

Topics in the Stress and Syntax of Words

by

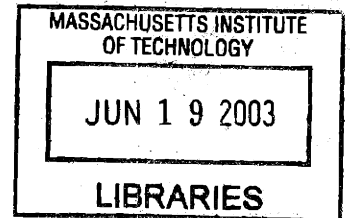
Tatjana Marvin

B.A. English Language and Literature
University of Ljubljana, 1997

SUBMITTED TO THE DEPARTMENT OF LINGUISTICS AND PHILOSOPHY IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY
AT THE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

FEBRUARY 2003



© 2002 Tatjana Marvin. All rights reserved.

The author hereby grants to MIT
permission to reproduce and to
distribute publicly paper and
electronic copies of this thesis
document in whole or in part

Signature of Author: _____
Department of Linguistics and Philosophy
August 27, 2002

Certified by: _____
Alec Marantz
Professor of Linguistics
Thesis Supervisor

Accepted by: _____
Alec Marantz
Professor of Linguistics
Head, Department of Linguistics and Philosophy

ARCHIVES

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. This is essential for ensuring the integrity of the financial statements and for providing a clear audit trail. The records should be kept up-to-date and should be easily accessible to all relevant parties.

2. The second part of the document outlines the procedures for handling any discrepancies or errors that may arise. It is important to identify the source of the error and to take appropriate steps to correct it. This may involve reviewing the original documents and consulting with the relevant staff members.

TOPICS IN THE STRESS AND SYNTAX OF WORDS

by

TATJANA MARVIN

Submitted to the Department of Linguistics and Philosophy
on August 27, 2002, in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in Linguistics

ABSTRACT

This dissertation is a study of word structure showing that words exhibit the syntactic phenomenon of phase-by-phase Spell-Out, Chomsky (2001), Marantz (2001). The analysis of data from English and Slovenian indicates that the syntactic structure in word formation, specifically, the existence of phases at the word level, is necessary to make generalizations about the meaning and stress properties of words in these two languages. This result gives support to a theory of morphology that treats word formation as occurring in the Syntax component, following the same rules for syntactic phrase formation, such as Distributed Morphology, Halle and Marantz (1993), Marantz (1997).

In Chapter 1 the basic ideas of Distributed Morphology are laid out. In Chapter 2 the central proposal of this dissertation is presented: category-forming phrases such as little *v*, *n* and *a* constitute Spell-Out domains, i.e. phases, at the word level. The idea is argued for with the example of English syllabification and schwa-insertion, showing that syllabification properties of derived words and the predictability of their meaning do not follow exclusively from diacritic markings on derivational affixes, but are reflexes of both idiosyncratic properties of affixes and of the syntax in which they are found. Chapter 3 deals with the interaction of stress assignment and the syntax of words in English, arguing that stress and vowel quality in English can be diagnostic of Spell-Out domains within words and that in turn syntactic domains predict the Spell-Out. Chapter 4 is an analysis of Slovenian participial nominalizations. It is first shown that these nominalizations are truly examples of nominalizing heads attaching to participial forms. And second, it is argued that their Spell-Out proceeds in phases defined by category-forming heads with the cyclic Spell-Out reflected in their stress pattern. Chapter 5 is a study of the stress patterns in Slovenian verbal environments and the interaction of stress and structure in these environments. The stress patterns are captured by positing two types of stress retraction rules – the phonological ones and those referring to the syntactic structure.

Thesis Supervisor: Alec Marantz

Title: Professor of Linguistics

ACKNOWLEDGMENTS

This dissertation would never have been completed if I were to have written it on my own. I would therefore like to seize the opportunity and thank the people that I am most indebted to.

To begin with, I would like to thank my committee members Alec Marantz, Morris Halle and Norvin Richards. Alec Marantz, my thesis supervisor, deserves my gratitude for providing professional help as a linguist in the form of numerous appointments, fast and detailed comments at every stage of the thesis and also for the encouragement and understanding of personal issues that at times interfered with my work. Morris Halle was never my official course teacher; however, I cannot even begin to describe how much I learned in numerous meetings with him, let alone gained by his spirit and energy. For that and for his constant encouragement and kindness I will be eternally grateful. Finally, I would like to thank Norvin Richards for providing valuable and challenging comments on various drafts and also for encouraging research on phases in general.

My life as a graduate student would have been much more stressful and frustrating if it had not been for my classmates and friends that helped me out in bad times, partied with me in good times and provided a relaxed and non-competitive atmosphere. To begin with, my thanks go to Ling-98: Cristina Cuervo, Elena Guerzoni, Daniel Harbour, Shin Ishihara, Zhiqiang Li, Ora Matushansky and Olga Vaysman. In addition, my special thanks go to Liina Pylkkänen for taking care of me in my first year, Cristina Cuervo for being such a great friend and roommate for three years, and Michela Ippolito for her emotional support in the worst and the best times of my graduate years.

I am greatly indebted to many people that introduced me to the field of linguistics and helped me with the research along the way. For that I thank David Embick, Sabine Iatridou, Peter Ludlow, Janez Orešnik, David Pesetsky, Jan-Wouter Zwart, and especially my undergraduate professor and advisor Milena Milojević-Sheppard.

My personal and professional gratitude goes also to the members of the debate circle Blabla, consisting of my linguist friends from Slovenia, with whom I shared passion for linguistics in my undergraduate years at University of Ljubljana. I would like to thank

especially Alenka Čopič, Lanko Marušič and Rok Žaucer, with whom I could also relate in terms of the experience of being a graduate student far away from home.

This thesis would never have been finished without a constant emotional support from my parents. I would like to thank my mother, Bojana Marvin, and my father, Venceslav Marvin, for their unconditional love without which I would not have made it through the dissertation time and life in general.

Finally, my deepest, greatest and most personal gratitude goes to Jure Derganc, whose love and support kept me happy and sane during these four years and whose presence in my life made this dissertation worth pursuing.

TABLE OF CONTENTS

ABSTRACT	3
ACKNOWLEDGMENTS	5
TABLE OF CONTENTS	7
CHAPTER 1: INTRODUCTION	11
1 Introduction	11
2 Distributed Morphology	12
2.1 Distributed Morphology as a Theory of Morphology	12
2.2 Distributed Morphology as a Theory of Word Structure	14
2.2.1 The Notion of 'Lexicon'	15
CHAPTER 2: THE SYNTAX IN WORDS	17
1 Introduction	17
2 Syntactic Phenomena at the Word Level	17
2.1 Derivation by Phase	18
2.2 The Proposal in a Nutshell	21
2.2.1 Technical Execution	23
2.3 Some Background on 'Little <i>v</i> P'	26
2.4 Some Conceptual Considerations	29
3 Morphology, Phonology and Phases: English Affixation	31
3.1 The Prediction	31
3.2 English: Syllabification and Schwa Insertion	34
3.2.1 Phonology and Phases	34
3.2.2 Meaning and Phases	39
3.2.3 Another Argument for Unaccusative Phases	39
CHAPTER 3: STRESS ASSIGNMENT AND PHASES IN ENGLISH	43
1 Introduction	43
2 The Rules of English Word Stress	43
3 Stress Assignment and Spell-Out Domains/Phases	48
4 Vowel Quality and its Relation to Stress: SPE Revival	51
4.1 Connection to the SPE Model	55
5 A Note on Primary Stress Assignment and Spell-Out Domains	56
6 Problems: Halle (1998), Halle and Kenstowicz (1991)	58

6.1 Long Underived Words	59
6.2 Derived Words	60
7 Defending the SPE/Phase View	62
7.1 The Conceptual Issue	63
7.2 A Phase Analysis of Exceptions	64
7.2.1 Acquiring Subsidiary Stress [<i>condense – condensation</i>]	64
7.2.2 Losing Subsidiary Stress [<i>consúlt – consultátion</i>]	66
8 A Group of Exceptions to SPE/Phase Analysis: Halle and Vergnaud (1987)	70
9 Other Theories of Morpho-phonology and Phase/SPE Approach	71
9.1 Lexical Phonology	72
9.1.1 Problems for Lexical Phonology	74
9.2 Halle and Vergnaud (1987)	76
9.3 Phase/SPE Approach between Kiparsky and Halle&Vergnaud	78
CHAPTER 4: THE STRUCTURE AND STRESS OF SLOVENIAN NOMINALIZATIONS	81
1 Introduction	81
2 The Morphosyntax of Slovenian Participles	83
2.1 <i>L</i> -Participle (Past Participle)	83
2.2 (<i>E</i>) <i>n</i> / <i>t</i> -Participle (Passive Participle)	91
3 Slovenian Participial Nominalizations	92
3.1 The Morphology of Participial Nominalizations	94
3.2 The Meaning and Structure of Participial Nominalizations	97
3.2.1 <i>L</i> -Participle Nominalizations	98
3.2.1.1 Agentive <i>L</i> -Participle Nominalization (Type 1)	98
3.2.1.1.1 Linearization of Agentive <i>L</i> -Participle Nominals	104
3.2.1.1.2 Root <i>L</i> -Participle Nominalization	108
3.2.2 (<i>E</i>) <i>n</i> / <i>t</i> -Participle Nominalizations	111
3.2.2.1 Verbal Passive Nominalization	111
3.2.2.2 Deadjectival (<i>E</i>) <i>n</i> / <i>t</i> -Nominalization	113
3.3 A Note on Root Nominalizations	118
4 Stress and Phases in Slovenian Participial Nominalizations	119
4.1 Background Assumptions: Theory of Stress	120
4.2 A Phase Analysis of Stress in Participial Nominalizations	123
4.3 Other Participial Nominalizations	128
4.4 Root Nominalizations	130
4.5 Other Examples of Stress and Structure Interaction	130

CHAPTER 5: STRESS PATTERN IN SLOVENIAN VERBAL ENVIRONMENTS	133
1 Introduction	133
2 Theoretical Background	134
2.1 Theory of Stress	134
2.2 Theory of Lexical Stress	134
2.3 Distributed Morphology	137
2.4 The Syntax of Words	137
2.5 The Phonology of Words	138
3 Stress and Accent in Verbal Environments – Data	138
3.1 Pattern A	139
3.2 Pattern B	
3.3 Pattern C	140
4 Capturing Stress in Verbal Environments	141
4.1 Arguing for Three Types of Root Accent	142
4.2 Applying Root Accentuation to Individual Forms	144
4.3 The Structure of Verb and the Interaction between Accent and Rules of Phonology	145
4.4 The Infinitive	146
4.5 The Present Tense	147
4.5.1 Present Tense Retraction	149
4.6 The <i>(E)n/t</i> -Participle	152
4.6.1 Interim Conclusions	155
4.7 The <i>l</i> -Participle and the Short Infinitive	156
4.7.1 Disyllabic Retraction in Nouns and Adjectives	160
5 The Interaction of Stress and Syntax in Verbal Environments	161
CHAPTER 6: CONCLUDING REMARKS	165
REFERENCES	169

CHAPTER 1: INTRODUCTION

1 Introduction

This study is an investigation into the structure of words, a contribution to answering the following question: Are words built by the same principles as sentences?

In the field of morphology this question is answered in different ways depending on the view taken by the linguists working on the issue. In the literature three distinct schools of thought are distinguished: the Strong Lexicalist Hypothesis, the Weak Lexicalist Hypothesis and what I term the 'Strong Syntactic' Hypothesis. Their main tenets and proponents are summarized in Table 1 below.¹

Table 1

STRONG LEXICALIST HYPOTHESIS	WEAK LEXICALIST HYPOTHESIS	STRONG SYNTACTIC HYPOTHESIS
Words are created in the lexicon by rules that differ from rules of syntax – words are atomic units that syntax cannot penetrate.	Derivation takes place in the lexicon by rules of derivation, Inflection takes place in the syntax by rules of syntax.	All word formation, Inflection as well as Derivation, takes place in the syntax by rules of syntax.
Halle (1973), Lieber (1980) Kiparsky (1982), Levin and Rappaport (1986), Williams and Di Sciullo (1987), etc.	Siegel (1974), Aronoff (1976), Wasow (1977), Anderson (1982), Baker (1988), Dubinsky and Simango (1996), etc.	Lieber (1992), Halle and Marantz (1993), Marantz (1997), etc.

In this study I adopt the version of the Strong Syntactic view proposed by Halle and Marantz (1993), Halle (1997a) and Marantz (1997), focusing on the question how it can be shown that words are built by the same principles as sentences.² The answer will be provided

¹ The proponents should be considered in the context of the linguistic theory of their period.

² For a critique of Strong Lexicalist Hypothesis, the reader is referred to Anderson (1982), Lieber (1992) and Marantz (1996, 1997). For criticism of Weak Lexicalist Hypothesis, see Lieber (1992), Halle and Marantz (1993) and Marantz (2001).

by presenting data from English and Slovenian that point to the existence of syntactic phenomena at the word level, specifically the existence of phase-by-phase Spell-Out, as in Chomsky's (2001) Derivation by Phase. We shall see that syntactic structure in word formation, specifically, the existence of impenetrable (cyclic) domains, is necessary to make generalizations about the meaning and stress properties of English and Slovenian words. In turn, the existence of phases at the word level gives support to a theory of morphology that treats word formation as occurring in the Syntax component, following the same rules for syntactic phrase formation.

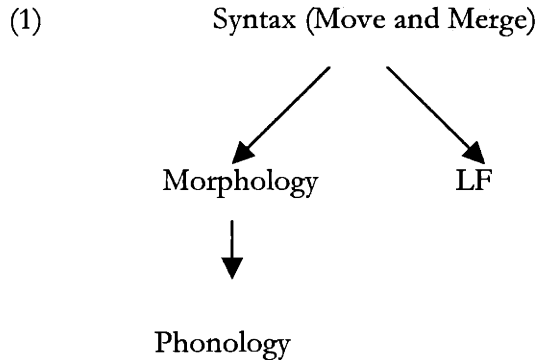
The thesis is organized as follows. In the introduction (Chapter 1) I present the basic tenets of the view of word formation adopted and argued for in this work. In Chapter 2 I present the proposal that category-forming phrases constitute Spell-Out domains, i.e. phases, illustrating the idea with the example of English syllabification and schwa-insertion. Chapter 3 deals with the interaction of stress assignment and the syntax of words in English. Featuring the proposal in Chapter 2, I show how stress and vowel quality in English can be diagnostic of Spell-Out domains within words and how in turn syntactic domains predict the Spell-Out. In Chapter 4 I analyze Slovenian participial nominalizations, showing that they are examples of nominalizing heads attaching to participial forms and that the Spell-Out of nominalizations proceeds in phases defined by category-forming heads, which is reflected in their stress pattern. Chapter 5 is a study of stress patterns and the interaction of stress and structure in Slovenian verbal environments. Finally, Chapter 6 is a discussion of some remaining issues and problems.

2 Distributed Morphology

2.1 Distributed Morphology as a Theory of Morphology

This study is couched in the framework of Distributed Morphology (henceforth DM), Halle and Marantz (1993), Halle (1997a), Marantz (1997) and subsequent work. In this section I present an outline of DM as a general theory of Morphology, while section 2.2 focuses on DM as a study of word structure.

DM adopts the organization of the grammar as shown in (1), where the level of Morphological Structure (MS, Morphology) is situated between Spell-Out and Phonology.



Word formation in the DM model does not take place in a single component of the grammar, but is distributed among several components. The basic principle of operation is Late Insertion, the idea that the Syntax component manipulates bundles of syntactico-semantic features realizing terminal nodes (morphemes), and not items with phonological content.³ At Morphology these terminal nodes can be modified by morphological processes such as impoverishment, fission and fusion before they are supplied phonological material via Vocabulary Insertion in the process of Spell-Out. Vocabulary Insertion is governed by the Subset Principle, which insures that the Vocabulary Item (VI) specified for the largest subset of the features contained in a terminal node is inserted in that terminal node.

(2) *Subset Principle*

The phonological exponent of a vocabulary item is inserted into a position if the item matches all or a subset of features specified in the terminal morpheme.

Insertion does not take place if the vocabulary item contains features not present in the morpheme. Where several vocabulary items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen.

Halle (1997a: 427)

Note however, that a VI does not have to be fully specified for the syntactic position where it can be inserted. So, VIs are often default signals, inserted where no more specific form is

³ The separation of semantico-syntactic features and phonological features was first introduced by Beard (1966, 1986) and is known as the Separation Hypothesis.

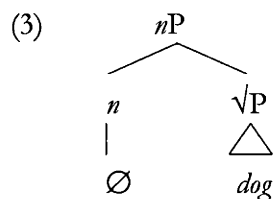
available. Finally, DM crucially operates under the assumption that the terminal nodes into which VIs are inserted are organized into hierarchical structures determined by the operations of the Syntax component.

2.2 Distributed Morphology as a Theory of Word Structure

This section is a more detailed summary of the claim that the terminal nodes serving as the locus of Vocabulary Insertion are organized into hierarchical structures determined by the operations of the Syntax component, Halle and Marantz (1993), Halle (1997a). This idea is further elaborated in Marantz (1997) and Marantz (2001) and is argued for in the subsequent work: Harley (1995), Harley and Noyer (1998), Embick (1997, 2000), Ippolito (1999), Oltra-Massuet (1999), Oltra-Massuet and Arregi (2001) etc..

The analysis in this study relies on the specific framework of word structure proposed in Marantz (1997) and Marantz (2001). In these two works Marantz argues against both the Strong Lexicalist and the Weak Lexicalist Hypotheses, proposing a way of unifying the inflectional and derivational morphology. The unification follows if the two processes of word formation employ the same generative engine – the syntactic computation comprising the operations Merge, Move and Agree. Marantz (2001) thus proposes that words are built by the Syntax performing all merger operations, including those between morphemes within a word.

A central innovation in Marantz (1997) is the treatment of roots and syntactic categories. In previous approaches to word formation syntactic categories such as V, N, A are properties of roots (stems) and affixes. In Marantz’s theory roots and affixes have no category per se, but are merged in the syntax with category-forming functional heads such as the ‘little’ *n*, *v*, *a* to form nouns, verbs and adjectives, respectively. These heads are typically realized by derivational affixes, i.e. the affixes determining the category of the word, or zero derivational affixes. For example, a simple noun *dog* has the syntactic structure as in (3).



2.2.1 The Notion of 'Lexicon'

In the theory of Distributed Morphology, the term 'lexicon' does not denote the same thing as in the Strong and Weak Lexicalist approaches, where the Lexicon is the collection of lexical items, i.e. morphemes and words with their pronunciation, meaning and syntactic category. In DM the latter properties are distributed across several components – the Lexicon, Vocabulary and Encyclopedia. The Lexicon is defined as the generated list of bundles of features that enter the computational system. The Vocabulary consists of Vocabulary Items, which are essentially connections between lexical features and phonologically relevant features; an example is given in (5).

- (5) /s/ ↔ [−p],
 /kaet/ ↔ √, for English.

The Encyclopedia is a component that connects pieces of the output of the grammar (derivations of PF and LF) to non-compositional meanings (idiomatic meanings). Only in the encyclopedia is the decision made about the meaning of /kaet/ in its syntactic environment.

CHAPTER 2: THE SYNTAX IN WORDS

1 Introduction

If we endorse a theory of morphology in which words are built by the principles of the Syntax Component (i.e. Merge and Move) and in which even part-of-speech information is encoded phrasally, e.g. a simple noun such as *cat* is phrasal, then we expect to come across sentential syntactic phenomena in the domain of word. For example, if certain phrases are islands for certain types of movement, then the same island phenomenon within words would provide independent support for the claim that words are built in the same way as sentences. In this work I shall argue that data from Slovenian and English can indeed be used to prove such a point: there are phenomena at the word level that are syntactic in nature. The syntactic theory that these data support is Chomsky's (2001) extension of the Minimalist Program known as Derivation by Phase (henceforth DbP).

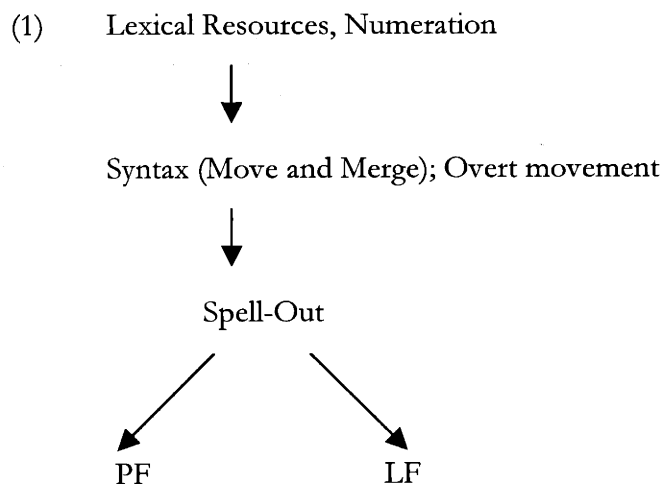
This chapter is organized in the following way. In Section 2, DbP is summarized and then the proposal for how syntax operates in morphology is briefly presented. In Section 3 this proposal is applied to English data. It is argued that English word-formation is consistent with the mechanisms proposed in Section 2. In Section 4 the proposal from Section 2 is seen in the light of two influential theories of phonology and morphology: Lexical Phonology as in Kiparsky (1982) and Halle and Vergnaud's (1987) proposal.

2 Syntactic Phenomena at the Word Level

The main question that this section addresses is what syntactic phenomena we can find at the word level and how they are to be formalized. I shall claim that one such syntactic phenomenon is the locality domain of the *phase* from Chomsky's (2001) Derivation by Phase. To my knowledge, the idea that syntactic phases occur within words was first introduced in Marantz (2001), where the claim is made that in word derivation, category-forming heads – that is the little *n*, *v* and *a* – determine the edge of a cyclic domain – that is a phase. In this work I develop this idea further, both theoretically and empirically.

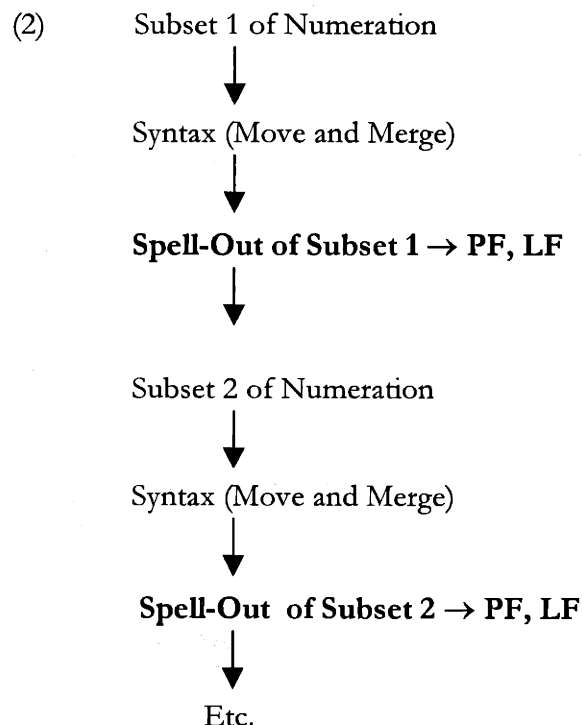
2.1 Derivation by Phase

To begin with, let us first summarize the main idea behind Derivation by Phase. The model of grammar that DbP adopts is essentially the same as in Chomsky (1995). Linguistic objects are built out of a Numeration of lexical choices, where elements constituting the Numeration are bundles of features: lexical, morphological or phonological. The computational system (the Syntax) then proceeds by building the syntactic structure from lexical choices in stages from bottom up. At each stage of computation, either an item is merged from the Numeration (by the operation Merge) or an existing item is moved (by the operation Move). The crucial point is the Spell-Out, at which the derivation splits into LF and PF and which occurs at the point where LF and PF conditions are best satisfied. The movement taking place before the Spell-Out is overt, while the movement taking place after the Spell-Out is covert and is input to the semantic interpretation (LF) of the sentence only. A derivation converges if it meets the minimum requirements of the two interfaces or crashes otherwise. The model can be schematized as in (1).



The claim that will be relevant in this thesis is that derivation of linguistic objects proceeds by phase, where each phase is determined by a subset of the Numeration placed in the active memory. Linguistic objects are thus not spelled out as a whole but cyclically, in chunks determined by the syntactic structure. To illustrate this idea, suppose our syntactic object is a sentence. When a sentence is constructed it is not constructed in one go and then spelled out, but is rather built in stages. Assuming that the derivation is bottom-up, we first

build a part of sentence, which is kept in our active memory, but only to a certain point (phase) determined by the position in the syntactic tree. At this point a part of the sentence is spelled out, i.e. shipped to PF and LF. The Syntax component then resumes the construction of the sentence up to the next such point, when the newly constructed part is sent to PF and LF. Derivation by phase can be illustrated schematically as in (2).



The process described is driven by economy considerations, i.e. derivation by phase results in a reduction of computational burden because once having shipped off (spelled out) the phase, the mechanism can forget about the internal structure of the spelled-out unit, though the latter is still a unit in the syntactic structure.

The proposal that Chomsky (2001) advances is that the Spell-Out is cyclic, where the cycle is at the phase level and the phonological and semantic components can not alter stages of derivation after these are spelled out. In other words, the spelled-out chunk of a sentence is impenetrable for the operations from above. This follows from the Phase Impenetrability Condition, Chomsky (2001). In (3a) I quote the first formulation of Phase Impenetrability Condition, in (3b) its later reformulation.

- (3) a. *Phase Impenetrability Condition*: The domain of H is not accessible to operations outside HP, but only H and its edge.¹
- b. *Phase Impenetrability Condition restated*: For [_{ZP} Z... [_{HP} α [H YP]]]: The domain of H is not accessible to operations at ZP, but only H and its edge.²

Chomsky (2001)

We already said that the Spell-Out domains, phases, are parts of sentential syntactic structure. In Chomsky's proposal there are two such domains: transitive *v*P and CP. Their properties are summarized below.

(4) Properties of phases:

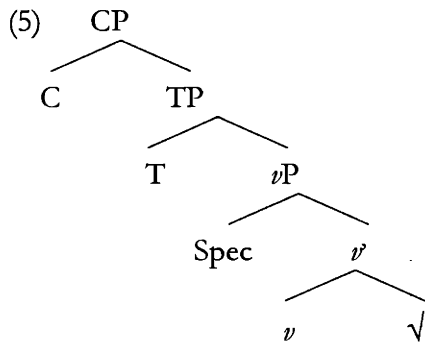
- Phases are reconstruction sites, Fox (1999)
- Phases are propositional
- Phases have phonetic independence: they can be moved, pronounced etc.
- Phases are potential targets for movement, they may have an EPP feature

It has to be pointed out that phases are not uniformly defined by these properties, an issue to which we turn later in Section 2.2.2.

To illustrate the phase impenetrability condition and cyclic Spell-Out, let us take a basic sentence structure, (5).

¹ The edge includes the residue outside of H-bar, either Specifiers or elements adjoined to HP.

² The notion 'strong phase' in Chomsky (2001) equals the notion 'phase' in this work. In Chomsky (2001) the term strong phase is used for the spell-out domain as opposed to the term 'weak phase', a phase at which no spell-out takes place. Here I decided to use the term phase for what Chomsky (2001) terms 'strong phase' and 'not a phase' for 'weak phase'.



Given that a head and its edge are accessible only to the next phase, the complement of ν , the root, is accessible to ν , but not to T or C. The head ν and its edge (Spec, ν P) are accessible both to T and C.

Chomsky (2001) proposes that the derivation of sentences proceeds in phases, but he makes no proposal as to how the derivation of words should proceed. In the next section Chomsky's proposal will be extended to the derivation of words and then data will be presented that argues in favor of such an extension.

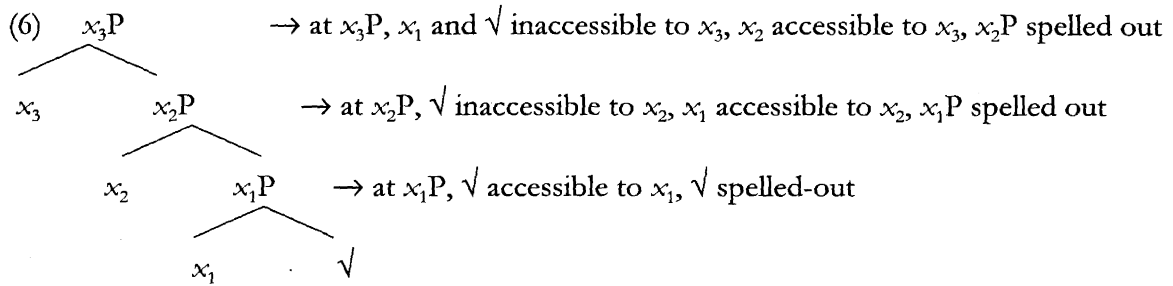
2.2 The Proposal in a Nutshell

Following the idea that category-forming phrases constitute Spell-Out domains/phases, first outlined in Marantz (2001), I shall defend the following two claims in this work.

- Phrases headed by category-forming functional heads, such as little ν , little n and little a , constitute Spell-Out domains at the word level.
- Phases at the word level are subject to Phase Impenetrability Condition, stated in (3).

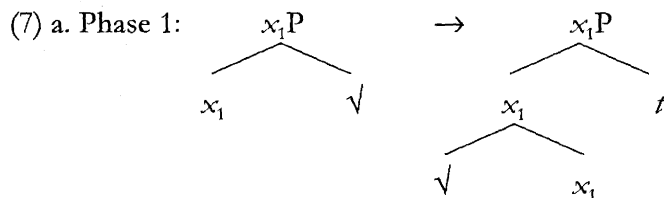
Thus, at the point of the merger of the category-forming head x (where x stands for ν , n , or a), the complement of the little x is spelled out and from that point on is inaccessible to heads attaching higher. The idea is schematized in the tree below.³

³ Note that this implies that a head attaching outside a little x takes as a complement the structure in which the root meaning and pronunciation have already been negotiated within the domain of x . Cf. Marantz (2001) for the opposition between category-forming heads attaching to the root directly and category-forming heads attaching to a category-forming head that already has attached to the root.

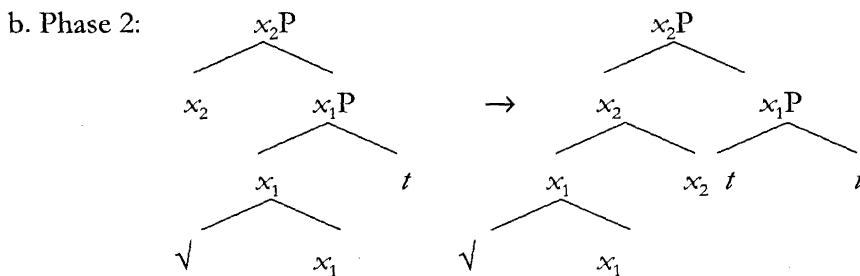


This analysis assumes the phase impenetrability condition holding at the word level. It follows from this proposal that the affixes attaching outside of a phase will have the power to influence the Spell-Out of the head of that phase but not the complement of the phase, since the meaning and pronunciation of the latter will already be known at the point of attachment. For example, an affix that could potentially affect the pronunciation of the base it attaches to (by triggering a phonological rule), will only be able to do so if the base is in its Spell-Out domain, but not otherwise.

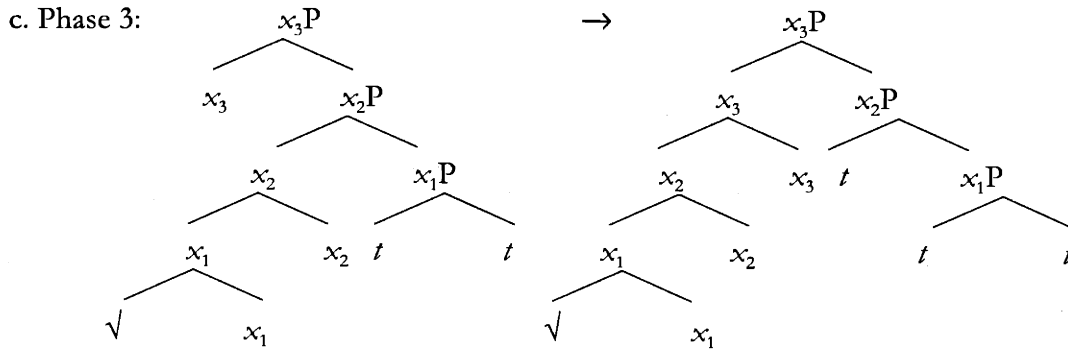
The complete derivation of the example in (6), including the head adjunction facts, is given in (7). We turn to the issue of head adjunction in the next section.



Head Adjunction: at x_1P , \checkmark is adjoined to x_1
 Spell-Out: \checkmark is spelled out
 Accessibility: \checkmark is accessible to x_1



Head Adjunction: x_1 is adjoined to x_2
 Spell-Out: x_1P is spelled out
 Accessibility: x_1 is accessible to x_2 , \checkmark inaccessible to x_2



Head Adjunction: x_2 is adjoined to x_3
 Spell-Out: x_2P is spelled out
 Accessibility: x_2 is accessible to x_3 , \checkmark and x_1 inaccessible to x_3

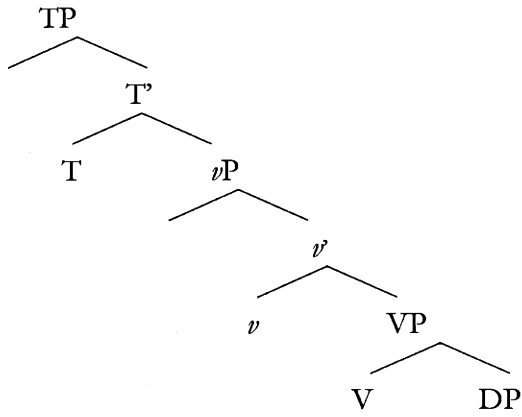
2.2.1 Technical Execution

In this part we proceed to the technical execution of the idea outlined above. We shall see that the Phase Impenetrability Condition needs to be somewhat ‘loosened’ to accommodate the process of word formation; more specifically, the head adjunction property of word formation needs to be taken into account.⁴

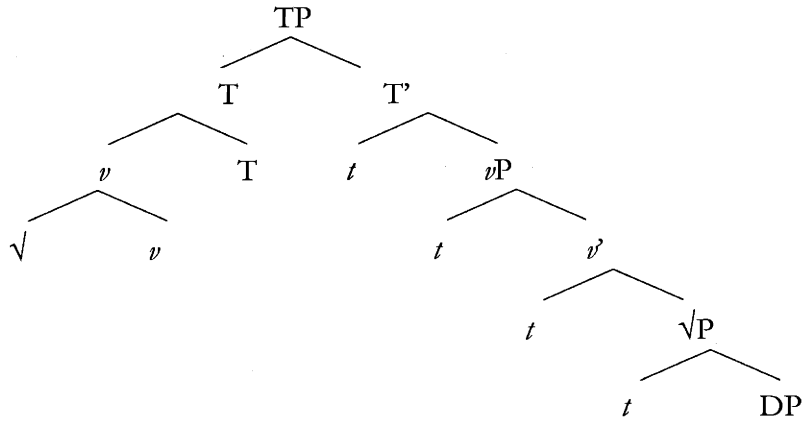
It has been a standard assumption at least since Pollock (1989) that words, inflected verbs in his proposal, are constructed by head adjunction. That is, the internal ordering of inflection is reflected in the sentence structure. The verb then moves up the sentence tree from the VP to ‘pick up’ the inflection – Tense and Agreement. A tensed verb (in French), for example, is built by adjoining the head V to T and then the two together to Agr. In the Minimalist program, Chomsky (1995), there is also an intermediate head ν between V and T, so the verb head V has to pass through it on its way feature checking up the tree. The basic sentence structure in the Minimalist Program is as in (8a) and verb derivation as in (8b).

