrated in (20) from Krifka (2008:23), where B illustrates corrective focus and B’ illustrates confirmation focus.

Corresponding Swedish examples are given in (21). Here it must be noted that Swedish can signal confirmation focus with a prominence level 1 accent or with a prominence level 2 accent (cf. the discussion in Ambrazaitis 2009). We return to the discussion of confirmations in Chapter 4.

15 Krifka refers to Klein and von Stutterheim (1987), van Kuppevelt (1994), Roberts (1996), and Büring (2003) for other accounts where implicit questions play an important role in discourse structuring.
Focus can also express contrasts, so called *contrastive focus*. Such focus is, according to Krifka (2008:259) most often corrective, but may also be additive, as in (22) and (23).

(22)  
A: John wants coffee.
B: Mary wants coffee, TOO.

(23)  
A: John vill ha kaffe.
B: Mary vill OCKså ha kaffe.

Another use of pragmatic focus is expressing *parallels*. Two such examples are given in (24).16

(24)  
(a) [Mary]_f stole the [Cookie]_f and [Peter]_f stole the [Chocolate]_f.
(b) An [American]_f farmer talked to a [Canadian]_f farmer.

(25)  
(a) [Mary]_f stal [Kakan]_f och [Peter]_f stal [chokLaden]_f.
(b) En [ameriKANSK]_f bonde pratade med en [kanaDENsisk]_f bonde.

The last use of pragmatic focus discussed by Krifka is *delimiting* focus illustrated in (26) and (27). This use includes the notion of *contrastive topic* as in (26)a and (27)a (see further 3.1.1.4). The other type of delimitation, *frame setters*, is illustrated in (26)b and (27)b. I return to the notion of contrastive topics in section 3.1.3.

(26)  
(a) As for [John]_f, he was seen in the [Kitchen]_f.
(b) In [MY]_f opinion [JOHN]_f stole the cookies.

16 We will return to the example in (24) and (25) in Chapter 7.
a) När det gäller [JOHN], så hade han sett i [KÖket].
   "As for John, he had been seen in the kitchen"

   "As for me, I believe that John stole the cookies"

The placement of semantic focus changes the truth conditions of the utterances, in contrast to pragmatic focus. Semantic focus can for example be induced by focus-sensitive particles, such as only, also and even. Thus, in (28)a the focus-sensitive particle only is associated with the focus on Bill whereas in (28)b it is associated with the focus on Sue. This causes different meanings of the a and b examples. In (28)a Bill was the only one to be introduced to Sue, but he could still have been introduced to other people than Sue as well. In (28)b, however, Bill was not introduced to anyone other than Sue, but Sue might have been introduced to other people than Bill. Krifka notes that several theories exist that try to account for the meaning of these particles and that most of them use the notion of alternatives in a similar way as it is used in Krifka's definition of focus (13).

(28)  a) Mary only introduced [BILL] to Sue.
    b) Mary only introduced Bill to [SUE].

(29)  a) Mary presenterade bara [BILL] för Sue.
    Mary introduced only Bill to Sue
    b) Mary presenterade bara Bill för [SUE].
    Mary introduced only Bill to Sue

3.1.1.3 Open and closed focus

Krifka also makes a distinction between open and closed focus, where open focus refers to a focus that has an unlimited set of alternatives, whereas closed focus has a limited set of alternatives, as in (30).

(30) A: What do you want to drink, coffee or tea?
    B: I want TEA

(31) A: Vad vill du dricka, kaffé eller te?
    What want you drink, coffee or tea?
    ‘What do you want to drink, coffee or tea?’
    B: Jag vill ha TE.
    I want have tea
    ‘I want to have tea’
3.1.1.4  Broad and narrow focus, focus projection

Further, Krifka distinguishes broad and narrow focus. This term pair is related to the size of a focused constituent. A broad focus focuses a larger constituent than a narrow focus.

When the focused constituent is longer than one word, the placement of the pitch accent that signals the focus is non-trivial. A rightward tendency for the placement of the pitch accent has been observed in English and other languages. This tendency was formulated by Chomsky and Halle (1968:18) as the Nuclear Stress Rule (NSR).

Later accounts have tried to relate the placement of pitch accents to syntactic structure. Selkirk (1995a) assumes that focus is marked in the syntactic structure with $F$-marks. She assumes that the so called Basic Focus Rule (32)i (1995a:555) combines with three principles of focus projection (32)ii (1995a:561). These three principles specify the way in which a pitch accented word may induce a focus interpretation on a larger constituent. Together, the focus projection principles and the basic focus rule “define the relation between accent and focus in languages like English, Dutch and German” (Selkirk 1995a:561). For Stockholm Swedish, the term accented in the Basic Focus Rule is to be interpreted as $\text{head (H)LH}$-accented.

(32)  

(i) **Basic Focus Rule**: An accented word is $F$-marked.

(ii) **Focus Projection**:

   a) $F$-marking of the head of a phrase licenses the $F$-marking of the phrase.

   b) $F$-marking of an internal argument of a head licenses the $F$-marking of the head.

   c) $F$-marking of the antecedent of a trace left by NP- or wh-movement licenses the $F$-marking of the trace.

(32) can account for the fact that the sentences in (33) are ambiguous with respect to the size of the focused constituent. Because *a book about bats* is an internal argument to the verb, the $F$-mark on this word can, but need not, license a focus interpretation on the whole VP, in accordance with (32)b. As seen in (34), the Swedish examples are entirely parallel to the English ones in this respect.

(33)  

   a) A: ‘What’s been happening?’
      B: [Mary bought a book about BATS]$^\flat$

   b) A: What did Mary do?
      B: Mary [bought a book about BATS]$^\flat$

---

17 See also Godjevac (2006:15) for a more extensive review of literature on focus projection.

18 The examples in (33) and (34) are due to Selkirk (1995a:554–555). Note however, that this is not the first time this ambiguity was observed. Cf. Gussenhoven (1992), Selkirk (1984).
c) A: What did Mary buy?
   B: Mary bought \([\text{a book about BATS}]_F\)

d) A: What kind of book did Mary buy?
   B: Mary bought a book \([\text{about BATS}]_F\)

e) A: What did Mary buy a book about?
   B: Mary bought a book \([\text{about BATS}]_F\)

\( (34) \)

a) A: Vad har hänt?
   ‘What has happened?’
   B: \([\text{Mary köpte en bok om FLADderMÖSS}]_F\)
   \(\text{Mary bought a book about bats}\)

b) A: Vad gjorde Mary?
   ‘What did Mary do?’
   B: Mary \([\text{köpte en bok om FLADderMÖSS}]_F\)
   \(\text{Mary bought a book about bats}\)

c) A: Vad köpte Mary?
   ‘What did Mary buy?’
   B: Mary köpte \([\text{en bok om FLADderMÖSS}]_F\)
   \(\text{Mary bought a book about bats}\)

d) A: Vad för sorts bok köpte Mary?
   ‘What kind of book did Mary buy?’
   B: Mary köpte \([\text{en bok om FLADderMÖSS}]_F\)
   \(\text{Mary bought a book about bats}\)

e) A: Vad köpte Mary en bok om?
   ‘What did Mary buy a book about?’
   B: Mary köpte \([\text{en bok om FLADderMÖSS}]_F\)
   \(\text{Mary bought a book about bats}\)

(32) also predicts a difference between complements and adjuncts. Whereas complements are internal arguments to the VP, adjuncts are not. Therefore, the former can project their F-mark onto the whole VP, whereas the latter cannot. This is illustrated in (35), where the PP \textit{at the garden} is an internal argument to the verb \textit{looked}, whereas the PP \textit{in the tent} is an adjunct. Accordingly, an F-mark on the PP \textit{at the garden} can project onto the whole VP, whereas the PP \textit{in the tent} cannot. Thus, one F-mark (and one pitch accent) is required for the verb + complement PP to be interpreted as focused as in (35)b and (36)b, whereas two F-marks (and two pitch accents) are required for the verb + adjunct PP to be interpreted as focused, as in (35)d and (36)d. As indicated by the direct translations of these sentences into Swedish, a similar distinction appears to exist in both languages. It should be noted, however, that experimental evidence may be needed in the case of Swedish before this can be confirmed.
(35)  a) He only looked [at the GARden]\textsubscript{f}
    b) He only [looked at the GARden]\textsubscript{f}
    c) He only smoked [in the TENT]\textsubscript{f}
    d) He only [SMOKED in the TENT]\textsubscript{f}

(36)  a) Han tittade bara [på TRÄDGÅRden]\textsubscript{f}
      he looked only at garden.DEF
    b) Han [tittade bara på TRÄDGÅRden]\textsubscript{f}
      he looked only at garden.DEF
    c) Han rökte bara [i TÄLtet]\textsubscript{f}
      he smoked only in tent.DEF
    d) Han [RÖKTE bara i TÄLtet]\textsubscript{f}
      he smoked only in tent.DEF

Some intransitive verbs allow the whole sentence to be interpreted as focused when the subject is accented. This is exemplified in (37) where B but not B’ is a felicitous answer to a question that requires the whole sentence to be focused. All intransitive verbs, however, do not behave this way, as illustrated by (38). The generalizations basically seem to hold also for Swedish. (see e.g. Selkirk 1995a, Adger 2007, Féry 1993, Kratzer and Selkirk 2007).

(37)  a) A: What happened?
    B: [The SUN came out]\textsubscript{f}
    B’: *[The sun came OUT]\textsubscript{f}
    b) A: Vad har hänt?
       ‘What has happened?’
    B: [SOlen har kommit fram]\textsubscript{f}
       sun.DEF has come out
    B’: *[Solen har kommit FRAM]\textsubscript{f}
       sun.DEF has come out

(38)  a) A: What happened?
    B: [Anna SNEEZED]\textsubscript{f}
    B’: *[ANna sneezed]\textsubscript{f}
    b) A: Vad har hänt?
       ‘What has happened?’
    B: [Anna NÖS]\textsubscript{f}
       Anna sneezed
    B’: *[ANna nös]\textsubscript{f}
       Anna sneezed

This distinction is also related to the distinction between individual-level and stage-level predicates, as exemplified in (39) (Selkirk 1995a, Gussenhoven
2007, Krifka 2007, 2008) Once again, the Swedish (H)LH-accent distribution is parallel to the nuclear accent placement in English.

(39)  A: Why are you looking at me?
      B: [Your EYES are red]$_f$
      B': [Your EYES are BLUE]$_f$

(40)  A: Varför tittar du på mig?
      ‘Why are you looking at me?’
      B: [Dina ÖGON är röda]$_f$
      your eyes are red
      B': [Dina ÖGON är BLÅ]$_f$
      your eyes are blue

A similar distinction appears to exist between the accenting of sentences with verbs that take a small clause as their complement on the one hand and, on the other hand, sentences with verbs that take a direct object and control structure, as shown in (41) (Gussenhoven 1992, Selkirk 1995a). Swedish data is parallel to English data in this case, too.

(41)  a)  A: What did you hear?
      B: I heard [a CLOCK tick]$_f$
      B': *I heard [a clock TICK]$_f$

b)  A: What did you do?
    B: I forced [the clock to TICK]$_f$
    B': *I forced [the CLOCK to tick]$_f$

(42)  a)  A: Vad hörde du?
      ‘What heard you?’
      B: Jag hörde [KLOCKAN ticka]$_f$
      I heard clock.DEF tick
      B': Jag hörde [klockan TICKA]$_f$
      I heard clock.DEF tick

b)  A: Vad gjorde du?
    ‘What did you do?’
    B: Jag tvingade [klockan att TICKA]$_f$.
    I forced clock.DEF to tick
    B': *Jag tvingade [KLOCKAN att ticka]$_f$.
    I forced clock.DEF to tick

Some accounts of pitch accent distribution have assumed that the pitch accent placement is (only or in part) due to a set of interacting Optimality Theoretic (OT) constraints (e.g. Selkirk 2000, Truckenbrodt 1999, see 6.1 for a discussion about OT). Féry and Samek-Lodovici (2006) use this frame-
work to develop the claim that pitch accents are not directly tied to F-marks. Instead, they assume that there are constraints on the prosodic structure specifying that heads are aligned with the right edges of their phrases, and constraints saying that focused constituents must have prosodic prominence whereas given constituents must not. Together, these principles predict rightmost pitch accent placement on focused constituents. However, Féry and Samek-Lodovici (2006) claim that these principles also offer an account of why examples like those in (43)a and b do not have rightmost accent placement. The explanation is roughly that since there are several embedded foci, one single pitch accent on the deepest embedded focus simultaneously ensures that all foci are prosodically prominent. As shown in (44) the strongest prominences appear in the same place in the Swedish translations of these sentences, as they do in the English sentences.

(43)  a)  Father: What happened?
    Mother: You know how I think our children should read decent books.
    Well, when I came home, rather than doing his homework,
    [Johnny [was reading [Superman]F3 to some kid]F2]F1

(44)  a)  [Johnny [läste [STÅLMAnnen]F3 för nån unge]F2]F1
    Johnny read Superman to some kid

We return to these examples and to the discussion by Féry and Samek-Lodovici (2006) in Chapter 7, where I use parts of their framework in an account of the syntax–prosody interface in Swedish.

3.1.2 Givenness and Second Occurrence Focus

For Krifka (2007, 2008), *givenness* has to do with whether the denotation of some expression is already present in the *Common Ground* (CG). He defines givenness as in (45) (Krifka 2008:262).

(45)  A feature X of an expression α is a Givenness feature iff X indicates whether the denotation of α is present in the CG or not, and/or indicates the degree to which it is present in the immediate CG.

---

Note that neither of these two constraints are originally due to Féry and Samek-Lodovici (2006). See a more detailed discussion in Chapter 7.

Krifka (2008:245) says that “the original notion of CG [Common Ground] (cf. Stalnaker 1974, Karttunen 1974, Lewis 1979) saw it as a way to model the information that is mutually known to be shared and continuously modified in communication”.

---

19 Note that neither of these two constraints are originally due to Féry and Samek-Lodovici (2006). See a more detailed discussion in Chapter 7.
20 Krifka (2008:245) says that “the original notion of CG [Common Ground] (cf. Stalnaker 1974, Karttunen 1974, Lewis 1979) saw it as a way to model the information that is mutually known to be shared and continuously modified in communication”.
There are several means by which givenness can be linguistically marked. First, some linguistic expressions inherently include the notion of givenness. Such expressions are for example personal pronouns and demonstratives. Givenness can also be marked by positional effects. For example Krifka claims that given constituents precede new constituents in double object structures of many free word order languages (Krifka 2008:263).

Krifka also discusses the fact that expressions which denote given features are subject to reductions of different kinds. An extreme form of reduction is deletion, but there is also the widely observed tendency that given material is prosodically non-prominent. This is illustrated in (46) from Krifka (2008:264). In (46)B, the whole VP is focused. Nonetheless, the pitch accent appears on the verb returned, not on the object the cookie. Supposedly, this is due to the fact that the object is given in the previous context.

A similar generalization holds for Swedish as well. Thus, in (47), the verb stal ‘stole’ receives a head (H)LH-accent, and no (H)LH-accent appears on the object kakan ‘the cookie’.

\[\text{(46) A: I know that John stole a cookie. What did he do then?}
\text{B: He [reTURNED [the cookie]}_{\text{G}}{]}_{\text{F}}\]

\[\text{(47) A: Jag vet att John stal en kaka. Vad gjorde han sen?}
\text{I know that John stole a cookie. What did he then?}
\text{B: Han [lämnade tillBAka [kakan]}_{\text{G}}{][]}_{\text{F}}\]
\text{he left back cookie.DEF}
\text{‘He returned the cookie’}

In Stockholm Swedish, however, given material is not completely deaccented. Even in given material the distinction between HL-accenting and no tonal prominence is retained. Thus, in (47), the object kakan is HL-accented.

The relation between HL-acents and givenness is elaborated upon in 4.3.

3.1.3 Topic

Krifka (2007, 2008) assumes that information is added to the content of the Common Ground (CG) in a structured way. The organization of the CG content is compared to a file card system, where new information is added to file cards. In this comparison, the role of topics is to indicate which file card new information should be added to.\(^{21}\) Krifka (2008:265) defines the notion of topic as in (48). He refers to the non-topic part of the sentence as comment. (It should be noted that the notion of comment is not identical to focused nor to new.)

---

\(^{21}\) Krifka follows Reinhart (1982) in this assumption.
The topic constituent identifies the entity or set of entities under which the information expressed in the comment constituent should be stored in the CG content.

Topics are often given in the previous context. In such cases, the file card that the new information in the comment should be added to is an already existing one. This is the case in (49). However, a topic may also be new information, in which case a new file card must be created before the new information is added. Such an example is seen in (50). The examples in (49) and (50) are adopted from Krifka (2008:256).

(49) a) [Aristotle Onassis]_{topic} [married Jacqueline Kennedy]_{comment}.
    b) [Jacqueline Kennedy]_{topic} [married Aristotle Onassis]_{comment}.

(50) [A good friend of mine]_{topic} [married Britney Spears last year]_{comment}.

In Krifka’s (2007, 2008) model, contrastive topics are topics that contain a focus. Such topics have been widely discussed in the literature (e.g. Büring 2007, Molnár 1998). The function of contrastive topics is often to mark that some requested piece of information is only partly provided by the utterance. Krifka formulates this as: “an issue is split into sub-issues” (2008:268). This is illustrated in (51), where siblings are split into sister and brother. My sister and my brother are highlighted by the contrastive topic as being alternatives in an alternative set, and therefore fulfill the requirement for focus in (13). Simultaneously they fulfill the requirements for topic in (48), since they are the constituents about which the new information in the comment constituents is predicated.

(51) A: What do your siblings do?
    B: [My [SISTer]_{topic} [studies MEDicine]_{r}, and [my [BROther]_{topic} is [working on a FREIGHT ship]_{r}.

However, Krifka (2008:268) notes that contrastive topics occur in other contexts as well, as exemplified in (52) and (53).

(52) A: Where were you (at the time of the murder)?
    B: [[Hr]_{topic} [was [at HOME]_{r}]_{comment}.

(53) A: Does your sister speak Portuguese?
    B: [My [BROther]_{topic} [DOES]_{r}]_{comment}.

In English, contrastive topics are marked with a rising accent (Krifka 2007, 2008). In Stockholm Swedish they are marked with a (H) LH-accent. This (H) LH-accent occurs on the last stress of the contrastive topic constituent. This phrase final placement of the accent crucially distinguishes it from an initiality accent (to be discussed in 3.2). (H)LH-accents marking topic are
rarely followed by a boundary tone. Because there is no boundary tone, the last H of the (H)LH-accent forms a plateau to the next HL-accent.\textsuperscript{22}

Thus, in the Swedish translations of (51)B and (52)B, there will be two (H)LH-accents, one on the contrastive topic and one within the focus in the comment, as indicated by the capitalization in (54) and (55).

\begin{enumerate}
\item[(54)] [Min [SYSter]\textsubscript{T}Topic [pluggar mediCIN]\textsubscript{T}, och [min [BROR]\textsubscript{T}Topic
\begin{itemize}
\item my sister
\item studies medicin
\item and my brother
\end{itemize}
\text{works on a freight ship}]
\end{enumerate}

\begin{enumerate}
\item[(55)] a) [JAG]\textsubscript{T}Topic [var HEMma]\textsubscript{T}Comment.
\begin{itemize}
\item I
\item was home
\end{itemize}

b) [Min [BROR]\textsubscript{T}Topic [[gör det]]\textsubscript{T}Comment
\begin{itemize}
\item my brother
\item does that
\end{itemize}
\end{enumerate}

In a translation of the sentence in (53)B, however, there is only one single (H)LH-accent, on the focus within the topic constituent. This is probably due to the fact that the whole comment constituent is given in the previous context. In this sense this sentence is similar to a confirmation focus. The pattern in (55)b, where the topic constituent contains the only (H)LH-accent in the sentence, is a regular realization of a confirmation even when the topic is given as well. This is illustrated in (56). I return to this particular example in section 3.2, and to the status of the HL-accent as a marker of focus in given sentences in Chapter 4.

\begin{enumerate}
\item[(56)] A: Jag har hört att du kom i kontakt med Lärarnas Riksförbund redan under förra året. Är det sant?
\begin{itemize}
\item I have heard that you came in contact with the Teachers’
\item Organization already last year. Is it true?
\end{itemize}

B: [Lärarnas RIKSförBUND [kom jag i kontakt med under teachers.DEF. organization came I in contact with during
\begin{itemize}
\item förra året.DEF]
\end{itemize}]
\begin{itemize}
\item last year.DEF
\end{itemize}
\begin{itemize}
\item ‘The teachers’ organization I came into contact with last year’
\end{itemize}
\end{enumerate}

3.1.4 Summary and a theoretical comment

This section has shown that (H)LH-accents can mark a constituent in a clause as being focused within a topic or within a comment constituent (for terminology see Krifka 2007, 2008). The (H)LH-accent appears on the last stressed word of the focused constituent, see e.g. (33) and (34) for (H)LH-
accents that mark focus in a comment constituent, and in (56) for (H)LH-accents within topic constituents.

I shall assume that all the (H)LH-accents that were discussed in this section are so called head (H)LH-accents. They are head accents because they are heads of Phonological Phrases, PPs (see section 2.2).

I have also shown here that there can be more than one (H)LH-accent in a sentence, as in section 3.1.3. Henceforth, I shall assume that the last of these is the head of an IP, if the whole sentence is phrased as a single IP, i.e. if they are not separated by any boundary tone (cf. Chapters 2, 5 and 6 for examples that discuss the presence or absence of boundary tones). I refer to heads of IPs as nuclear accents.

3.2 Initiality (H)LH-accents

In the previous section, 3.1, I showed that the distribution of (H)LH-accents in Stockholm Swedish largely depends on the information structure of the sentence. This dependence is similar in Stockholm Swedish as in other Germanic languages such as English, Dutch and German. Thus, as for the data presented in 3.1, it can be said that (H)LH-accents constitute prosodic heads in PPs and that they are markers of some information structural categories.

In the present section, it will be shown that (H)LH-accents also frequently appear initially in Intonation Phrases (IP). Importantly, such initial (H)LH-accents appear independently of any particular information structural category on the words which carry them. Instead, this accent marks the left edge of a phrase by increasing the prominence on the leftmost stress of the phrase. (H)LH-accents which have this function will be termed initiality (H)LH-accents.23 I shall sometimes use the shorter term initiality accents with the same meaning. Initiality accent will sometimes be abbreviated IA in this section and henceforth in the thesis.

The initiality accent is represented with the same tonal sequence as the head (H)LH-accent. An accent 2 word with an initiality (H)LH-accent is thus assigned a H*LH contour, whereas an accent 1 word is assigned a L*H contour.

The definition of an initiality accent is presented in (57):

(57) An initiality accent is a (H)LH-accent which:

a) is assigned to the initial (i.e. leftmost) HL-accent of the Intonation Phrase (IP) phrase in which it occurs.

b) does not mark the word on which it appears as part of a focus of any type (the definition of focus assumed here is that of Krifka 2007, 2008, thus including e.g. the notion of contrastive topic).

---

23 Much of the data presented in this section was previously published in Myrberg (2009).
This definition draws on the two crucial differences between head accents and initiality accents. Head accents are associated with the final stress in the phonological constituent where they are assigned (with few exceptions, cf. 6.3.3 and 7.3.3). Also, head accents generally mark a constituent as a focus of some type. Thus, the presence of a head (H)LH-accent on a word means that this word is a part of or by itself constitutes a domain which is focused (including the notion of prosodically prominent topics, 3.1). Initiality accents, however, have neither of these two properties.

The panel in Figure 7 illustrates an initiality (H)LH-accent. This panel shows a sentence where the VP-constituent is focused, whereas the subject is given. As indicated on the bottom tier, there is one (H)LH-accent on the final word of the sentence åtgärdas. This word is perceived as the most prominent word in the sentence. In addition to the (H)LH-accent on åtgärdas, however, there is also a (H)LH-accent on dåliga, which is the initial word of the sentence.

The (H)LH-accent on dåliga ‘bad’ in this sentence meets the criteria for an initiality accent. First, it appears on the initial word of the IP. Second, it does not mark a focus within a topic nor a comment constituent. Note that any accent which would mark the whole subject as a focus within a topic or a comment constituent would have been analyzed as a head accent. Crucially, such an accent would have appeared on the last stress of the subject, lagningar ‘repairs’. This is because head accents are oriented towards the right edge of the phrase (3.1). After the initiality (H)LH-accent there is a plateau which stretches to the following HL-accent (cf. the discussion in 2.1).
The following sections contain a discussion of initiality accents. It is organized as follows. I begin by illustrating various realizations of initiality (H)LH-accents (3.2.1). Then I move on to discuss the distribution of such accents (3.2.2). Thereafter, I discuss in some detail how previous researchers have analyzed this phenomenon and compare these accounts to the one I give here (3.2.3). Finally I explain how the initiality accent can be thought of in terms of an edge prominence, drawing on the Phrase Edge Prominence constraint suggested by Selkirk (1995a) (3.2.4).

3.2.1 Realizational properties of initiality (H)LH-accents

An example of an accent 2 initiality (H)LH-accent was given in Figure 7. Figure 8 illustrates an accent 1 initiality (H)LH-accent.

![Figure 8. Initiality accent on the accent 1 word förstörda ‘broken’, which is assigned a L*H accent. The head(H)LH-accent of the phrase is on the final word åtgärdas ‘be attended to’. The utterance is from the set of test recordings in the material (see Table 1).](image)

Just as is the case with the head (H)LH-accent, the LH-part of the initiality accent associates with the secondary stress of a compound, as illustrated in Figure 9 (the secondary stress of a compound is the rightmost one, see section 2.1.3).

As was already noted, a word which is assigned an initiality accent is not perceived as focused on a par with a word that carries a head (H)LH-accent. A simple question-answer test can illustrate this. Figure 7, Figure 8 and Figure 9 illustrated answers to context questions inducing VP-focus. These answers were all realized as one single IP, with an initiality (H)LH-accent on the initial word and a head (H)LH-accent on the final word.

A context question that induces narrow focus on the initial word, however, triggers a contour where there is no head (H)LH-accent on the last stress of the phrase, as in Figure 10. Instead the head (H)LH-accent occurs on the focused word, which is the initial one. Note also that in Figure 10, the
The transition period between the two systems can be complicated.

Dåliga gamla lagningar måste åtgärdas, which is associated with the last secondary stress, and in this sense behaves like the L*H in a head (H)LH-accent. The head (H)LH-accent of the phrase is on the final word krånglig ‘complicated’. The utterance is from experiment 3 (see Table 1).

Perhaps the most striking difference between the realization of head (H)LH-accents and initiality (H)LH-accents, is their timing properties. The final H of the head (H)LH-accent is usually realized on the syllable immediately following the (H)L sequence (Bruce 1987). This tone is referred to as the focal tone or focal H in much previous literature, Chapter 2.
Figure 11. Assimilating initiality HL*H-accent on många ‘many’. The last H of this accent is assimilated into the H of the following H*L accent on rostiga ‘rusty’. The head (H)LH-accent of this phrase is on the last word kastade ‘thrown away’ (note that the voice is creaky at the end of the utterance, which is why the characteristic two peak contour is not seen in the pitch track). The utterance is from the set of test recordings in the material (see Table 1).

case of initiality (H)LH-accents, however. In the IA, the final rise often (but not always) floats away to the right. It can float so far that it completely assimilates with a following HL-accent. If this happens, there is no plateau between the IA and the following HL-accent. Instead there is a steady rise from the syllable that is assigned the IA to the syllable which carries the HL-accent closest to the IA. This is illustrated in Figure 11.

A similar, but less extreme, tendency to rightward drifting can be observed in Figure 7, where the last H of the initiality accent is realized on the last syllable of the initial word.

This timing difference is observed by Horne (1994), Horne et al. (1999), as well as by Roll (2004, 2006, 2009) and Roll and et al. (2009). However, in these accounts, a complete assimilation, like that in Figure 11, is assumed to be very general or even obligatory. We shall return to these accounts in section 3.2.3.

I do not assume that such assimilation is a defining criterion of the initiality (H)LH-accent. Instead it is regarded here as a tendency for the last H in the initiality to drift rightward. Thus, there are IAs which do not assimilate in this way. For example there is a clear plateau after the IA in Figure 7, even though this accent is later timed than the standard assumption would predict for a head (H)LH-accent. It is unclear what causes this timing difference. It is also unclear what governs the degree of assimilation. I leave this question open to future research.

The type of contour seen in Figure 11, which has complete assimilation between the initiality (H)LH-accent and the following HL-accent, might be

---

25 Roll et al. (2009) has also been published in Roll (2009:88–107).
Figure 12. Initiality accent on Maria, but the word många ‘many’ is not assigned an initiality accent here, since it is not phrase initial. Therefore, många ‘many’ as realized here contrasts with the same word in Figure 11, where it does have an initiality accent. The focus marking head (H)LH-accent on this phrase is on the last word kastade ‘thrown away’ (note that the voice is creaky at the end of the utterance, which is why the characteristic two peak contour is not seen in the pitch track). The utterance is from the set of test recordings in the material (see Table 1).

mistaken for a sequence of HL-accents, (one on många ‘many’ and one on rostiga ‘rusty’). However, there are two indications that such an analysis is wrong, and that instead, the first accent must be analyzed as a (H)*LH-accent instead of just HL. First, the second peak is considerably higher than the first. Had this been a matter of sequential HL accents, we would have expected the second one to be lower than, or possibly equally high as, the first, due to downdrift. The height of the second peak on rostiga ‘rusty’ can also not be explained by any apparent pragmatic or information structural factors in this case.

Second, the contour in Figure 11 contrasts with a contour where there is only a H*L accent on många, auditably as well as visually. Such a contour is shown in Figure 12. The crucial difference between the context in Figure 11 and Figure 12 is that in Figure 11 the word många is the first word of a main clause whereas in Figure 12 it is the first word in a non-initial embedded clause. Figure 12 then, shows a pronunciation of a similar sentence, except here the clause is not phrase initial. In this context, there is no rise on the second syllable of the words många or (unstressed and unaccented) gamla. Instead the tone stays low until the next HL-accent on urverk. Note that in the sentence in Figure 12, there is an initiality (H)LH-accent on Maria, which is the initial word of the main clause.

