Topics in the Phonology of Picard

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ABSTRACT OF THE THESIS

This thesis investigates a number of phonological phenomena in Picard, a Gallo-Romance dialect spoken in France: Across-Word Regressive Assimilation and its variation patterns, and the domain-sensitive strategies that the language employs in the Resolution of Vocalic Hiatus (i.e. Semivocalization, Vowel Elision and Heterosyllabification). More generally, the thesis is about "variation" in its broadest sense. It explores variation that occurs within a single prosodic domain as well as the type of variation that operates across domains; while the former is variable and triggered by linguistic and extralinguistic factors (and is thus the subject of sociolinguistic investigation), the latter is invariable and strictly determined by domains.

For the analysis of these two types of "variation", I adopt the framework of Optimality Theory. One of the advantages of this framework is that it allows us to account for domain-driven and sociolinguistic variation within a language by means of a single grammar. In the context of domain-sensitive phenomena, this can be accomplished by the decomposition of constraints into their domain-specific counterparts, each of which may be ranked independently within a single grammar to yield the alternations observed across domains. Based on this line of research and influenced by insights from Prosodic Phonology, I propose an approach to the decomposition of constraints in which only prosodic domains may serve for constraint specification. I argue that this is advantageous because it constrains the grammar by imposing limitations on the types of domains that may be subject to decomposition, and captures Prosodic Phonology's view

that the interface between phonology and morphosyntax must be indirect, that is, mediated by domains from the prosodic hierarchy. In the context of variation triggered by linguistic and extralinguistic factors, I argue that variable patterns are best analyzed as the result of crucial nonranking of constraints. A positive consequence of this approach is that it is able to incorporate variation and its frequency effects directly into the grammar (i.e. competence), via constraint ranking.

RÉSUMÉ DE LA THÈSE

Cette thèse examine un nombre de phénomènes phonologiques dans le Picard, un dialecte Gallo-roman parlé en France : l'Assimilation régressive à travers le mot et les patrons de variation qui gouvernent ce processus, ainsi que les stratégies sensibles aux domaines que la langue emploie pour la Résolution de hiatus vocalique (i.e. Formation de semi-voyelles, Élision vocalique et Hétérosyllabification). Plus généralement, la thèse traite de la « variation » dans son sens le plus large. Elle explore la variation qui se produit dans un seul domaine prosodique de même que le type de variation qui opère à travers les domaines; tandis que le premier est variable et déclenché par des facteurs linguistiques et extra-linguistiques (étant ainsi le sujet d'investigations sociolinguistiques), le dernier est invariable et strictement déterminé par les domaines.

Pour l'analyse de ces deux types de « variation », j'adopte le cadre théorique de la théorie de l'optimalité. L'un des avantages de cette théorie est qu'elle nous permet d'expliquer les variations qui s'appliquent à la fois par le domaine phonologique et par les facteurs sociolinguistiques gouvernant une langue au moyen d'une seule grammaire. Dans le contexte de phénomènes sensibles aux domaines, ceci peut être accompli par la décomposition de contraintes dans leurs homologues qui sont spécifiques sur les domaines, dont chacun peut être indépendamment classé dans une seule grammaire pour produire les alternances observées entre les domaines. Basé sur cette ligne de recherche et influencé par les fondements de la Phonologie prosodique, je propose une approche à la décomposition de contraintes selon laquelle seulement les domaines prosodiques peuvent

servir pour la spécification de contraintes. Je soutiens que cette approche offre des avantages marqués, parce qu'elle contraint la grammaire en imposant des limitations sur les types de domaines qui peuvent être sujets à la décomposition. De plus, cette approche est compatible avec le point de vue de la Phonologie prosodique selon lequel l'interface entre la phonologie et la morpho-syntaxe doit être régie indirectement par des domaines de la hiérarchie prosodique. Dans le contexte de la variation déclenchée par des facteurs linguistiques et extra-linguistiques, je soutiens que les patrons variables sont mieux analysés comme le résultat de non-ordonnancements cruciaux de contraintes. Une conséquence positive de cette approche est qu'elle est capable d'incorporer la variation et ses effets de fréquence directement dans la grammaire (i.e. compétence), par l'ordonnancement de contraintes.

ACKNOWLEDGMENTS

> By degrees I made a discovery of still greater moment. I found that these people possessed a method of communicating their experience and feelings to one another by articulate sounds. I perceived that the words they spoke sometimes, produced pleasure or pain, smiles or sadness, in the minds and countenances of the hearers. This was indeed a godlike science, and I ardently desired to become acquainted with it.
>
> ~ Mary Shelley's "Frankenstein"

Many people have played a crucial role in the conception, development and refinement of this thesis. I would like to thank everyone who has guided me, taught me, inspired me, challenged me, influenced me, or supported me during the time it has taken me to complete this PhD. After all these years, I have come to realize that "it takes a village to raise a ~~child~~ [thesis]". Let us now go to its inhabitants:

The greatest and most enduring presence in this process was that of my supervisor, Heather Goad, who has guided this work in its several metamorphoses since a very immature analysis of across-word assimilation in Picard appeared in a term paper for one of the courses she taught me. It has been a great privilege to work and interact with Heather during my PhD years. I feel lucky to have been one of her disciples and the beneficiary of her meticulous comments in several (and I mean several) versions of this thesis. Her relentless pursuit of excellence and perfection are both exemplary and inspirational. She has taught me that patience and perseverance are key elements in doing research, writing a thesis and pursuing a career in academia. Without her phonological expertise, guidance and constant encouragement this thesis would not have been possible. Thank you so much, Heather! You are the queen of the village.

I also wish to express my gratitude to Glyne Piggott for having planted the seed of phonology in me. He was my first phonology teacher at McGill and has indirectly accompanied my work on Picard since I wrote a paper (again on across-word assimilation) for one of the courses he taught me. With him, I have spent many inspiring moments, some of which were discussing his challenges to my ideas. He has taught me that scientific research can be not only rewarding and creative, but also fun.

I am also deeply grateful to Julie Auger, who contaminated me with the Picard virus and has since then been feeding my thirst with more and more information about the language. I was introduced to Picard via her research project for which I worked as a research assistant. Through Julie, I had access to an invaluable corpus of oral interviews (some of which were designed specifically for my research) and written data in Picard. Despite her departure from the department, she remained a key element in my research by providing data, answering my questions about Picard without delay, and always providing feedback for my work. I hope that this thesis is able to reflect her invaluable contribution.

Obviously, this thesis would not exist if it were not for the contribution of those who know it all: the Picard speakers. A special "mérci" goes to all the participants of the interviews conducted for this research.

This thesis has benefited from comments and/or discussions from a multitude of organizations and individuals. While it is impossible to mention each of those people here, there are a few who deserve special recognition: first and foremost, I am deeply grateful to the committee members of my PhD Comprehensive Evaluation: Jonathan Bobaljik, Heather Goad, Michel Paradis and Glyne Piggott for their insightful comments, discussions and suggestions in an earlier version of what now constitutes Chapter 4 in this thesis. My special thanks go to the audiences of the several conferences where parts of this thesis have been presented (e.g. Going Romance, NWAVE, New Trends in Variationist Linguistics, APLA, SCIL, LASSO). I am also indebted to several anonymous reviewers who participated in the improvement of the sections of this thesis that were submitted for publication. Without the editorial assistance of editors such as Jim Black, Jon Jonz, and David Sankoff, the task of publishing would be a more arduous experience. This thesis has also benefited enormously from e-mail conversation(s) with Arto Anttila, Jill Beckman, Eugene Buckley, Susan Garrett, Keren Rice, and with some members of the LINGUIST List, who provided relevant data and insight on a variety of topics. Among these linguists, I am particularly grateful to Amalia Arvaniti, Stefan Frisch, Johannes Heinecke, Dylan Herrick, Simon Musgrave, Toby Paff, Lukas Pietsch, Claus Pusch, and Lameen Souag. Finally, I am thankful to my non-linguist brother-in-law Philippe Richard for accompanying me to Amiens and helping me arrange and record some interviews in Picard.

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"So many [people], so little [space]. How can I choose?" (Miguel Brown). I am also indebted to all the people who had an indirect influence on this dissertation. Among these, I would like to thank Dona Raimunda Alves (aka "vizinha", who introduced me to the wonderful world of books and whose teachings live with me to this day), Léo Fürész (aka Leocádia – she will hate to see her aka name in this thesis – the teacher, boss and friend – in order of occurrence – who greatly influenced me and my teaching career), and "Xie" (without whom the completion of this thesis would probably have to wait some more months).

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Oh, I was forgetting… Yes, Daria, this means it's finished!

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CHAPTER 1

INTRODUCTION

The Princess and Picard[1]

> Once there were two princesses – twins, as it happens – who lived side by side in nearby provinces. They resembled each other so closely that in public people sometimes mistook one for the other, though with a more careful inspection the differences could be seen. In time one twin became queen. With her ascension came land and power, and as a result her subjects started looking down on the lesser-seeming sibling, regarding her as a kind of pretender. Her similarities to the queen seemed vaguely threatening, while her differences came to look more like corruption, a kind of falling-away from true regal nature.
>
> William Orem

The story above, written in the form of a fairy tale, clearly illustrates the status of two Gallo-Romance languages for the last few centuries: French is the "queen" and Picard is represented by the "lesser-seeming sibling". In this thesis, the focus will be on the less prestigious variety of these closely-related Gallo-Romance languages, Picard.

In this chapter, I will introduce Picard and present my main objectives in the thesis, followed by a general overview of the topics in the phonology of Picard that will be investigated. Chapter 1 is divided into three sections. Section 1.1 contains a brief

[1] This passage was originally written as an introduction to William Orem's article "The Princess and Picard" (http://www.indiana.edu/~rcapub/v23n1/p16.html). The article discusses Julie Auger's research interests and her involvement with Picard.

history of Picard in order to contextualize the language and its status in present-day France. This will contribute to a better understanding of some issues that will become evident in Chapter 4; for instance, the virtual absence of younger Picard native speakers can be attributed to the lack of interest of most parents in "subjecting" their children to the learning of a less prestigious and stigmatized language. In section 1.2, I present the main objectives of the thesis as well as a general discussion of the topics in the phonology of Picard that will be investigated in Chapters 3 and 4. Finally, in section 1.3, I provide an outline of the thesis.

1.1. Introduction to Picard

The history of Picard starts in the first century BC, when the conquering legions of Caesar introduced a spoken, popular version of Latin in the region of Transalpine Gaul (*Gallia*), bordered by the Alps, the Rhine and the Pyrenees, part of which later developed into present-day France. In the fourth century AD, however, this region was invaded and colonized by Germanic tribes or, more specifically, by the Franks. With the ascension of the Franks to power, certain Germanic features were subsequently incorporated into the variety of Latin spoken in Gaul (e.g. the Germanic vowels /y/ and /ø/, nonexistent in other languages descended from Latin). Around the 9th century, the Gaul version of popular Latin had already developed into several other languages that could be grouped into two larger families: *langue d'oil* and *langue d'oc*, spoken in Northern and Southern Gaul respectively. Some of these languages include the ancestors of what are now Gallo-Romance languages, including the *langue d'oil* varieties of French, Picard, Franco-Provençal, Zarphatic (extinct), etc.

During the middle ages, Picard, French and other Gallo-Romance languages prospered in their respective regions in France. However, in the 16th century, French gained a special status due to its association with the monarchy who had been established in the region where French was spoken, i.e. Paris. Ever since then, the status of Paris as the financial and cultural center in France has remained intact. The rest of the story is well known to linguists and is clearly illustrated in the fairy tale at the beginning of this chapter.

Because of the similarities between French and Picard and the abovementioned circumstances, one could hypothesize that the more prestigious of the two languages would most likely prevail while the other would be perceived as a substandard, sloppy version of the dominant variety. This is exactly what happened with Picard: relegated to second-class status, frequently associated with uneducated speakers and peasants and often subjected to ridicule, most parents no longer speak or want to speak Picard to their children.[2] This stigmatization leads to a more serious consequence: language death. In fact, despite some efforts to revive Picard in certain regions of Picardie, the language is still in serious danger of extinction. As alluded to above, a clear indication of this is the absence of younger subjects in the experimental investigation that I will discuss in Chapter 4.

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[2] Lefebvre (1988:263) notes, however, that the process of stigmatization of Picard may have started as early as in the 13th century, as shown in the following passage by Jean de Meun apologizing for his crude and untamed language:

> Rude, malostru et sauvage:
> Car nés ne sui pas de Paris,
> Ne si cointes com fut Paris.

Picard is spoken in Northern France (in most of the region of Picardie) and Southern Belgium.[3] Like any other language, it also has several dialectal varieties: Amienois, Artois, Boulonnais, Calaisis, Cambresis, Hainaut, Lillois, Ponthieu, Santerre, Vermandois, and Vimeu. In this investigation, I will focus on one particular dialect: Vimeu Picard, which is spoken in the Vimeu region of Picardie, encircled in Figure 1.[4] For expository reasons, I will refer to this dialect by its more general designation, Picard.

Figure 1: Picardie in Northern France

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[3] The status of Picard as a "language" has been officially recognized by the Belgian government and by the European Bureau for Lesser Used Languages (http://www.ethnologue.com – SIL International). The French government, however, has been ambiguous regarding the status of Picard in France: sometimes it is considered a dialect of French, sometimes a separate language.

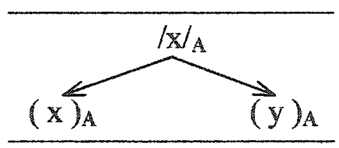
[4] See a more detailed map of Vimeu in Chapter 4, where I provide evidence for the existence of two distinct dialects in the region.

1.2. Objectives and topics in the phonology of Picard

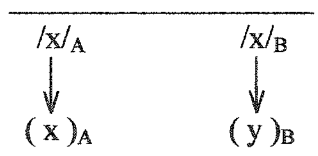
The main objective of this thesis is to investigate a select number of phenomena in the phonology of Picard. For the analysis of these phenomena, my goals are: (1) to argue for and elaborate an approach to analyze domain-sensitive phenomena via the decomposition of general constraints into their (prosodically-based) domain-specific counterparts, in order to capture the range of domain asymmetries found crosslinguistically; (2) to provide an analysis for the prosodization of the morphosyntactic constituents involved in several phonological processes in Picard, e.g. prefixes, suffixes, proclitics, stems, etc., and thus test Selkirk's (1997) proposal for the prosodization of function and lexical words with a larger set of crosslinguistic data. These prosodically-based domains will subsequently serve as domain specifications into which constraints can be decomposed; (3) to analyze the phenomenon of Across-Word Regressive Assimilation (AWRA) and the processes involved in the Resolution of Vocalic Hiatus in Picard (e.g. Semivocalization and Vowel Elision) in light of the domain-specific constraint approach; and finally, in the context of variation in AWRA, (4) to provide support for Reynolds' (1994) and Anttila's (1997) proposal that variation can be satisfactorily accounted for in the framework of Optimality Theory (OT) via crucial nonranking of constraints.

More generally, this thesis is about "variation" in the broadest sense of the word. It will explore the variation that occurs within a single prosodic domain, as well as the type of variation that operates across domains when the entire phonological string is taken into consideration. The crucial difference between the two is that, while the former is variable and triggered by linguistic and extralinguistic factors (and is thus the subject of sociolinguistic investigation), the latter is invariable and strictly bounded by domains. This is illustrated below, where "A" and "B" designate prosodic domains, and "x" and "y" indicate the output forms of an input segment /x/ that exhibits alternations:

(1) Domain-internal variation: domain A



(2) Across-domain variation: domains A and B



For lack of a better word, I will use the term "domain-sensitive phenomena" to characterize processes that exhibit phonological asymmetries such as the ones observed in (2) above. As is well recognized, however, all phonological phenomena are sensitive to domains, even when they involve the entire phonological utterance.

The general theoretical framework that I will assume here is that of Optimality Theory (Prince and Smolensky 1993). More specifically, I will adopt an integrated version of Prosodic Phonology (Selkirk 1978a et seq., Nespor and Vogel 1986) and Optimality Theory (OT). In most respects, my assumptions about the two frameworks are fairly standard apart from a few non-traditional positions that I embrace in order to fully account for the Picard data under investigation (e.g. crucial nonranking of constraints, morpheme-specific constraints). The formal apparatus that I adopt will be presented and motivated as it becomes relevant to the analysis.

1.3. Outline of the thesis

This thesis is organized as follows:

In Chapter 2, I will outline my proposal for the investigation of domain-driven variation as illustrated in (2), and I will argue that such phenomena are better analyzed via the decomposition of general constraints into their independently ranked domain-specific counterparts. Firstly, I will review some pre-OT approaches to the subject in order to contextualize the approach that I will utilize in the analysis of domain-sensitive phenomena in Picard. Of these, I will give emphasis to Prosodic Phonology, since the constituents established in this framework will serve as domains for the analyses that I will later provide. Secondly, I will introduce the framework of Optimality Theory and discuss how insights from Prosodic Phonology and OT can be integrated into a single approach via the alignment of morphosyntactic and prosodic domains. Finally, I will present the (Prosodic Phonology-based) domain-specific constraint approach, which will serve as a tool for the analysis of several phonological processes in Picard.

Chapter 3 applies the approach introduced and developed in Chapter 2 to the analysis of domain-sensitive phenomena as illustrated in (2) above. More specifically, Chapter 3 will provide an analysis for the phenomena of Across-Word Regressive Assimilation and Vocalic Hiatus Resolution in Picard, the latter of which includes the strategies that Picard utilizes to syllabify vowel plus vowel sequences at different levels of the prosodic hierarchy, namely Semivocalization, Vowel Elision or the non-application of these processes, Heterosyllabification. Because each of these processes is strictly bounded by a specific prosodic domain, the prosodization of the morphosyntactic elements involved in each case will be provided so that they can serve as domains into which constraints can be decomposed.

Chapter 4 investigates a different type of variation from that undertaken in Chapters 2 and 3. In this chapter, I will show a pattern of variation which resembles that illustrated in (1) above, and is thus determined by both linguistic and extralinguistic factors. More specifically, in Chapter 4, I will reanalyze the process of Across-Word Regressive Assimilation (AWRA) from a variationist OT perspective, along the lines of Reynolds (1994) and Anttila (1997). Firstly, I will discuss the variable aspects of AWRA and the data collection procedures adopted in the investigation. Secondly, I will present and discuss the quantitative results obtained by VARBRUL (Pintzuk 1988), a computer program designed for and extensively used in variationist studies in linguistics. Finally, I will present an OT analysis that will account for both the categorical and variable results of AWRA, within an approach that recognizes crucial nonranking of constraints. Because AWRA is also sensitive to a specific prosodic domain, as will be demonstrated in Chapter 3, the analysis that I will propose in this chapter also makes use of the domain-specific constraint approach. In sum, Chapter 4 will illustrate a phenomenon that exhibits the two types of "variation" illustrated in (1) and (2) above.

Finally, in Chapter 5, I will provide my concluding remarks to the thesis, which will be accompanied by a discussion of some residual issues that were not addressed and are thus left aside for future research.