⁴ See Matushansky (2002) for an extensive discussion of head movement in phase syntax.

(8)

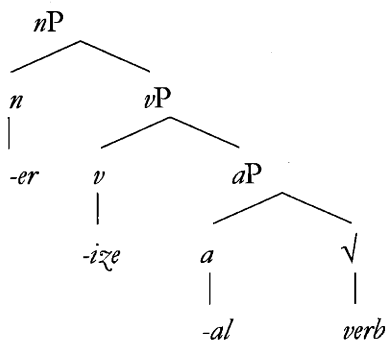


b.

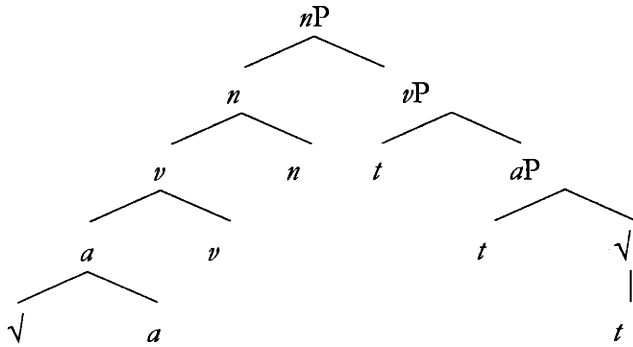


In the theory of word formation adopted in this work, both derivation and inflection are syntactic in nature, so derivation also involves head movement. For example, if a nominalization is built on top of a verbalization of an adjective, as in the word *verbalizer*, the syntactic tree of such a word would look as in (9).

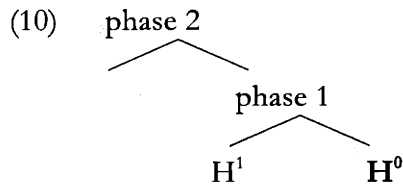
(9) a. before head-movement:



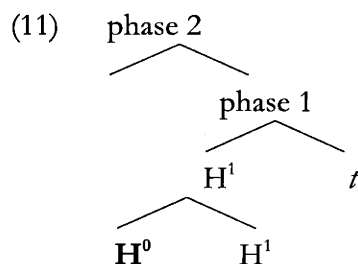
b. after movement



Under the assumption that category-forming functional heads are phases, the PIC should apply to them. According to the PIC, the head of a phase HP and its edge are spelled out at the next strong phase, while the complement of the phase head is spelled out at the phase of HP. Take the schematic structure as in (10).



Let us see at which points the head H^0 can be spelled out according to whether or not it is subject to head-movement. If H^0 stays where it is, then, given PIC, it will be spelled out at *phase 1* because it is in the domain of the head of that phase (i.e. it is its complement). If H^0 for some reason moves out of the complement of *phase 1* and adjoins to its head H^1 , then it is no longer in the domain of *phase 1* and therefore should be penetrable from above. Its Spell-Out should then take place at the next strong phase, *phase 2* in our example. The structure is as in (11).



Where is the problem? If moving a head and then adjoining it to the head of a strong phase implies that the material of the moved head is penetrable for phases above it (since it is not in the complement of the lower phase, but on its edge and the edge is penetrable), then how do we ever get impenetrable domains in syntactic word formation? We simply lose the connection between the impenetrability of a certain chunk of the structure and the attachment site of an affix that can potentially influence the PF of a word. Therefore, to apply to word-formation, the PIC needs to be strengthened so that head movement cannot escape it. The PIC is restated as follows.

- (12) H and its edge are spelled out at the next (strong) phase. The domain of H is spelled out at the phase of HP. A head *b* adjoined to H is in the domain of H.⁵

2.3 Some Background on ‘Little *vP*’

Now we turn to the most complex category-forming head, the so-called verbal functional head little *v*.⁶ In this part I briefly present the assumptions I shall make concerning little *v* and a historical overview of its coming into existence.

The motivation for positing the verbal functional head *v* comes from different lines of research within the field of linguistics. The original insight with respect to the semantics of agentivity and external arguments is first found in Marantz (1984) and Kratzer (1993). The conclusion that Marantz (1984) draws is that external arguments, unlike direct objects,

⁵ Another question relating to head adjunction is how to incorporate the forgetting-of-the-spelled-out-chunk formally. That is, when the root of the word is spelled-out, does that mean that it is erased from the syntactic structure? Such questions might relate more to the actual processing of a linguistic object than the theory of it.

⁶ This head is the most complex because it is part of the basic sentence structure as well as a category forming head.

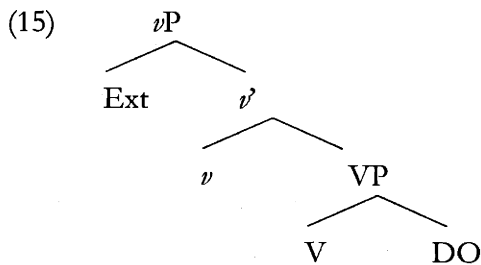
are not true arguments of their verbs, but rather the arguments of the predicate VP. The asymmetry between the two types of arguments follows from the manner in which they combine semantically with the verb. A direct object combines with the verb by direct composition, while an external argument combines with the verb only with the assistance of a licensing head, the semantics of which allows an external DP to combine as an argument of the VP. The assumption that external arguments are introduced by syntactic heads is taken up in Kratzer (1993), where an explicit semantic account of this combination is provided. The external argument introducing head is usually given as the ‘light-verb’ ν , while Kratzer names it *Voice*. The content of this head is an element AG, which stands for *Agent* with the following semantic interpretation.

$$(13) \quad \text{AG} = \lambda x_e \lambda e_s [\text{Agent}(x)(e)]$$

The head is of the type $\langle e, \langle s, t \rangle \rangle$ and it combines with the VP by Event Identification.

$$(14) \quad f \langle e, \langle s, t \rangle \rangle g \langle s, t \rangle \rightarrow h \langle e, \langle s, t \rangle \rangle$$

The role of ν is to license an external argument by providing the agentive semantics that then allows the external argument to be composed with the predicate. Syntactically, the external argument is introduced in the Spec, ν P position.



It was also suggested in Kratzer (1993) and then proposed in Chomsky (1995) that the functional head ν is also responsible for the checking of the accusative case of the object. The two properties of ν , introducing an external argument and checking case features on the object, are a technical means of expressing Burzio’s generalization concerning the relationship between external arguments and case.

Subsequent work proposed new properties of the functional head *v*. Harley (1995) argued that this head is associated with eventive semantics, which is not provided by the pieces of the word below verbal category. Marantz (1997) proposed that in the model of Distributed Morphology, where category of a root is defined syntactically, little *v* is responsible for verbalizing category-free roots.

The properties of functional head *v* can be summarized as follows.

- Introduces external argument. Kratzer (1993)
- Has case feature for the object. Kratzer (1993), Chomsky (1995) etc.
- Has features relating to eventivity and stativity. Harley (1995), Embick (1997)
- Morphosyntactically it defines the category of category-free roots. Marantz (1997)

As to the relationship between the functional head *v* and type of verb (i.e. transitive, unaccusative, passive), there are several views held in the literature. Here I will schematize the three main ones, of which only one will be adopted throughout this work.

Chomsky (1995) claims only transitive verbs have the functional head *v*, since the other two types of verbs, unaccusatives and passives, do not have an agent. However, it has been shown, Kratzer (1994) and subsequent work, that passives do have an implicit agent (as opposed to unaccusatives), which is a property that cannot be captured if we adopt a view in which only transitive verbs have a little *v*.

Embick (2000) holds a view in which all types of verbs have the functional and verbalizing head *v* and in which the properties of verbs are reflected in different features on this head. Unaccusatives are in his approach specified $-AG$ for the feature introducing agentivity, while passives are specified for $+AG$, which reflects their possibility of expressing an implicit agent. On the other hand, the difference between transitive verbs and others is only the former have $+ACC$ feature for assigning the case to the object and $+EXT$, the feature that is responsible for introducing external arguments. Also, in Embick (2000) the functional head *v* contains features relating to eventivity and stativity and is a morphosyntactic verbalizer of roots. The three classes of little *v* are schematized below.

	TRANSITIVE UNERGATIVE	PASSIVE	UNACCUSATIVE
FEATURES ON <i>v</i>	+AG +Ext	+AG -Ext	-AG -Ext

The third view, Pylkkänen (2001), divides the before-mentioned properties of little *v* between two heads. In her view, the functional head *v* is a head that is associated with eventive semantics and defines the category of the root, but does not introduce an external argument. The external argument is introduced by a separate functional head, *Voice*, as proposed in Kratzer (1993). Pylkkänen actually adopts Kratzer’s proposal for the existence of *Voice* and Marantz’s (1997) proposal for a verbalizing head *v*, but does not merge these two heads in one as this is done in other two groups of proposals.⁷

In this work I will adopt the proposal made by Embick (2000) because it is in my opinion most clear about all four characteristics that are usually assigned to the functional head *v*. Therefore, the functional head *v* is the one introducing the external argument, taking care of the object case and verbalizing a category-free root. It is both part of the basic sentence structure (such as T and C) and a category forming head.⁸

2.4 Some Conceptual Considerations

There is one immediate problem with the proposal presented in Section 2.2 if we are to adopt Chomsky (2001) entirely. In Chomsky (2001) what is considered a phase is not the verbalizing little *v* in general, but only its transitive version. Word formation, on the other hand, should not distinguish between transitive and unaccusative verbs, because both are verbs as opposed to nouns or adjectives. The unaccusative verb *arrive* and the transitive verb *buy* belong to the same category by classic arguments from morphological and syntactic distribution: they take the same types of inflection and appear in the same position in the verb phrase. Thus there is no reason why the former should have no verbalizing head in the

⁷ Pylkkänen argues that bundling of *Voice* and little *v* into one head is a parameter – for example, English bundles them, Finnish, on the other hand, does not.

⁸ If in some languages “*Voice*” and “little *v*” do split, one may also split the eventive semantic features and the [+/-Ag, +/- Ext] features into different heads, as in Pylkkänen (2002).

syntax, while the latter should have one. So, the view in this work is not entirely compatible with Chomsky's (2001) theory as to what constitutes a phase.

Let us now see what reasons Chomsky gives for his claim that only transitive *v* is a phase and then look at opposing arguments to his view. First, there are four primary diagnostics for what may constitute a (strong) phase. Phases 1) are reconstruction sites; 2) are propositional; 3) have phonetic independence: can be moved, pronounced etc.; and 4) are potential targets for movement – they may have an EPP feature (e.g. transitive little *v* versus unaccusative/passive little *v*).

The first observation is that these criteria are vague and not bi-conditional. That is, it is not the case that if a head of a phrase has an EPP feature, then it is a phase – Tense does have an EPP feature, but a TP does not constitute a phase. Furthermore, it is not clearly stated at any point why a transitive little *v* is propositional and has more phonetic independence than an unaccusative little *v*.

The next objection is that the argument in favor of distinguishing between transitive and unaccusative/passive little *v*s is internal to theory of Chomsky (2001). The argument goes as follows: the status of the object of a verb can be known at *v*P only if the *v*P is transitive. If the *v*P is unaccusative or passive, then at *v*P we do not know whether the object will be accusative or nominative and whether it will raise to Spec-T. One could assume that there is an escape hatch for movement in Spec-*v*, but then the Spec-*v* position, an A' position is used for A-movement. So, the reason for distinguishing transitive *v* from others in terms of phase-hood comes from not allowing an escape hatch for movement in spec-*v*, a theory-internal issue.

Finally, Chomsky's assumption about the transitive *v*P being a phase as opposed to unaccusative and passive little *v* has been questioned in the literature. Legate (2000) shows that diagnostics such as *wh*-reconstruction effects, quantifier raising, parasitic gaps, and the nuclear stress rule all equally support the phase-hood of transitive as well as unaccusative and passive *v*Ps.

If we want to defend the analysis of syntactic word formation as presented in Section 2, then Chomsky (2001) cannot be adopted without some modification. As already mentioned above, a strong intuition is that from morpho-syntactic point of view, all verbs are the same in the sense that they involve attachment of the root to a verbalizing head *v*. In principle, the configurational properties of transitive, unaccusative, and passive verbs are the

same in that they all involve a verbalizer selecting for a root phrase, even if the verbalizer itself can be different in features that do not relate to category. For now, I will just assume that all three types of *v* constitute phases. In the next section, however, when we discuss English derivation, we shall see that there is morpho-phonological evidence that all three types of *v* are phases.

3 Morphology, Phonology and Phases: English Affixation

The main goals of this section are first, to discuss what predictions are made by the proposal in Section 2, i.e. the existence of phasal phenomena at the level of the word (3.1); and, second, to illustrate the general point of the proposal in Section 2 by laying out an example of English affixation which shows how phases and the Phase Impenetrability Condition account for morpho-phonological phenomena found in natural language (3.2-3.3). In the latter two sections we shall see how the data from English falls out naturally from extending the notion of phase to word formation.

3.1 The Prediction

In this section I present which phenomena are predicted to occur and are accounted for by adopting the notion of *phase* in word formation. In the model of word formation that we assume, Marantz (1997), a word is built by taking a root and then attaching to it category-forming affixes, heads of category-forming phrases, to form what we traditionally call verbs, nouns and adjectives.⁹ In this process, the attachment site of category-forming affixes is relevant for both meaning and pronunciation. If an affix is attached directly to the root, the meaning of the whole can be idiosyncratic (unpredictable). This follows from the fact that the root meaning itself is unpredictable and encyclopedic knowledge has to be evoked in order to negotiate the meaning of the root in the context of the category-forming head. If an affix is attached on top of the root that already has a category-forming affix attached, the meaning of the whole is predictable from the meaning of the upper affix and the unit it attaches to, because the meaning of this unit, comprising the root and the lower category-forming affix, has already been negotiated at this point. The same considerations apply to

⁹ Here I simplify the process of word formation, ignoring Late Insertion etc.

Phonology: an affix that attaches directly to the root can cause idiosyncratic pronunciation of the root and the combination of root and the attaching category-forming head. An affix that attaches to an already affixed root, on the other hand, can influence the pronunciation of the immediately dominated categorial head, but not the pronunciation of the root.

Let me illustrate the claim with the example of *-er* versus *-ee* nominalization in English, Marantz (2001). Agentive *-er* affixation is completely productive and has a predictable meaning. This follows from the fact that the affix attaches outside category-forming affixes and involves the external argument of the verb. Also, *-er* does not influence the pronunciation of the root – the stress of *-er* nominalizations is the same as the stress of the verbs that *-er* attaches to, as illustrated in (16).

- (16) wórk wórker
 pláy pláyer
 términate términator

The attachment of the affix *-ee*, on the other hand, results in words whose meanings consistently involve a particular negotiation with root semantics and never implicate verbal argument structure. Barker (1998) shows that the *-ee* nominalization does not refer to any particular syntactic argument of the verb. It can refer to the direct object, but that is not necessary, as exemplified in (17).

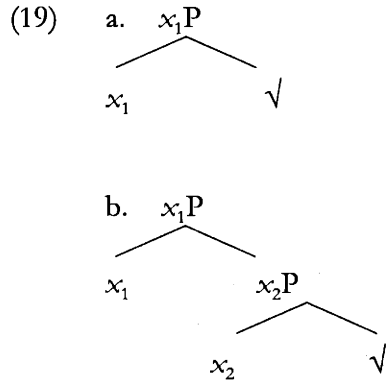
- (17) Direct Object: *nominee, employee*, etc.
 No particular argument: *amputee, twistee*, etc.

Also, the affix *-ee* is capable of affecting the stress of the root by placing stress on the last syllable, as seen below.¹⁰

- (18) emplóy employée
 escápe escapée

In this part we continue the line of research presented above by examining what predictions are made by the specific proposal that phase phenomena are exhibited at the level of word. First, let us examine what contrasts the phase analysis predicts to exist in words.

Suppose we find a category-forming affix x_1 in the following two configurations.



In tree (19a), the x_1 is attached directly to the root, so the idiosyncratic meaning and the idiosyncratic pronunciation of the whole do not come as a surprise. As to the phonology, suppose x_1 can induce a phonological rule. Then in (19a) this rule could affect the PF of the root and consequently of the whole. As to the semantics, suppose x_1 has a predictable meaning. Being attached to the root directly, there is still the possibility of unpredictable meaning for the whole due to the idiosyncratic meaning properties of the root. In tree (19b), however, the same affix is attached on top of the root that already has a category-forming affix x_2 attached to it. In this configuration, we do not expect the affix x_1 to have any ‘special’ influence on the pronunciation and meaning of the root. Namely, the affix x_1 has attached to a unit in which the idiosyncratic properties of the meaning and pronunciation of the root have already been established by attaching the lower category-forming head x_2 . Therefore, the potential that x_1 might have in that respect cannot materialize due to the structural position in which x_1 is found.

Translated into ‘phase vocabulary’, this can be paraphrased as follows. Lexical category-forming heads define phases and therefore at their point of attachment, their

¹⁰ Strictly speaking, I should say that *-ee* places the stress in a different position in the root than it would be placed if the root were to become a verb. English is not a language with lexical stress, so we cannot really refer to the stress of roots. In this part this is done for expository reasons only.

complement is spelled out. So, affixes attached to roots directly can influence the spell-out of the root, but affixes attached above an α P should not influence the spell-out of the root. So, phonological properties of words and the predictability of meaning are a reflex of both idiosyncratic properties of affixes and of the syntax in which they are found. In the section to follow we shall examine some relevant cases in English.

3.2 English: Syllabification and Schwa-Insertion

In this part, we show how the phonological phenomena of schwa insertion and syllabification depend on the attachment site of category forming heads. Section 3.2.1 focuses on phonological Spell-Out in relation to the attachment site, while in Section 3.2.2, the focus is on the interaction of meaning and the attachment site. We conclude in 3.2.3 by showing how the phonological phenomenon in question argues for treating all types of functional heads ν as phases.

3.2.1 Phonology and Phases

It is a well-known fact that in English syllabification differs according to specific suffixes, Chomsky and Halle (1968) (henceforth SPE). In words such as *hinder*, *cylinder*, *meter*, *burgle* etc. the final sonorant is syllabic in word final position, i.e. the neutral vowel schwa /ə/ is inserted phonetically. But in related forms, such as *hindrance*, *metric*, *burglar*, etc., the sonorants in question are not syllabic. The standard assumption drawn from these facts is that the underlying representation of roots of these related words is /hindr/, /mitr/, etc. while the schwa is inserted by a rule that makes the final sonorant syllabic, as illustrated in (20).

- (20) a. Schwa-Insertion Rule: sonorants become syllabic / C_# SPE
b. hidr-# → Schwa-Insertion Rule → hin.dər

When affixes beginning with a vowel, such as *-ance* or *-ic*, are attached, the rule above no longer applies and the root final consonant is syllabified as part of the onset of the following syllable.

- (21) a. *hindr -ance* → *hin.drance*
b. *metr-ic* → *me.tric*

However, not all affixes that begin in a vowel behave the same with respect to the Schwa-Insertion Rule. With some of these affixes the rule in (20) applies regardless of their vowel-initial status. The participle forming affix *-ing* is one of them. Consider (22).

- (22) *hinder /hindər/ - hindrance /hindrans/ - hindering /hindəriŋ/, */hindriŋ/*
*meter /mi:tər/ - metric /mɛtrik/ - metering /mi:təriŋ/, */mɛtriŋ/*

Phonologically and phonetically there is no reason why *metering* or *hindering* should not be syllabified without a schwa inserted, the same way as *metric* and *hindrance* are.

- (23) *hin.drance, *hin.dring, hin.dr.ing*
*me.tric, *me.tring, me.tr.ing*

Therefore, it must be some property other than vowel-initial character of the affix that determines the syllabification. In the SPE approach, this other property is an inherent property of the affix: affixes contain a + or # boundary, imposing different phonotactic restrictions on strings they form. A string containing a + boundary must satisfy the phonotactic constraints that hold in a string containing no boundary, while a string containing # is not subject to such constraints (it is neutral). In our example, *-ic* in *metric* contains a + boundary and the phonotactic constraint of the syllabification has to be satisfied within the whole word; therefore, the syllabification is */me.tric/* and consequently no schwa insertion is triggered. The affix *-ing* on the other hand, contains a # boundary and therefore does not impose the new syllabification upon its attachment. The syllabification in the word *metering* is first decided when the underlying verb *meter-* is formed, triggering the

schwa insertion. The addition of *#ing* therefore cannot change the syllabification into **/mɛt.rɪŋ/* and the schwa inserted stays, yielding */mi:tərɪŋ/*.¹¹

However, the affix *-ing* does not have uniform behavior. Take the following example from SPE.

- (24) a. *twinkling* /*twɪŋkəlɪŋ*/ - ‘the event of twinkling’
b. *twinkling* / *twɪŋklɪŋ*/ - ‘a short instant’

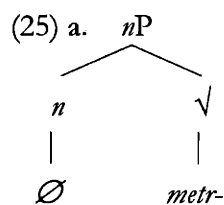
SPE observes that the word *twinkling* has two pronunciations and two meanings. The one in (24a) is the gerund with the schwa inserted and the predictable meaning, ‘the event of twinkling’. The one in (24b) is the noun without the schwa insertion meaning ‘a short moment’. If *-ing* is to uniformly contain a *#*boundary, then this fact cannot be explained, since in (24a) *-ing* behaves as *#ing* in *hindering*, while in (24b) it behaves as *+ance* in *hindrance*. SPE has to conclude that in fact, the suffixes in (24a) and (24b) are not one and the same affix.

The question we shall ask at this point is the following: having a more detailed tool for the syntax of words and using the data and insight from SPE, what further claims can we make about the phenomenon discussed above? If we can make the syllabification properties follow not exclusively from a diacritic on the affix (as in SPE), but also from the position of the affix in the syntactic structure of the word, then we capture the difference between *metering* and *metric* as well as the difference between *twinkling* (24a) and *twinkling* (24b). That is a desirable solution, since not only do we solve finer grained problems, but also, we make the data follow from the syntactic structure of the word, which is present in a word independently. Such solution is suggested in the SPE already. “The affixes that carry *#* are, to a certain extent, syntactically distinguished. For the most part, these are the affixes that are assigned to a word by a grammatical transformation, whereas the derivational affixes that affect stress placement are, largely, internal to the lexicon. ... This principle for assigning *#* is the same, in many cases, as the principle that *#* should be introduced at the boundary of

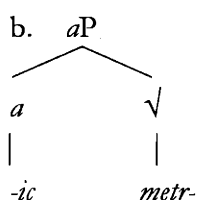
¹¹ Translated in the terminology and notions of Lexical Phonology, Kiparsky (1982), syllabification properties differ according to the level of the affix attached. If a Level 1 affix such as *-iz* is attached to the root, the syllabification of the whole takes place and no schwa is inserted. If a Level 2 affix, such as *-ing*, is attached, the syllabification is different. Actually, the syllabification behavior is in this approach used as one of the diagnostics to determine whether a particular affix belongs to Level 1 or Level 2.

strings dominated by a lexical category in the surface structure. Thus the word *singing* is a verb containing the verb *sing*, and so on.” SPE, p. 86.

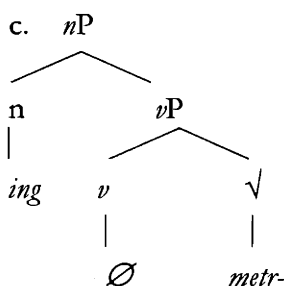
The notion of phase and the Spell-Out at phase level we introduced into the morphology of words enables us to propose a natural account of the above data. Take *metric-metering*. Suppose the structures of the three words are as in (25).



→ syllabification and schwa-insertion process within nP →
 → spell-out of $\sqrt{\text{mi:t}\text{ər}}$



→ syllabification process within aP , no schwa-insertion
 → spell-out of $\sqrt{\text{m}\text{ɛ}\text{t}\text{r}\text{ɪ}\text{k}}$



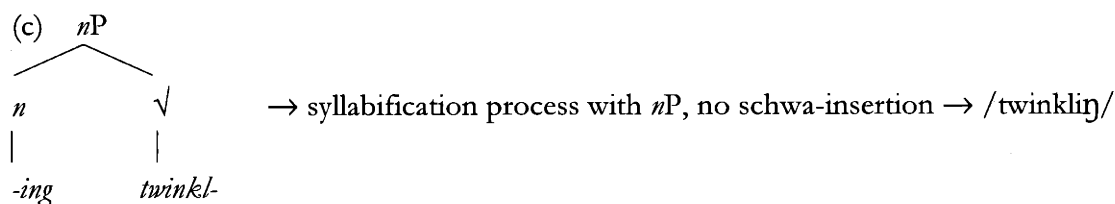
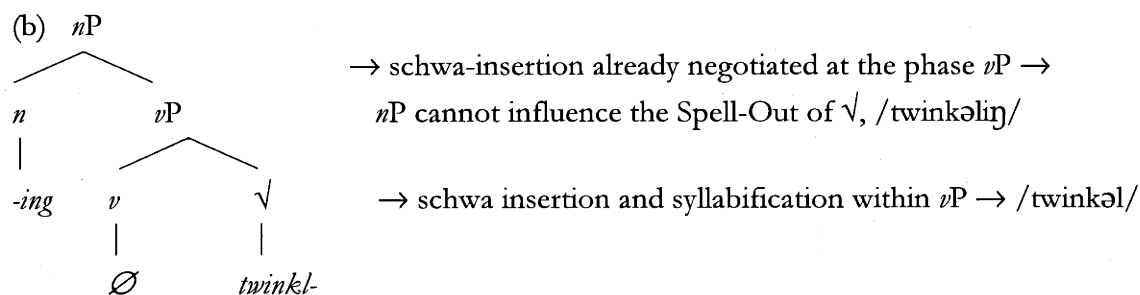
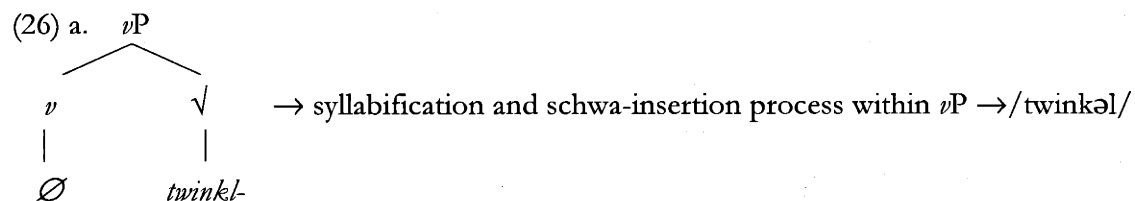
→ schwa-insertion already negotiated at the phase vP → n
 cannot influence the spell-out of $\sqrt{\text{mi:t}\text{ər}}$, $*/\text{m}\text{ɛ}\text{t}\text{r}\text{ɪ}\text{k}/$, $*/\text{mi:t}\text{ər}\text{ɪ}\text{ŋ}/$

→ schwa insertion and syllabification within vP →
 spell-out of $\sqrt{\text{mi:t}\text{ər}}$

In (25a), the spell-out of the root will take place at nP , with the root being still accessible to n . The string $[\sqrt{\text{mi:t}\text{ər}} + n]$ is subject to phonotactic constraints holding in English. That means that in (25a), the final consonant will become syllabic by schwa insertion. In (25b), the spell-out of the root will take place at aP , with a being able to influence the spell-out. So, the string $[\sqrt{\text{m}\text{ɛ}\text{t}\text{r}\text{ɪ}\text{k}} + a]$ will be syllabified without schwa insertion, since the final consonant of *metric* can become the onset of the following syllable, i.e. of *-ic*. How about (25c)? In (25c) the $\sqrt{\text{mi:t}\text{ər}}$ will be spelled out at vP ; therefore, the phonotactic rules will already have applied and

inserted a schwa by the time *-ing* is introduced. Therefore, *-ing* will have access to *v* at *vP*'s Spell-Out at the phase level of *nP*, but will not be able to see into the properties of the root and change its syllabification so that it would become */mɛt.rɪŋ/.

We explain two different pronunciations of *twinkling* in the same way, i.e. by resorting to two different syntactic structures in which *-ing* is found. They are as in (26).



In (26a), the root is spelled out at the *vP* phase, and, given the syllabification of English words, the schwa has to be inserted to make the word-final sonorant syllabic. (26b), ‘an event of twinkling’, is a nominalization built on a *vP*. So, at *nP*, when *-ing* is attached, the pronunciation of the root *twinkl-* has already been negotiated in the same way as in (26a), with a schwa inserted. Therefore, *-ing* can have no influence on the Spell-Out of the root not because of a phonological diacritic, but because of its syntactic position – its attachment site is outside of the phase in which the root pronunciation is negotiated. (26c), ‘a short moment’, on the other hand, is a nominalization in which the functional head *n* attaches to

the root directly. Therefore the pronunciation of the root will be decided together with the attached affix *-ing* at the *nP* phase, which means that the final sonorant of *twinkl-* will become the onset of the following syllable, giving the pronunciation / *twinklɪŋ*/. Therefore, the behavior of an affix does not follow only from its idiosyncratic properties (# or +), but also from its attachment site. We saw how an affix that is +boundary can appear as #boundary if attached outside of the relevant Spell-Out domain in which it could otherwise use its potential.

3.2.2 Meaning and Phases

In this part I just briefly touch on the interaction between the meaning of words and Spell-Out by phase. The example illustrating this interaction is (24), repeated here as (27).

- (27) a. *twinkling* /*twinkəlɪŋ*/ - ‘the event of twinkling’
b. *twinkling* / *twinklɪŋ*/ - ‘a short instant’

We saw the syntactic structures for (27a) and (27b) above, which are (26b) and (26c) respectively. The argumentation is the same as in the case of pronunciation. In (27a) the affix *-ing* is attached above another phase and therefore both the meaning and the pronunciation of the root *twinkl-* have already been negotiated at that point. Therefore, the affix cannot have any influence on the idiosyncratic meaning of the root. In (27b), however, the affix *-ing* is attached to the root directly, which allows for the ‘special’ meaning. And indeed, the meaning of (27a) is predictable, while the meaning of (27b) is not. Similar examples from SPE are given in (28) with the same phonological and semantic properties.

- (28) a. *lightening* ‘an event of lightening’
b. *lightning* ‘a brilliant electric spark discharge in the atmosphere’

3.2.3 Another Argument for Unaccusative Phases

For Chomsky (2001) the example of syllabification/schwa-insertion in *metering* should be a classical example to illustrate a phase Spell-Out and the transfer to the PF component. The little *v*P, transitive in this example, is the point of the Spell-Out, so the pronunciation of the root is negotiated at that point and spelled out as shown above in (25c).

It so happens that *metering* is a transitive verb. Let us imagine, however, the same phenomena are observed with unaccusative verbs. If such examples existed, then they would provide an argument against distinguishing transitive versus unaccusative *v*P's in terms of their phase-hood.

One such example has already been discussed, namely, the contrast between *-ing* attachment directly to the root producing /twinklɪŋ/ and *-ing* attachment to a *v*P, in which the pronunciation of the root has already been negotiated, yielding /twinkəlɪŋ/. This example is parallel to *meter-metric-metering*, the only difference being that the verb in question, *twinkle*, is unaccusative. That the verb *twinkle* is unaccusative can be seen from the impossibility of it taking a cognate object (29a) and the ungrammaticality of the reflexive resultative construction (29b).

- (29) a. *?The star twinkled a sparkle.
 b. *?The star twinkled itself into exhaustion.

Other examples of unaccusative verbs that behave as *twinkle* are as in (30) and (31).

- (30) kindle /kindəl/ 'to start a fire'
 kindling /kindəlɪŋ/ 'an event of starting a fire'
 kindling /kindlɪŋ/ 'material that can be readily ignited, used in starting a fire'

also: crinkle /krɪnkəl/ crinkling /krɪnkəlɪŋ/ crinkling /krɪnkɪŋ/

- (31) wobble /wɒbəl/ 'to move unsteadily from side to side'
 wobbling /wɒbəlɪŋ/ 'an event of moving unsteadily from side to side'
 wobbly /wɒbli/ 'shaky'

also:	crumple /krampəl/	crumpling /krampəliŋ/	crumply /krampli/
	crumble /krambəl/	crumbling /krambəliŋ/	crumbly /krambli/
	rumple /rampəl/	rumpling /rampəliŋ/	rumply /rampli/
	wrinkle /rinkəl/	wrinkling /rinkəliŋ/	wrinkly /rinkli/

The unaccusative status of the verbs in (30-31) is established by their participating in the transitive (causative) – unaccusative (inchoative) alteration, Levin (1993), as exemplified for *wobble* in (32).

- (32) a. I wobbled the chair into the corner. (transitive)
 b. The chair wobbled. (unaccusative)

To conclude, the phonological properties of verbal nominalizations versus root nominalizations examined in this section point to the fact that the same phonological behavior is displayed in all verbal nominalizations, regardless of the whether they are formed out of unaccusative or transitive verbs. The data observed can be readily accounted for by assuming that all verbs have a verbalizing head *v*P constituting a Spell-Out domain.

CHAPTER 3: STRESS ASSIGNMENT AND PHASES IN ENGLISH

1 Introduction

The goal of this chapter is to show how stress assignment in English interacts with the syntax of words, defending the claim that the rules of stress assignment and vowel reduction in English reflect the organization of word structure proposed in Chapter 2. Specifically, I shall make a proposal that the preservation of stress and vowel quality in the sense of Chomsky and Halle (1968) (SPE henceforth), and Kiparsky (1979) is a consequence of applying the ‘phase analysis’ at the word level to stress assignment and vowel reduction rule.

The chapter is organized as follows. First, the main rules of stress assignment in English are summarized (Section 2); in this work I rely on the Halle (1998) analysis of English stress. Then I illustrate how stress and vowel quality reflect the syntax of words proposed in Chapter 2, featuring the insight from SPE. It will be shown how stress and vowel quality in English can be diagnostic of Spell-Out domains within words and how in turn syntactic domains predict the Spell-Out (Sections 3-5). The following section will focus on discussing the problems of the phase analysis, as pointed out by Halle and Kenstowicz (1991) and Halle (1998) (Section 6). Finally, these objections will be addressed and solutions proposed within the syntactic account of word morphology (Section 7). Section 8 discusses the data from Halle and Vergnaud (1987) that are seemingly a problem for the analysis proposed. In the last section (Section 9) the proposal argued for in Sections 3-5 is compared to two influential proposals in the field – Lexical Phonology, Kiparsky (1982) and the theory advocated in Halle and Vergnaud (1987).

2 The Rules of English Word Stress

English is a language in which word stress depends on phonological properties and the position of syllables. Descriptively, English words fall into three groups with respect to stress, SPE (1968), Burzio (1995), Halle (1998). Nouns and simple adjectives typically follow pattern (1a), while verbs and derived adjectives typically follow pattern (1b). There is a third

group that consists of words with one primary and one secondary stress, as in (1c).¹² The examples given below are taken from Burzio (1995) and Halle (1998).