The initiality (H)LH-accent can also be realized in a high and narrow pitch span. In such cases it can be difficult or impossible to visually recognize the characteristic H*LH/L*H pattern of an IA. This type of contour is illustrated in Figure 13, where the IA is similar to a high plateau.
Figure 13. Illustration of an initiality (H)LH-accent in a narrow and high register, on många ‘many’. The utterance is from the set of test recordings in the material (see Table 1).

Figure 14. Illustration of a high realization of an accent 1 word. An informant was asked to read the following piece of text, as part of a recording session:

A: Poland was invaded by Germany in 1939. Who gave the orders?  B: Hitler gave the orders’. The utterance is from the set of test recordings in the material (see Table 1).

As can be seen in Figure 13, the pitch stays high until the first HL-accent, where it falls crisply and is considerably lowered. This is analyzed here as plateau formation from the last H of a (H)LH-accent to an adjacent HL-accent. Such plateau formation is very generally observed after both head and initiality (H)LH-accents (cf. Bruce 1977, 1987).

It appears that the difference between accent 1 and 2 remains even in the high realization of the IA. Figure 14 and Figure 15 illustrate the difference between an accent 1 and an accent 2 word. As an informal confirmation that the difference between these two sentences is audible to a native speaker, the
A: The drill that is used to break the hardest sediment of the sea bed, may break at the first attempt. Why is this? B: At the time of the first attempt the bed is more compressed than at the second attempt. The utterance is from the set of test recordings in the material (see Table 1).

initial word in each sentence was presented in isolation to four informants (who were all speakers of Stockholm Swedish). Three were able to distinguish between them without any hesitation, only the fourth could not say.26

It is my assumption at this point that the high realization of the initiality accent is a pitch span effect, possibly originating in the tendency for a new phrase to start high.

3.2.2 The distribution of initiality (H)LH-accents

Not all IPs have an initiality (H)LH-accent. This raises the question what determines the distribution of such accents.

In order to investigate the distribution of initiality accents, four sets of recordings were carried out. Each set was targeted to test a specific set of hypotheses concerning the distribution of initiality accent with respect to syntactic, pragmatic or prosodic factors. Three informants, two female and

26 It should be noted that the accent 2 pålen ‘the pole’ was pronounced much slower than the accent 1 Polen ‘Poland’. Therefore it was easy for the informants to identify this word, whereas the accent 1 word was harder to identify. I consider the fact that the accent distinction can be expressed in this type of context as the relevant piece of evidence that it is phonologically preserved. It is still possible, and I think even expected, that it might not be clearly audible in each and every instantiation.
one male, aged between 32 and 52 years participated in the three first experiments. In the fourth one, only one of the informants read the set of sentences. All in all, the three experiments resulted in a corpus of 219 sentences.

The recordings were analyzed by myself with regard to the presence of an initiality accent on the initial stressed syllable and placement of the head (H)LH-accent(s) in the rest of the clause.

All target words are accent 2 words. This is because the accent 2 double peaked initiality accent is more easily distinguished from a HL-accent than the single peaked accent 1 initiality accent. It is assumed that the results can be generalized to accent 1 words, since there is no reason to believe that accent 1 and accent 2 words are assigned different levels of prominence (cf. Bruce 2005:411).

The experiments are introduced in 3.2.2.1–3.2.2.4. In 3.2.2.5–3.2.2.7 the results from the recordings are organized in terms of the conclusions that can be drawn from the whole set of recordings. Thus, the results from each recording set is not presented separately. See also Chapter 7 for further discussion on the results of these recordings in terms of an OT-analysis.

### 3.2.2.1 Experiment 1

Experiment 1 was designed to study how phrasing is affected by the interaction between syntactic structure, sentence length and information structure. Only subjects in Spec,CP position were studied. There were two sentential subjects and two NP subjects (one of which had a pre-modifier and the other of which had post-posed PP complement). Each of the 4 syntactic subject types occurred in a long variant and a short variant. Thus, there were 8 sentences in the data set. Each of the 8 sentences was read five times by each informant, and each reading was triggered by a different context question intended to invoke a specific focus structure. The different focus structures are exemplified in (58). All in all, each of the three informants was asked to read 40 sentences: 2 types of subjects x 2 examples of each x 2 different lengths of each subject x 5 information structural contexts.

(58) The five different focus conditions under which each sentence was tested:

- **a) Focus on the VP, the subject is given information.**
  
  A: Det har kommit en ny rapport från LO. Vad står det där om skillnader i löneavtalen?
  
  ‘There is a new report from the Workers’ Union. What does it say about differences in agreements on wages?’
  
  B: Skillnader i löneavtalen kan påverka möjligheten att få tjänstedledigt.
  
  ‘Differences in agreements on wages may affect one’s possibility to take a leave of absence’.
b) **All new focus on the whole sentence.**

A: Det har kommit en ny rapport från LO. Vad stod det i den rapporten? ‘There is a new report from the Workers’ Union. What does that report say?’

B: Skillnader i löneavtalen kan påverka möjligheten att få tjänstledigt. ‘Differences in agreements on wages may affect one’s possibility to take a leave of absence’.

c) **Contrastive focus on both the subject and the VP.**

A: Det har kommit en ny rapport från LO. Vad stod det i den rapporten? ‘There is a new report from the Workers’ Union. What does that report say?’

B: Skillnader i löneavtalen kan påverka möjligheten att få tjänstledigt men olika avtal om övertidsersättning påverkar bara möjligheten att kunna arbeta hemifrån. ‘Differences in agreements on wages may affect one’s possibility to take a leave of absence, but different agreements on compensation only affects the possibility of working from home’.

d) **Narrow focus on the subject.**

A: Vad kan enligt LO:s rapport påverka möjligheten att få tjänstledigt? ‘What may affect one’s possibility to take a leave of absence, according to the Workers’ Union?’

B: Skillnader i löneavtalen kan påverka möjligheten att få tjänstledigt. ‘Differences in agreements on wages may affect one’s possibility to take a leave of absence’.

e) **Narrow focus on the subject, with the rest of the main clause omitted.**

A: Vad kan enligt LO:s rapport påverka möjligheten att få tjänstledigt? ‘What may affect the possibility to take a leave of absence, according to the Workers’ Union?’

B: Skillnader i löneavtalen. ‘Differences in agreements on wages’.

The informants were asked to read both the context question and the answer out loud in a way that they thought sounded natural, and were instructed to repeat the sentence if they thought it sounded unnatural.

3.2.2.2 **Experiment 2**

Experiment 2 was designed to study the phrasing of (adverbial) embedded clauses in Spec,CP position. The three informants were given a number of sentences and an appropriate context for each sentence. They were asked to read the context silently to themselves and then to read the sentence out loud, in a way that would suit the context, but without being too theatrical. They were allowed to repeat the sentence if they felt that the first attempt did not sound natural. The recording was running continuously. The test sen-
sentences were of two types: the first type consisted of a main clause with a conditional sub-clause in Spec,CP position (59), and the second type consisted of two coordinated main clauses where the first one expressed a condition to the second one (59).

(59) Structure of the test sentences in experiment 2:

a) \([S \ VP]_{CP} \ S \ VP]_{CP}\)
   
   \([\text{Om hundar ska bli rumsrena} \text{ så måste deras ägare lära dem det.}]\)
   
   \([\text{‘If dogs are to get house trained] their owners must teach them’}]\)

b) \([S \ VP]_{CP} \ [S \ VP]_{CP}\)
   
   \([\text{De andra skulle vara utklädda}] \ [\text{så Anna ville inte vara med.}]\)
   
   \([\text{‘The others were getting dressed up] [so Anna didn’t want to come’}]\)

There were three sentences of type (59)a (adjunct clause + main clause), and three sentences of type (59)b (main clause + main clause). This made a set of 6 test sentences. Each informant was asked to read the full set of sentences three times. Two of the repetitions were used in the experiment.

3.2.2.3 Experiment 3

Experiment 3 was designed to study the hypotheses that a) in a two-word sentence like \(\text{Hanna vände} \) ‘Hanna turned’, there is an initiality (H)LH-accent on the subject as well as a head (H)LH-accent on the verb, b) there is no initiality accent in a sentence, if the Spec,CP position contains only unstressed material as in \(\text{de ville inte följa med} \) ‘they didn’t want to come along’ and c) the initiality (H)LH-accent behaves like a head (H)LH-accent in a compound (as presented in Figure 9). Experiment 3 consisted of 17 sentences and as in experiment 1, the three informants were asked to read the target sentences preceded by a context question.

3.2.2.4 Experiment 4

Experiment 4 contained a set of six main clauses with embedded clauses in the VP. Three of the main clauses contained an embedded clause with main clause word order. The other three main clauses were parallel to the three first, except that the embedded clause had embedded clause word order. This set of sentences was designed to illustrate the difference in phonological phrasing between embedded clauses with main clause word order and embedded clauses with embedded clause word order.

In Swedish, embedded clauses usually have sentence adverbials before the finite verb. In contrast, main clauses have sentence adverbs after the finite verb. There are, however, some verbs which can take embedded clauses with either word order as complements (Teleman et al. 1999:537–539, vol. 4). As noted by Roll (2004, 2006, 2009) and Roll et al. (2009), embedded clauses with main clause word order generally have an initiality (H)LH-
accent, whereas the embedded clause word order complement clauses generally do not have such an accent. (Note, however, that Roll has a different terminology to talk about this phenomenon. His analysis is more carefully reviewed in section 3.2.3).

The sentence set here aims to add one point to Roll’s observations. In sentences where the embedded complement clause is marked with an initiality (H)LH-accent, the main clause can contain another initiality accent. In such cases two initiality accents are either adjacent on the tonal tier, or are only separated by HL-acents. The existence of such structures will have consequences for the analysis of prosodic branching in Chapters 6 and 7.

3.2.2.5 Vicinity to a head (H)LH-accent

In the results from experiment 1, there are quite strong indications that the probability of having an initiality (H)LH-accent decreases in the immediate vicinity of a head (H)LH-accent. This is interpreted here as reduction of the initiality accent in order to avoid stress clash between the initiality and the head accent.

The strongest tendency for such reduction of the initiality (H)LH-accent can be observed when the subject is narrow focused. As described in the previous section, there were two types of narrow focus on the subject in the experiment. In one type, the VP was not omitted (8 sentences, (58)d). In the other type the VP was omitted (8 sentences, (58)e). Because there were 3 informants, the corpus contains 48 sentences with a narrow focus on the subject. In all of these 48 sentences, the subject had a head (H)LH-accent on the final stress, and (with 2 exceptions), this head (H)LH-accent was followed by a L%. In only 14 of the 48 narrow focus cases did the subject simultaneously contain a head (H)LH-accent and an initiality accent. Of these 14 cases, 5 were of the type that had an omitted VP.

Thus, the cases with narrow focus on the subject rarely contained an initiality (H)LH-accent beside the head (H)LH-accent.

In the remaining three information structural contexts in (58), the combination of the two types of (H)LH-accent was slightly more common. These contexts resulted in 72 sentences in total (8 sentences x 3 informants x 3 information structural contexts). In 53 of these, the subject had a head (H)LH-accent, and in 35 of these cases there was also an initiality (H)LH-accent present, in addition to the head accent. The remaining 18 sentences only had the head (H)LH-accent on the subject. Interestingly, for two of the informants, the longer subjects consistently had initiality accents whereas the shorter subjects did not.

The subject lacked a head (H)LH-accent altogether in 19 out of the 72 times. Almost all of these 19 were in the context where the VP was given information.
We see then, that there is a stronger tendency for the initiality accent to be reduced when the subject carries a head (H)LH-accent due to narrow focus, than when it carries such an accent in the other information structural contexts such as focus on the whole clause or on the VP. We also see that there is a stronger tendency to reduce the initiality accent in short phrases than in long ones. Because of this sensitivity to focus type as well as distance from the head (H)LH-accent, it may be concluded that the reduction is directly due to the presence of the head (H)LH-accent.

Interestingly, reduction also appears to be sensitive to syntactic structure. For example, it does not apply across the boundary between the Spec,CP position and the rest of the clause. This means that a head (H)LH-accent in the VP does not inhibit an initiality accent on the subject, even in a two word sentence. This is seen in experiment 3, where the three informants were asked to read three two word sentences of the type *Anna vände* ‘Anna turned’. All readings had both an initiality accent on the subject and a head (H)LH-accent on the verb.

### 3.2.2.6 Absence of stressed material in Spec,CP position

We now move on to a pattern that emerges from the recordings in experiment 3. There is no initiality (H)LH-accent in sentences where the Spec,CP position does not contain any stressed word, as in (60) a and b.

\[(60)\quad \text{a)} \quad [\text{Hon hade gärna haft mer TID på sig}]_F \]

\[\text{she had rather had more time on RX} \]

‘She would have liked to have more time’

\[\text{b)} \quad [\text{Vi lämnade honom på DAgis}]_F \]

\[\text{we left him at day nursery} \]

‘We left him at the day nursery’

In such sentences, either a sentence adverbial (which is not in Spec,CP) as in (60)a, or the finite verb as in (60)b, is the first HL-accented word. However, these words are not eligible for initiality (H)LH-accent assignment, and therefore, no initiality accent appears in the sentence.

To demonstrate this, the 3 informants were asked to read 6 sentences that had an unstressed pronoun in the Spec,CP position (i.e. there were 18 sentences with only unstressed material in the Spec,CP position). 3 of the 6 sentences had an unstressed auxiliary and a subsequent accented sentence adverb following the pronoun (as in (60)a). The remaining 3 sentences had an accented verb immediately following the unstressed pronoun (as in (60)b). Under the assumption that the first stressed word of a phonological phrase is assigned an initiality accent, an initiality (H)LH-accent would have been expected on the sentence adverbial in the first 3 sentences, whereas the verb would have been expected to carry the initiality accent in the last 3
sentences. However, none of the informants had any initiality accents in any of these sentences.

This implies that there is a limit to how far into the IP the initiality accent may occur. It is not the matter of a simple syllable counting distance from the phrase edge, however, since we do find anacrustes of several syllables before initiality accents. Neither can it be the matter of an absolute confinement of the initiality accent to the Spec,CP position, since there are initiality accents in the subject position of sentences with adjunct clauses in Spec,CP position, as in experiment 2. The data in the corpus used here suggests instead that only the initial syntactic XP in a phonological phrase is eligible for initiality accent assignment.

3.2.2.7 Mirroring the syntactic structure

The corpus that was compiled in order to study the initiality accent also allows for some conclusions regarding the interdependence between initiality accents and syntactic boundaries. Specifically, the presence of a syntactic left edge can be mirrored in the prosody by an initiality (H)LH-accent. The opposite is also true, so that in the absence of a syntactic left edge, an initiality (H)LH-accent may fail to appear.

We can observe the relationship between syntactic left edges and initiality (H)LH-accents in syntactic structures which contain embedding. This will be exemplified with an embedded clause which is contained in a main clause. The embedded clause is a subset of the main clause. Thus, the main clause contains not only the embedded clause, but also additional material, which is not part of the embedded clause. This means that somewhere inside the main clause, there is a right or left boundary of the embedded clause, which need not be immediately adjacent to any boundary of some other embedded clause. This is the difference between embedding and coordination. If two clauses are coordinated, the right edge of the first clause is adjacent to the left edge of the second clause. In this sense, embedding (but not coordination) involves asymmetries between left and right syntactic boundaries. In embedded structures, therefore, we may isolate a syntactic left edge or a syntactic right edge, which is not followed by any opposite syntactic edge. Furthermore, the edge of an embedded structure is potentially both preceded and followed by some material. In this way such boundaries are different from the very beginning or end of the utterance.

Asymmetries between syntactic boundaries provide an interesting environment for studying the distribution of prosodic edge markers. The question that arises is what the prosodic reflexes are of a lone syntactic boundary. Will the prosody also insert only left edge markers with a left syntactic edge, or will it insert both right and left edge markers in order to create a flat prosodic structure?
Recall that experiment 2 tested the phrasing of adjunct clauses in Spec,CP position (as in (59)a), vs. the phrasing of two coordinated main clauses (as in (59)b). Recall also that the sentence set in experiment 4 tested the phrasing of embedded clauses with main clauses word order vs. embedded clauses with embedded clause word order. These embedded clauses were all placed in the VP of the main clause. In the corpus of initiality (H)LH-accent sentences, we thus have embedded clauses which occur to the left as well as to the right in a main clause. This is summarized in (61).

\[(61)~\]

\[
a) [[S VP]_{CP} ~ [S VP]_{CP}]
b) [[S VP]_{CP} ~ S VP]_{CP}
c) [S V ~ [S VP]_{CP}]_{CP}
\]

The attested phrasings of these three contexts exhibit some interesting patterns. The two main clauses were always phrased as two separate IPs, containing an initiality accent on the subject as well as a head (H)LH-accent on the last stressed word in the VP. Both clauses also always ended with a L%. This pattern is shown in (62), where IA stands for initiality (H)LH-accent, HA stands for head (H)LH-accent and % stands for a low boundary tone L%. Round brackets mark Phonological Phrase (PP) boundaries, whereas curly brackets mark Intonation Phrase (IP) boundaries. We return to the difference between these two types of boundaries in Chapter 6.

\[(62)~\]

\[
a) \{ (IA HA) % \} \{ (IA HA) % \}
\]

For the adjunct clauses in Spec,CP position, however, four different phrasings were attested. One option was for the whole main clause to have one initiality accent and one head accent, as in (63)a. In this case the right edge of the embedded clause is given no prosodic correlate. Instead the whole main clause is phrased as one single PP in one single IP. Another option was for this syntactic structure to be phrased the same way as the coordinated main clauses, i.e. as two separate IPs, each with both an initiality accent and head accent, as illustrated in (63)b. The third option, (63)c, also had both an initiality accent, a head accent and a boundary tone on the adjunct clause. On the subject and the VP of the main clause, however, there was a head accent, but no initiality accent. The fourth phrasing option, (63)d, is identical to the third one with the expectation that there is no boundary tone in the adjunct clause.

In the last two phrasings, the syntactic right boundary is given a prosodic correlate in the head accent, and in the boundary tone. There is, however no left edge signal immediately following these right edge correlates. Therefore,
we can say that the prosody mirrors the asymmetry of the syntactic clauses in the last two phrasings.

(63) The four attested phrasings of a main clause with an embedded clause in the Spec,CP position.

\[
\begin{array}{c}
S & \text{VP} & \text{CP} & S & \text{VP} & \text{CP} \\
\{ & \{ & (\text{IA}) & (\text{HA}) \} & (\text{HA}) \} & (\text{HA}) \} \\
\{ & \{ & (\text{IA}) & (\text{HA}) \} & (\text{HA}) \} & (\text{HA}) \} \\
\{ & \{ & (\text{IA}) & (\text{HA}) \} & (\text{HA}) \} & (\text{HA}) \} \\
\{ & \{ & (\text{IA}) & (\text{HA}) \} & (\text{HA}) \} & (\text{HA}) \} \\
\end{array}
\]

The sentences in experiment 4, where the embedded clause is sentence final, exhibited only two different phrasing options. The first of these ignored the left edge of the embedded clause. There was thus an initiality (H)LH-accent on the first stress of the embedded clause, which is also the first stress of the main clause. The head accent is on the last stress of the main clause and it is followed by a boundary tone on the last syllable of the whole main clause. This is illustrated in (64)a. The other option was identical to the one in a, except that it inserted an initiality (H)LH-accent on the first stress of the embedded clause. There are two initiality accents in (64)b: one on the first stress of the main clause and another on the first stress of the embedded clause. There was never a head accent on the VP of the main clause, however. Thus there are two left edge markers, but only one right edge marker. Therefore, the phrasing in b can be said to mirror the asymmetry between clause boundaries that is caused by embedding one clause inside another.

(64) The two attested phrasings of a main clause with an embedded clause in the VP.

\[
\begin{array}{c}
S & \text{V} & \text{[S VP]} \text{CP} \\
\{ & \{ & (\text{IA}) & (\text{HA}) \} \\
\{ & \{ & (\text{IA}) & (\text{HA}) \} \\
\end{array}
\]

In conclusion, the distribution of initiality (H)LH-accents is determined by many different factors. We may note that it fails to appear in the vicinity of a head (H)LH-accent, and that it fails to appear if there is no stressed syllable in the initial syntactic XP of an IP. Also, we see that the presence and absence of initiality (H)LH-accents can be used to mirror asymmetries between syntactic left and right edges in embedded structures. We return to these distributional patterns in Chapters 6 and 7.
3.2.3 Previous analyses

As illustrated above, the very first accent in a phrase generally has a (H)LH contour, called initiality (H)LH-accent in the present work. This first accent is different from other accents that occur before a head accent, since other pre-head accents generally receive only a HL-contour. This phenomenon has been commented on in various ways in the previous literature. To my knowledge, this was first observed by Horne (1994). Bruce (1998) also mentions it. The phenomenon is also commented on in a paper by Horne et al. (1999). A discussion can also be found in a series of articles and the dissertation by Roll (2004, 2006, 2009) and Roll et al. (2009). Below I account for how this phenomenon has been described in these different works (3.2.3). In the next section (3.2.4), I move on to describe how the account given in the present work relates to these descriptions and to the notion of edge prominence.

Horne (1994) analyzes the last H of the initiality accent as a H% boundary tone of a prosodic word. This boundary tone is assumed to appear on prosodic words that contain content words that are contextually given in the previous context. She writes:

[The prosodic word] is characterized by a word accent […] [corresponding to a HL-accent in the present work] and potentially a focal accent [corresponding to the last H of the (H)LH-accent in the present work]. It is also marked by a boundary tone which is realized by a final rise in the case where the content word is not focussed (i.e. contextually given). (Horne 1994:72)

Note that Horne’s (1994) definition of prosodic word is different from the one used here. For Horne, a new prosodic word begins at each HL-accent and ends before the next HL-accent. In the present work, this definition corresponds most closely to the Accent Phrase (AP) (2.2). In effect, Horne predicts a (H)LH phrase initial contour, which is the same as in the present work. The statement that the last H of the contour is a boundary tone of the prosodic word predicts that the last H of this contour always occurs right before the following HL-accent in the phrase. This prediction arises from her definition of the prosodic word.

In the present work this late timing is analyzed as assimilation to a following HL-accent, and is assumed to be a consistent tendency for initiality (H)LH-accents. However, it was noted that some initiality accents show extreme such assimilation, whereas others occur earlier and are followed by a plateau (3.2.1).

As for the distribution of this phenomenon, Horne (1994) assumes that it occurs on all contextually given content words. Horne (1994) does not specifically say that the high boundary tone of a prosodic word is a phrase initial phenomenon, even though it is illustrated on the initial prosodic word in Horne’s Figure 1 (1994:73).
Bruce (1998:140) calls the (H)LH contour on the left edge of a phrase a prominence. He states that phrases generally have two tonal prominences if no special focus is assumed, one in the beginning and one in the end. According to Bruce, this is a general tonal pattern, which extends to many types of syntactic constituents, such as noun phrases and different types of clauses. Under this assumption, then, the initiality (H)LH-accent is assumed to be essentially the same phonological contour as the head (H)LH-accent (which Bruce (1998) refers to as a focal accent). In this sense the analysis by Bruce is close to the one given in the present work. However, the distributional properties of the initiality (H)LH-accent is assumed to be more general in Bruce’s account than in the account given here.

In a paper by Horne et al. (1999), (H)LH contours on given information are discussed in terms of prominence lending accents. It is noted that such accents appear whenever the given information occurs in initial position of a phrase, whereas given information which occurs phrase finally does not carry any such accents (Horne et al. 1999:94). It is observed that the last H in the sequence is later timed than the prominence lending accents that occur on new information:

[…] although the given information is prominently accented, the accentual pattern would appear to not be the same as that occurring on new (focal) information in phrase final position […]. Rather, the focal H∗ tone […] [in the present work this is the last H in a (H)LH-sequence] is relatively late timed. (Horne et al. 2001:95)

Horne et al. also conduct a perception experiment testing whether listeners prefer late or early timing of the last H in an initial (H)LH-sequence on a given item. They find that late timing is preferred by the listeners.

The analysis by Horne et al. (1999) collapses two phonological categories that are distinguished in the present work. These two categories are the topic marking head (H)LH-acents, and the initiality (H)LH-acents. In the present work these two are assumed to be distinct mainly through their distribution within a phrase. The initiality (H)LH is assumed to be assigned to the initial stress, whereas the topic marking is assumed to be assigned to the final stress in a phrase. In the test material used by Horne et al., only one-word noun phrases are used to test the timing of initial (H)LH contours. From the perspective of the present work it is thus unclear what is being tested. Hypothetically, both categories are late timed.

Roll (2004, 2006, 2009) and Roll et al.’s (2009) account is similar to that of Horne (1994) in terms of the tonal identity of the initial (H)LH-contour. Roll and Roll et al. thus assume that the initial (H)LH contour is composed of a HL head of a prosodic word (cf. AP in the present work) and an additional H which associates with the right boundary of this prosodic word. However, their account of the distribution of this contour is different from
Horne’s. They hypothesize that this boundary tone is a marker of main clauses (not that it appears on given items). Therefore, Roll et al. also state that the last H of this (H)LH contour is a left boundary tone %H. They write:

Some languages have left edge boundary tones in addition to the right edge boundary tones. Standard Swedish is one of these, where left edges of main clauses are marked by a high (H) tone associated with the last syllable of the first prosodic word (Roll et al. 2009:58–59)

Roll’s and Roll et al.’s studies of this phrase initial phenomenon take one specific syntactic construction as their starting point. As mentioned, main clauses and embedded clauses have different word order in Swedish. Whereas main clauses have sentence adverbials after the finite verb, subordinate clauses (generally) have the sentence adverbial before the finite verb. There are, however, some contexts where embedded clauses may have either the word order of a main clause or the word order of a subordinate clause. The possibility of having main clause word order in an embedded clause exists with so called assertive verbs. Roll et al. (2009:57) describe assertive verbs as “main clause verbs that take complement clauses with an assertive interpretation”.

Roll et al. hypothesize that when these verbs occur with main clause word order, the initial H will occur. Whenever there is embedded clause word order, the initial rise is predicted to be absent. In an ERP study, Roll et al. find evidence that this hypothesis is correct.

The account given by Roll and Roll et al. is different from the one given in the present work in two respects. First, Roll and Roll et al. assume that the distribution of initial (H)LH-contours is directly determined by left edges of main clauses. In the account given here, in contrast, the initiality (H)LH-accent is assumed to be licensed by a prosodic domain IP. The hypothesis assumed in the present work is compatible with the assumption that phonological processes refer to phonological domains, rather than to syntactic ones. The evidence presented by Roll and Roll et al. does not contradict the assumption that initiality (H)LH-acents are licensed by IPs. This is because phonological domains are assumed to be aligned with syntactic domains. However, Roll and Roll et al.’s hypothesis makes some wrong predictions for the data presented here. His account predicts that initiality (H)LH-acents only occur at main clause left edges. The data presented in this section contains two examples that contradict this. The first is that in experiment 4, one of the sentences with an assertive verb and a complement with embedded clause word order had an initiality (H)LH-accent. The second counterexample is the phrasing shown in (63)b. Here, an initiality accent appears on a subject which is not in the initial position of the main clause. Under the assumption that the initiality (H)LH-accent is licensed by the IP, Roll and Roll et al.’s results should be taken to show that there is a
strong, but not absolute, correlation between main clause boundaries and IP boundaries.

Second, Roll and Roll et al. assume that the rise is a boundary tone, whereas in the present account it is seen as a prominence. The main argument in favor of the boundary tone analysis is the fact that the last \( H \) in an initial (\( H \))LH contour is exceptionally late timed in the initial sequence. This late timing makes the initial (\( H \))LH sequence different from a (\( H \))LH sequence which marks focus, and therefore, it should be given a different phonological analysis. However, as shown here, the last \( H \) of the initial sequence has a tendency to drift far to the right, rather than being firmly associated with any specific syllable. In fact, such a drifting behavior is also assumed for the last \( H \) in the head (\( H \))LH-accent (Bruce 1987), though it does not drift as far. With the observation that the last \( H \) of the initiality (\( H \))LH-accent is floating rather than associated with some boundary, the timing difference becomes a similarity between the two contours rather than a difference. Thus, the fact that the last \( H \) in the initial (\( H \))LH contour drifts, should not necessarily be interpreted as a difference in behavior from the head (\( H \))LH-accent.

Furthermore, under the assumption that the last \( H \) is a boundary tone, the boundary tone \( H \% \) does not appear at the left edge of the phrase which it is the boundary tone of. Instead it appears on the right edge of the first prosodic word (that is, the AP in the present account) within this phrase. Expressed in the terminology used in the present work, this means after the first HL-accent in the phrase. This creates another problem since we need to assume some plausible explanation for why the boundary tone should move to the edge of the first position of the prosodic word. Though such an explanation might be found, an account which gets rid of these assumptions is more economical, and should therefore be preferred, all other things being equal.

In conclusion, there is general agreement that the tonal sequence in the initial contour is the same as that of head (\( H \))LH-acents. Under this observation, the preferred hypothesis should be that these two are the same phonological object. Before such a hypothesis is ruled out, it should be extensively shown that it fails to account for data. At this point, no strong indications in that direction appear to exist. (The mere fact that these two tonal sequences have different functions is not taken as evidence that they are phonologically different here).

### 3.2.4 The initiality (\( H \))LH-accent as edge prominence

As shown in the previous sections, initiality (\( H \))LH-acents resemble head (\( H \))LH-acents with respect to their tonal composition. Also, they associate with secondary stresses in the same way as head (\( H \))LH-acents. Therefore, initiality (\( H \))LH-acents are represented here with the same tonal sequence as head (\( H \))LH-acents.
I assume here that initiality (H)LH-accents are prominence-lending pitch accents, just like head (H)LH-accents. It is well known and accepted that phonological prominences, and tonal prominences in particular, are used to mark material that is information structurally salient in some way. This is true for Swedish and many other languages (3.1). However, the initiality (H)LH-accent has no such function. Therefore, under the assumptions made in the present work, the functions of prominences are not limited to marking information structure in Stockholm Swedish. Instead, they also have the function of marking edges of phonological constituents.