CHAPTER 2

DOMAIN-SENSITIVE PHENOMENA IN CONSTRAINT-BASED PROSODIC PHONOLOGY[1]

There ain't no rules around here.
We're trying to accomplish something.
~ Thomas Edison

It has been widely recognized in the phonology literature that phonological phenomena are domain-sensitive: while a given phonological process may apply within a certain morphological, syntactic or prosodic domain, the same process may be barred from applying elsewhere. The domain sensitivity aspect of phonological phenomena has been given extensive attention throughout the development of contemporary phonology, and it has received considerable interest over the last thirty-five years in the generative literature (e.g. Chomsky and Halle 1968's *The Sound Pattern of English*; Kiparsky 1982ab and Mohanan 1982's *Lexical Phonology*; Selkirk 1978ab et seq. and Nespor and Vogel 1986's *Prosodic Phonology*; Inkelas and Zec 1990's *The Phonology-Syntax Connection*; McCarthy and Prince 1993ab's *Generalized Alignment*; Selkirk 1997's *The Prosodic Structure of Function Words*; to cite some of the most influential studies).

[1] A preliminary version of this chapter appeared in the *Proceedings of the Atlantic Provinces Linguistic Association* (Cardoso 1999b).

Since SPE's observation that phonological processes are inherently domain-sensitive, several approaches have been proposed with the purpose of including the domain aspect into the analysis of phonological phenomena. A number of these sometimes-divergent approaches will be reviewed in this chapter. In this context, I will illustrate a few cases of domain-sensitive processes crosslinguistically, some of which are better analyzed in the framework of Prosodic Phonology (e.g. Selkirk 1978a et seq., Nespor and Vogel 1986, Hayes 1989). Finally, this chapter will turn its focus to the optimality theoretic (Prince and Smolensky 1993) approaches that have been proposed for the analysis of domain-driven phenomena. Of these, I will argue that the domain-specific constraint approach (e.g. Buckley 1995a et seq, Pater 1996, Grijzenhout 2000, however implicit in the works of Kiparsky 1993, and McCarthy and Prince 1995, 2002 as well) constitutes a more restrictive tool for the analysis of domain-sensitive phenomena, precisely because of its assumption that a single constraint hierarchy (i.e. one grammar) is responsible for domain-driven alternations across different prosodic and/or morphosyntactic domains. Influenced by Prosodic Phonology, I will introduce an approach in which only prosodic constituents may serve as domains for decomposition. I will argue that this is advantageous because it constrains the grammar by imposing limitations on the types of domains that may be subject to decomposition. Most importantly, this approach captures Prosodic Phonology's view that the interaction of phonology with the other components of the grammar must be indirect, mediated by prosodic constituents.

This chapter is organized in the following way: in section 2.1, I contextualize my proposal by reviewing several prominent pre-optimality theoretic approaches to domain-sensitive phenomena, and illustrate crosslinguistic data that confirm the need for an approach that recognizes domains as loci for phonological processes. In section 2.2, I discuss how a constraint-based version of Prosodic Phonology may advantageously serve as a tool to determine domains for a more precise analysis of domain-driven phenomena. In view of this approach and in the context of crosslinguistic data, I will also illustrate how the decomposition of general constraints into domain-specific ones can adequately account for phonological alternations across domains, via a single constraint hierarchy (i.e. a single grammar).

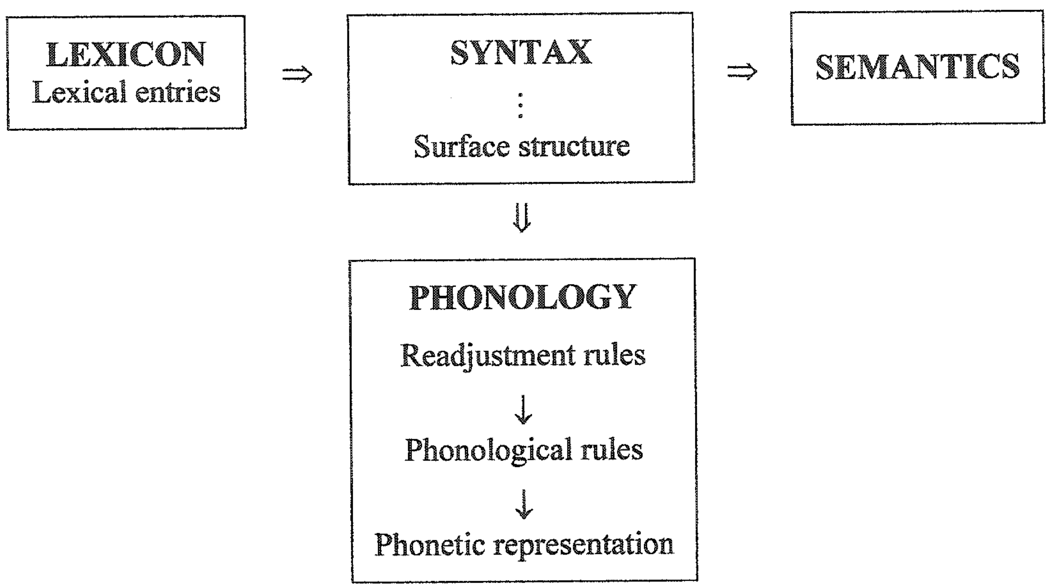
2.1. Contextualizing the domain-specific constraint approach

In this section, I will contextualize the domain-specific constraint approach in light of the three most significant pre-optimality theoretic approaches to the analysis of domain-sensitive phenomena. From a chronological perspective, I will discuss how the frameworks of SPE, Lexical Phonology and Prosodic Phonology handle a range of crosslinguistic data. Ultimately, I will argue in favor of the Prosodic Phonology framework to analyze the Picard data in this thesis.

2.1.1. SPE and Lexical Phonology

SPE is a rule-based theory in which the loci of phonological processes are directly defined by the boundaries of syntactic surface structures, i.e. they are syntactically motivated. When surface structure fails to provide an adequate representation for phonology to operate, the syntactic structure is adjusted by so-called *readjustment rules* located between the syntactic and phonological components. One of the tasks of these readjustment rules is to insert morpheme boundaries such as + and # into the bracketed syntactic structure in order to build appropriate domains for phonological processes to operate; for instance, SPE makes a crucial distinction between word boundaries (e.g. ##sign##) and morpheme boundaries of different types (e.g. ##sign#ed##, ##sign+al##). A schematic representation of the SPE model (slightly modified) is given below.[2]

(1) The SPE model



In the 1980s, the SPE model was argued to be inadequate in determining domains for phonological operations. As Nespor and Vogel (1986:1) pointed out, "this view is fundamentally inadequate because [...] the interaction of phonology with the rest of the grammar was limited to an interface with syntax [...]". Consequently, no phonological

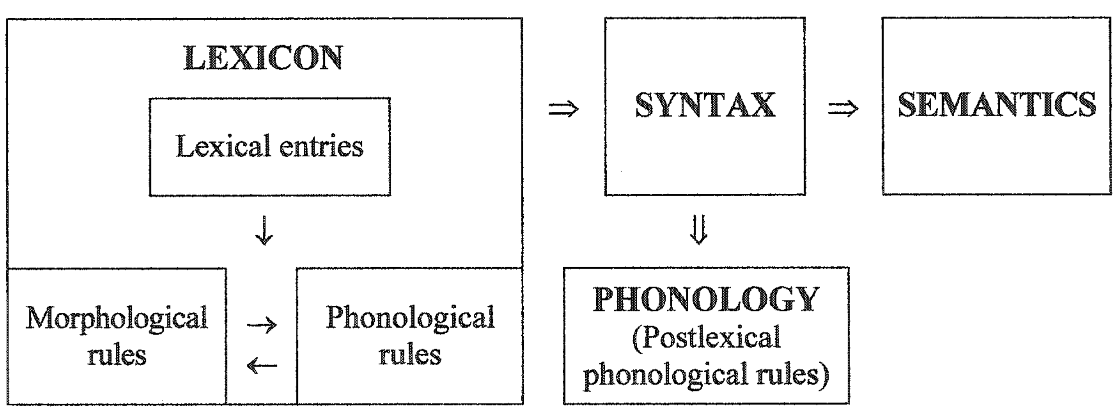
[2] After the publication of Chomsky (1970), this model changed considerably. Most importantly, new models started to include a morphological component within the lexicon, which consequently allowed phonological processes to apply within that component. This line of research was taken up by several authors and constitutes the basis for the theory that is now known as Lexical Phonology (see forthcoming discussion).

phenomena take place either in the lexicon (the repository of everything that was unpredictable), or in the (still non-existent) morphological component. The framework, for instance, does not acknowledge the existence of processes that apply exclusively within the word before transformational rules shape the surface structure generated by the syntactic component. Along these lines, Selkirk (1980a et seq) and Nespor and Vogel (1986) (among others) provide convincing arguments and data that emphasize the necessity of an approach in which prosodic domains are not determined directly from domains generated by the syntax: these do not always correspond to the domains required by phonological processes.

In spite of its inadequacies, SPE's insights served as the foundation for all subsequent theories of domain-driven phonology. One of these frameworks is the theory of Lexical Phonology, which grew out of opposition to SPE. Because of its focus on phonological phenomena at and below the word level, the framework of Lexical Phonology (LP) constitutes a more refined model than that proposed by SPE for dealing with domain-sensitive phenomena, especially those that involve the relation between phonology and morphology.

As a theory, the LP framework appeared in 1982 with the publication of Kiparsky's "From Cyclic to Lexical Phonology". As implied in note 2, however, its roots go back much earlier to the publication of Chomsky's (1970) article "Remarks on Nominalization" in which the author argues for a separate morphological component in the grammar, notably as part of the lexicon. This line of research was later taken up by several authors who argued that the locus of some phonological rules could be determined in terms of morphologically defined domains (e.g. Halle 1973, Siegel 1974, Allen 1978, and Pesetsky 1979). As originally proposed by Kiparsky (1982ab) and Mohanan (1982, 1986), LP advocates that the lexicon is organized into an (internally modularized) hierarchy of levels, each of which constitutes an independent morphological and/or phonological domain. Underlying representations are thus subjected to the application of phonological and morphological processes in each of these domains until the correct lexical representations are obtained. At the post-lexical (or post-syntactic) level, all rules apply non-cyclically (i.e. across the board).[3] Similar to SPE, the framework makes use of rules, which are now governed by well-formedness principles that hold within the lexical phonology.[4] A schematic representation of the LP model is given below.

(2) The LP model[5]



[3] In Kiparsky (1985:98), however, the author acknowledges the possibility that, based on Pulleyblank (1986), both cyclic and non-cyclic rules could apply post-lexically.

[4] Under Lexical Phonology, lexical phonological rules are subject to principles such as the *Strict Cycle Condition* and *Structure Preservation*. For a discussion of these restrictions, the reader is referred to Mohanan (1982, 1986), Kiparsky (1985), and Shaw (1985), among others.

[5] This is a slightly modified version of Kiparsky's (1982a) model. As is the case with every new theory, this model has been revised. For instance, for several authors (e.g. Booij and Rubach 1984, 1987, Rubach 1985, 1993), the model includes a sub-component within the lexicon, where postcyclic phonological rules operate. In addition, Mohanan (1982, 1986) and Kiparsky (1985) proposed that the phonology consists of a single system of lexical and postlexical rules where phonological rules are marked for the domains in which they are applicable.

As stated earlier, Lexical Phonology was primarily proposed for the analysis of phonological phenomena that take place at or below the word level and, as such, it best captures the interaction of phonology with morphology. Despite its successful application in the analysis of several above-the-word phenomena (e.g. Catalan Nasal Assimilation and Cluster Simplification – Kiparsky 1985; Flapping in North American English – Kaisse and Shaw 1985), the framework was not specifically designed to analyze these types of phenomena. For instance, one of the claims of LP that is not easily sustainable in certain above-the-word phenomena is that all postlexical rules apply non-cyclically, hence across the board (e.g. Kiparsky 1985, Pulleyblank 1986, 1986, Mohanan 1986). While this assumption can be maintained for the analysis of across-the-board processes such as Voicing Assimilation in Spanish (see (3) below), it nevertheless has to be weakened for the analysis of postlexical phenomena that do not operate in such a fashion, as in the case of Liaison in French (see (4) and (5)), and Word-Final Voicing and Visarga at Pause in Sanskrit (see (6) and (7) respectively). Because postlexical phonology feeds off of syntactic representation, these processes are incorrectly expected to apply across the board.[6]

Voicing Assimilation (VA) in Spanish is a process whereby the first obstruent in a consonant cluster assimilates in voicing to the following consonant. As illustrated below, the phenomenon is not sensitive to morphological structure and thus applies post-lexically (i.e. across the board) in all morphosyntactic configurations: word-internally

[6] Note that phonological processes can also be bound by the syntax (e.g. post-lexical ATR Harmony in Akan – Clements 1981; cf. Kiparsky 1985). The problem arises with cases in which the syntactic representation does not coincide with the prosodic configuration required to describe the phenomenon, as I will show in the case of Word-Final Voicing and Visarga at Pause in Sanskrit in (6) and (7) respectively.

(3a) and across words (3b), whenever the segmental environment is appropriate (data from Nespor and Vogel 1986 and Piñeros 1999 – the former originally from Harris 1969):

(3) Voicing Assimilation in Spanish

a. Word-internally

a/tm/osfera	→	a[t^{d}m]osfera	'atmosphere'
de/sd/e	→	de[s^{z}d]e	'from'
a/bs/urdo	→	a[β$^{\phi}$s]urdo	'absurd'
A/gf/a	→	A[ɣ^{x}f]a	'Agfa'

b. In higher morphosyntactic domains

lo/s d/os	→	lo[s^{z} d]os	'both of them'
cli/p g/rande	→	cli[p^{b} g]rande	'big clip'
ti/k n/ervioso	→	ti[k^{g} n]ervioso	'nervous tick'
Beatri/s b/abea	→	Beatri[s^{z} b]abea	'Beatrice slobbers'

Just like VA in Spanish, Liaison is a process that operates post-lexically across words in Colloquial French. In the context of a word-final consonant followed by a vowel-initial syllable, the relevant consonant syllabifies as the Onset of the following syllable (e.g. beau/z ɑ̃/fants → beau[.zɑ̃.]fants 'beautiful children').[7] Liaison is illustrated in (4) below, where only the relevant segments are shown (data from Selkirk 1980c, and Nespor and Vogel 1986). Nevertheless, unlike VA, Liaison applies in a more restrictive manner. Observe that the process is operative in the following syntactic contexts: (i) between a determiner and the following noun (see (4a)); (ii) across a sequence of auxiliary plus main verb (see (4b)); (iii) between two clitics (see (4c)); and (iv) between two lexical words (see (4d-f). However, not all strings of lexical words are subject to

[7] In the contexts of a following consonant or pause, the consonant simply does not surface (for example, beau/z l/ivres → beau[_ l]ivres 'beautiful books').

Liaison; see (5). The distinction between the lexical plus lexical word sequences where Liaison does and does not apply will be discussed in section 2.1.2 from a prosodic phonology perspective.

(4) Applicability of Liaison in Colloquial French

a. Le/z i/les. 'The ilands.'	→	[lɛ . zil]
b. Les enfants son/t a/llés à l'école. 'The children went to school.'	→	[… sõ . tale…]
c. Vou/z ɑ̃/ voulez beaucoup? 'Do you want a lot of it?'	→	[… vu . zɑ̃vu …]
d. Il y a encore deu/z a/près-midis. 'There are still two afternoons.'	→	[… dø . zaprɛ …]
e. Cette famille a trois beau/z ɑ̃/fants. 'This family has three beautiful children.'	→	[… bo . zɑ̃fɑ̃]
f. Ils s'habillent d'une façon tro/p e/légante. 'They dress in a very elegant fashion.'	→	[… tro . pelegɑ̃t]

(5) Inapplicability of Liaison: other contexts

a. Il y a encore deu/z a/près lui. 'There are still two after him.	→	[… dø . _aprɛ…]
b. Les maison/z i/taliennes coûtent beaucoup. 'The Italian houses cost a lot.'	→	[… mɛzɔ̃ . _italjɛ̃n …]
c. Le garçon les aidai/t a/ctivement. 'The boy helped them actively.	→	[… edɛ . _aktivmɑ̃]

Similar to VA in Spanish and Liaison in French, Word-Final Voicing (WFV) is a process that operates across words (i.e. post-lexically) in the phonology of Sanskrit. The phenomenon can be described as a regressive assimilation process that affects word-final voiceless obstruents: in the context of a following voiced segment (including voiced obstruents and sonorants), the word-final obstruent is voiced (6a). Contrary to VA in Spanish, however, WFV does not apply within words (neither within morphemes nor in affixed words), as illustrated in (6b) (data from Whitney 1889, Selkirk 1980a, and Nespor and Vogel 1986; some of the glosses were provided by Brendan Gillon – personal communication).

(6) Word-Final Voicing in Sanskrit

a. Across words

tat namas	→	tad namas	'that homage'
parivrāṭ gacchati	→	parivrāḍ gacchati	'mendicant goes'
sat aha	→	sad aha	'good day'
sumyak uktam	→	sumyag uktam	'spoken correctly'
parivraṭ ayam	→	parivraḍ ayam	'mendicant this'

b. Word-internally

prãñc-ah	→	prãñcah	'Easterner-NOM-PL'
vãc-ya	→	vãcya	'speak-GER'
marut-i	→	maruti	'wind-LOC'

The phonological alternations encountered in Liaison in French and in Word-Final Voicing in Sanskrit are problematic for the theory of Lexical Phonology, according to which all postlexical processes are expected to operate across the board. Considering that Liaison and WFV are indisputably postlexical processes, how can one prevent these processes from applying in some above-the-word contexts and at the same time allow them to apply in other contexts if the theory only allows for one postlexical level? On the basis of the Spanish and Sanskrit data in (3) and (6) respectively, it would appear that the theory requires at least two types of postlexical phonological rules: those that can apply up into the lexicon (e.g. VA in Spanish), and those that cannot (e.g. WFV in Sanskrit).

Furthermore, what if more types of phonological rules (or levels) were required to account for postlexical phenomena which are even more restricted than Liaison and Word-Final Voicing? For instance, Visarga at Pause in Sanskrit (VAP) is a process that applies exclusively at the right edge of the utterance (i.e. before a pause). As illustrated below, VAP turns utterance-final /s/ or /r/ into "voiceless breathing" (represented by [ḥ] in (7a); data from Whitney 1889, Selkirk 1980a, and Nespor and Vogel 1986; some of the glosses were provided by Brendan Gillon – personal communication).

(7) Visarga at Pause in Sanskrit

a. Utterance-finally (i.e. before a pause)

… devas	→	… devaḥ	'God'
… punar	→	… punaḥ	'again'

b. Inapplicability of Visarga in other contexts[8]

tvā-īśvara	→	tveśvara	'you God'
caksus-mat	→	caksus-mat	'eye-Possessor'
sarpis-ā	→	sarpisā	'clarified butter-INSTR'
bhrātar dehi	→	bhrātar dehi[9]	

Another problem with the LP framework, pointed out by Nespor and Vogel (1986), is its assumption that the internal morphological structure of each word is erased at the end of every cycle (or level). Based on this assumption, the mapping rules of

[8] Because I am only interested in the surfacing of the segments /r/ and /s/, I do not illustrate processes that apply to the other segments in these words.