- (1) a. Heavy penultimate: agénda, appéndix, horizon
 Antepenultimate: américa, ásterisk
- b. Superheavy final: prevént, decíde, obéy, annóy
 Penultimate: inhábit, imáGINE, paréntal, governméntal
- c. málachíte, eléctróde, monophýsite, cóllòid

The analysis of these three groups that I shall adopt is as in Halle (1998). Relying on the metrical theory in Idsardi (1992) and Halle and Idsardi (1995), Halle (1998) proposes that English stress system is constituted by the Main Stress Rule (henceforth MSR) supplemented by two edge-marking rules. The Main Stress Rule has two parts. The first part constructs a binary foot at the end of a string whose last asterisk (a Stress Bearing Unit) projects a light syllable. If the last syllable is heavy or there are not enough syllables in the word to construct a binary foot, a unary foot is constructed. This part of the MSR is illustrated in (2a). For example in the word *develop*, the last syllable is light, therefore a binary foot is constructed: *de(velop)*. In the words *usurp* and *cajole*, on the other hand, the last syllables are heavy, therefore a unary foot is constructed: *u(surp)*, *ca(jole)*. In the rightmost column we find words with only one syllable, where only unary feet can be constructed regardless of the syllable weight: (*put*, *black*).

- | | | | | | |
|-----|----|-------------|--------|--------|-------|
| (2) | a. | *(** | *(* | *(* | (* |
| | | devélop | usúrnp | cajóle | pút |
| | | clandéstine | robúst | divíne | bláck |

Halle (1998)

¹² The secondary stress in words such as *Winnipésaukee* is a result of other processes. Also, the secondary stress in derived words is not due to membership in group (1c).

In addition to being subject to the MSR, some words, namely the ones illustrated in (1b) and (1c) are also subject to an edge-marking rule (henceforth EMR), which applies to a list of words before the MSR. The first of the two edge-marking rules, referred to as the *RLR* EMR, inserts a right parenthesis before the final syllable of the word if the syllable contains a short vowel, (2b).

(2)	b.	*(**)*	*(*]*	*(*]*	(*]*
		América	agénda	Tacóma	vílla
		cómpetent	consistent	cohérent	cúrrrent
		oríginal	paréntal	anecdótal	móral

The second edge-marking rule, the *LLR* EMR, inserts a left parenthesis to the left of the rightmost syllable and applies in words where *RLR* EMR has not applied. This is illustrated in (2c).¹³

(2)	c.	(**[*	*(*[*	**(*[*	(*[*
		málachíte	stalágmíte	monophýsíte	Hússíte
		amýgdalòid	mollúscòid	epicýclòid	cóllòid
		plátinòid	eléctróde		ánòde

These rules are summarized in (3-4) below. EMRs apply first to a list of words, followed by the MSR, which applies to all words. Note that the feet constructed on line 0 are left-headed.¹⁴

¹³ Examples in (2c) have two stresses, one primary and one secondary. They are subject to the Rhythm Rule, Halle (1998), which places the main stress on the leftmost syllable on line 1. The Rhythm Rule in Halle (1998) is an extended Rhythm Rule proposed by Liberman and Prince (1977), applying in word sequences as well as within single words.

(i) Rhythm Rule, Halle and Vergnaud (1987), Halle (1998)

a. $\emptyset \rightarrow ($ in env. ## ___ * line 1 LLL

b. Line 1 heads are leftmost.

(3) **Edge-marking rules**

a. RLR Edge Marking

$\emptyset \rightarrow]$ in env. *__* ## line 0

Condition J: Final asterisk projects short vowel.

b. LLR Edge Marking

$\emptyset \rightarrow [$ in env. *__* ## line 0

(4) **Main Stress Rule**

a. $\emptyset \rightarrow ($ in env. __** <P*> line 0

Condition K: Second asterisk projects vowel in a light rime.

b. $\emptyset \rightarrow ($ in env. __* <P*> ## line 0

Halle (1998)

At this point we need to say something about the general theory of morphophonology assumed by Halle (1998).¹⁵ First, following Halle and Vergnaud (1987), rules are divided into two blocks, the cyclic and the non-cyclic. The central idea is that such an organization of rules reflects the constituent structure of the word – a constituent within a word belongs either to the cyclic or the non-cyclic category. Whether a given constituent is cyclic is a purely lexical property of the constituent; English suffixes *-ic*, *-al*, *-ity* form cyclic constituents, while *-ment*, *-ing*, *-ness* are non-cyclic.¹⁶ For example in [[[develop]_V -ment]_N -al]_A, the verb stem *develop* is cyclic, the noun constituent *development* is non-cyclic, and the adjective constituent *developmental* is cyclic. Cyclic rules apply to each cyclic constituent of the word beginning with the innermost one and proceeding outward. If a non-cyclic constituent is encountered, cyclic rules skip it, proceeding to the next cyclic constituents. After all constituents have passed through the cyclic block, the rules of non-cyclic block are applied once only in the entire word.

¹⁴ Apart from these two rules a few other minor rules are needed to account for certain exceptions, however, we shall not go into their details now.

¹⁵ Cf. Section 8 of this chapter for a detailed discussion of the Halle and Vergnaud (1987) theory.

¹⁶ Cyclic affixes in Halle and Vergnaud (1987) correspond to Level 1 affixes in Siegel (1974) and Kiparsky (1982). Non-cyclic affixes correspond to Level 2 affixes.

The rules relating to stress in English belong to both the cyclic and non-cyclic blocks. The two rules mentioned in this summary, i.e. the MSR and EMRs, are cyclic rules.¹⁷ Let us illustrate how they operate in English suffixation. When a suffix is added in English, there are two possible scenarios. If the suffix is non-cyclic, the two rules are not applied in the newly formed constituent, as illustrated in (5). In (5a) I illustrate the application of the EMR and MSR to the word *govern*; in (5b) a non-cyclic affix is added to the constituent in (5a), triggering no new application of the two rules – the SBU of *-ment* is added on line 0 of the metrical grid, while the rest of the metrical grid is preserved from (5a).

- (5) a. *govern* → E-M Rule, MSR → *góvern*
 metrical grid: line 1 *
 line 0 (* *
- govern*
- b. non-cyclic affixation: *góvern* + *-ment* → *góvernment*
 metrical grid: line 1 *
 line 0 (* * *
- govern ment*

If the suffix is cyclic, then the rules apply in the newly formed constituent, as in (6). In (6a) I illustrate the stress assignment in the constituent *government*; in (6b) a cyclic affix is added to the constituent in (6a), deleting the parentheses of the constituent in (6a) and triggering new application of the two rules – the SBU of *-al* is added on line 0 of the metrical grid, while the rest of the metrical grid is changed according to the MSR and EMR.

- (6) a. non-cyclic affixation: *góvern* + *-ment* → *góvernment*
 metrical grid: line 1 *
 line 0 (* * *
- govern ment*

¹⁷ There are other cyclic stress rules, such as Tri-Syllabic Shortening, proposed in Halle (1998), but here we are

b. cyclic affixation: *gouvernement* + *-al* → E-M Rule, MSR → *gouvernemental*

metrical grid: line 1 *
 line 0 * * (*] *
 govern ment al

Note that in the word *governmental*, it is not the case that *-al* is pre-stressing; the stress assignment follows from the fact that *-al* is cyclic and the subsequent application of the stress rules. For Halle (1998) it does not matter that in *governmental*, *-al* has attached to an already derived word, it only matters that *-al* triggers first the deletion of any parentheses from previous cycles and then the application of stress rules regardless of the internal structure of the constituent it attaches to. The affix *-al* would trigger the same stress placement in any word that shares with the word *governmental* the number and weight properties of its syllables; for example, it would place the stress on the same syllable in nonce words such as *bogovernment-al* or *soberment-al*.

3 Stress Assignment and Spell-Out Domains/Phases

In this part I present data from English that supports the notion of phase at the word level, showing how stress assignment and vowel reduction reflect the organization of word structure proposed in Section 2. The view that I shall defend is a modernized version of the SPE analysis of the data and I shall therefore refer to it as a SPE/phase analysis. That is, the original insight into the interaction between stress and structure in the SPE analysis can nowadays be straightforwardly translated into a model where the syntax of words mirrors the syntax of sentences.

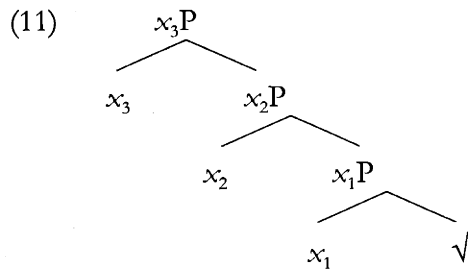
The two phonological phenomena that I shall be concerned with are stress assignment and vowel reduction. As stress assignment rules, I adopt Halle (1998) proposal summarized above and repeated in (7-8). The vowel reduction rule, to my knowledge first proposed in SPE, is as in (9). In SPE, where stress is considered a feature, the vowel reduction rule is stated as “reduce an unstressed vowel”, (9a). In the Halle and Vergnaud (1987), Idsardi (1992) and Halle and Idsardi (1995) theories stress is not considered a feature,

only concerned with the two main ones.

- The MSR and EMR, the so-called cyclic rules in Halle (1998), apply at every xP if triggered by the diacritic marking on head x .
- The Vowel Reduction Rule, a non-cyclic rule in the Halle (1998) system, takes place after all cyclic rules in a word have already applied at the level of ‘prosodic word’.
- A ‘phase analysis’ (phase Spell-Out and the Phase Impenetrability Condition) applies to the stress assignment rules and the Vowel Reduction Rule.

The consequences of the proposal above are as summarized in the two points below.

- The underlying representation (UR) of a head x is accessible only to the next phase level. In the tree below, the UR of the head x_1 is accessible only up to x_2P , where it is spelled out, but not at x_3P .



- The stress (projecting an asterisk on line 1) and consequently the quality of a vowel can be changed only up to the next phase Spell-Out. Stress and vowel quality preservation in the sense of SPE and Kiparsky (1979) are a consequence of the phase Spell-Out mechanism – when a chunk of word to which the stress rules have applied is spelled out, the new affixation and Vowel Reduction taking place at the end of the word cannot erase this information.

It should be noted at this point that my proposal makes a claim as to the accessibility of lines 0 and 1 of the metrical grid only. Lines higher than line 1 are in this proposal allowed to be accessible at all stages of derivation for phenomena different from the EMR and MSR: e.g., the primary stress assignment rule (the rightmost element of line 1 projecting on line 2), the Rhythm Rule, Liberman and Prince (1977), Kiparsky (1979), the Compound Stress Rule, etc.

Let us take the Rhythm Rule as an example illustrating the point. The rule itself is exemplified in (12).

- (12) a. thirtéén
b. thirtèèn mén

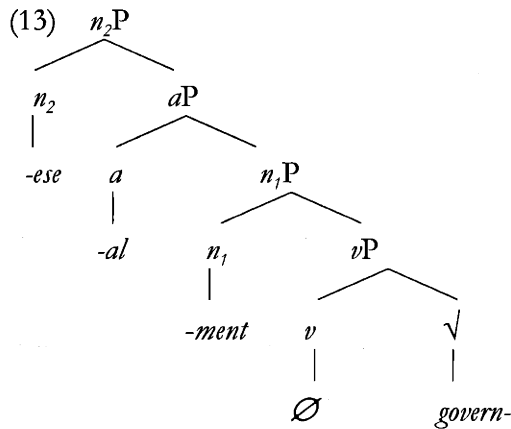
When the word in (12a) is pronounced in isolation, the main stress falls on the final syllable and the first syllable receives a subsidiary stress: *thirtéén*. When the same word is pronounced as part of a noun phrase, as in (12b), the main stress falls on the first syllable, while the final syllable receives subsidiary stress: *thirtèèn*. Liberman and Prince (1977) propose that this data be captured by a rule (the Rhythm Rule) retracting the primary stress in certain word sequences.

The Rhythm Rule can therefore interfere with word stress in a way that represents an apparent contradiction to the phase-by-phase Spell-Out analysis – the stress of the first syllable in the word *thirteen* is changed from primary to secondary after the word has already been spelled out. This contradiction is resolved by restricting the phase analysis (the phase Spell-Out and the PIC) to lines 0 and 1 of the metrical grid. It thus follows that the Rhythm rule, which takes place on line 2, is not subject to the phase-by-phase Spell-Out and the PIC.

4 Vowel Quality and its Relation to Stress: SPE Revival

In this part I present the data from English that illustrate the claims about stress assignment and vowel reduction made above. After showing how the mechanism works I show how the phase analysis can be considered a modern version of the SPE analysis.

The proposal made in Section 3 of this chapter will now be illustrated by examining the structure and stress properties of the word *governmentalèse*. We take its structure to be as in (13) and the stress pattern and pronunciation as in (14). At this point we shall not make a distinction between primary and subsidiary stress; we divide vowels into those that project an asterisk on both line 0 and line 1 (i.e. stressed) and those that project an asterisk on line 0 but not on line 1 (i.e. non-stressed), regardless of the prominence of their stress.¹⁸



(14) *gouvernementalèse*, pronunciation: /gʌvərnmentəli:z/

Let us now illustrate the application of stress rules phase by phase. At each phase I indicate the corresponding metrical grid after first illustrating rule application by using a diacritic, (e.g. *â*), to mark vowels whose SBUs receive asterisks on line 1. I make use of this diacritic marking in addition to the grid for expository reasons. Vowel Reduction rule takes place after the Spell-Out of n_2P .¹⁹

At vP , where the root phrase is spelled out, the stress rules apply, which gives the root Spell-Out *govern*, illustrated in (15a).

(15) a. at vP : *govern-(∅)* → EMR → MSR → the root is spelled out as *gôvern*

line 1 *
 line 0 (* *)
 govern

At the next phase, n_1P the affix *-ment* is added to the structure and consequently to the metrical grid, but since this affix is non-cyclic, it does not trigger application of EMR and MSR. Thus the vP is spelled out as *govern*, as illustrated in (15b).

¹⁸ We return to the issue of primary versus subsidiary stress in Section 5.

¹⁹ In principle, the Vowel Reduction rule could take place at any phase that is the last phase in the prosodic word. Given that n_2 is the last head attached in this example and n_2P the intended prosodic word, the Vowel Reduction Rule applies after n_2P phase only.

(15) b. at n_1P : *govern(ment)* → the vP is spelled out as *góvern*

line 1 *
 line 0 (* * *
 govern ment

The next Spell-Out, illustrated in (15c), occurs at aP , where the stress rules are triggered by the attachment of the cyclic affix *-al*. The UR of the affix *-ment* is still accessible at this point, so after that syllable receives an asterisk on line 1, the vowel in *-ment* surfaces as a /ε/. The UR of the root is inaccessible at this point, so even if the stress rule would at this point assign no asterisk on line 1 to the root *govern-*, the latter still retains the asterisk due to its already having been spelled out two phases ago, as in (15a). The resulting effect of this mechanism is that it appears as if the stress is preserved from the previous assignments.

(15) c. at aP : *government(al)* →EMR → MSR → the n_1P is spelled out as *góvernmént*

line 1 * *
 line 0 (* * (*] *
 govern ment al

At n_2P , the complement aP is spelled out as *góvernmentál*, as illustrated in (15d). The affix *-ese* attached at this point triggers a reapplication of the stress rules, causing a projection of a line 1 asterisk on the syllable /ese/. However, since the chunk *góvernmént-* is inaccessible to the stress rules applying at n_2P all line 1 asterisks of n_1P are preserved in the grid.

(15) d. at n_2P : *governmental(ese)* →EMR → MSR → the aP is spelled out as *góvernmentál*

line 1 * * *
 line 0 (* * (* * (*
 govern ment al ese

Finally, at the next higher phase n_2P is spelled out. Stress rules have assigned a line 1 asterisk to *-ese* while line 1 asterisks of aP are still preserved from previous phases. Since now we reach the end of the word, Vowel Reduction takes place. This is illustrated in (15e).

4.1 Connection to the SPE Model

In this part I shall comment on how the analysis proposed above relates to the SPE analysis. We shall see that the phase analysis could be described as the SPE analysis translated into the modern language of word structure, in which the phase Spell-Out relates to what in SPE is termed the 'preservation of stress from earlier cycles'.

There are numerous influential analyses in the literature claiming that stress assignment from previous cycles is preserved as non-primary stress and is reflected in the impossibility of vowel reduction to schwa, e.g. SPE, Kiparsky (1979).

The standard example from the SPE illustrating the claim is the (near) minimal pair *condensation* - *compensation*. The observation is that in some dialects of English, the boldfaced /e/ in *condensation* reduces to a schwa, while this is not the case in the word *compensation*, despite the fact that phonotactically and morphologically the two words are very similar. The vowel reduction is a consequence of the Vowel Reduction Rule, which reduces a lax vowel to a schwa in English.

- (17) a. *condensátion* (/e/ is not reduced to schwa)
b. *compensátion* (/e/ is reduced to schwa)

The explanation for this fact offered in SPE is that the difference between the two nominalizations follows from the stress of their constituents. That is, the nominalizations 'contain' verbs *condense* and *compensate*, which have different stress patterns. In the former verb, the primary stress is found on *condense*, which consequently means that the stressed vowel cannot be reduced to a schwa in the cycle of the verb. In the latter verb, the main stress is found on the first syllable of *compensate*, therefore the corresponding /e/ in *compensate* can be reduced to a schwa in cycle of the verb. If the stress from earlier cycles is preserved, we now have a natural explanation for the different vowel quality in the nominalizations *condensation* - *compensation*. In *condensation*, the vowel /e/ has received stress on an earlier cycle, i.e. the verb cycle, and therefore is prevented from being reduced. In *compensation*, the vowel /e/ has been reduced on the earlier cycle and has remained the same in the nominalization.

- (18) a. *condé*se → *condéns*ation (/e/ is not reduced to schwa)
 b. *cómpens*ate → *compens*ation (/e/ is reduced to schwa)

SPE's conclusion is: "In each case a vowel which has never received primary stress (and therefore retains the specification [-stress] reduces, and a vowel which has at some point received primary stress (and thus belongs to the category [+stress]) is immune from phonological reduction." p. 112 "... the stress assignment in an early cycle can protect a vowel from phonological reduction, even when its actual stress, at the point when the Vowel Reduction Rule applies, is quite weak, and even though minus-stressed vowels in the same context do characteristically reduce." P.112.²⁰

5 A Note on Primary Stress Assignment and Spell-Out Domains

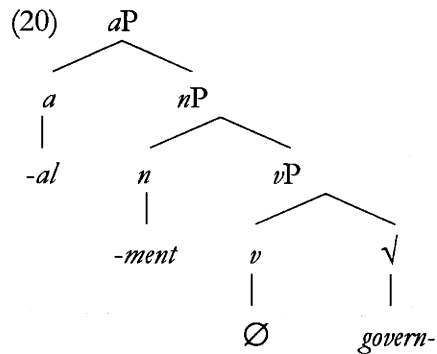
Up to this point we made no distinction between primary/main stress and subsidiary stress. We saw that stress is a phonological property that conforms to the rules of phase-by-phase Spell-Out proposed in Section 3. However, the representation of primary stress itself does not obey the Phase Impenetrability Condition, since certain affixes (cyclic in Halle (1998) terminology), e.g. *-al*, *-ity*, force the main stress to be reassigned regardless of where in the structure they are attached. In this section I would like to show the behavior of cyclic affixes and propose that primary stress assignment is an exception to the phase analysis in the same way as the Rhythm Rule, discussed in Section 3. Primary stress assignment is a phenomenon occurring at lines higher than line 1 in the metrical grid and is therefore not subject to the phase Spell-Out and the PIC.

As an illustration of a stress-neutral (non-cyclic) and a stress-changing (cyclic) affix, consider the stress in *-ment* and *-al* derivatives in (19) below.

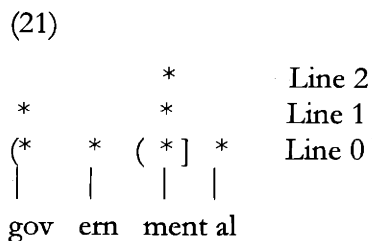
- (19) a. *orna-* → *ór*nement → *orna*méntal
 b. *gó*vern → *gó*vernment → *gorna*méntal

²⁰ As to the Vowel Reduction Rule, SPE places it after the process of stress assignment within the word, i.e. in the non-cyclic block.

The affix *-ment* attaches either to roots (19a) or verbs (19b) and has no influence on stress. The affix *-al* can be attached to *-ment*. Whenever *-al* follows *-ment* the stress is reassigned and the root, which used to have the main stress in the *-ment* derivative, loses its stress in the *-al* derivative. But the root in the word *governmental* is two phases below the *aP* of *-al* affixation, (20), and therefore, according to the PIC, its Spell-Out should take place at *vP* and should not be influenced by *-al* affixation.



I would like to propose that the behavior of stress-changing (cyclic) affixes does not represent a problem for our analysis, since the latter is restricted to the lines 0 and 1 of the metrical grid, while primary stress assignment in English (for independent reasons) occurs on lines higher than 1. The difference between primary and secondary stress can be expressed on line 2 of the metrical grid. Take the word *gòvernmentàl*. Its representation in the metrical grid is as in (21).



On line 0 all Stress Bearing Units are projected. On line 1, only SBUs that are heads of feet on line 0 are projected, therefore *gov-* from the first cycle and *-ment* from the last cycle triggered by the suffix *-al*. Only the rightmost asterisk on line 1 is projected on line 2, resulting in main stress on that syllable.

We can see that what is an exception to PIC is not the representation on lines 0 and 1, but the representation on lines higher than 1. So, the property of obtaining a line 1 asterisk (having stress in SPE terminology) obeys the PIC, but the property of obtaining an asterisk on line 2 and thus receiving main stress does not. The lines on metrical grids above 1 are allowed to be accessed at all stages of word formation (apparently disobeying PIC) because the assignment of main stress is a different phenomenon from the assignment of stress. In my view it belongs to the realm of prosody above the word and it interacts with the phrase and sentence stress, Cf. the Rhythm Rule, the Compound Stress Rule. Consequently, the PIC is not even expected to apply when main stress assignment is in question.²¹

6 Problems: Halle (1998), Halle and Kenstowicz (1991)

The analysis of stress preservation and vowel reduction from SPE is not universally accepted. Its main opponents are Halle and Kenstowicz (1991) and Halle (1998). Their view is different from that of SPE in that subsidiary stress and consequently vowel reduction are results of non-cyclic rules applying at the end of word-formation and not results of preservation of stress from previous cycles.

Let us see how Halle and Kenstowicz (1991) analyze subsidiary stress and vowel reduction. The subsidiary stress on words is a result of a non-cyclic rule, Iterative Foot Construction (IFC henceforth). Vowel reduction, which follows IFC, belongs to the same non-cyclic block.

(22) a. Iterative Foot Construction

Construct binary feet by inserting right parentheses iteratively from left to right. (Put secondary stress on syllables to the right of the bracket.)

b. Vowel Reduction

[-high] → schwa if unstressed

Take the word *governmental*. The rules in (22) apply to this word after the MSR in the following way.

²¹ This claim needs to be worked out in detail. Wagner (2002) comes to a similar conclusion about German compound stress.

- (23) cyclic block: go-vern-ment-al → MSR → go-vern-(mént-al)
 non-cyclic block: go-vern-(mént-al → IFC →)go -vern)-(mént-al → gòvernmentál
 → Vowel Reduction → /gʌvərnmentəl/

It is important to observe that in this analysis the secondary stress and vowel reduction in English words result solely from post-cyclic rules and not from the primary stress assigned on the previous cycle being weakened to subsidiary stress. So, when *-al* in *governmental* is attached, the grid constructed in the first cyclic application, *góvern*, is deleted and forgotten. The fact that a secondary stress appears on the same syllable (and consequently that vowel is not subject to reduction to schwa) in *gòvernmentál* is a coincidence -*gòv* just happens to be in the right place for IFC to assign it a subsidiary stress. This view departs from the view in the SPE model, where this was not regarded as a coincidence, but as a consequence of the fact that at some point in the derivation the constituent *govern* had primary stress.

The motivation for the view in Halle and Kenstowicz (1991) and Halle (1998) is that their analysis deals straightforwardly with secondary stress in long non-derived words, such as *Apalachicola* and with certain exceptions among derived words, where the primary stress from the previous cycles is not preserved such as *affirm - affirmation*.

6.1 Long Underived Words

Let us first see their reasoning as to long non-derived words. In the word *Apalachicola*, native speakers of English judge the odd numbered syllables to be stressed and the even numbered syllables to be unstressed. In Halle and Vergnaud (1987) analysis, this judgment reflects the parsing of the line 0 in the metrical grid into binary left-headed constituents. The heads on line 0 are then projected to line 1, where the rightmost one receives a line 2 asterisk and consequently the primary stress.

(24) A pa la chi co la
 | | | | |
 (* *) (* *) (* *) line 0
 (* * *) line 1
 * line 2

Other examples include: Hàlicàrnàssus, sèrendípity, Àlabáma, Càlifórnia, Màssachúsetts, àbracadábra, Kàlamazóo, Winnipesáukee, hàmamèlidánthemum.

How does the mechanism work? First, since these words are not derived, they are only submitted to the Main Stress Rule in the first and only cycle. Then they go to the non-cyclic block of rules, containing the rules of IFC and the Vowel Reduction Rule. Below I illustrate the stress assignment in the word *Apalachicola*.

(25) Cyclic block: Apalachicola → MSR → apalachicóla

Non-cyclic block: apalachicóla → IFC →)a pa)la chi) cóla → àpalàchicóla

) * *) * * (* *)
 * * *
 *

6.2 Derived Words

Recall that in the SPE model, subsidiary stress (and consequently the blocking of vowel reduction) are a consequence of the primary stress from the previous cycle, reduced to subsidiary stress through derivation. The minimal pair to illustrate this view is *condensation* versus *compensation*, derived from *condense* and *compensate* respectively. But SPE notes there are exceptions to this rule, i.e. there are cases of subsidiary stress that come about in a different way. One example are long non-derived words, where subsidiary stress appears on syllables of words that never received primary stress on these syllables, e.g. *sèrendípity*. These examples were discussed above. More disturbing for SPE are examples where a vowel that did receive primary stress on an earlier cycle loses its stress and then reduces, e.g. (26). In the word *solidity*, consisting of the adjective *solid* and *-ity*, we expect the stress to be as in *sòlidity* with no vowel reduction of /ò/, but instead we get *solidity* with a reduced vowel.

- (26) first cycle: sólíd /solid/
 second cycle: expected: *sòlidity /soliditi/ we get: solidity /səlidity/

SPE acknowledges the problem and offers a solution in the form of a series of rules applying to specific groups of words. The important thing to note is that the groups of words that behave as *sólidity* are not the general case, but exceptions that are very hard to capture. “...there are many details and special cases that do not seem to fall under any large-scale generalizations and that shed little light on general questions of phonological theory or on the structure of English.” SPE, p. 113.

Halle and Kenstowicz (1991) and Halle (1998) share a different opinion; the exceptions to the SPE model are for them default cases and crucial in assigning non-primary stress and vowel reduction to the non-cyclic component, while dispensing with the preservation of primary stress from earlier cycles altogether.

Let us now look at exceptions similar to (26) that Halle and Kenstowicz (1991) discuss. I shall first present their argument and then critically examine it, defending the SPE view.

The following derived words are problematic for the SPE analysis.

- (27) àffirmátion, cònfir MÁtion, cònservátion, cònsultátion, cònversátion, ìnformátion,
 làmentátion, prèservátion, trànsportátion, ùsurpátion

Halle and Kenstowicz (1991)

These words should have a subsidiary stress on the second syllable, given that that syllable is stressed in the verbs they are derived from, (28a). But they don't, (28b). Consequently, in these words, the vowel in the second syllable should not reduce to a schwa, as it does, (28b).

- (28) a. consult /kənsʌlt/
 b. consultation /kʌnsəlteɪʃən/, expected: */kənsʌlteɪʃən/

What is more, the schwa in the prefix *con-* in the verb in (28a) should remain a schwa without any stress; however, in the derived word (28b) it receives a subsidiary stress and is

pronounced as a full vowel. So, these words are obviously problematic for an analysis that wants to maintain the preservation of stress and vowel quality from earlier cycles.

Halle and Kenstowicz (1991) can deal with these examples straightforwardly, since they do not maintain any connection between the stress assigned on a particular cycle and the stress assigned on earlier cycles. Their IFC and vowel reduction rule deal with these cases as in (55).

(29) a. *consult*

cyclic rules: Main stress Rule: consúlt

non-cyclic rules: IFC, vowel reduction: reduce unstressed /o/ to schwa

b. *consultation*

cyclic rules: Main Stress Rule + delete previous stress: consúltation

non-cyclic rules: IFC (consult)átion → cònsúltation

$$\begin{array}{cc} (* *) & (**) \\ * & *) \\ & * \end{array}$$

non-cyclic rules: Vowel Reduction: /u/ to schwa, but not /o/: cònsúltation

7 Defending the SPE/Phase View

In this section I shall defend the SPE/Phase view and show how a syntactic approach to word structure as in Marantz (2001) and the analysis of word phases in Chapter, Section 2 are able to deal with the exceptions in question. The critique of Halle and Kenstowicz (1991) will be addressed from two perspectives. The first objection is of a conceptual nature, namely that the mechanism proposed in Halle and Kenstowicz (1991) has to resort to preservation of stress and vowel quality from earlier cycles to deal with certain derived words. And second, it will be shown that exceptions to SPE that Halle and Kenstowicz are not really exceptions if the structure of these words is taken into account.

To sum up, in order to work, the system of Halle and Kenstowicz (1991) has to make use of stress preservation from the earlier cycles, an SPE device that their analysis dispensed with in the first place.

7.2 A Phase Analysis of Exceptions

The next task is to deal with the derived words that are clearly counterexamples to the SPE type analysis. There are two groups of such exceptions. First, there are words where the non-primary stress emerges even if the syllable has never had primary stress on any of the previous cycles, such as *condense* - *còndensátion*. And second, there are words where primary stress from earlier cycles is lost such as *consúlt* - *cònsultátion*. These two groups shall be discussed in the order in which they were introduced.

7.2.1 Acquiring Subsidiary Stress [*condense* - *còndensátion*]

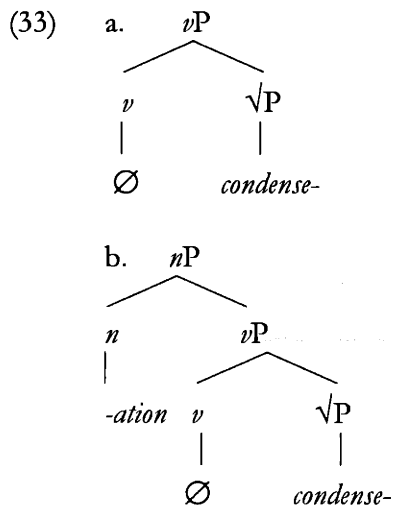
To illustrate words where the non-primary stress emerges even if the syllable has never had primary stress on any of the earlier cycles, consider the pair *condense* - *còndensátion*.

- (32) a. *condense* → /o/ in prefix reduced to schwa → /kəndɛns/
b. *còndensátion* → /o/ in prefix not reduced to schwa → /kʌndənsɛɪʃən/

c. *other examples of the same pattern:*

adoration, admiration, affirmation, condensation, confirmation, combination, commutation, compellation, compilation, conservation, consolation, conspiracy, consultation, conversation, consummation,...

We already saw in the previous section why such examples are problematic for SPE. Let us now state the problem in the Phase/SPE approach. If the structures of (32a,b) are as in (33a,b) respectively, then we should not be able to change the stress and vowel quality in the root when forming the noun *condensation*. According to the PIC, the pronunciation of the root should be already negotiated as /kəndɛns/ when we reach the nP.



There is a solution to this problem. Take the word *condensation*. There are supposedly two cycles associated with it: *condense*, *condensation*. Take the word *compensation*. Again, there are two cycles associated with it: *compensate*, *compensation*. We see that in the case of *compensation* *-ation* is not one affix, but two affixes: *-ate* and *-ion*, while in the case of *condensation*, *-ation* is one affix. However, how do we know that *-ation* is not composed of *-ate* and *-ion* in *condensation* as well? Or in other words, perhaps there are in fact three cycles in *condensation*: *condense*, *condensate* and *condensation*, only *condensate* happens not to be an English word.²³

Analyzing the vocabulary item *-ation* consistently as composed of *-ate* and *-ion* deals with the subsidiary stress found on the first syllable of *condensation* straightforwardly. *-ate*, being a cyclic affix, forces the application of the Main Stress Rule, which assigns primary stress to *con-*, while the primary stress on *-dense* becomes subsidiary. Then, *-ion*, again a cyclic affix, triggers the MSR and assigns the main stress to *-at-*, making the other two stresses subsidiary. The derivations and rule application are exemplified below.²⁴

²³ Note that there exists a word in English that is spelled as *condensate*, but that is not the missing verb that appears in Cycle 2. It is a noun with the same stress pattern as the group of words in (2b).

(i) * (*]*
condensate

In this noun *-ate* is not a verbal affix, but a non-cyclic nominal affix. The main stress is therefore preserved from cycle/phase 1. But more importantly, due to non-application of the MSR no subsidiary stress appears on the first syllable, which is consistent with and predicted by our analysis.

(34) cycle 1/phase1 (ν_1 P): MSR *condéense*

line 2 *

line 1 *

line 0 * (*)

condense

cycle 2/phase 2 (ν_2 P): MSR *condénsàte*²⁵

line 2 *

line 1 * * *

line 0 (*) (*) [*

condensate

cycle 3/phase 3 (ν P): MSR *condénsátion*

line 2 *

line 1 * * *

line 0 (*) (*) (*) *

condensation

A side product of the offered analysis of problematic pairs such as *condéense* – *condénsátion* is that *-ation* is now in all cases composed of two affixes, *-ate* and *-ion*, even if the intermediary word [ν P+ate] is not always a word of English.

7.2.2 Losing Subsidiary Stress [*consúlt* – *consúltátion*]

We now turn to the problem of syllables losing their stress altogether (and thus becoming subject to vowel reduction) despite their having primary stress at some earlier cycle in the derivation. An example is the pair *consúlt* – *consúltátion*, repeated in (35). In cycle/phase 3 we expect the stress pattern to be *consúltátion*, but instead we get *consúltátion*, where the second syllable is reduced to a schwa.

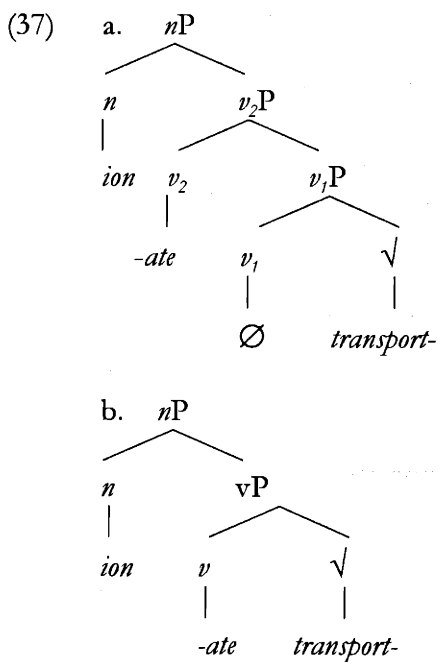
²⁴ The asterisk that was the last one to be projected to on line 1 is projected to line 2 and consequently receives main stress.