3.2.4.1 The Phrase Edge Prominence constraint

This edge marking property of the (H)LH-accent is ascribed to the Phrase Edge Prominence constraint formulated by Selkirk (1995a:565) (65).

(65) Phrase Edge Prominence

The most prominent syllable of an edge constituent is more prominent than that of a non-edge constituent.

Selkirk claims that some of the cases of stress movement that have been observed in the literature can be explained in terms of the constraint in (65). She gives the structures in (66) as examples of violations of the Nuclear Stress Rule (NSR), which says roughly that “the most prominent syllable of the rightmost constituent in a phrase P is the most prominent syllable of P” (Selkirk 1995a:562,564 see also 3.1). The NSR has been shown to be able to derive many instances of prominence placement in phrases. However, (66) a and b represent the intuitively correct structures, whereas c and d represent the structures predicted by the NSR. In (66), the x’s represent prominences. The higher the staple of x’s, the higher the prominence.

(66) a) x b) x

x x x x
x x x x
( (hard-boiled) (eggs) ) ( (four) (new mugs) )

c)* x d) *

x x x x
x x x x
( (hard-boiled) (eggs) ) ( (four) (new mugs) )

Under the assumption that the constraint in (65) sometimes overrides the NSR, the early accent placement in (66) can be accounted for. Selkirk argues that, at least in part, this should be assumed to be the explanation for the type of violations of the NSR found in (66) a and b (1995a:565).

According to Selkirk, both the Phrase Edge Prominence constraint and the NSR are edge alignment constraints in the sense of McCarthy and Prince (1993). This means that they align edges of prosodic constituents with edges
of syntactic constituents. This applies well to the data of initiality accent distribution in Swedish, where there is a general tendency for IPs to be aligned with main clauses, as observed by Roll (2004, 2006, 2009) and Roll et al. (2009).

3.2.4.2 Satisfying the Phrase Edge Prominence constraint

I assume that the Phrase Edge Prominence constraint applies both at the PP and at the IP level of the prosodic hierarchy. It applies to the left as well as to the right.

At the PP level the Phrase Edge Prominence constraint is satisfied to the left by the initial raising of pitch that is caused by reset. It is a well observed tendency in Swedish and in many other languages that the tonal contour drifts downwards throughout the phrase, so that the pitch goes lower, and the pitch span shrinks towards the end of a phrase (see e.g. Bruce 1982 for references on Swedish, and Gussenhoven 2004 and Ladd 2008 for a more general discussion and further references). At the left edge of each phrase, the falling pattern is interrupted, and the speaker returns to a higher pitch level and larger pitch span. This is termed reset.

It is also well known that high pitch and a larger pitch register are common correlates of phonological prominence (e.g. Gussenhoven 2004:85). Thus, the correlates of phrase initial reset overlaps with the typical correlates of prominence. Therefore I assume that the Phrase Edge Prominence constraint is satisfied by reset at the left edges of PPs. For each layer of PP structure, a reset rule applies, generating reset at each PP left edge and simultaneously satisfying the Phrase Edge Prominence constraint with respect to that edge.

However, at the highest level of the prosodic hierarchy, the IP level, the highest level of phonological prominence is required (in addition to reset) for the Phrase Edge Prominence constraint to be satisfied. Thus, a prominence level 2 (H)LH-accent is assigned to the initial (i.e. leftmost) constituent of every IP.

At the right edge of the IP as well as the PP, the Phrase Edge Prominence constraint is satisfied by the fact that the PP as well as the IP are right headed (2.2 and 3.1).27

In conclusion, in the model outlined here, the IP can be described as a delimitative domain, where boundaries are strongly marked. Both right and left edges have markers which are categorically distinct phonological objects. An initiality (H)LH-accent marks the left edge of IP and a boundary L% or H% tone marks the right edge (2.2). The head of IP, however, is only (if at all) signaled in the phonetic implementation on the rightmost head (H)LH-

---

27 Note that in some narrow focus cases, a head (H)LH-accent does not appear at the right edge of a PP. This is discussed in section 6.3.3 and 7.3.3. In such cases the Phrase Edge Prominence constraint is violated at the right edge of the PP.
accent with phonetically gradient properties such as pitch span and lengthening (2.2). The PP, in contrast, is primarily a **culminative** domain, where there is a very strong head marked with a prominence level 2 (H)LH-accent. PP edges, however, lack categorically distinct markers but are signaled with gradient correlates, such as lengthening and reset.

### 3.2.4.3 Selecting an edge constituent

The Phrase Edge Prominence constraint as formulated by Selkirk (1995a) does not specify in detail how an edge constituent is selected. I shall assume that when selecting an edge constituent, only the edge constituents of the next lower level are considered. Thus, in order for a constituent to be eligible for edge prominence assignment at level n of the prosodic structure, it must be an edge constituent at level n–1.

The alternative to this procedure would be to place the initiality accent on the head of the next lower level in the hierarchy. This, however, would make the incorrect prediction that initiality accents are assigned to the last (right-most) stress in an initial constituent, since both PPs and IPs are right headed.

If, as assumed here, an initial prominence is selected from the prominences at the next lower level of the prosodic structure, initial prominence is predicted to exhibit a **cumulative** effect. This is because the initial prominence is enhanced for each layer of prosodic structure. The effect is that deeper embedded prosodic constituents exhibit weaker initial prominences than prosodic constituents higher up in the structure. Therefore, the initiality (H)LH-accent can be said to build on the effect of edge prominence accumulated by reset at lower levels of the hierarchy.

The assumption that initial prominences should be accumulated in this way is supported by the fact that similar cumulative effects are usually assumed for both head prominences and reset. Such effects emerge because the rules that assign prominences and cause reset apply once for each layer of structure. Each time the rules apply, the correlates of each category are enhanced. In the case of prominences, the cumulative property emerges because one domain at level n in a prosodic structure is selected to be the head of a domain at level n+1. Higher up in the prosodic structure, more prominence is required on a head constituent. The idea behind this is illustrated in grids of the type shown in (66). For reset, the cumulative effect has been observed in English by Ladd (1986, 2008) and in German by Féry and Truckenbrodt (2005). These studies show that the degree of reset depends on the depth of embedding of a prosodic constituent. In a structure as (67)a, where A B and C represent clauses, there is a higher degree of reset between B and C than between A and B. However in (67)b there is a higher degree of reset between A and B than between B and C. This can be accounted for with the assumption that more layers of prosodic structure is reflected with more reset. We return to this example in 6.1.
(67)  
a) \(((A) \text{ and } (B)) \text{ but } (C)\)

b) \((A) \text{ but } ((B) \text{ and } (C))\)

3.3 Summary

In this chapter I have argued that the function of (H)LH-accent divides into two different functions: head (H)LH-accents (3.1) and initiality (H)LH-accents (3.2).

Head (H)LH-accents mark foci within topic and comment constituents (these terms are used here in the sense of Krifka 2007, 2008). Stockholm Swedish has a categorical distinction between two prominence levels which is less clear in most other well studied Germanic languages. Nonetheless, the distribution of head (H)LH-accents is in many ways similar to that of pitch accents in other Germanic languages.

Initiality (H)LH-accents mark the left edge of an Intonation Phrase (IP) through increased prominence on the leftmost stressed syllable of that IP. I explained the presence of initiality (H)LH-accents by the Phrase Edge Prominence constraint, due to Selkirk (1995a). This constraint says that phonological edge constituents have higher prominence than non-edge constituents. I show that initiality (H)LH-accents can fail to appear if a head (H)LH-accent is close to the initial syllable of the IP. I also show that initiality accents fail to appear if the position before the verb in a clause only contains unstressed syllables, such as unstressed pronouns.

There will be instances of (H)LH-accents which cannot be unambiguously assigned to one of the categories head (H)LH-accent and initiality (H)LH-accent. Such examples include (H)LH-accents on one word phrases, where a (H)LH-accent might, but need not, be a marker of a contrastive topic or a frame setter (exemplified in (26) and (27)). Nonetheless, when studying (H)LH-accents in unambiguous cases, a number of differences emerge.

The ultimately defining criterion for distinguishing them is the difference in distribution within the phrase that they occur in. The initiality accent is assigned to the initial (leftmost) stress of the phrase. The head accent, in contrast, is assigned to the final (rightmost) stress of the phrase. In addition to this distributional difference, it can be observed that the timing of the (last) H in the (H)LH tonal sequence is generally later for the initiality accents than for the head accents. Also, head accents may (but need not) be followed by boundary tones whereas initiality accents may not. Of these three factors, the distribution within the phrase is the defining one, because it is obligatory. An initiality accent may not be final in its phrase, and a head accent may not be initial in a focused phrase. The other two criteria are less obligatory. A head accent is not necessarily followed by a boundary tone, and the timing of the rise in an initiality accent may vary, as may the timing of the rise of a head accent.
I analyze these types of accents as being licensed by two different prosodic categories. Whereas the head accent is licensed as the head of the Phonological Phrase (PP), the initiality accent is licensed by the Intonational Phrase (IP). This will be extensively argued for in Chapter 6.
This chapter discusses the function and phonological status of the HL-accent. The HL-accent is regarded here as a reflex of the word accent, as has been a common assumption in previous research (e.g. Bruce 1977, 1998, Riad 1998, 2006, 2009a see also section 2.1). However, it is suggested in the present work that the HL-accent should also be studied with respect to their information structural properties. This chapter lays out some initial hypotheses, but much research still remains to be done on this point.

I begin with a general background and a review of the distribution of HL-accents in section 4.1.

In section 4.2 some cases of HL-accent boosting are illustrated. In such cases, one HL accent is higher than a previous HL-accent in the phrase. Data of this sort suggests that HL-accents are sometimes used to express information structural properties of words. Approaches to HL-accents which view them purely as a realization of lexical information are unable to account for this observation. The cases of boosting illustrated in this section appear before a (H)LH-accent.

Section 4.3 discusses two cases where a HL-accent can appear on a focused constituent, and where boosting may, therefore, be expected. In both cases, the reason that a HL-accent is found on a focused constituent may be related to the fact that the focus appears on given material (cf. the definition by Krifka 2007, 2008, see section 3.1.2). In section 4.3.1 discuss IPs which have a HL-accent in the nuclear position. Such phrases has previously been studied by Amrazaitis (2009), who claims to see some amount of boosting on a HL-accent in nuclear position that marks narrow focus. In section 4.3.2, I discuss Second Occurrence Focus (SOF) in Stockholm Swedish, suggesting that such cases are realized with a HL-accent when they occur after the nuclear accent but that they can be realized with either HL or (H)LH-accent when they appear before the nuclear accent. It remains to be seen in future research whether HL-accent which mark SOF are somehow marked phonetically in Stockholm Swedish.

4.1 The distribution of HL accents

The HL-accent, which is the realization of prominence level 1 in Stockholm Swedish, has generally been seen as the realization of the lexical word accent distinction (Bruce 1977, Riad 1998, 2006, 2009a, Engstrand 1995, 1997).
For Bruce (1977), there are three levels of prominence: *stress, word accent* and *sentence accent*. The HL-accent is the middle one of these, i.e. the word accent. It is the lowest *tonal* prominence level (since stress is assumed to have only non-tonal correlates). The lexical word accent distinction is expressed with the timing of a tonal fall from H to L. Accent 2 has a late fall, whereas accent 1 has an early fall. Bruce also hypothesizes that a prominence level 1 accent may exist in dialects which lack the word accent distinction, and suggests that the Finland-Swedish dialects may be of this type (1977:11).

The *Lund model* largely builds on the work of Bruce (1977) (cf. also Chapter 2). It has the two tonal prominence categories *accented* (corresponding to the *word accent* level in Bruce 1977) and *focused* (corresponding to the *sentence accent* in Bruce 1977). As for non-tonal prominence levels there is one category for secondary stressed words and one for unstressed words. However, a category for words which are primary stressed but un-accented does not seem to exist in the Lund model (cf. Bruce 1998, Heldner 2001, Hansson 2003). It therefore appears to be the underlying assumption that each primary stress receives a HL-accent. In general this is probably true. However, there are a number of exceptions which will be discussed below.

### 4.1.1 Plateau formation as a means of identifying the HL-accent

Recall from section 2.1 that the head (H)LH-accent ends with a H in both accent 1 and accent 2. Following this H, a plateau is created which stretches until the next HL-accent (HL is the only tonal contour which may occur in post-nuclear environment). The existence of such plateaus has been described in Bruce (1977, 1987).

A plateau is illustrated in Figure 16, which shows a reading of the phrase *även de som har egna inkomster* ‘even those who have their own income’. In this phrase, the phonologically most prominent word is *även* ‘also’. This prominence is realized as a (H)LH-accent. Following the (H)LH-accent there is a high plateau across the words *de som har* ‘those who have’. These words are not HL-accented, but are tonally unspecified. The word *egna* ‘own’, however, does carry a HL-accent. There is interpolation between the last H of the (H)LH-sequence and the initial H in the HL-accent on *egna*. This interpolation creates a high plateau across the tonally unspecified syllables. The HL-accent on *egna* is obligatory here. Therefore, the plateau has to end on this word. Continuing the plateau across *egna* will make this word sound unaccented, which is intuitively strange.

Because the rule of plateau formation between a (H)LH-accent and the following HL-accent is very general in Stockholm Swedish, we can use it to
The speaker says: "även dom som har egna inkomster" ‘even those who have their own incomes’. In the immediately preceding context, the speaker has explained that a group of sisters which the book is about were all looking to find husbands. She then adds that this fact should not be taken to imply that the girls were exceptional, nor that they were not emancipated, as this is common to all girls of all times, even the girls of our time.

Figure 16. Illustration of plateau formation after the (H)LH-accented word ‘even’. The contour is from the audio book in the material (see Table 1). The speaker says: "även dom som har egna inkomster" ‘even those who have their own incomes’. In the immediately preceding context, the speaker has explained that a group of sisters which the book is about were all looking to find husbands. She then adds that this fact should not be taken to imply that the girls were exceptional, nor that they were not emancipated, as this is common to all girls of all times, even the girls of our time.

test whether a HL-accent must be inserted in a given context. By inserting a narrow focus on an immediately preceding word and testing whether a plateau must end on the word in question or not, we can see whether that word obligatorily carries HL-accent or not.

It is often the case that words either must or cannot carry HL-accents. Thus, some words necessarily end plateaus, whereas others do not. (This is true provided the context in which words are uttered. Also there are exceptions to this rule, for example some pronouns and prepositions vary with respect to whether they are accented or not. We shall return to this in the next section). This means that the length of a plateau is not pragmatically determined, but is determined by the number of syllables intervening between a (H)LH-accent and the following stressed syllable that carries a HL-accent.28

However, in spontaneous as well as read speech, HL-falls are sometimes so small that they cannot be clearly seen in the pitch track. It is an interesting question which factors condition variation in fall height. I assume that down-drift in phrases causes HL-accents to lower successively throughout the phrase (cf. Bruce 1982). As will be discussed in section 4.2, I shall also assume that HL-accents can be boosted in some contexts.

---

28 Note, however, that a plateau may be interrupted by a L%, as will be described in section 5.1.2 on external low post-nuclear areas. Note also that accents may be realized in a high pitch register, in a contour resembling a plateau, as will be described in section 5.1.3 on external high post-nuclear areas. The presence of a L% or a raised base line is determined by the pragmatic and syntactic context, cf. Chapter 5.
4.1.2 Lexically stressed words that receive no HL-accent

At a first glance, it may seem that every lexical stress carries a HL-accent. However, upon closer examination it becomes obvious that there are many exceptions to this simple pattern. In this section, some of these exceptions are reviewed.

When doing tests of the type mentioned in section 4.1.1 it becomes clear that many lexicalized phrases lack HL-accents on all words but the last one, i.e. plateaus may continue until the last word. This type of deaccenting pattern was described already in the seventies by Anward and Linell (1976).\(^{29}\) According to Anward and Linell it is characteristic of lexicalized phrases in general that they exhibit a deaccenting pattern. They refer to this prosodic pattern as connective prosody\(^{30}\), because it signals coherence within the lexicalized phrase (1976:78).

The deaccenting pattern shows up in lexicalized phrases of many different syntactic types. One common type is verb phrases with complements that look much like direct objects, exemplified in (68).\(^{31}\) Another common type is noun phrases or adjective phrases with pre- or postposed modifiers exemplified in (69).

\[(68)\]
\[
a) \text{Hänga läpp} \quad \text{hang lip} \quad \text{‘mope’} \\
b) \text{Hålla mun} \quad \text{hold mouth} \quad \text{‘shut up’} \\
c) \text{Slita hund} \quad \text{work dog} \quad \text{‘have a rough time of it/work hard’} \\
d) \text{Spela kort} \quad \text{play card(s)} \quad \text{‘play cards’} \\
e) \text{Skaka hand} \quad \text{shake hand} \quad \text{‘shake hands’} \\
f) \text{Tappa huvet} \quad \text{lose head.DEF} \quad \text{‘lose one’s head’}
\]

\[(69)\]
\[
a) \text{Första hjälpen} \quad \text{first help} \quad \text{‘first aid’} \\
b) \text{Gustav den tredje} \quad \text{Gustav the third} \quad \text{an 18thC Swedish king} \\
c) \text{Flygande tefat} \quad \text{flying saucer} \quad \text{‘UFO’}
\]

---
\(^{29}\) See also Frid (2003:30) and Jande (2001).
\(^{30}\) The Swedish term is konnektiv prosodi. My translation.
\(^{31}\) Anward and Linell are unspecific with regard to whether these complements are actually direct objects in the standard sense, but refer to several grammarians who discuss this issue.
Some phrases are ambiguous with respect to whether they are lexicalized or produced according to productive syntactic patterns. In such cases, deaccenting triggers the lexicalized phrase interpretation. For example, if someone throws a saucer in anger in their own kitchen, the phrase *flygande tefat* ‘flying saucer’ will not refer to a UFO but to an actual flying saucer. In such a context *flygande* ‘flying’ does carry a HL-accent.

However, Anward and Linell (1976) also stress that the deaccented prosodic pattern is neither a necessary nor sufficient condition for the definition of lexicalized phrases. There are lexicalized phrases which are not deaccented, and there are also deaccented phrases which are not lexicalized.

For example, many verbs are not assigned any HL-accent. To my knowledge, it has never really been extensively studied what the factors are that may cause verbs to lack HL-accents. The outline given below is also not very extensive, but illustrates a few different cases. One first generalization is that for auxiliary verbs it is probably generally true that they lack HL-accents, as illustrated in (70).

(70) A: Vem skulle ha velat vara ett spöke på maskeraden?  
‘Who would have wanted to be a ghost at the masquerade?’

\[H^*LH\] \[H^*L L%\]

B: Anna skulle ha velat vara ett spöke.  
‘Anna would have wanted to be a ghost’

In (70) the main verb *vara* ‘be’ is also unaccented. This is probably indicative of a general tendency for this verb to lack a HL-accent. It appears to share this property with some other common verbs like *ha* ‘have’. Also, as pointed out to me by Staffan Hellberg (p.c) verbs can be deaccented when they have a plural indefinite object noun phrase, as in (71). This deaccenting also appears to apply to particles of verbs, such as *sönder* in (71)c.

(71) a) Jag ska laga kopiaTOrer.  
*I will mend copying machines*  
‘I’m going to mend copying machines.’

b) Jag måste byta HÖRLUrar.  
*I need replace head phones*  
‘I need to replace (my) headphones’

c) Hon bryter sönder SAXar.  
*She breaks PT scissors*  
‘She’s breaking scissors’
In addition to these exceptions, there is a small group of words which often does not receive a HL-accent. This group of words includes: liten, lilla, små (different morphological forms of ‘small/little’) and gammal ‘old’. It is unclear why these words would behave this way. There is nothing in their semantic content which would appear to motivate such a behavior, and it may be noted that their opposites stor ‘big’ and ny ‘new’ do not share this prosodic property.\footnote{Gammal ‘old’ is polysemous. It has, at least, two different meanings, much like English ‘old’. These meanings have different antonyms: ny and ung, corresponding to ‘new’ and ‘young’. Whereas ny never behaves as unstressed in this sense, ung may do so in expressions like (min) unga fröken ‘(my) young lady’ and (min) unge man ‘(my) young man’.
}

It is true for all of the above listed examples that they can be HL-accented, or, when narrowly or contrastively focused, even (H)LH-accented. The pragmatic effect of inserting HL-accent on words that do not obligatory carry accents is relatively small, and mainly adds a general impression of exceptionally clear speech. Possibly, the effect is larger in the case of lexicalized phrases and auxiliary verbs than in the other cases. However, it is outside the scope of this work to provide a solution for the question of the HL-accent distribution, and this issue will be left aside for future research.

### 4.2 HL-accent boosting

In the account of Stockholm Swedish intonation provided by the Lund model and also in the accounts by Engstrand (1995, 1997) and Riad (1998, 2006, 2009a), HL-accents (or the correspondence of HL-accents in the individual models, see Chapter 2) are viewed as the realization of the word accent distinction. However, there are indications that the height of the HL fall and the duration of a HL-accented word may be modified to signal other functions than just the lexical word accent distinction. In this section I give some examples of such modifications of HL-accents, and I shall talk of it here as \textit{HL-accent boosting}. However, further research must provide more data before this phenomenon can be fully understood.

HL-accent boosting can be recognized because one HL-accent in a sequence of HL-accented words is higher than, or as high as, a preceding HL-accent. The word on which the boosted HL-accent appears can also be longer than the other HL-accented words. Such boosting is illustrated in Figure 17. The panel shows a phrase with three subsequent HL-accented words. The second accent (marked by an arrow) is clearly higher than the first one and the third one.\footnote{There is a L*H initiality accent on det ‘it’. Thus, it is not a plausible explanation that the height of the peak on ingen ‘none’ is due to an initiality accent on nästan ‘almost’}

In this case, the entire phrase ingen blomma alls ‘no flower at all’ is focused. In a phrase that is negated with ingen alls ‘none at all’ a focus
Figure 17. HL-accent boosting on *ingen* ‘no’. A phrase with three HL-accented words in pre-head position, on *nästan* ‘almost’, *ingen* ‘no’ and *blomma* ‘flower’. The utterance is from the radio interview, see Table 1.

marking (H)LH-accent obligatorily falls on *alls* ‘at all’, whereas *ingen* ‘no’ must carry a HL-accent.34 The (H)LH-accent on *alls* ‘at all’ is marked as L*H* in Figure 17, since *alls* is monosyllabic and has accent 1. However, *ingen* carries a boosted HL-accent, making it clearly more prominent-sounding than the previous HL-accent on *nästan* ‘almost’ and the following HL-accent on *blomma* ‘flower’.

A HL-accent can be subject to this type of boosting in other types of focused phrases, too, e.g. when one word obligatorily assigns a (H)LH-accent to some other word in the same phrase. For example, in the case of focus particles such as *bara* ‘only’, *till och med* ‘even’ och *inte ens* ‘not even’ similar readings are possible. In order to illustrate this, one informant was asked to read the target sentence *det var verkligen bara jag som sa nåt* ‘It was really only I who said anything’. She was given the following context:

Eva vill starta en studentorganisation som ska se till att alla studenter får samma rättigheter. Hon har lagt mycket tid på att försöka samla folk och några har till slut lovat att gå. Men dagen efter den utsatta mötestiden är hon mycket besviken. Ingen av de som gick på mötet sa ett enda ord, utan Eva fick föra hela diskussionen själv.

‘Eva wants to start a students’ rights organization. She has spent much time trying to convince people to come, and has finally persuaded a few to do so. After the meeting, however, she is very disappointed. None of the participants said a single word. Eva was the only one who made any contribution to the discussion.’

34 Cf. Teleman et al. (1999:430, vol 2) who analyze *alls* as a determiner of *ingen*. Note, also, that *alls* will carry a HL-accent whenever it does not carry a (H)LH-accent, i.e. both words can be HL-accented simultaneously.
The informant was asked to read the target sentence in as many different ways as she could think of that could suit the context. She was given a sheet of paper with the context sentences and the target sentence. The target sentence occurred in seven different versions. In each version different words were written in capital letters to trigger different readings of the sentence. This is referred to as experiment 6 in Table 1.

A reading with boosting of the type in Figure 17 (ingen alls) was triggered by sentences where both bara ‘only’ and jag ‘I’ were written in capital letters. This reading is shown in Figure 18 where the word bara ‘only’ carries a boosted HL-accent. The same capitalization also triggered readings where both bara ‘only’ and jag ‘I’ were assigned (H)LH-accents, as shown in Figure 19 ((H)LH-accent on bara). Among the different types of readings there were also sentences where bara ‘only’ was given a HL-accent without boosting (Figure 20) and sentences where it was not given any accent at all (Figure 21).

HL-accent boosting can be found in other phrase types as well. In Figure 22, the word aldrig ‘never’ (marked with an arrow) has a HL-fall which is notably higher than the preceding one.

In the three examples shown here, HL-accent boosting occurs on negations and on a focus sensitive adverb, and the boosted accents appear in the area before a head (H)LH-accent. However, from these three examples it is not really possible to make any larger generalizations about the exact function or about the distribution of this phenomenon. More research is needed to provide more information about HL-accent boosting, both in different information structural contexts, and with respect to the difference between areas before head (H)LH-accents and areas after (H)H-accents.
Figure 19. (H)LH-accent on bara ‘only’ as well as on jag ‘me’. This (H)LH-accent is not an initiality accent, since it is not in Spec,CP position, cf. section 3.2.2.2. The utterance is from experiment 6, see Table 1.

Figure 20. A HL-accent, but no boosting, on bara ‘only’. The HL-accent on bara is much lower than the HL-accent on verkligen ‘really’. Note also that the duration of bara is much shorter in this example than in the one shown in Figure 18. The utterance is from experiment 6, see Table 1.

Figure 21. No HL-accent on bara ‘only’. The utterance is from experiment 6, see Table 1.
Figure 22. HL-accent boosting on *aldrig* ‘never’. *Aldrig* ‘never’, marked with the arrow, receives a HL-accent which is notably higher than the previous HL-accent on *om*. There is no head (H)LH-accent before *aldrig*. There is, however, an initiality (H)LH-accent on the first stressed word *alla*. This is transcribed as H*LH, but is realized in a high pitch register and therefore resembles a plateau. (Cf. the discussion of Figure 13, Figure 14, and Figure 15 in section 3.2.1 for a description of this realization of the initiality accent.)

Even if no detailed analysis can be provided with only the three examples at hand, they nevertheless raise the question of what role HL-accents play in signaling information structural aspects of the utterance. This type of boosting could not be due to the word accent distinction alone.

In section 4.3.1 and 4.3.2, I shall briefly discuss two cases where HL-accent boosting might be expected because a HL-accent appears in a position where one would normally expect a (H)LH-accent. The reason why we find a HL-accent in these cases appears to be related to the notion of givenness.

### 4.3 HL-accents and givenness

It is well known that many languages have a general tendency to deaccent given material. Stockholm Swedish is one of these languages. However, in Stockholm Swedish, given material is not completely deprived of tonal material. Instead, whereas (H)LH-accents are avoided, HL-accents (which are generally assumed to be the realization of the lexical word accent contrast), are retained on given material, cf. section 3.1.2.

Below, I first discuss cases where a HL-accent appears in the nuclear position of the Intonation Phrase (IP) (4.3.1). The use of HL-accents in nuclear position can be related to the fact that the IP contains given information. This type of context is potentially interesting for studying whether there is HL-accent boosting as discussed in 4.2, because in nuclear positions, we normally expect stronger prominences than in non-nuclear positions. Ambrazaitis (2009) finds some indication that HL-accents can be boosted in nuclear position, when they signal narrow focus. His account of this fact is different from the given here, however. We return to these differences in 4.3.1.
Thereafter, I discuss cases of Second Occurrence Focus, where focused material fails to be realized with a strong prominence, because there is another focused constituent in the same sentence (4.3.2). In Stockholm Swedish, Second Occurrence Focus also provides an interesting context for testing the presence of HL-accent boosting, since HL-accent there appear on focused constituents (which normally have strong prominences relative to surrounding prominences). In Second Occurrence Focus cases, we could potentially examine HL-accent boosting both in areas before a head (H)LH-accent and in areas after a head (H)LH-accent. The lack of a strong prominence on Second Occurrence Foci has been related to the notion of given-ness in the literature. Thus, in both cases discussed in this section, the presence of a HL-accent on a syllable where we might otherwise expect a (H)LH-accent can be connected to the fact that the material is given.

4.3.1 HL-accents as head of IP

In this section, I give examples of IPs that lack a (H)LH-accent in the nuclear position and instead exhibit a HL-accent. I propose that this use of HL-accent is motivated by the pragmatic association of the HL-contour with givenness. Thus, the HL-accent can sometimes have the nuclear function in a phrase, and in such cases it is associated with givenness. The pragmatics of givenness can also be extended since HL-accent can be used as the head of IPs also when the speaker wants to signal that the information conveyed by the phrase is for some reason obvious or expected.

When the nuclear accent in an IP is not marked with a (H)LH-accent, it is not always possible to determine which accent is the nuclear accent. Here, I shall assume that the last HL-accent is the nuclear accent as long as the phrase exhibits a regularly downdrifting pattern. However, as indicated by data in Ambrazaitis (2009), narrow focus on a non-final discourse-given constituent can be expressed by a boosted HL-accent on that constituent. In such cases, a non-final HL-accent may be the nuclear accent.

Before moving on to discuss the structure of IPs with nuclear HL-accent in greater detail, we shall compare the account given by Ambrazaitis (2009) with the one given here, since there are some significant differences.

Ambrazaitis discusses in confirmation focus some detail. This is one case where HL-accent can occur in the nuclear position and it was illustrated in (21) in section 3.1, repeated here as (72). Mary in B can have either a HL-accent or a (H)LH-accent in this context. This is unusual in the sense that most foci are obligatorily marked with a (H)LH-accent (cf. the discussion in 3.1).