[9] I am unable to provide a gloss for the Sanskrit phrase "bhrātar dehi".

prosodic phonology cannot make reference to the internal structure of words generated by LP. This jeopardizes the creation of certain prosodic constituents, in particular the Prosodic Word, whose constituency does not always coincide with that of the Morphological Word, and whose status must be determined by an interaction between the phonological and morphological components.

A clear illustration of this observation can be found in Hungarian, a language that has a variety of phenomena restricted to the Prosodic Word which does not correspond to the Morphological Word: e.g. Back Vowel Harmony, Palatalization (see Nespor and Vogel 1986). For instance, to account for Palatalization (a process in which /d, t, l, n/ assimilate to a following /j/ yielding the corresponding palatal sounds), the mapping rules of prosodic phonology must make reference to the internal structure of words in order to define the Prosodic Word in the language: while roots and their adjacent suffixes constitute Prosodic Words in Hungarian, the domain in which Palatalization takes place (e.g. $(\text{men-jen})_{\text{PWd}} \rightarrow$ me[ɲ]en 'go - 3rd sg. imp.'), prefixes form Prosodic Words on their own and thus Palatalization is blocked from applying across the two PWds (e.g. $(\text{fel})_{\text{PWd}}$ $(\text{jönni})_{\text{PWd}} \rightarrow$ fe[l j]önni 'to come up').

In order to establish a more adequate framework for analyzing above-the-word phenomena in which the phonology can make reference to morphological and/or syntactic structures in order to construct and restrict domains (as was needed in the cases of Liaison in French and Word-Final Voicing in Sanskrit), a theory that concentrates explicitly on domains was in demand. It is in this context that the framework of Prosodic Phonology appeared in the early 1980s, adapting and further developing some of the insights of SPE and Lexical Phonology. This new theory of domains will be discussed in the next section.

2.1.2. Prosodic Phonology

The framework of Prosodic Phonology expanded on the Lexical Phonology approach to more precisely handle domain-related phonological phenomena, especially those involving above-the-word alternations. The appearance of Selkirk's seminal works (e.g. 1978ab et seq), Nespor and Vogel's (1986) *Prosodic Phonology* book and Hayes (1989, previously 1984 ms.) contributed to the elaboration of the new approach for dealing with domain-sensitive phenomena.

Inspired by SPE, Prosodic Phonology advanced the assumption that "syntactically motivated" surface structures may serve as loci for phonological rules. In this new approach, however, domains are no longer established exclusively from an interaction of phonology with syntax: the interaction is now extended to comprise all the components of the grammar, namely morphology, syntax and semantics,[10] which provide input to the phonological component via mapping rules – rules that convert morphosyntactic elements into the prosodic structures required by the phonology. A schematic representation of the Prosodic Phonology model (slightly modified) is illustrated below.

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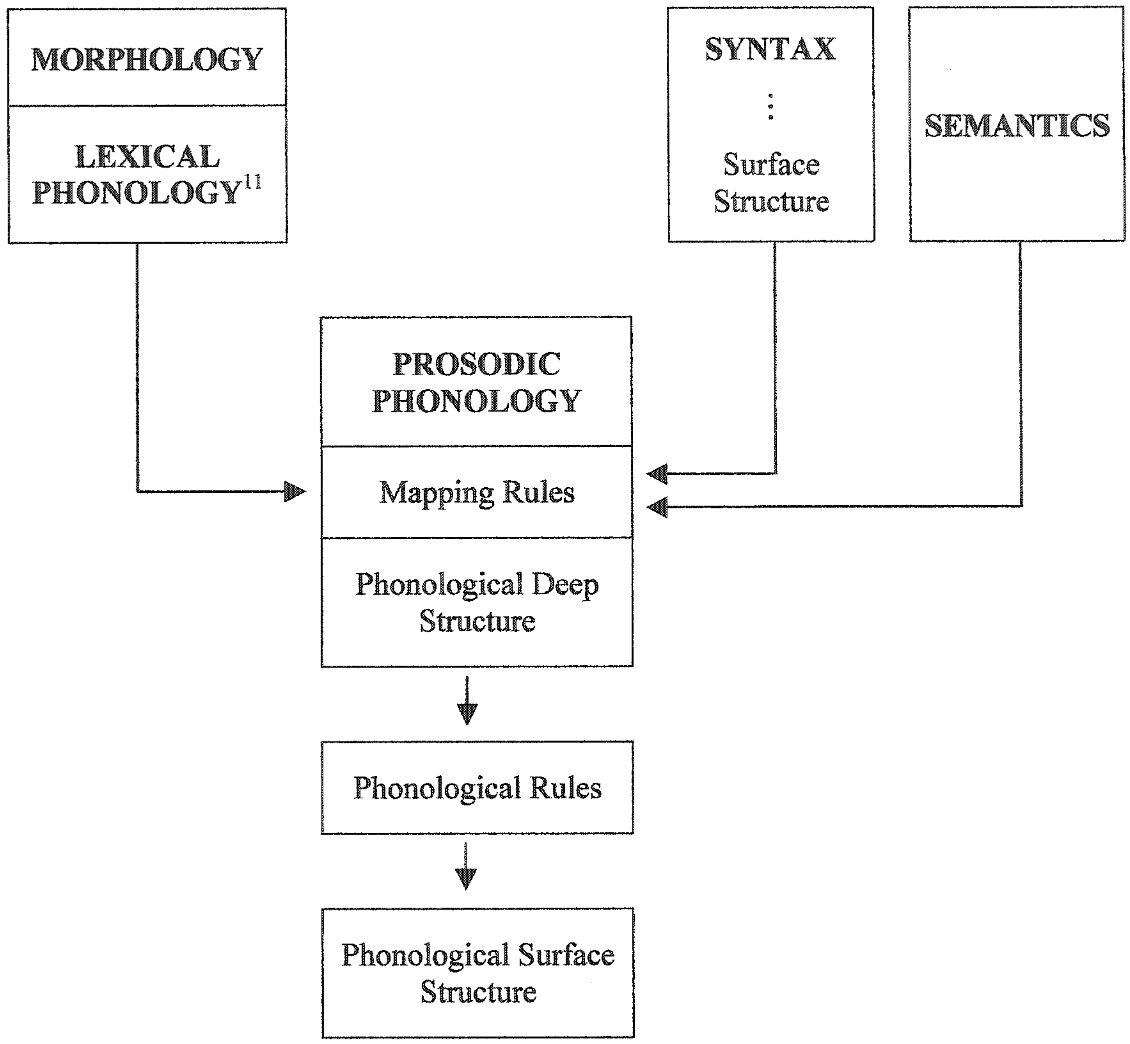
[10] As proposed in Nespor and Vogel (1986:300), the mapping rules make reference only to morphological and syntactic structure. The semantic component is called upon only when restructuring rules are required. For an example, see the restructuring of the Phonological Utterance in the context of r-linking in British English in (9), where this constituent is restructured in order to accommodate two sentences into a single Phonological Utterance.

(8) The Prosodic Phonology model



Prosodic Phonology came into existence due to the inadequacy of morphology and syntax in directly defining domains in which phonological phenomena operate. To illustrate, consider r-linking in Standard British English, a process that involves the pronunciation of an underlying /r/ only when it is followed by another vowel. As

[11] Nespor and Vogel (1986:18) recognize that certain morpho-phonological processes should be accounted for by the theory of Lexical Phonology, which explains the inclusion of this "component" in their model of Prosodic Phonology. Nevertheless, the authors remain agnostic about the possibility of the output of Lexical Phonology serving as the input for the mapping rules of Prosodic Phonology. As discussed in section 2.1.1, the output of Lexical Phonology contains no information about the internal morphological structure of words and, as illustrated in the case of the Prosodic Word in Hungarian, the construction of some domains does require access to that type of information.

illustrated below, the process applies within words (9a), across words within a sentence (9b), and across words in separate sentences (9c). It is inapplicable in (9d), however, even though the syntactic and segmental contexts are identical to that of (9c) (data from Nespor and Vogel 1986).

(9) r-linking in Standard British English

Before a vowel	Pronounced in isolation
a. clea[r]est	clea[ ]
b. fai[r] idea	fai[ ]
c. There's my brothe[r]. I have to go.	brothe[ ]
d. There's my brothe*[r]. I have a cold.	brothe[ ]

From a purely syntactic perspective, it is impossible for us to delimit the domain in which r-linking applies, since the syntactic contexts in (9c) and (9d) are exactly the same. In Nespor and Vogel's (1986) view, however, r-linking is bounded by the Phonological Utterance (U), a domain that resembles that of Voicing Assimilation in Spanish and usually coincides with the sentence in syntax. In order to account for the application of the phenomenon in (9c) and its non-application in (9d), the authors redefine the Phonological Utterance (in English as well as in several other languages, e.g. Spanish, French) as a constituent that includes not only one sentence (i.e. the string dominated by the highest node in the syntactic tree), but also other adjacent sentences whenever there is a semantic relation between the sentences in question (this is called U-restructuring). In other words, r-linking applies in (9c) because these sentences consist of a single U (i.e. (There is my brothe[r] I have to go)$_U$), while the process is inapplicable in (9d) because the two sentences prosodize as two separate Us (i.e. (There is my brothe[ ])$_U$ (I have a cold)$_U$).

On the basis of phenomena such as r-linking, which clearly illustrate that domains required by phonology are not always directly available from morphology and syntax, Selkirk and Nespor and Vogel proposed an approach in which the phonology component interacts with the other components of the grammar in an indirect manner, via prosodic domains (see (10) below).[12]

According to Prosodic Phonology, strings of segments are divided into a hierarchically organized structure: the Prosodic Hierarchy illustrated in (10), as originally conceived by Nespor and Vogel (1986) and Hayes (1989).[13]

(10) The Prosodic Hierarchy

Phonological Utterance (U)
|
Intonational Phrase (I)
|
Phonological Phrase (PPh)
|
Clitic Group (CG)
|
Prosodic Word (PWd)
|
Foot (Ft)[14]
|
Syllable (σ)

[12] There are two main approaches for the analysis of above-the-word phenomena in which phonology and syntax interact. The direct approach, defended by Kaisse (1985), Odden (1987), Hyman et al. (1987), Chen (1990) and others, advocates that domain-sensitive processes only apply when certain syntactic conditions are met, e.g. when two words involved in a phonological process are contained within a given syntactic constituent (e.g. a Noun Phrase), or when one word c-commands the other (see, however, Selkirk 1986 for reanalyses of some studies conducted within this approach). The indirect approach is the one that I advocate in this thesis and that is under discussion in the text.

[13] The Clitic Group, proposed by Nespor and Vogel (1986) and Hayes (1989), has been subjected to much criticism in the phonology literature (e.g. Booij 1988, Jacobs 1991, Helsloot 1995, der Leeuw 1977, Peperkamp 1997, Selkirk 1997). I include it here for illustrative purposes and, most importantly, because in section 2.2.4 I will discuss an analysis that originally made reference to this domain.

The organization of the constituents of the Prosodic Hierarchy obeys a set of principles that comprise the Strict Layer Hypothesis:

(11) The Strict Layer Hypothesis (Selkirk 1984)

The categories of the Prosodic Hierarchy may be ranked in a sequence C_1, C_2,...C_n, such that

- all segmental material is directly dominated by the category C_n, and
- for all categories C_i, $i \neq n$, C_i directly dominates all and only constituents of the category C_{i+1}.

The Strict Layer Hypothesis (SLH) ensures an invariable relation of domination among the hierarchically organized prosodic domains that constitute the Prosodic Hierarchy. According to Selkirk (1986), the phonological string is exhaustively divided into prosodic units, which are in turn exhaustively combined into larger domains until the whole utterance is parsed on every prosodic level, thus generating the Prosodic Hierarchy. These layers then provide the loci for the domain-sensitive phonological processes observed crosslinguistically.

While traditional generative phonology (e.g. SPE) recognized the domain-sensitivity aspect of phonological rules, domains were often not explicitly expressed in rules since the emphasis was typically on formalizing the segmental alternations of processes that apply exclusively at or below the word level. In Prosodic Phonology, on the other hand, the domain of a phonological process and its precise range of application within that domain are always included in the description of the phenomenon. According

[14] Unlike Nespor and Vogel (1986), Selkirk (1986:385) contends that feet and syllables should be treated as constituents of a "separate sub theory of the syntax-phonology relation". In her view, phonological processes below the word level (i.e. involving word-internal junctures) should be dealt with by the theory of Lexical Phonology.

to the theory, this precise range of application can be expressed via three types of prosodic processes: (1) *domain span* processes, which apply everywhere within the range of a domain whenever the segmental specifications are met (e.g. Voicing Assimilation in Spanish in (3) and Liaison in French in (4)); (2) *domain juncture* processes, which apply at the juncture of two adjacent prosodic constituents (e.g. Word-Final Voicing in Sanskrit in (6)); and finally (3) *domain limit* processes, which apply at the edges of prosodic constituents (e.g. Visarga at Pause in Sanskrit in (7)). These types of processes are shown schematically in (12) from a rule-based perspective, where D_i and D_j are prosodic constituents, A and B are segments, and X and Y are strings of segments (slightly adapted from Selkirk 1980a, and Nespor and Vogel 1986):

(12) Types of prosodic processes

a. Domain span

$A \rightarrow B \ / \ [\ldots X \_\_ Y \ldots]_{Di}$

b. Domain juncture[15]

(i) $A \rightarrow B \ / \ [\ldots [\ldots X \_\_]_{Dj} \ [Y \ldots]_{Dj} \ldots]_{Di}$

(ii) $A \rightarrow B \ / \ [\ldots [\ldots X]_{Dj} \ [\_\_ Y \ldots]_{Dj} \ldots]_{Di}$

c. Domain limit

(i) $A \rightarrow B \ / \ [\ldots X \_\_]_{Di}$

(ii) $A \rightarrow B \ / \ [\_\_ X \ldots]_{Di}$

[15] As originally proposed and to comply with the Strict Layer Hypothesis, prosodic processes involving domain junctures always consisted of two constituents of the same type (e.g. $((\ldots \_\_)_{Ft} (\ldots)_{Ft} \ldots)_{PWd}$). After the weakening of the SLH (e.g. Hayes 1980, Berendsen 1986, Odden 1987, Inkelas 1989, Itô and Mester 1992, McCarthy and Prince 1993), this requirement is no longer necessary (see Chapter 3).

This is the approach to domain-sensitive phenomena that I will adopt in this thesis, within the framework of Optimality Theory. The examination of how Prosodic Phonology can be reinterpreted into a framework of constraints and constraint interaction will be addressed in section 2.2. Beforehand, I will show below how the framework accounts for the three distinct types of prosodic processes outlined in (12): (1) the domain span processes of Voicing Assimilation in Spanish and Liaison in French, (2) the domain juncture phenomenon of Word-Final Voicing in Sanskrit, and (3) the domain limit process of Visarga at Pause in Sanskrit.

As illustrated in (3), Spanish phonology provides an example of a domain-sensitive phenomenon that applies at every level of the Prosodic Hierarchy, according to which the voicing of an obstruent in a consonant cluster is determined by the voicing of the following consonant, within the domain span of the Phonological Utterance. Some relevant data are repeated below from (3) for convenience, followed by a rule formulation (from Nespor and Vogel 1986) that clearly states both the segmental and domain aspects of the phenomenon ([-HSP] = [-heightened subglottal pressure]).

(13) Voicing Assimilation in Spanish

$(a/tm/osfera)_U$	→	$a[t^d m]osfera$
$(lo/s\ d/os)_U$	→	$lo[s^z\ d]os$
$(cli/p\ g/rande)_U$	→	$cli[p^b\ g]rande$
$(Beatri/s\ b/abea)_U$	→	$Beatri[s^z\ b]abea$

(14) Rule formulation for Voicing Assimilation in Spanish

$$\begin{bmatrix} +\text{obstruent} \\ -\text{HSP} \end{bmatrix} \rightarrow [\alpha\text{voice}] \ / \ (\ldots \_\_ \begin{bmatrix} +\text{cons} \\ \alpha\text{voice} \end{bmatrix} \ldots)_U$$

The range of applicability of VA in Spanish resembles most analyses in the phonology literature that imply, by not specifying the domain in which phonological phenomena operate, that all processes apply across the board, i.e. within U. As I will illustrate below in the context of Liaison in French and Word-Final Voicing in Sanskrit, however, this is most often not the case: if the scope of a given process is not taken into consideration, its analysis will yield erroneous results, i.e. overapplication.

I will now turn to the prosodic analysis of Liaison in Colloquial French, a process that operates within the span of a domain lower in the Prosodic Hierarchy than VA in Spanish: the Phonological Phrase.[16] Recall from (4) that Liaison operates in contexts that include a variety of distinct morphosyntactic constituents (e.g. between a clitic and the following word, between two clitics), all of which cannot be uniformly identified by a specific syntactic constituent. Adopting concepts provided by X-bar theory, Nespor and Vogel (1986:179) define the Phonological Phrase domain in French as "a head X and whatever is on its nonrecursive [i.e. left] side until another head outside of the maximal projection of X is reached."[17] The delimitation of the Phonological Phrase domain is thus able to account for the application of Liaison in the data in (15a), and its non-application in (15b): while in the former examples the relevant consonant plus vowel sequence

[16] Note that the PPh-span specification correctly implies that Liaison applies in all sequences of vowel plus consonant within the Phonological Phrase; e.g. across syllables word-internally: /mezɔ̃/ → $((\text{me.z}\tilde{ɔ})_{PWd})_{PPh}$ 'house'.

[17] For the sake of illustration, I am simply assuming Nespor and Vogel's (1986) delimitation of the Phonological Phrase in French. For a comprehensive discussion of their analysis, I refer the reader to the original work.

occurs within the Phonological Phrase, in the latter, the consonant and vowel belong to different Phonological Phrases.[18]

(15) Liaison in French

a. Within the Phonological Phrase

Il y a encore (deu/z a/près-midis)$_{PPh}$ 'There are still two afternoons.'	→	[… dø . zaprɛ …]
Cette famille a (trois beau/z ɑ̃/fants)$_{PPh}$ 'This family has three beautiful children.'	→	[… bo . zɑ̃fɑ̃]
(Vou/z ɑ̃/ voulez)$_{PPh}$ beaucoup? 'Do you want a lot of it?'	→	[… vu . zɑ̃ …]

b. In other domains

Il y a encore (deu/z)$_{PPh}$ (a/près lui)$_{PPh}$ 'There are still two after him.'	→	[… dø . _aprɛ…]
(Les maison/z)$_{PPh}$ (i/taliennes)$_{PPh}$ coûtent beaucoup 'The Italian houses cost a lot.'	→	[… mɛzɔ̃ . _ita …]
Le garçon (les aidai/t)$_{PPh}$ (a/ctivement)$_{PPh}$ 'The boy helped them actively.'	→	[… edɛ . _aktiv …]

Clearly, failure to include the domain aspect in the analysis of Liaison in French predicts incorrect results. By delimiting the phenomenon's range of application to the span of the Phonological Phrase, one achieves a satisfactory account for the domain-related idiosyncrasies that pertain to the process, eliminating the possibility that the

[18] Nespor and Vogel (1986) do not provide a rule formulation for Liaison in French. In their prosodic analysis for the phenomenon, the authors simply state that "the Liaison rule applies within the domain of the Phonological Phrase" (p.179).

phenomenon will erroneously overapply in domains distinct from that of the Phonological Phrase.