²⁵ The constituent *condensate* has the same stress pattern as the group in (2c) and is subject to the Rhythm Rule as in Halle (1998), therefore *condénsàte*.

- (35) cycle/phase 1: MSR: *consúlt*
 cycle/phase 2: MSR: *consúlt* + *ate* → *cónsúltàte*²⁶
 cycle/phase 3: MSR: *cónsúltate* + *ion* → *cònsúltàtion*, **cònsúltàtion*

- (36) *other examples of the same pattern:*
trànsportàtion *informàtion* *làmentàtion*, *adoration*, *admiration*, *affirmation*,
condensation, *confirmation*, *combination*, *commutation*, *compilation*, *conservation*,
consolation, *conspiration*, *consultation*, *conversation*, *consummation* etc.

I propose a syntactic solution to the problem outlined above. Up to now we have been assuming that nominalizations such as *consultation* are made out of verbs *consult*, *inform*, *transport*, *lament* and therefore have the structure in (37a). I propose that these nominalizations have the structure in (37b) instead, which means that are built on roots *consult-*, *inform-*, *transport-*, *lament-* and not on the corresponding verbs.



²⁶ The constituent *consultate* has the same stress pattern as the group in (30c) and is subject to the Rhythm Rule as in Halle (1998), therefore *cónsúltàte*. The same goes for *trànsportàte* in (65).

Let us spell out the derivation in the SPE/phase fashion. If the structure of *transportation* is as in (37a) above, then the Main Stress Rule operates on the *vP* cycle/phase and the second syllable in *transport* receives the primary stress, which is lost in the next cycle/phase, contradicting the preservation of stress principle. The derivation is illustrated below.

- (38) cycle 1: MSR: transport → transpórt
 cycle 2: MSR: transpórt + ate → tránsportàte
 cycle 3: MSR: tránsportàte + ion → expected: *trànsportátion,
 correct: trànsportátion

But if the structure of *transportation* is as in (37b), then the first cycle/phase is not the *vP transport*, but the *vP transportate*. Such derivation results in the correct pronunciation – at the *vP* (constituent *transportate*), the root is still accessible for phonological changes of stress, which later result in the change of vowel quality.

- (39) Cycle 1: MSR: transport- + -ate → tránsportàte
 Cycle 2: MSR: tránsportàte + -ion → trànsportátion; Vowel Reduction /o/ → schwa

The question now is whether there are any independent reasons to believe there is a difference between the structures of say *condensation*, *consolidation*, *contestation* etc. (as in (37a)) on one hand, and *transportation*, *admiration*, *conservation* etc. (as in (37b)) on the other. An argument in favor of the treatment here proposed is a possible difference in the semantic composition of meaning between the two groups of words.

In some cases the meaning of the derived noun in the same group as *transportation* is not composed of the meaning of the corresponding verb and the meaning of the nominalizer, which argues for a root nominalization structure as in (37b). This reasoning is argued for in SPE to apply in the word *information*. For SPE, *information* is not the nominalized form of the verb *inform*, but rather a single noun represented as /inform + At + iVn/. The support for this view comes from the observed contrast between *information* and *relaxation* as in (40). (40) shows that the meaning of *information* is not derivable from the meaning of *inform* in the same way that the meaning of *relaxation* is derivable from *relax*.

- (40) a. he informed my friend about the lecture
 b. * his information of my friend about the lecture
 c. he relaxed the conditions
 d. his relaxation of the conditions

SPE

In some cases, however, such difference in meaning cannot be found. Take *condensation* (structure 37a) versus *adoration* (structure 37b). The meanings of the derived nouns relate to the verbs/roots they are built on in the same way.

- (41) **condense:** to make more dense or compact; reduce the volume or extent of;
 concentrate.

condensation: the act of condensing; the state of being condensed; the result of
 being made more compact or dense.

adore: to regard with the utmost esteem, love, and respect; honor.

adoration: the act of paying honor, as to a divine being; worship.

Webster Random House

The analysis put forward in this section treats the exceptions to subsidiary stress placement such as *transport-transportation* as resulting from the syntactic structure of derived nouns. In cases such as *transportation*, the nominalizer attaches to the root and not the verb *transport*, while in cases such as *condensation* it attaches to the verb *condense*. Some of these exceptions receive independent justification in the semantics of nominalizations as already observed in SPE for *information*; some others do not (e.g. *adoration*, *transportation*, etc.). However, it does not follow that if we cannot find semantic proof for positing the structure (37b) for certain cases, then these cases indeed do not have that structure. It only follows that it is impossible to show conclusively what is the case independent of the pronunciation; the structure proposed, however, is consistent with the data and the pronunciation is sufficient to force

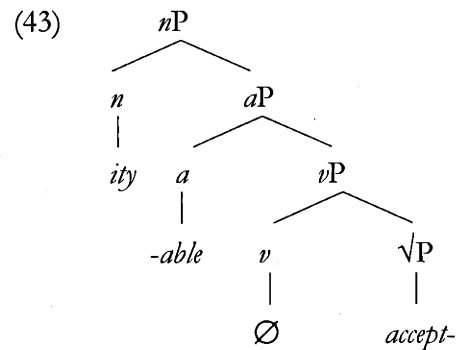
the proposed structure for the language learner. In my view this solution has an advantage over the one proposed in Halle and Kenstowicz (1991) because it connects the effects of phonological rules – such as emergence of subsidiary stress and vowel reduction – with the structure of words.²⁷

8 A Group of Exceptions to SPE/Phase Analysis: Halle and Vergnaud (1987)

In this section I would like to address a group of words that are an apparent exception to the SPE/Phase analysis. Halle and Vergnaud (1987) list 97 Kenyon and Knott's dictionary entries with alternative stress patterns on the first two syllables. Some are listed in (42) below.

- (42) a. academician, acceptability, acceleration, accessibility, antipathetic, etc.
 b. stress pattern1: accèptability
 c. stress pattern2: àceptabíity

The structure of the words in (42b,c) is as in (43).



The pronunciation in (42b) is consistent with the proposal I am trying to defend – the root has one asterisk on line 1 (resulting in subsidiary stress on /sept/), while the first syllable of the root /acc/ is reduced to a schwa by the Vowel Reduction rule applying at the end of the word. The pronunciation in (42c) is problematic for my account, since the reduced syllable surfaces with a subsidiary stress at the spell-out of *nP*. How is that possible?

²⁷ This is a 'conceptual' advantage, since the relationship between word structure and word phonology is not an

I would like to suggest that the alternative pronunciation in (42c) is not a result of a reduced vowel acquiring subsidiary stress, but rather a result of two possible pronunciations of the verbs these nouns are derived from. Take *accept* for example. Webster Random House lists two possible pronunciations, indicated in (44a, b).

- (44) a. accépt /əksɛpt/
b. àccépt /æksɛpt/

It is therefore not surprising that two pronunciations are possible in words derived from (44 a,b). Speakers pronouncing the word *accept* as in (44a) will pronounce *acceptability* as (45a), while speakers with the pronunciation in (44b) will pronounce it as in (45b).

- (45) a. accèptability /əksɛptəbiliti/
b. àccèptability /æksɛptəbiliti/

It thus follows that the pronunciation in (42c) is not an exception to the phase analysis, but rather its confirmation – given two possible pronunciations of the base forms in question we actually *expect* two possible pronunciations of the corresponding nominalizations. The same applies to other words from Kenyon and Knott's dictionary listed in Halle and Vergnaud (1987).

9 Other Theories of Morpho-phonology and Phase/SPE Approach

In this section I shall compare Phase/SPE approach advocated in this work to two influential theories of morphology and phonology, Kiparsky (1982) and Halle and Vergnaud (1987). I chose the comparison to these two theories not only because they are important in the field but also because they are representative of quite opposing views. The analysis in the framework of phases/SPE shares some properties with both, though it does not wholly accept either. I shall first present and critically examine the Kiparsky (1982) model of Lexical Phonology. We shall see despite the elegance and appeal of the original insight of level order

issue in Halle and Kenstowicz (1991).

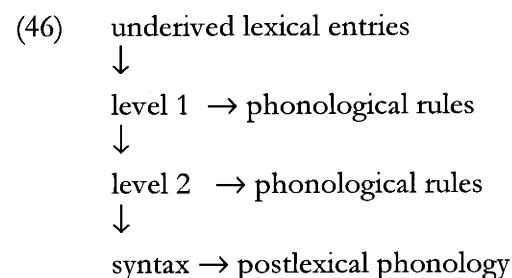
morphology, the theory is too restrictive to be correct. Then I shall proceed to Halle and Vergnaud (1987) in the same fashion showing that while doing away with the main problem of Lexical Phonology, this model suffers from the opposite problem - a lack of strong predictions.

9.1 Lexical Phonology

Lexical Phonology, (Pesetsky (1979), Kiparsky (1982)), is an important and influential theory of phonology and morphology that is usually classified as belonging to the school of Strong Lexicalism. Here, I will briefly present the model proposed by Kiparsky (1982). Kiparsky (1982) joins the idea of level ordering proposal by Siegel (1976) and Strict Cyclicity introduced by Mascaro (1978) in a model with the following three characteristics.

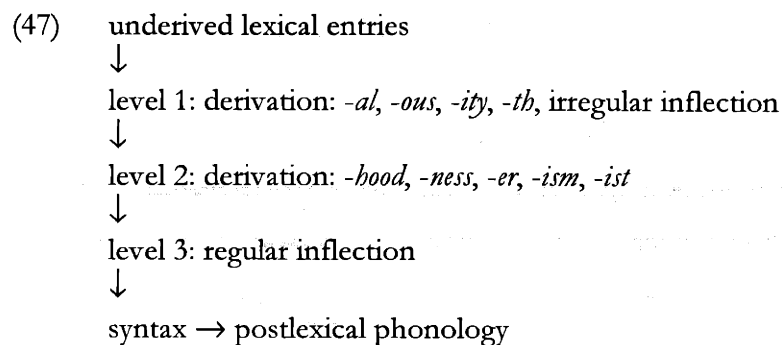
- Derivational and inflectional processes are organized in a series of levels, where each level is associated with a set of phonological rules for which it defines the domain of application.
- The ordering of levels defines the possible ordering of morphological processes in word formation. Affixation in words proceeds in levels, i.e. affixes of Level 2 are attached after affixes of Level 1.
- Phonological rules are divided into two groups: those that take place within the lexicon at certain levels (rules of lexical phonology), and those that take place after words have been combined into sentences in the syntax (postlexical phonology).

The model can be schematized as in (46).



We can see that in this model, words are made in a component that is separated from the Syntax, and they are then inserted in syntactic structures. The phonological rules taking place after syntax are automatic rules that take place at word boundaries and have nothing to do with morphology (e.g. the flapping rule in English).

In English, the levels are as illustrated in (47). The main diagnostic of a traditional derivational affix being Level 1 or Level 2 is whether it changes the stress of the form it attaches to. Level 1 affixes are stress changing, while Level 2 affixes are not. Regular inflection in this model occurs after all levels of derivation.



We can immediately see the appeal of a model such as Lexical phonology. The phonological properties of affixation, i.e. whether they trigger the stress rule for example, are defined by the level of attachment. So, the difference between stress-sensitive and stress-neutral affixes is captured by ordering the attachment of stress-sensitive affixes before the block of phonological rules including the stress rule, i.e. at level 1, and by ordering stress-neutral affixes after this block of rules, i.e. at level 2. Consequently, stress-sensitive affixes will influence stress placement, while stress-neutral affixes will not be able to do so. The important thing is that the property of being able to influence stress placement follows from the order of attachment of affixes.

The notion of Cyclicity in the theory of Lexical Phonology is borrowed from Mascaro (1976).

(48) Strict Cycle Condition (SCC)

A cyclic rule may apply to a string x just in case either of the following holds:

- a. The rule makes crucial reference to information in the representation that spans the boundary between the current cycle and the preceding cycle.
- b. The rule applies solely within the domain of the previous cycle but crucially refers to information supplied by a rule operating on the current cycle.

From Kenstowicz (1994), adaptation of Mascaro (1976), Halle (1978)

If we try to think about Lexical phonology in terms of the Marantz (2001) insight, Lexical Phonology can be seen as advocating a syntactic approach to word formation. Of course, this is purely interpretational, since Lexical Phonology claims very strongly that words are composed in the lexicon and not in the syntax. But if we think of levels in the lexicon as levels of syntactic attachment of affixes, we can actually say that Lexical Phonology suggests that phonological rules are limited by syntactic domains, possibly phases. Indeed, it would be a very desirable result if one could show that stress sensitive affixes can influence word stress because they are attached in the first category-forming xP above the root phrase, while stress neutral affixes cannot do that because they are attached higher than the first category-forming xP above the root, when the root phrase has already been sent to the PF. However, as we shall see below, Lexical Phonology is an idealistic and not a realistic picture of the state of affairs.

9.1.1 Problems for Lexical Phonology

In this part I present the main criticisms of Lexical Phonology from the literature. Its critics are numerous, which is not surprising given how influential this theory became in the field.

Aronoff (1976) was the first one to show that Lexical Phonology is empirically invalid, since it cannot account for a substantial portion of the English data. First, Aronoff observes that a consequence of Lexical Phonology is that stress-neutral affixes must not

appear to the left of stress-sensitive suffixes. However, stress-neutral affixes *-able*, *-ment* and *-ize* can be followed by stress-sensitive suffixes *-ity*, *-al* and *-ion*, as illustrated below.

- (49) pátentable - patentability
développement - developméntal
órganize - organizátion

The other set of exceptions of a similar sort are the so-called bracketing paradoxes, where a level 1 suffix appears to attach to the output of level 2 prefixation. For example, in the word *ungrammaticality*, the level 1 suffix *-ity* attaches to a level 2 output *ungrammatical*.²⁸

The next problem I shall discuss is concerned with the lack of consistency of certain English suffixes. Many suffixes display so-called double membership: they belong either to Level 1 or to Level 2. Take *-able* for example. It appears that in (50a) it is stress-sensitive, while in (50b) it is not. Also, the meaning for (50a) is unpredictable, while for (50b) it is compositional. For other examples of double membership see Aronoff (1976), Aronoff and Sridhar (1983), Szpyra (1989) and Giegerich (1999).

- (50) a. cómparable – ‘roughly the same’
b. compáritable – ‘to be able to be compared’

The problem that double membership poses for Lexical phonology is that a large number of affixes fail to serve unambiguously in defining the levels of word formation, which is the strongest appeal of Lexical Phonology.²⁹

The last criticism discussed here comes from Fabb (1988). Fabb attacks Lexical Phonology from the other side – he does not provide new examples of combinations that occur but should not, but instead looks at properties of affix combinations that in principle should occur given Lexical Phonology but appear not to. Siegel (1974), whose work is the cornerstone of this theory, claims that if we combine the usual category-based selectional restrictions holding for affixes with the ordering of affix subsets, we can correctly predict which pairs of affixes exist and which do not exist. Fabb shows that the Siegel approach fails

²⁸ A solution to this problem is offered in Pesetsky (1985).

to rule out a large number of affix pairs that do not exist – Lexical Phonology predicts these combinations to be possible.

Let us briefly summarize Fabb's argumentation. Fabb calculates that given the number of affixes in English, there should be 1849 potential suffix pairs. The restrictions as to categorial selection cut this number down to 614. Level ordering, i.e. the impossibility of a level 2 affix embedded under a level 1 affix, cuts the number to 459 pairs, which is then the number predicted by Lexical Phonology. But in fact, there are only 50 attested pairs of suffixes, so Fabb concludes that some other constraint distinct from level ordering must apply.

The conclusion that Fabb reaches is that level ordering cannot possibly predict the range of possible suffix pairs, but that this can be achieved by suffix selection in the following ways: some suffixes never attached to an already suffixed word (e.g. deverbal *-age*), some suffixes attach to only one particular suffix (e.g. *-ary* to *-ion*), some suffixes have only part-of-speech restrictions but otherwise attach freely (e.g. *-able*) and some suffixes are only semi-productive (e.g. *-ion*). Therefore, the possible pairs of affixes can be predicted solely by selectional restrictions that affixes have: 1) categorial selection, 2) whether they attach to a suffixed word at all and 3) whether they select for some specific affix. One of the strongest arguments for level-ordering, i.e. that it makes predictions about occurring and non-occurring affix pairs in English, can thus no longer stand. See also Plagg (1999).

9.2 Halle and Vergnaud (1987)

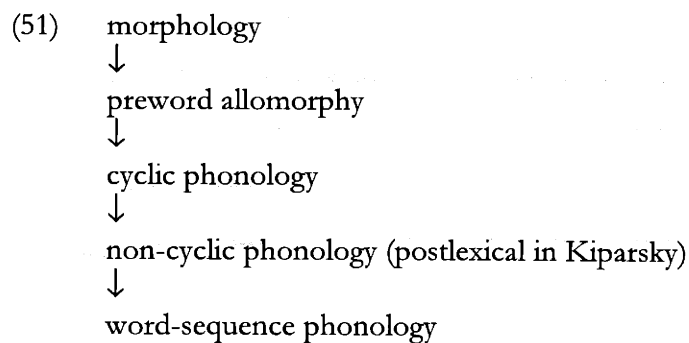
Halle and Vergnaud (1987), Mohanan (1985), Halle and Mohanan (1985), are theories that borrow many concepts from Lexical Phonology, but are fully aware of its faults. In this work I chose Halle and Vergnaud (1987) as a representative of such theory of phonology and morphology. Its basic tenets are as summarized in the five points below.

- There are no levels of affixation; the information whether an affix is dominant or recessive for stress is not encoded in the order of affixation, but by diacritic marking on affixes.

²⁹ This question is extensively discussed in Giegerich (1999), where the conclusion is that affix-driven lexical stratification cannot be sustained.

- It has been observed that in many languages affixes fall into two major classes with respect to their interactions with the rules of phonology, e.g. in English some affixes are stress-sensitive while others stress-neutral. Halle and Vergnaud adopt Halle and Mohanan's (1985) claim that these distinctions correspond to the distinction between cyclic and non-cyclic affixation. For example, Tri-Syllabic shortening is triggered by stress sensitive suffixes (*-ity, divinity*), but not by stress-neutral suffixes (*-hood, maidenhood*).
- Therefore, affixes are marked as +/- cyclic, which means that they either trigger the rules in the cyclic component or not, respectively. Note the difference in the notion of 'cyclicity' between Halle and Vergnaud (1987) and Kiparsky (1982) (as in (48)).
- There are two components in morphology, a cyclic and a non-cyclic one, each containing a set of rules. A specific rule can be a member of both blocks.
- First the word is built. Then the rules apply from inside out. Cyclic rules apply every time they are triggered by a cyclic affix. Non-cyclic rules apply once only at the point when the last suffix is added.

The model can be represented as below.



This theory has many advantages over Lexical phonology. First, it practically does away with all the problems that the latter had. Since there is no level ordering and all the information on what rules should be triggered is encoded on the affixes themselves instead in the order of attachment, there is no problem with bracketing paradoxes (*ungrammaticality*) or level 2 affixes embedded in level 1 affixes (*governmental*).

However, Halle and Vergnaud (1987) suffers a big disadvantage in comparison to Lexical Phonology. Namely, if we give up the role of affix ordering completely, then the

theory of phonology and morphology becomes largely unrestricted and all the work is done by the properties of affixes and none by the syntactic structures of words.

9.3 Phase/SPE Approach between Kiparsky and Halle&Vergnaud

In this section I shall try to place the analysis advocated in this work with respect to the two approaches summarized above. This will be done by schematically comparing the main points of the three views, showing that the phase/SPE view falls between the Halle and Vergnaud and the Lexical Phonology approaches. From Halle and Vergnaud (1987), it adopts the notion that affixes carry the information about which block of rules they trigger, at the same time relating to Lexical Phonology in the sense that part of the interaction between morphology and phonology follows from the syntactic structure of words, if we think of 'syntactic structure' as being parallel to 'level ordering'.

Schematically, the three approaches can be represented as follows.

Lexical Phonology:

- There exist building blocks (morphemes) with selectional specification relating to category.
- There exist rules of phonology, e.g. Main Stress Rule. Some of these rules are cyclic (can reapply), some non-cyclic (apply only once in the derivation).
- There exist a structure in which the blocks are inserted. Specific positions in the structure (levels) are associated with specific building blocks and with specific phonological rules.

Therefore:

- Position in the structure = Set of affixes in that position = Rules applying in that position.
- *-ity* is stress-sensitive because it is found in the position in the structure (level 1) that precedes and can therefore interact with the MSR; *-ness* is stress-neutral because it is found in a position (level 2) that follows the MSR and therefore no interaction between the two is possible. Why *-ity* is found at level 1 and *-ness* at level 2 is not relevant.

Halle and Vergnaud:

- There exist building blocks (morphemes) with selectional specification, including categorical specification and specification as what set of rules they trigger.
- There exist two blocks of phonological rules, the cyclic block (including MSR) and non-cyclic (e.g. Vowel Reduction Rule).
- There is no structure in which the building blocks are inserted in the sense that it would have an effect on/define the behavior of the building blocks. The latter is decided exclusively by the diacritic markings on the building blocks as to where they can be inserted and what rules they can trigger.

Therefore:

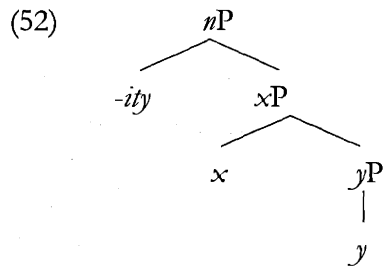
- The notion of 'the position in the structure' in terms of Lexical Phonology is replaced by the diacritic marking on the building blocks.
- *-ity* is stress-sensitive because it is marked as [+cyclic] in the lexicon and thus triggers the MSR (which is a cyclic rule); *-ness* is stress-neutral because it is marked as [-cyclic] and therefore does not trigger the MSR.

Phase/SPE Approach:

- There exist building blocks (morphemes) with selectional specification, including categorical specification and specification as what rules they trigger.
- There exists a set of phonological rules.
- The structure in which the building blocks are inserted can to a certain extent define the behavior of the building blocks. Chunks of words are spelled out in phases and a building block can affect the spell-out of a chunk only if the latter has not already been spelled out in a phase.

Therefore:

- The notion of 'the position in the structure' in terms of Lexical Phonology is replaced partly by the diacritic marking on the building blocks and partly by the mechanism of phase spell-out.
- *-ity* is stress-sensitive because it is marked as [+cyclic] in the lexicon and thus triggers the MSR; *-ness* is stress-neutral because it is marked as [-cyclic] and therefore does not trigger the MRS. However, the potential of *-ity* to change the pronunciation of a certain chunk of word depends on its attachment position. In the tree below, the rules that *-ity* triggers can change the pronunciation of *x*, but not *y*.



CHAPTER 4: THE STRUCTURE AND STRESS OF SLOVENIAN NOMINALIZATIONS

1 Introduction

This chapter is an analysis of Slovenian participial nominalizations arguing for two points: first, participial nominalizations share a syntactic structure with verbal environments – they are examples of nominalizing heads attaching to participial forms. And second, the Spell-Out of nominalizations proceeds in phases defined by category-forming heads; a cyclic Spell-Out is reflected in their stress pattern.

As to the syntactic structure of nominalizations, I shall defend the proposal that a group of Slovenian nominalizations displays participial morphology, which therefore occurs in both verbal and nominal environments. To illustrate the claim with an example, consider (1) and (2).

- (1) a. Janez je **plaval** v reki.
John is swim-*/Ptc.*-imp in river
'John swam in the river.'
- b. **plavalec** 'a swimmer'
- (2) a. Razstava je bila **odprta** ob osmih.
Exhibition is been open-*(e)n/t-Ptc* at eight
'The exhibition was opened at eight.'
- b. **odprtje** (razstave)
'the opening (of the exhibition)'

(1a) is an instance of the */*-Participle (traditionally called the Past Participle) found in a verbal environment, while (2a) is an instance of the *(e)n/t*-Participle (traditionally called the Passive Participle) in a verbal environment. Now consider (1b) and (2b), the nominalizations related

to (1a) and (2a). In this work I wish to defend a proposal in which the nominalizations in (1b) and (2b) are related to (1a) and (2a) in that they involve participial heads in their structure, followed by nominalizing heads realized by the affixes *-ec* and *-je* respectively.¹ In previous accounts, such examples are analyzed as involving a root followed by affixes *-alec* and *-tje* instead, while the overlapping participial morphology is taken as a coincidence.

And second, I shall defend the claim that participial nominalizations such as (1b) and (2b) display phenomena that are syntactic in nature. My claim will be that differences in the stress pattern between the two nominalizations and the participles they are derived from are a result of differences in the structure of these two nominalizations. Specifically, the stress pattern of such nominalizations argues for the presence of phases and phase spell-out at category-forming phrases. The data that the proposal will focus on is here illustrated in Table 1, with the main observation being that in *l*-Participle nominalizations stress always falls on the pre-nominalizer syllable, regardless of its position in the *l*-Participle (the leftmost two columns), while in *(e)n/t*-Participle nominalizations the stress is in the same position as it is in the *(e)n/t*-Participle (the rightmost two columns).

Table 1

<i>l</i> -Participle	Nominalization in - EC	<i>(e)n/t</i> -Participle	Nominalization in - EC
plával ‘swim’	plaválec , *plávalec	pítan ‘feed’	pítanec , *pitánec
dřsal ‘skate’	dřsálec , *dřsalec	oběšen ‘hang’	oběšenec , *obešēnec
moríl ‘murder’	morílec	obdarován ‘give’	obdarovánec

The chapter will be organized as follows. Section 2 is devoted to the analysis of the morphosyntax of the *l*-Participle and *(e)n/t*-Participle. In Section 3 I examine the structure of participial nominalizations, arguing that in cases such as (1b) and (2b) participial morphology is default morphology inserted in the participial nodes present in the nominalizations. In

¹ There are other participial nominalizations in the language that will be discussed later; however, for expository reasons I limit myself only to these two at this point.

Section 4 I present an analysis arguing for phases in word formation, featuring stress properties of participial nominalizations.

2 The Morphosyntax of Slovenian Participles

Before an analysis of participial nominalizations can be offered, one should consider the structure and semantic features present on participles in verbal environments. In this section I therefore state the assumptions as to the morphosyntax of Slovenian participles and then analyze verbal environments in which these participles appear, namely compound tenses and the passive voice. I begin with the *l*-Participle and the formations it appears in, showing how the vocabulary item /l/ realizing the participial node has to be a default vocabulary item. My analysis is in line with similar research by Embick (2000) for Latin and Ippolito (1998) for Italian. Then I proceed to *(e)n/t*-Participle, showing how the vocabulary item /(e)n/t/ is a realization of the Passive node, which is either an adjectival node dominating a root in ‘adjectival passives’ or a Passive node dominating a passive *vP*, Marantz (2001).

2.1 *L*-Participle (Past Participle)²

L-Participle is a participle that appears in Slovenian compound tenses and conditional sentences. Compound tenses are formed by the auxiliary ‘be’ and the *l*-Participle of the main verb. The finite auxiliary agrees with the subject in number and person, while the participle (of the main verb or the auxiliary) agrees with the subject in gender and number. The conditional is formed by the non-agreeing conditional particle *BI* and the *l*-Participle showing gender and number agreement with the subject. All formations that include the *l*-Participle are given in (3); the agreement is boldfaced.

² I call this participle the *l*-Participle to reflect the Vocabulary Item that realizes the participle head. In the parenthesis I give the traditional name ‘Past Participle’, which is used by various grammars because this participle appears in the Past Tense. Given that the same participle appears in the Future and Conditional, a fact not taken into account by those grammars, one could just as well call it the Future or the Conditional Participle. Therefore I decided not to use the name ‘Past Participle’ and use the name *l*-Participle instead. For a discussion of a similar issue in Latin see Aronoff (1994).

- (3) a. Past Tense/Present Perfect³
- | | | |
|--------------------|-------------------------|------------------------|
| sem | delala | 'I was working' |
| be-pres/1sg | work-/Ptc-sg/fem | |
- b. Pluperfect
- | | | | |
|--------------------|-----------------------|-------------------------|-----------------------------|
| sem | bila | delala | 'I had been working' |
| be-pres/1sg | be-/Ptc-sg/fem | work-/Ptc-sg/fem | |
- c. Future
- | | | |
|-------------------|-------------------------|----------------------------|
| bom | delala | 'I will be working' |
| be-fut/1sg | work-/Ptc-sg/fem | |
- d. Conditional
- | | | |
|--------------|-------------------------|-----------------------------|
| bi | delala | 'I would be working' |
| would | work-/Ptc-fem/sg | |

My proposal is couched partly in a general framework of the syntax and morphology of compound tenses, proposed by Giorgi and Pianesi (1997), and partly in Ippolito's (1998) view of compound and simple tenses, including Halle and Marantz's (1994) view on agreement.

To begin with, in Slovenian agreement and tense are never bundled together, which means that the feature scattering principle, quoted here in (4), holds in its strongest version: each feature must head a projection.

- (4) Feature Scattering Principle:
Each feature can head a projection

Giorgi and Pianesi (1997)

³ In Slovenian a form such as in (3a) can denote both the Past Tense and the Present Perfect, the latter in the case the grammatical aspect of the verb is perfective. (3a), being imperfective, therefore has only the Past Tense interpretation.

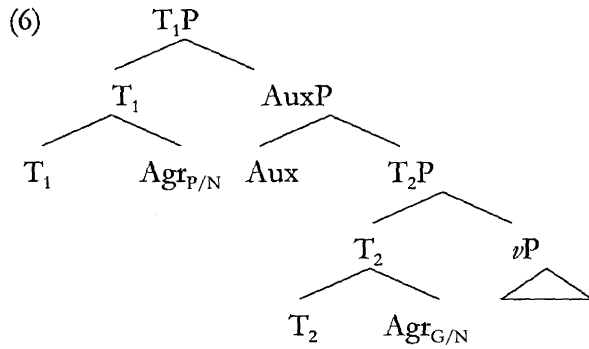
As to the agreement node - I adopt Halle and Marantz (1994) proposal that agreement nodes are not present in the syntax, but are rather a morphological phenomenon, merged in the post-syntactic component after the agreement features of the subject are copied onto them.

The next assumption with respect to compound tenses from Giorgi and Pianesi (1997) is the Reichenbachian theory of tenses, based on entities S (utterance time), E (event time) and R (reference time), and the binary relations between them, simultaneity (e.g. the time of Speech is simultaneous with the time of the Event: S, E) and precedence (e.g. the time of Speech precedes the time of the Event: S_E). These combinations result into a relatively limited inventory of tenses, as in (5).

(5) present:	$(S, R) \bullet (R, E) = S, R, E$
past:	$(R_S) \bullet (E, R) = E, R_S$
future:	$(S_R) \bullet (R, E) = S_R, E$
present perfect:	$(S, R) \bullet (E_R) = E_S, R$
future perfect:	$(S_R) \bullet (E_R)$
past perfect:	$(R_S) \bullet (E_R) = E_R_S$
future in past:	$(R_S) \bullet (R_E)$
proximate future:	$(S, R) \bullet (R_E) = S, R_E$
distant-future:	$(S_R) \bullet (R_E) = S_R_E$

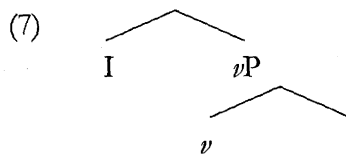
Hornstein (1990), Giorgi and Pianesi (1997)

Giorgi and Pianesi propose that these temporal relations are incorporated in two syntactic heads, the tense heads T_1 and T_2 . T_1 , the structurally higher head lexicalizes the tense relation S/R, while T_2 , the lower head, lexicalizes the relation E/R. T_1 , the tense head immediately dominated by C hosts temporal features, while the lower head T_2 hosts temporal and aspectual features. The basic tree of a compound tense thus looks as in (6).



I assume Giorgi and Pianesi's view in that temporal heads incorporate the basic S, R, E relations and that (6) is the basic tree for compound tenses. However, I am loosening the requirements on what Reichenbachian features T_1 and T_2 can host. In my view T_1 and T_2 can host any combination of S, R, E, while the difference between the two heads is that T_1 is followed by person/number agreement, while T_2 is followed by gender/number agreement.⁴

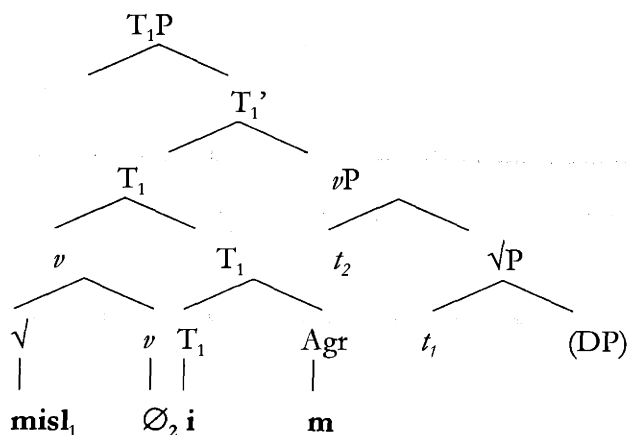
As to the syntax and morphology of simple and compound tenses I shall be working with Ippolito's (1998) analysis. Her claim is that for every ν given in the numeration, an inflectional head must be given, too, and that overt ν -to-I movement, Pollock (1989), concerns the first inflectional head c-commanding ν P. In a sentence the minimal piece of structure is as in (7), where I stands for either T_1 or T_2 from the tree above.



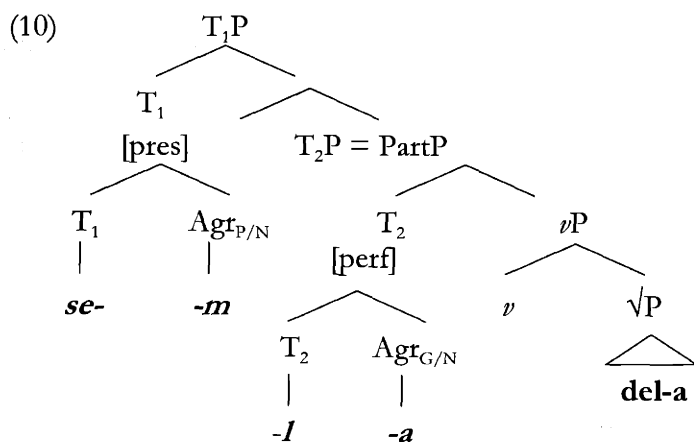
Any extra inflectional projection is added to the structure above and if there is agreement added to the lower inflectional head (T_2 P), movement to the higher inflectional head (T_1) does not occur. As a consequence, the T_2 P surfaces as a participle, while an auxiliary is inserted in the node immediately dominated by T_1 , because it is a morphological well-formedness requirement that each inflectional head has a verb as its sister. Both insertion of agreement and morphological merger are operations at Morphological Structure (MS).