(72) A: Mary stal kakan.
   Mary stole cookie.DEF
   ‘Mary stole the cookie’
Ambrazaitis (2009) shows that a confirmation focus can be realized either with a fall from high to low, or with a (H)LH-accent. He accounts for this fall from high to low by assuming an additional prominence level 2 accent in Swedish. The representation assumed for this accent is H+L- (2009:158). He denotes this the L-hypothesis, (73) (2009:113).

(73) **The L-hypothesis:**
Besides the high phrase-level accent (H-), Swedish also has a low phrase-level accent (L-).

Ambrazaitis considers and rejects the option of representing this contour as a word accent fall, i.e. as H*L for accent 2 and HL* for accent 1. He has two main arguments for this. First, he finds some indication that HL-acents can be boosted in nuclear position when they signal a narrow focus (2009:123, 133–134). Second, he finds that there are cases where the word accent distinction is not clearly maintained in nuclear falls from high to low (2009:153–158) (there are, however, also many cases where it is maintained). He uses the term neutralization to refer to those cases where the word accent distinction is not maintained. Ambrazaitis suggests that these two facts are not true of pre- or post- nuclear HL-acents. Therefore, he suggests that the nuclear fall is phonologically different from the word accent fall and needs a separate phonological representation, and that the L-hypothesis is therefore motivated.

I shall not assume the L-hypothesis, but rather argue that the fall from high to low observed in confirmations is a regular HL-accent represented as H*L for accent 2 and HL* for accent 1. There are four main reasons for this.

First, as shown in section 4.2, it appears that HL-accent boosting can appear in the pre-nuclear areas, not only in the nuclear position. Therefore, a separate representation of the nuclear fall from the other variants is not warranted. A more general argument also applies here. Tonal contours can differ both in terms of scaling and duration, without being different in terms of their phonological representation. This is predicted by the assumption that tones exist on a separate tonal tier, and that the tonal H or L value is orthogonal to the scaling of the tone (cf. Ladd 2008).

The second argument presented by Ambrazaitis, i.e. that the word accent distinction is sometimes neutralized in nuclear positions, does not seem like sufficient argument for the L-hypothesis. The type of neutralization found by Ambrazaitis can be thought of as articulatory reduction as he also discusses (2009:158–159). Ambrazaitis’ material contains a relatively high degree of articulatory reduction (2009:151). However, he considers reduction an unsatisfactory explanation, since the reduction in these cases is found in nu-
clear positions of phrases. The L-hypothesis introduces a new phonological category, which does not need to express the word accent distinction. However, since there are also many cases in his material where the word accent distinction is maintained, the L-hypothesis essentially introduces an additional phonological category which is intermediate to and/or partly overlapping with the two word accent falls. If taken further, this strategy of accounting for articulatory reduction will force numerous new phonological categories in the system. I therefore favor the hypothesis that there is indeed neutralization of the word accent distinction in the nuclear position of phrases. Ambrazaitis also notes that if the neutralization were a case of articulatory reduction which is found in nuclear positions, it should also be expected that such reduction can appear in pre- and post-nuclear positions. Such data has not been reported (Ambrazaitis 2009:158). However, though it is generally assumed that the word accent distinction is maintained in pre- and post nuclear positions (Bruce 1977), to my knowledge it has never been shown that it is always maintained. I therefore acknowledge the prediction made by the analysis provided here, that there can be neutralization of the word accent distinction in non-nuclear positions as well as in nuclear positions. Future research is needed to follow up on this issue.

The third argument for not assuming the L-hypothesis is that the new contour introduced by the L-hypothesis would be the only prominence contour in Stockholm Swedish which does not express the word accent distinction. Thus, there appears to be no natural place for this contour in the phonological system.

Fourth, the HL-representation has the advantage of relating the shape of the word accent HL-fall with the shape of the nuclear HL-fall. If it is true, as suggested here, that the use of the HL-contour in nuclear position is related to the notion of givenness, the HL-representation provides a potential explanation for the presence of a HL-nucleus in the phonological system, since HL-accents in non-nuclear position generally appear on given items (though they are not primarily a signal of givenness).

4.3.1.1 The phonological structure of IPs with HL-heads

In this section I will show that initiality (H)LH-accents as well as head (H)LH-accents can appear in IPs with HL-accents as their heads.

To illustrate this, we need to look at an example which has a sufficiently complex syntactic and phonological structure. Consider the sentences shown in Figure 23 and Figure 24. Both contours were produced in a set of recordings where two speakers read a set of sentences with varying syntactic and information structures. Figure 23 and Figure 24 illustrate two syntactically parallel sentences which are read with confirmation focus. Thus, both sentences are given and uttered as confirmations of a previous speaker’s pro-
Figure 23. Initiality (H)LH-accent (the last H in this accent is marked with an arrow) in a confirmation sentence with a two word object noun phrase in initial position. The utterance is: Sekreterarens barnbarn har jag känt sen tio år tillbaka. ‘The secretary’s grandchild I have known for ten years’. The context given to the informant was: Jag visste inte att du känner sekreterarens barnbarn sen tio år tillbaka. Är det sant? ‘I didn’t know you’ve known the secretary’s grandchild for ten years. Is it true?’. The utterance is from experiment 5, see Table 1.

Figure 24. Topic marking (H)LH-accent (the last H in this accent is marked with an arrow) in a confirmation sentence with a two word object noun phrase in initial position. The utterance is: Lärarnas riksförbund kom jag i kontakt med under förra året. ‘The teachers’ organization I came into contact with last year.’ The context given to the informant was: En erfaren lärare till en nyutexaminerad kollega: Rektorn sa att du hade kommit i kontakt med lärarnas riksförbund redan under förra året. Är det sant? ‘An experienced teacher to a colleague who just received a teachers’ degree: The principle told me you already came into contact with the teacher’s organization last year. Is it true?’. The utterance is from experiment 5, see Table 1.
They don’t affect many kinds of plants. The phrase is uttered by the plant expert in the radio interview (see Table 1). The immediately preceding context is: *det som är jättebra – hehe, om nånting är bra med de här skadorna – det är det att de är så specifika de här insektorna* ‘what is really good – hehe, if there is anything good – about these damages – is that they are really limited, these insects’.

The Spec,CP position is filled with a two-word noun phrase object consisting of one pre-posed modifier and a head noun, both of which are HL-accented. As a comparison between the figures reveals, both sentences have only HL-contours in the VP. However, they also have one (H)LH-accent each. The contour in Figure 23 has an initiality (H)LH-accent on the initial word of the noun phrase in the Spec,CP position, whereas the contour in Figure 24 has a topic marking (H)LH-accent on the final word of the noun phrase in the Spec,CP position.

The (H)LH-accent in Figure 23 is an initiality (H)LH-accent (3.2). It is assigned to the leftmost stressed word in the sentence (*sekreterarens*) and floats rightwards toward the following HL-accent (on *barnbarn*). The (H)LH-accent in Figure 24 is a head (H)LH-accent, which marks the contrastive topic of the sentence (3.1.3). It is assigned to the rightmost stress in a syntactic phrase (*riksförbund*) and is followed by a high plateau which is interrupted by the following HL-accent (on *jag*). Thus, the sentence in Figure 23 is phrased as one single PP in an IP, whereas the sentence in Figure 24 is phrased as two PPs in an IP.

As mentioned, the HL-accent is associated with the pragmatics of givenness when used in nuclear position of a phrase. This association with givenness appears to motivate the use of nuclear HL-accents also in other contexts, where the sentence is not given in a strict sense, but where the speaker has reason to make the content of the phrase sound expected or not surprising. One such example is given in Figure 25. The immediately preceding context to this utterance is as follows: *det som är jättebra – hehe, om*
nånting är bra med de här skadorna – det är det att de är så specifika de här insekterna ‘what is really good – hehe, if there is anything good about these damages – is that they are really limited, these insects’. The sentence in Figure 25 is then actually a repetition and reformulation of something that the speaker just said. In this sense it is close to being given in the context, and need not really be marked as containing new information. In this particular example the use of this intonation contour may also be related to the speech situation. The speaker is trying to explain something to a radio listener and she is therefore speaking relatively clearly.

4.3.2 HL-accent and Second Occurrence Focus

This section looks at another context where a HL-accent is found in a position where we might otherwise expect a (H)LH-accent. This is the case of so called Second Occurrence Focus, henceforth SOF. As was illustrated in section 3.1, foci generally attract a strong prominence. In Stockholm Swedish, this strong prominence is a (H)LH-accent. However, a SOF, unlike most other types of focus, fails to receive such a prominence because there is another focus in the sentence which attracts it. An SOF is illustrated in (74)c and (75)c from Beaver et al. (2007:256).

(74)  a) Both Sid and his accomplices should have been named in this morning’s court session.

    b) But the defendant only named [SID], in court today.

    c) Even the state [PROsecutor] only named [Sid] in court today.

(75)  a) Både Sid och hans medbrottslingar skulle ha nämnts both Sid and his accomplices should have mentioned PASS in rättegångsförhandlingarna idag.

    b) Men svaranden nämnde bara SID i rättegångsförhandlingarna but defendant.DEF mentioned only Sid in court idag.

    c) Till och med [ÅKLAgaren] nämnde bara [Sid] i even prosecutor.DEF mentioned only Sid in rättegångsförhandlingarna idag.

The sentences in (74)b and (75)b introduce a focus on the word Sid, in reply to the context sentences in a. Sid is a focus by virtue of being associated with the focus sensitive adverbs only/bara, and receives a nuclear prominence. In the c sentences, Sid is repeated, and it remains focused since it is still associated with only/bara. However, it no longer receives a strong promi-
nence, because there is another focus in the sentence which attracts the nuclear prominence. This focus will be referred to here as the First Occurrence Focus (FOF). 35

Although the SOF does not receive nuclear prominence, Féry and Ishihara (2009a) find that SOF is marked with a tonal excursion in German. The excursion is larger when the SOF appears before the FOF than when it appears after it.

As for Swedish, no phonetic studies have been done on SOF, as far as I am aware. As indicated in (74)–(75), SOF is not (H)LH-accented in Stockholm Swedish when it occurs after the FOF. When SOF precedes FOF, it can be (H)LH-accented. This is illustrated in the Swedish example in (76)b.

(76) Sven och Ylva vill flytta in i sin nya villa så fort som möjligt. De hoppas kunna flytta på bara fyra dagar. Deras vänner tror inte att det går.

‘Sven and Ylva want to move into their new house as quickly as possible. They hope to move in only four days. Their friends don’t think it is possible.’

a) Inte ens [professionella FLYTTGUBbar]$_{FOF}$ kan flytta på bara [fyra dagar]$_{SOF}$.

b) På bara [fyra DAgar]$_{SOF}$ kan inte ens [professionella FLYTTGUBbar]$_{FOF}$ flytta.

However in (76)b, there are two possible reasons for the presence of the (H)LH-accent on dagar ‘days’. First, it could be due to the SOF. Second, it could be due to the fact that the whole phrase på bara fyra dagar ‘in only four days’ is a frame setter, a notion which is close to a contrastive topic (Krifka 2008:269, see the discussion in 3.1.3). Such frame setters can be marked with a (H)LH-accent on its final stressed syllable. In order to see whether a SOF alone would trigger a (H)LH-accent in pre-nuclear position we can use an example like (77). This illustrates that if a SOF occurs on a non-final word of the frame setter, the SOF, and not the final word of the frame setter, must receive the pre-nuclear (H)LH-accent.

35 There has been some discussion as to what exactly causes the SOF to be unaccented. It has often been assumed in the literature that SOF is given, and that this is the reason why it receives no accent. The FOF, on the other hand, is new and therefore does receive an accent (e.g. Féry and Ishihara 2009a). However, Büring (2008) argues that givenness does not provide a full account of the problem of SOF. There are cases in which both the FOF and the SOF are given, but still only the SOF remains unaccented. Instead he argues that the size of the focus domain is the reason why SOF does not receive an accent. I shall leave it open here what exactly causes the deaccenting of SOF.
Sven och Ylva ska flytta. De undrar om de har råd att betala en flyttfirma för att hjälpa dem. Flyttfirman säger att bara en flyttare inte ens kostar tusen kronor, fast kostnader för en bil tillkommer.

’Sven and Ylva are moving. They wonder if they can afford to pay a moving company to help them. The moving company says that only one mover doesn’t even cost a thousand crowns, but there are some extra charges for the car.’

Eftersom de bara behöver en flyttare behöver de inte ens betala två tusen kronor.

Sven och Ylva ska flytta. De gissar att de behöver beställa sex flyttare från flyttfirman. Men flyttfirman säger att bara en flyttare till och med kan bära deras stora mahognyhylla.

’Sven and Ylva are moving. They are guessing that they might need to engage six movers from the moving company. But the moving company claims that only one mover can even carry their huge mahogany shelf.’

In conclusion, the HL-accent has usually been seen as a lexical tonal sequence in the literature (Chapter 2). However, it has also been referred to as a prominence (e.g. Bruce 1977, 1994). The status and function of the HL-accent as a prominence has, however, not been thoroughly studied. In section 4.2, I provided examples where HL-accents are boosted. Although no exact generalization could be formulated here regarding the cause of the boosting, it is clear that it could not be due to the lexical word accent distinction. Thus, it is assumed that HL-accents also help signal different aspects of the information structure of utterances.

In section 4.3 I discussed two cases where HL-accents appear in positions where we normally expect to find (HL)H-accents. The first of these was cases where a HL-accent appears in the nuclear position of an IP, and the second of these was so called Second Occurrence Focus which appears in pre-nuclear as well as post nuclear positions. Both cases in section 4.3 can be related to the notion of givenness. Both these cases also provide interesting
contexts for future investigations of HL-accent boosting. In the case of nuclear HL-accents, the question is if the nuclear HL-accent is somehow distinguished from non-nuclear HL-accents in the IP. Ambrazaitis (2009) argues that this is true when the HL-accent expresses narrow focus. Similarly, SOF cases provide an interesting point of study, since we might expect that the focused HL-fall would be boosted in relation to surrounding HL-accents.

Hypothetically, both duration and fall height can be used for HL-accent boosting. At this point it is not understood how these two factors interact to create an impression of increased prominence on a HL-accent.

4.4 Discussion: on the relation between HL-accents and (H)LH-accents

In this study, I assume that the distinction between the two prominence levels in Stockholm Swedish is a categorical one. However, there is reason to believe that the degree of perceived prominence is not a two-step scale in Stockholm Swedish, but that degrees of prominence can be distinguished within each of the two prominence levels. For example, initiality (H)LH-accents as discussed in 3.2 are usually impressionistically less prominent than head (H)LH-accents as discussed in 3.2, in spite of the fact that they are both prominence level 2 accents. Also, HL-accent boosting creates different degrees of prominence among different prominence level 1 accents.

It may be expected that duration as well as the height and possibly also the timing of the tonal contour interacts with the choice between prominence level 1 and prominence level 2 contours in creating the perception of perceived prominence. Heldner (2001:61–66, 329–361), finds that duration correlates with (H)LH-accenting in Swedish. It can also be expected that the height of tonal peaks affects the degree of prominence perceived by listeners. Some discussion on this topic in Swedish can be found in Heldner (2001:58). A more general discussion on pitch height in relation to the so called effort code can be found in Gussenhoven (2004:85). See also Gussenhoven (2004:90 f.) for a discussion on the role of peak timing for the perceived prominence.

The interaction between these factors for the degree of perceived prominence are not understood for Swedish, and it is beyond the scope of the present work to pursue that issue here.

---

36 Heldner (2001:61–66) was also published as Heldner and Strangert (1997). Heldner (2001:329–361) was also published as Strangert and Heldner (2001). Note that these researchers use the term focal accent for what I term head (H)LH-accents, cf. the discussion in Chapter 2.

37 Heldner (2001:55–60) was also published as Strangert and Heldner (1995).
However, on a conceptual level, we can think of prominence in Stockholm Swedish as a two dimensional model. One dimension is the combination of phonetic prominence cues which contribute to the degree of perceived prominence. The other dimension is the phonological distinction between prominence level 1 and 2. The degree of perceived prominence is a combination of these two dimensions.

Figure 26 represents such a model. The thick black line represents a gradient scale along which prominences can be placed according to their degree of perceived prominence. A higher degree of perceived prominence correlates with a higher point on the scale. The placement of a given prominence on the scale of perceived prominence depends on a range of factors, such as duration, pitch height and peak alignment. The role of the two prominence levels in Stockholm Swedish, and also the absence of tonal prominence can be thought of as covering different sections on this scale, as indicated by the brackets.

If we think of the relation between the prominence levels as indicated in Figure 26, we can also hypothesize that different functions of one prominence level organize themselves within the area of that prominence level. For example, one hypothesis would be that (H)LH-accenting that signal narrow
focus generally occur higher up on the scale than initiality (H)LH-accents. We may also hypothesize that a HL-accent which signals a SOF is higher in the HL-area than a HL-accent which does not signal SOF.

As indicated by the fact that the brackets are overlapping in the figure, we can also hypothesize that a (H)LH-accent which is very low in the (H)LH-accent area, can be perceived as less prominent than a HL-accent which is very high in the HL-accent area.

This type of two dimensional model of the relation between the two prominence levels underlies the description provided here. However, it must be noted that experimental evidence is needed before we can establish whether this is the right way of thinking about the relationship between the two prominence levels. Two immediate questions present themselves. First, we need to examine what the parameters are that affect the degree of perceived prominence, and second we need to find out how the different functions organize themselves along the scale of prominence.
5 Post-nuclear areas and IP boundary tones

This chapter presents the intonational options that are available for the area following the last head (H)LH-accent (the nuclear accent) in an IP in Stockholm Swedish. I refer to this area as the post-nuclear area, cf. also section 2.2.38

I claim that Stockholm Swedish has a set of six structurally different options for post-nuclear areas that contain post-nuclear HL-accent. In addition to these six options, there is an optional process which merges the last H of a (H)LH-accent with a H% boundary tone if these are adjacent on the tonal tier.

The number of options for the post-nuclear area presented here is considerably larger than that assumed by the Lund model. Bruce (1998:168) distinguishes between L% and LH%, whereas Hansson (2003:23) distinguishes between L% and H%. Thus, the Lund model distinguishes two, or possibly three, boundary tones on the right edge of phrases.

Ambrazaitis (2009) compares Stockholm Swedish utterances with German ones, and claims that Stockholm Swedish has a larger set of nuclear patterns than the Lund model reveals. The argument presented in this chapter corroborates Ambrazaitis’ claim, in the sense that it expands the possible options for the post-nuclear area. However, the present analysis accounts for the variation in post-nuclear areas in terms of boundary tones only. Thus, in all the cases discussed here, a head (H)LH-accent is assumed to be the nuclear prominence of the IP.

In Stockholm Swedish, HL-accent are realized in the area between the nuclear accent and the IP boundary (as well as in the area preceding the nuclear accent). As in most languages, the area following the nuclear accent generally has an overall falling tonal pattern (Bruce 1982). Some researchers have argued that this falling tendency is best described as grammaticalized downstep which is dependent on the number of HL-accent in the post-nuclear area. Others have assumed that it is due to time-dependent down-drift. It is a still ongoing discussion which of these analyses is the better one (see Chapter 4 in Hansson 2003 for an extensive review). I shall not go in to this discussion here.

38 A previous analysis of the data in this chapter was previously published in the proceedings volume from Svenskans Beskrivning 30, 2008 (Myrberg, to appear).
Instead, this chapter presents a typology of post-nuclear intonational contours. I present only a description of the phonological contours here. That is, there remains a range of questions concerning the pragmatics of these contours. These questions will be left for future research. It may be noted, however, that all the rises appear to have similar or partly overlapping pragmatic functions. Possibly, some distributional differences between them are to be found in social factors and/or individual preferences.

The chapter is organized as follows. 5.1 provides an overview of the six basic options that are available for post-nuclear areas in Stockholm Swedish. Sections 5.1.1, 5.1.2 and 5.1.3 exemplify these options and provide a more detailed discussion. 5.2 discusses the processes that can apply in areas where there are no post-nuclear accents. The chapter ends with a summary in 5.3.

5.1 A typology of post-nuclear areas
The typology presented in this section is based on post-nuclear areas that contain post-nuclear HL-accents. In principle, the same typology is also valid for post-nuclear areas without HL-accents, although the realizations of such areas are different enough to warrant a separate discussion at the end of the chapter.

Figure 27 presents the six types of post-nuclear areas which are distinguished. In each contour, the post-nuclear area begins at the black dot, which represents the last H tone of the nuclear (H)LH-accent in an IP. The triangles represent post-nuclear HL-accents, and there may be any number of such accents in a phrase.

<table>
<thead>
<tr>
<th>Internal</th>
<th>External Low</th>
<th>External High</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Internal contour" /></td>
<td><img src="image2.png" alt="External Low contour" /></td>
<td><img src="image3.png" alt="External High contour" /></td>
</tr>
</tbody>
</table>

Figure 27. The typology of post-nuclear areas containing post-nuclear HL-accents. The dot represents the last H tone of the nuclear (H)LH-accent, and the triangles represent post-nuclear HL-accents. The three columns show the three types of post-nuclear areas. A distinction is made between external and internal areas, where internal areas belong to the same PP as the nuclear accent. External areas, on the contrary, are separated from the nuclear accent by an IP boundary tone. This IP boundary tone also cuts off the PP which contains the nuclear accent, so that the external area is not part of this PP. The two rows show the alternatives for the boundary on the final syllable of the post-nuclear area in the IP.
The three columns in Figure 27 represent the three types of post-nuclear areas: internal areas, external high areas, and external low areas. The two rows in Figure 27 represent the two alternative boundary tones. The boundary tone aligns with the last syllable of the phrase and describes the pitch at the very end of the phrase. As seen here, two boundary tones are assumed for Stockholm Swedish, L% and H%.

The distinction between internal and external post-nuclear areas refers to their status in a tree representation. The internal area is the resulting prosodic structure when the post-nuclear area belongs to the PP that contains the nuclear (H)LH-accent (Figure 28). The external area on the contrary, does not belong to the same PP as the nuclear accent (Figure 29). Instead, an IP boundary is inserted immediately after the nuclear accent. The post-nuclear area is added to the right of this IP, under a higher IP projection. The post nuclear area remains unparsed at the PP level. The difference between internal and external post-nuclear areas is further discussed in section 6.1.2.

Figure 28. Representation of internal post-nuclear area. This figure is repeated in Chapter 6 as Figure 49. See further discussion there.

Figure 29. Representation of external post-nuclear area. This figure is repeated in Chapter 6 as Figure 48. See further discussion there.
The **internal post-nuclear area** has a plateau between the last H of the (H)LH-accent and the first HL-accent. This happens in many types of post-nuclear areas, and may for example happen when there is a narrow focus in a neutral declarative clause. If there is a H% at the end of the post-nuclear area, this type of area can be used to signal list intonation.

Within **external post-nuclear areas**, **high** and **low** are further distinguished. This distinction is due to whether the IP boundary tone immediately following the nuclear (H)LH-accent is H% or a L%. Note that there is another boundary tone on the last syllable of the external area. This boundary tone belongs to the higher IP that contains the post-nuclear area, and can be either H% or L%.

The **external low post-nuclear area** has a fall immediately after the nuclear (H)LH-accent. This fall is a L% IP boundary tone which is inserted right after the nuclear accent. The external low area is different from the internal area in that it lacks the plateau that connects the (H)LH-accent and the first post-nuclear HL-accent. The external low area is due to pressure for the nuclear accent to occur IP-finally (see 7.3.3).

The **external high post-nuclear area** has a H% immediately following the nuclear (H)LH-accent. It is realized in a higher register than the rest of the phrase and has a similar function as the H% in external low or internal areas. In the following sections I exemplify and discuss these types in more detail.

### 5.1.1 Internal post-nuclear areas

Internal post-nuclear areas in combination with L% boundary tones is an unmarked way of realizing a declarative clause. This is the type of sentence that much of the research on Stockholm Swedish intonation has focused on, and on which the Lund model of Swedish intonation is based (cf. Hansson 2003, Ambrazaitis 2009).

The main characteristic of the internal post-nuclear area is the formation of a high plateau that connects the last H tone of the (H)LH-accent with the first (leftmost) post-nuclear accent. A typical internal post-nuclear area with one post-nuclear accent is illustrated in Figure 30.

It may be noted that the shape of plateaus can vary, ranging from crisp to somewhat sloping. In Figure 31 and Figure 32 two very different plateaus are shown.

In Figure 31, there is a very crisp high plateau connecting the head (H)LH-accent on *även* and the first post-nuclear accent on *egna*. In Figure 32, by contrast, there is a sloping plateau between the focused word *hemulen* and the word *stort* which carries the first post-nuclear HL-accent.

Previous research on plateaus is rather sparse and to my knowledge the only systematic study of the shape of plateaus is that presented in Bruce (1987) which shows that longer plateaus tend to be less crisp than shorter
Figure 30. An internal post-nuclear area in combination with a L% boundary tone, illustrating a typical pattern for a declarative sentence. The utterance is taken from the prank call (see Table 1), and reads *Jag ringer från Mumindalen* ‘I’m calling from the Moomin valley’. At this point in the conversation, the Swedish comedian has been explaining to a hotel receptionist that a group of (non-human) inhabitants of *Mumindalen* ‘the Moomin valley’, a place in a well known children’s book, would like to stay in the hotel. In an attempt to understand the situation, the hotel receptionist asks *Var ringer duifrån?* ‘from where are you calling?’. Because *Mumindalen* ‘the Moomin valley’ is now discourse-given, it carries a HL-accent. The verb *ringer* ‘calling’ carries the head (H)LH-accent. There is plateau formation from the head (H)LH-accent on *ringer* to the HL-accent on *Mumindalen*.

Figure 31. A very crisp high plateau that connects the last H tone of the (H)LH-accent with the first post-nuclear HL-accent. This utterance comes from the audio book (see Table 1), and reads *även de som har egna inkomster* ‘also those who have their own income’. The head (H)LH-accent is on *även* ‘also’ and the first post-nuclear accent is on *egna* ‘their own’. This phrase has a second post-nuclear accent on *inkomst* ‘income’. This accent does not participate in any plateau formation since it is not immediately preceded by any (H)LH-accent.
Figure 32. A sloping plateau between the head (H)LH-accented word and the first post-nuclear accent. The utterance comes from the prank call (see Table 1), and reads Hemulen behöver ett stort eget rum ‘The Hemul needs a large room of his own’, where hemulen ‘the Hemul’ is focused and stort ‘large’ carries the first post-nuclear accent. This phrase has three post-nuclear accents (on stort, eget and rum, where the accent on rum is somewhat affected by the phrase final rise). Only the first accent participates in plateau formation. The phrase is terminated by a rise due to a H% which signals continuation in this particular case.

ones. It appears from the examples in my corpus that the crispness of plateaus also varies with different types of speech, so that more careful speech exhibits more crisp plateaus than less careful speech.

The fall of the HL-accent which ends the plateau can start on a much higher pitch level than the rest of the post-nuclear HL-accents (Bruce 1977, 1987). This is seen in Figure 31.

An internal post-nuclear area may have a low (L%) or a high (H%) boundary tone. As already mentioned, a L% in combination with an internal post-nuclear area is a common realization of a neutral declarative clause. This is the type of contour seen in Figure 30 and Figure 31. An internal post-nuclear area may, however, also have a H%. This type of tone can be used in continuation contexts, as well as in questions. The phrase final rise in Figure 32 illustrates a continuation rise. In Figure 33 a rise in an internal post-nuclear area occurs in a question.

The pragmatics of phrase final rises in Swedish has not been fully explained. In many languages, high pitch at the end of a phrase is used to signal questions. In Swedish however, a phrase final rise is generally not seen as necessary to signal question intonation (Gårding 1979, Hadding-Koch and Studdert-Kennedy 1964, see also Gussenoven 2004:209 ff.). This
Figure 3.3. Phrase final rise due to a H% in an internal post-nuclear area, in a question. The utterance is taken from the radio interview (see Table 1) and reads *har det kommit tillräckligt med regn nu då?* ‘has there been enough rain now, then?’ The utterance has a relatively crisp plateau connecting the head (H)LH-accent on *tillräckligt* with the first post-nuclear accent on *regn*.

makes Swedish different from many other Germanic languages, such as English or German.39

Studies on question intonation can be found in House (2003, 2004) House (2004), finds that about 20% of the questions in Swedish do have a rise, and therefore concludes that:

[A]s an optional interrogative marker, a final rise does occur in a considerable number of spontaneous questions and therefore should be considered as an important component of interrogative intonation when describing and modeling Swedish intonation. (House 2004:58)

However, the fact that many Swedish questions display a phrase final rise does not mean that a phrase final rise can function independently as a signal of question e.g. by turning a declarative into an interrogative. Many factors apart from interrogative mode trigger phrase final rises, and may well be at play in questions as well. Thus, the rises found in House’s questions need not be seen as direct cues to interrogative mode, but could also be some type of social markers or attitude markers which may interact with other cues in questions. Thus, further studies of final rises are required before we can say anything conclusive about their pragmatics. It should also be noted here that the pragmatics of phrase final rises in internal areas appears to, at least partly, overlap with the pragmatics of external low areas with H% (discussed in section 5.1.2) and external high areas (discussed in section 5.1.3).

39 However, as shown by Rialland (2007), there are many non-Germanic languages which do not use phrase final rises to signal interrogative mode.
5.1.2 External low post-nuclear areas

In an external area, the nuclear (H)LH-accent is immediately followed by a fall. This fall is analyzed as a L% boundary tone. Because of this boundary tone, there is no plateau formation between the nuclear (H)LH-accent and the following HL-accent. Except for this lack of a plateau, the external area is very similar to an internal area. An example of an external low post-nuclear area is given in Figure 34.

As was already discussed in 5.1, external areas are delimited on both sides by IP boundary tones. The boundary tone to the left determines whether the external area is high or low. Since this section is about low areas, all post-nuclear areas discussed here have a L% boundary tone to the left. However, the boundary tone to the right may be either L%, as in Figure 34 or H% as in Figure 35. Pragmatically, an external low area with a H% is similar to an internal area with a H%.