Another phenomenon that cannot be analyzed without reference to domains is Word-Final Voicing in Sanskrit. WFV differs from VA in Spanish and Liaison in French because it does not involve the span of a prosodic constituent. Instead, WFV is restricted to the juncture of two Prosodic Words. Recall from (6) that WFV voices an obstruent before a word-initial voiced segment. While the process applies across words (16a), it fails to apply in domains internal to the word (including monomorphemic and affixed words), as illustrated in (16b). In order to define the application of WFV in Sanskrit, Selkirk (1980a) and Nespor and Vogel (1986) propose that the process exclusively applies to the last segment of a Prosodic Word, at the domain juncture of two Prosodic Words within the Phonological Utterance, as illustrated in the rule formulation in (17).

(16) Word-Final Voicing in Sanskrit

a. Across Words

$((\text{sat})_{PWd}\ (\text{aha})_{PWd}\ )_U$	→	sad aha
$((\text{sumyak})_{PWd}\ (\text{uktam})_{PWd}\ )_U$	→	sumyag uktam

b. Word-internally

$(\text{marut-i})_{PWd}$	→	maruti
(prāñc-ah)$_{PWd}$	→	prāñcah

(17) Rule formulation for Word-Final Voicing in Sanskrit

$$[\text{-son}] \rightarrow [\text{+voice}] \ / \ (\ldots (\ldots \_\_\_)_{PWd} ([\text{+voice}] \ldots)_{PWd} \ldots)_U$$

Finally, in contrast to the three cases of domain-sensitive phenomena discussed above, which are restricted to either an entire domain span or to the juncture of two domains, the process of Visarga at Pause in Sanskrit is a domain limit process that exclusively operates at the right edge of a prosodic constituent, the Phonological Utterance. As illustrated in (18), the process only applies to U-final /s/ and /r/. This is expressed in the rule formulation in (19) (Selkirk 1980a).

(18) Visarga at Pause in Sanskrit

a. Utterance-finally (i.e. before a pause)

… $devas)_U$	→	… devaḥ
… $punar)_U$	→	… punaḥ

b. In other contexts

$(tveśvara)_{PWd}$	→	tveśvara
$(bhrātar)_{PWd}$ $(dehi)_{PWd}$	→	bhrātar dehi

(19) Rule formulation for Visarga at Pause in Sanskrit

$/ s, r / \rightarrow ḥ \;/\; (\ldots \_\_\_)_U$

In sum, from the data discussed in this section, it is clear that an analysis that recognizes the interaction between phonological and morphosyntactic constituents (i.e. to build the prosodic hierarchy) is necessary for a comprehensive account of the domain-driven effects of these phenomena. As was evident from the illustrative cases above, an analysis that does not delimit the range of application of phonological processes will most often yield incorrect results. In the following section, I will propose an analysis for these and other domain-sensitive phenomena within an integrated version of the frameworks of Prosodic Phonology, as discussed in this section, and Optimality Theory, to be introduced next.

2.2. The domain-specific constraint approach in Optimality Theory

In this section, I will demonstrate how Prosodic Phonology can be incorporated into a framework of constraint interaction, i.e. Optimality Theory (OT). I will start by providing a general overview of OT, which will be followed by a discussion of how the rationale behind the theory of domains can be incorporated into this framework via constraints on alignment of edges of prosodic and morphosyntactic constituents. In the approach, which I will refer to as Prosodic Phonology in OT (PP-OT), I assume the traditional Prosodic Phonology view that the interaction of phonology with the other components of the grammar is an indirect one, mediated by prosodic domains. In order to account for inevitable violations of the SLH,[19] I adopt a version of the hypothesis that allows its general properties to be decomposed into independent constraints. Finally, I propose a reinterpretation in OT of the rules with domain specification from Prosodic Phonology, as seen previously in section 2.1.2. In PP-OT, this will be accomplished through the decomposition of general constraints into their domain-specific counterparts, which will account for phonological alternations across domains via a single grammar.

2.2.1. An overview of Optimality Theory

Optimality Theory is a theory of constraint interaction that advocates that a grammar consists of a set of universal constraints CON which form part of Universal Grammar (Prince and Smolensky 1993). Two important premises of OT are (1) *Violability*: constraints are violable; violation of low ranked constraints occurs in order to satisfy higher ranked ones; and (2) *Ranking*: constraints are ranked on a language-

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[19] The statement that violations of the Strict Layer Hypothesis are inevitable is based on Selkirk's (1986:384) assertion that languages in which all properties of the SLH are strictly obeyed are rare.

particular basis; the notion of minimal violation is thus defined in terms of a language-specific ranking. Accordingly, as all constraints are standardly assumed to be present in the grammars of all languages, cross-linguistic variation can be accounted for through variation in constraint ranking.

Constraints are primarily of two types: (a) faithfulness constraints, those that demand a match between the input (underlying representation) and the output (surface representation) (e.g. Max-IO: Every segment in the input has a correspondent in the output); and markedness constraints, those that demand structurally well-formed outputs (e.g. NoCoda: Syllables do not have codas). In my analysis, I adopt the Correspondence Theory version of OT (McCarthy and Prince 1994, 1995), where faithfulness constraints are expressed in terms of the identity relation between input and output (in contrast to standard OT – Prince and Smolensky 1993, McCarthy and Prince 1993ab – where all constraints are stated on outputs). Correspondence is defined in (20).

(20) Correspondence (McCarthy and Prince 1995)

> Given two strings S_1 and S_2, **correspondence** is a relation $\Re$ from the elements of S_1 to those of S_2. Elements $\alpha \in S_1$ and $\beta \in S_2$ are referred to as **correspondents** of one another when $\alpha \Re \beta$.

To exemplify the correspondence relations involving segments in the input (S_1 or I) and output (S_2 or O), consider the hypothetical representation below:

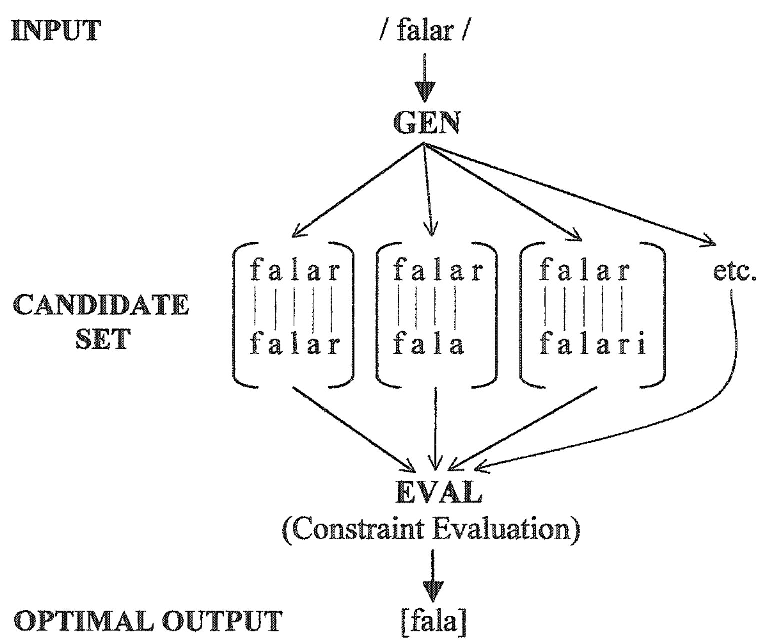
(21) Input-output correspondence relations

S_1		S_2
	→	(a) [f a l a r]
/ f a l a r /	→	(b) [f a l a]
	→	(c) [f a l a r i]

Observe that the output depicted in (21a) represents a fully faithful correspondence between all members of the input and output. In (21b) and (21c), on the other hand, each relation has a member that does not have a correspondent: while the input segment /r/ has no correspondent in S_2 in (21b), the output segment [i] in (21c) has no correspondent in S_1.

Under Optimality Theory, each candidate comes from GEN (the function *generator*, whose task is to produce a potentially infinite number of candidates) with an input-output correspondence relation. The candidate that best satisfies the constraint hierarchy of the language (selected by EVAL, the mechanism that chooses the optimal candidate from the candidate set created by GEN) emerges as the optimal form. A schematic representation of how OT works is illustrated below. Observe that the optimal output [fala] is not the most faithful to the input /falar/; however, it is the form that best qualifies as a surface form in this hypothetical language, as determined by the language-specific constraint ranking upon which EVAL operates.

(22) A schematic representation of how OT works



In reality, the "hypothetical" evaluation illustrated in (22) reflects the phenomenon of r-deletion in colloquial Brazilian Portuguese (BP) (Cardoso 1999a; see also forthcoming section 2.2.3). To illustrate constraint interaction in OT, assume that r-deletion is triggered by a markedness constraint that bans syllable-final consonants in the language: NoCoda.[20] The interaction of NoCoda with two other constraints that require faithfulness of inputs and outputs, namely MAX-IO (which, as mentioned above, rules out the deletion of segments) and DEP-IO (which militates against epenthesis), yields the output observed in BP. The constraints are defined below.

(23) Constraint definitions

NoCoda:	Syllables do not have Codas (Prince and Smolensky 1993)
MAX-IO:	Every element of the input has a correspondent in the output. (i.e. No deletion) (McCarthy and Prince 1995)
DEP-IO:	Every element of the output has a correspondent in the input. (i.e. No epenthesis) (McCarthy and Prince 1995)

The manner in which BP ranks these three constraints will determine the correct outcome in the language. For instance, the ranking of NoCoda and DEP-IO above MAX-IO (see hierarchy in (24)) will yield r-deletion. Note that in the hierarchy, constraints are organized from highest ranked on the left to lowest ranked on the right. Double arrowheads indicate that two constraints are crucially ranked with respect to one another,

[20] For the present discussion, I adopt the general (i.e. not domain-specific) version of NoCoda. I will show in section 2.2.5, however, that the general version of this constraint cannot capture the domain-sensitivity aspects of r-deletion in BP: while NoCoda is "in force" at the right edge of a word (resulting in r-deletion; e.g. /falar/ → [fa.la_] 'to speak'), the same constraint has no effect word-internally (e.g. /karta/ → *[ka_.ta], ✓[kar.ta] 'letter').

while commas indicate that the ranking is indeterminate between the two constraints involved.

(24) Constraint ranking in BP: NoCoda, DEP-IO >> MAX-IO

The evaluation of this ranking is illustrated in (25) (where [i] indicates an epenthetic vowel). Briefly, the tableau demonstrates an evaluation procedure in which the constraints are listed horizontally following the language specific constraint ranking, and the candidates for evaluation are provided in the leftmost vertical column. A solid line in the tableaux indicates that two constraints are crucially ranked with respect to each other. A dotted line indicates that the ranking is indeterminate. The hand on the left indicates the winning candidate or output, that is, the candidate with the fewest violations of highly ranked constraints. Each constraint violation is indicated by an asterisk. An exclamation mark after an asterisk marks a fatal violation, the point where a given candidate loses out to at least one other candidate. After a candidate is out of contention, the cells for the lower ranked constraints are shaded to emphasize the irrelevance of these constraints for the selection of the optimal candidate.

(25) Constraint evaluation for PWd-final r-deletion in BP

	/falar/	NoCoda	DEP-IO	MAX-IO
	a. [falar]	*!		
	b. [falari]		*!	
☞	c. [fala]			*

In the tableau, the most faithful candidate (a) violates the highly ranked constraint NoCoda and, for that reason, it is ruled out as optimal. Similarly, candidate (b) is rejected because it fatally violates DEP-IO due to the presence of the epenthetic vowel. The selection of candidate (c) is determined by its minimal violation of MAX-IO, ranked low in the constraint hierarchy of BP.

This brief introduction to Optimality Theory will allow us to proceed to the following section, in which our focus will switch to the topic of how domain-sensitive phenomena can be captured within a theory of constraint interaction.

2.2.2. Domains in Optimality Theory

Since its establishment in the early 1990s, Optimality Theory has received considerable interest as a framework for investigating domain-sensitive phenomena. While some traditional approaches have been adapted and converted into OT (e.g. Lexical Optimality Theory, based on the LP framework discussed in section 2.1.1; e.g. Kiparsky 1999, 2000, Herrick 2001), others have attempted to adhere to the non-derivational orientation of the framework by introducing new ways of analyzing domain-related phenomena.[21] Of the possibilities allowed in OT, I will now address three alternatives to analyze these phenomena: (a) one in which domain-driven alternations are captured by a type of alignment of prosodic and/or morphosyntactic categories (e.g. Prince and Smolensky's 1993 Generalized Alignment; see section 2.2.3); (b) one in which different domains are assigned different rankings and consequently distinct grammars (e.g. Kiparsky 1999, 2000's Lexical Optimality Theory – see section 2.2.5.1;

[21] For instance: Output-Output or Base-Identity Correspondence (Kenstowicz 1996, Benua 1997), and Local Conjunction (Lubowicz 1999). These approaches, however, were not designed for the analysis of data such as those discussed in section 2.1. For example, the Output-Output Correspondence approach was intended to handle domain-driven alternations involving complex words (i.e. those that display cyclicity effects), as well as patterns of reduplication and truncation (see Benua 1997).

and Itô and Mester 1995ab's Cophonologies); and (c) one in which domain-sensitive phenomena are captured by a single constraint ranking (i.e. one grammar), composed of domain-specific constraints (e.g. Buckley 1995a et seq., Pater 1997, Grijzenhout 2000; see section 2.2.5). These are summarized below:[22]

(26) Domains in Optimality Theory: three possibilities

(a) Different domains	=	different edge alignments
(b) Different domains	=	different rankings
(c) Different domains	=	one ranking (composed of domain-specific constraints)

In the forthcoming sections, I will review these three approaches to the analysis of domain-sensitive phenomena. I will argue in favor of an alternative that mirrors option (26c), in which domain-driven patterns such as the ones illustrated in section 2.1 are accounted for by the assignment of a single constraint ranking (or grammar), composed of domain-specific constraints. On the other hand, for the prosodization of morphosyntactic constituents, I will utilize alignment constraints as in option (26a). The utilization of these constraints, however, will be exclusively restricted to the prosodization of morphosyntactic constituents into the prosodic units in which constraints will operate (see section 2.2.4 and, in the context of Picard, Chapter 3).

[22] As regards input-output relations, observe that the possibilities illustrated in (26) represent two general lines of research in OT: one that considers a one-level interaction between the input and output (i.e. options (26a) and (26c)), and one that presupposes a multi-level relation between these two levels of representation (i.e. option (26b)) (see discussion in forthcoming section 2.2.5.1).

2.2.3. Generalized Alignment – The mapping rules of Prosodic Phonology revisited

One of the first attempts to incorporate domain-sensitive phenomena into the framework of Optimality Theory was proposed by McCarthy and Prince (1993ab) in the form of Generalized Alignment (GA), which regulates the alignment of edges of prosodic and/or morphosyntactic categories.[23] According to this theory, the constraints produced by the schematic machinery of GA may require that a specified edge (Left (L) or Right (R)) of a given grammatical category (G) be lined up with the edge of a prosodic category (P) in any language; in addition, an alignment constraint may also require that a grammatical category be aligned with another grammatical category, or that a prosodic category be aligned with another prosodic category. The formal schema of Generalized Alignment is shown below.

(27) Generalized Alignment

Align(Cat1, Edge1, Cat2, Edge2) $=_{def}$

$\forall$ Cat1 $\exists$ Cat2 such that Edge1 of Cat1 and Edge2 of Cat2 coincide.

Where

Cat1, Cat2 $\in$ PCat $\cup$ GCat

Edge1, Edge2 $\in$ {Right, Left}

As stated in the tenets of the theory, GA's main concern is with the morphology-phonology interface between prosodic elements up to the Prosodic Word (McCarthy and Prince 1993b:5) and these constituents' relations with morphological units (e.g. word, stem, prefix, etc.). The main goal of the theory, thus, is to capture edge-related

[23] The edge-based approach to the syntax-prosody interface was originally proposed by Selkirk (1986), and later adopted by several authors (e.g. Chen 1987, Hale and Selkirk 1987, Selkirk and Tateishi 1988, Selkirk and Shen 1990, Golston 1996).

phenomena that result from the concatenation of morphological units as is found in affixation and compounding.

A phenomenon that can be straightforwardly accounted for within the GA framework is word-final r-deletion in colloquial Brazilian Portuguese (see earlier section 2.2.1), as this process operates exclusively at the right edge of a Prosodic Word (i.e. a morphological word), regardless of the following environment (consonant, vowel or pause). This is illustrated in (28). In (29), observe that r-deletion is blocked in configurations in which the target /r/ is outside the domain limit just specified for the phenomenon. In these cases, /r/ is either internal to a Prosodic Word (29a), or it occurs at the right edge of a constituent that does not constitute a PWd in BP (29b).[24]

(28) Applicability of r-deletion in Brazilian Portuguese: PWd-finally

$(\text{falar})_{PWd}$ $(\text{portuges})_{PWd}$	→	[fala_ portuges]	'to speak Portuguese'
$(\text{dormir})_{PWd}$ $(\text{sedo})_{PWd}$	→	[dormi_ sedo]	'to sleep early'
$(\text{beber})_{PWd}$ $(\text{agwa})_{PWd}$	→	[bebe_ agwa]	'to drink water'
$(\text{sabor})_{PWd}$ $(\text{azedo})_{PWd}$	→	[sabo_ azedo]	'sour taste'
$(\text{dor})_{PWd}$	→	[do_]	'pain'
$(\text{mar})_{PWd}$	→	[ma_]	'sea'

[24] The only /r/-final word that does not undergo r-deletion in Brazilian Portuguese is the (typically unstressed) preposition /por/ 'to, for, around, by'. Because of its unstressed nature, /por/ cannot form a Prosodic Word, which explains why /r/-deletion in inapplicable in this word.

(29) Inapplicability of r-deletion in Brazilian Portuguese

a. PWd-internally

$(karta)_{PWd}$	→	[karta]	*[ka_ta]	'letter'
$(dormir)_{PWd}$	→	[dormi]	*[do_mi]	'to sleep'
$(perdi)_{PWd}$	→	[perdi]	*[pe_di]	'lost-1pr.sg.'

b. When /r/ is not PWd-final

$(por)_{\sigma}$ $(ali)_{PWd}$	→	[por ali]	*[po_ ali]	'around there'
$(por)_{\sigma}$ $(amor)_{PWd}$	→	[por amo]	*[po_ amo]	'for love'
$(por)_{\sigma}$ $(diɲejro)_{PWd}$	→	[por diɲejro]	*[po_ diɲejro]	'for money'

In the GA framework, the variation patterns across domains illustrated above can be captured by the alignment constraint AlignPWd-Nuc, which requires that the right edge of every Prosodic Word be aligned with the right edge of a Nucleus (i.e. a vowel). A positive aspect of this constraint is that it captures both the domain (i.e. PWd-finally) and segmental (i.e. r-deletion due to NoCoda) aspects of the phenomenon in BP. The formalization of the constraint is provided below, followed by a tableau in which the form with word-final r-deletion is selected.