⁴ I am actually not fully aware of all consequences of such a proposal – at this stage it is rather tentative. It seems that I have to assume something along these lines, because the T_2 head in Slovenian participial nominalizations hosts the S, R relation with an open E variable, as will be shown later (Section 3.2.1.1). But in Giorgi and Pianesi, T_2 can host only E/R relation.

- (9) The Present Tense of Slovenian Verb after Syntax and Morphology, feature on T [S, R, E]



As an example of a compound tense, let us consider the Present Perfect/Past Tense. In that tense, there are two features relating to tense: [S,R] and [E_R].⁸ Given that they cannot be bundled together each of the two should be hosted by its own functional head. Therefore, we obtain the syntactic structure in (10), where the agreement on the lower inflectional head T_2 prevents the merger of v with T_1 and consequently forces the formation of a synthetic tense as in (9) above. Instead of merger, an auxiliary will be inserted into T_1 (with the $\text{Agr}_{P/N}$ adjoined at MS).



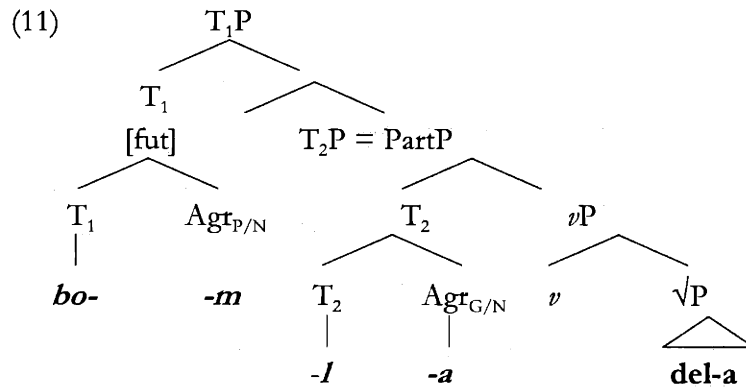
⁸ Maybe the feature [perf] is not really the right feature for T_2 head in Slovenian, but I shall assume it is correct for the purpose of illustration.

se-m dela-l-a

be-pres-agr_{P/N} work-l-agr_{G/N}

Reichenbachian relations: on T₁: S, R = [pres]; on T₂: E_R = [perf]

We now proceed to Vocabulary Insertion. In the framework of DM, vocabulary items compete to fill terminal nodes. If we assume there is a structural distinction between T₁ and T₂ – T₁ is immediately dominated by C – then the list of items competing for T₁ can differ from those competing for T₂. The auxiliaries and the Present Tense will be competing for T₁, and the vocabulary item /l/, which surfaces in /-Participles, for insertion into T₂. However, it cannot be that the vocabulary item /l/ is consistently inserted in T₂ position with features [E_R] as one could conclude given the Present Perfect/Past Tense. Consider the Future Tense in (11).



bo-m dela-l-a

be-fut-agr_{P/N} work-l-agr_{G/N}

Reichenbachian relations: on T₁: S_R, on T₂: R,E

The feature on T₁ is [fut] and the vocabulary item inserted in that position is *bo*, the future form of the auxiliary verb *biti*, ‘be’ (followed by person and number agreement). The features on the participial head T₂, however, are not the same as in the Present Perfect, where they express ‘anteriority’ (R_E). If they were the same, this compound tense would express the meaning of ‘future perfect’. But the compound tense we call the Future is mostly just simple future and not future perfect. It *can* acquire the future perfect meaning, but only through the

interaction with grammatical aspect – only perfective verbs in combination with an adverb such as ‘already’ will allow for a future perfect reading (12c).

- (12) a. Jutri ob dveh bom pojedla jabolko.
 Tomorrow at two will eat-pf apple.
 ‘Tomorrow at two I will eat-pf an apple/*will have eaten’
- b. Jutri ob dveh bom jedla jabolko.
 Tomorrow at two will eat-imp apple
 ‘Tomorrow at two I will be eating an apple.’
- c. Jutri bom do dveh *(že) pojedla jabolko.
 Tomorrow will till two already eat-pf apple
 ‘Tomorrow by two I will *(already) have eaten an apple.’

Therefore, the vocabulary item /l/ inserted in T_2 cannot have any specific tense feature if it is to be inserted in T_2 nodes with different (non-overlapping) features. It must rather be the case that /l/ is a default realization of the participle-forming head (which itself has temporal and aspectual features), itself underspecified for features relating to tense and aspect. This way it will be possible for it to be inserted in participial heads with different temporal features. The more specified item /oč, eč/, the other item competing for insertion in T_2 , will be inserted when T_2 is specified for feature [pres]. The latter VI is given here only for expository reason; I do not wish to go into detail about what the right semantics of the /oč, eč/participial form is.

- (13) Vocabulary insertion in T_2
 /l/ ↔ []

For a similar point see Aronoff's (1994) discussion of the Future Participle in Latin, Embick (2000) for Latin and Ippolito (1998) for Italian.

2.2 (E)n/t-Participle (Passive Participle)

This section is devoted to laying out the assumptions about the other of the two participles that I shall claim occurs in both nominal and verbal environments, the (e)n/t-Participle. This participle appears in the formation of the Passive Voice and shows an allomorphy between Vocabulary Items /n/, /en/ and /t/, hence the name (e)n/t-Participle. I assume that these VIs are default realizations of the node Pass, which does not always host the same features.⁹

Any discussion of passive participle must take into account the difference between adjectival and verbal passives. Here, I adopt an analysis in which adjectival passives involve an attachment of the passive morpheme to the root, with no verbalizing head *v*. Verbal passives, on the other hand, involve attaching the passive morpheme above a *v*P. See Marantz (2000), Kratzer (1993), Embick (2000) for a detailed account and arguments for such an analysis. The features on Pass in the case of adjectival passive are [Stat], relating to the meaning, Embick (2000); and [a], a feature relating to category and reflected in the fact this passive is an adjective. Pass in the verbal passive hosts features [-Ext] (reflecting the impossibility of an external argument) and [+AG] (reflecting the possibility of expressing an implicit agent). For a more detailed discussion of features on Pass the reader is referred to Chapter 2, Section 2.3. The two structures are as in Table 2. The gender/number agreement with the derived subject is inserted at MS as part of morphological well-formedness condition.

Table 2

Adjectival Passive: Pass directly to the root	Verbal Passive: Pass above little <i>v</i>
<pre> graph TD PassP --> Pass1[Pass [Stative]] PassP --> vP1[vP] Pass1 --> Pass2[Pass] Pass1 --> AgrG_N1[Agr_{G/N}] vP1 --> Arrow1[↓] </pre>	<pre> graph TD PassP --> Pass1[Pass] PassP --> vP1[vP] Pass1 --> Pass2[Pass] Pass1 --> AgrG_N1[Agr_{G/N}] vP1 --> v[v] vP1 --> vP2[vP] vP2 --> Arrow2[↓] </pre>

(14) Vocabulary insertion in Pass

/t/ ↔ [Pass] /_List (root verbs (class Ø) ending in a sonorant (v, j, r, l, m, n))

/n/ ↔ [Pass] /_{class -ā and class -ē verbs}

/en/ ↔ [Pass]

Later when we analyze Slovenian participial nominalization, we shall see another environment where the VIs above are a default realization of Pass with yet different features from the Pass node in verbal and adjectival passives.

3 Slovenian Participial Nominalizations

In this section I shall argue that Slovenian displays several classes of nominalizations (some exemplified in (1-2)) that involve participial morphology as default insertion into participial nodes T_2 or Pass. I shall refer to such nominalizations with the term ‘participial nominalizations’. The claim will be that nominalizations involving *l*-Participle and *(e)n/t*-Participle in their structure appear in the four configurations below. In my analysis I rely on a comprehensive collection of nominalization data in Stramljič Breznik (1999), Toporišič (2001), and SSKJ (Dictionary of Contemporary Standard Slovenian).

There are two types of *l*-Participle nominalizations, differing in the presence or absence of the verbalizing head. In Type 1, which contains a verbalizing head, the nominalizer is inserted in the Spec of νP ; in Type 2, which is without a νP , the nominalizing affix is inserted in the position immediately dominating T_2 .

(15) ***l*-Participle Nominalizations**

Type 1: drsalec ‘a skater’

Type 2: drsališče ‘a skating rink’

 rezilo ‘a blade’

⁹ It would be desirable if vocabulary items */(e)n/t/* and */l/* were both competing for the same node, possibly T_2 . However, I could not make such a proposal work and therefore decided to propose two participial heads, T_2 , hosting temporal features, and Pass, hosting features relating to external agent or stativity in adjectival passives.

Table 3

Type 1	Type 2

Nominalizations containing the *(e)n/t*-Participle are also of two types. In Type 3, Pass is a node above a *v*P with the nominalizer attaching to the position immediately dominating Pass. In Type 4, the functional node Pass is an adjectivizing node attaching to a root phrase, immediately dominated by the nominalizer.

(16) *(e)n/t*-Participle Nominalizations

Type 3: mešanje 'mixing'

Type 4: mešanec 'a hybrid'

Table 4

Type 3	Type 4

In the next few sections I shall offer arguments for the specific analysis of participial nominalizations summarized above. They will be organized in the following groups.

- i) I shall argue that nominalizations such as the above do indeed contain participial morphology (section 3.1)
- ii) I shall argue that nominalizations such as the above display properties of the T₂/Pass heads they contain, reflected in their meaning (section 3.2)

3.1 The Morphology of Participial Nominalizations

In this section I shall argue that the nominalizations in (1-2) are indeed participial and not root nominalization. In contrast, the ‘traditional’ school of Slovenian grammar, represented by Toporišič (2001) and Stramlič Breznik (1999), analyzes the formations in question quite differently. Take the examples of *l*-Participle in (17).

(17)	Column 1	Column 2	Column 3	Column 4 ¹⁰
	plavalec ‘a swimmer’	morilec ‘a murderer’	preživelec ‘surviver’	pivec ‘drinker’
	dvigalec ‘a lifter’	gasilec ‘a fireman’	vrelec ‘boiler’	pevec ‘singer’

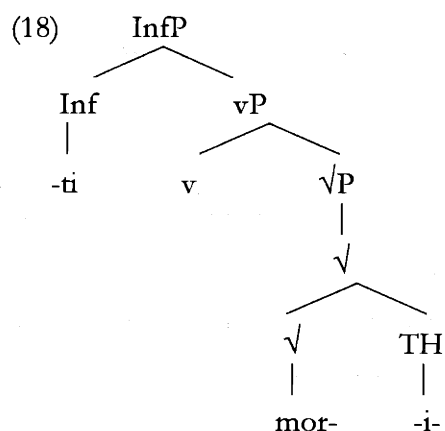
In the ‘traditional approach’ these examples are analyzed as involving affixation of different suffixes: *-alec* in column 1, *-ilec* in column 2, *-elec* in column 3 and *-vec* in column 4. However, compare the above nominalizations with the corresponding *l*-Participles and the Infinitive (VI /ti/).

Table 5

	plav-aj ‘swim’	čes-a ‘comb’	mor-i ‘murder’	vr-e ‘boil’	pej-Ø ‘sing’
<i>l</i> -Participle	plaval	česal	moril	vrel	pel
Nom (agent)	plavalec	česalec	morilec	vrelec	pevec
Infinitive	plava-ti	česa-ti	mori-ti	vre-ti	pe-ti

¹⁰ In these nominalizations, the participial VI /l/ surfaces as /v/. In fact, the pronunciation of the participle in –l is /w/, when the consonant /l/ is not followed by a vowel. It seems that in a group of nominalizations, /l/ in front of a vowel surfaces as /v/, mostly in the zero theme class and a few others: *delavec*, ‘worker’ etc. In some words, both /v/ and /l/ are possible, though /l/ is the preferred one and /v/ felt as obsolete: *?bravec* vs *bralec*, ‘a reader’.

The crucial observation is that the overlapping morphology between the /-Participle and the nominalization is not only the participial /l/, but also the vowel preceding it, which equals the vowel found in verbal forms, such as the Infinitive. This vowel is in the literature called a theme vowel and is a piece of morphology that carries no syntactic information, such as agreement or case, and makes no contribution to meaning. The theme vowel appears solely for morphological reasons and is part of the morphological well-formedness of words in Slovenian (and many other languages). Each verb must have a theme, the choice being dependent on the root. In Slovenian there are five theme vowels, *aj*, *i*, *a*, *e* and \emptyset and these five theme vowels appear in all the three forms in question, as seen from the chart above.¹¹ For more on theme vowels and verb morphology the reader is referred to Chapter III. Taking into account the presence of a theme vowel, the structure of the infinitive *moriti*, 'to murder' is thus as in (18). I assume that the theme adjoins to the root.¹²



Similarly, the /-Participle can be morphologically decomposed as in (19).

¹¹ There are some phonological rules that obscure the facts as shown in the table that I do not want to go into at this point. For example, in class *-aj*, /j/ is lost in the participle and infinitive, because these two endings are consonantal and /j/ is deleted before a consonant. The same phonological process occurs in the root *pej-* 'sing'.

(19) The morphology of *l*-Participle:

root-theme vowel- participle – (agreement)

plav - a(j)	-l	- Ø	<i>l</i> -Participle of ‘swim-masc/sg’
mor- i	-l	- Ø	<i>l</i> -Participle of ‘murder-masc/sg’

If nominalizations above are described as involving four different affixes *-alec*, *-ilec*, *-elec* and *-l/vec*, then the overlapping of the morphology, namely the theme vowel and participial VI, is a coincidence. Moreover, the *-ec* nominalizer in those four affixes is not in any way related to (apparently) the same nominalizer *-ec* in root formations such as in (20).

(20) a. bor- ‘fight-’	→ borec	‘a fighter’
b. ved- ‘know-’	→ vedec	‘a knowledgeable person’
c. jed- ‘eat-’	→ jedec	‘an eater’

This leads to positing five different VIs that act as nominalizers and missing important generalizations that follow if we assume only one nominalizing affix *-ec*, while allowing the nominalizing head to attach to different structures – either roots or participles.

The argument is even clearer for *(e)n/t*-Participle. On top of overlapping with verbal morphology (participial morphology and themes), this participle involves allomorphy and the same allomorphs that appear in the participle are observed in the nominalization, as seen from (21).

(21) <i>(e)n/t</i> -Participle	JE nominalization
plavan ‘swim’	plavanje ‘swimming.’
dvigan ‘lift’	dviganje ‘lifting’
odprt ‘open’	odprtje ‘opening’
sprejet ‘accept’	sprejetje ‘accepting’

¹² But see Oltra who argues that theme is adjoined to every functional head in Catalan. In Slovenian that is not the case – while one could argue that themes are adjoined to category-forming heads, it is not the case that they are adjoined to any other functional head, such as Tense heads (T₁, T₂), Aspect or Passive.

As with the *l*-Participle, the theme vowel morphology and participial morphology overlap completely in the participle and the nominalization, as seen from the chart below.

Table 6

	plav-aj 'swim'	čes-a 'comb'	mor-i 'murder'	vr-e 'boil'	pej-Ø 'sing'
<i>(e)n/t</i> -Participle	plavan	česan	morjen ¹³	vret	pet
Nom (act)	plavanje	česanje	morjenje	vretje	petje
Infinitive	plava-ti	česa-ti	mori-ti	vre-ti	pe-ti

So, if we posit the existence of many different affixes *-anje* and *-etje, -tje*, as is done in the traditional approach, we are missing a generalization: *-je* nominalizations are built by nominalizing the *(e)n/t*-Participle form.¹⁴

3.2 The Meaning and Structure of Participial Nominalizations

In the previous section I showed how the pieces of morphology found in participial nominalizations indeed correspond to pieces of morphology in participles (*l*- and *(e)n/t*). In this part I would like to lay out further arguments that support the claim that participial nominalizations contain participial heads: the structures proposed in Tables 4 and 5 for the nominalizations are justified also in terms of their meaning. I shall first offer an analysis of meaning for

l-Participle nominalizations and then for *(e)n/t*-Participle ones. In section 3.4 I will round up Section 3 by commenting on the meaning of root nominalizations.

¹³ Here there is some phonology going on: /i/ [VI for theme]+ /en/ [VI for Pass] → /jen/

¹⁴ Toporišič and Stramljič Breznik have speculated that these nominalizations might contain a Passive Participle.

3.2.1 L-Participle Nominalizations

3.2.1.1 Agentive L-Participle Nominalization (Type 1)

Let us start with Type 1 L-Participle nominalization, repeated here in (22). Up to now I only provided examples of nominalizations where the nominalizer is the masculine singular *-ec*.¹⁵ However, such nominalizations are possible also with the feminine variant *-k* and the neuter variant *-Ø*, which then appear in their singular, plural and dual variants in all six cases.¹⁶ In this paper, I will use the masculine singular nominative as the representative case.

(22)

MASCULINE	FEMININE	NEUTER
plavalec 'a swimmer'	plavalka 'a swimmer'	gobezdalo 'a babbler'
dvigalec 'a lifter'	dvigalka 'a lifter'	rezalo 'a cutting device'
morilec 'a murderer'	morilka 'a murderer'	strašilo 'a scarecrow'
brusilec 'a sharpener'	brusilka 'a sharpener'	brusilo 'a sharpening device'

These nominalizations have an entirely predictable meaning, namely they denote the “external argument” of the event denoted by the root. An “external argument” can either have the meaning of “agent” as in (23) or of “instrument” as in (24).¹⁷

¹⁵ To be more specific, the vowel in /ec/ is a yer that surfaces as /e/ only in the nominative singular, when followed by another yer. However, I shall keep referring to it as /ec/ for the sake of simplicity.

¹⁶ The nominalizers are specified for gender (*ec* for masculine, *k* for feminine, *Ø* for neuter), and are as all nouns followed by a case/number ending. So, in *plavalec*, ‘swimmer’, *-ec, ec* is the nominalizing affix, followed by the zero case/number ending (a yer in fact), in *plavalka*, ‘swimmer-fem’ *-k* is the affix, while *-a* is the singular/nominative ending. In *rezalo*, ‘cutting device’, the nominalizing affix is *Ø*, while *-o* is the singular/nominative ending.

¹⁷ The other meaning of “external argument” that could in principle be possible is “experiencer”. It turns out, however, that nominalizations of that meaning are not found in the language. I attribute the impossibility of experiencer nominalization to the fact that the verbs of the “subject experiencer” – “object experiencer” pairs require *SE* when the subject is an experiencer. Below I give examples of *be angry* and *frighten* with subject experiencer in (i) and an object experiencer in (ii).

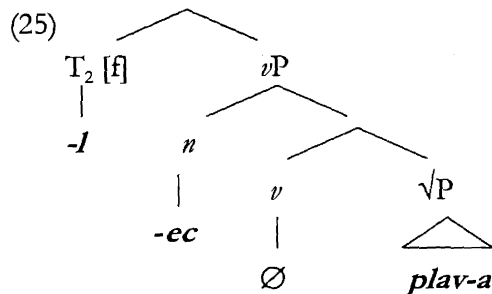
(i) Janez se je prestrašil/jezil.
John-nom *SE* is frightened/was angry
‘John was frightened’, ‘John was angry’

(ii) Janeza je prestrašila nevihta/ Janeza je razjezila nevihta.
John-acc is frightened storm-nom/John-acc is angered storm-nom

- (23) a. *plavalec/ka* = the (masc/fem) agent of the swimming event
 b. *dvigalec/ka* = the (masc/fem) agent of the lifting event
 c. *morilec/ka* = the (masc/fem) agent of the murdering event
 d. *brusilec/ka* = the (masc/fem) agent of the sharpening event

- (24) a. *rezalo* = the thing that is the instrument performing the cutting event¹⁸
 b. *brusilo* = the thing that is the [-human] agent of the sharpening event

I propose that the predictability of “external argument” meaning follows from the structure in which the nominalizer is inserted; specifically, I would like to suggest it be inserted in the external argument position, the specifier of the verbalizing head *v* in the structure (25).



This proposal has an immediate prediction: ergative and transitive verbs have an external argument position, while unaccusative verbs do not. Therefore we expect the former to be able to form *l*-Participle nominalizations, while the latter should be incapable of doing so. This prediction indeed holds; no *l*-Participle nominalizations are available with unaccusative verbs, as seen from (26).

The storm frightened/angered John.

This suggests that in the subject experiencer verbs, the experiencer is not an external argument.

¹⁸ The meaning “instrument” is mostly found with nominalizations of the neuter gender. However, it is possible that neuter variants refer to the meaning “agent”, only that the meaning involves emotional coloring. For example, if somebody is cutting vegetables really fast, I can say: wow, you are a real *rezalo* ‘a cutting device’. Also, there is a group of neuter nominalizations that refer to human agents, but have a pejorative meaning, e.g. *gobezdalo* ‘a babbler’, *blebetalo* ‘a babbler’, etc.

- (26) a. *prijajalec ‘an arriver’
 b. *umiralec ‘a dier’

Even clearer examples are given in (27-28).¹⁹ In Slovenian, there are many deadjectival inchoative-causative pairs of verbs differing in the theme vowel, *ī* for the causative, *ē* for the inchoative. The inchoative verb does not project an external argument, while the causative one does. As exemplified in (27-28), *l*-Participle nominalizations are possible only with the causative variant, which confirms our prediction.

- (27) **Inchoative**
 rumeneti ‘to become yellow-inf’
l-Participle: rumenel
 Nominalization: ***rumenelec** ‘the one that becomes yellow’

Other examples: *črnelec ‘the one that becomes black’, *zelenelec, ‘the one that becomes green’, *bogatelec ‘the one that becomes rich’, etc.

- (28) **Causative**
 rumeniti ‘to make yellow-inf’
l-Participle: rumenil
 Nominalization: **rumenilec** ‘the one that makes things yellow’

Other examples: črnilec ‘the one that blackens’, zelenilec ‘the one that makes something green’, bogatilec ‘the one that makes something rich’, etc.

If the proposal is that the nominalizer occupies an external argument position, then the pattern observed in (27)-(28), otherwise unexplained, follows naturally.

We now proceed to justifying the occurrence of the verbalizing head *v* and the participial head in *l*-Participle nominalizations. It was proposed in the literature, Harley (1995), Embick (2000), etc. that the verbalizing head *v* is also a host of features relating to

eventivity; see Chapter 2, section 2.3 for the relevant assumptions. Therefore, formations containing the verbalizing head obligatorily imply an event, while root formations without a little *ν* do not.²⁰ Here, I would like to show that *l*-Participle nominalizations show an event component, using the adverbial modification test. The logic behind the test is simple: If there is an event in the nominalization, an adverbial will be able to modify it. It turns out that agentive *l*-Participle nominalizations can be modified by adverbials that refer either to the manner, time or location of the event. Note that in the examples in (29), two types of modification are possible in theory, modification of the event in the nominalization or modification of the NP. In examples (29a, b, d, e), only modification of the event is possible; modification of the NP does not make sense. In example (29c), both modifications are possible.

(29) **Modification of the event component**²¹

MANNER

a. rezalo na tanke kose

cutter on thin slices

‘the cutting device that cuts thin slices’

b. plavalec na dolge proge

swimmer on long lanes

‘a long-distance swimmer’

c. morilec s plastično vrečko

murderer with plastic bag

meaning 1 (modification of event in NP): ‘a murderer that murders using a plastic bag’

meaning 2 (modification of NP): ‘a murderer with a plastic bag on him’

¹⁹ These are clearer from the ones in (26), because in (26) one could say that perhaps *l*-Participle nominalizations are impossible for other reasons. In (27-28) we really see it is a structural issue, independent of the root or blocking etc.

²⁰ Unless the eventive meaning is consistent with the meaning of the root.

²¹ Some speakers find examples (29a, d) somewhat marginal and prefer (29c2) to (29c1), but they like (29b, e). The important thing is that these speakers notice the contrast between the modification of the *l*-Ptc

TIME

d. iztrebljevalec v enem dnevu

exterminator in one day

‘an exterminator that exterminates in one day’

LOCATION

e. sprehajalec po parku

walker on park

‘the person taking a walk in the park’

Compare the impossibility of modifying an event component of root nouns with meanings similar to those of the participle nominals, e.g. ‘a knife’, which is a kind of ‘cutting device’. In those cases the adverb cannot modify the NP because the meaning does not make any sense. However, it cannot modify the event within the noun either, because the noun does not imply an event.

(30) a. rezalo na tanke kose
cutter on thin slices
‘a cutting device that cuts thin slices’

b. *nož na tanke kose
knife on thin slices
*‘a knife that cuts thin slices’

We now move to a discussion of how temporal and aspectual properties of the *L*-Participle are structurally and semantically encoded. *L*-Participle nominalizations have two possible meanings as to the Time/Aspect frame of the “external argument” they denote. They can either denote an agent/instrument of a habitual event, or an agent/instrument of on-going event denoted by the verb. The time of the event denoted by the verb can itself be

nominalizations and the modification of non-eventive nouns, ranking the former as acceptable/marginally acceptable and the latter completely unacceptable.

in the Present, Past or Future. For example, (31) can either refer to someone that is a swimmer by profession or someone that is/was/will be swimming at some contextually determined moment.²²

(31) plavalec 'swimmer'

a. Habitual: Janez je plavalec na dolge proge.

'John is a long-distance swimmer.'

b. On-going: i) someone that is swimming now

ii) someone that was swimming

iii) someone that will be swimming

I propose that temporal properties of *l*-Participle nominalizations follow from the presence of a T_2 head in these nominalizations. This head hosts the temporal feature (S,R) and an E variable, while the actual event time E is determined contextually. The vocabulary item inserted in the Tense head is the default participial piece of morphology /l/.

Another property related to tense and aspect is that the T_2 selects verbs of imperfective aspect only – *l*-Participle nominalizations are possible only with *l*-Participles of imperfective verbs and never with those of perfective verbs, as shown below.²³

²² In the semantic literature, Musan (1995), such noun phrases are argued to have an independent temporal interpretation from the rest of the clause and dependent only on the discourse context. See their work for a detailed semantic analysis.

²³ Slovenian is a Slavic language in which aspect is a property of individual verbs, i.e. every verb carries morphologically encoded information about aspect. There are many pairs consisting of a perfective and an imperfective verb (the so-called aspectual pairs) that do not differ in lexical semantics, e.g. (1a). Many similar pairs are not really pairs – they differ in aspect and in meaning (1b). However, in any case, even if a verb does not belong to an aspectual pair, we can still determine its aspect, e.g. (1c).

(1) a. prepisati 'to copy-perf' – prepisovati 'to copy-imp'
b. pisati 'to write-imp' – prepisati 'to copy-pf', zapisati 'to write down-pf'
c. zaplavati 'to start swimming-pf'

Table 7

Imperfective INF	Nominalization	Perfective INF	Nominalization
plavati 'swim'	plavalec	preplavati	*preplavalec
sprehajati 'walk'	sprehajalec	sprehoditi	*sprehodilec
zasledovati 'follow'	zasledovalec	zaslediti	*zasledilec

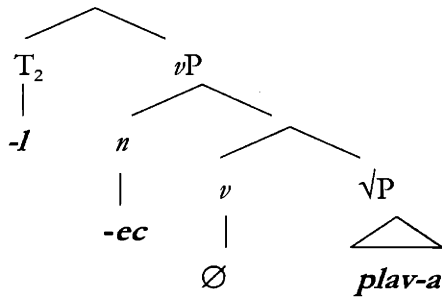
In this part I laid out the arguments for an analysis that treats agentive *l*-Participle nominalizations as involving a participial Tense head, into which a default piece of morphology /l/ is inserted, while the nominalizer /ec/ is inserted as an external argument of *v*P projection. The arguments can be summarized as follows:

1. The insertion of the nominalizer /ec/ in the external argument position is justified by two facts: the predictable and constant meaning “external argument” of these nominalizations and the impossibility of unaccusative verbs to participate in *l*-Participle nominalizations.
2. The presence of *v*P is justified by the event component of meaning in these nominalizations; the event component can be modified by adverbs of time, place and manner.
3. The presence of a Tense head is justified by the meaning of these nominalizations that point to temporal features.

3.2.1.1.1 Linearization of Agentive *l*-Participle Nominals

In the previous section, I proposed that in *l*-Participle nominalizations, the nominalizing affix realizing a little *n* head starts out in the specifier of *v*P position, as in (32).

(32) plavalec 'swimmer'



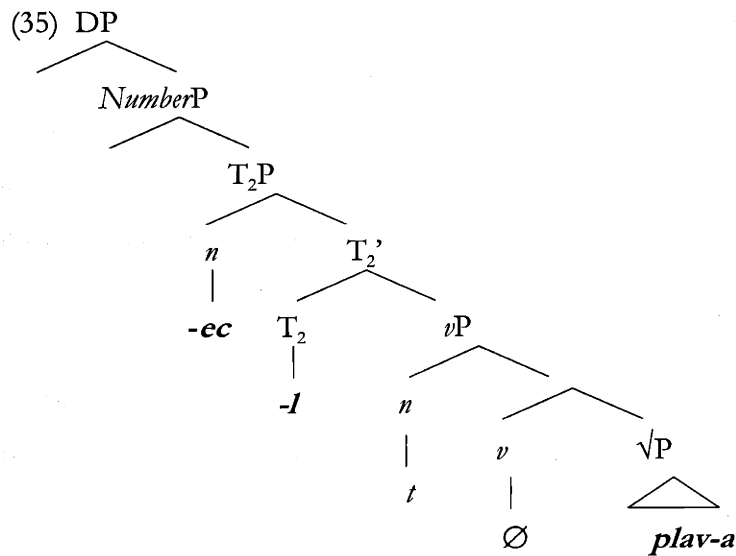
This structure, however, does not result in the correct order of the constituents. After the movement of the root to v , and then the root- v complex to T_2 , the nominalization surfaces as is (33a), while what we would like to get for 'a swimmer' is (33b).

- (33) a. *plavaecl
b. plavalec

I would like to suggest that this problem is solved by movement of the nominalizing head to the specifier position of T_2 for purposes of feature checking. That is, the temporal head T_2 host an EPP feature, which triggers the movement of n to the Spec of T_2 . As to the agreement relations, T_2 and n agree in gender. As already noted, there are three Vocabulary Items that can be inserted into the n node. They differ in gender: /ec/ is masculine, /k/ is feminine and / \emptyset / is neuter. When the nominalization is used in a sentence, an inflectional ending carrying number and case agreement is inserted in the *Number* head.^{24,25} After the movement takes place, the structure we get is as in (35).

²⁴ Gender in Slovenian is independent of inflectional class. For example, there are nouns of masculine gender (when they are subjects, the verb takes masculine agreement, (ii)), but their inflectional endings (case/number) are the same as in feminine forms of the same inflectional class, (i).

- (i) a. lipa – sg/nom/fem, lipe – sg/gen/fem, lipi – sg/dat/fem, etc. 'linden'
b. vodja – sg/nom/masc, vodje – sg/gen/masc, vodji – sg/dat/masc, etc. 'leader'
- (ii) a. Lipa je cvetela.
Linden-sg/nom/fem is bloom-/l-Ptc.-sg/nom/fem
'The linden was blooming.'
b. Vodja je pel- \emptyset .
leader-sg/nom/masc is sing-/l-Ptc.-sg/nom/masc



The structure in (35) is then subject to verb movement – the verb root adjoins to little *v* and then they move to T_2 to ‘pick’ the *tense* morphology, and finally to *n* to satisfy the morphological property of the *n* head. These movements together give us the correct linear order of morphemes: *plava-l-ec*, ‘a swimmer’.

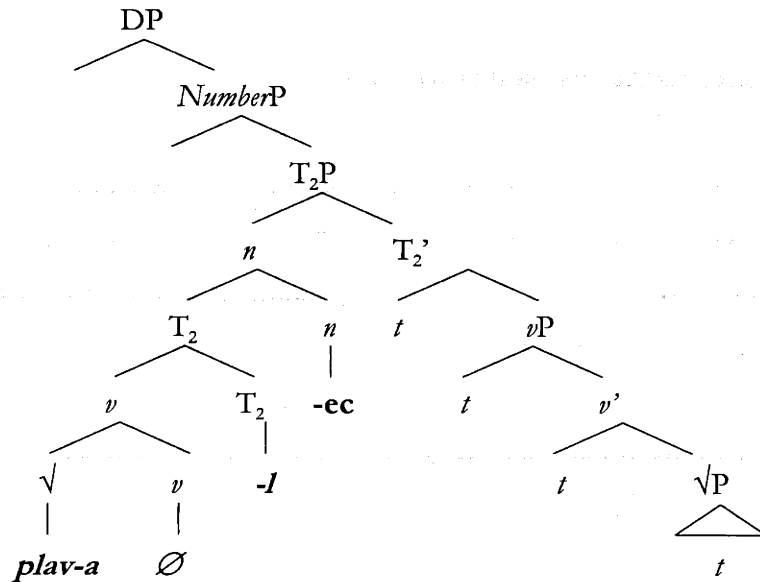
‘The leader was singing.’

²⁵ T_2 node in Slovenian requires gender agreement (along with number and case agreement) not only in the nominalizations under discussion, but also in its use as an *l*-Participle in a verbal environment.

- (i) a. Zala je plaval-a v bazenu.
 Zala is swim-*l*-ptc-**fem**/sg in pool
 ‘Zala swam in the swimming pool.’

b. Denar sem dal gospej, prispeli z jutranjim vlakom.
 money am give-*l*-Ptc. lady- **fem**/sg/dat arrived-*l*-Ptc.-**fem**/sg/dat by morning train
 ‘I gave the money to the lady who arrived by the morning train.’

(36)



T_2P is dominated by the heads Number and D. The Determiner head is the head proposed by Abney (1987), following the idea that noun phrases, like clauses, are headed by a functional element. NumberP (also AgrP, GenderP) was proposed by various authors from studies suggesting that the structure of noun phrases includes additional inflectional structure between DP and nP (Ritter (1991), Cinque (1993), etc.). Alexiadou (2001) proposes that Number is also responsible for nominalizing unspecified roots. I adopt the existence of DP and NumberP and the fact that NumberP is a nominalizer. If I were to be precise, every nominalization in Tables 3 and 4 should have these two heads indicated when the nominalization is used in a sentence. However, since NumberP is relevant as a nominalizer only in Agentive *l*-Participle nominalization, I do not indicate it in other nominalization trees for simplicity's sake. Note that Agentive *l*-Participle nominalization has basically the structure of a sentence, with movement of external argument into the specifier of a Tense phrase (T_2P). If the Tense phrase were dominated by C, the linguistic object constructed would be a sentence; since it is dominated by Number and D, the linguistic object constructed is a noun.

More on the linearization process and the importance of movement for phonological Spell-Out will be presented in Section 4.

3.2.1.2 Root /-Participle Nominalization

In addition to Agentive /-Participle nominalization, Slovenian displays a construction very similar in its surface form, which I label as Root /-Participle nominalization. In this section I shall propose a structure for Root /-Participle nominalization, claiming that it differs from Agentive nominalization in the presence of a verbalizing head and in the features found on T_2 .

To begin with, let us consider a few examples. With some roots, more than one /-Participle nominalization is possible. Take roots *barv-* ‘color’ and *rez-* ‘cut’.