As mentioned in 5.1, the fall at the left edge of the external low area is analyzed as a L% IP boundary tone. There are some arguments in favor of this analysis. First, the fall looks and sounds similar to those falls that mark the IP boundaries in a sequence of IPs, see Figure 36 which illustrates three sequential IPs, each of which ends with a L%.

Second, the external area may be separated from the rest of the phrase by a pause, which indicates the presence of a prosodic boundary. An example illustrating this is seen in Figure 37. It should be noted that when the pause is long, the external low area may look prosodically independent. Therefore, it may be difficult to separate it from an IP with a nuclear HL-accent (i.e. an IP
Figure 35. External low area with H% boundary tone. The utterance is from the radio interview (see Table 1) and the speaker says *det är det att de är så specifika de här insekterna* ‘it is that they are so specific, these insects’. There is a fall due to a L% immediately following the nuclear (H)LH-accent. On the last syllable of the post-nuclear area, there is a H%.

Figure 36. Three sequential IPs. Each IP contains one head (H)LH-accent that is immediately followed by a L% (marked by the arrows). The utterance is taken from the prank call (see Table 1). The speaker says *det är en filminspelning så det är skådespelarna i de här rollerna*, så ‘well it is a film shoot so it’s the actors in these parts you see’.

which lacks a (H)LH-accent). Such IPs are usually connected with given information, as discussed in Chapter 4.

Third, there appears to be a tendency for the L% that precedes external areas to appear in positions where prosodic boundaries might be expected. For example, there appears to be a tendency for the falls to separate syntactic arguments (such as objects) from syntactic adjuncts (such as adverbials). This is the case in the example from the prank call: *å jag skulle vilja reser-
Figure 37. An external low post-nuclear area that is separated from the rest of the phrase by a pause. The utterance is taken from the audio book (see Table 1) and reads dold bakom en skärm har Nancy berättat ‘hidden behind a screen, Nancy has said’.

vera ett antal rum till nästa vecka (Figure 34), where the adjunct till nästa vecka is not connected to the head (H)LH-accented rum by a plateau. It is known at least from English that adjuncts are prosodically more independent than arguments. For example, focus projection is argued to take place across a syntactic head-argument boundary, but not across a syntactic head-adjunct boundary (cf. Selkirk 1984:230 ff., 1995a, see also Chapter 3).

From an Optimality Theoretic (OT) perspective, external low areas may be explained in terms of interaction between, on the one hand, constraints that demand that the head of a domain be aligned with its boundary, and, on the other hand, constraints that require all elements to be parsed on all levels of the prosodic structure. This analysis is further developed in 7.3.3.

5.1.3 External high post-nuclear areas

The main characteristic of the external high post-nuclear area is the fact that the baseline of the pitch span is raised. This, I assume, is due to a H% IP boundary tone which is inserted directly after the (H)LH-nuclear accent, i.e. at the left edge of the post-nuclear area.

The high external area is parallel to the low external area in being preceded by a right IP edge which is inserted after the nuclear (H)LH-accent. This edge has one boundary tone, which is always H% in the case of a high external area. In addition, there is an IP boundary tone at the right edge of the post-nuclear area. This boundary tone can be either L% or H%.

An example of such a high external post-nuclear area with a L% is given in Figure 38. Figure 39 shows the same type of area with a H%.

Pragmatically, external high post-nuclear areas are similar to internal and external low post-nuclear areas with a H%. This is true for external high
Figure 38. A high post-nuclear area with a L%. The baseline is raised after the head (H)LH-accent on ö ‘island’, causing the post-nuclear area to be realized in a high register. The utterance is taken from the audio book (see Table 1) and reads kunde köpa sig en ö så där i förbifarten ‘could buy an island just in passing’.

Figure 39. A high post-nuclear area with a H%. The post-nuclear area stretches from the head (H)LH-accent on kryddväxter ‘herbs’ to the end of the phrase. The utterance is taken from the radio interview (see Table 1) and reads bland annat gäller det kryddväxter som inte vill trivas ‘among other things it is about herbs that will not grow properly’.

areas with L% as well as with H% boundary tones. Even though there is a clear difference in the contours of Figure 38 and Figure 39, this distinction is not always easy to hear and future research is needed before the relation between these two contours can be understood.

HL-accent are realized within the external high post-nuclear area, as in any other type of post-nuclear area. This is illustrated by the slight tonal fall on förbifarten ‘passing’ in Figure 38, and is also seen on trivas ‘thrive’ in Figure 39.
5.2 Post-nuclear areas without HL-accents

In the beginning of this chapter I said that the typology in Figure 27 is valid independently of whether an area contains post-nuclear HL-accents or not. However, I also claimed that the differences are large enough to warrant a separate discussion of areas which lack HL-accents. This section contains that discussion.

An initial observation is that, in the absence of HL-accents, it is difficult to distinguish the internal area with a L% from the low external area with a L%. The L% in these areas may be realized as more or less steep or early and may also be combined with creaky voice and sometimes also with a slight rise after the fall. These differences in the realization of the L% are connected with somewhat different pragmatic nuances. Very steep falls, sometimes enhanced by a creak at the bottom of the fall, give the impression of a very clearly marked L% tone. Hypothetically, the fall to L% could be earlier or steeper in the case of an external area than in an internal area. I have no evidence in favor of such a claim at this point, however. Therefore I shall assume that these two options are indistinct when there are no post-nuclear accents.

In addition, the difference between the two external high areas is difficult to make. Therefore I assume that these two can also not be distinguished.

The resulting typology contains one phrase final fall and three types of final rises. This is illustrated in Figure 40.

![Diagram](image)

Figure 40. The typology of post-nuclear areas that lack post-nuclear HL-accents. As seen, the internal and external low areas merge, as does the external high with H% and with L%.

The internal post-nuclear area with a H% is illustrated on the bottom row, in the first column of Figure 40. In such areas the (H)LH-accent is adjacent to the H% boundary tone on the tonal tier. In this tonal context, the last H of the (H)LH-accent merges with the H%. The resulting contour lacks a separate peak for the head (H)LH-accent. Such a contour is seen in Figure 41. It is obvious from the pragmatic context in this case that the word akleja-
gallmyggan ‘columbine gall midge’ (a pest that kills the buds of columbines before they bloom) carries the nuclear accent. However, there is no tonal peak on the secondary stress of this word, as would be expected on a (H)LH-accented accent 2 word. Instead, there is a rise on the phrase final syllable. The HL-fall on the main stress of the word is realized as expected, and it is thus only the last H of the (H)LH-accent that is affected by being adjacent to the H%. This is probably the most neutral way of realizing a phrase final focus in combination with a H% boundary tone.

Since the last high tone of the (H)LH-accent is merged with the H% rise, the realization of the contour (H)LH H% is the same as the realization of a HL-accent followed by H%. The effect of this is that these patterns are ambiguous, audibly as well as visually. Therefore, it is sometimes necessary to use the pragmatic and phonological context to decide whether a final word in a phrase with a H% is focused or not.

House (2004:58) appears to note this phenomenon and says that:

In this material final rises occur mostly in conjunction with final focal accent [i.e. the head (H)LH-accent]. The rise can be seen as a replacement accent (i.e. an interrogative focal accent) or a deformation of the focal accent where the peak is delayed. The fact that the final rise can also occur on a non-focal accent can be seen as evidence that the rise is an extra intonational factor which either delays the focal peak or surfaces as an extra rise.
I follow House in assuming that the phrase final rise is a different gesture from the head (H)LH-accent. Thus, it is not seen here as an interrogative nucelar (H)LH-accent, since, as House notes, the H% can occur both after a (H)LH-accent and after a (sequence of) HL-accent(s). Importantly, it appears to have similar pragmatics in either case. The phrase final rise is due to a H% boundary tone, which attracts and merges with the last H of the head (H)LH-accent when no tonal elements intervene between them.

The fact that the last H of the (H)LH-accent is attracted by and merged with an adjacent H tone does not only happen in phrase final context. A similar process takes place with initiality accents (3.2). This can be seen as a part of the floating behavior of this tone discussed in e.g. Bruce (1987), (see also Hansson 2000).

The phrase final rise in Figure 41 contrasts with a phrase final rise that is due to an external high area, shown in Figure 42. In Figure 42 there is no delay of the last H of the (H)LH-accent. Instead the pitch rises where the last H of the (H)LH-accent is usually realized. After that, it stays high until the end of the phrase.

The last type of phrase final rise is the one which is due to a low external area followed by a H% boundary tone. This type of area can cause a two peak contour to occur on one single phrase final syllable, as in Figure 43.

Figure 42. An external high post-nuclear area without post-nuclear accents. The speaker says *och e den här gallmyggan* ‘and eh this gall midge’. The baseline is raised after the (H)LH-accent, on mygg which is the secondary stressed syllable. The contour is different from that in Figure 41 in having a flatter high pitch toward the end of the phrase, instead of a clear rise on the final syllable. The utterance is taken from the radio interview (see Table 1).
Figure 43. A phrase final rise due to an external low post-nuclear area. The speaker is introducing herself. On the last syllable of her name, which is stressed, she has both the last H of the accent \(1 \text{ L}^*\text{H-accent}, \) a L% IP boundary tone, and a H% boundary tone. Note that the first L of the accent \(1 \) sequence has been pushed leftwards and appears before the stressed syllable. Possibly this is due to tonal crowding.

5.3 Summary

This chapter has presented a typology of post-nuclear areas in Stockholm Swedish. A distinction was made between internal and external post-nuclear areas. Internal areas belong to the same PP as the nuclear (H)LH-accent, whereas external areas belong to an IP higher up in the structure.

Internal post-nuclear areas are characterized by plateau formation between the last head (H)LH-accent in the IP and the first HL-accent, whenever there are post-nuclear HL-acents. When there are no such accents, the last H of the nuclear (H)LH-accent merges with the H% into a rise on the final syllable of the phrase.

External areas can be high or low in the speakers register. They have two IP boundary tones, one right after the last (H)LH-accent and one on the rightmost syllable of the post-nuclear area. External low post-nuclear areas are characterized by the lack of plateau formation, since the plateau is interrupted by a L% IP boundary tone, which is inserted immediately after the nuclear (H)LH-accent. When there are no post-nuclear accents and a H% in an external low area, the last H of the (H)LH-accent, the L% and the H% create a two peak phrase final contour. External high areas are characterized by a raised baseline and a high pitch register.

The introduction of this typology carries with it some implications for the understanding of the Stockholm Swedish intonational grammar in general, and challenges some of the earlier assumptions that have been made about it. It has been said that Swedish has an essentially simpler intonational phono-
logy than other Germanic languages (cf. Selkirk 1995a, Gussenhoven 2004, Gussenhoven & Van der Vliet 1999). Though this may be true, the analysis of Stockholm Swedish post-nuclear areas presented here, suggests considerably more intonational options than has been assumed in the earlier Lund model of Swedish intonation.
6 The Phonological Phrase (PP) and the Intonation Phrase (IP)

In the previous chapters, we have discussed the different phenomena that exist in the Stockholm Swedish intonational phonology. Based on the insights from these chapters, the following two chapters will discuss the branching of phonological structure at the PP and the IP level (the present chapter), as well as their interface with the syntax (Chapter 7).

I show in the present chapter that Stockholm Swedish presents evidence for complex branching of these two phonological domains. In order to account for the distribution of phonological phenomena that are licensed by the PP and the IP, we need to allow recursion of phonological domains (e.g. an IP domi- 

40 It should be noted that my use of the term adjunction is different from how this term is used in syntactic theory.

41 Note that prosodic adjunction is different from non-exhaustive parsing, at least in a system which allows recursion. For example, an IP node dominating another IP and a PP is a case of prosodic adjunction, even though it is exhaustively parsed.
The chapter begins with a review of prosodic hierarchy theory in 6.1. After that, section 6.2 arrives at the set of tonal patterns which can be created by the linear organization the objects in (79), and illustrates the difference between adjunction and coordination in Stockholm Swedish. Section 6.3 provides a branching structure for each of the tonal patterns from 6.2. Section 6.4, finally, summarizes the main arguments of the chapter.

6.1 Prosodic hierarchy theory

The theory of a prosodic hierarchy originates partly in the observation that the distribution of phonological phenomena cannot be explained only in terms of rules that apply within morphological or syntactic domains.

Selkirk (1986) shows that vowel lengthening rules in Chi Mwi:ni, apply to a phrasal constituent that is neither a word nor a syntactic constituent. In order to account for data of this sort, she assumes a hierarchy of phonological domains that are separate from the syntactic domains. Nespor and Vogel (1986) present an attempt to develop a universal prosodic hierarchy using data from many different languages to show that the application of phonological rules cannot be described with reference to syntactic and morphological structure only.

The claim that phonological rules refer to phonological domains rather than to syntactic ones is formulated in the Indirect Reference Hypothesis (1), originally from Inkelas (1989), referred here from Truckenbrodt (1999:221):

(80) Indirect Reference Hypothesis
Phonological rules refer to only prosodic constituent structure.

There is no complete agreement among researchers on how many levels should be assumed in the prosodic hierarchy, nor on the defining criteria for each level. However, the general idea of a set of hierarchically organized prosodic constituents is widely accepted (Ladd 1996:237). The differences between models of the prosodic hierarchy is due both to ideological preferences and to the fact that the descriptions of different languages is not easily captured by any universal set of domains.

Subsequently, a variety of different definitions of domains and terms for denoting them have been used in previous research. However, several researchers have operated with two sentence level domains. The highest one is referred to as the Intonation Phrase in several models, and the lower one has been termed intermediate phrase, Major Phrase or Phonological Phrase. For instance, the American ToBI system operates with Intonation Phrase (IP) and intermediate phrase (ip) (e.g. Beckman and Ayers 1994, Beckman and Hirschberg 1994, see also Beckman et al. 2005 for a review of the develop-

---

42 Chi Mwi:ni is spoken in Somalia and is closely related to Swahili.
ment of the ToBI system), Selkirk (e.g. 1995a, 2000) uses the terms *Intonation Phrase* and *Major Phrase*, and e.g. Nespor and Vogel (1986) Truckenbrodt (1999), Gussenhoven (2004:124, 2005) and Féry and Samek-Lodovici (2006) use *Intonation Phrase* and *Phonological Phrase*. In the present work, I use the terms *Intonation Phrase* (IP) and *Phonological Phrase* (PP). In previous work on Swedish, however, no distinction has been made between these two levels (Hansson 2003).

In addition to the two sentence level domains, some researchers have also assumed a higher level domain, the *Utterance*, which connects several Intonation Phrases (e.g. Gussenhoven 2004:124, Nespor and Vogel 1984). I assume no utterance level here (I shall assume that IPs may be related in terms of their scaling, but this will be accounted for with recursion of the IP).

Below the two sentence level domains, some researchers include yet a tonal level. This level is termed the *Accentual Phrase* and the *Minor Phrase* in some descriptions of Japanese (cf. e.g. Beckman and Pierrehumbert 1986, Venditti 2005 for the term Accentual Phrase and Selkirk and Tateishi 1988 for Minor Phrase). In Japanese, this level of phrasing has been used to account for the lexically governed accents. Within Scandinavian intonation research a (roughly) corresponding domain has also been assumed. It has been called the *tonal foot* (cf. work on Norwegian within the Trondheim Model by Fretheim 1981, Fretheim 1987, Fretheim and Nilsen 1989a, Fretheim and Nilsen 1989b, Fretheim 1990, and Nilsen 1992), the *Accent Phrase* (cf. Kristoffersen 2000:240) or the Norwegian translation *aksentfrase* (Abrahamsen 2003). Within the Lund model, this level is referred to as the *prosodic word* (e.g. Bruce 1998, Hansson 2003, Ambrazaitis 2009, Roll et al. 2009). Here I shall use the term Accent Phrase (AP) for this tonal domain, thus reserving the term prosodic word for the non-tonal domain below this level (see Chapter 2).

Recently Itô and Mester (2008, to appear) have reviewed the domains in the prosodic hierarchy in order to create a typologically valid model. They introduce the notions of *minimal* and *maximal* projections into the prosodic hierarchy. A minimal projection is one which dominates a node of the next lower category in the hierarchy, and a maximal projection is one which is dominated by the next higher category. By allowing infinite recursion (see below) of phonological domains and by allowing phonological rules to single out and refer specifically to minimal and maximal projections, they can reduce the need for the Minor Phrase in Japanese. It is possible that a parallel analysis could be made for Stockholm Swedish and the other Scandinavian dialects. However, at least the situation in Stockholm Swedish seems to be slightly more complicated than the one in Japanese, since there are two categorically distinct prominence levels which are separated with different tonal contours. I leave it for future research to find out whether such a reduction is also possible for Stockholm Swedish and other Scandinavian varieties. Wagner (2005) suggests that prosodic structure can be
modeled with unlabeled nodes. I shall not follow up on the predictions for Stockholm Swedish of such an assumption.

In addition to the discussion of how many domains there are, and how these are best defined, there has been a discussion regarding the branching of prosodic structure. Many researchers have taken prosodic structure to be “flatter” than syntactic or morphological structure. Chomsky and Halle (1968:372) illustrated this with the nursery rhyme *The house that Jack built*. Ladd (1996:237) refers to this example in his textbook on intonational phonology (81).43

\[(81) \quad [\text{This is } [\text{the dog that chased } [\text{the cat that killed } [\text{the rat that ate } [\text{the malt that lay in } [\text{the house that Jack built}]]]]]].\]

The syntactic phrasing is shown by the brackets in (81). As shown in (82) however, the prosodic phrase boundaries do not correspond with the syntactic boundaries, and do not in any clear way seem to reflect the hierarchical syntactic structure of this example.

\[(82) \quad (\text{This is the dog}) (\text{that chased the cat}) (\text{that killed the rat}) (\text{that ate the malt}) (\text{that lay in the house that Jack built}).\]

The mismatch between the syntactic and the prosodic structure can be seen as the result of mapping the flatter prosodic structure onto the deeper branching syntactic structure.

This flatness of prosodic structure has been formulated in the *Strict Layer Hypothesis* (SLH), which according to Ladd (1996:238) is originally due to Selkirk (1984:26, cf. also 1995b:443).

\[(83) \quad [...] \text{a category of level } i \text{ in the hierarchy immediately dominates a (sequence of) categories of level } i-1. [\text{Selkirk 1984:26}]\]

Another version of the SLH is presented in the first two (out of four) principles that govern the geometry of prosodic tree structures in Nespor and Vogel (1986:7):

\[(84) \quad \text{Principle 1. A given nonterminal unit of the prosodic hierarchy, } X^i, \text{ is composed of one or more units of the immediately lower category } X^{i-1}.\]

\[(85) \quad \text{Principle 2. A unit of a given level of the hierarchy is exhaustively contained in the superordinate unit of which it is a part.}\]

Ladd (1996:238) formulates the SLH as:

\[(85) \quad \text{Strict Layer Hypothesis (SLH)}\]

\[\text{There is a hierarchy of prosodic domain types such that, in a prosodic tree, any domain at a given level of the hierarchy consists exclusively of domains at the next lower level of the hierarchy.}\]

---

43 Note that the original example used by Chomsky and Halle (1968:372) was the shorter version: This is [the cat that caught [the rat that stole [the cheese]]].
The SLH bans prosodic structures of the types shown in (86)–(90) (from Ladd 1996:239). These assumptions make prosodic structure rather different in nature from syntactic structure.

(86) No multiple domination

```
  A   A
 B   B   B
```

(87) No heterogeneous sisters

```
  A
 C  B
```

(88) No skipping of levels

```
  A
 C  C
```

(89) No unlabelled nodes

```
  A
 B   B   B
```

(90) No recursion

```
  A
 A
```

However, several researchers have argued that the SLH is too strict. Evidence has been presented in favor of both recursive phonological structure, as in (90), and for heterogeneous sisters, as in (87). Selkirk (1995b) presents an analysis of a number of phenomena which appear to violate the SLH. Selkirk (1995b:443) decomposes the strict layer hypothesis into four Optimality Theoretic (OT, see section 7.1) constraints, as in (91).  

(91) Constraints on Prosodic Domination

(where C = some prosodic category)

a) **Layeredness** No C dominates a C, j > i,
   e.g. “No σ dominates a Ft.”

b) **Headedness** Any C must dominate a C (except if C = σ),
   e.g. “A PWd must dominate a Ft.”

44 I use capitalization of constraints here. In the original representation italics are used.
c) **EXHAUSTIVITY** No \( C_i \) immediately dominates a constituent \( C_j \), \( j < i - 1 \), e.g. “No PWd immediately dominates a \( \sigma \).”

d) **NONRECURSIVITY** No \( C_i \) dominates \( C_j \), \( j = i \), e.g. “No Ft dominates a Ft.”

She suggests that the constraints in a and b are undominated in all languages, i.e. that such structures are not attested in the phonology of any language, whereas the constraints in c and d are violable, which means that such structures do appear in languages, whenever some higher ranked constraint requires it. Under this view, the SLH still plays an active role in forming prosodic structures, but can be overridden by other, higher ranked, constraints. I shall follow her assumption that constraints a and b are inviolable. In Chapter 7, I shall suggest that the latter two constraints may be replaced by the constraint *ADJUNCTION.

One early argument in favor of recursive structure in intonational structure is presented by Ladd (1986). He claims that the size of reset in a phrase, i.e. “the actual amount by which the pre boundary is higher than the post boundary peak” is larger after *but* than after *and* in sentences like (92)a and b (Ladd 1986:327).

(92)  

a) Ryan is a stronger campaigner, and Warren has more popular policies, but Allen has a lot more money.

b) Ryan is a stronger campaigner, but Warren has more popular policies, and Allen has a lot more money.

He argues that the distinction in the size of the reset reflects a hierarchical grouping of the clauses as in (93)a and b respectively (Ladd 1986:327). He argues that this hierarchical relation cannot be described in terms of different prosodic domains, but must be accounted for by recursion of some domain.

(93)  

a) [(Ryan…) and (Warren…)] but [(Allen…)].

b) [(Ryan…)] but [(Warren…) and (Allen…)].

A similar experiment was conducted by Féry and Truckenbrodt (2005) who found similar evidence with German data.


In this chapter, I argue that Stockholm Swedish provides evidence for recursive prosodic structures as well as for non-exhaustive parsing at the level of the intonation phrase. I shall suggest that no constraint bans recursion in phonology. Instead I assume a constraint that bans heterogeneous sis-
ters, like in (87).\textsuperscript{45} I return to how the question of how to model this in an OT-framework in Chapter 7.

6.2 Tonal patterns in Stockholm Swedish

In this section I present the linear organization of the phonological phenomena which help identify the IP and the PP domains in Stockholm Swedish. These phenomena were presented in (79), repeated here as (94).

(94) Phonological objects that help to identify IP and PP boundaries in Stockholm Swedish.

a) initiality (H)LH-accents (IA) licensed by IP see 3.2
b) boundary tones (T\%) licensed by IP see Chapter 5
c) head (H)LH-accents (HA) licensed by PP see 3.1

The objects in (94) can be linearly organized in a number of ways, depending on the information structure and the syntax of a sentence. Thus, these tonal objects can create a number of different tonal patterns. In this section, the full set of such tonal patterns will be generalized from the previous chapters in the thesis. In section 6.3 we will use these tonal patterns as arguments for branching patterns of PPs and IPs. Thus, we shall return to each tonal pattern and show how it can be represented in terms of PP and IP branching.

We may begin with the observation that if there is an IA, a HA and a boundary tone T\% in one and the same sentence, and if these are the only tonal objects in that sentence, they will appear in the said order. The IA will occur on the first lexical stress, and the HA on the last lexical stress. The boundary tone appears on the last syllable.\textsuperscript{46} There can also be HL-accents in the sentence. The presence and the number of such accents is largely, but not entirely, determined by lexical properties of individual words (see discussion in Chapter 4). (95) illustrates the tonal pattern for a sentence which has one IA, one or more pre-head accents, one HA, one or more post-head accents and one boundary tone T\%.

\textsuperscript{45}Within research on Scandinavian intonation Nilsen (1992), Fretheim (e.g. 1990) and Abrahamsen (2003) assume structures that are not exhaustively parsed at the sentence level. To my knowledge the question of recursion in intonation has not been extensively studied in the Scandinavian research tradition. Cf. however Riad (2008) who discusses the structure of the prosodic word in Swedish, based on the model by Itô and Mester (2008).

\textsuperscript{46}In Chapter 5, I made a distinction between internal and external post-nuclear areas. An internal area has one boundary tone on the last syllable of the phrase. This may be either H\% or L\%. An external area is different from an internal area because it has two boundary tones, one immediately preceding the head accent (which may be either H\% or L\%), and another one on the last syllable of the phrase (which may also be either H\% or L\%). I shall account for the external areas in terms of prosodic branching, and get back to them below. However, for the moment we consider only the internal case with a single boundary tone.
A linear representation of the five objects which are given a tonal realization in Stockholm Swedish. Below each position the tonal representation is given, cf. Chapter 2.

<table>
<thead>
<tr>
<th>Position</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Initiality Accent</td>
</tr>
<tr>
<td>2</td>
<td>one or more pre-nuclear HL-accents,</td>
</tr>
<tr>
<td>3</td>
<td>Head Accent</td>
</tr>
<tr>
<td>4</td>
<td>one or more post-nuclear HL-accents,</td>
</tr>
<tr>
<td>5</td>
<td>boundary Tone</td>
</tr>
</tbody>
</table>

(95) is the tonal pattern which is generated when one IP dominates one PP. It contains one IP left edge (which is simultaneously the PP left edge) marked with an IA. It has one IP head (which is simultaneously the PP head) marked with a HA, and it also has one IP boundary (which is simultaneously the PP boundary) marked with a T%. In addition, (95) contains HL-accents. These are the heads of APs which are dominated by the PP and the IP. AP heads are the only syllables that are eligible for IA or HA assignment.

(95) is an abstract tonal pattern, which can be matched to almost any string of words, for example a clause or a syntactic phrase. When a string of words is given a tonal realization, a set of APs will be established, based on the number and the nature of the lexical stresses in that string of words. Each AP will be headed by a HL-accent. The IA is assigned to the initial AP head, i.e. the initial HL-accent, whereas the HA is assigned to the final AP head in a focused constituent of the sentence (cf. Krifka’s 2007, 2008 definition of focus, which includes the notion of contrastive topics, 3.1).

It should be noted that the pattern in (95) is maximized in the sense that the IA is allowed to be realized. The IA will fail to appear if there is not a sufficient number of APs between the initial AP head, where the IA would appear, and the AP which is assigned the HA (if these two APs occur within the same syntactic XP) (cf. 3.2.2.5). It will also fail to appear if there is no AP head (i.e. a stressed syllable which receives a HL-accent) within the Spec,CP position in a sentence (cf. 3.2.2.6).

If an IP always dominated a PP, we would expect to find that Stockholm Swedish intonation were a constant repetition of the tonal pattern in (95). The intonation pattern would vary only in terms of the number of HL-accents, and the presence of the IA, which would sometimes be reduced because the HA would appear too close to the initial AP.

However, throughout the thesis I have discussed several types of sentences whose tonal pattern does not fit this description. We find cases where either an IA, a HA or a T% are adjacent to eachother (except for the presence of HL-accents). We also find cases where either an IA, a HA or a T% is absent.
The different variations of (95) can be generalized into the six different patterns in (96)b–g. (96) is basically structured in the same way as (95), except that it is doubled. (95) was based on a set of four AP heads, where one was eligible for IA (position 1) and one was eligible for HA (position 3). One additional position represented the final syllable of an IP, which was eligible for the boundary tone T% (position 5). Because (96) has two sets of (95), there are two positions for IA, HA and T% respectively. This is necessary to show the full range of variation of tonal patterns in Stockholm Swedish. Positions 1–5a constitute the first set of (95) and positions 1–5b the second set. Note that the two additional AP positions are omitted in (96). This is not to say they cannot appear, of course. However, they do not add any information about the structure of the PP or the IP, since they are essentially conditioned by the number and the nature of the lexical stresses that occur in the phrase (cf. Chapter 4).

(96) The tonal patterns in Stockholm Swedish. The presence of a HL-accent which appears in the place of an IA or a HA is marked with x.

\[
\begin{array}{cccccc}
1a & 3a & 5a & 1b & 3b & 5b \\
a) & IA & HA & T% & – & – & – \\
b) & IA & HA & T% & IA & HA & T% \\
c) & IA & HA & – & x & HA & T% \\
d) & IA & x & – & IA & HA & T% \\
e) & IA & HA & T% & x & x & T% \\
f) & IA & HA & – & x & x & T% \\
g) & IA & HA & T% & x & HA & T%
\end{array}
\]

When all positions of (96) are filled with a designated tonal object, we have two adjacent IPs. For example, this can correspond to two coordinated clauses.

Whenever an IA or a HA fail to appear, a HL-accent will appear in its place. This is because only syllables which take HL-acents are eligible for IA and HA assignment.\(^{47}\) HL-acents that appear in the place of an IA or a HA are represented with x in (96). HL-acents that fill IA or HA positions in (96) are no different in terms of their phonological behavior from the HL-acents which fill positions 2 and 4. When a boundary tone fails to occur, there is no tonal specification on that syllable. This is marked by ‘–’ in (96).

\(^{47}\)This follows from the assumption that the IA and the HA are prominence level 2 accents, whereas HL-acents are prominence level 1 accents. A higher level prominence can only be assigned to a prominence on the next lower level in the hierarchy, Thus, syllables which take level 1 accents are eligible for level 2 accents, whereas lexically stressed syllables are not (cf. also the discussion in chapter 2).
As in (95), the IA can be reduced if a HA is too close, or if there is no HL-accent in the Spec,CP position. Importantly, an IP edge is still an IP edge, even if the IA is reduced due to an adjacent HA or if there is no HL-accent in the Spec,CP position. This means that the identity of a tonal pattern does not change if the IA is reduced for one of these reasons. Thus, in (96)c and e–g, where the IA is absent in position 1b, it is assumed that the IA fails to appear independently of HAs in the sentence and even if there is a HL-accented syllable in the Spec,CP.