(30) AlignPWd-Nuc

Align (PWd, Right; Nucleus, Right)

(31) Tableau for r-deletion in Brazilian Portuguese

	/dormir/	AlignPWd-Nuc	DEP-IO	MAX-IO	NoCoda
	a. $dormir)_{PWd}$	*!			**
☞	b. $dormi\_)_{PWd}$			*	*
	c. $do\_mir)_{PWd}$	*!		*	*
	d. $do\_mi\_)_{PWd}$			**!	
	e. $dormiri)_{PWd}$		*!		*

In the context of edge-based phenomena, GA yields satisfactory results in cases like r-deletion in Brazilian Portuguese. Nevertheless, the framework is inadequate for the investigation of juncture processes such as Word-Final Voicing in Sanskrit (see section 2.1), and it is also problematic for the analysis of span phenomena (e.g. Voicing Assimilation in Spanish and Liaison in French).[25]

Despite not having been designed for this purpose, Generalized Alignment constitutes the ideal framework for the delimitation of domains for Prosodic Phonology because of the interaction assumed between prosodic and grammatical (i.e. morphological or syntactic) constituents. As discussed in section 2.1.2, recall that domains in Prosodic Phonology are established from an interaction between phonology and the morphological and/or syntactic components. Via mapping rules, these morphosyntactic constituents are then converted into the domains that mediate the phonology-morphosyntax interface. In the GA framework, this interaction as well as the concept of mapping rules can be straightforwardly captured by the alignment of prosodic and morphosyntactic constituents, as I will demonstrate in forthcoming section 2.2.4.

In the following sections, I will present an OT proposal for the analysis of domain-sensitive phenomena using an integrated version of Generalized Alignment and Prosodic Phonology. The former theory, however, will be restricted to the delimitation of the prosodic domains in which constraints will operate. As indicated previously, this is also the approach that I will adopt in my investigation of Picard in Chapters 3 and 4.

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[25] See, however, Kirchner (1993), Pulleyblank (1996), and Goad (1997) for accounts of the domain span phenomena of vowel and consonant harmony within the GA framework using features as arguments for alignment. Note, however, that harmony can be differentiated from other domain span processes (e.g. Voicing Assimilation in Spanish), because the features involved in harmony usually extend to the edge of a constituent.

2.2.4. Prosodic Phonology in Optimality Theory

The theory of Prosodic Phonology in OT (PP-OT) (à la Selkirk 1997) proposes a reinterpretation of some of the fundamentals of Traditional Prosodic Phonology (TPP) (discussed in section 2.1.2) in the framework of OT, via constraints on the alignment of edges of prosodic and morphosyntactic constituents. Although it is not required in GA to assume that the interaction of phonology with the other components of the grammar is indirect (i.e. via prosodic domains), this crucial assumption of Prosodic Phonology can be preserved in OT via the alignment of certain edges of constituents, which will then define the domains in which phonological phenomena operate. In other words, the essence of mapping rules of Prosodic Phonology can be maintained in OT via alignment of edges of constituents.

To illustrate how morphosyntactic constituents can be mapped into prosodic constituents under PP-OT, consider the context in which r-deletion applies in BP: the Morphological Word (MWd), including the root, stem and all adjacent suffixes. In TPP (e.g. Nespor and Vogel 1986), this morphological unit can be converted into a Prosodic Word by requiring that Prosodic Words in BP consist of a root or stem plus all linearly adjacent affixes. In PP-OT, however, this mapping of Morphological Words into Prosodic Words is achieved by alignment constraints demanding that all MWds in BP be right and left aligned with Prosodic Words (i.e. MWd = PWd; see definition of this constraint in forthcoming (36), in the context of Nasal Deletion in Greek).

Even though Selkirk's (1997) work focuses on the prosodization of function words and their host constituents, its contribution to the study of domain-sensitive phenomena was that of providing the apparatus necessary to accommodate insights of

Prosodic Phonology into OT via constraints on alignment of edges of constituents. Along the lines of Inkelas (1989) and Itô and Mester (1992), and complying with one of the principles of OT that constraints are violable, Selkirk proposed the decomposition of the Strict Layer Hypothesis (see (11)) into separate constraints, each with an independent status in the grammar. In her view, the SLH should not be seen as a monolithic entity requiring that (1) every prosodic constituent dominate an immediately lower constituent (e.g. a Foot must dominate a Syllable), and (2) that a category be exhaustively contained within a category of the immediately superordinate type (e.g. a Syllable must be dominated by a Foot). Instead, Selkirk decomposes the SLH into four constraints as in (32) (where "C" indicates some prosodic constituent).

(32) Constraints on Prosodic Domination (Decomposition of the Strict Layer Hypothesis)

a. **Layeredness** No C^i dominates a C^j, $j > i$
b. **Headedness** Any C^i must dominate a C^{i-1} (except if $C^i = \sigma$)[26]
c. **Exhaustivity** No C^i immediately dominates a constituent C^j, $j < i-1$
d. **NonRecursivity** No C^i dominates C^j, $j = i$.

According to Layeredness, no constituent C^i dominates a C^j, where j is higher than i in the prosodic hierarchy; for instance, no Foot may dominate a Prosodic Word. Headedness requires that C^i dominate at least one C^{i-1}; for example, a Prosodic Word must dominate at least one Foot. According to Exhaustivity, no C^i immediately dominates a constituent C^j, where j is lower than i-1 in the prosodic hierarchy; for

[26] Note that the Syllable, and not the Mora, is the lowest level of the Prosodic Hierarchy in Selkirk's (1997) view (cf. Zec 1988 and others).

instance, no Prosodic Word immediately dominates a Syllable.[27] NonRecursivity requires that C^i not dominate C^j, where j equals i; for example, no Prosodic Word dominates another Prosodic Word.

Selkirk (1997) claims that Layeredness and Headedness are universally undominated constraints that hold of all phonological representations, while the constraints Exhaustivity and NonRecursivity do not hold of all prosodic structures, and therefore may be violated.[28] Due to space limitations, the tableau analyses that I will show henceforward will not display candidates that violate Layeredness and Headedness.

As we shall see in more detail in chapter 3, the decomposition of the SLH into separate and violable constraints brings considerable advantages to the theory of Prosodic Phonology. Most importantly, it allows languages to violate certain prosodic well-formedness constraints (e.g. a Prosodic Word *sometimes* must dominate a syllable instead of a Foot, which constitutes a violation of Exhaustivity) in order to satisfy other requirements imposed by the language. Because of the inadequacies of the SLH as a monolithic and inviolable whole and its overly restrictive nature, several pre-OT analyses

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[27] Violations of the constraint Exhaustivity are assessed based on the distance between the two constituents involved. For instance, a structure depicting a Prosodic Word dominating a syllable (in which only the intermediate category Foot is skipped – see (i)) fares better in terms of Exhaustivity than one having a Phonological Phrase dominating a syllable (in which case two intermediate categories are missing: the Prosodic Word and the Foot – see (ii)):

(i) PWd (*)	(ii) PPh (**)
|	|
σ	σ

[28] Kawasaki (1998) draws a distinction between universally inviolable constraints that constrain outputs only and those that have the status of principles and therefore constrain both inputs and outputs. Along these lines, Van der Leeuw (1997) claims that Headedness and Layeredness are not constraints but principles that only operate within GEN; consequently, candidates violating these two "constraints" will never be generated. Since this distinction is irrelevant to the present discussion, I will simply adopt Selkirk's view that these constraints are undominated in the grammars of all languages.

had proposed amendments to the theory; e.g. Stray Syllable Adjunction (Hayes 1980), Phonological Phrase Incorporation (Berendsen 1986), Recursion of the Prosodic Word (Inkelas 1989, McCarthy and Prince 1993), Recursion of the Phonological Phrase (Odden 1987), Weak Layering Hypothesis (Itô and Mester 1992), etc.

The importance of the decomposition of the SLH is best recognized when one considers the prosodization of function words, especially clitics, due to their hybrid nature: sometimes they behave like independent words, and sometimes they assume the status of word-internal elements. The phonology of Demotic Greek provides an interesting illustration of the inadequacies of the Strict Layer Hypothesis as a monolithic and inviolable whole to analyze Nasal Deletion (ND) in the language. To illustrate, consider the data below that show the application of ND, a process that deletes a clitic-final nasal consonant when in the presence of a fricative-initial following word, as shown in (33) (cf. a following vowel-initial word: /tin aliθia/ → [ti<u>n</u> aliθia], *[ti_ aliθia] 'the truth (ACC.)'). Observe in (34) that the process does not apply in contexts in which the morphosyntactic structure involved does not correspond to that of a clitic and following word (data from Nespor and Vogel 1986).

(33) Applicability of Nasal Deletion in Demotic Greek: clitic + MWd

/ton θelo/	→	[to_ θelo]	'(I) want him'
/tin θea/	→	[ti_ θea]	'the view-ACC'
/tin vlepo/	→	[ti_ vlepo]	'(I) see her'

(34) Inapplicability of Nasal Deletion: other morphosyntactic contexts[29]

/prin fao/	→	[prin fao]	*[pri_ fao]	'before (I) eat'
/exun ði/	→	[exun ði]	*[exu_ ði]	'(they) have seen'
/otan fiɣo/	→	[otan fiɣo]	*[ota_ fiɣo]	'when (I) leave'

In order to comply with the Exhaustivity aspect of the SLH and still capture the idiosyncratic character of the proclitics involved in the process, Nespor and Vogel (1986) propose an intermediate domain between the Prosodic Word and the Phonological Phrase: the Clitic Group. Under this analysis, unstressed proclitics such as /ton/ and /tin/ in (33) are assigned the status of Prosodic Words, just like (stressed) words, so that they can be directly dominated by the Clitic Group, as required by the SLH. This analysis for the prosodization of proclitics delimits the application of ND to the domain juncture of two Prosodic Words within the Clitic Group, as illustrated in (35a), and captures the peculiarities of clitics as being both semi-words and semi-affixes.

[29] Within the Prosodic Word domain, Nasal Deletion applies optionally in this dialect of Greek (Nespor and Vogel 1986):

/anθropos/	→	[anθropos]	or	[a_θropos]	'human being'
/simvivazmos/	→	[simvivazmos]	or	[si_vivazmos]	'compromise'

Note that optionality of ND application at the lexical level goes against one of Lexical Phonology's hypotheses that, in cases when there is an overlap across levels for a given process, optionality is reserved for the postlexical level (e.g. Kiparsky 1985:86). As illustrated above, Greek phonology exhibits the opposite pattern in which optionality is restricted to a lower domain. Optionality in Nasal Deletion in Greek will not be taken into consideration in forthcoming discussions (see Chapter 5, however, for a brief discussion of the subject).

(35) The Clitic Group as the domain of Nasal Deletion in Greek

a. Applicability of Nasal Deletion

($(\text{ton})_{\text{PWd}}$ $(\theta\text{elo})_{\text{PWd}}$ $)_{\text{CG}}$	→	[to_ θelo]
($(\text{tin})_{\text{PWd}}$ $(\theta\text{ea})_{\text{PWd}}$ $)_{\text{CG}}$	→	[ti_ θea]

b. Inapplicability of Nasal Deletion

($(\text{prin})_{\text{PWd}}$ $)_{\text{CG}}$ ($(\text{fao})_{\text{PWd}}$ $)_{\text{CG}}$	→	[pri<u>n</u> fao]	*[pri_ fao]
($(\text{exun})_{\text{PWd}}$ $)_{\text{CG}}$ ($(\eth\text{i})_{\text{PWd}}$ $)_{\text{CG}}$	→	[exu<u>n</u> ði]	*[exu_ ði]

What the assignment of PWd status to clitics does not capture, however, is the observation that clitics are unstressed (i.e. unfooted) and, as such, should not be assigned the same status of other (always stressed) Prosodic Words in the language.[30] Assuming that unstressed syllables cannot form Feet due to their lack of stress (e.g. Selkirk 1997; see also section 3.2.2.1 in Chapter 3), the assignment of PWd status to unfooted syllables constitutes a clear violation of the universally undominated constraint Headedness in (32b) (e.g. $*((\text{ton})_{\sigma})_{\text{PWd}}$).

I will now provide a reanalysis for the domain of ND in Greek in light of the PP-OT framework. According to Nespor and Vogel (1986), the domain of the Prosodic Word in Greek is equal to the terminal element in a syntactic tree and therefore consists of a root or stem plus all adjacent affixes (i.e. MWd = PWd; e.g. Deevy 1995, Peperkamp 1997, the latter under Align(X_0, L/R; PWd, L/R)). In the theory of Generalized Alignment, this analysis of PWd constituency in Greek can be recast as a type of

[30] Note that, despite being unstressed by default, clitics may appear in their stressed (i.e. footed) forms in exceptional circumstances. Selkirk (1997) shows this in the context of English; for instance, English clitics may appear stressed when they are uttered in isolation (e.g. HER), or when they are focused (e.g. We need HER, not him). Unfortunately, the relevant data for Greek are not available.

alignment requiring that every Morphological Word be aligned with a Prosodic Word, as stated below.

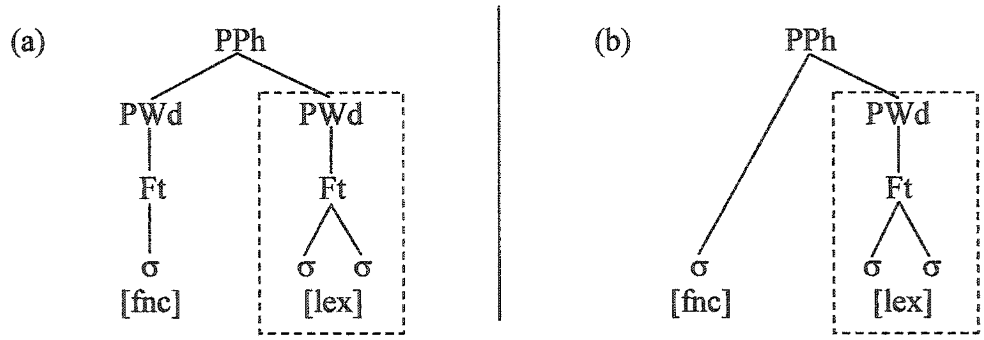
(36) AlignMWd/PWd
(i) Align (MWd, L; PWd, L)
(ii) Align (MWd, R; PWd, R)

In Selkirk's (1997) approach to the analysis of function words, the Clitic Group is no longer necessary as a prosodic constituent because the idiosyncrasies of clitics can be easily distinguished in terms of domination and sisterhood relations defined with respect to the Prosodic Word domain (see also Zec 1988, Inkelas 1989, Jacobs 1991, Inkelas and Zec 1996, van der Leeuw 1997, Peperkamp 1997, and Vigário 2001). Since clitics are not stressed, this is a positive result that could not be adequately captured within a stricter version of the Strict Layer Hypothesis. From an OT perspective in which constraints are violable, as we have seen, strict compliance with the SLH is no longer required and no longer expected in phonology, since constraints are violable. This issue will be discussed further in Chapter 3, in the context of another clitic-bounded phenomenon.

Ignoring the Clitic Group as a prosodic constituent and following Nespor and Vogel's view that Greek clitics prosodize at a domain external to the Prosodic Word that contains the Morphological Word, AlignMWd/PWd predicts that a proclitic may appear in two possible configurations in Greek (the boxed structures in (37a) and (37b) indicate compliance with AlignMWd/PWd; [fnc] represents a proclitic and [lex] a word): (1) either as a Prosodic Word, sister to another Prosodic Word and dominated by the

Phonological Phrase (see (37a)); (2) or as an independent syllable, sister to a Prosodic Word and dominated by the Phonological Phrase (see (37b)).

(37) Two possibilities for the prosodization of proclitics in Greek



Because function words are usually unstressed (and therefore unfooted) in Greek, the configuration in (37a) is not an adequate representation for the prosodization of proclitics in the language. To account for the fact that function words typically do not have the status of Prosodic Words as shown in (37a), Selkirk (1997) adopted the alignment constraint AlignPWd/Lex, defined below, which requires that every Prosodic Word be aligned with a lexical word (e.g. a stem, a root). Note that the assignment of PWd status to the function word in (37a) violates AlignPWd/Lex.

(38) AlignPWd/Lex
(i) Align (PWd, L; Lex, L)
(ii) Align (PWd, R; Lex, R)

Following Selkirk's approach to the prosodization of clitics and more specifically the interaction of the constraints AlignMWd/PWd and AlignPWd/Lex, the clitic plus lexical word sequence in Greek can only prosodize, in order to satisfy these constraints, as an unstressed (and therefore unfooted) syllable, sister to a Prosodic Word, and dominated by the constituent Phonological Phrase, as illustrated in (37b) above. This constitutes the domain juncture in which Nasal Deletion operates in Greek from a PP-OT perspective.[31]

Selkirk's approach to the prosodization of function and lexical words has contributed considerably to the theory that captures the interaction of phonology with the other components of the grammar. However, due to the narrow scope of her investigation (which, as mentioned earlier, exclusively focuses on the prosodization of function words), the author does not provide an account for how the relevant domains and the segmental aspects of phonological phenomena interact. More specifically, her investigation does not deal with the issue of what happens after a prosodic domain is determined, and how phonological processes and their domain of application as a whole interact to yield a surface form. In the context of Greek Nasal Deletion, for example, what happens once the prosodic domain of the process is delimited? How does one prevent the process from applying in smaller and larger domains? These questions will be addressed in the following section.

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[31] This hasty analysis for the prosodization of proclitics in Greek is exclusively for the purpose of illustration and is entirely based on the discussion provided in Nespor and Vogel (1986). Greek Nasal Deletion deserves a more detailed analysis within the framework of Optimality Theory; however, this is beyond the scope of this thesis.

2.2.5. The domain-specific constraint approach in constraint-based Prosodic Phonology

The use of constraints that refer to specific morphosyntactic and/or prosodic domains, i.e. domain-specific constraints, is not an innovative proposal in this thesis and can be found in a variety of works within the framework of Optimality Theory; e.g. Kiparsky 1993, Prince and Smolensky 1993, McCarthy and Prince 1993ab, 1995, Reynolds 1994, Benua 1995, 1997, Buckley 1995ab, 1996ab, Casali 1996, Golston 1996, Pater 1996, 1999, Smith 1997, Beckman 1997, 1998, Zoll 1998, Lubowicz 1999, Anttila 2000ab, Borowsky 2000, Grijzenhout 2000, Krämer 2000ab, Alderete 2001, Herrick 2001, Goad and Rose in press. Even though these types of constraints have frequently been used in OT analyses, thus far, the approach has not received any comprehensive or systematic evaluation in light of the different possibilities permitted by OT. In this section, I demonstrate how the constraint-based approach to Prosodic Phonology outlined in the previous section is able to account for the phonological asymmetries observed in domain-sensitive phenomena such as those illustrated in the first section of this chapter. To achieve these goals, I elaborate an approach that recognizes the decomposition of general constraints into a set of constraints that refer to domains established by Prosodic Phonology, each of which can be ranked independently within a single grammar.