(37)	a. Roots:	barv- color-	rez- cut-
	b. /-Ptc.:	barval	rezal
	c. Nominalization 1:	barvalo ‘coloring device’	rezalo ‘cutting device’
	d. Nominalization 2:	barvilo ‘coloring matter’	rezilo ‘blade’

Nominalization 1 is an example of an Agentive nominalization with the structure in (32). It denotes a [-human] Agent and contains an event component that can be modified by adverbs of time, manner and location (Cf Section 3.2.1.1). Nominalization 2 is a different creature. First, not all pieces of morphology overlap with /-Participle; the theme vowel is not the same as the one in the corresponding /-Participle (i.e. the participle from the same root), as seen in (38).

(38)	a. barv-	barval, *barvil	barvilo
	b. rez-	rezal, *rezil	rezilo

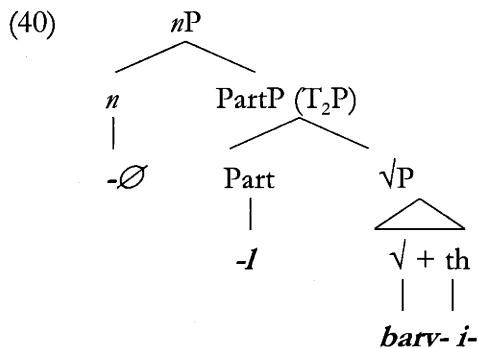
Second, the meaning of these nominalizations is not ‘an Agent of the event denoted by the *vP*’, but is rather non-compositional: *rezilo* means ‘a blade’, while *barvilo* means ‘coloring matter’. Third, these nominalizations do not contain eventive meaning - no adverbial modification apart from the modification of the whole NP is possible, as seen in (39).

- (39) a. *rezilo na tanke kose
 blade on thin slices
 *‘a blade that cuts thin slices’
- b. rezilo za tanke kose
 blade for thin slices
 ‘a blade for cutting thin slices’
- c. *barvilo na hitro
 coloring matter on fast
 ‘a coloring matter that paints fast’
- d. barvilo za hitro barvanje
 coloring matter for fast painting

Finally, no temporal properties are observed in these nominalizations; there is no on-going event or habitual event that the nominal refers to. For example, *rezilo* has the same temporal properties as a non-derived noun *nož*, ‘a knife’, i.e. it has none. On the other hand, *rezalo* ‘a cutting device’, an Agentive /-Participle nominalization, has temporal properties – it can either be something that usually cuts (habitual) or something that is cutting at some contextually specified time (on-going).

These properties follow if the structure of Nominalization 2, which I call Root /-Participle nominalization, is as in (40).²⁶

²⁶ The inflectional ending /-o/ (nominative singular) is inserted into the Number head, so it is not indicated in the tree.



The structure does not contain a verbalizing head, which accounts for the absence of an event component. There is a T_2 head (with no temporal features) into which the default participial morphology is inserted, the VI /*l*/. Finally, as to the theme, I propose that the inserted themes are the default themes in the language. There are two such themes: *i* and *aj*.²⁷ In (37) we saw examples of *i* insertion, but there are also examples with theme *-aj*, e.g. (41).

(41) god-∅ ‘play-zero theme’ → godalo ‘a string instrument’

This structure predicts the following: since no *v*P is present, there is no external argument position. Therefore these nominalizations should be possible with roots that typically become unaccusative verbs when verbalized. This prediction is confirmed by the data. Take the root *pad-*, ‘fall-’. The Root *l*-Participle nominalization built on this root is as in (42). Note also the non-compositional meaning.

(42) pad- ‘fall’ → padalo ‘a parachute’

The *l*-Participle component in Root *l*-Participle nominalizations is basically an extended root. Its meaning is non-compositional (encyclopedic) as if it were a regular bare root with some extra pieces of morphology, to which then a nominalizer is added as in root nominals in general. It appears as if the language is making use of the process of root

²⁷ These are the only productive themes in the language. See Lenček (1982) for the same claim.

extension to introduce new non-compositional meanings that for some reason could not be introduced by nominalizing just a bare root.

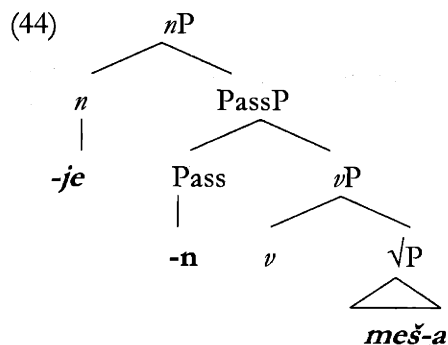
3.2.2 (E)n/t-Participle Nominalizations

We now turn to (e)n/t-Participle nominalizations. In the following two sections I would like to suggest that there are two kinds of such nominalizations. In one type (Type 3, Verbal Passive nominalization), Pass is a node above a *v*P with the nominalizer attaching to the position immediately dominating PassP. In the other type (Type 4, Deadjectival (e)n/t-Participle nominalization), the nominalizer dominates the functional node Pass, which is an adjectivizing node attaching to a root phrase. Such nominalizations are very common; the nominalizer attaches to either simple or ‘derived’ adjectives. Below I repeat the examples of nominalizations. I shall first discuss nominalizations such as (43b) and then proceed to (43c).

- (43) a. mešan ‘mix-(e)n/t-Ptc’
 b. mešanje ‘mixing’
 c. mešanec ‘a hybrid’

3.2.2.1 Verbal Passive Nominalization

In section 3.1 I showed how overt morphology and allomorphy argue for the presence of an *en/t*-Participle in JE-nominalizations (i.e. nominalizations with the nominalizer /je/). Now I would like to argue more specifically that the structure of such nominalization is (44).



The meaning of JE-nominalization is predictable - these nominalizations denote the event denoted by the *v*P. They are parallel to English gerundive *-ing* nominalization, except that the latter does not involve any participial morphology apart from *-ing*.

It was suggested in Marantz (1997) that gerundive nominalizations contain both a verbalizing head and the nominalizing head (realized by VI *-ing*). I assume this is true of Slovenian, too. The presence of the verbalizing head is justified also by a possibility of an adverb modifying the event component of the nominalization, as seen in (45).

- (45) *plavanje eno uro/v reki/hitro*
 swimming for an hour/in the river/fast

However, in Slovenian there is an additional functional node above *v*P hosting what appears to be a piece of passive morphology. Because of this surface morphology, I shall call this projection Pass, while in fact, Pass does not have anything to do with the Passive Voice. First, it does not require an external argument feature (which is reflected in a *by*-phrase in the verbal Passive and impossibility of unaccusative passives) and it does not select for a particular verbalizing head. All verbs, transitive, unaccusative or unergative are acceptable in JE-nominalization. For example, the verb *padati*, ‘fall’ a typical unaccusative verb, can appear in JE-nominalization, though the *(e)n/t*-Participle of this verb does not exist outside JE-nominalization since no Passive Voice is possible with unaccusative verbs.

- (46) *padati* ‘fall-*inf*’
 Passive Voice *(e)n/t*-Participle: **padan* ‘fall-*(e)n/t*-Ptc’
 Nominalization: ***padanje*** ‘falling’

Similarly, with inchoative-causative pairs, the JE-nominalization has both meanings, even if the Passive Voice *(e)n/t*-Participle (whose pronunciation would be the same for both) can refer to the causative variant only.

- (47) ***bogatenje*** ‘becoming rich’ or ‘enriching’
bogaten ‘enrich-*(e)n/t*-Participle’, *‘become rich-*(e)n/t*-Participle’

- a. Hrana je bila obogatena z vitamini.
 Food is been enriched/*become rich with vitamins
 ‘The food was enriched with vitamins’
 *‘The food was become rich with vitamins’
- b. Bogatenje hrane z vitamini
 Enriching/becoming rich food with vitamins
 ‘enriching food with vitamins’ or ‘food’s becoming rich with vitamins’

In this kind of nominalization we are dealing with a vocabulary item /*(e)n/t/* that is a default instantiation of the functional participial head *Pass*, whatever features the latter might host.

3.2.2.2 Deadjectival *(e)n/t*-Nominalization

In this section I would like to discuss the kind of participle nominalization in which the participating participle is the adjectival *(e)n/t*-Participle. Below I give examples of the two most common nominalizers. The nominalizer *-ec* produces nominalizations with the meaning ‘the carrier of the property denoted by the adjective’, while *-ost* gives nominalizations with the meaning ‘the property denoted by the adjective’.²⁸

- (48) a. Masc.: mešan ‘mix-*(e)n/t*-Participle’ → mešanec ‘a cross-breed, a hybrid’
 Fem.: → mešanka ‘a cross-breed, a hybrid’
- c. mešan ‘mix-*(e)n/t*-Participle’ → mešanost ‘the property of being mixed’
- d. gledan ‘watch *-(e)n/t*-Ptc.’, ‘popular (of a TV-show)’ → gledanost ‘popularity/rate of watching’

²⁸ There are other affixes participating in this kind of nominalization, *-ik*, *ež*, \emptyset . However, *-ec* and *-ost* are the ones that most commonly attach to participles. *-ik* does not attach to participles, while *-ež* and \emptyset attach occasionally, but *-ec* is the preferred version.

I propose that the structure of (48) is as below, where the Passive participle is basically an adjective with participial morphology attaching directly to the root. In this I follow Marantz 2000 analysis of verbal and adjectival passives.²⁹

Table 8

mešan-ec 'a cross-bred'	mešan-ost 'property of being mixed'

There are three arguments that I would like to put forward for saying that the *(e)n/t*-Participle in *-ec* and *-ost* nominalizations have structures as in Table 8. First, I would like to argue that these nominalizations are not Verbal Passives, and second, I would like to argue for the adjectival status of the participles involved in these nominalizations.

Let me now proceed to showing that nominalization is Table 8 cannot be Verbal Passive nominalizations. These nominalizations can contain the *(e)n/t*-Participle of verbs with both perfective and imperfective aspect, as illustrated in (49).

²⁹ Let me briefly describe the analysis I am adopting to treat the difference between adjectival and verbal passives, i.e. the two readings that the sentence in (i) can have.

(i) The vase was broken.

a. adjectival (stative) reading: the vase was in the state of being broken

b. verbal (eventive) reading: somebody broke the vase

Marantz (2000) argues that the difference between the two readings in (i) can be derived from the height of attachment of the passive affix. If the affix is attached to the root, then we get the adjectival passive; if it is attached above *v*, then we get the verbal passives. The structures are illustrated in the table below.

a. adjectival passive	b. verbal passive

- (49) *pitan* 'feed-(e)n/t-Ptc.-imp' + *ec* → *pitanec* 'animal for feeding'
obešen 'hang-(e)n/t-Ptc.-pf.' + *ec* → *obešenec* 'the hanged person'

However, when the (e)n/t-Participle appears in a Passive Voice sentence and is clearly verbal, it cannot be of the imperfective aspect, as illustrated in (50).³⁰ If verbal passives are incompatible with the imperfective aspect, the (e)n/t-Participle form of an imperfective verb cannot be a verbal passive.³¹

- (50) a. Avto je bil ukraden danes zjutraj
 car is been stolen-pass.ptc.-pf today morning
 'The car was stolen this morning.'
- b. *Avto je bil kraden danes ob desetih.
 car is been stolen-pass.ptc.-imp. today at ten
 'The car was being stolen today at ten.'

The second argument against a verbal passive analysis has to do with adverbial modification of the event component in the nominalization. It is possible to show that there is no event component in Deadjectival (e)n/t-nominalizations and therefore no *vP*. *Ec/ost* nominalizations cannot be modified by an adverbial so that the adverbial refers to the event of the nominal, as shown below.

- (51) a. *gledanost oddaje eno uro
 rate of watching show one hour
 *'the rate of watching of the show for one hour'

³⁰ Russian has the same property. In Slovenian, some speaker would claim that the imperfective passives are possible, but not for (50b).

³¹ (E)n/t-Participles of imperfective verbs have a special, non-compositional, meaning, which is consistent with their being direct root attachments of Pass. Consider (i), which has the meaning in (ib) and not the meaning in (ia).

- (i) Ta hiša je zidana.
 this house is built-pass.ptc.-imp.
 a. *This house is being built.
 b. This house is made of brick.

b. *gledanost oddaje doma*
rate of watching show at home

meaning 1 (NP modification): the rate of watching of the show at home, within a family, i.e. how popular a show is with the members of the family

meaning 2: (event modification of the nominalization): *the rate of watching of the show that takes place at home

Compare the examples above to JE-nominalization, which contains a *v*P and in which adverbial modification of the event is possible.

(52) *gledanje oddaje doma/eno uro*
watching show home/an hour
'watching a show at home/for an hour'

Finally, let us proceed to showing that participles in the nominalizations in Table 8 are indeed adjectival. A strong argument for this claim is the distribution that these participles share with other adjectives (derived and non-derived) appearing in the same type of nominalization.

(53) Non-derived adjectives:
a. *bel* 'white' + *-ec* → *belec* 'a white person'
+ *-ost* → *belost* 'whiteness'
b. *zelen* 'inexperienced' + *-ec* → *zelenec* 'an inexperienced person'
+ *-ost* → *zelenost* 'greenness'

Derived adjectives:

c. *brad-at* 'bearded' + *-ec* → *bradatec* 'a person with a beard'
+ *-ost* → *bradatost* 'beardedness'

- d. *domišlj-av* ‘conceited’ + *-ec* → *domišljavec* ‘a person that is conceited’
 + *-ost* → *domišljavost* ‘conceitedness’

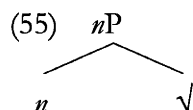
Consider an alternative to the present analysis in which *-ec* is an internal argument of the verb, parallel to *-ec* inserted in an external argument position in Agentive *l*-Participle nominalization. An argument against such an analysis have been given above – the *(e)n/t*-Participle stem of the nominalization is an adjective and therefore cannot have an internal argument. There is an additional argument for this claim. Agentive *l*-Participle nominalizations with *-ec* had a predictable meaning: they always denoted an external argument of the event denoted by the verb. *(E)n/t*-Participle nominalizations do not have such a predictable meaning with respect to the meaning of the embedded verbal root. In many cases, the meaning of the nominalization is indeed a patient or a theme, but that does not hold of all cases. Consider (54). While we could say that in examples (54a-b) the noun is a patient/theme of the event related to the verb, the same cannot be claimed for examples (54c-d), where the noun is an agent of the event related to the verb.

- (54) a. *obešenec* ‘the hanged person’
 b. *pretepenec* ‘the beaten person’
 c. *slavljenec* ‘the person celebrating’; ??‘the person celebrated’
 d. *dosluzenec* ‘the person that finished serving’; *‘the person that was served’

So, *-ec* attaching to the adjectival *(e)n/t*-Participle does not create nominalizations that refer to the direct object of the verb; in fact such nominalizations do not refer to any specific syntactic argument across all uses of the construction.³²

3.3 A Note on Root Nominalizations

Root nominalizations are nominalizations in which a nominalizing affix attaches directly to the root in the configuration (55) below.



In this section I would just like to briefly comment on the meaning of the root nominalizations in comparison to participial nominalizations. Marantz (1997, 2000) argues that root nominalizations and root formations in general are built by taking a root and then attaching to it category-forming affixes, heads of category-forming phrases, to form what we traditionally call verbs, nouns and adjectives. In this process, the attachment site of category-forming affixes is relevant for meaning. If an affix is attached directly to the root, the meaning of the whole can be idiosyncratic, i.e. unpredictable. This follows from the fact that the root meaning itself is arbitrary and encyclopedic knowledge has to be evoked in order to negotiate the meaning of the root in the environment of the category-forming head. However, once a category-forming head is attached to a root, the higher attachment of category-forming heads should result in a predictable meaning of the whole. In other words, the meaning is unpredictable up to the attachment of the first category-forming head.

This theory predicts that if a certain nominalizer attaches to the root, the meaning of the nominal is unpredictable, while if the same nominalization attaches to an xP , the meaning is predictable. This prediction holds in Slovenian. Take the nominalizer *-ec/ka* as an example. We saw that in Agentive *l*-Participle nominalization, the meaning of the whole is predictable (the agent of the event denoted by the vP); the same holds in Deadjectival *(e)n/t*-Participle nominalization (the carrier of the property denoted by aP). Apart from attaching to participles, this nominalizer attaches to bare roots as well.³³ However, meanings of nominalizations built in this way are largely unpredictable, ranging from ‘the agent of the event related to the root’, ‘the tool of the event related to the root’ to ‘the result of the event related to the root’ as seen in (56).³⁴

³² A similar point is found in Marantz (2001) about the difference between *-er* and *-ee* nominalizations in English, also summarized in Chapter 2, Section 3.1.

³³ In Slovenian there are many affixes (around 20) that participate in root nominalizations. A comprehensive list is found in Toporišič (2001) and Stramlič Breznik (1999).

(56) AGENT

- a. govor- 'speak-' → govorec, govorka 'the one that speaks'
b. bor- 'fight-' → borec, borka 'the one that fights for something'

METAPHORICAL AGENT

- a. vid- 'see-' → videc 'someone that can see, someone psychic'
b. ved- 'know-' → vedec 'someone knowledgeable'

Cf. '*somebody that knows a particular fact'

TOOL

- doj- 'breastfeed-' → dojka 'breast'
zib- 'rock-' → zibka 'cradle'

RESULT

- pad- 'fall-' → padec 'a fall'

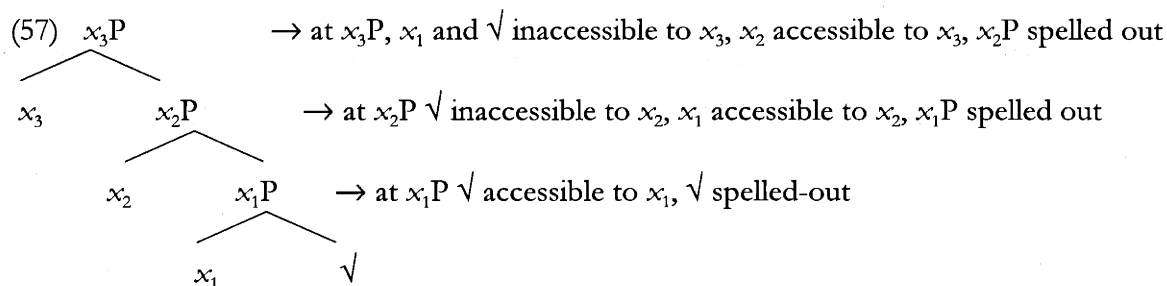
4 Stress and Phases in Slovenian Participial Nominalizations

In this part I would like to show how stress properties of Slovenian participial nominalizations constitute evidence for the syntactic structures argued for in section 3 and in addition argue for the phase-by-phase Spell-Out of word level syntax, as proposed in Chapter I and summarized here below.

- Phrases headed by word-forming functional heads, such as little *v*, little *n* and little *a*, constitute spell-out domains on the word level.
- Phases on the word level are subject to the Phase Impenetrability Condition
- *Phase Impenetrability Condition at word level*: H and its edge (Specifiers, adjoined elements) are spelled out at the next strong phase. The domain of H is spelled out at the phase of HP. A head *h* adjoined to H is in the domain of H.

³⁴ Note the similarity between Extended Root Participial nominalizations and Bare Root Nominalizations in terms of their negotiation of meaning.

The idea is schematized in the tree below. At the point of the little x attachment (where x stands for v , n , or a), the complement of the little x is spelled out and from that point on inaccessible to heads attaching higher.



The analysis of stress in participial nominalizations will focus on the differences in stress between the Agentive l -Participle nominalization and the Deadjectival $(e)n/t$ -Participle nominalization. I will show how the stress facts are a result of stress properties of nominalizing affixes and of the structures in which these affixes are inserted.

Section 4 will be organized as follows. First, I present the necessary background assumptions on stress in Slovenian. Second, I present an analysis arguing for phase Spell-Out in words, focusing on Agentive l -Participle nominalization and Deadjectival $(e)n/t$ -nominalization. Third, I investigate the interaction between stress and structure in other nominalizations and point out the problems that my analysis faces.

4.1 Background Assumptions: Theory of Stress

The analysis of the data is proposed within the framework of Idsardi (1992), Halle and Idsardi (1995) and Halle (1997). The basic principles of this theory are summarized below.

- Stress is not a phonetic feature, but the phonetic means for marking certain groupings of linguistic elements.
- The phonemes in the sequence that are capable of bearing stress (Stress Bearing Units (SBU)) project an abstract mark on a separate autosegmental plane. These abstract units

are represented by asterisks. The stressable phonemes projected on the metrical plane constitute line 0 of the metrical plane.

- A line is grouped into feet, which are defined by projecting brackets on the metrical plane. Brackets can be left [(], or right [)], and can appear to the left [(*,)*] or to the right [*), *(] of an asterisk.
- Idsardi's (1992) innovation is that only one bracket is needed to group elements. A left parenthesis, for example, groups all metrical elements on its right up to the next parenthesis or to the end of the string. For, example, in (58), the parenthesis groups the last two asterisks in a foot, while the asterisk preceding the bracket is ungrouped.

(58) * (* *
 | | |
 CV-CV-CV

- Brackets are inserted at the edges of certain syllables. They can be inserted due to phonological properties of a syllable, e.g. after a heavy syllable, as a result of counting, e.g. after every odd syllable; or they may come from the lexicon on vocabulary items that appear in a word.
- Each foot has a head (leftmost or rightmost element), which is then projected onto the next line in the metrical grid.
- On lines above line 0, the same processes occur as on Line 0: brackets are inserted to make feet, feet are either left or right headed and their heads are projected on the next line. It is not, however, necessary that the rules on subsequent lines are the same as on line 0.

Slovenian belongs to the group of languages in which words contain exactly one stressed vowel and in which the position of the stress cannot be predicted on the basis of the phonological properties of the word or from syllable counting. It is common for such languages to find stress alternation within a particular paradigm. For example, one group of nouns has a property that stress varies according to the case. Below I give an example from Slovenian noun *mož*, 'man', where we find initial stress in Nom., Dat., Loc., and Instr., but final in Gen. and Acc., all singular.

- (59) Nom: móž ‘man’
 Gen: možá
 Dat: móžu
 Acc: možá
 Loc: móžu
 Inst: móžem

The most studied language from this accentual group of languages is Russian. For Russian and other IE languages with movable stress, Halle (1997) proposes the rules in (60) for building the lines in the metrical grid of the word that govern stress assignment. I assume that the rules in (60) derive stress in most Slovenian words.³⁵

(60) Stress and accent in IE, Halle (1997):

- a. Morphemes have idiosyncratic accents, which are marked in vocabulary representations with a left parenthesis on line 0.
- b. Line 0 is subject to the edge-marking rule RRR
- c. Line 0 is subject to head-marking rule L.
- d. Line 1 is subject to edge marking rule LLL.
- e. Line 1 is subject to the head-marking rule L.
- f. Assign high tone to the head of the word, low tone to all other line 0 elements.

Let me give an example from a nominal form: a derivation of an unaccented root *mož-*, ‘man’ followed by an unaccented case ending *-u* (Dat. sg.) and by an accented case ending *-a* (Acc. sg.):

Table 9

mož + u	mož + (a
* *)	* (*)
line 0, RRR, head L	line 0, RRR, head L
(*	*
line 1, LLL, head L	line 1, LLL, head L
*	*
line 2	line 2
móžu	možá

³⁵ Rules of retraction have to be posited to capture the stress in certain verbal and nominal forms. This topic will be thoroughly examined in Chapter 5.

The last assumption that needs to be stated relates to stress properties of individual affixes. In some words involving particular affixes, stress cannot be computed by general stress rule in (60) unless we allow the attached affixes to wipe out the stress of other SBUs. Such affixes can sometimes only wipe out the previously assigned stress, but are themselves unaccented; or, in addition to wiping out the stress they can place a new bracket in the word. After this process, word stress is re-assigned according to general stress rules. Affixes with such property are called dominant and were first discussed by Kiparsky (1982) for Vedic.³⁶ Affixes that do not affect stress placement in such a way are called recessive.

4.2 A Phase Analysis of Stress in Participial Nominalizations

I shall now present and analyze the stress facts of Agentive *l*-Participle nominalizations and Deadjectival (*e*)*n*/*t*-Participle nominalizations. These two nominalizations are particularly suitable for comparison and contrast because they can both utilize the nominalizer *-ec*. Since the stress properties of the nominalizing affix *-ec* should in principle be the same in both nominalizations, any difference in stress can be attributed to the structure in which the affix is inserted.

Let us now proceed to the stress related puzzle concerning the two participial nominalizations in question. As mentioned above, the nominalizer *-ec* appears in both nominalizations, but yields two different stress patterns, as seen in (61) and in the charts below.³⁷

³⁶ Let me give an example from Vedic. The basic stress principle for Vedic is as in (i).

(i) Stress the leftmost accented vowel, or in absence of accented vowels, the leftmost vowel.

Take the accented root *rath* and the dominant and accented affix *in*. According to the basic rule in (i), the stress should fall on *rath* when these two are combined. But that does not happen – the affix *-in* is dominant, so it deletes the stress on the root and, since it is accented, the stress falls on the affix, as shown in (ii).

(ii) (*rath* + (*in* + *e* → *rath* + (*in* + *e* → *rathíne* ‘charioteer’ (dat.sg.)

In Vedic, if the dominant suffix is unaccented, it just wipes out the stress of other syllables, but does not place a new stress bracket; the stress in such cases falls on the first syllable.

³⁷ The only exception to the illustrated pattern is the word *delavec* ‘worker’ (out of many, many nominalizations).

- (61) a. **plésal** ‘dance-*l*-Ptc’ → **plesálec**, *plésalec, ‘a dancer’
 b. **cépljen** ‘inoculated-*(e)n/t*-Ptc’ → **cépljenec**, *cepljénc ‘something inoculated’

Table 9

<i>l</i> -Participle	<i>l</i> -Participle + -EC
plával ‘swim’	plaválec , *plávalec ‘swimmer’
dfsál ‘skate’	drsálec , *dřsalec ‘skater’
moríl ‘murder’	morílec ‘murderer’
brúsil ‘sharpen’	brusílec , *brúsilec ‘sharpener’
poznával ‘know’	poznaválec , *poznávalec ‘connoisseur’

Table 10

<i>(e)n/t</i> -Participle	<i>(e)n/t</i> -Participle + -EC
pítan ‘feed’	pítanec , *pitánec ‘the animal for feeding’
oběšen ‘hang’.	oběšenec , *obešénc ‘the hung person, thing’
obdarován ‘give’	obdarovánec , ‘the one that was given a gift’
doslúžen ‘retire’	doslúženec ‘the one that retired’
slávljen ‘worship’	slávljenec ‘the one that celebrates’

When attaching to the Agentive *l*-Participle, *-ec* is dominant and pre-accenting, as exemplified in (61a). That is, if the affix is attached to the *l*-Participle, the stress always falls on the syllable preceding the affix *-ec*, regardless of the position of stress in the *l*-Participle that serves as the base of the nominalization. The dominance can be stated as in (62).

- (62) *-ec*: wipe out the stress on the left, insert a bracket : ...* ***(**
 |
-ec

When attaching to *(e)n/t*-Participle as in (61b), *-ec* appears to be recessive; the stress is found in the same position as in the *(e)n/t*-Participle without *-ec*.

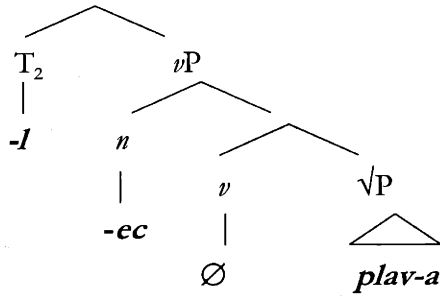
How do we account for the fact that *-ec* appears to be dominant and recessive at the same time? One could, of course, say that the facts in (61) are not puzzling at all because we are actually dealing with two different affixes, *-ec₁*, the dominant one, which attaches to the Agentive *l*-Participle and *-ec₂*, the recessive one, which attaches to the *(e)n/t*-Participle. That solution, however, is not desirable. First, *-ec* is a nominalizer in both cases with the same feature specification in terms of gender. Second, such rationale would lead to positing at least four VIs */ec/* – we saw in Section 3 that */ec/* also attaches to Root *l*-Participle nominalizations and to bare roots.

Rather, I would like to suggest that there is only one vocabulary item *-ec* specified for stress properties as in (62) above, while the stress of *-ec* nominalizations follows from both the stress properties of the affix and the differences in the syntactic structures of participial nominalizations. On this view, *-ec* is always a dominant affix; however, the activation of its stress-changing properties depends on the position in the structure in which it attaches.

Specifically, I would like to propose that stress data argue for the notion of phase in word formation as proposed in Chapter I and repeated at the beginning of Section 4. The claim is that the affix *-ec* in question can affect stress placement of a particular chunk of word if attached before the point in the derivation when that chunk is sent to PF, in other words, within the phase *xP* of that chunk. So, if *-ec* is attached within an *xP*, where *x* is a category-forming functional head, it will influence the stress of the *xP* complement. If attached outside of *xP*, it will have no bearing on the stress of *xP* complement, since at that point the phonology of the latter will have already been negotiated.

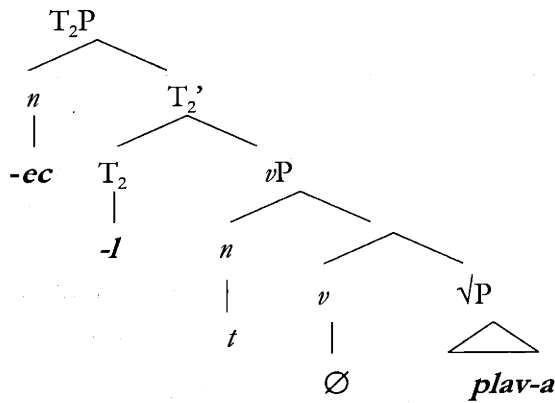
In Agentive *l*-Participle nominalizations, the nominalizing affix which realizes a little *n* head starts out in the specifier of the little *v* as its external argument, (63); arguments for this structure are given in section 3.2.1.1.

(63) Before movement: plavalec 'swimmer'

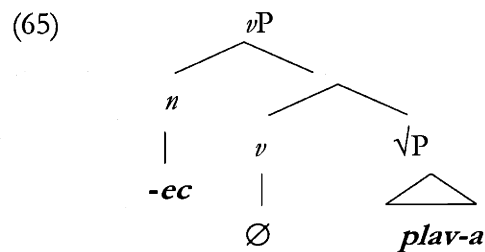


An Agree relation in terms of gender is established between T_2 and the affix *-ec*. To satisfy the EPP feature on T_2 , *-ec* moves to the Spec of T_2 . After the movement takes place, the structure we get is as in (64).

(64) After movement

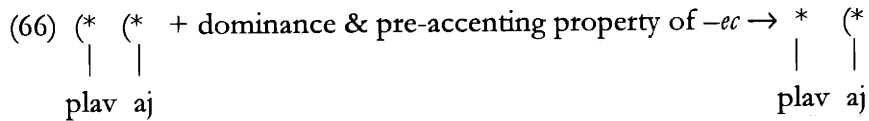


Let us now consider the stages of phase Spell-Out of this word. The first phase occurs at vP , where the structure is as in (65). I assume that Vocabulary Insertion occurs at each phase.³⁸

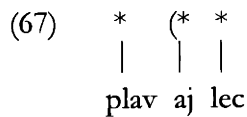


³⁸ This means that the elements that move out of the phase are not only abstract nodes, but Vocabulary Items. A parallel can be seen in the movement of the external argument realized by a DP – a DP inserted in the

At ν P the complement of ν , the Root Phrase is spelled out. That means that its stress properties will be negotiated at ν P and that the head ν and its edge (n here) will be able to influence the Spell-Out. We know independently that the root *plav-* and theme vowel *-aj* are both accented from the lexicon – they carry a left bracket to the left of the only syllable they have. And we know that *-ec* is dominant and pre-accenting, (62), which means it will wipe out the stress on the constituent it attaches to and insert a bracket one syllable to the left of the right of the stem (\sqrt{P}). The stress assignment in the spelled-out complement will proceed as in (66). At this stage of derivation *-ec* itself will be inserted, but not spelled out, therefore what is important for the Spell-Out of the Root Phrase are its dominance and pre-accenting property, but not the actual VI it is realized by.



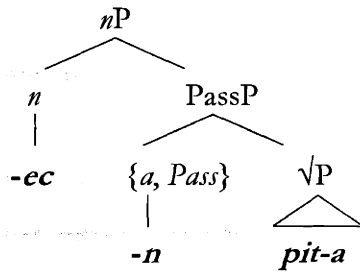
The next Spell-Out occurs at NumberP, at which point n (realized by *-ec*) has already moved from the Spec of ν P to the Spec of T_2 P. At NumberP, T_2 P is spelled out as *plaválec*, indicated in (67).



In *-ec* nominalizations with the *(e)n/t*-Participle the affix *-ec* does not influence the stress of the root phrase. This behavior follows from the syntactic structure of the nominalization and the place of the attachment of *-ec*. When attached to the *(e)n/t*-Participle, the nominalizer *-ec* does not start within the ν P phase, but is rather attached in the next higher phase, the n P phase, as in (68).

External Argument position has been subject to Vocabulary Insertion before its movement to TP for EPP and

(68) pita-n-ec 'the animal for feeding'



According to the phase analysis at the word level, the Spell-Out of the root phrase will take place at *aP*. Therefore, by the time the nominalizing affix is attached, the pronunciation of the root will already have been determined and the nominalizing affix, being attached outside the *aP* phase will have no bearing on its stress. Thus it will appear as if the affix is recessive and not dominant.³⁹

4.3 Other Participial Nominalizations

There are two participial nominalizations whose stress has not been considered at this point, the Root *l*-Participle nominalization and the Verbal Passive JE-nominalization. Their structures are repeated below.

Table 11

Root <i>l</i> -Participle Nominalization	Verbal Passive Nominalization
<p>A morphological tree for Root <i>l</i>-Participle Nominalization. The root node is <i>nP</i>, which branches into <i>n</i> and <i>T₂P</i>. The <i>n</i> node dominates the affix <i>-o</i>. The <i>T₂P</i> node branches into <i>T₂</i> and <i>√P</i>. The <i>T₂</i> node dominates the affix <i>-l</i>. The <i>√P</i> node is represented by a triangle and dominates the root <i>√ + th</i>, which then dominates the root <i>barv- i</i>.</p>	<p>A morphological tree for Verbal Passive Nominalization. The root node is <i>nP</i>, which branches into <i>n</i> and <i>PassP</i>. The <i>n</i> node dominates the affix <i>-je</i>. The <i>PassP</i> node branches into <i>Pass</i> and <i>vP</i>. The <i>Pass</i> node dominates the affix <i>-n</i>. The <i>vP</i> node branches into <i>v</i> and <i>√P</i>. The <i>√P</i> node is represented by a triangle and dominates the root <i>plav-a</i>.</p>

phi features.

³⁹ In principle, the dominant affix *-ec* could influence the stress of the *T₂* and *Pass* if these were realized by VIs that project SBUs instead of consonants */-l/* and */-n/*.