Just like the pattern in (95), the patterns in (96) should be thought of as abstract tonal patterns, which can be matched to individual sentences or phrases with different phonological and syntactic structures. The patterns themselves only signal the order of the tonal objects which appear in the sentence and are in principle pragmatically neutral. The % indicates the placement of a boundary tone in relation to other tonal objects but says nothing about whether this boundary tone is H% or L%. The variations in (96)b–g are conditioned by the syntactic and information structural properties of the sentence that they are matched to.

There is no single sentence that can be phrased in all of the ways in (96)b–g. Importantly, though, there is also no one-to-one relationship between the syntactic or information structural properties of a sentence and the prosodic pattern. It is usually the case that one pattern can be matched with several types of syntactic patterns (as will be further discussed in Chapter 7).

In the remainder of this chapter, I show how the options in (96) can be represented in terms of PP and IP branching. Chapter 7 contains a more extensive discussion of how this branching relates to the branching of the syntactic structure and to the information structure of the sentence.

### 6.3 The branching of Phonological Phrases (PP) and Intonation Phrases (IP)

This section lays out the prosodic representations for the tonal patterns in (96)a–h. As explained in Chapter 2 and in the previous section, I assume two phrasal levels above the prosodic word, the Phonological Phrase, PP, and the Intonation Phrase, IP.

I assume that the head (H)LH-accent is the head of PP, and that the PP lacks boundary tones at both edges. The initiality (H)LH-accent and the boundary tone at the right edge are licensed by the higher category IP. Reset is assumed to apply within a PP as well as an IP.

A short all-new sentence, say a sentence with a one word subject followed by a one word verb phrase such as *Anna dansar* ‘Anna dances’, is normally assigned one initiality accent on the (first) stress of the subject, and a head (H)LH-accent on the (last) stress of the VP. If there are more stressed words, they will generally be assigned HL-accents (but see Chapter 4 for a discus-
sion of exceptions). These tonal sequences will be followed by a boundary
tone, which is generally L% in a declarative. Such a sentence, then, can be
matched to the phrasing in (96)a. This type of phrasing has been discussed
several times in the thesis. For instance, it is the pattern in the simple
sentences in (17) and (33) in Chapter 3 (Peter stäl Kakan ‘Peter stole the
cookie’, Mary köpte en bok om FLÄdderMÖSS ‘Mary bought a book about
bats’). Under the assumptions that the head (H)LH-accent is licensed by the
PP, and that the initiality accent and T% are licensed by IP we may assume
that the representation of (96)a is as in Figure 44.

![Figure 44. Representation of the prosodic pattern in (96)a. Below the tree
structure the same structure is given in brackets. In this figure, and in the rest
of the bracket representations in this chapter, IP boundaries are indicated with
curly brackets, PP boundaries are indicated with round brackets, and right
edge IP boundary tones are indicated with ‘%’. Within the brackets AP heads
are marked for IA and HA whenever they are predicted to have either of
these functions.](image)

Figure 44 shows a tree with an IP dominating one single PP, which in turn
dominate two APs. Below the tree I give the same structure represented in
brackets. Curly brackets represent IP boundaries and round brackets re-
present PP boundaries. Each IP boundary is predicted to have a boundary
tone at its right edge, which is marked in the bracketing with a ‘%’ to the left
of the curly bracket. Within the brackets, I mark APs, whose heads are pre-
dected to project to a higher prominence level and become the head of a PP
or an initiality accent, with HA and IA, respectively. In this case, the IP
licenses an initiality (H)LH-accent on the initial AP, and a boundary tone,
represented as %, on the (final syllable of the) final AP. The PP licenses a
head (H)LH-accent on the final AP.

The positions which are assigned IAs or HAs are selected from the
available prominences at the next lower level in the structure. If a PP directly
dominate a sequence of AP heads, (as in Figure 44), two of these AP heads
will project and become prominences within the PP. The leftmost AP head
projects to satisfy the Phrase Edge Prominence constraint at the left edge
(section 3.2) and the rightmost AP head projects to provide the domain with
a head, and simultaneously satisfies the Phrase Edge Prominence constraint
at the right edge. The rightmost AP head receives a (H)LH-accent once it is assigned as head of the PP. The leftmost AP-head, however, receives no such accent at the PP level. Instead, I assume that it is subject to reset. Since the phonetic cues for reset are generally similar to prominence cues (raised/expanded pitch), I assume that reset satisfies the Phrase Edge Prominence constraint with respect to the left edge at the PP level (cf. the discussion in section 3.2.4.2). Other than reset, there is essentially no empirical evidence for the edges of PPs in this model. It should be noted, however, that the assumption that reset applies within PPs (which fills the function of satisfying the Phrase Edge Prominence Constraint here) makes some predictions with respect to reset which are not followed up on here. The cases where such predictions are made will be pointed out in see footnotes 50, 52 and 53 in the discussion below. Future phonetic research is needed to reveal whether these predictions are correct.

In the IP, too, two prominences project. As in the PP, one satisfies the Phrase Edge Prominence constraint at the left edge and the other one provides the IP with a head, while simultaneously also satisfying the Phrase Edge Prominence Constraint at the right edge. The IP selects the last PP head as its own head, but in contrast to the PP, it adds no tonal structure to its head. Thus in the model here the IP head is a purely formal notion, with no real empirical status, much like the edges of PPs. Future phonetic studies will have to reveal whether the IP head is cued with raised pitch range and/or lengthening. Instead, the IP assigns a (H)LH-accent to its leftmost prominence (i.e. the IA). In addition, the IP assigns a boundary tone to its rightmost syllable.

(97) illustrates the projection of prominences in a metrical grid, where x marks a prominence.

(97) Metrical grid illustrating how prominences project in the phonological structure. Plain x marks a prominence. Bold x marks a prominence which is assigned a (H)LH-accent.

```
x  x  IP
x  x  PP
x  x  x  x  AP
```

I assume that nodes select their initial prominences exclusively from prominences which they directly dominate. This means that an AP head which is dominated by a PP, but which is not the initial prominence or the head prominence of this PP, cannot receive an IA at the IP level. However, if an IP directly dominates an AP head, this head can be assigned an initiality (H)LH-accent. This happens in Figure 47 below.

---

48 Note, however, that in narrow focus cases, the head is forced leftwards, causing the edge prominence constraint to be violated with respect to the right edge. See 3.2.4.2.
Heads, however, are selected by a slightly different principle. The highest prominence in a domain becomes the head of that domain. If there are several prominences which have equal prominence, as in Figure 44, the rightmost one will be selected as the head. We need to make this distinction between the selection of initial prominence and head prominence to make sure that the head of an AP is not selected as the head of IP, in narrow focus structures like that in Figure 48.

According to the model outlined here, the PP has a strong head, whereas the IP has strong edges. In this sense, the two domains have slightly different functions in the phonological system. The distributional properties of heads versus edges, however, suggests that the two levels need nonetheless be kept separate. For instance, two heads may occur between an IA and boundary tone. This is common e.g. with contrastive topics as in (96)c (see section 3.1 for examples).

6.3.1 Prosodic coordination

This section discusses the tonal patterns in (96)b and c. These patterns can be accounted for by assuming that sister PP nodes or sister IP nodes are dominated by a higher IP projection. In these structures, all sister nodes belong to the same prosodic category (i.e. all sister nodes are either APs, PPs or IPs), and they are therefore cases of prosodic coordination.

In (96)b, two IPs are coordinated. This is represented in Figure 45.

![Figure 45](image)

Figure 45. Representation of the prosodic pattern in (96)b. It shows two coordinated IPs within a higher projection of IP. Each of the lower IPs dominate a PP. These PPs assign one HA to the rightmost AP heads which they dominate. Each IP assigns both an IA to its leftmost AP head, and a boundary tone to its final syllable. The heads of the lower IPs are the same as the PP heads. The higher IP chooses the rightmost PP head as its head.

One common use for the pattern in Figure 45 is with coordinated clauses, where each of the lower IPs are matched to one clause. However, it is also
attested in syntactic structures where one clause is embedded into another one. We saw examples of this in examples (62)–(63) in section 3.2.2.7.

Figure 45 shows two IPs which are coordinated under one higher IP projection. The three IPs have one boundary tone each. Thus, there are two boundary tones at the edge of the last IP, but only one at the edge of the first one, which makes the prediction that the last boundary will be realized more strongly than the first one. As explained in section 6.1, there is evidence from English and German that when two clauses are syntactically coordinated, this has prosodic effects on the down drifting patterns (Ladd 1986, Féry and Truckenbrodt 2005). I know of no parallel study using Swedish data. However, I shall assume that the same principle applies in Stockholm Swedish as in English and German. 49

I shall also assume that two PPs may be coordinated under one IP node, as in Figure 46. Under the assumptions made here about the PP and IP in Stockholm Swedish, this structure generates the pattern in (96)c. 50

49 I assume here that there is no constraint on the number of layers of embedding. Therefore, this model could allow for any number of boundary tones after each other, and potentially also for any combination of H% and L% in the boundary tone sequence. However, there appears to be relatively strong constraints on how boundary tones may be combined. Here I shall not discuss how such combinations are prohibited from occurring in the phonological structure. Cf. however, Chapter 5 for a description of boundary tones and post-nuclear areas.

50 Note that if it is true, as I suggest, that the edge prominence constraint is satisfied by reset at PP left edges, this structure should have reset after the first HA. Future research is needed to follow up on this prediction.
lowed by any boundary tone. Instead the contrastive topic is followed by a high plateau (see the discussed in section 3.1.3). This tonal pattern can also occur with sentences which have an embedded clause in the Spec,CP position, cf. (63)d in 3.2. In Chapter 7 I discuss the phrasing of the structure in (63)d and suggest an alternative structure for this pattern. (The representation of the contrastive topic, will be left for future research, however.)

6.3.2 Prosodic adjunction, left

The previous section discussed the patterns in (96)b and c, which could be accounted for in terms of prosodic coordination. In this section I discuss the pattern in (96)d. In order to account for this pattern I will introduce a distinction between prosodic coordination and prosodic adjunction, which will turn out to have major consequences for the OT-account in Chapter 7 (where I argue that coordination is preferred over adjunction). The definition of prosodic adjunction is that sister nodes are phrased on different levels of the prosodic hierarchy, (i.e. sister nodes are a combination of APs and PPs, APs and IPs or PPs and IPs).

The pattern in (96)d has two initiality accents without any head (H)LH-accent or boundary tone between them. The representation of this pattern is illustrated in Figure 47.

![Figure 47. Representation of the prosodic pattern in (96)d. An IP node simultaneously dominates an IP and two APs. The lower IP node dominates a PP. The PP assigns a HA to the rightmost AP head which it dominates. The lower IP node assigns one IA to the leftmost tonal prominence which it dominates, which is the leftmost AP within the PP, and a boundary tone to its final syllable. The highest IP node assigns one IA to the leftmost tonal prominence which it directly dominates, which is the initial AP head. It also assigns a boundary tone to its final syllable, which coincides with the final syllable of the lower IP node. Thus, the structure contains two IAs but only one HA.](image-url)
The prosodic adjunction in Figure 47 is a consequence of embedding one IP into another IP. Such embedding of prosodic structures can be triggered by the need for the prosodic structure to mirror the syntactic structure of a sentence. For example, the prosodic structure in Figure 47 can be triggered by a sentence where a main clause has an embedded clause in its VP (note that the embedded clause will usually have main clause word order in the Swedish sentence, cf. 3.2.). The embedded clause will correspond to the lower IP, whereas the main clause will correspond to the higher IP, as is illustrated in (98), cf. (64) in 3.2.51

(98) Illustration of how IP embedding mirrors CP embedding in a sentence.

a) [ Anna sa [ att flingorna var inte ALLS slut ] CP ] CP

b) { IA } { ( IA HA ) % } %

Anna said that cereal.DEF was not at all gone

'Anna said that the cereal isn’t gone at all'

Note that in Figure 47, the two first APs have not been phrased at the PP level. Therefore, it is a case of level skipping, or non-exhaustive parsing. This, however, is not a necessary requirement for prosodic adjunction. For example, a case where an IP simultaneously dominates another IP and a PP node is a case of adjunction, but not a case of level skipping. We will return to such a structure in Figure 51.

6.3.3 Prosodic adjunction, right

The structure in Figure 47 illustrated a case where APs were adjoined to the left of an IP. In this section I illustrate cases where adjoined material appears to the right. This section provides the structure for the tonal patterns in (96)e and (96)g, as well as two alternative representations for the pattern in (96)f. It also provides an alternative representation of the structure in (96)c.

Beginning with (96)e, this pattern can be represented as in Figure 48.

51 In principle, one could also expect that one of the structures in (i)-(iii) would be possible realizations of the syntactic structure in (98)a.

(i) { (IA HA) } { (IA HA) % } %

(ii) { (IA x (reset HA) ) % } %

(iii) { IA x (reset HA) % }%

I have no evidence for these structures. Therefore they are excluded in the model presented here. However, there is nothing in the phonological structure per se which prevents such structures from being generated, and, as will be illustrated in section 6.3.3, the mirror images of these structures are attested. They can be triggered by a syntactic structure like [[S VP]CP S VP]CP. In Chapter 7, I explain these asymmetries between left and right adjunction in terms of the interaction between OT-constraints. The structure in (i) is ruled out by the assumption that DEPSYNPROS is strictly ranked above ALIGNL,CP whereas ALIGNRIGHT is not (7.3.1). The latter two, (ii) and (iii) are ruled out automatically, since they incur more violations of both DEPSYNPROS and ALIGNL,CP than the candidate in Figure 47 (7.2.3).
Figure 48. Representation of the prosodic pattern in (96)e. An IP node simultaneously dominates another IP node and two AP nodes. The lower IP node directly dominates a PP node. The PP assigns a HA to its rightmost AP head. The lower IP assigns a (H)LH-accent to its leftmost prominence and a boundary tone to its final syllable. The highest IP node assigns an IA to its leftmost prominence, which coincides with the IA of the lower IP. It also assigns a boundary tone to the final syllable of the last AP which it dominates. The highest IP node will select the same head as the lower IP node, since this is the highest prominence in the IP. This structure will have one boundary tone directly following the PP head, and another one at the edge of the sentence.

The structure in Figure 48 is entirely parallel to that in Figure 47, except that the prosodic adjunction appears to the right, not to the left of the highest IP node.

Figure 48 has two boundary tones, one directly after the PP head, and another one at the right edge of the sentence. In other words, it contains an external low post-nuclear area, as was discussed in section 5.1.2. Structures such as these are due to the interaction of the independent requirements for a) the head of an IP to be aligned with its boundary, b) for the head to be placed somewhere other than at the end of the IP and c) for all material to be included in an IP domain. Structures like that in Figure 48 can for instance be triggered by a narrow focus which forces a head (H)LH-accent on a non-final constituent (and simultaneously inhibits any head (H)LH-accent on any of the following material). The same structure can also occur with some adjunct adverbials, such as time adverbials or other more loosely attached syntactic positions. I shall return to the narrow focus case in Chapter 7.

Moving on now to the tonal pattern in (96)f, the structure is as shown in Figure 49.
Figure 49. Representation of the prosodic pattern in (96)f, alternative 1. An IP node dominates a PP node. The PP assigns a head (H)LH-accent to a non-final AP head. Such head assignment can be forced by a focus on a non-final constituent, as will be discussed in section 7.3.4. The IP assigns an initiality (H)LH-accent to its initial AP-head and a boundary tone to its final syllable. The IP is forced to choose the head of the PP as its head, since this is the highest prominence which it dominates. This causes the head and the boundary to be separated at PP as well as PP level. Note that if there are no post-nuclear HL-accents in the sentence that this structure is matched to, this structure is the same as that in (96)a.

We could assume the representation in Figure 50 as an alternative to the one in Figure 49. Both these structures are in fact equally plausible representations of (96)f. We return to the question of how to choose between these structures in Chapter 7, where it will turn out that the structure in Figure 50 is never chosen as the output structure.

Figure 50. Representation of the prosodic pattern in (96)f, alternative 2. An IP node dominates a PP node and two AP nodes. The PP assigns a head (H)LH-accent to its final AP-head. The IP assigns an initiality (H)LH-accent to its initial AP-head and a boundary tone to its final syllable. The IP is forced to choose the head of the PP as its head, since this is the highest prominence which it dominates. Because of this, the IP head and the IP boundary tone are not adjacent. Note that if there are no post-nuclear HL-accents in the sentence that this structure is matched to, this structure is the same as that in (96)a.

52 Potentially, they would make different predictions with respect to downdrift. However, it is unclear what exactly would be the predicted difference, since downdrift applies both within PPs and IPs. Thus, both alternatives predicts some amount of downdrift in the post-nuclear area, and neither predicts that there should be reset after the nuclear accent.
Empirically, there is only one difference between (96)e, Figure 48, and (96)f, Figure 49. Whereas Figure 48 has two boundary tones, Figure 49 has only one. Thus, whereas the structure in Figure 48 represents the external post-nuclear area discussed in 5.1.1, Figure 49 represents the internal post-nuclear area. These two structures also have similar distributional properties, and the variation between them often seems to be arbitrary. Further research is needed on this point, as discussed in Chapter 5.

The last pattern that we need to account for, (96)g, will be represented as an IP node dominating another IP node and a PP node. This is illustrated in Figure 51.

![Diagram of Figure 51](image)

Figure 51. Representation of the pattern in (96)g. An IP node dominates another IP node and a PP node. The lower IP directly dominates a PP. Both PPs assign HA to their rightmost AP heads. The lower IP assigns an IA to its leftmost AP-head and a boundary tone to its last syllable. The highest IP also assigns an IA to its leftmost prominence, which coincides with the IA of the lower IP. It also assigns a boundary tone at its right edge.

This pattern can for example be triggered by a main clause with an embedded clause in the Spec,CP position. This was shown in (63)c in section 3.2.2.7, and is also exemplified in (99).

(99) Illustration of how IP embedding mirrors CP embedding in a sentence.

a) [[Om sebrorna kom NÄRmare] så skulle Ida kunna RÖRA vid dem]
   `if the zebras came closer then would Ida could touch them`
   `If the zebras came closer, Ida would be able to touch them.'

b) `{( ( IA HA )%} ( HA )%}`

As stated already in footnote 51, the parallel mirror image of this structure, i.e. a PP which is adjoined to the left of an IP under a higher IP node, is not included in the set of possible prosodic structures in Stockholm Swedish. There is nothing inherent in the PP or IP domain which would inhibit such a structure. Instead I assume that such structures are not attested because the
pressure for inserting a boundary at a left edge of a syntactic structure is not strong enough in Stockholm Swedish, in a way to be specified in more detail in 7.3.1.

We have now provided representations for all the tonal patterns in (96). However, before concluding we shall add another alternative prosodic structure, to the pattern in (96)c. One representation of this tonal pattern was already given in Figure 46. However consider the structure in Figure 52.

![Figure 52](IP
 PP
 PP
 AP AP AP AP
 {(IA HA) (HA)%})

The structure in Figure 52 generates the same tonal pattern as Figure 46. Therefore, we shall distinguish between these options on theoretical grounds only. In Chapter 7, I show that the structure given Figure 52 is the preferred one, at least in relation to a CP which is embedded into another CP. As the structure in Figure 46, then, we can use this structure to describe the phrasing of contrastive topics (see discussion in section 3.1.3) and with sentences which have an embedded clause in the Spec,CP position, cf. (63)d in 3.2.2.7.

In summary, we can divide prosodic branching into two different types. The first type is coordination, which means that all sister nodes are phrased at the same level of the prosodic hierarchy. The second type is adjunction, which means that sister nodes are phrased at different levels of the prosodic hierarchy. Based on the distinction between coordination and adjunction, we may sort the prosodic structures found in Stockholm Swedish as in (100).

53 Note that the two structures actually do make different predictions with respect to reset. However, I have no data at this point which can distinguish them. I therefore treat them as equal. The model in Chapter 7 will prefer Figure 52 over Figure 46, but it should be noted that the model can be falsified on this point.
(100) Prosodic structures in Stockholm Swedish († marks unattested structures. 
Superscripted numbers mark alternative representations)

(i) no internal boundaries:
   a) { (IA HA)%} (96)a, Figure 44

(ii) prosodic coordination
   b) { (IA HA) %} { (IA HA) %}% (96)b, Figure 45
   c¹) { (IA HA) (x HA) %} (96)c, Figure 46

(iii) prosodic adjunction
   adjunction to the left
   d) { IA x (IA HA) %} % (96)d, Figure 47
   †¹) { IA x (reset HA) %} unattested, cf. fn 51
   †²) { IA x (reset HA) ) %} unattested, cf. fn 51
   †³) { IA HA ) (IA HA) %} % unattested, cf. fn 51

   adjunction to the right
   e) {{ (IA HA) %} x x %} (96)e, Figure 48
   †⁴) { (IA HA) x x ) %} (96)f, Figure 49
   †⁵) { (IA HA) x x %} (96)f, Figure 50
   g) {{ (IA HA) %} (x HA) %} (96)g, Figure 51
   c²) { (IA HA) x HA) %} (96)c, Figure 52

In the next chapter, we shall look closer at how different Optimality Theoretic 
constraints on the syntax–prosody interface interact to match these 
structures onto sentences with different syntactic structure and information 
structure.

6.4 Summary

This chapter has provided a detailed discussion about branching of the two 
highest levels of the prosodic hierarchy of Stockholm Swedish, the Intonation 
Phrase (IP) Phonological Phrase (PP). The chapter begins with a review of the linear organization of initiality (H)LH-accents (IA), head (H)LH- 
accents (HA) and boundary tones can appear in Stockholm Swedish sentences. This review is based on the findings in previous chapters of the thesis. 
The tonal patterns resulting from the linear organization of these three objects are presented in (96). Based on the tonal patterns in (96) I argue that 
Stockholm Swedish provides evidence for prosodic recursion. Also, I argue 
that it is necessary to distinguish prosodic coordination from prosodic adjunction. In cases of coordination, all sister nodes belong to the same cate-
category of the prosodic hierarchy (i.e. all sister nodes are either APs, PPs or IPs). In cases of adjunction, however, sister nodes belong to different prosodic categories (i.e. one node dominates both APs and PPs, APs and IPs, or PPs and IPs).

The resulting set of prosodic structures is summarized in (100). (100) comprises a rich array of structures that must be kept apart based on their branching on the IP and PP levels. The intonational phonology of Stockholm Swedish thus provides evidence for an elaborate hypothesis on the possible branching of prosodic structure at intonation level. Three factors in the phonology of Stockholm Swedish are crucial for the distinguishability of these structures: a) the fact that there are two tonal prominence levels which makes it possible to decide upon the presence or absence of initial prominence and therefore a left edge boundary, b) the fact that heads are categorically different from non-heads, c) the fact that the position of boundary tones can be distinguished from the beginning of the post-nuclear area. This is possible because HL-accents are preserved after the head in a PP and after the nuclear accent in the IP.
7 An Optimality Theoretic (OT) account of the distribution of prosodic patterns

In Chapter 6, the eight different tonal patterns in (96) were generalized from the previous chapters in the thesis. Based on these patterns, an account of the prosodic hierarchy of Stockholm Swedish was provided, which relates these eight patterns to each other in terms of different branchings of the PP (Phonological Phrase) and IP (Intonation Phrase). The branching options were summarized in (100).

This chapter presents an Optimality Theoretic (OT) analysis which accounts for the mapping between the phonological structures in (100) and sentences with varying information structure and syntactic structure. Each phonological structure in (100) can be mapped to more than one type of sentence. In OT terms, this will be expressed as variable ranking of the OT constraints that map one output phonological structure to one input syntactic bracketing. However, the OT-constraints will also be shown to constrain the variation of the syntax–prosody mapping in principled ways.

The analysis presented here is restricted to the phrasing of CP-structures. CP-internal XP structures will be disregarded. The reason for studying only CP-structures is that they can trigger all the prosodic options I want to evaluate. CP-internal XP-phrasing does not trigger this whole set as straightforwardly as do CP-structures. We return to this point below.

The contribution of this chapter is twofold. First, it provides independent support for the assumptions made in the previous chapter about the branching of prosodic structure. The mapping between prosody and syntax as laid out in this chapter shows that the prosodic branching is to a large extent conditioned by the syntactic branching. This makes predictions for which types of prosodic structures can be matched to which syntactic structures. The predicted possible mappings are also the ones that have been attested in the thesis.

Second, this chapter makes a contribution to the theoretical framework of Optimality Theory as a model for the syntax–prosody interface. I suggest that the branching of prosodic structure is constrained in terms of the distinction between prosodic recursion and prosodic coordination, as suggested in Chapter 6. I formulate this in the constraint *ADJUNCTION, building on the idea of Compound Prosodic Domains (CPD) by Ladd (2008).

With this constraint in hand, it is not necessary to assume that recursion as such is prohibited by prosodic structure. Thus I will assume that there is no constraint corresponding to NONRECURSIVITY (e.g. Selkirk 1995b, Trucken-
brodt 1999). Also, the constraint EXHAUSTIVITY (Selkirk 1995b) is not needed in this analysis.

The chapter is structured as follows. I begin with a general introduction to some basic concepts of Optimality Theory (7.1). I proceed with a discussion of how the grammar can choose between attested structures in relation to syntactic structures assuming a set of variably ranked OT-constraints (7.2). Thereafter I discuss how two strict rankings can exclude some unattested structures (7.3). Section 7.4 contains a summary of the assumed constraint rankings.

7.1 Optimality Theory (OT) and the syntax–prosody interface

Optimality Theory (OT) models grammar by matching linguistic input structures to linguistic output structures via a set of constraints. Some constraints control the well-formedness of output structures (markedness constraints). They favor unmarked linguistic output structures over marked ones (e.g. a structure which is parsed on all levels of the prosodic hierarchy over one which is not, or syllables with onsets over syllables without onsets). Other constraints militate against any difference between the input structure and the output structure (faithfulness constraints). Markedness constraints and faithfulness constraints are inherently conflicting in the sense that they opt for different output structures. Markedness constraints prefer differences between the input and output over marked output structures, whereas faithfulness constraints prefer marked output structures over differences between input and output. The interaction of markedness constraints and faithfulness constraints thus expresses that grammars are a compromise between the desire to distinguish different linguistic structures, and the desire to use as little marked structure as possible (see e.g. Kager 1999, McCarthy 2002:13, 66).

All potential output structures, referred to as candidates, are evaluated with respect to whether they satisfy or violate the different constraints. There is no restriction on the candidates that are evaluated with regard to a certain input structure. Instead all combinations of linguistic primitives are assumed to be valid candidates for any input structure. This hypothesis is referred to as the richness of the base (McCarthy 2002:70).

The evaluation process selects one candidate as the winner. This winner is the output structure. No candidate can satisfy all constraints. Instead, the winning candidate is an optimal structure, i.e. it is the candidate that incurs the least serious violations of the constraint set (Kager 1999:13). Thus, structures in the language can be grammatical even though they do not satisfy all constraints. In this sense, constraints are violable. Nonetheless, the constraints do have an impact on the grammar of the language.
What constitutes more or less serious violations is determined by language specific constraint rankings. Constraint rankings express that it is more important to satisfy some constraints than others. A candidate which satisfies a higher ranked constraint will be preferred over one which satisfies a lower ranked constraint. The constraints themselves are universal. The difference between languages is due to different rankings of the constraints.

OT has been used by several researchers to model the interface between the syntactic and the prosodic structure in a variety of different languages. These accounts generally assume syntactic bracketing as the input, and prosodic bracketing as the output (to mention a few see e.g. accounts of English by Truckenbrodt (1999), Selkirk (2000) and Féry and Samek-Lodovici (2006), on Catalan by Prieto (2007) and Feldhausen (2008), on European Portuguese by Frota and Vigario (2007), on Basque by Elordieta (2007), on Chitumbuka by Downing (2006), and also on Swedish by Hansson (2001, 2003).

It should also be noted that other approaches have attempted to derive prosodic phrasing more directly from the syntactic structure. Selkirk (1995a) is one of these, and there are also more recent proposals which develop the idea that prosodic phrasing is related to the phases of spell-out. Examples of such work can be found in Ishihara (2003, 2007), Kahnemuyipour (2004), Adger (2007), and Kratzer and Selkirk (2007).

In the present account of prosodic phrasing in Stockholm Swedish, I shall show that there is variation in terms of which prosodic structure is chosen for a given syntactic structure (under one information structure). “Classic” versions of OT cannot capture variation, since all constraints are strictly ranked with respect to one another. Hence, a grammar can only match any one single input to a single output structure.

However, some solutions to this problem have been presented in the literature (McCarthy 2002:227). One example of such a solution is presented in Nagy and Reynolds (1997). This model allows for a floating constraint to appear in different positions between strictly ranked constraints. In this way it allows for several different rankings within a single grammar.

A different approach is argued for by Anttila (1997, 2006a–d). This model includes partial rankings, meaning that some constraints remain unranked in the grammar, whereas others are ranked. A partial ranking corresponds to several different tableaus, each representing one of the different rankings that are left unspecified by the partial ranking. This model inherently makes predictions about how often each pattern will occur in a given phonological context, because the occurrence of a pattern is assumed to correspond to the number of times it would win in the different tableaus.

Yet another approach to variation in OT is Stochastic OT (Boersma and Hayes 2001). This approach models ranking of constraints on a continuous scale. Constraints are associated with a range of values on the scale (where higher values reflect higher ranking). When an output has to be determined
in relation to some input, at the evaluation time, the constraint is assigned one selection point, i.e. a single point on the scale within its range. When the ranges of two constraints overlap, the ranking between these constraints will vary, depending on where the selection point is set within the range of each of the two constraints. When they do not overlap, however, the ranking will be strict. Stochastic OT also makes predictions about the frequency of occurrence of different patterns. These predictions are derived in part from the assumption that the chance is lower for a selection point to be set at the edge of a constraint’s range on the ranking scale than in the middle. Also, the distance between constraints can vary, thus varying the size of the overlapping area.