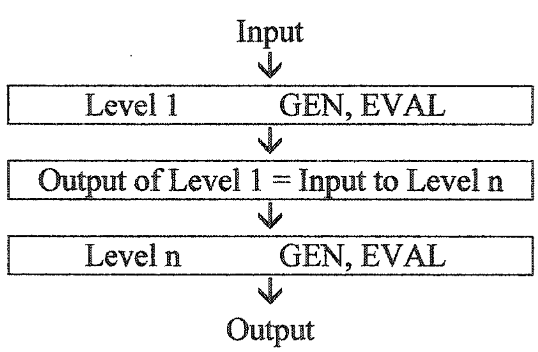
2.2.5.1. Multi-Level and one-level OT

As indicated in section 2.2.2, in general terms, there are at least two main lines of research for the analysis of domain-sensitive phenomena in the OT literature: (1) the multi-level approach, which assumes intermediate levels between input and output (e.g.

Kiparsky 1999, 2000, Herrick 2001);[32] and (2) the one-level (or domain-specific constraint) approach (e.g. Buckley 1995a et seq., Pater 1996, Grijzenhout 2000), which captures domain-driven phonological alternations via the decomposition of constraints into their corresponding domain-specific variants.

According to the multi-level approach (e.g. Kiparsky 1999, 2000), the grammar is internally structured as a stratified constraint system in which the output of a level serves as the input to the next level until the grammar selects the correct output form. Each level, thus, contains its own GEN, EVAL and ranking of constraints (the latter of which may differ across domains). A schematic representation of the multi-level model is shown below.

(39) The multi-level model



[32] I am also including here the Cophonology approach (e.g. Itô and Mester 1995ab, Orgun 1996, Inkelas et al. 1997, Inkelas 1998, Inkelas and Orgun 1995, Inkelas and Zoll 2000), which shares with Lexical Phonology the concept of multiple grammars to account for domain-related alternations. According to this theory, each morphological component (e.g. a root, an affix, etc.) or even a class of specific morphemes is associated with its own subgrammar or cophonology (i.e. a set of constraint rankings). Within this approach, the grammar (i.e. a set of constraints) is split up into multiple cophonologies via the reranking of faithfulness constraints, each of which selects its own optimal output.

In an OT-based Prosodic Phonology approach, Peperkamp (1997) also distinguishes two levels in the grammar: the lexical and post-lexical levels. She substantiates her proposal with a discussion of resyllabification in Romance languages, a process that triggers a "readjustment" of Prosodic Word boundaries when resyllabification (a postlexical operation) applies.

Even though the multi-level approach is able to provide a satisfactory account for several domain-sensitive phenomena, the machinery that this model requires goes against some of the premises of OT: firstly, the concept of intermediate stages is incompatible with the assumption that candidate evaluation is conducted entirely in parallel; secondly, the OT hypothesis that there are no language-particular restrictions on inputs (i.e. Richness of the Base) cannot be maintained within this approach.[33] In addition, the approach is inadequate for the analysis of some domain juncture and domain edge phenomena such as those illustrated in section 2.1, especially if some of LP's concepts are strictly maintained, e.g. that postlexical processes apply across the board.

The second approach to the investigation of domain-sensitive phenomena does not require distinct levels of constraint evaluation. It does, however, require the decomposition of general constraints into their domain-specific counterparts because, as previously discussed, the general versions of some constraints are not always sufficient to account for phonological asymmetries across domains.

To illustrate how this approach works, let us now return to the data on r-deletion in Brazilian Portuguese. Recall from section 2.2.3 that the phenomenon applies exclusively at the right edge of words (e.g. /falar/ → [fa.la_] 'to speak') and is inapplicable word-internally (e.g. /karta/ → [kar.ta], *[ka_.ta] 'letter'). If we simply assume that the phenomenon is triggered by the high ranking of the general constraint NoCoda, an incorrect form without the word-internal coda is selected (i.e. candidate (d)

[33] To circumvent Richness of the Base (ROB) in a multi-level approach, one must assume that ROB only holds for the input to the first level. This is not a drastic assumption considering that the inputs to the other levels are themselves outputs.

below). In (40), ☠ indicates an output that was wrongly selected while ☹ illustrates the correct BP form that was incorrectly discarded.

(40) Tableau for r-deletion in Brazilian Portuguese

	/dorm-ir/	NoCoda	DEP-IO	MAX-IO
	a. dor.mir	*!*		
☹	b. dor.mi_	*!		*
	c. do_.mir	*!		*
☠	d. do_.mi_			**

To capture the fact that certain constraints have an effect in some domains but not in others, some authors, as mentioned earlier, have proposed the decomposition of general constraints into their domain-specific counterparts. For r-deletion in BP, for instance, the constraint NoCoda must be decomposed into two domain-specific constraints. For the sake of illustration, NoCoda will be decomposed into morphologically based domains (i.e. root and suffix): $\text{NoCoda}_{\text{Rt}}$, whose scope is the root domain, and $\text{NoCoda}_{\text{Suf}}$, which only evaluates segments that belong to a suffix (see also McCarthy and Prince 1995 and Buckley 1996b, 1997 for analyses of other phenomena along these lines). In the following sections, however, I will dispense with morphologically or syntactically based domains in favor of domains established exclusively by Prosodic Phonology. The decomposition of NoCoda into the relevant domain-specific constraints is illustrated below.

(41) The decomposition of NoCoda

	Domain-specific versions	
NoCoda →	$NoCoda_{Rt}$	Syllables do not have codas in roots.
NoCoda →	$NoCoda_{Suf}$	Syllables do not have codas in suffixes.

The following tableau illustrates how the domain-specific constraints in (41) interact with other constraints to select the correct output in BP. Observe that the winning candidate (b), the one in which r-deletion has applied word-finally, does not violate the constraint $NoCoda_{Suf}$ because the only coda present in this form is outside the scope of the constraint. The candidate does, however, violate the lower ranked constraint $NoCoda_{Rt}$ due to the surfacing of the root-internal coda [r]. Violations of the domain-specific $NoCoda_{Suf}$ are shown in the non-optimal candidates (a) and (c).[34]

(42) Tableau for r-deletion in Brazilian Portuguese

	/dorm-ir/	$NoCoda_{Suf}$	DEP-IO	MAX-IO	$NoCoda_{Rt}$
	a. dor.mir	*!			*
☞	b. dor.mi_			*	*
	c. do_.mir	*!		*	
	d. do_.mi_			**!	
	e. dor.mi.ri		*!		*

[34] Recall from (28) and (29) that r-deletion also applies in monomorphemic words such as /mar/ 'sea' and /amor/ 'love', each of which constitutes a single Morphological Word in BP. Considering the ranking of the morphologically-based constraints $NoCoda_{Suf}$ and $NoCoda_{Root}$ proposed in (42), one expects the incorrect non-application of r-deletion in these words, since $NoCoda_{Suf}$ will have no effect on the word-final coda. However, if $NoCoda_{Suf}$ is replaced by a constraint specifying exactly where in the relevant morphological domain codas are disallowed, i.e. $NoCoda_{MWd\text{-}Final}$, the correct results are obtained. I will return to the subject of how the limit, edge or span of a domain can be expressed in constraints in the context of prosodically-based constraints, in forthcoming section 2.2.5.2.

The domain-specific constraint approach has some advantages over a multi-level approach for the analysis of domain-sensitive phenomena. One is that it is able to account for phonological alternations across domains without the proliferation of grammars or cophonologies. Instead, within this approach, only constraints are allowed to proliferate, within a single grammar. This is consistent with Pater's (1996:109) view, for whom "the tack of proliferating constraints over that of proliferating grammars [is preferable] because [...] it gives a clear view of the limits that a language imposes on reranking, and specifically because the proliferation of lexically specific constraints seems independently necessary (e.g. alignment constraints [...])".[35] In addition, the decomposition of previously alleged monolithic constraints into their domain (or position) specific counterparts has been argued to be essential for the analysis of several phonological phenomena; e.g. the decomposition of Faithfulness constraints (e.g. McCarthy and Prince 1995, 1999, Buckley 1996b, Casali 1996, 1997, Peperkamp 1997, Schütze 1997, Smith 1997, Féry 1999, Pater 1999, Plag 1998, Inkelas and Zoll 2000, Goad and Rose in press); and the decomposition of markedness constraints (e.g. Buckley 1996bc, 1997, Golston 1996, Zoll 1998, McCarthy 2002).

Because the domain-specific constraint approach presupposes a single grammar (or ranking) to account for phonological alternations across domains without resorting to intermediate stages, I will adopt this approach in the analysis of domain-sensitive phenomena in Picard.

[35] Even though the domain-specific and multi-level approaches handle domain-sensitive phenomena from different perspectives, it remains to be seen whether they have the same empirical coverage.

2.2.5.2. Where do domains come from?

Based on the assumption that constraints that make reference to domains are essential in a theory of constraint interaction (as the references at the outset of section 2.2.5 indicate), we now need to address the question of what may constitute the domains into which constraints can be decomposed. In the OT literature, at least two types of domain-specific constraints have been proposed: (1) constraints that refer directly to morphosyntactic constituents (MS-based constraints) (e.g. MAX-IO_{Suf}, MAX-IO_{Rt});[36] and (2) constraints that refer to morphosyntactic constituents indirectly, via the prosodic hierarchy (PP-based constraints) (e.g. MAX-IO_{PWd}). Observe that each type of domain-based constraint reflects a different approach to the interaction of phonology and morphosyntax: the direct approach, and the indirect (Prosodic Phonology) approach respectively.

The first type of domain-specific constraints, those that refer to morphosyntactic structures in a direct manner (MS-based constraints), have already been illustrated in the previous section, wherein the constraint NoCoda was decomposed directly into morphological constituents, i.e. the root ($NoCoda_{Rt}$) and the suffix ($NoCoda_{Suf}$).

The second type of domain-specific constraints consists of those that make reference to prosodic domains established within the framework of Prosodic Phonology, via an indirect interface between phonology and the other components of the grammar

[36] A variant of the direct approach to the decomposition of constraints was proposed by Buckley (1995ab, 1996c), based on the framework of Lexical Phonology. In his view, domains are determined by a reinterpretation of levels established by Lexical Phonology, which also coincide with those available from morphology. For instance, to capture the opacity of the BP root /dorm/ to r-deletion, his approach allows for the delimitation of two domains that, in this case, coincide with the ones illustrated in the MS-based analysis shown in the previous section 2.2.5.1: $(Root)_{Domain1}$ $(Suffix)_{Domain2}$. In this approach, the isolation of the suffix as a domain (into which constraints can be decomposed) captures the non-derived environment effects observed in BP roots, similar to what was shown in the tableau in (42).

(see section 2.1.2). So instead of reference to morphosyntactic domains, PP-based constraints refer directly to the constituents of the prosodic hierarchy in (10) (e.g. the Phonological Phrase, the Prosodic Word, the Foot, etc.).

To illustrate, within the context of r-deletion, recall from section 2.2.3 that the process operates exclusively at the right edge of the Prosodic Word in BP (which coincides with the right edge of a Morphological Word). From a PP-based constraint perspective, the relevant constraint for r-deletion (i.e. NoCoda) should be decomposed into prosodically determined domain-specific constraints: NoCoda$_{PWd}$, NoCoda$_{PPh}$, NoCoda$_{Foot}$, etc. These domain specifications (and most importantly NoCoda$_{PWd}$), however, are insufficient for a precise delimitation of the scope of r-deletion: if the NoCoda constraint simply refers to the Prosodic Word (i.e. NoCoda$_{PWd}$), without any specification of the precise context within the PWd in which the constraint is relevant (i.e. at the right edge), it incorrectly implies that NoCoda$_{PWd}$ operates within the entire Prosodic Word. This yields results that do not correspond to the BP data, as illustrated below:

(43)

	/dormir/	NoCoda$_{PWd}$
	a. (dor.mir)$_{PWd}$	*!*
☹	b. (dor.mi_)$_{PWd}$	*!
	c. (do_.mir)$_{PWd}$	*!
☠	d. (do_.mi_)$_{PWd}$	

Because NoCoda has a stronger effect at the right edge of the Prosodic Word (where r-deletion takes place), the constraint needs to be further decomposed into one of the three types of processes that Prosodic Phonology recognizes (see (12) in section

2.1.2): domain span, domain juncture and domain limit processes.[37] The latter describes the locus of r-deletion and, accordingly, the appropriate NoCoda constraint should also indicate precisely where in the PWd the constraint is operative – at the right limit of the domain PWd: $\text{NoCoda}_{\text{PWd-Final}}$ (cf. $\text{NoCoda}_{\text{MWd-Final}}$ in note 34). For expository convenience, throughout this thesis, I will only indicate the distinction between the general constraints (e.g. NoCoda) and their domain-specific counterparts (e.g. $\text{NoCoda}_{\text{PPh}}$, $\text{NoCoda}_{\text{PWd-Final}}$, etc.) when they become relevant to the analysis. In addition, constraints that lack a domain specification will not be labeled for a domain. It should be understood, however, that they operate throughout the entire Phonological Utterance (U), as if they were specified for the domain span U (i.e. NoCoda_{U}).

(44) The decomposition of NoCoda into PP-based constraints

	Domain-specific versions	
NoCoda →	$\text{NoCoda}_{\text{PWd-Final}}$	Syllables do not have codas at the right edge of the Prosodic Word.
NoCoda →	NoCoda	Syllables do not have codas (e.g. in U).

The tableau below illustrates how PP-based domain-specific constraints interact with other constraints within a single grammar to yield the correct outputs in the relevant domains: r-deletion in PWd-final position (e.g. in polymorphemic (45a-d) and

[37] That a constraint should specify exactly where within a prosodic (or morphosyntactic) domain it is operative is not an original claim. In OT, several authors have adopted different markedness and faithfulness versions of domain-sensitive constraints; for example: *[-high]ω (No [-high] vowel word-finally – Inkelas 1997), *[+voice]ω (no voiced obstruents in word-final position – Grijzenhout and Krämer 1999), MAX(COR)/M-Edge (no deletion of coronals at word edges – Herrick 2001), $]_\sigma$/*Voice (no syllable-final voiced obstruents – McCarthy 2002), $\text{DEP}_{\text{Init-}\sigma}$ (No epenthesis in syllable-initial position – McCarthy 2002), etc. See also Beckman (1997) for a larger selection of examples.

monomorphemic words (45e-f)), and its inapplicability in other domains (e.g. internal to the Prosodic Word (45c-d) and in other domains (45g-h)):

(45) Tableau for r-deletion in Brazilian Portuguese

	/dorm-ir/	NoCoda$_{PWd\text{-}Final}$	MAX-IO	NoCoda
	a. (dor.mir)$_{PWd}$	*!		**
☞	b. (dor.mi_)$_{PWd}$		*	*
	c. (do_.mir)$_{PWd}$	*!	*	*
	d. (do_.mi_)$_{PWd}$		**!	
	/amor/			
	e. (amor)$_{PWd}$	*!		*
☞	f. (amo_)$_{PWd}$		*	
	/por diɲejro/			
☞	g. (por)$_{\sigma}$ (diɲejro)$_{PWd}$			*
	h. (po_)$_{\sigma}$ (diɲejro)$_{PWd}$		*!	

For the analysis of domain-sensitive phenomena in Picard, a PP-based approach to the decomposition of general constraints will be adopted. As is the case with MS-based constraints, this approach captures the surface orientation of OT by not allowing intermediate steps to intervene between inputs and outputs, as shown in the analyses of r-deletion from the perspective of the two approaches. Nevertheless, I will adopt a PP-based approach to the decomposition of constraints for the following reasons: first and foremost, it captures one of the fundamentals of Prosodic Phonology, namely that the morphology and syntax cannot adequately provide domains for phonological processes. As was illustrated in the case of r-linking in British English (see section 2.1.2), there are often mismatches between morphosyntactic domains and the domains in which phonological phenomena operate (e.g. Selkirk 1980abc, 1982, 1986, Nespor and Vogel

1986, Hayes 1989, Buckley 1996a, Peperkamp 1997). As a result, the interaction of phonology with the other components of the grammar must be mediated by PP-based domains. Second, since prosodic constituents are essential to capture other phonological behavior (e.g. Selkirk 1978a et seq., Nespor and Vogel 1986, Peperkamp 1997), the adoption of a single framework for specifying domains harmonizes and constrains the grammar by restricting the possibilities of domain-specific constraints to those that refer exclusively to domains established by Prosodic Phonology, i.e. to the constituents of the prosodic hierarchy.

In the following section, I will demonstrate how constraint-based Prosodic Phonology is able to account for some of the phenomena discussed previously, via the adoption of PP-based domain-specific constraints.

2.2.5.3. Greek and French Revisited

The first data that I will examine within a constraint-based approach to Prosodic Phonology are those from Greek involving Nasal Deletion (ND). Recall from section 2.2.4 that the deletion of clitic-final /n/ in Greek applies exclusively at the domain juncture of a Syllable and the following Prosodic Word, within the prosodic configuration of the Phonological Phrase (e.g. $((\text{ton})_{\sigma}\ (\theta\text{elo})_{PWd}\ )_{PPh} \rightarrow$ [to_ θelo] '(I) want him') (see (37b)). I assume, thus, that the relevant domain for ND in Greek is the domain juncture just specified which, for convenience, I will refer to as ϕ.

In order to account for ND in sequences of nasal plus fricative segments at the domain juncture ϕ, I invoke the markedness constraint *NasFric, discussed in Kirchner (2000). This constraint expresses the markedness of nasal plus fricative clusters.[38]

(46) *NASAL PLUS FRICATIVE CLUSTERS (*NasFric)
No nasal plus fricative clusters

A fixed ranking of *NasFric, however, cannot be maintained across distinct domains in Greek: if *NasFric is positioned at the higher end of the constraint hierarchy (e.g. above MAX-IO), it will lead to unattested Nasal Deletion across the board (e.g. $(\text{prin})_{PWd}$ $(\text{fao})_{PWd}$ → *[pri_ fao], ✓[prin fao] 'before (I) eat'). If the constraint is placed at the lower end of the hierarchy (e.g. below MAX-IO), ND will be blocked in domains in which it is expected to apply, i.e. at the ϕ juncture (e.g. $((\text{ton})_{\sigma}$ $(\theta\text{elo})_{PWd}$ $)_{PPh}$ → *[ton θelo], ✓[to_ θelo] '(I) want him').

(47)

Rankings	Incorrect Predictions	
a. ***NasFric** >> MAX-IO	ND across the board	e.g. *[pri_ fao]
b. MAX-IO >> ***NasFric**	No ND in ϕ or elsewhere	e.g. *[ton θelo]

Following the rationale of the domain-specific constraint approach developed in the previous sections, I propose the decomposition of *NasFric into PP-based domain-

[38] The constraint *NasFric is used for convenience, as an abbreviation for a set of constraints on Coda-Onset profile.

specific constraints, each of which will have an independent status in the phonology of Greek.

(48) The decomposition of *NasFric

	Domain-specific versions	
*NasFric →	*Nas]$_\phi$[Fric	No nasal plus fricative clusters at the domain juncture ϕ
*NasFric →	*NasFric	No nasal plus fricative clusters (e.g. in U)

For the sake of brevity, I will only provide candidates that display the application versus non-application of Nasal Deletion. To show the effect of domain-specific constraints across two distinct domains in Greek, in (49) I provide a tableau that illustrates, via the use of a single constraint ranking, the selection of Nasal Deletion at the domain juncture ϕ (49a-b), and its inapplicability in higher domains (e.g. at the juncture of two Prosodic Words) (49c-d)).