The stress behavior of these nominalizations is consistent with my analysis. In Root *l*-Participle nominalizations, the first phase is at *n*P, therefore the nominalizer will be able to influence the stress of the PartP and the Root phrase. Thus, the nominalizer *-ec* (its neuter variant $-\emptyset$) appears to be pre-stressing here – the stress in these nominalizations is consistently found on the preceding syllable.

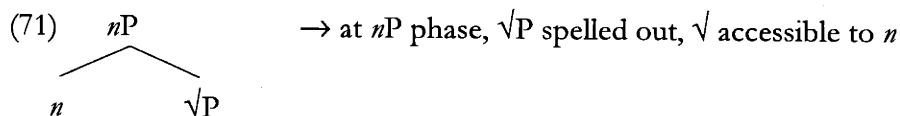
- (69) a. barvílo ‘coloring matter’
 b. rezílo ‘a blade’
 c. padálo ‘a parachute’

In Verbal Passive Nominalization, the first phase is *v*P, so the attachment of the nominalizer should not have any influence over the stress assignment of the root regardless of whether it is dominant or recessive. This is consistent with the data: the stress in Verbal Passive nominalization is found on the same syllables as it would be in corresponding participle.

(70)	(<i>e</i>) <i>n</i> /t-Participle	Nominalization
	plávan ‘swim’	plávanje
	igrán ‘play’	igránje
	hitén ‘hurry’	hiténje
	zaprt ‘close’	zaprtje

4.4 Root Nominalizations

If a pre-stressing affix attaches to the root, we expect it to influence the stress pattern of the root, because the root will be spelled out in the phase of nominal affix attachment.



Indeed, this is the case with roots and the nominalizing affix *-ec*. Take the root *góvor-*, stressed on the first syllable. If the root nominalization is built by attaching *-ec*, the stress

shifts to the second syllable of the root (72a). In monosyllabic roots the same process of application of (62) takes place, but we cannot see the difference (72b).

- (72) a. *góvor*- ‘speak’ → *govórec* ‘a speaker’
 b. *bór*- ‘fight’ → *bórec* ‘a fighter’

A phase analysis has an advantage over a theory in which *-ec* would be the pronunciation of several homophonous affixes with different stress properties; namely, the analysis unifies its pre-stressing property in both root nominalizations and */-*Participle nominalizations.

4.5 Other Examples of Stress and Structure Interaction⁴⁰

The stress in words containing the nominalizer *-ost* parallels that of words in *-ec*. Consider (73).

(73)	Column 1	Column 2	Column 3
	<i>mlád</i> ‘young’	<i>mládost</i> ‘youngness’	<i>mladóst</i> ‘youth, young years’
	<i>stár</i> ‘old’	<i>stárost</i> ‘oldness’	<i>staróst</i> ‘old years’
	<i>debél</i> ‘wide’	<i>debélost</i> ‘wideness’	<i>debelóst</i> ‘fatness, obesity’
	<i>visók</i> ‘tall’	<i>visókost</i> ‘tallness’	<i>visokóst</i> ‘royal highness’
	<i>nóv</i> ‘new’	<i>nóvost</i> ‘newness’	<i>novóst</i> ‘a novelty’

In the first column, the adjectives with their stress are listed. In the second column, *-ost* nominalizations are given in which the embedded adjectives have kept their stress assignment. In the third column, I list the *-ost* nominalizations, apparently built on the same adjectives, but with a different stress placement. There are two ways of looking at things. First, we could say that there are two nominalizers, a recessive *-ost* (column 2) and the dominant *-ost* (column 3). However, that would mean a multiplication of VIs, while the facts

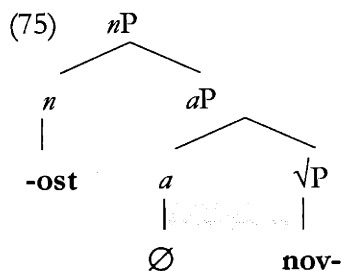
⁴⁰ Unfortunately, examples of a single dominant affixes attaching in different structures are not numerous in the language. However, those that exist have a predictable behavior.

could be captured straightforwardly if the syntax of the nominalizations is taken into account.

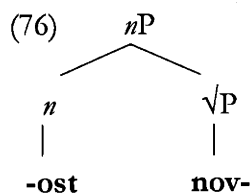
The nominalizations in column 2 have a consistent and compositional meaning – they can be decomposed as ‘the property of being adjective’, as in (74).

- (74) a. *nóvost* = the property of being *nóv* ‘new’
 b. *stárost* = the property of being *stár* ‘old’

This suggests that the nominalizer is attached to an adjectival phrase in the structure (75).



The nominalizations in column 3, on the other hand, do not have a compositional meaning in relation to the corresponding adjective. They can either mean the period when the adjective applies – ‘old age’, ‘young age’ – or a thing that is like the adjective ‘novelty’. This suggests a root attachment of the nominalizing head, which gives space for the negotiation of ‘special meaning’.



Suppose now that there is only one VI *-ost* with the following stress properties.

- (77) *-ost*: delete stress on the stem, insert a bracket at the right edge of the stem: ...* * *(

Then the data in (73) are readily explained under a phase analysis, in which the Spell-Out takes place at every category-forming phrase. In the structure (75), the spell-out of the root will take place at *a*P and therefore the dominance of the nominalizer will have no bearing on its stress anymore. In the structure (76), on the other hand, the dominant affix is attached in the phase of the root's spell-out, *n*P and therefore will be able to change the stress on the root accordingly.

CHAPTER 5: STRESS PATTERN IN SLOVENIAN VERBAL ENVIRONMENTS

1 Introduction

This chapter is an investigation into stress patterns and the interaction of stress and structure in Slovenian verbal environments.

Slovenian is a language with lexical stress, which means that stress in words cannot be determined by phonological properties or the position of syllables alone; rather, stress appears to be a property of individual vocabulary items. Kiparsky and Halle (1977) propose that roots and affixes in such languages are marked in the lexicon with respect to accent and when they combine in a word, the stress is further computed so that one of the syllables becomes most prominent and receives the main stress. This proposal is further elaborated in Halle (1997b).

When it comes to Slovenian verbal environments, the Kiparsky and Halle algorithm accounts for the majority of the data, but cannot straightforwardly account for all examples. The data it cannot account for are instances of stress alternations - situations in which the stress of one and the same root differs according to the form in which the root appears. In this work I would like to show that despite seeming 'unaccountable', such data are systematic and support the division of roots into three accentual types, as in Halle (1997b). Specifically, to capture stress in such environments additional machinery in the form of stress retraction rules needs to be introduced. In addition, I would like to argue that stress retraction rules are of two kinds: those referring to the syntactic structure and those belonging to the realm of prosody, sensitive to the number of syllables.

This chapter is organized as follows. In section 2 I present an overview of the theoretical background in which the analysis is couched. In section 3, I lay out the data from verbal environments that will be accounted for; I limit myself to the Infinitive, Short Infinitive, Present Tense, *l*-Participle and *(e)n/t*-Participle. In section 4 an analysis of the stress in Slovenian verbal forms is offered, showing that Halle and Kiparsky (1977) and Halle (1997b) can capture the data if retraction rules are posited. Section 5 deals with the interaction of the

stress and syntax of these forms and ties the analysis in Chapter 5 with the proposal of phase Spell-Out at the word level in Chapter 2.

2 Theoretical Background

2.1 Theory of Stress

The analysis of the data is proposed within the framework of Idsardi (1992), Halle and Idsardi (1995) and Halle (1997b). The reader is referred to Chapter 4, Section 4.1 for a detailed summary of the theory adopted in this work.

2.2 Theory of Lexical Stress

Slovenian belongs to the group of languages in which words contain exactly one stressed vowel and in which the position of stress cannot be predicted solely on the basis of the phonological properties of the word or from syllable counting.¹ That stress cannot be predicted from phonological properties can be seen from numerous examples of homophonous or nearly homophonous words with contrasting stress.

- (1) a. **ígra** ‘a game-nom/sg’ *versus* **igrá** ‘play-pres/3/sg’
b. **nabór** ‘a draft’ *versus* **tábor** ‘a camp’

That stress cannot be determined by counting can be seen from the possibility of having stress on any syllable in the word, as exemplified in (3).

- (2) a. **Pérot**a ‘Peter-gen/sg’ – **peré**sa ‘feather-gen/sg’ – **gospá** ‘lady-nom/sg’
b. **miljonár** ‘millionaire-masc/nom/sg’ – **miljonárka** ‘millionaire-fem/nom/sg’ –
miljonárčica ‘millionaire-fem/dim/nom/sg’

Languages with lexical stress commonly show stress alternation within a particular set of forms. A group of nouns, for example, has a property that stress varies according to the case.

Below I give an example from Slovenian: the nouns *mož* 'man', and *gora* 'mountain', where we find initial stress in Nom., Dat., Loc., and Instr., but final in Gen. and Acc., all singular.

(3)	Nom: mož 'man-masc'	(4)	góra 'mountain-fem'
	Gen: možá		goré
	Dat: móžu		góri
	Acc: možá		goró
	Loc: móžu		góri
	Inst: móžem		góro

For Russian and other IE languages with movable stress, Halle (1997b) proposes the rules in (5) for building the lines in the metrical grid of the word that govern stress assignment.

(5) Stress and accent in IE, Halle (1997b):

- a. Morphemes have idiosyncratic accents, which are marked in vocabulary representations with the left parenthesis on line 0.
- b. Line 0 is subject to the edge-marking rule RRR (= insert a right bracket to the right of the rightmost asterisk)²
- c. Line 0 is subject to head-marking rule L.
- d. Line 1 is subject to edge marking rule LLL. (= insert a left bracket to the left of the leftmost asterisk)
- e. Line 1 is subject to the head-marking rule L.
- f. Assign high tone to the head of the word, low tone to all other line 0 elements.

Basically, stress is a result of the interaction of lexically determined accentual properties of vocabulary items and the rule that assigns stress to the leftmost accented vowel or, in the absence of an accent, to the leftmost vowel. A note on terminology is in order at this point: in this work I shall be using the terms *accent* and *stress* in the same way as Halle (1997). Accent

¹ Compounds can be an exception, since they can have two (or more) stressed syllables.

² Edge marking is argued for in Idsardi (1992).

is a property of the lexical representation of a vocabulary item, while stress is a property of the metrical domain in a word. Thus, an accented syllable is one supplied with a parenthesis in its lexical representation, while a stressed syllable is one that is phonetically more prominent than other syllables in the word.

Let me exemplify Halle and Idsardi's proposals with examples from Slovenian nominal environments.³ In the tables below, I lay out derivations of the main stress of three different types of roots. First, a root that carries a left parenthesis on the root syllable in its lexical representation: (*lip*- 'linden'; second, a root that carries a left parenthesis following the root syllable in its lexical representation: *stez*(- 'path' and third, a root with no parentheses in its lexical representation: *gor*- 'mountain'. These roots are followed first by a case ending with no parenthesis in its lexical representation: *-i* (Dat. sg.); and second by a case ending with a left parenthesis on the VI: *-(o* (Acc. sg.).

Table 1

(<i>lip</i> + <i>i</i>	(<i>lip</i> + (<i>o</i>
(* *)	(* (*)
line 0, RRR, head L	line 0, RRR, head L
(*	(* *
line 1, LLL, head L	line 1, LLL, head L
*	*
line 2	line 2
<i>lípi</i>	<i>lípo</i>

Table 2

<i>stez</i> (+ <i>i</i>	<i>stez</i> (+ (<i>o</i>
*(*)	*((*)
line 0, RRR, head L	line 0, RRR, head L
(*	(*
line 1, LLL, head L	line 1, LLL, head L
*	*
line 2	line 2
<i>stezí</i>	<i>stezó</i>

Table 3

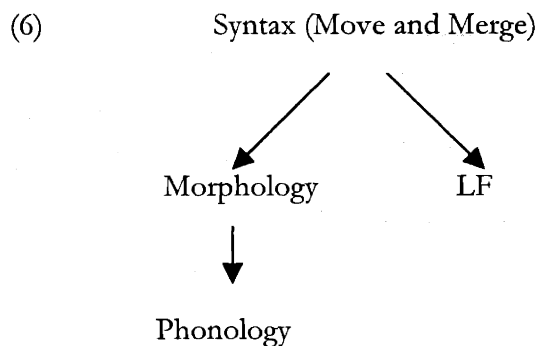
<i>gor</i> + <i>i</i>	<i>gor</i> + (<i>o</i>
* *)	* (*)
line 0, RRR, head L	line 0, RRR, head L
(*	(*
line 1, LLL, head L	line 1, LLL, head L
*	*
line 2	line 2
<i>góri</i>	<i>goró</i>

³ For more on stress in Slovenian nominal environments the reader is referred Marvin (2001).

We will see that a substantial part of the data in verbal environments can be derived in the same way stress is determined in the nouns in Tables 1-3, i.e. by the property of roots and affixes and the rules in (5), but that additional rules need to be posited to account for the complete set of data.

2.3 Distributed Morphology

This work adopts the framework of Distributed Morphology (DM), Halle and Marantz (1993). In this approach, the syntactic terminal nodes are complexes of syntactic and semantic features, selected by each particular language from a UG set of features. After the operations of the computation system, the syntactic structures enter “the Morphology”, where morphological processes can modify them before they are supplied with phonological features through Vocabulary Insertion. The morphological component is situated between the Spell-Out and Phonology.



2.4 The Syntax of Words

I adopt the proposal in Marantz (1997) by which roots have no category per se, but are rather merged in the syntax with category-assigning functional heads such as *n*, *v*, *a* to form nouns, verbs and adjectives respectively. These heads are typically realized by overt derivational affixes, i.e. the affixes determining the category of the word, or by zero derivational affixes.

A verb form is formed in the syntax by successive head-to-head movement of the verbal head to functional heads c-commanding it. The latter involve *v*, T_1 , T_2 and Pass, depending on the verb form. The subject agreement Agr is adjoined to Tense heads and Pass

in the Morphology component, Marantz (1991). The structures for individual verb forms will be laid out in the following section. The reader is referred to Chapter 2, Section 2.3 for a general discussion of features in the verbal domain and phonological realizations of verbal forms.

As to the position of theme vowels, I assume that theme vowels are adjoined to the root.⁴ The theme vowels in Slovenian are: -aj, -ī, ē, ā and Ø.

2.5 The Phonology of Words

After vocabulary insertion, words are subject to phonological rules. In this part I summarize the main phonological rules operating in Slovenian that will be relevant for deriving surface word forms and stress.

(7) Phonological rules:

- a. Vowel deletion: $V \rightarrow \emptyset / _ V$ Jakobson (1948)
- b. glide deletion: $j, w \rightarrow \emptyset / _ C$ Jakobson (1948), Lunt (1966)
- c. glide deletion: $j \rightarrow \emptyset / [\check{c}, \check{s}, \check{z}, j] _$ Lunt (1966)
- d. first velar palatalization: $/k, g, x/ \rightarrow [-back]$ (i.e. $\check{c}, \check{z}, \check{s}$) / $_ i, \bar{i}, \bar{e}$ Lunt (1966)
- e. Iotation: $[s, z, t, st] \rightarrow [\check{s}, \check{z}, \check{c}, \check{sc}] / _ j$ adapted from Lunt (1966)
- f. j-insertion: $V_1 V_2 \rightarrow j V_2 / V_1 \text{ is long, } V_2 \text{ is short}$
- g. $a j e \rightarrow a / -aj$ class adapted from Rubach (1993)

3 Stress and Accent in Verbal Environments – Data

In this part I give an overview of the four basic stress patterns found in Slovenian verbal environments. Each pattern will then be analyzed in section 4.

Before presenting the data, I would like to briefly comment on the forms appearing in the tables. Since I cannot list all possible forms, i.e. forms of all genders, numbers, cases and

⁴ However, see Oltra (1999) for a different approach: the idea that theme vowel are the realization of a morphological well-formedness requirement in Catalan. See also Guerzoni (2002) on Italian.

persons, I chose to lay out only one or two typical representatives of each different verbal form.

- Present Tense: only 1st person singular and 1st person plural are exemplified; the rest of the forms (all three persons in singular, dual, plural) carry the stress on the same syllable as these two forms.
- *L*-Participle: only masculine singular and feminine singular are exemplified; all other forms (combinations of genders and numbers) have the stress in the same place as the feminine singular form
- *(E)n/t*-Participle: only masculine singular and feminine singular are exemplified; all other forms (combinations of genders and numbers) have the stress in the same place as these two forms
- *(E)n/t*-Participle: the prefixes are given in brackets because the Passive Voice employing this participle in Slovenian is marginally acceptable or not acceptable in the imperfective aspect; therefore, prefixation is needed to achieve the perfective aspect.

There are three basic stress patterns as exemplified in 3.1-3.3, with one of the patterns subdivided into two sub-patterns.

3.1 Pattern A

Pattern: stress fixed on the root

Distribution: verbs of classes -aj, -ī, ē, ā, Ø

Example: del-aj- *work*
√ th

Table4

Infinitive	délati
Short Inf.	délat
Present Tense 1sg.	délam
Present Tense 1pl.	délamo
L-Participle masc. sg.	délal ⁵
L-Participle fem. sg.	délala
(E)n/t-Participle masc. sg.	(iz)-délan
(E)n/t-Participle fem. sg.	(iz)-déлана

3.2 Pattern B

Pattern: stress fixed on the root, except in the Infinitive, three-syllabic L-Participle forms and

Short Infinitive

Distribution: -aj, -ī, ā

Example: bran-ī- *defend*
 √ th

Table 5

Infinitive	braníti
Short Inf.	bránit
Present Tense 1sg.	bránim
Present Tense 1pl.	bránimo
L-Participle masc. sg.	bránil
L-Participle fem. sg.	braníla
(E)n/t-Participle masc. sg.	(o)-bránjen
(E)n/t-Participle fem. sg.	(o)-bránjena

⁵ The ending for masculine singular is not null, but a yer. However, for expository reasons I will not mark that fact in this text unless necessary.

3.3 Pattern C

Pattern: stress fixed on the syllable following the root, except in a group of disyllabic *L*-Participles and Short Infinitives (rightmost column)

Distribution: -aj, -ī, ē,

Example: bogat-ē *become rich*, let-ē- *fly*
 √ th √ th

Table 6

Infinitive	bogatéti	letéti
Short Inf.	bogatét	letét, létet
Present Tense 1sg.	bogatím	letím
Present Tense 1pl.	bogatímo	letímo
<i>L</i> -Participle masc. sg.	bogatél	letél, létel
<i>L</i> -Participle fem. sg.	bogatéla	letéla
(<i>E</i>) <i>n</i> / <i>t</i> -Participle masc. sg.	(o)-bogatén	(pre)-letén
(<i>E</i>) <i>n</i> / <i>t</i> -Participle fem. sg.	(o)-bogaténa	(pre)-leténa

Let me at this point just briefly describe the data I will try to account for in the following section. First, we notice that in verb forms of Pattern A, the main stress is consistently found on the root. Pattern B and C appear to be more complex – in these two patterns, the stress is sometimes found on the root, sometimes on the post-root syllable. It is appealing to assume that such stress properties are due to differences in the lexical representation of roots participating in the three patterns. An analysis along these lines will be offered in this work; however, we shall see that the assumption regarding the accentual properties of roots will not be able to do all the work by itself and that some other mechanism will have to be evoked to complete the account.

4 Capturing Stress in Verbal Environments

In this section I analyze stress assignment in verbal environments. I would like to show that general stress rules as in (5) and three types of root accent as proposed in Halle (1997b)

accommodate all data in verbal environments, except a certain group of Present Tense forms and participial forms. Here I wish to defend a proposal that the data not captured straightforwardly by the Halle algorithm are systematic and subject to rules of stress retraction. However, they still support the division of roots into three types with respect to accent.

Section 4 is organized as follows. First, I give arguments for treating roots of Pattern A, B and C as being accented, post-accenting and unaccented, respectively. Second, I show how this classification bears on stress in verbal environments by examining the stress pattern of individual verb forms. As already said, main stress assignment in the Present Tense and the participles cannot be derived for all roots by assuming the rules in (5) and three different accentuation properties of roots. To capture the Present Tense and the *(e)n/t*-Participle stress, I shall propose a stress retraction rule sensitive to syntactic structure and to the number of parentheses on line 0 in the stress grid, which will divide the roots into the same three accentual classes. To capture the stress in the *l*-Participle and the Short Infinitive I shall propose a rule that is sensitive to the number of syllables, but indifferent to the accentual classification of roots.

4.1 Arguing for Three Types of Root Accent

In this section I shall argue that the roots from the three stress patterns observed correspond to traditional three-way division of roots into accented, post-accenting and unaccented. I would like to suggest that roots participating in Pattern A are accented, roots participating in Pattern B post-accenting and roots participating in Pattern C unaccented. The arguments for such an analysis will partly be drawn from the data itself, i.e. the behavior of the roots in verbal environments, where the accent of other constituents of the verb is fixed, and partly from the behavior of the roots in nominal environments. To see how stress in nouns is derived by the rules in (5) and a three-way division of accentual properties of roots, the reader is referred to the appendix.

Let me start with the Pattern A. The observation is that the main stress is consistently found on the root. Given general stress rules insuring that in a word with more than one accent the stress falls on the leftmost accented vowel, the data in Pattern A can be obtained straightforwardly if the participating roots come accented from the lexicon. If these

roots are accented, then, given that the affixation is to the right and that prefixes do not count for stress assignment, the stress will always fall on the root, regardless of whether the attaching affixes are accented or not. This is schematically illustrated in (8) with two possible combinations – the syllable receiving main stress by rules in (8) is boldfaced.

(8) prefix **root** suffix suffix suffix etc.
 (* (* (* (* etc.
 or (* * * * etc.

In Pattern B and C, on the other hand, the main stress is sometimes found on the root, sometimes on the post-root syllable, which means that roots participating in these two patterns cannot be accented – that would have resulted in Pattern A instead. I would like to propose that differences in the stress properties of the two patterns stem from differences in the lexical representation of these roots: Pattern B roots differ from Pattern C roots in that the former (B) are post-accenting while the latter (C) are unaccented.

There are two arguments I would like to put forward for such an analysis. The first one has to do with general properties of the theory of lexical stress. Making accent a property of a root predicts or at least makes it highly desirable that a particular root will have the same accentual properties in all environments - verbal, nominal and adjectival. So, if a root is unaccented in the verbal paradigm, we expect it to be unaccented in the nominal paradigm as well, unless there is some other interfering factor, such as the dominance of an attaching affix, for example.⁶ Examining the behavior of roots appearing in Pattern B and C in nominal environments can thus tell us about their accentual properties.

Let us first consider roots participating in Pattern C. When they appear in nominal forms they can display mobile stress, i.e. they behave as unaccented, which means that the stress of noun forms depends on the stress of the case ending as exemplified in (9). What is more, Pattern C roots never display uniform post-root stress in nominal environments, which is a possible pattern in the language. I therefore propose that roots of Pattern C are unaccented in their lexical representation.

⁶ For a definition of dominance see Chapter 4, Section 4.1.

(9) a. Nominal forms for 'man':

Nom: m^ož

Gen: mo^žá

Dat: móžu

Acc: mo^žá

Loc: móžu

Inst: móžem

b. Verbal forms for 'marry (a man)':

Inf: mo^žíti

Pres: mo^žím, mo^žímo

/Ptc: mo^žíl, mo^žíla

(e)n/t-Ptc: (o)- mo^žén, (o)-mo^žéna

On the other hand, we never find any examples of roots from verbal Pattern B that behave as *mož-* in nominal environments. This leads to a conclusion that since Pattern B roots never behave as unaccented in nominal forms, they are unlikely to be unaccented. I therefore propose Pattern B roots are post-accenting.⁷

In addition to the arguments from the behavior of roots in nominal environments, this classification gains support in the parallelism with Russian, a related language from the IE group. Cognate roots from Slovenian Pattern B behave in Russian as post-accenting, while cognate roots from Slovenian Pattern C behave in Russian as unaccented.

4.2 Applying Root Accentuation to Individual Forms

In this section I would like to show how stress is derived from the accentual information on roots as proposed in section 4.1 above and general stress assignment rules for IE in (5). In addition, I wish to propose two stress retraction rules operating in certain verbal forms: (1) a retraction rule sensitive to syntactic structure and metrical representation for the Present

⁷ Roots of pattern B appear as accented in nominal environments. The reason for such behavior is to be sought in the fact that post-accenting pattern is disappearing from the language. That means that we have positive evidence for Pattern C roots being unaccented, but no positive evidence for Pattern B roots being post-accenting. I will return to this issue at the end of this chapter.

Tense and (e)n/t-Participle, and (2) a retraction rule sensitive to the number of syllables for the l-Participle and Short Infinitive operating also in a group of nouns and adjectives. The section will be organized as follows. Given the conclusions about the accentual information on roots, I shall derive stress for each specific verb form: the Infinitive, the Present Tense, the (e)n/t-Participle, the l-Participle and the Short Infinitive. Rules of stress retraction will be proposed wherever needed. The repercussions that stress retraction rules have for the syntactic theory and a phase Spell-Out of words will be discussed in section 5.

4.3 The structure of Verb and the Interaction between accent and rules of phonology

To begin, I would like to clarify the assumptions about the interaction between accent and phonological rules listed in section 2. The linear order of constituents in a ‘simplex’ verb, i.e. a verb without derivational morphemes such as aspect or diminutive morphology, is as in (10).

(10) $\sqrt{\text{ }}$ + Theme vowel + Tense or Participial ending + Agreement

Throughout the analysis I shall be working with the assumption that suffixes in verb forms carry accentual properties as indicated in Table 7 below. Prefixes, on the other hand, are never stressed in Slovenian – I assume they do not project a SBU.

Table 7

	A. Accented	B Post-accenting	C. Unaccented
Theme Vowels	-(ā, -(ē, -(ī, -(aj) (∅)		
Imperfective Suffixes	-(av-	-ov(-	
Tense (Present)			e, ī
(e)n/t-Participle			-en
Person/Number Agreement			-va, -ta, -mo, -te, -jo
Gender/Number Agreement			-a, -o, -i, -e

It should be noted at this point that theme vowels and the tense morpheme (which is also a vowel) do not surface in all forms – they often get deleted in the derivation as a result of a vowel deletion rule, repeated here in (11).

(11) $V \rightarrow \emptyset / _V$, Jakobson (1948).

Let us, as an example, show the derivation of a Present Tense form of the verb *leteti*, 'to fly'.

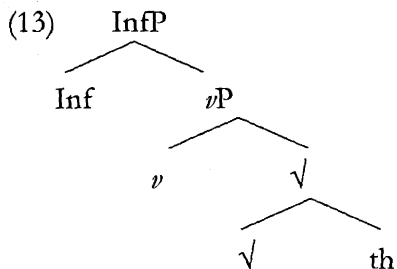
(12) UR: let - ē - i - m → (11) → letim 'fly-pres-1sg'

root	theme	pres.	agr-1sg

I assume that metrical representation on line 0 contains accentual properties of all VIs inserted at Morphological Structure. As to the interaction between accent on VIs and vowel deletion rule, I assume that when the process of vowel deletion occurs, only the corresponding asterisk on the metrical plane is deleted, but not the parenthesis that the vowel might have brought from its lexical representation. For the justification of this move, see Melvold (1990).

4.4 The Infinitive

The syntactic structure of the Infinitive is as in (13); the VI for the infinitival ending are in (14).



(14) Vocabulary Item for Inf: /ti/

The stress in the Infinitive can be straightforwardly derived only from the lexical representation of accent on roots and affixes as given above, assuming the three types of

root accentuation and accented theme vowels. Let me repeat the data and lay out the derivations of stress in (15).

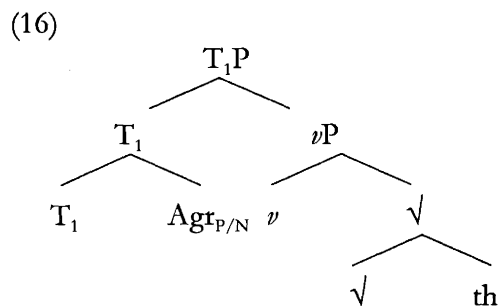
Table 8

Accented A	Post-accenting B	Unaccented C
délati <i>work-inf</i>	braníti <i>defend-inf</i>	letéti <i>fly-inf</i>

- (15) a. del-aj-ti →
 (* (* * → (7g), (5) → délati⁸
- b. bran-ī-ti
 ((* → (5) → braníti
- c. let-ē-ti
 * (* * → (5) → letéti

4.5 The Present Tense

The structure of a Present Tense form is as in (16); the relevant Vocabulary Items are in (17).



- (17) Vocabulary Items for T₁
- /ī/ ↔ [pres] {after theme ē, ī}
- /e/ ↔ [pres]

⁸ In these derivations and the following ones I represent line 0 of metrical grid, which is then subject to phonological rules. I do not, however give a full derivation (as in tables 1-3), which would have to include also lines higher than 0. For the sake of simplicity I only give the final result by marking the syllable that receives main stress in the grid by a diacritic mark, e.g. á.

Present Tense verbs show subject agreement in person and number. In this work I assume that agreement is adjoined to T_1 at Morphological Structure as part of morphological well-formedness, Marantz (1991). Vocabulary Items inserted in the Agr node are as in the Table below.

Table 9: Vocabulary Items for Agr

Person/Number	singular	dual	plural
1st	-m	-va	-mo
2nd	-š	-ta	-te
3rd	-Ø	-ta	-jo

Now I proceed to deriving correct stress placement for all three types of roots. The data are repeated below.⁹

Table 10

ACCENTED	POST-ACCENTING	UNACCENTED
1sg délam	bránim	letím
2sg délaš	brániš	letíš
3sg déla	bráni	letí
1du délava	brániva	letíva
2du délata	bránita	letíta
3du délata	bránita	letíta
1pl délamo	bránimo	letímo
2pl délate	bránite	letíte
3pl délajo	bránijo	letíjo

The stress in the Present Tense can be easily derived for accented roots. The root *del*, ‘work’, is accented in the lexicon; therefore, given that the main stress falls on the leftmost accented vowel, the root accent will always win over the suffix accent. This is illustrated below.

⁹ I give all persons and numbers of the Present Tense paradigm to show that the stress is the same regardless of person, number or the number of syllables. The issue of the effect of syllable number will become relevant when we discuss the stress in the *l*-Participle.

- (18) del a j e mo del a mo
 (* (* * * → (7g) → (* (* * → (5) → délamó

Also, stress in the Present Tense can be derived for verbs with unaccented roots. In these cases, since the root is unaccented and the theme vowel is accented, the stress will go on the post-root syllable. This is illustrated below.

- (19) let ī ī mo let ī mo
 * (* * * → (7a) → * (* * → (5) → letímo

Stress in the Present Tense cannot be derived correctly in verbs with post-accenting roots. The prediction is that in such cases, the stress will fall on the post-root syllable; however, the stress falls on the root syllable as shown in the example below.

- (20) bran ī ī mo bran ī mo
 * (* * * → (7a) → * (* * → (5) → *branímo

It appears that stress in roots such as *bran-* is moving one syllable to the left and, consequently, a special treatment is called for to derive the correct stress placement.

4.5.1 Present Tense Retraction

Before making a concrete proposal, let us verify that in roots like *bran-*, ‘defend’ we are dealing with the retraction rather than placing stress on the first syllable in the absence of other accent. One could in principle suppose that the Present Tense affix is dominant and therefore erases the parentheses on its left, which results in an accent-less word that eventually receives stress on the initial syllable. In a monosyllabic root such as *bran-* we could not tell the two processes apart. The evidence that this is indeed retraction and not placing stress on the first syllable is found with polysyllabic verbs of class *-ā*. Consider (21).

- (21) blebetáti ‘babble-inf’
 blebéčem *blebečém, *blébečem ‘babble-1/sg’

Suppose *blebet-* is a post-accenting root and the theme *-ā* accented. Then we are dealing with a shift of stress in the Present, since otherwise we would have to get **blebečém*. But this shift of stress is not placement of the stress on the first syllable in absence of other stress, because that would yield the ungrammatical form **blébečém*. Therefore we are dealing with retraction one syllable to the left, which derives the grammatical *blebécém*.

Now, to approach our original problem, suppose the root *bran*, 'defend' is post-accenting and the root *let-*, 'fly' is unaccented. In the Present Tense form, we get the following distinction on line 0 of the metrical grid between the Present Tense forms.

- (22) a. $\sqrt{\quad}$ th pres agr
 bran $\bar{i} - \bar{i} - mo$
 ((* * → (7a) → * ((* *
- b. $\sqrt{\quad}$ th pres agr
 let - $\bar{i} - \bar{i} - mo$
 * (* * * → (7a) → * (* *

The crucial factor for positing the stress retraction in the Present Tense of post-accenting roots, but not in the Present Tense of unaccented roots is the presence of a double parenthesis versus the presence of a single parenthesis on line 0 of the metrical grid. Post-accenting roots, such as *bran-*, that are followed by a theme vowel will appear in a grid with two projected parentheses (of the root and the theme). Unaccented roots will be found in a grid with one parenthesis, i.e. the one of the theme. The difference between the two examples above can be captured if we posit the rule in (23).

(23) *Present tense retraction*: In the environment [+present]: $*((* \rightarrow (*((*$

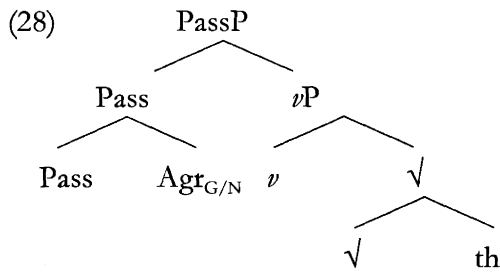
A brief note has to be made at this point with respect to a convention proposed in Halle (1997) that deletes the parentheses that group no stress bearing elements (e.g. $*((* \rightarrow *(*)$). We therefore have to make sure that the latter applies after the Present Tense Retraction. We add (24) to (23) above.

These results are in line with the analysis of Spanish stress by Oltra-Massuet and Arregi (2001). Their paper argues that stress placement in Spanish is determined by syntactic structure; specifically, in Spanish words a right boundary is projected to the left of T on line 0 and a right boundary is projected to the right of *n* and *a* nodes.

4.6 The (E)n/t-Participle

In this section I examine stress patterns of the (e)n/t-Participle and show that a retraction similar to the Present Tense retraction is taking place in the (e)n/t-Participle. The data are interesting for two reasons. First, the retraction in the (e)n/t-Participle overlaps almost completely with the retraction in the Present and therefore groups roots in the same accentual classes. And second, the one case where the two do not overlap confirms the proposed rules of stress retraction – the retraction does not apply in these forms because the conditions on line 0 are not met due to the nature of the vocabulary item inserted in the Pass node.

The structure of the (e)n/t-Participle is as in (28); the relevant Vocabulary Items as in (29).



- (29) Vocabulary insertion in Pass
- /t/ ↔ [Pass] /_List (root verbs (class Ø) ending in a sonorant (v, j, r, l, m, n))
 - /n/ ↔ [Pass] /_{class -ā and class -ē verbs}
 - /en/ ↔ [Pass]

Subject gender and number agreement is adjoined to Pass at MS; the vocabulary items inserted into Agr are as in the table below.