One of the differences between the different approaches lies in the predictions they make with regard to the frequency of occurrence of different patterns. However, for the purposes of the present work, it is actually not necessary to select one of these models, as I shall not present any statistical data for intonational variation. Suffice it here to assume that phonological variation can be modeled in OT in terms of some variable rankings and some strict rankings in the grammar. Thus, I shall remain agnostic about exactly how variation in OT is best modeled.

Instead, this chapter shows how a combination of free and variable rankings can model how sentence level syntactic branching restricts phonological branching.

7.2 Choosing between attested candidates

The following sections show how a set of OT-constraints and different rankings of these constraints can select all the phrasing options which were attested in this thesis for each of the syntactic structures in (101). The attested phrasings for each of the structures in (101) are indicated in (102) through (105). Note that all the structures from Chapter 6 are included in (102) through (105).

(101) The three structures which will be considered as inputs to the candidate set.

a) \[ \text{CP} \]

b) \[ \text{CP} \]

c) \[ \text{CP} \]

d) \[ \text{CP} \]

(102) Phrasing of two coordinated CPs.

\[ \{ (IA \ HA) \} \{ (IA \ HA) \} \] (96)b, Figure 45
(103) Phrasing options for a CP with an embedded CP structure in Spec,CP.

\[
\begin{align*}
&\text{[[ ]}_{\text{CP}} \text{ ]}_{\text{CP,F}} \\
a) \{\{(\text{IA} \ \text{HA}) \%\}\} \ (96)a, \ \text{Figure 44} \\
b) \{\{(\text{IA} \ \text{HA}) \%\} \ (\text{IA} \ \text{HA}) \%\} \ (96)b, \ \text{Figure 45} \\
c) \{(\text{IA} \ \text{HA}) \ x \ (\text{HA}) \%\} \ (96)c, \ \text{Figure 52} \\
d) \{\{(\text{IA} \ \text{HA}) \%\} \ (x \ (\text{HA}) \%\} \ (96)g, \ \text{Figure 51}
\end{align*}
\]

(104) Phrasing options for a CP with an embedded CP structure in the rightmost position of VP.

\[
\begin{align*}
&\text{[[ ]}_{\text{CP}} \text{ ]}_{\text{CP,F}} \\
a) \{\{(\text{IA} \ \text{HA}) \%\}\} \ (96)a, \ \text{Figure 44} \\
b) \{(\text{IA} \ x \ (\text{IA} \ \text{HA}) \%\} \ (96)d, \ \text{Figure 47}
\end{align*}
\]

(105) Phrasing options for a CP with an embedded CP structure in Spec,CP, narrow focus on the embedded clause.

\[
\begin{align*}
&\text{[[ ]}_{\text{CP,F}} \text{ ]}_{\text{CP}} \\
a) \{\{(\text{IA} \ \text{HA}) \%\} \ x \ x \ %\} \ (96)e, \ \text{Figure 48} \\
b) \{\{(\text{IA} \ \text{HA}) \ x \ x (\text{HA}) \%\} \ (96)f, \ \text{Figure 50}
\end{align*}
\]

The OT-constraints which will be used in the analysis are listed in (106) through (112).54

(106) **ALIGNR,CP**

The right edge of any CP in syntactic structure must be aligned with the right edge of a PP and with the right edge of an IP in prosodic structure.

(107) **ALIGNL,CP**

The left edge of any CP in syntactic structure must be aligned with the left edge of a PP and with the left edge of an IP in prosodic structure.

(108) **DEPSYNPROS**

A Phonological Phrase (PP) or Intonation Phrase (IP) boundary in the output representation corresponds to a CP boundary in the input representation.

(109) **ADJUNCTION**

Sister nodes in prosodic structure are instantiations of the same prosodic category.

---

54 I assume that IPs and PPs are aligned by two separate constraints. Thus, there are actually four alignment constraints, as will be illustrated in section 7.2.1. However, for pedagogical purposes I will conflate align IP and align PP. This is of no consequence to the outcome of the analysis.
(110) **STRESS-FOCUS**: A focused phrase has the highest prosodic prominence in its focus domain.

(111) **DESTRESS-GIVEN**: A given phrase is prosodically non-prominent.

(112) **ALIGNR,HEAD**: Align every head of category Cᵢ with a right edge boundary of Category Cᵢ.

As explained in section 7.1, I assume that constraint rankings can vary. This explains why there is more than one phrasing option for each syntactic structure. However, some strict rankings must also be assumed in order to exclude some unattested options. An overview of the constraints along with the strict rankings that will be assumed is provided in Figure 53. Black lines in the diagram mark strict ranking between constraints or groups of constraints. The higher placed constraints are higher ranked. Note, however, that the way constraints are positioned does not independently mark strict ranking. ALIGNL,CP is thus ranked below DEPSYNPROS, but is not ranked below *ADJUNCTION or ALIGN,R,HEAD.

![Figure 53. Diagram over the constraints assumed in this thesis and their rankings.](image)

In the following sections, we discuss (102) through (105), showing how the constraints in (106) through (112) derive the attested phrasings and rule out the unattested phrasings of each structure. Section 7.2.1 shows how ALIGNL,CP and ALIGNR,CP select the single option in (102). Section 7.2.2 and 7.2.3 discuss how variable rankings of ALIGNL,CP and ALIGNR,CP together with the DEPSYNPROS and *ADJUNCTION can explain the choice between the options in (103) and (104). Section 7.3.1 explains why there is a coordinated structure in (103), but not in (104), by strictly ranking DEPSYNPROS over ALIGNL,CP. Section 7.3.2 explains why there are non-exhaustively parsed structures in (104) but not in (103), by strictly ranking STRESS-FOCUS and DESTRESS-GIVEN over all other constraints. Section 7.3.4, finally, discusses how the two options in (105) can be selected by variable ranking of ALIGNR,HEAD and *ADJUNCTION.
7.2.1 ALIGNCP

I assume that so called alignment constraints account for the fact that the coordinated structure (102) is mapped to two IPs. Alignment constraints require that the edges of morpho-syntactic constituents should coincide with edges of phonological constituents (Selkirk 1986, McCarthy and Prince 1993).

I shall assume alignment constraints which align the left and right edges of CPs in the syntactic structure, to the left and right edges of IP and PP in the phonological structure. This amounts to a group of four alignment constraints, given in (113) through (116).55

(113) ALIGNR,IP,CP
The right edge of any CP in syntactic structure must be aligned with the right edge of an IP in prosodic structure.

(114) ALIGNR,PP,CP
The right edge of any CP in syntactic structure must be aligned with the right edge of a PP in prosodic structure.

(115) ALIGNL,IP,CP
The left edge of any CP in syntactic structure must be aligned with the left edge of an IP in prosodic structure.

(116) ALIGNL,PP,CP
The left edge of any CP in syntactic structure must be aligned with the left edge of a PP in prosodic structure.

The alignment constraints are violated if a CP boundary in the input structure does not correspond to an IP boundary or to a PP boundary in the output structure. Henceforth in this chapter, I shall not treat the constraints aligning IPs and PPs separately, since this distinction is of no consequence for the analysis. Instead, I shall refer to (113) and (114) together as ALIGNR,CP, and to (115) and (116) together as ALIGNL,CP. I shall mark candidates with two stars in the tableaus below, if they violate an alignment constraint with respect to both PP and IP, but with one star if they violate an alignment constraint only with respect to one of them.

In the accounts by Selkirk (2000) and Truckenbrodt (1999) and also in the Swedish account by Hansson (2001, 2003), the alignment constraints that determine the phrasing at sentence level are assumed to align (lexical) XPs in the syntactic structure with phonological PPs (Truckenbrodt 1999), or with MaPs (Selkirk 2000). However, Gussenhoven (2004:167) as well as Feldhausen (2008:125) use alignment constraints that refer directly to the to

55 The formulations of the constraints are adapted from Selkirk’s (2000:232) formulation: “AlignR XP ‘The right edge of any XP in syntactic structure must be aligned with the right edge of a MaP in prosodic structure.’”.
the root sentence and to CP structure respectively. In the recently suggested match theory (Selkirk, to appear), it is also assumed that phonological structure can refer to syntactic clauses. Note, however, that match theory assumes that left and right boundaries are inserted together, and that only the highest level of phonological structure is aligned with clauses, whereas lower levels are aligned with smaller syntactic domains.

In the previous section, and in Chapter 6, I said that there is seemingly only one option for the phrasing of two coordinated CPs. Each CP is phrased in its own IP. Referring to evidence from studies on English and German, I argued in Chapter 6 that the two CPs are simultaneously phrased together in one single, higher, IP which includes both CPs ((102) above).

Such phrasing is required by the four alignment constraints. If these constraints are to be fully satisfied in a structure with two coordinated CPs, then each CP must be phrased in one PP that projects to IP. Any candidate which does not have all of its four CP boundaries aligned with both a PP and an IP boundary violates some alignment constraint. Thus, a candidate which has all four CP boundaries aligned with both a CP and a PP boundary incurs no violations of the alignment constraints at all, whereas all other possible candidates do incur such violations. This is illustrated in Tableau 1, where candidate a wins, whereas candidate b can never be selected as the winner. Candidate b is shaded to mark that it can never surface as the winner.

Tableau 1. Syntactic coordination.

| a | \{ (IA HA) } | \{ (IA HA) \} |
| b | \{ (IA HA) \} |

Throughout the analysis, it will turn out that coordinated CPs phrased as coordinated IPs (when all-new focused) do not violate any of the constraints which will be assumed here. The fully aligned candidate will always be optimal and will always be chosen by the grammar, independently of the constraint ranking. This explains why there is only a single attested phrasing of the coordinated CPs in (102).

56 The two IPs will also project yet another time, to create an IP which contains both CPs, see (102). This projection is however not driven by the alignment constraints. I provide no formal explanation for this projection.
Under this model, then, there is no interaction of constraints in the phrasing of single or coordinated CP structures, since one candidate simultaneously satisfies all constraints. Interaction of constraints can be observed only when the input contains embedded syntactic structures. In the following sections, we shall look closer at such cases.

7.2.2 **DepSynPros**

We now move on to discuss the phrasing options for the embedded structure in (103), repeated here as (117). This section explains the choice between (117)a and b. Candidates c and d will be discussed in section 7.2.3.

(117) Phrasing options for a CP with an embedded CP structure in Spec,CP.

\[
\begin{align*}
a) & \quad \{ \{ (IA \ HA) \% \} \} \quad (96)a, \ Figure \ 44 \\
b) & \quad \{ \{ (IA \ HA) \% \} \ (IA \ HA) \% \} \% \} \quad (96)b, \ Figure \ 45 \\
c) & \quad \{ (IA \ HA) \% \} \ x \ HA) \% \} \quad (96)c, \ Figure \ 52 \\
d) & \quad \{ \{ (IA \ HA) \% \} \ (x \ HA) \% \} \quad (96)g, \ Figure \ 51
\end{align*}
\]

In addition to the alignment constraints, there is also a constraint which inhibits prosodic boundaries in the output structure which do not correspond to syntactic boundaries in the input structure. This constraint is essentially the inverse of the alignment constraints. I shall call this constraint **Syntax-Prosody Dependence (DepSynPros)**, formulated as in (118).

(118) **DepSynPros**

A Phonological Phrase (PP) or Intonation Phrase (IP) boundary in the output representation corresponds to a CP boundary in the input representation.

When presented with the choice of phrasing (117) as in (117)a, with one IP or as in (117)b with two IPs, **DepSynPros** prefers one IP, whereas the alignment constraints prefer two. This is illustrated in Tableau 2 (the ALIGNL,CP constraints are omitted in the tableau since they cannot help distinguish these two candidates). I use multiple violations for **DepSynPros** so that candidates are given one star for each PP or IP boundary that does not correspond to a syntactic boundary.

The syntactic structure in (117) can be phrased *both* as in candidate a and as in candidate b. This falls out if we assume variable ranking of the **DepSynPros** constraint and the alignment constraints. If ALIGNR,CP is ranked higher than **DepSynPros**, candidate a wins. Under the opposite ranking, the winner is candidate b.
Tableau 2. A CP structure embedded to the left in a bigger CP structure, with two candidates.

<table>
<thead>
<tr>
<th></th>
<th>CP</th>
<th>CPf</th>
<th>ALIGN,R,CP</th>
<th>DEP,SYN,PROS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>{ (IA HA)%}</td>
<td>{ (IA HA)%} %}</td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>{ (IA HA)%}</td>
<td></td>
<td>**</td>
<td></td>
</tr>
</tbody>
</table>

In tableau 2, only one ranking is shown. However, both rankings of the constraints are possible, and consequently, both candidates can win under some ranking. This is the effect of variable ranking, which allows one set of constraints to produce different outputs under different rankings. Thus, one person may alternate between output structures. Because of this, no indication is given of the winning candidate in the tableau. In all of the tableaus shown in section 7.2, all rankings of the candidates which appear in the tableaus are possible. Also, all the candidates in the tableaus will win under some ranking.

In section 7.3, some strict rankings will be introduced in order to explain why some prosodic structures are incompatible with some syntactic structures. These strict rankings will be indicated in the tableaus with a thick black line between the constraints as in Tableau 5. A normal black line between constraints indicates variable ranking. All candidates which are not shaded will surface as the winner under some ranking.

7.2.3 *ADJUNCTION
This section introduces the constraint *ADJUNCTION. I first introduce the empirical evidence which motivates this constraint in Stockholm Swedish (7.2.3.1) and then provide a more general discussion on why this constraint is needed in an account which allows recursion of prosodic structure (7.2.3.2).

7.2.3.1 Stockholm Swedish data supporting *ADJUNCTION
We now move on to discuss the candidates (117)c and d. The alignment constraints and DEPSYNPROS can choose between these two candidates in a similar way as they can choose between a and b, but actually, they can not select a and b over c and d. In order to explain why all four candidates can win, I introduce a fourth constraint: *ADJUNCTION.
*ADJUNCTION militates against prosodic adjunction. As explained in Chapter 6, the definition of prosodic adjunction used here is that sister nodes belong to different prosodic categories. *ADJUNCTION will prefer prosodic coordination over prosodic adjunction and is formulated as in (119). In the present analysis, *ADJUNCTION replaces both NONRECURSIVITY and EXHAUSTIVITY (cf. section 6.1).

(119) *ADJUNCTION
Sister nodes in prosodic structure are instantiations of the same prosodic category.

As mentioned, without this constraint, the candidates in Tableau 2 could never be selected as the optimal candidates (which they should be, since they are in fact attested). Consider in Tableau 3.

Tableau 3. A CP structure embedded to the left in a bigger CP structure, with four candidates.

<table>
<thead>
<tr>
<th>CP</th>
<th>CPf</th>
<th>ALIGNR,CP</th>
<th>DEPSYN,PROS</th>
<th>*ADJUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>{ (IA HA) %} { (IA HA) %}</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>{ (IA HA) %}</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>{ (IA HA) } { (IA HA) %}</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>{ (IA HA) %} { (IA HA) %}</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

Candidate c lacks an IP boundary at the rightmost edge of the embedded CP, and violates ALIGNR,CP once. Candidate d has both a PP and an IP boundary at all CP boundaries and therefore does not violate ALIGNR,CP. In return, however, it has a PP boundary which does not correspond to any syntactic boundary. This causes one violation of DEPSYN,PROS instead. Therefore, when ALIGNR,CP is higher ranked than DEPSYN,PROS, c wins, and when DEPSYN,PROS is higher ranked, d wins.

However, candidates a and b can never be selected by the two constraints ALIGNR,CP and DEPSYN,PROS. This is because these candidates incur two violations each. For a or b to win, then, candidates c and d must first be ruled out. This happens when *ADJUNCTION is ranked above ALIGNR,CP and DEPSYN,PROS. In both c and d in Tableau 3, one node dominates material which is phrased on two different levels of the prosodic hierarchy. In c, the highest PP node dominates both another PP node and some AP nodes. In d,
the highest IP node dominates both an IP node and a PP node. Once candidates c and d have been ruled out by *ADJUNCTION, either of the candidates a and b in Tableau 3 may be selected, depending on the ranking of ALIGNR,CP and DEPSYNPROS.

*ADJUNCTION in interaction with the alignment constraints can also choose between the attested phrasing options of (103), repeated here as (120) a and b. In addition to the two winning candidates, we might consider the unattested candidate †2 from (100) in Chapter 6.

(120) Phrasing options for a CP with an embedded CP structure in the rightmost position of VP.

\[
\begin{array}{ll}
\{ \{ (IA \ HA) \% \} \} & (96)a, Figure 44 \\
\{ IA \ x \ { (IA \ HA) \%} \% \} & (96)d, Figure 47 \\
\{ ( IA \ x \ (reset HA) ) \% \} & unattested, cf. fn 51
\end{array}
\]

Consider Tableau 4, where (120)a, b and †2 are repeated as candidates a, b and c respectively. (Note that there are two further candidates which could surface as winners in assuming only the constraints in Tableau 4. These will be ruled out in Tableau 5).

Tableau 4. A CP structure embedded to the right in a bigger CP structure.

<table>
<thead>
<tr>
<th></th>
<th>[ [ ]CP ]CPf</th>
<th>ALIGN,L,CP</th>
<th>*ADJUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>{ (IA \ HA) % }</td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>{ IA { (IA \ HA) % }</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>{ (IA \ (reset HA) ) % }</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

Candidate a incurs two violations of ALIGN,L,CP because the left edge of the embedded CP corresponds neither to a PP nor to an IP boundary. Candidate b fully satisfies ALIGN,L,CP, but violates *ADJUNCTION. Thus, if *ADJUNCTION is high ranked, candidate a wins, whereas if ALIGN,L,CP is high ranked, candidate b wins.\(^{57}\)

\(^{57}\) ALIGN,R,CP is not violated by any of the candidates here, and thus does not have to be considered in deciding between candidates.
Candidate c can never win. It violates *ADJUNCTION because all the material to the left of the embedded CP is adjoined to a PP without being phrased at the PP level. It also violates ALIGNL,CP, because the left edge of the embedded clause does not correspond to an IP boundary. Note that we do not need the constraint EXHAUSTIVITY from (91) in order to select b over c.

7.2.3.2 *ADJUNCTION: discussion

In the present analysis, *ADJUNCTION replaces the previously suggested constraints NONRECURSIVITY, WRAPXP and EXHAUSTIVITY as a means of restraining the branching properties of prosodic structure. In the remainder of this section I contrast *ADJUNCTION with these three constraints, and relate *ADJUNCTION to the suggestion of Compound Prosodic Domains (CPDs) suggested by Ladd (2008:298).

If the insertion of boundaries created by alignment constraints is not restricted in any way, prosody will become a direct mirror image of the syntax. Thus, in order to account for the fact that there are sometimes mismatches between the prosodic and syntactic structure, insertion of boundaries created by the alignment constraints needs to be restricted.

The constraint WRAPXP is one way to constrain boundary insertion. It is formulated as in (121) from Truckenbrodt (1999:228).

(121) WRAPXP

“Each XP is contained in a phonological phrase.”

Whenever some XP is embedded in another XP, WRAPXP comes into conflict with constraints that align XPs with prosodic structure (in this section I shall refer to such constraints as ALIGNXP). (122)a shows a syntactic structure with an embedded XP inside another XP. ALIGNXP wants to insert a right prosodic boundary at the place of the embedded XP right edge. WRAPXP opposes this insertion, if it triggers a corresponding left boundary as in (122)b. This is because under the phrasing in (122)b, the bigger XP is not phrased in one single PP but in two PPs. WRAPXP instead prefers the phrasing in (122)c, where both the smaller embedded XP and the bigger XP are contained within one single PP.

(122) Phrasing alternatives for an XP which embedded in another XP

a) \[
\begin{array}{c}
[ [ ]]_\text{XP} \\
\{ [\text{XP}] \}
\end{array}
\]
b) \[
\begin{array}{c}
( ]_\text{PP} \\
\{ [\text{XP}] \}
\end{array}
\]
c) \[
\begin{array}{c}
( ]_\text{PP} \\
\{ [\text{XP}] \}
\end{array}
\]
d) \[
\begin{array}{c}
( )_\text{PP} \\
( ]_\text{PP} )_\text{PP}
\end{array}
\]
e) \[
\begin{array}{c}
( )_\text{PP} \\
( ]_\text{PP}
\end{array}
\]
f) \[
\begin{array}{c}
( )_\text{PP} \\
\{ [\text{IP}] \}
\end{array}
\]
The conflict between \textit{WRAPXP} and \textit{ALIGNXP} restricts the insertion of prosodic boundaries and \textit{WRAPXP} therefore expresses the intuition that not all syntactic boundaries correspond to a prosodic boundary.

However, \textit{WRAPXP} only works as intended if it interacts with a constraint that prohibits recursion. Once recursion is allowed to occur freely in the prosodic structure, \textit{WRAPXP} loses its ability to restrict the insertion of boundaries. This is because a bigger projection of the same category can be added, as in (122)d and e. One bigger PP projection includes two smaller ones, thereby ensuring that \textit{WRAPXP} is satisfied with respect to the biggest XP, and simultaneously allowing the embedded XP to be fully aligned. In this way, \textit{WRAPXP} and \textit{ALIGNXP} are simultaneously satisfied and no conflict arises which could cause a difference between the syntactic and prosodic structure.

Of course, \textit{WRAPXP} still opposes a structure like that in (122)f. However, so does \textit{EXHAUSTIVITY}. Thus, once recursive structure is allowed in prosody, the effect of \textit{WRAPXP} reduces to that of \textit{EXHAUSTIVITY} (note that this constraint is also unneeded in the present analysis, however).

The problem which now emerges is how the grammar can choose between structures like those in (122)d and (122)e. Both fully satisfy \textit{ALIGNXP} and \textit{WRAPXP}. They also fully satisfy \textit{EXHAUSTIVITY} so none of these constraints can distinguish them. A constraint that bans any recursive structure (e.g. \textit{NONRECURSIVITY} as it is formulated by Selkirk 1995, Truckenbrodt 1999 or as by Itô and Mester 2008) cannot distinguish them either, because both candidates violate this constraint equally.

A constraint like \textit{DEPSYNPROS} as is suggested here, or some more general constraint which bans structure can select the recursive prosody in (122)e, because it has one less boundary than the coordinated structure in (122)d. However, some force also needs to favor the candidate in (122)d. If not, then the prosodic structure will directly mirror the syntactic structure, and the intuition syntactic and prosodic structure are somehow different in terms of their branching is left unexpressed.

I propose the constraint \textit{*ADJUNCTION} is a violable constraint which sometimes causes prosodic structure and syntactic structure to diverge in terms of their branching. This constraint chooses prosodic coordination over prosodic adjunction, thus it will prefer (122)d over (122)e. \textit{*ADJUNCTION} means that some node of category \( n^1 \) may dominate one or several nodes of the same category \( n^1 \), or one or several nodes of some lower category \( n^{1-} \).

However, the constraint bans the formation of any prosodic domain whose constituents are of different categories. Thus, \textit{*ADJUNCTION} flattens out the prosodic structure by preferring prosodic coordination over adjunction.

Another potential advantage of the constraint \textit{*ADJUNCTION} over \textit{NONRECURSIVITY} is that the phrasing of single or coordinated syntactic structures does not lead to any constraint interaction. This predicts that prosodic embedding can only appear when there is syntactic embedding. Coordinated
structures which are subsumed under one and the same IP projection violate the NONRECURSIVITY constraint. For example, in Tableau 1, the structure from (100)c₁ will win over candidate a if NONRECURSIVITY is ranked above ALIGNXP. At least for Stockholm Swedish, such an effect is not desired, since each of the coordinated CPs always seems to have an initiality accent, whereas the structure in (100)c₁ predicts that the second CP has no IA.

That coordination should be seen as a preferred prosodic structure over adjunction, is suggested by Ladd (2008:298). He discusses how to weaken the SLH and restrict recursion in prosody, without prohibiting it. He suggests CDPs Compound Prosodic Domains in prosody. In his model, compounding is the only way in which recursive structures may be created. Two or more elements of the same type and level in the prosodic hierarchy may be compounded into a domain of the same type, much like two words may be compounded in morphology.

Thus, with the assumption of CPDs, recursion exists in prosody, but it is not as powerful as the recursion in syntax. Because of this, the categories of the prosodic hierarchy are preserved, and remain ranked in relation to each other in a strict way. Still the depth of the prosodic structure can vary, which is not allowed under the SLH.

*ADJUNCTION incorporates the notion of compounding in the prosodic system in the form of a violable OT-constraint. Coordination is thus not the only way of creating recursion, but the preferred one. The main argument for this weakening is that an asymmetry between prosodic left and right edges is observed in Stockholm Swedish, for example in the case of a CP that is embedded in another CP.

I propose, then, that recursion is not banned in prosody. Instead mismatches between syntax and prosody are due to a preference for prosodic coordination over prosodic adjunction. Adjunction is dispreferred independently of whether it involves recursion or not. Too many layers of recursion without any correspondence in the syntax will be prohibited by *STRUCTURE constraints. Therefore no constraint like NONRECURSIVITY is needed. Also, no constraint like EXHAUSTIVITY is needed in the present analysis, since non exhaustively parsed structures violate both alignment constraints and *ADJUNCTION.

7.3 Excluding ungrammatical candidates with strict rankings

I have now shown how the grammar can choose between all the attested phrasings given in (102), (103) and (104), assuming variable ranking of the constraints ALIGNR, CP, ALIGNL, CP DEPSYNPROS, and *ADJUNCTION. I have also shown that the interaction of these constraints rules out some candidates and prevents them from surfacing as the output structures (candi-
date b in tableau 1 and candidate c in Tableau 4). However, there are additional candidates which never surface as winners. The present section explains why these candidates never win. In order to account for the fact that the unattested candidates never surface for the different input structures, this section will introduce the constraints STRESS-FOCUS and DESTRESS-GIVEN. Also, two strict rankings will be introduced: STRESS-FOCUS and DESTRESS-GIVEN always dominate all the other constraints in the constraint set, and DEPSYNPROS always dominates ALIGNL,CP.

Recall from section 7.1 that all possible candidates are evaluated for each input. Therefore, we must make sure that all unattested candidates are excluded by the constraint set. Thus, in this section in the evaluation process for each input, we shall consider all the tree structures that can be produced by the phonology. These were listed in (100) (Chapter 6), repeated here as (123).

(123) Prosodic structures in Stockholm Swedish († marks unattested structures. Superscripted numbers mark alternative representations)

(i) no internal boundaries:
   a) \{ (IA HA)\}\% \hspace{1cm} (96)a, Figure 44

(ii) prosodic coordination
   b) \{ \{ (IA HA)\}\% \} \{ (IA HA)\}\%\% \hspace{1cm} (96)b, Figure 45
   c\^1\} \{ (IA HA) \} (x HA)\% \hspace{1cm} (96)c, Figure 46

(iii) prosodic adjunction
   adjunction to the left
   d) \{ IA x \ (IA HA)\%\} \% \hspace{1cm} (96)d, Figure 47
   †\^1\} \{ IA x (reset HA)\} \hspace{1cm} unattested, cf. fn 51
   †\^2\} \{ (IA x (reset HA))\% \hspace{1cm} unattested, cf. fn 51
   †\^3\} \{ (IA HA) \} (IA HA)\% \% \hspace{1cm} unattested, cf. fn 51

   adjunction to the right
   e) \{\{ (IA HA)\% \} x x \} \hspace{1cm} (96)e, Figure 48
   f\^1\} \{ (IA HA) x x )\% \hspace{1cm} (96)f, Figure 49
   f\^2\} \{ (IA HA) x x \} \hspace{1cm} (96)f, Figure 50
   g) \{\{ (IA HA)\% \} (x HA)\% \hspace{1cm} (96)g, Figure 51
   c\^2\} \{ (IA HA) x HA)\% \hspace{1cm} (96)c, Figure 52

As mentioned in Chapter 6, (123)c\^1 and c\^2 do in fact make different predictions with respect to reset at the third AP (which is predicted to be absent
in $c^1$ but not in $c^2$). Also, a difference in terms of reset might be expected in
$g^1$ vs. $g^2$. However since we do not have sufficient experimental data at this
point to distinguish them empirically, we shall distinguish them on theore-
tical grounds only. The consequence for the analysis is that it is enough for
one of them to win under some ranking, since this will be enough to explain
why the pattern in question can ever surface. It may be noted that the ana-
lysis makes empirical predictions here, which could possibly be tested.

Section 7.3.1 discusses why coordinated prosodic structures are attested
with syntactic left embedding (main clauses with an embedded clause in
Spec,CP (103)), but not with right embedding (main clauses with an embed-
ded clause in the VP (104)). 7.3.2 discusses why exhaustive parsing of all
material is required in the case of right embedding (104), but not in the case
of left embedding (103). 7.3.3 discusses the two phrasing options which are
attested for the narrow focus structures in (105).

7.3.1 **DepSynPros >> AlignL,CP**

This section discusses why initial embedding can be parsed in coordinated
structures, whereas final embedding cannot, as indicated in (124) versus
(125).

(124) \[
\{ (IA \ HA) \% \} \{ (IA \ HA) \% \} \] \ CP
\]

(125) \[
*\{ (IA \ HA) \% \} \ CP
\]

In order to explain this difference, I claim that AlignL,CP is always
dominated by DepSynPros. The same is not true for AlignR,CP which can
dominate DepSynPros.

This expresses the intuition that prosodic right boundaries are more
important than left boundaries in Stockholm Swedish, which is probably also
related to the fact that Phonological Phrases are right headed. Still, it admits
for AlignL,CP to play a role in this intonation system. With this strict rank-
ing, syntactic left boundaries may correspond to prosodic left boundaries.
However, such boundaries may not exist at the cost of additional prosodic
right boundaries that do not correspond with any syntactic boundary.