(49) Nasal Deletion across domains in Greek

	/ton θelo/	*Nas]$_\phi$[Fric	MAX-IO	*NasFric	
	a. ((ton)$_\sigma$ (θelo)$_{PWd}$)$_{PPh}$	*!		*	Juncture ϕ
☞	b. ((to_)$_\sigma$ (θelo)$_{PWd}$)$_{PPh}$		*		
	/prin fao/				Other domains
☞	c. (prin)$_{PWd}$ (fao)$_{PWd}$			*	
	d. (pri_)$_{PWd}$ (fao)$_{PWd}$		*!		

Within the same approach to domain-sensitive phenomena, I will now turn to the analysis of Liaison in French, a process that triggers resyllabification of a word-final consonant as the onset of the following vowel-initial syllable (see earlier section 2.1). As was the case with Nasal Deletion in Greek, recall that the application of Liaison is limited to a precise prosodic configuration: the domain span of the Phonological Phrase (e.g. $(\text{boz ɑ̃fɑ̃})_{PPh}$ → [bo.zɑ̃.fɑ̃] 'beautiful children'); in other domains, Liaison is blocked (e.g. $(\text{mɛzɔ̃z})_{PPh}$ $(\text{italjɛn})_{PPh}$ → [mɛ.zɔ̃._i.ta.ljɛn], *[me.zõ.zi.ta.ljɛn] 'Italian houses').

Within the OT framework, the crosslinguistic preference for syllables to have Onsets, as is the case in French, can be expressed by the constraint ONSET (Prince and Smolensky 1993), illustrated below.

(50) ONSET: Syllables have Onsets.

Because Liaison does not operate at all levels of the prosodic hierarchy in French, the constraint ONSET cannot have the same ranking throughout the phonology of this language. For instance, if ONSET were ranked at the higher end of the hierarchy, its ranking would incorrectly predict Liaison across the entire phonological utterance. The data, however, indicate that Liaison applies exclusively within the domain span of the Phonological Phrase (PPh). In order to account for Liaison without resorting to separate grammars, ONSET must be decomposed into the domain-specific constraints illustrated below:

(51) The decomposition of ONSET

		Domain-specific versions
ONSET	$ONSET_{PPh}$	Syllables have Onsets in the domain span of the Phonological Phrase
	ONSET	Syllable have Onsets (e.g. in U)

To yield the non-application of Liaison at domains other than the Phonological Phrase, I appeal to the constraint NoResyllabification (NoResyl) (e.g. Kiparsky 1993, Reynolds 1994), which bans the resyllabification of segments across words.

(52) NoResyllabification (NoResyl): No resyllabification across words.

The ranking of NoResyl above the general version of ONSET accounts for the non-application of Liaison in other prosodic configurations. A tableau illustrating the effect of Liaison in two different domains is given in (53).

(53) Liaison in French

	/boz ɑ̃fɑ̃/	$ONSET_{PPh}$	NoResyl	ONSET	
☞	a. (bo.zɑ̃.fɑ̃)$_{PPh}$		*		Span PPh
	b. (bo._ɑ̃.fɑ̃)$_{PPh}$	*!		*	
	/mɛzoɔ̃z italjɛn/				Other domains
	c. (mɛ.zɔ̃)$_{PPh}$ (zi.ta.ljɛn)$_{PPh}$		*!		
☞	d. (mɛ.zɔ̃)$_{PPh}$ (_i.ta.ljɛn)$_{PPh}$			*	

Importantly, Liaison cannot be straightforwardly analyzed by means of alignment constraints. Firstly, the phenomenon is a span process and, despite the fact that edges of constituents are involved in Liaison, reference to edges in the form of alignment cannot account for this span process in French. For instance, if we adopt a constraint requiring that every syllable be left aligned with a consonant to account for Liaison (Align (Syl, L; Cons, L); AlignSyl), the phenomenon will incorrectly overapply (e.g. *[me.zɔ̃.zi.ta.ljɛ̃n]; cf. (50d) above). If we instead replace the argument Syl with PPh (e.g. Align (PPh, L; Cons, L)), we expect Liaison to apply incorrectly at the left edge of the PPh constituent (e.g. *(me.zɔ̃)$_{PPh}$ (zi.ta.ljɛ̃n)$_{PPh}$). Finally, the first argument cannot be changed to a constituent other than the Syllable or PPh because the constituents across which Liaison operates cannot be categorized into a single morphosyntactic or prosodic domain whose limits may serve as edges for alignment;[39] for instance, the process operates across the following sequences of distinct categories of words: (a) between a clitic (determiner) and a following noun, e.g. /lɛz ɑ̃fɑ̃/ → (lɛ.zɑ̃.fɑ̃)$_{PPh}$ 'the children'; (b) between two clitics, e.g. /vuz ɑ̃/ → (vu.zɑ̃...)$_{PPh}$ 'you + partitive pronoun'; between two lexical words (Adjective + Noun, Adverb + Adjective, etc.), e.g. /boz ɑ̃fɑ̃/ → (bo.zɑ̃.fɑ̃)$_{PPh}$ 'beautiful children' (cf. /mɛzɔ̃ italjɛn/ → (mɛ.zɔ̃)$_{PPh}$ (_i.ta.ljɛn)$_{PPh}$ 'Italian houses'). In sum, only an analysis that refers to the span of the Phonological Phrase as the relevant domain for Liaison is able to account for the phenomenon in French.

To conclude, I have provided analyses for domain-sensitive phenomena in a number of languages in order to illustrate the application of the domain-specific approach to Prosodic Phonology within the constraint-based framework of OT. More specifically, I

[39] See Nespor and Vogel (1986:41, 179-180) for a comprehensive discussion of the inappropriateness of syntactic constituents as domains for Liaison in French.

have provided an account for the domain-driven phenomena of r-deletion in BP, Nasal Deletion in Greek and Liaison in French from the perspective of an approach that recognizes the decomposition of general constraints into their independent, domain-specific counterparts. In the context of these phenomena, the most important consequence of the approach is that alternations across domains can be accounted for, not by resorting to separate grammars, but by assuming a single grammar (one ranking) consisting of PP-based domain-specific constraints.

2.3. Conclusion to Chapter 2

In this chapter, I have introduced and provided support for the domain-specific constraint approach for the analysis of domain-sensitive phenomena. In the context of Optimality Theory, I have argued that this approach is preferable because it is able to account for domain-driven phonological alternations by means of a single constraint ranking, composed of independently ranked domain-specific constraints.

I began by discussing some of the inadequacies of SPE and Lexical Phonology for the analysis of above-the-word phenomena: the former because of its (not always appropriate) direct interaction with morphology and syntax, and the latter because of its primary focus on processes at and below the word level. Assuming Prosodic Phonology's view that domain-sensitive phenomena cannot always be accounted for via a direct reference to morphosyntactic domains (e.g. Selkirk 1980a et seq, Nespor and Vogel 1986 and Hayes 1989), I have argued that Prosodic Phonology constitutes a satisfactory framework for an investigation of the word-level and above-the-word phenomena included in this thesis.

Within an integrated version of Prosodic Phonology (à la Selkirk 1997) and Optimality Theory, I have proposed that only constituents from the prosodic hierarchy may serve as domains for decomposition. This approach was shown to be advantageous because it constrains and harmonizes the grammar by imposing limitations on the types of domains that may be subject to decomposition and, most importantly, it captures the Prosodic Phonology view that morphosyntactic constituents cannot adequately serve as domains for the operation of phonological phenomena.

CHAPTER 3

DOMAIN-SENSITIVE PHENOMENA IN PICARD[1]

In Chapter 2, I provided arguments in favor of the domain-specific constraint approach to analyze domain-sensitive phenomena across different languages. In this chapter, I will extend the applicability of the approach to the analysis of domain-related phenomena in Picard, namely: (1) Across-Word Regressive Assimilation (AWRA); and (2) The Resolution of Vocalic Hiatus, which includes the three strategies that the language utilizes in the syllabification of illicit vowel plus vowel sequences: (a) Semivocalization (SV), (b) Vowel Elision (VE), and (c) Heterosyllabification (HS) (i.e. non-application of SV and VE). In the investigation, I focus on two particular topics in the analysis of these phenomena: (1) their domain of application, since they are only operative within specific prosodic domains; and (2) the segmental aspects of the phenomena (i.e. how constraints interact in order to generate the correct output forms found within the domain of application of each process). The analysis is couched within the frameworks of Prosodic Phonology and Optimality Theory (PP-OT), as delineated in Chapter 2.

[1] Portions of this chapter have previously appeared in the *MIT Working Papers in Linguistics* (Cardoso 2000a), in the *Southwest Journal of Linguistics* (Cardoso 1999c), and have been presented at Going Romance XI (Cardoso 1997).

Chapter 3 is composed of two main sections, each of which is dedicated to the analysis of a domain-sensitive phenomenon in Picard: while section 3.1 focuses on the analysis of Across-Word Regressive Assimilation, section 3.2 is directed at the investigation of Vocalic Hiatus Resolution.

Section 3.1 is composed of four subsections: in 3.1.1, I provide the data that demonstrate the significance of a domain analysis for the investigation of the AWRA phenomenon, grounded in current assumptions about the prosodization of function words (e.g. Selkirk 1986, 1997, van der Leeuw 1997) and within the framework of Optimality Theory. In section 3.1.2, I present my proposal for the prosodization of the morphosyntactic elements involved in AWRA. Along the lines of Selkirk (1997), I argue that the function words involved in the AWRA process prosodize as unstressed syllables, daughters to Phonological Phrases and sisters to Prosodic Words (contra the Clitic Group proposed by Nespor and Vogel 1986 and Hayes 1989). It is in this precise configuration that I argue AWRA takes place. In section 3.1.3, I provide an analysis for the segmental aspects of AWRA within the domain-specific constraint approach, introduced in Chapter 2. Finally, in 3.1.4, I provide an overview of AWRA-like phenomena crosslinguistically, which will serve to reinforce the hypothesis that some languages use phonological cues to signal the special status of clitics (e.g. via certain types of assimilation) and, most importantly, to differentiate this class of words from other morphosyntactic constituents such as affixes and roots in the same language.

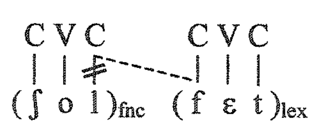
In section 3.2, I provide an OT analysis for the resolution of Vocalic Hiatus contexts in Picard; more specifically, the investigation will focus on the prosodization of the morphosyntactic elements involved in Semivocalization, Vowel Elision and

Heterosyllabification, as well as on the segmental aspects of these three strategies. Section 3.2 is divided into three main subsections: in section 3.2.1, I introduce the relevant data upon which I will base my analysis. In section 3.2.2, within the approach developed for the analysis of AWRA, I will provide the prosodic domains of application for Semivocalization, Vowel Elision and Heterosyllabification. Finally, in section 3.2.3, I will present an analysis for the segmental aspects of the processes involved in the resolution of Vocalic Hiatus in Picard.

3.1. Across-Word Regressive Assimilation

Across-Word Regressive Assimilation (AWRA henceforth) is a domain-sensitive phonological process of Vimeu Picard that operates exclusively at the domain juncture of a (CV)l shape clitic (*fnc* in (1)), followed by a consonant-initial lexical word (*lex*). When both phonological and morphosyntactic contexts are met, the root node of the lexical word's initial consonant associates to the timing slot of the preceding clitic-final /l/, resulting in a geminate across the two words:[2]

(1) The AWRA process



→ [ʃof fɛt] 'the/this party'

[2] The representation in (1), in particular the CV tier and the rule formalism, is used for illustrative purposes only. Consistent with Chapter 2, I will dispense with the CV tier in favor of prosodic constituents in section 3.1.2.

In the following section, I will illustrate the domain specificity of AWRA and, consequently, I will provide evidence of the need for an approach that takes into consideration domains in the analysis of phonological phenomena.

3.1.1. The data

The relevant data upon which my study is based are reviewed in this section. Here, I will provide evidence that AWRA is sensitive to prosodic domains inasmuch as the scope of the process is limited to a specific prosodic configuration. As I have illustrated in (1) above, AWRA operates at the domain juncture of a (CV)l shape clitic (l-clitic henceforth) followed by a consonant-initial lexical word.

In (2), (3) and (4), I demonstrate that the application of AWRA is sensitive to the prosodic domains in which the constituents involved prosodize, as well as to the melodic properties of the following segment (i.e. consonant vs. vowel). Observe in (2a) through (2f) that the clitic-final /l/ completely assimilates to the following onset when the proclitic (which is by definition unstressed) is followed by a consonant-initial lexical word, regardless of its grammatical status (i.e. Noun, Adjective, etc.).[3]

---

[3] I will refer to these (CV)l-items as clitics or prosodic clitics because of the manner in which they are licensed in the phonology of Picard. Unlike prefixes, which are licensed by a Recursive Prosodic Word (Cohn and McCarthy 1994, Peperkamp 1997, van der Leeuw 1997; see also section 3.2.2.3), l-clitics are licensed directly by the Phonological Phrase (Berendsen 1986, Peperkamp 1997; see forthcoming section 3.1.2), a typical example of a free clitic in Selkirk's (1997) view. For a comprehensive analysis of the prosodization of function words and, more specifically, the prosodization of clitics and prefixes, see Selkirk (1997), and sections 3.1.2 and 3.2.2.3 respectively on Picard.

From a morphosyntactic perspective, Zwicky and Pullum (1983) provide a set of criteria to determine whether certain bound morphemes are clitics or affixes. From these criteria, four tests assign the l-final words under consideration the status of clitics, while one test assigns the status of affixes to the pronouns /al/ and /l/.

(2) AWRA contexts (Vasseur 1963, Debrie 1981 and field notes of Auger and my own)

a. Determiner /ʃol/

/ʃol rẽdʒi/	→	[ʃor rẽdʒi]	'the/this row'
/ʃol vak/	→	[ʃov vak]	'the/this cow'
/ʃol pjøt tab/	→	[ʃop pjøt tab]	'the/this small table'
/ʃol jø/	→	[ʃoj jø]	'the/this water'
/ʃol glɛn/	→	[ʃog glɛn]	'the/this chicken'

b. Partitive and Preposition /dol/

/dol grɛs/	→	[dog grɛs]	'some fat'
/dol bibin/	→	[dob bibin]	'some brandy'
/dol bɔn vjan/	→	[dob bɔn vjan]	'some good meat'
/dol sup/	→	[dos sup]	'some soup'
/dol vjan/	→	[dov vjan]	'some meat'

c. Preposition /al/

/al fɛt/	→	[af fɛt]	'at the party'
/al kaʃ/	→	[ak kaʃ]	'at the hunting'
/al mem plaʃ/	→	[am mem plaʃ]	'in the same place'
/al seri/	→	[as seri]	'at the evening party'
/al pɛk/	→	[ap pɛk]	'at the fishing'

d. Pronoun /al/[4]

/al dɑ̃s/	→	[ad dɑ̃s]	'she dances'
/al va/	→	[av va]	'she goes / is going'
/k al dizwo/	→	[k ad dizwo]	'that she said'
/k al sɛ̃t/	→	[k as sɛ̃t]	'that she feels'
/al kur/	→	[ak kur]	'she runs'

[4] Unlike the other clitics illustrated in (2), a consonant-initial clitic may intervene between /al/ and the following lexical word (e.g. /al m fzwø/ 'she made me'). The domain-based analysis that I will provide in section 3.1.2 predicts that in these cases, Picard will opt for /l/-preservation, since from a *morphosyntactic* perspective, the domain juncture required for AWRA to operate is not present (cf. data in (4)). I will show in Chapter 4, however, that AWRA is variable within this morphosyntactic context: while /l/-preservation is still the most likely outcome of /al/ + C-initial clitics + lexical word sequences (66%), as predicted by my analysis, AWRA and /l/-deletion can also be observed within this context (19% and 15% respectively). This issue will be discussed in the context of variation in AWRA, in Chapter 4.

e. Determiner /l/ [5]			
/l fis/	→	[e**f** fis]	'the son'
/tu l mɔn/	→	[tu **m** mɔn]	'everybody'
/l vrɛ/	→	[e**v** vrɛ]	'the real'
/ɔn a l tɛ̃/	→	[ɔn a **t** tɛ̃]	'we have the time'
/erɔ̃ l drwø/	→	[erɔ̃ **d** drwø]	'will have the right'
f. Object Pronoun /l/			
/i l pɔrt/	→	[i **p** pɔrt]	'he brings it'
/va l vir/	→	[va **v** vir]	'is going to see it'
/l dir/	→	[e**d** dir]	'say it'
/pur l savwer/	→	[pur e**s** savwer]	'to know it'
/pur l mɛt/	→	[pur e**m** mɛt]	'to put it on'

Nevertheless, AWRA does not apply in phonological and morphosyntactic contexts distinct from the ones illustrated in (2). Observe below that /l/-faithfulness (or inapplicability of AWRA) is the result if the following lexical word is vowel-initial, as in (3), or when the relevant sequence of consonants occurs in monomorphemic words, in prefixation, in compounding and in other higher syntactic configurations; see (4a-d).

[5] I am assuming here Steele and Auger's (1999) and Auger's (2001ab) view that the proclitics in (2e) and (2f) are underlyingly monosegmental in Picard: /l/. According to the authors, the vowel [e] that sometimes appears in the output forms in (2e-f) is epenthesized to allow for the syllabification of otherwise illicit strings. To illustrate epenthesis more generally, in the cluster /rdv/ in /sasir dvɑ̃/ → [sasir edvɑ̃] 'sit in front of', [e] is inserted to allow the unsyllabifiable cluster to surface. The formalization of epenthesis in Picard is beyond the scope of the investigation and will not be addressed in this study.

(3) Inapplicability of AWRA (phonological environment)[6]

Following vowel-initial word			
/ʃol armwɛr/	→	[ʃl armwɛr]	'the closet'
/dol arb/	→	[dl arb]	'the tree'
/al e/	→	[al e]	'she is'

(4) Inapplicability of AWRA (morphosyntactic environments)

a. Monomorphemic word				
/kalfa/	→	[kalfa]	*[kaffa]	'caulker'
/belʒik/	→	[belʒik]	*[beʒʒik]	'Belgium'
/elvyr/	→	[elvyr]	*[evvyr]	'yeast'

b. Prefixation[7]				
/malpoli/	→	[malpoli]	*[mappoli]	'impolite'
/maltretø/	→	[maltretø]	*[maltretø]	'to maltreat'
/malʃãs/	→	[malʃãs]	*[maʃʃãs]	'bad luck'

c. Compounding				
/bryl dʒœl/	→	[bryldʒœl]	*[brydʒdʒœl]	'pipe with short tube'
/bel mer/	→	[belmer]	*[bemmer]	'mother-in-law'
/bel fiij/	→	[belfij]	*[beffij]	'daughter-in-law'
/bel sœr/	→	[belsœr]	*[bessœr]	'sister-in-law'

d. Other domains				
/enmwezel sã/	→	[enmwezel sã]	*[enmwezes sã]	'young lady without'
/bel de bel/	→	[bel de bel]	*[bed de bel]	'(the) very last match'
/bel tab/	→	[bel tab]	*[bet tab]	'beautiful table'
/sjel pur/	→	[sjel pur]	*[sjep pur]	'sky for'

[6] Observe that the vowel in /ʃol/ and /dol/ is deleted when these forms are followed by a vowel-initial lexical word. Leininger (1998) proposes that this vowel/zero alternation is motivated by the highly ranked constraints INTEG-DET (the prosodic structure of the determiner must correspond with its morphological structure), which requires that the entire clitic be in one syllable rather than split across two syllables, and ONSET (syllables have onsets). Her analysis, however, focuses exclusively on the clitics /ʃol/ and /dol/ and therefore predicts incorrect results when other clitics are involved. For instance, in the case of the pronoun /al/, Leininger's analysis wrongly predicts that the clitic-final /l/ will syllabify as a coda and not as the onset of the following vowel-initial word, e.g. /al e/ → *[al.e], ✓[a.le] 'she is'. The issue of vowel deletion in /ʃol/ and /dol/ is beyond the scope of this research and will be left aside for further investigation.