Table 11: Vocabulary Item of Gender/Number Agr:

Gender/Number	singular	dual	plural
masculine	-Ø	-a	-i
feminine	-a	-i	-e
neuter	-o	-i	-a

Below, I repeat the stress patterns that take place in this form.

Table 12

(e)n/t-Ptc	Accented	Unaccented	Post-accenting: -aj	Post-accenting: -ī	Post-accenting: -ā
masc. sg.	délan	(pre)-letén	čákan	bránjen	česán
fem. sg.	délana	(pre)-letén	čákana	bránjena	česána

Accented roots and unaccented roots behave as expected (and as in the Present Tense form). Post-accenting roots, on the other hand, show an asymmetry with respect to their theme vowel – roots that take *-aj* and *ī* as their themes retract the stress (as in the Present Tense form), but roots that take *ā* do not. The analysis I will give will be able to handle this problem.

Given that the stress pattern of (e)n/t-Participle almost completely overlaps with the Present Tense pattern, I propose the same rule sensitive to line 0 representation and syntactic structure proposed for the Present Tense applies also in the (e)n/t-Participle form.¹¹

(30) a. In environment: $*((* \rightarrow *(((*$
 $\quad \quad \quad |$
 $\quad \quad \quad T_i/Pass$

b. *Convention*: Parenthesis that group no stress-bearing elements are deleted, Halle (1997b).

c. *Present Tense* & *Passive Retraction* precedes *Convention*.

¹¹ Notice that this rule correctly predicts that in the unaccented stems, the stress will not retract for exactly the same reasons as in the Present – the environment for (30a) is not met as exemplified in (i).

(i) * (*
 let- ē-n → (5) → letén

The retraction in (30) takes place in roots of classes $-aj$ and $-\bar{i}$ as exemplified in (31).

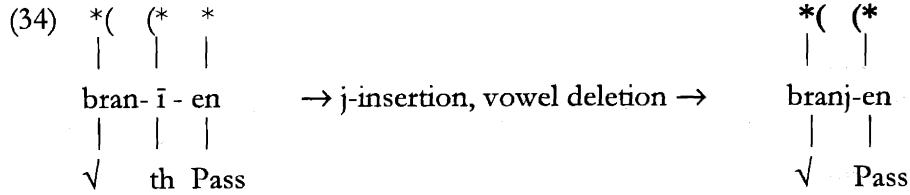
- (31) $\text{bran-}\bar{i}\text{-en}$ branj-en branj-en
 $*(\quad (** \rightarrow (7f) \rightarrow *(\quad (* \rightarrow (30a) \rightarrow (*((* \rightarrow (5) \rightarrow \text{bránjen}$

Class $-\bar{a}$, on the other hand, is special. Here I would like to suggest that stress pattern of class \bar{a} follows if we consider the vocabulary items inserted in Pass node – see (29) above for vocabulary insertion rules – and that nothing needs to be changed in the stress retraction rule in (30). Note that in \bar{a} class, as opposed to \bar{i} class, the passive affix is $/-n/$ and not $/-en/$. This difference reveals itself in differences in the surface forms. In class $-\bar{i}$, which takes $/en/$, the vowel $/e/$ in $/en/$ triggers j-insertion (7f, repeated 32a) and causes the deletion of the theme vowel (which precedes the vowel $/e/$). If the inserted VI in Pass were $/n/$, this would result in an incorrect surface form, as in (32c). If the passive affix for class \bar{a} were $-en$, we would expect j-insertion to occur in class $-\bar{a}$ as well. The j-insertion in class \bar{a} verbs does not occur, as exemplified in (32d-e), which suggests that the VI inserted in Pass with class $-\bar{a}$ verbs \bar{a} is only the consonant $/n/$.

- (32) a. j-insertion: $V_1V_2 \rightarrow jV_2 / V_1$ is long, V_2 is short
 b. $\text{bran-}\bar{i}\text{-en} \rightarrow \text{branjen}$ (j-insertion)
 c. $\text{bran-}\bar{i}\text{-n} \rightarrow * \text{branin}$ (no j-insertion)
 d. $\text{čes-}\bar{a}\text{-n} \rightarrow \text{česan}$ (no j-insertion)
 e. $\text{čes-}\bar{a}\text{-en} \rightarrow * \text{češen}$ (j-insertion)

The representation of the line 0 in the grid and linking to the syntactic structure between verbs of class $-\bar{i}$ and $-\bar{a}$ is represented in (33) and (34).

- (33) $\begin{array}{c} *(\quad (* \\ | \quad | \\ \text{čes-}\bar{a}\text{-n} \\ | \quad | \quad | \\ \checkmark \quad \text{th Pass} \end{array}$



Consider the metrical representation on line 0 after the application of phonological rules (the boldfaced representation). Given the rule of retraction in (30), the conditions on the metrical grid are met in (34) – the SBU linked to the node Pass is preceded by two parentheses. The conditions are not met in (33), where there is no SBU linked to Pass at all.¹² Therefore, these examples are readily explained if the vocabulary items inserted in Pass and the consequent phonological rules are taken into account.

4.6.1 Interim Conclusions

Before proceeding to a new verbal environment, let me briefly summarize the results obtained in parts 4.2-4.6.

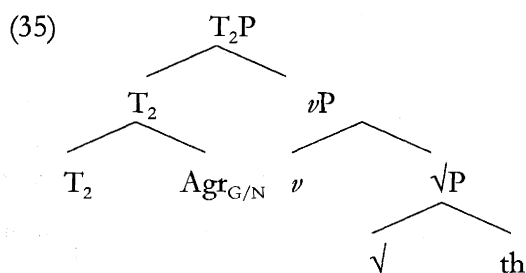
- Tense and Passive functional nodes have the property that they can influence the stress assignment in the word. If the SBU linked to T or Pass is preceded by two parentheses, then a left parenthesis is inserted one asterisk to the left, which has the effect of shifting stress one syllable to the left from where we would normally expect it.
- These results are consistent with the work by Oltra-Massuet and Arregi (2001), who show that stress placement in Spanish is determined by syntactic structure. There is one difference between the results obtained. Oltra-Massuet and Arregi (2001) claim that syntactic nodes in Spanish project parentheses in the metrical grid regardless of what the realization of the nodes is. In Slovenian, that might be the case for nodes T₁ and Pass; however, we saw in the Present Tense and (e)n/t-Participle that syntactic nodes insert parentheses depending on the conditions on the metrical grid, so syntax has to see the stress plane before interacting with the metrical representation.

¹² Note that the SBU of the theme vowel, which is preceded by two parentheses, cannot cause the retraction.

4.7 The *l*-Participle and the Short Infinitive

In this part I examine in parallel the stress pattern in the *l*-Participle and Short Infinitive. First, we shall see that the stress in these two forms cannot be straightforwardly derived from the lexical representation of accent in unaccented and post-accenting roots. Second, I shall argue that stress facts in these two forms are not a result of syntactic node interaction with the metrical plane, but a result of an entirely phonological process – a stress retraction rule sensitive to the number of syllables. Finally, I shall propose that the same stress retraction rule takes place in a group of nominal and adjectival environments.

To begin with, the structure of the *l*-Participle is as in (35); the relevant Vocabulary Item is shown in (36). The gender and number agreement is adjoined at MS, the vocabulary items being the same as in the *(e)n/t*-Participle.



(36) Vocabulary insertion in T_2 ¹³
 /l/ ↔ []

The structure of the Short Infinitive is the same as the structure of the Infinitive, i.e. (13), while the Short Infinitive is derived by deleting the final vowel in the Infinitival form in colloquial standard speech, as exemplified in (37).

(37) *delati* ‘work-inf’ → /i/ deletion → *delat* ‘work-short inf’

Let me repeat the data concerning post-accenting roots.

¹³ See Chapter 4 for a detailed analysis of vocabulary insertion of /l/.

Table 13

<i>bran-</i> 'defend'	Post-accenting
Infinitive	braníti
Short Infinitive	bránit
Present Tense 1sg.	bránim
Present Tense 1pl.	bránimo
/-Participle masc. sg.	bránil
/-Participle fem. sg.	braníla

We observe that in post-accenting roots the main stress is sometimes found on the root, sometimes on the post-root syllable (the instances of root stress are boldfaced). In section 4.5 I argued that, given the root accentuation, the main stress is expected to occur on the post-root syllable and verb forms of post-accenting roots show the Present Tense retraction (following the rule in (30)). Considering data in Table 13, we observe that post-accenting roots are subject to stress retraction in the Short Infinitive and Masculine Singular /-Participle forms as well.

A natural question arises: are the retractions in the Present Tense and Masc. Sg. /-Participle and Short Infinitive results of the same process? It would be desirable if the retraction observed in the Masc. Sg. /-Participle and Short Infinitive were a new instance of syntax interacting with stress assignment, dividing the roots in the same three groups as Present Tense Retraction.

However, that cannot be the case, as I will try to show below. As already stated, the retraction in the /-Participle is only found in the masculine singular form, never in forms of other numbers and genders. To exemplify this fact, I lay out all /-Participle forms for post-accenting roots (such as *bran-*) in Table 14 below.

Table 14

	SINGULAR	DUAL	PLURAL
MASCULINE	bránil	braníla	braníli
FEMININE	braníla	braníli	braníle
NEUTER	branílo	braníli	braníla

If the retraction in the *l*-Participle and Short Infinitive followed the same rule as the Present Tense retraction, then we would expect it to occur in all possible forms and not only in the masculine singular form. As already noted, Present Tense retraction is not sensitive to any particular phi feature – all Present Tense forms retract their stress regardless of number or person, (see Table 10).

Another important fact is that in *l*-Participle, the retraction is not actually sensitive to features masculine and singular. When we consider polysyllabic roots such as *blebet-* ‘babble’, we see that no retraction is triggered in either the masculine singular form or in any other form of the verb, as exemplified in Table 15. The same is true of the Short Infinitive, (38).¹⁴

Table 15

	SINGULAR	DUAL	PLURAL
MASCULINE	blebetál, *blebétal	blebetála	blebetáli
FEMININE	blebetála	blebetáli	blebetále
NEUTER	blebetálo	blebetáli	blebetála

(38) Short Infinitive: blebetát, *blebétat

Rather, the correct description of the data concerning post-accenting roots is that stress is retracted when the *l*-Participle and Short Infinitive happen to be disyllabic and stress is not retracted if the *l*-Participle and Short Infinitive are polysyllabic.

Let us now proceed to the data concerning unaccented roots. We shall see that they confirm the observation stated above. Unaccented roots show an optional retraction in the masculine *l*-Participle and Short Infinitive, but only if the forms are disyllabic. That is, in disyllabic forms, we can have a retraction with some roots (such as *let-* ‘fly’), but not with others (such as *grm-* ‘thunder’) while in polysyllabic forms (such as *bogat-* ‘rich’) the retraction never takes place with any root. The relevant examples are laid out in the Table below.^{15, 16}

¹⁴ There are approximately 20 roots such as *blebet-*, Lenček (1982).

¹⁵ As we can see from the data, disyllabicity is a necessary though not sufficient condition for disyllabic retraction of forms built on unaccented roots. There are many disyllabic verbs that do not retract stress in Masc. Sg. *l*-Participle and Short Inf. Approximately one third of roots optionally retract stress like *let-* ‘fly’, the

Table 16

	Unaccented	Unaccented	Unaccented
Infinitive	letéti <i>fly</i>	grméti <i>thunder</i>	bogatéti <i>become rich</i>
Short Infinitive	létet	grmét,*gímet ¹⁷	bogatét, *bogátet
Past Participle masc.	létel	grmél, *gímel	bogatél, *bogátel
Past Participle fem.	letéla	grméla	bogatéla

I would like to propose that the retraction in the /-Participle and Short Infinitive sensitive to the number of syllables is captured by the rule in (39). This rule is takes place at “the Phonology”.

(39) *Disyllabic retraction*: List of roots: #*(*# → (*(

Rule Ordering: Convention (30b) precedes Disyllabic retraction

Let me briefly lay out how the rule above correctly derives the /-Participle and Short Infinitive forms. In the Infinitive and the Feminine /-Participle form the conditions for the disyllabic retraction are not met and the latter does not apply. In the Short Infinitive and the Masculine /-Participle, which are all disyllabic, the disyllabic retraction will apply.

(40) a. Post-accenting: Infinitive/ trisyllabic Past Participle:

bran-ī-ti

bran-ī-ti

bran-ī-la

bran-ī-la

* ((* * → Convention → * (* * → (5) → braníti; braníla

rest do not retract the stress. It is impossible to predict from phonological, morphological or semantic properties whether a certain root will appear in an /-Participle or Short Infinitive with retracted stress. However, it can be predicted that no polysyllabic roots such as *bogat-* ‘rich’ will show retraction.

¹⁶ Note that verbs with unaccented roots provide another argument for not unifying the Present Tense Retraction and the retraction in the Past Participle and Short Infinitive. Namely, the root *let-*, which can be stress-retracting in its Past Participle and Short Infinitive is never stress-retracting in its Present Tense form.

b. Post-accenting: Short Infinitive/disyllabic Past Participle

bran-ī-l bran-ī-l bran-ī-l
 bran-ī-t bran-ī-t bran-ī-t
 * ((* → Convention → * (* → (39) → (* (* → (5) → brānil; brānit

4.7.1 Disyllabic Retraction in Nouns and Adjectives

There is a group of approximately seventy very common nouns from Class I declension for which the stress cannot be derived by the rules in (5). An example is illustrated in the table below.

Table 17

medved - bear	SING	PL	DUAL
NOM	médved	medvédje	medvéda
GEN	medvéda	medvédov	medvédov
DAT	medvédu	medvédom	medvédoma
ACC	medvéda	medvéde	medvéda
LOC	medvédu	medvédih	medvédih
INST	medvédom	medvédi	medvédoma

The problem here is the following. In the noun *medved*, the root must be accented since the stress never falls on the ending. If the root is accented on the first syllable, *med-*, then that syllable should always carry the main stress in all forms. However, this only occurs in the singular nominative (*médved*). If the root is accented on the second syllable, *-ved*, then we should always see the main stress on *-ved*, which we do with the exception of the nominative singular form.

I would like to suggest that the data above are parallel to the data in the /-Participle and Short Infinitive. That is, in the disyllabic form (nominative singular), the stress is on the root-initial syllable; in three syllabic forms, the stress is on the root-final syllable. This suggests that the root *medved* comes from the lexicon with the accent on the second syllable, while the rule in (39) retracts the stress to the left in the disyllabic form *medved*.

¹⁷ The stress in /í/ is not on the consonant, but on the schwa preceding it.

(41) * (* → (39) → (* (* → (5) → médved
 med-ved med-ved

The same stress phenomenon is observed also in a small group of Adjectives, as exemplified in Table 18 below.¹⁸

Table 18

	SINGULAR	DUAL	PLURAL
MASCULINE	vélík <i>big</i>	velíka	velíki
FEMININE	velíka	velíki	velíke
NEUTER	velíko	velíki	velíka

I would like to propose that Disyllabic retraction is reformulated as in (42) so that it includes the examples from the nominal and adjectival environments.¹⁹

(42) *Disyllabic retraction*: In the environment {list of verbs/nouns/adjectives}: #*(# → (*(

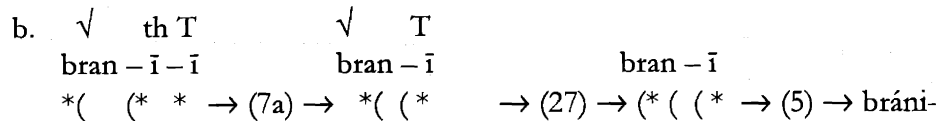
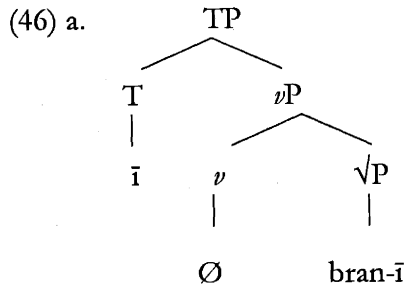
5 The Interaction of Stress and Syntax in Verbal Environments

In this section I would like to discuss the proposed analysis of stress retraction as an instance of interaction between syntactic structure and the metrical grid. Specifically, if the analysis of word stress demands that syntactic nodes are capable of parenthesis insertion in the metrical grid, then the question is how this property relates to the phase Spell-Out of Chapter 1. Here I would like to clarify the fact that the Tense node can influence the pronunciation of the root (in Present Tense retraction), even if at the point at which T causes a retraction the root should be inaccessible.

To begin with, let me summarize the proposal about the phase Spell-Out of words and the proposal of Present Tense stress retraction.

¹⁸ Patterning with velik, 'big' are : débel - debéla, 'fat', zélen - zeléna, 'green'.

¹⁹ David Pesetsky pointed out to me that disyllabic retraction could be viewed not as a retraction, but as penultimate stress in certain environments in the language (Present Tense verbal forms, a group of nouns). So, there would be two systems of stress assignment that the language employs - one that follows general stress rules in (5) (like Russian) and the other one that assigns stress to the penultimate syllable (like Polish). This is an



I believe the problem can be solved by providing a finer-grained definition for phase Spell-Out and penetrability. The proposal we have been working with up to now is as follows: chunks of words can be accessed up to their Spell-Out, while spelled-out chunks of words are impenetrable for operations triggered by structures above. Now we have to consider what the definition of ‘accessibility’ of a certain word chunk is. In Chapter 1 we saw that the underlying representation of a vocabulary item realizing a category-forming head is accessible only to the next higher phase (vowel reduction and stress in English). In Chapter 4 I laid out examples where a dominant constituent wiped out the parentheses of the constituents it attached to and inserted a new parenthesis if those constituents were found in the same phase as the dominant affix (*/-*Participle nominalizations); when the same affix attached to constituents that were already spelled out in the previous phase it could not have any influence on the stress pattern of the spelled-out constituents. These properties of phase Spell-Out can be summarized as in (47).

- (47) a. accessing the already created metrical structure of a constituent to change the constituent’s pronunciation
 b. adding new information to the already created metrical structure of a constituent

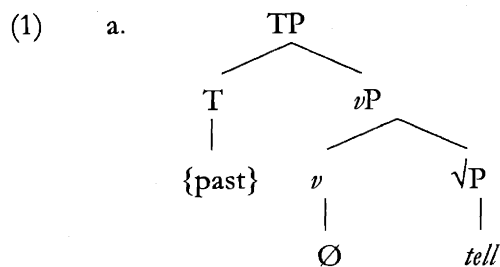
The retraction occurring in the Present Tense has the property in (47b) – it adds a new parenthesis on line 0 of the metrical grid. It is not the case, though, that Present Tense retraction also has the property in (47a) – one cannot claim that Present Tense changes the UR of a constituent it attaches to by wiping out the parentheses from that constituent.

Therefore, the conclusion is that given the analysis of stress retraction in Chapter 3, we have to restate the notion of penetrability. The underlying representation of accent of a spelled-out constituent is not accessible to higher occurring phases for *change*, but only for *addition* of new material to the metrical grid. This conclusion is tentative and requires further investigation that goes beyond the scope of this work.

CHAPTER 6: CONCLUDING REMARKS

In this work I argued that words exhibit the syntactic phenomenon of a cyclic Spell-Out, basing the arguments on the analysis of data from English and Slovenian. The data examined indicates that the syntactic structure in word formation, specifically, the existence of phases at the word level, is necessary to make generalizations about the meaning and stress properties of words in these two languages. In this chapter I present an obvious problem for my analysis and discuss possible solutions.

The problem occurs with the English Past Tense forms of irregular verbs, where the temporal feature E, R_S (or [+past]) on Tense can change the pronunciation of the root as in (1) despite the fact that Tense is two phases above the root and given Phase Impenetrability Condition (repeated in (2)) should not be able to affect the Spell-Out of the root, which is spelled out at *v*P.



b. *tell* + {past} → *told*

- (2) *Phase Impenetrability Condition (PIC) at word level*: H and its edge (specifiers, adjoined elements) are spelled out at the next strong phase. The domain of H is spelled out at the phase of HP. A head *h* adjoined to H is in the domain of H.

In Distributed Morphology, Halle and Marantz (1993), the issue of irregular Past Tense forms is solved by positing readjustment rules: stem allomorphies such as (1b) result from readjustment rules that have the form of phonological rules and apply to morphemes after Vocabulary Insertion; an example is given in (3).

word *thirteen* is changed from primary, (4a), to secondary, (4b), after the word has already been spelled out. This contradiction is resolved by restricting the phase analysis (the phase Spell-Out and the PIC) to lines 0 and 1 of the metrical grid, so that the Rhythm rule, which takes place on line 2, is not subject to the phase Spell-Out and the PIC.

Returning to irregular Past Tense forms in English, a parallel solution to the Rhythm Rule solution is to claim that there exist processes in word-formation in which a syntactico-semantic feature triggers the application of phonological rules that do not obey the PIC.

A similar example of a syntactically conditioned phonological rule is discussed in Hayes, (1990) for Hausa (and several other languages), where final long vowels appear short when the verb precedes a full NP direct object, as exemplified in (5).

(5)	na: ka:ma:	'I have caught (it)'	no object
	na: ka:ma: ši	'I have caught it'	pronominal object
	na: ka:ma ki:fi:	'I have caught a fish'	full NP object
	na: ka:ma: wa Mu:sa: ki:fi:	'I have caught Musa a fish'	object does not directly follow

Therefore, the analysis argued for in this study needs further research to deal with what appears to be a pattern showing up in many unrelated languages.²¹

²¹ It is, however, important to note that such processes represent a problem for any theory of word formation: lexicalist theories have to allow a certain degree of interaction between the Syntax and the Lexicon while Distributed Morphology has to posit readjustment rules limited to short lists of Vocabulary Items.

REFERENCES:

- Abney, S. 1987. *The English Noun Phrase in its Sentential Aspect*. Ph.D. dissertation, MIT.
- Alexiadou, A. 2001. *Functional Structure in Nominals: Nominalizations and Ergativity*. Amsterdam/Philadelphia: John Benjamins.
- Anderson, S. 1982. Where's Morphology? *Linguistic Inquiry* 13: 571-621.
- Anderson, S. 1992. *A-morphous Morphology*. Cambridge: Cambridge University Press.
- Aronoff, M. 1976. *Word Formation in Generative Grammar*. Cambridge MA: MIT Press.
- Aronoff, M. 1994. *Morphology by Itself*. Cambridge MA: MIT Press.
- Baayen, R. H. and R. Lieber. Productivity and English Derivation: a Corpus-based Study. *Linguistics* 29: 801-43.
- Baker, M., K. Johnson, and I. Roberts. 1989. Passive Arguments Raised. *Linguistic Inquiry* 16: 373-416.
- Baker, M. 1988. *Incorporation: A Theory of Grammatical Function Changing*. Chicago: University of Chicago Press.
- Barker, C. 1998. Episodic *-ee* in English: A Thematic Role Constraint on New Word Formation. *Language* 74: 695-727.
- Beard, R. 1966. *The Affixation of Adjectives in Contemporary Literary Serbo-Croatian*. Doctoral dissertation, University of Michigan, Ann Arbor.
- Beard, R. 1995. *Morpheme-Lexeme Base Morphology*. Albany: SUNY Press.
- Bresnan, J. 1972. On Sentence Stress and Syntactic Transformations. In *Contributions to Generative Phonology*, Michael Brame ed., 73-107. Austin: University of Texas Press.
- Burzio, L. 1994. *Principles of English stress*. Cambridge: Cambridge University Press.
- Chomsky, N. 1981. *Lectures of Government and Binding*. Dordrecht: Foris.
- Chomsky, N. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.
- Chomsky, N. 1998. *Minimalist Inquiries*. Cambridge, Ms. MIT.
- Chomsky, N. 1999. *Derivation by Phase*. Cambridge MA: MIT Working Papers in Linguistics 18.

- Chomsky, N. 2001. *Beyond Explanational Adequacy*. Cambridge MA: MIT Occasional Papers in Linguistics 20. Cambridge, MA: MITWPL.
- Chomsky, N. and M. Halle. 1968. *The Sound Pattern of English*. New York: Harper and Row.
- Czaykowska-Higgins, E. 1988. *Investigations into Polish Morphology and Phonology*. Doctoral Dissertation, MIT.
- DiSciullo, A. -M and E. Williams. 1987. *On the Definition of Word*. Cambridge, MA: MIT Press.
- Dubinsky, S. and S. R. Simango 1996. Passive and Stative in Chichewa: Evidence for Modular Distinctions in Grammar. *Language* 72.4: 749-781.
- Embick, D. 1997. *Voice morphology and its Interfaces with Syntax*. Doctoral dissertation, University of Pennsylvania.
- Embick, D. 2000a. Features, Syntax, and Categories in the Latin Perfect. *Linguistic Inquiry* 31: 185-230.
- Embick, D. 2000b. *Participial Structures and Participial Asymmetries*. Ms. MIT.
- Fabb, N. 1988. English Suffixation is Constrained Only by Selectional Restrictions. *NLLT* 6: 527-539.
- Giegerich, H. 1999. *Lexical Strata in English: Morphological Causes, Phonological Effects*. Cambridge: Cambridge University Press.
- Grimshaw, J. 1990. *Argument Structure*. Cambridge, MA: MIT Press.
- Guerzoni, E. 2000. *Stress and Morphology in the Italian Verb System*. Ms. MIT.
- Halle, M. 1973. Prolegomena to a Theory of Word Formation. *Linguistic Inquiry* 4: 3-16.
- Halle, M. 1997a. Distributed Morphology: Impoverishment and Fission. *MIT Working Papers in Linguistics* 30: 425-449.
- Halle, M. 1997b. On stress and accent in Indo-European. *Language* 73: 275-313.
- Halle, M. 1998. The Stress of English Words 1968-1998. *Linguistics Inquiry* 29: 539-568.
- Halle, M. and K. P. Mohanan 1985. Segmental Phonology of Modern English. *Linguistic Inquiry* 16: 57-116.
- Halle, M. and J.-R. Vergnaud. 1987. *An Essay on Stress*. Cambridge MA: MIT Press.
- Halle, M. and M. Kenstowicz. 1991. The Free Element Condition and cyclic versus noncyclic stress. *Linguistic Inquiry* 22: 457-501.

- Halle, M. and A. Marantz 1993. Distributed Morphology and the Pieces of Inflection. *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, ed. Kenneth Hale and S. Jay Keyser. Cambridge, MA: MIT Press, 111-76.
- Halle, M. and A. Marantz 1994. Some Key Features of Distributed Morphology. *MIT Working Papers in Linguistics 21*: 275-288.
- Halle, M. and W. Idsardi. 1995. General Properties of Stress and Metrical Structure. In *The Handbook of Phonological Theory*, ed. John Goldsmith, 402-443. Oxford: Blackwell.
- Harley, H. 1995. *Subjects, Events and Licensing*. Doctoral dissertation, MIT.
- Harley, H. and R. Noyer. 1998a. Licensing in the non-lexicalist Lexicon: Nominalizations, Vocabulary Items and the Encyclopedia. *MIT Working Papers in Linguistics 32*: 119-137.
- Harley, H. and R. Noyer. 1998b. Mixed Nominalizations, Short Verb Movement and Object Shift in English. In *Proceedings of NELS 28*.
- Harley, H. and R. Noyer. 1999. State-of-the-Article: Distributed Morphology. *Glott International 4.4*, 3-9.
- Harris, J. 1991. The Exponence of Gender in Spanish. *Linguistic Inquiry 22*: 27-62.
- Heim, I. and A. Kratzer. 1998. *Semantics in Generative Grammar*. Oxford: Blackwell Publishers.
- Hornstein, N. 1990. *As Time Goes By*. Cambridge MA: MIT Press.
- Ippolito, M. 1997. *Reference Time and Tense Anaphora*. Ms. MIT.
- Ippolito, M. 1999. On the Past Participle Morphology in Italian. *MIT Working Papers in Linguistics 33*: 111-137.
- Jakobson, R. 1948. Russian Conjugation. *Word 4*: 155-167. Also in *Selected Writings II*. The Hague: Mouton. 119-129.
- Kenstowicz, M. 1994. *Phonology in Generative Grammar*. Cambridge: Blackwell.
- Kiparsky, P. 1979. Metrical Structure Assignment is Cyclic. *Linguistic Inquiry 10*: 421-441.
- Kiparsky, P. 1982. From Cyclic Phonology to Lexical Phonology. In H. van der Hulst and N. Smith, eds., *The Structure of Phonological Representations*, pt1 Dordrecht: Foris, 130-175.
- Kiparsky, P. 1985. Some Consequences of Lexical Phonology. In C Ewen and J. Anderson, eds., *Phonology Yearbook 2*. Cambridge: Cambridge University Press.

- Kiparsky, P., and M. Halle. 1977. Towards a Reconstruction of the Indo-European Accent. In L. Hyman, ed., *Studies in Stress and Accent*. Southern California Occasional Papers in Linguistics 4. Department of Linguistics, University of Southern California, Los Angeles.
- Kratzer, A. 1993. *The Event Argument and the Semantics of Voice*. Ms. Umass Amherst.
- Kratzer, A. 1996. Severing the External Argument from its Verb. *Phrase Structure and the Lexicon*. J. Rooryck and L. Zaring. Dordrecht, Kluwer: 109-137.
- Kratzer, A. 2000. Building Statives. *Proceedings from Berkeley Linguistics Society* 26.
- Legate, J. 2001. *Some Interface Properties of the Phase*. Ms. MIT.
- Lenček, R. 1966. *The Verb Pattern of Contemporary Standard Slovene*. Wiesbaden: Otto Harrassowitz.
- Lenček, R. 1982. *The Structure and History of Slovene Language*. Ohio: Slavica.
- Levin, B. 1993. *English Verb Classes and Alternations: A Preliminary Investigation*. Chicago: University of Chicago Press.
- Levin B. and M. Rappaport. 1986. The Formation of Adjectival Passives. *Linguistic Inquiry* 17: 623-62.
- Levin B. and M. Rappaport. 1995. *Unaccusativity: at the Syntax-Lexical Semantics Interface*. Cambridge MA: MIT Pres.
- Liberman, M. and A. Prince. 1977. On Stress and Linguistic Rhythm. *Linguistic Inquiry* 8: 249-336.
- Lieber, R. 1980. *On the Organization fo the Lexicon*. Doctoral dissertation, MIT.
- Lieber, R. 1992. *Deconstructing Morphology*. Chicago: University of Chicago Press.
- Lieber, 2002. *Compound interpretation: lexical semantics, not syntax*. Ms. University of New Hampshire.
- Lightner, T. 1972. *Problems in the Theory of Phonology: Volume I. Russian Phonology and Turkish Phonology*. Edmonton: Linguistic Research, Inc..
- Lunt, H. 1966. Attempt at a Generative Description of the Slovene Verb. *The Verb Pattern of Contemporary Standard Slovene*. Wiesbaden: Otto Harrassowitz.
- Marantz, A. 1984. *On the Nature of Grammatical Relations*. Cambridge MA: MIT Press.
- Marantz, A. 1991. Case and Licensing. *Proceedings of Escol*: 234-253.

- Marantz, A 1997. No Escape from Syntax: Don't Try Morphological Analysis in the Privacy of Your Own Lexicon. In A. Dimitriadis, L. Siegel, C Surek-Clark, and A. Williams, eds., *Proceedings of the 21st Annual Penn Linguistics Colloquium, Upenn Working Papers in Linguistics 4.2*: 201-225. Philadelphia: Penn Linguistics Club.
- Marantz, A. *Cat as a Phrasal Idiom*. Ms. MIT.
- Marantz, A. 1999. *Morphology Lecture Notes*. Ms. MIT.
- Marantz, A. 2000. *Reconstructing the Lexical Domain with a Single Generative Engine*. Ms. MIT.
- Marantz, A. 2001. *Words*. Ms. MIT.
- Marvin, T. 2000. *Two Topics in the Verbal Conjugation of Slovenian*. Ms. MIT.
- Mascaró, J. 1976. *Catalan Phonology and the Phonological Cycle*. Doctoral Dissertation. MIT.
- Matushansky, O. 2002. *The Status of Head-Movement in the Linguistic Theory*. Ms. MIT.
- Melvold, J. 1990. Structure and Stress in the Phonology of Russian. Doctoral dissertation, M.I.T.
- Musan, R. 1995. *On the Temporal Interpretation of Noun Phrases*. Doctoral dissertation, MIT.
- Oltra-Massuet, I. 1999. On the Constituent Structure of Catalan Verbs. *MIT Working Papers in Linguistics 33*.
- Oltra-Massuet, I. and K. Arregi 2001. Stress-by-Structure in Spanish. In M. Hale and C. Reiss, eds., *Phonology at the Turn of the Millenium*.
- Orešnik, J. 1994. *Slovenski glagolski vid in univerzalna slovnica*. Ljubljana: SAZU.
- Pesetsky, D. 1995. *Zero Syntax*. Cambridge MA: MIT Press.
- Pesetsky, D. 1985. Morphology and Logical Form. *Linguistic Inquiry* 16: 193-246.
- Plag, I. 1999. *Morphological Productivity*. Berlin: Mouton de Gruyter.
- Pollock, J-Y. 1989. Verb Movement, UG and the Structure of IP. *Linguistic Inquiry* 20: 365-424.
- Pylkkänen, L. 2002. *Introducing Arguments*. Doctoral dissertation, MIT.
- Reichenbach, H. 1947. *Elements of Symbolic Logic*. New York: MacMillan.
- Rosen, C. 1984. The Interface between Semantic Roles and Initial Grammatical Relations. in

- D. Perlmutter and C. Rosen, eds. *Studies in Relational Grammar*. University of Chicago Press.
- Rubach, J. 1993. *The Lexical Phonology of Slovak*. Oxford: Clarendon Press.
- Scalise, S. 1984. *Generative Morphology*. Dordrecht: Foris.
- Schoorlemmer, M. 1995. *Participial Passive and Aspect in Russian*. Utrecht: OTS.
- Selkirk, E. 1982. *The Syntax of Words*. Cambridge MA: MIT Press.
- Selkirk, E. 1982. *The Syntax of Words*. Cambridge MA: MIT Press.
- Selkirk, E. 1984. *Phonology and Syntax*. Cambridge MA: MIT Press.
- Siegel, D. 1974. *Topics in English Morphology*. Doctoral dissertation MIT.
- Spencer, A. and A. M. Zwicky 1998. *The Handbook of Morphology*. Oxford: Blackwell Publishers.
- Spencer, A. 1991. *Morphological Theory: an Introduction to Word Structure in Generative Grammar*. Oxford: Blackwell Publishers.
- Steriade, D. 1998. Lexical Conservatism. *Proceedings from SICOL 1998*.
- Stramljič - Breznik, I. 1999. *Prispevki iz slovenskega besedoslovja*. Maribor: Slavistično društvo Maribor.
- Toporišič, J. 2000. *Slovenska slovnica*. Maribor: Založba Obzorja Maribor.
- Vidovič-Muha, A. 1988. *Slovensko skladenjsko besedotvorje ob primerih zloženek*. Ljubljana: Partizanska knjiga.
- Wagner, M. *Configurational Stress in Derivatives, Compounds, and Phases*. Ms. MIT.
- Wasow, T. 1977. Transformations and the Lexicon. In P. Culicover, T. Wasow, and A. Akmajian, eds., *Formal Syntax*. New York: Academic Press.