In Tableau 5, the strict ranking of DepSynPros over AlignL,CP is indi-
cated with a thick black line. AlignL,CP and *Adjunction can choose
between the attested candidates a and b, as already shown in Tableau 4.
Candidates c and d are ruled out by the strict ranking of DepSynPros over
AlignL,CP and are thus shaded.
Tableau 5. Strict ranking $\text{DEPSYNPROS} \gg \text{ALIGNL IP,CP,PP,CP}$

<table>
<thead>
<tr>
<th></th>
<th>[            ] CP</th>
<th>[            ] CP,F</th>
<th>DEPSYNPROS</th>
<th>ALIGNL-CP</th>
<th>*ADJUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>{ (IA        HA) }%</td>
<td></td>
<td></td>
<td></td>
<td>**</td>
</tr>
<tr>
<td>b</td>
<td>{ IA         }</td>
<td>{ (IA        HA) }%</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c</td>
<td>{ (IA          HA) }%</td>
<td>{ (IA        HA) }%</td>
<td></td>
<td></td>
<td>**</td>
</tr>
<tr>
<td>d</td>
<td>{ (IA          HA) }</td>
<td>{ (IA        HA) }%</td>
<td></td>
<td>**</td>
<td>*</td>
</tr>
</tbody>
</table>

### 7.3.2 STRESS-FOCUS and DESTRESS-GIVEN

This section discusses why non-exhaustive parsing is not permitted in the case of left embedding, as in (126), whereas it is permitted in the case of right embedding, as in (127).

(126) $\left[ \left[ \left[ \left[ \text{CP} \right] \text{CP,F} \right] \text{CP,F} \right] \text{CP,F} \right] \text{CP,F} \left\{ \left\{ \left\{ \text{IA} \text{ HA} \right\} \% \right\} x x \% \right\} (96)e, \text{ Figure 48}$

(127) $\left[ \left[ \left[ \left[ \text{CP} \text{CP,F} \right] \text{CP,F} \right] \text{CP,F} \right] \text{CP,F} \right] \text{CP,F} \left\{ \text{IA} x \right\} \left\{ \left\{ \text{IA} \text{ HA} \right\} \% \right\} \% (96)d, \text{ Figure 47}$

I shall argue that this difference is due to information structural considerations. In order to account for this, we need to add to the analysis constraints which control the interface between the prosody and the information structure: STRESS-FOCUS and DESTRESS-GIVEN. These will be assumed to be strictly ranked above all other constraints.

As mentioned, I follow several other researchers in assuming that focused constituents are F-marked in the syntactic structure (e.g. Selkirk 1995a, Féry and Samek-Lodovici 2006). Thus, the discourse status of a constituent is placed outside of the prosody per se. It is beyond the scope of this thesis to account for how focus marks are assigned in relation to the discourse structure. Instead this analysis aims to account for how focused and given constituents are reflected in the prosodic structure.

I follow Féry and Samek-Lodovici (2006) in assuming that the two constraints STRESS-FOCUS and DESTRESS-GIVEN, formulated as in (128) and (129), govern the relationship between F-marks and pitch accents.

(128) **STRESS-FOCUS**: A focused phrase has the highest prosodic prominence in its focus domain.

(129) **DESTRESS-GIVEN**: A given phrase is prosodically non-prominent.
Some comments on the interpretation of these constraints are called for. First, Féry and Samek-Lodovici (2006:136) (following Truckenbrodt 1995) assume that the focus domain “always contains the focused phrase and identifies the background information relevant to the semantic denotation of focus. It is thus defined in semantic terms and does not necessarily coincide with a single prosodic constituent”. For the purposes of the account of CP-phrasing given in this chapter, it suffices to assume that the focus domain is the entire main clause.\(^{58}\)

Second, the interpretation of the notion highest prosodic prominence in Stockholm Swedish requires some further comment. In Stockholm Swedish, focused material is generally (H)LH-accented. On given material, there are generally no (H)LH-accented, but HL-accented are retained (cf. 3.1 and Chapter 4). Thus, the distinction between focused and not focused is expressed with the distinction between (H)LH-accents and HL-accents, i.e. between PP heads and AP heads. The distinction between head of IP vs. head of PP, or head of AP vs. head of prosodic word cannot be used in Stockholm Swedish to distinguish between focused and non-focused material. This means that a focused XP in a sentence cannot be singled out from other XPs in that sentence by being head of IP, whereas the rest of the XPs in the sentence are PP heads.

The formulation of STRESS-FOCUS as in Féry and Samek-Lodovici does not capture this. (130)a shows the phrasing that their model predicts of a so called “superman sentence”. The sentence is characterized by having three nested focus domains, as marked with the square brackets. The highest prominence goes to the deepest embedded focus, since this prominence is contained within all foci, and thus simultaneously allows all three domains to contain the highest prominence in the sentence.

The Swedish translation of the superman sentence, with two alternative phrasings, is given in (130)b and c. Importantly, the Swedish phrasings contain only one PP head, whereas the model actually predicts three PP heads, as in the English example in a. In order to make this prediction we need to add to the STRESS-FOCUS constraint, the assumption that in Stockholm Swedish only the difference between AP heads and PP heads is large enough to satisfy STRESS-FOCUS.

(130) The phrasing of a “superman sentence”. The phrasing predicted by Féry and Samek-Lodovici’s model is shown in a (2006:141). The structures in b and c show the two possible phrasings of the sentence in Stockholm Swedish. For clarity, I use curly brackets for IP boundaries and HA for the head of PP.

\(^{58}\) However, in order to provide a fuller account of the PP phrasing of CP internal XPs which would be able to account for all the types of sentences discussed in section 3.1, a more elaborate definition of focus domains is needed. I refer to Féry and Samek-Lodovici (2006) and references therein for a discussion.
Father: What happened?
Mother: You know how I think our children should read decent books.
Well, when I came home, rather than doing his homework,
Johnny was reading Superman to some kid.

\[
a) \{ (HA) \quad (HA) \} \\
[Johnny \text{ [was reading Superman to some kid]}_{F2}]_{F1}
\]

\[
b) \{ (IA) \quad (HA) \} \% \quad (96)f, \text{ Figure 49} \\
[Johan \text{ [läste STÅLMANnen för nån unge]}_{F3}]_{F2}\]
\]

\[
c) \{ (IA) \quad (HA) \} \% \quad (96)e, \text{ Figure 48} \\
[Johan \text{ [läste STÅLMANnen för nån unge]}_{F3}]_{F2}\]
\]

Likewise, the notion *prosodically non-prominent* in the constraint DESTRESS-GIVEN must be interpreted as non-prominent at the PP level, even though the AP structure is retained.

Once the two constraints have been adopted (with the proviso that they can be satisfied only with the AP vs. PP head distinction), we can explain the difference between (126) and (127). In the case of initial embedding, the phrasing shown in (126) induce a narrow focus interpretation on the embedded clause, since there is no (H)LH-accent in the VP of the main clause. This problem does not arise in the case of final embedding, since the HA appears on the last stress of the VP, thus allowing an all-new focus interpretation of the sentence.

We can exclude the phrasing in (126) by strictly ranking STRESS-FOCUS and DESTRESS-GIVEN above all the other constraints in the constraint set. This ranking will exclude all candidates that do not insert a head (H)LH-accent on an F-marked constituent.

### 7.3.3 ALIGNR,HEAD

In the previous section we ruled out the prosodic structure in (126) because it invokes a narrow focus reading on the embedded clause. In this section, we discuss cases where the embedded clause is in fact narrow focused. The phrasing options for such structures were given in (105), repeated here as (131).

\[
(131) \text{ Phrasing options for a CP with an embedded CP structure in Spec,CP,} \\
\text{narrow focus on the embedded clause.}
\]

\[
\begin{align*}
a) \{ (IA) \quad (HA) \} \quad x \quad x \quad \% \quad (96)e, \text{ Figure 48} \\
b) \{ (IA) \quad (HA) \} \quad x \quad x \quad \% \quad (96)f, \text{ Figure 50}
\end{align*}
\]
In order to explain the choice between (131)a and b, we shall introduce the constraint \textsc{alignr,head}, formulated as in (132).

\begin{equation}
(132) \textsc{alignr,head}: \text{Align every head of category C' with a right edge boundary of Category C'}. \end{equation}

Consider Tableau 6. Candidate a is the structure in (131)a. Candidates b\textsuperscript{1} and b\textsuperscript{2} are two alternative representations of (131)b (cf. Figure 49 and Figure 50 in Chapter 6). There are also two additional candidates, c and d, which have HAs within the VP of the main clause. Candidates b\textsuperscript{3}, c and d are shaded because they cannot win under any ranking.

Tableau 6. Initial embedding with narrow focus. The thick black line marks strict ranking between the constraints to its left and to its right. Candidates ruled out by this strict ranking are shaded.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>CP\textsubscript{f}</th>
<th>CP</th>
<th>STRESS-FOCUS</th>
<th>DESTRESS-GIVEN</th>
<th>\textsc{alignr,head}</th>
<th>*\textsc{adjunction}</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>{ (IA HA) %}</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| b\textsuperscript{1} | { (IA HA) %} | | | | | | *
| b\textsuperscript{2} | { (IA HA) %} | | | | | * | *
| c | { (IA HA) HA %} | | | | | * | |
| d | { (IA HA) %} | | | | | | *

Candidate a is empirically different from b\textsuperscript{1} and b\textsuperscript{2} only with respect to the IP boundary immediately following the HA. Candidate a has such a boundary whereas candidates b\textsuperscript{1} and b\textsuperscript{2} do not. At present we have no means of empirically distinguishing between b\textsuperscript{1} and b\textsuperscript{2}, and therefore we leave this choice to theoretical considerations.

The choice between candidates a and b\textsuperscript{1} can be accounted in terms of interaction between the constraints \textsc{alignr,head}, and *\textsc{adjunction}. Candidate a violates *\textsc{adjunction} because the highest IP dominates both another IP and the APs in the post-nuclear area. Candidates b\textsuperscript{1} and b\textsuperscript{2} violate

\textsuperscript{59} The formulation of this constraint is inspired by the constraints HI (i) and HP (ii) in Féry and Samek-Lodovici (2006:134).
(i) HP: Align the right boundary of every P-phrase with its head(s).
(ii) HI: Align the right boundary of every I-phrase with its head(s).
The formulation used here is necessary to distinguish the candidates a and b from the one in c in Tableau 5, because it punishes only non-aligned heads, whereas the formulation in Féry and Samek-Lodovici (2006) punishes both non-aligned heads and non-aligned boundaries.
ALIGNR,HEAD once each because there is one HA which is not aligned with any IP or PP boundary. Candidate \( b^2 \) also violates \(*\text{ADJUNCTION} \) because the highest IP dominates both a PP the APs in the post-nuclear area. Crucially, candidate \( b^1 \) does not violate \(*\text{ADJUNCTION} \). Because candidate \( b^2 \) violates both ALIGNR,HEAD, and \(*\text{ADJUNCTION} \) it cannot be selected as the winning candidate under any constraint ranking.

In Tableau 6 we also see that any candidate which has a HA on the VP of the main clause, or which lacks a HA on the embedded clause, like candidates \( c \) and \( d \), are ruled out by the strict ranking of STRESS-FOCUS and DESTRESS-GIVEN above all other constraints.

### 7.4 Summary

This chapter has presented an Optimality Theoretic (OT) analysis of the phonological phrasing of CP-structures in Stockholm Swedish. I model the phrasing of the four structures in (101), repeated below as (133). A number of phrasing options are possible for each of the syntactic structures in (133), see (102) through (105). These options have been discussed and exemplified in previous chapters of the thesis. I derive the observed variation through a set of OT constraints on the syntax–prosody interface. The ranking of the constraints is assumed to be variable, thus allowing one speaker to vary between output structures.

(133) The three syntactic structures which are considered as inputs to the candidate set.

- a) \[ [ \quad \text{CP} \quad [ \quad \text{CP,F} \quad ] \]
- b) \[ [[ \quad \text{CP} \quad ] \quad \text{CP,F} \quad ] \]
- c) \[ [ \quad [ \quad \text{CP,F} \quad ] \quad \text{CP,F} \quad ] \]
- d) \[ [[ \quad \text{CP,F} \quad ] \quad \text{CP} \quad ] \]

I propose that when selecting winning output candidates, the phonology distinguishes between prosodic coordination (i.e. when a mother node only dominates nodes of the same prosodic category) and prosodic adjunction (i.e. when a mother node dominates sister nodes which belong to different prosodic categories). In order to model this, I assume the constraint \(*\text{ADJUNCTION} \), formulated as in (134). This constraint replaces both NON-RECURSIVITY and EXHAUSTIVITY in the present analysis.

(134) \(*\text{ADJUNCTION} \)

Sister nodes in prosodic structure are instantiations of the same prosodic category.
The full set of constraints assumed here is shown in Figure 54, where the solid black lines mark strict ranking, and where ranking varies between any constraints which are not connected with such a line.

*ADJUNCTION

DEPSYNPROS

ALIGNL,CP

Figure 54. Diagram over the constraints assumed in this thesis and their rankings.
This thesis explores the intonational phonology of Stockholm Swedish. It has two major aims. First, it aims to describe the intonational options that are available to a Stockholm Swedish speaker. Second, it aims to provide a phonological model for Stockholm Swedish intonation which includes these options and explains how they are structurally related. The major claims of the thesis were presented in (1) in Chapter 1, repeated and slightly adapted below as (135). This summary provides an overview of the content in each chapter of the thesis and reviews the main claims one by one.

(135) a) The so-called focal accent, which are referred to here as the (H)LH-accent, should be divided into two groups, the head (H)LH-accent, which marks different types of focus (including the notion contrastive topic, cf., the definition by Krifka 2007, 2008) and the initiality (H)LH-accent, which marks left boundaries. (Chapter 3)

b) The word accent tones, here referred to as HL-accents, can be boosted in some contexts. Also, they can be used as nuclear contours when the content of a phrase is given. This suggests that they may have a more complex function in the intonation system than only signaling the distinction between accent 1 and accent 2. (Chapter 4)

c) The range of options for post-nuclear areas and boundary tones in Stockholm Swedish is larger than previous research has revealed. (Chapter 5)

d) Stockholm Swedish provides evidence that the phonological domains which govern intonational phenomena branch in complex ways. This makes it possible to distinguish prosodic coordination (equal sister nodes) from prosodic adjunction (unequal sister nodes). (Chapter 6)

e) Evidence for such branching is easier to recognize in Stockholm Swedish than in other Germanic languages. This is because left as well as right edges have categorical phonological markers, heads can be categorically distinguished from non-heads, and the location of phonological heads can be distinguished from the location of the boundary tone. (Chapter 6)

f) Constraints on phonological structure make reference to prosodic adjunction (unequal sisters), which is avoided in favor of coordination (equal sisters). This is formulated in the OT-constraint *ADJUNCTION *ADJUNCTION which replaces both NONRECURSIVITY and EXHAUSTIVITY. in the present analysis. (Chapter 7)
The outline of the thesis is as follows. Chapter 1 introduces the aims of the thesis, some basic theoretical assumptions, and the material that is used. Chapter 2 gives an overview of the intonational grammar of Stockholm Swedish. Chapters 3, 4, and 5 review different phonological phenomena in the intonation system of Stockholm Swedish. Chapter 6 relates these phonological phenomena to each other within the theory of a **prosodic hierarchy** (e.g. Nespor and Vogel 1986), and Chapter 7 discusses the interface between the phonology and the syntax within an **Optimality Theoretic** (OT) framework. Below, I review the content of each chapter.

### 8.1 Theoretical assumptions and material

The theoretical background to this thesis is provided by a combination of approaches to grammar and intonation. First, I use **autosegmental-metrical theory**, which models the intonation contour as interpolation between high (H) and low (L) tonal targets (e.g. Ladd 1996, 2008), see section 1.3.

I also use the theory of a **prosodic hierarchy** to model distributional properties of the intonational phenomena in Stockholm Swedish (e.g. Nespor and Vogel 1986), see section 6.1. It is assumed within this theory that tones are licensed by a set of hierarchically organized phonological categories. Tones either mark heads or edges of such categories.

I also discuss the relationship between the intonational structure and the syntax and information structure. In this discussion, I assume that prosodic categories are mapped onto syntactic categories via a set of **Optimality Theoretic** (OT) **constraints**, (e.g. Prince and Smolensky 1993), see section 7.1. Within OT, a set of constraints on grammatical structure are assumed, which impose restrictions on grammatical structure. Constraints are sometimes conflicting and this is solved by the **ranking** of constraints. Structures which satisfy higher ranked constraints are selected over structures which satisfy lower ranked constraints. I assume that constraint ranking is variable. This can account for the fact that one syntactic structure may correspond to more than one intonational structure.

The study is based on a corpus including both controlled and uncontrolled speech. The controlled speech consists of approximately 230 recorded sentences which were designed to test various phonological hypotheses. The uncontrolled speech includes approximately 17 minutes of excerpts from some different types of speech, such as a radio interview with a gardening expert, a prank call with a Swedish comedian, an audio book read by a Swedish actress, and a recording of three children playing with a video camera. The intention behind using several different types of speech was to account for a wide range of intonational phenomena. It remains to be further studied how these patterns are exploited in different speech styles and by different speakers.
8.2 Previous research and major claims

This section first presents a short summary of the tones and the prosodic domains that are assumed for Stockholm Swedish in this thesis. Thereafter, I briefly explain the content of Chapters 3–8, mentioning each of the claims in (135).

Like most other Scandinavian languages, Stockholm Swedish has two lexical word accents, accent 1 and accent 2. There are also two distinct tonal prominence levels. It is usually assumed that the lower tonal prominence level consists of lexical tones which express the word accent distinction, and that the higher prominence level consists of the lexical tones plus an additional H tone. In total, this assumption gives four tonal contours which signal some type of prominence in Stockholm Swedish. I assume that these four contours are represented as in Figure 1, repeated here as Figure 55. These representations are due to insights from previous work by Bruce (1977 et seq.), Riad (1998, et seq.), and Engstrand (1995, 1997), see section 2.1.

<table>
<thead>
<tr>
<th></th>
<th>Prominence level 1</th>
<th>Prominence level 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accent 1</td>
<td>H L*</td>
<td>L* H</td>
</tr>
<tr>
<td>Accent 2</td>
<td>H* L</td>
<td>H* L H</td>
</tr>
</tbody>
</table>

Figure 55. The tonal inventory assumed for Stockholm Swedish in the present work. The asterisks mark tones that are associated to the vowel of the stressed syllable.

I refer to the lower prominence level as prominence level 1 and the higher level as prominence level 2. The tonal contours that are used to express the prominence levels in Stockholm Swedish are referred to as HL-accents and (H)LH-accents respectively. In previous research, the terms accent vs. focus has been common (cf. e.g. Bruce 1998, Hansson 2003, Heldner 2001). These terms are not used in the present work. In addition to these tones, I assume that Stockholm Swedish has a high and a low boundary tone, represented as H% and L%, respectively.

Tones are licensed by prosodic categories which are hierarchically organized in a prosodic hierarchy. The prosodic hierarchy of Stockholm Swedish assumed in this thesis was illustrated in Figure 5, repeated here as Figure 56.

In Chapter 3 the (H)LH-accent is discussed. I argue that this accent has two main functions. Accents which are used in these two functions are referred to as head (H)LH-accents (3.1) and initiality (H)LH-accents (3.2). Head (H)LH-accents are (H)LH-accents which are heads of PPs. They mark focus within topic and comment constituents (defined here in the sense of Krifka 2007, 2008) and have a similar function as strong prominences in
In the first years it happened rather often

Figure 56. The phonological hierarchy of Stockholm Swedish as assumed in this thesis, along with the tones they license. The context question is: *Hur ofta hade dina barn öroninflammation när de gick i skolan?* ‘How often did your kids have inflammations of the ears when they went to school?’.

In the answer, there are two strong prominences. The first one is on åren ‘the years’ which is a head accent marking a frame setter (an information structural notion close to a contrastive topic, Krifka 2007, 2008). The second one is on ofta ‘often’, a head accent that marks the information that was asked for in the question as focused. IP = Intonation Phrase, PP = Phonological Phrase, AP = Accent Phrase, PW = Prosodic Word, IA = Initiality (H)LH-accent, HA = Head Accent. Curly brackets mark IP boundaries. Round brackets mark PP boundaries. See text for further explanation.

other Germanic languages. Initiality (H)LH-accents are (H)LH-accents which appear on the first HL-accented syllable of an IP. The function of such accents is to mark the left edge of the IP by increased prominence. I assume that this accent is motivated by the Edge Prominence constraint, which says that edge constituents are more prominent than non-edge constituents (Selkirk 1995a). In section 3.2, I also present the results of some experiments which are designed to examine the distribution of initiality (H)LH-accents. It is noted that such accents fail to appear in sentences with an early narrow focus, as well as in sentences where the pre-verbal position does not contain a HL-accent.

Chapter 4 discusses the HL-accent, i.e. the prominence level 1 accent. It is noted that this accent occurs on most, but not all, lexically stressed syllables. Exceptions include lexicalized phrases, auxiliaries and some other verb phrases. It is shown that HL-accents may be boosted under certain condi-
Figure 57. The typology of post-nuclear areas containing post-nuclear HL-accents. The dot represents the last H tone of the nuclear (H)LH-accent, and the triangles represent post-nuclear HL-accents. The three columns show the three types of post-nuclear areas. A distinction is made between external and internal areas, where internal areas belong to the same PP as the nuclear accent. External areas, on the contrary, are separated from the nuclear accent by an IP boundary tone. This IP boundary tone also cuts off the PP which contains the nuclear accent, so that the external area is not part of this PP. The two rows show the alternatives for the last boundary tone in the IP.

Chapter 5 discusses post-nuclear areas, defined here as the area following the last, i.e. nuclear, (H)LH-accent of an IP. This area includes the boundary tones, i.e. the H% and the L%. A schematized typology of the contours I distinguish is presented in Figure 27, repeated here as Figure 57.

I distinguish between internal and external post-nuclear areas. In an external area there is a H% or a L% boundary tone immediately following the nuclear accent. In an internal area, such a boundary tone is lacking. External areas are further divided into low and high. This distinction refers to whether the boundary tone which is inserted immediately after the nuclear accent is H% or L%. When it is L%, the pitch in the post-nuclear area is lowered and compressed. When it is H%, the pitch is raised and compressed.

When there are no HL-accents in a post-nuclear area, the internal and the external low area cannot be distinguished. Also, it is difficult to make the distinction between the external high area with L% and the one with H%. In an internal area with no post-nuclear HL-accents, the last H of the nuclear accent merges with the H% boundary tone. These facts warrant a slightly different representation of post-nuclear areas without HL-accents, given in Figure 40, and repeated here as Figure 58.

The range of options for post-nuclear areas proposed here is much larger than the number of options in the Lund model (cf. Bruce 1998, Hansson
Chapter 6 discusses the branching of the two highest categories in the prosodic hierarchy, the Intonation Phrase (IP) and the Phonological Phrase (PP). I argue that Stockholm Swedish provides evidence for prosodic recursion, and for a distinction between prosodic coordination and prosodic adjunction. Prosodic coordination means that sister nodes in the phonological representation belong to the same prosodic category, whereas prosodic adjunction means that sister nodes belong to different prosodic categories. The evidence for these claims comes from the distribution of tonal phenomena in Stockholm Swedish. Because we can identify both left and right edges in Stockholm Swedish via the initiality accent and the L% and H% boundary tones, we can observe asymmetries in the presence of left and right edges. Such asymmetries can be explained in terms of recursion, coordination and adjunction of nodes in the phonological representation.

In Chapter 7 the various branching options of the PP and IP structure are related to the branching of the syntactic structure. This chapter gives an Optimality Theoretic (OT) account of the mapping of PP and IP structure onto syntactic structure. I show in this chapter that several prosodic structures can be mapped onto the same syntactic structure. However, I also show that the variation is constrained in principled ways, which means that the branching of prosodic structure is constrained by the branching of syntactic structure.

The main new suggestion of Chapter 7 is that the analysis of Stockholm Swedish intonation does not need any contraint which bans prosodic recursion. Recursion has often been assumed to be avoided in prosodic structure (cf. e.g. Selkirk 1995b, Truckenbrodt 1999). I suggest that rather than avoiding recursion, prosody avoids adjunction over coordination. This pre-
ference is expressed with the constraint *ADJUNCTION which is formulated in (109), repeated here as (136).

(136) *ADJUNCTION

Sister nodes in prosodic structure are instantiations of the same prosodic category.

*ADJUNCTION is based on the proposal of Compound Prosodic Domains by Ladd (2008). This constraint accounts for the fact that syntactic adjunction can be mapped to prosodic adjunction or to prosodic coordination. Syntactic coordination, however, is always mapped to prosodic coordination, and never to prosodic adjunction.

A model for the Stockholm Swedish intonational system has been around at least since Gösta Bruce published his thesis in 1977. Many of the phonological aspects of this intonational system have, however, remained understudied. This thesis provides some new and detailed phonological hypotheses with regard to sentence level intonation in Stockholm Swedish, and identifies a number of new areas of interest for future studies.
Sammanfattning


Jag argumenterar bland annat för att tonala prominenser används både för att markera vänstergränser och för att markera informationsstrukturerliga kategorier som fokus och topik (se Krifka 2007, 2008). Jag visar också att stockholmsvenska har en betydligt större uppsättning tonala fenomen vid högergränser i yttranden än vad som framgått i tidigare forskning.


Kapitel 1 ger en introduktion till hela avhandlingen. En del teoretisk bakgrund presenteras, liksom mitt material och min metod. Jag utgår från grundläggande antaganden inom autosegmentell-metrisk teori, som antar att den fonologiska representationen av intonationsstrukturen består av tonala punk-

Materialet för avhandlingen presenteras i Tabell 1 och utgör en korpus bestående av 420 inspelade meningar och cirka 17 minuter tal från bland annat en radiointervju, ett telefonsamtal och en uppläst ljudbok.


<table>
<thead>
<tr>
<th></th>
<th>prominensnivå 1</th>
<th>prominensnivå 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>tonaccent 1</td>
<td>H L*</td>
<td>L* H</td>
</tr>
<tr>
<td>tonaccent 2</td>
<td>H* L</td>
<td>H* L H</td>
</tr>
</tbody>
</table>

Figur 1. De tonala representationerna för de två olika prominensnivåerna i stockholmsvenska så som de realiseras på ord med de två olika tonaccenterna.

Jag refererar i avhandlingen till prominensnivå 2-konturer som (H)LH-accenter, och till prominensnivå 1-konturer som HL-accenter. Dessa termer syftar på formen hos de tonala konturerna, och är därmed dialektspecifika, till skillnad från termerna prominensnivå 1 och 2.

Förutom de tonala konturerna i Figur 1, antar jag att det finns två gränsstoner: H% och L%. Dessa uppträder vid högergränser.

I kapitel 2 presenteras också de prosodiska kategorier som jag antar ingår i stockholmsvenskans prosodiska hierarki. Den hösta kategorin, intonationsfrasen (IP), markeras vid sin vänstergräns med en prominens, en så kallad initialitetsaccent. Initialitetsaccenten är en (H)LH-accent som uppträder på IP:ns första HL-accentuerade stavelse. Till höger har IP:n en gränston, som kan vara H% eller L%. Nästa kategori är den fonologiska

I kapitel 3 argumenterar jag för att stockholmssvenskans (H)LH-accenter har två olika funktioner, nämligen den nyss nämnda skillnaden mellan huvudaccenter och initialitetsaccenter. Huvudaccenter används på liknande sätt som starka prominenser i andra germanska språk, för att markera fokus och topiker (Krifka 2007, 2008), och jag jämför i kapitlet placeringen av accenter i svenska och engelska i en mängd olika kontexter som har diskuterats i engelsk och tysk forskning. Initialitetsaccenter markerar vänstergränser på IP:ar med höjd prominens på den första betonade stavelsen.

I kapitel 4 visar jag att HL-accenter kan realiseras med ett extra högt fall i vissa kontexter, samt att de kan användas istället för en (H)LH-accent om de markerar given information.

I kapitel 5 visar jag att det område som följer på den sista (H)LH-accenten i en IP uppvisar betydligt större variation vad gäller intonationen än vad som antagits inom Lundamodellen. Jag argumenterar för att det finns sex olika typer av sådana områden, samt att en H% gränston släcker samman med den sista H-tonen i en (H)LH-accent, om denna uppträder på det sista ordet i IP:n.

References


Beckman, Mary and Hirschberg, Julia. 1994. The ToBI annotation conventions. Online manuscript. Available at: <http://www.ling.ohio-state.edu/~tobi/ame_tobi/annotation_conventions.html>.


3. **Ingemar Olsson**, Gotländska terrängord. (Gotländische Geländewörter.) 1959. 196 pp. **German Summary**.


Subscription to the series and order for single volumes should be addressed to any international bookseller or directly to the distributor:
eddy.se ab
P.O. Box 1310
SE 621 24 Visby
Tel: +46 498 25 39 00
Fax: +46 498 24 97 89
E-mail: order@bokorder.se
Corpus Troporum
Romanica Stockholmiensia
Stockholm Cinema Studies
Stockholm Economic Studies. Pamphlet Series
Stockholm Oriental Studies
Stockholm Slavic Studies
Stockholm Studies in Baltic Languages
Stockholm Studies in Classical Archaeology
Stockholm Studies in Comparative Religion
Stockholm Studies in Economic History
Stockholm Studies in Educational Psychology
Stockholm Studies in English
Stockholm Studies in Ethnology
Stockholm Studies in History
Stockholm Studies in History of Art
Stockholm Studies in History of Ideas
Stockholm Studies in History of Literature
Stockholm Studies in Human Geography
Stockholm Studies in Linguistics
Stockholm Studies in Modern Philology. N.S.
Stockholm Studies in Musicology
Stockholm Studies in Philosophy
Stockholm Studies in Psychology
Stockholm Studies in Russian Literature
Stockholm Studies in Scandinavian Philology. N.S.
Stockholm Studies in Sociology. N.S.
Stockholm Studies in Statistics
Stockholm Theatre Studies
Stockholmer Germanistische Forschungen
Studia Baltica Stockholmiensia
Studia Fennica Stockholmiensia
Studia Graeca Stockholmiensia. Series Graeca
Studia Graeca Stockholmiensia. Series Neohellenica
Studia Juridica Stockholmiensia
Studia Latina Stockholmiensia
Studies in North-European Archaeology