[7] 'mal-' is the only l-final prefix provided by Vasseur (1963, 1996).

Based on the aforementioned facts, I conclude that an analysis that recognizes an interaction between the phonological and morphosyntactic components is necessary for a comprehensive investigation of the AWRA process in Picard: an account that does not refer to prosodic domains predicts the illicit forms in (4). In the forthcoming sections, I will provide an analysis to establish the domain of AWRA application within an integrated version of the frameworks of Prosodic Phonology and Optimality Theory, and subsequently propose an account for the segmental aspects of the phenomenon.

3.1.2. The domain of AWRA: the prosodization of proclitics

To analyze the domain-sensitive process of AWRA illustrated in the previous section, I adopt Selkirk's (1978a et seq.) and Nespor and Vogel's (1986) framework of Prosodic Phonology, which holds that syntactic information is only accessed indirectly by the phonology, via the Prosodic Hierarchy shown in (5).[8] As discussed in Chapter 2, domain-sensitive phonological phenomena may refer to entire constituents within the Prosodic Hierarchy, to the edges of constituents, or to the juncture between two constituents.

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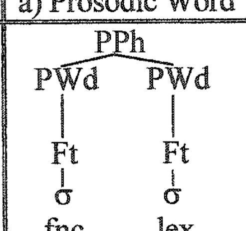
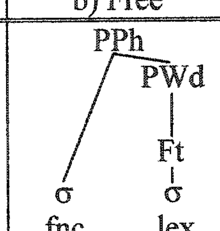
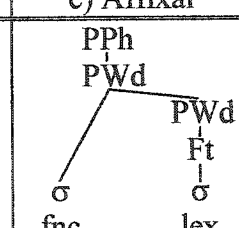
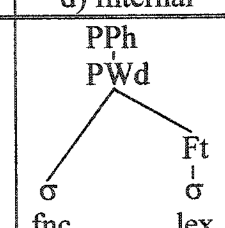
[8] This is a simplified version of the prosodic hierarchy, in which only the relevant constituents up to the Phonological Phrase are shown (see Chapter 2 for the complete hierarchy). Also, observe that I do not include the controversial Clitic Group as a prosodic constituent (see Chapter 2 where the exclusion of this domain from the prosodic hierarchy is discussed).

(5) The Prosodic Hierarchy (Selkirk 1978a)

Phonological Phrase (PPh)
|
Prosodic Word (PWd)
|
Foot (Ft)
|
Syllable (σ)

I will now demonstrate how the interaction of constraints on prosodic domination in the grammar of Picard yields the optimal prosodic structure for the constituents involved in the AWRA process. Following Selkirk (1997), I assume that function words may appear in a variety of prosodic configurations, determined by the interaction of various well-motivated constraints on prosodic structure. According to the author, non-lexical words may be prosodically licensed as *prosodic words*, *free clitics*, or as *affixal* or *internal* to the Prosodic Word, as I illustrate in Table 1. Following Casali (1996) and Selkirk (1997), I assume that *lex* designates a free root or stem coextensive with a lexical category (e.g. Noun, Verb, etc.), excluding all other non-lexical categories (represented here as *fnc*) such as pronouns, determiners, etc. With regard to PWd-internal contexts, for convenience, I treat all roots as lexical and all affixes as non-lexical or *fnc*.

(6) Table 1: Prosodic forms for {Fnc + Lex} sequences

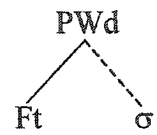
Fnc Status	a) Prosodic Word	b) Free	c) Affixal	d) Internal
Prosodic Form				

In Table 1, (a) illustrates the prosodization of a function word bearing the status of a *prosodic word*, which is then sister to another Prosodic Word. The representation in (b) assigns the function word the status of *free clitic* in relation to the Prosodic Word: it is sister to a Prosodic Word and daughter to a Phonological Phrase. (c) depicts the function word bearing the status of an *affixal fnc*; it is adjoined to a recursive Prosodic Word and thus has the relation of both sister and daughter to a Prosodic Word. Finally, (d) illustrates the function word as *internal* to a Prosodic Word, constituting a single Prosodic Word with the following lexical word. In section 3.2, I will show that the configurations in (b), (c) and (d) are all relevant for the grammar of Picard because they delimit the application of certain phonological processes in the language: while (b) serves as the locus for Vowel Elision as well as AWRA, (c) delimits one of the domains in which the Heterosyllabification of vowels is allowed, and (d) represents the mirror image of the domain within which suffixes prosodize (i.e. the Prosodic Word) in order to constitute the domain of Semivocalization, i.e. the Foot.

Observe that of all the structures above, only (a) does not violate the Strict Layer Hypothesis (see (11) in Chapter 2). In order to allow for the prosodic configurations in (b) through (d) to be selected as optimal in different morphosyntactic contexts, I adopt Selkirk's (1997) proposal for the decomposition of the Strict Layer Hypothesis into independent constraints, two of which are repeated from Chapter 2 in (7) below (the dashed lines in the examples highlight the elements involved in the violation).

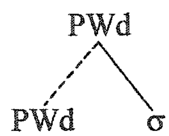
(7) Constraints on Prosodic Domination

a. **Exhaustivity** (ExhC): No C^i immediately dominates a constituent C^j, $j < i-1$

E.g. 

incurs a violation of Exhaustivity

b. **NonRecursivity** (*RecC): No C^i dominates C^j, $j = i$.

E.g. 

incurs a violation of NonRecursivity

I will now demonstrate how the domain of AWRA is established by providing the prosodization of the elements involved in procliticization. In order to account for procliticization, another family of constraints is necessary besides the constraints on prosodic domination illustrated in (7) above: constraints on the alignment of edges of constituents, formalized by McCarthy and Prince (1993ab) as Generalized Alignment (see discussion in Chapter 2).

The Prosodic Word alignment constraint, originally proposed by McCarthy and Prince (1993a) but with direct precedents in Selkirk (1984b) and Nespor and Vogel (1986), expresses the notion that each Prosodic Word must contain a free root (lex) by default, and ensures that the left and/or right edge of every Prosodic Word coincide with the left and/or right edge of some lexical word.

(8) The Prosodic Word Alignment Constraint (AlignPWd)

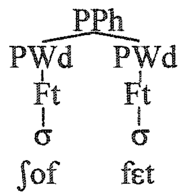
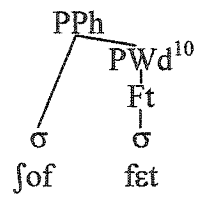
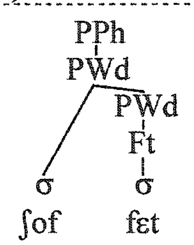
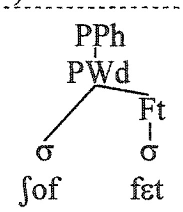
(i) Align (PWd, L; Lex, L)
(ii) Align (PWd, R; Lex, R)

The adoption of AlignPWd is directly implicated in my rejection of the Clitic Group as a prosodic constituent. Following from (8), I assume, along the lines of Selkirk (1997), that the prosodization of morphosyntactic *fnc* can only be defined in terms of a sisterhood or domination relation with the Prosodic Word, as discussed earlier in this section. The prosodization of non-lexical words, therefore, must be driven by an additional mechanism, which requires all segmental material to be part of prosodic constituency.[9]

In view of the facts and constraints discussed, I propose a ranking in which AlignPWd is ranked above the remaining constraints. A tableau illustrating how the optimal prosodic structure is selected for the input {clitic word} appears in (9).

[9] Under Optimality Theory, non-lexical words (*fnc*) must be licensed by a prosodic constituent by the constraint PARSE (see esp. Kenstowicz 1995 and Peperkamp 1997), which requires that all segmental material be licensed by an (immediate) dominant constituent in the prosodic hierarchy (the Foot in this case). Because of their unstressed status, clitics cannot constitute feet. In addition, they cannot form Prosodic Words (due to the constraints AlignPWd and undominated Headedness). As will be shown shortly, proclitics can only be licensed by the Phonological Phrase in Picard (see Berendsen 1986 for a similar analysis for proclitics across languages).

(9) Tableau 1 - Prosodization of clitic plus word sequences (procliticization)

	{ Clitic Word }	AlignPWd	*RecC	ExhC
	(a) fnc = PWd 	*!*		
☞	(b) fnc = free[10] 			**
	(c) fnc = affixal 	*!	*	*
	(d) fnc = internal 	*!		*

[10] As was shown in the data set in (2), AWRA is also applicable in the context of following CV words; e.g. [ʃoj.jø] 'the water'. Considering that CV and longer words behave identically with respect to AWRA, it is clear that the former constitute Prosodic Words (by AlignLex; see forthcoming (53)) and consequently Feet in Picard (by Headedness; see Chapter 2); e.g. $(ʃoj)_{\sigma}$ ($(jø)_{Ft}$ $)_{PWd}$. However, note that the resulting structure violates FtBIN (a constraint that requires feet to be binary; see forthcoming section 3.2.2.1). Based on the fact that AWRA has the same effect on these CV words as on longer words (see (9b)), we must assume that *fnc* does not prosodize internal to the Prosodic Word is these cases to satisfy FtBIN, i.e. *($(ʃoj.jø)_{Ft}$ $)_{PWd}$. Instead, FtBIN is not highly ranked in Picard.

Candidate (a) is the equivalent of Nespor and Vogel's (1986) analysis for the Clitic Group (replaced by PPh here), in which the prosodic representation rigorously obeys the Strict Layer Hypothesis. Such a prosodization for l-clitics, however, constitutes two violations of the highly ranked AlignPWd constraint due to the right and left alignment of the Prosodic Word with both edges of the function word; in addition, it does not reflect the natural stress pattern for proclitics in Picard: in normal utterance, the clitic does not receive stress as it would in the representation in (a). Candidate (b) is the optimal structure: it only violates the lowly ranked Exhaustivity constraint and captures the fact that the l-clitic is unstressed and therefore must not constitute a Foot.[11] In more traditional frameworks, this representation violates the Strict Layer Hypothesis and is usually accounted for by Stray Syllable Adjunction (Hayes 1980), Phonological Phrase Incorporation (Berendsen 1986) or Weak Layering (Itô and Mester 1992). Candidate (c) illustrates the l-clitic as affixal to a Prosodic Word. The representation, however, has not been selected among the competing forms because it also violates the highly ranked AlignPWd constraint. As I will discuss below, this is the correct representation for prefixation in Picard. Finally, candidate (d) shows the proclitic as internal to a Prosodic Word, which similarly leads to a fatal violation of AlignPWd. Such a representation for proclitics incorrectly predicts that clitic plus word sequences display phonological

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[11] The analysis that I present for clitics as syllables licensed by a higher constituent in the prosodic hierarchy is in agreement with van der Leeuw's (1997) position that clitics constitute a set of items with the specification "σ", which expresses the maximal prosodic structure of clitics. A similar pre-OT view is proposed by Berendsen (1986) for whom phonological clitics are recognized as inherently unstressed monosyllabic morphemes, which are marked "as not to undergo the lexical foot and phonological word construction rules". In this way, his analysis regards cliticization as the adjunction of floating (because they are not licensed by a Prosodic Word) clitic-syllables to the Phonological Phrase, by Phonological Phrase Incorporation.

behavior identical to that of a Prosodic Word consisting of a single *lex*. In section 3.2, I will show that this is not the case in Picard.

I now provide evidence that the rejected structures in Tableau 1 are incorrect for representing the prosodization of proclitics in Picard. Note that candidate (a), which depicts the function and lexical words as forming two independent Prosodic Words, cannot form the domain of AWRA application. The examples in (10), which show *lex* elements prosodized in a similar manner as in (9a), demonstrate that the first l-final lexical word in a PWd-PWd sequence does not undergo assimilation.

(10) Lexical word plus lexical word sequences (cf. candidate (9a))

a. Compounds[12]

(bryl)$_{PWd}$ (dʒœl)$_{PWd}$	→	[bryldʒœl]	*[brydʒdʒœl]	'pipe with short tube'
(bel)$_{PWd}$ (mer)$_{PWd}$	→	[belmer]	*[bemmer]	'mother-in-law'

b. Other morphosyntactic contexts

(bel)$_{PWd}$ (mezɔ̃)$_{PWd}$	→	[bel mezɔ̃]	*[…mm…]	'beautiful house'
(ʒurnal)$_{PWd}$ (matinal)$_{PWd}$	→	[ʒurnal matinal]	*[…mm…]	'morning paper'

Furthermore, AWRA does not apply within the Prosodic Word, either in sequences of a prefix followed by a *lex* (11) (i.e. $((\sigma)(\text{PWd}))_{PWd}$), or between two syllables in a monomorphemic word (12) (i.e. $((\sigma)(\sigma))_{PWd}$). Thus, candidates (9c) and (9d) do not correspond to the domain of AWRA:

[12] The prosodization of the morphosyntactic constituents involved in compounding will be discussed in forthcoming section 3.2.2.3.

(11) Prefixation (cf. candidate (9c))

$((\text{mal})_{\sigma}\,(\text{poli})_{PWd})_{PWd}$	→	[malpoli]	*[mappoli]	'impolite'
$((\text{mal})_{\sigma}\,(\text{prɔp})_{PWd})_{PWd}$	→	[malprɔp]	*[mapprɔp]	'dirty'

(12) Monomorphemic words (cf. candidate (9d))

$((\text{bel})_{\sigma}\,(\text{ʒik})_{\sigma})_{PWd}$	→	[belʒik]	*[beʒʒik]	'Belgium'
$((\text{kal})_{\sigma}\,(\text{fa})_{\sigma})_{PWd}$	→	[kalfa]	*[kaffa]	'caulker'

Only the structure in candidate (b) captures the prosodic limitations of the AWRA process: it applies at the domain juncture of a footless syllable and the following Prosodic Word, within the constituent Phonological Phrase, as seen in (13). Inasmuch as clitics behave neither completely like independent words nor completely like prefixes in Picard, it is expected that they will prosodize distinctly from prefixes, compounding stems and other types of non-clitic words.

(13) Procliticization and AWRA (candidate (9b))

$((\text{dol})_{\sigma}\,(\text{grɛs})_{PWd})_{PPh}$	→	[dog grɛs]	'some fat'
$((\text{ʃol})_{\sigma}\,(\text{fɛt})_{PWd})_{PPh}$	→	[ʃof fɛt]	'the party'

This behavior observed with clitics in Picard conforms to a variety of studies that demonstrate that clitics behave in a peculiar way with respect to phonological processes. As Zwicky (1977:1) points out, clitics are "morphemes that present analytic difficulty because they are neither clearly independent words nor clearly affixes" (see also note 11). Due to their hybrid nature, the hypothesis that there exist restrictions that are exclusively pertinent to this category of words is not surprising (see forthcoming section 3.1.4, where it will be shown that Picard is not alone as concerns the assimilation behavior of proclitics).

The next section will address the segmental aspects of AWRA in light of the discussion above.

3.1.3. Segmental Aspects of Across-Word Regressive Assimilation

To extend the investigation of AWRA to the segmental level, I utilize the following constraints in my analysis:

(14) Constraint definitions

FAITH-Lex	The output of a lexical word must be faithful to its input (Casali 1997, Beckman 1998)
MAX-IO	(No Deletion) Every segment of S_1 (input) has a correspondent in S_2 (output) (McCarthy and Prince 1995)
Linearity	S_1 reflects the precedence structure of S_2, and vice versa (McCarthy and Prince 1995)
NoCoda-Rt	A Coda cannot license a Root node (cf. Prince and Smolensky 1993)

The constraint FAITH-Lex, which should be interpreted as a cover term for a set of constraints on correspondent elements (e.g. MAX-Lex, DEP-Lex, IDENT-Lex, Linearity-Lex), expresses the cross-linguistic tendency for preservation of information contained in lexical words rather than in function words. It was proposed by Casali (1997) and Pulleyblank (1997) (under 'Faith-Stem'), although implicit in McCarthy and Prince (1995) under the Root-Affix Faithfulness Metaconstraint: Root-Faith >> Affix-

Faith.[13] Originally, the notion that certain prominent positions maintain contrasts goes back to Trubetzkoy (1939), and has recently been discussed in the works of Steriade (1995), Casali (1996) and Beckman (1998), among others. In the context of AWRA, FAITH-Lex predicts the directionality of AWRA, and thus prevents cases of *progressive* assimilation (e.g. /ʃol kurɛ/ → *[ʃol lurɛ] vs. ✓[ʃok kurɛ] 'the pork paté').[14]

As discussed in Chapter 2, MAX-IO is a constraint that militates against deletion and is violated in cases in which the clitic-final /l/ is deleted from the output.

The Linearity constraint rules out candidates in which the sequence of input segments is reversed or otherwise not obeyed in the surface representation. In cases of regressive assimilation, the precedence relation of S_1 /l-k/ is not reflected in S_2 [k-k]: /l/ precedes /k/ in S_1 but the correspondent of /l/ does not precede the correspondent of /k/ in the output. This is illustrated below (where the linking lines express input-output relations, not association lines).[15]

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[13] Note that, despite its reference to a morphological constituent (i.e. Lex), FAITH-Lex should not be interpreted as a domain-specific constraint of the types introduced in Chapter 2. What FAITH-Lex expresses is in essence a semantic contrast: while languages are more likely to preserve segmental and featural material within content words (i.e. words that encode greater semantic content), they are less likely to do so in function words (i.e. words that serve to indicate a grammatical function). This observation was expressed in Casali (1997) by the constraint MAXCONTENT, which was later subsumed under the more general constraint FAITH-Lex.

[14] I should add that AWRA also results from the non-existence of a constraint requiring function words to be identical to their inputs, e.g. FAITH-Fnc. If such a constraint exists, however, data from Picard suggest that it must be ranked lower in the language's hierarchy.

[15] There are at least four other constraints that rule out the assimilation process illustrated in (15): (1) No Resyllabification (Kiparsky 1993, Reynolds 1994): no resyllabification across words; (2) CrispEdge (Itô and Mester 1999): multiple linking across prosodic categories is prohibited; (3) NoSPREAD$_{S1\text{-}S2}$ (McCarthy 1997, Keer 1999); and finally, (4) NoLINK (Selkirk 1984b, Urbanczyk 1999): linked structures are not allowed. I am aware that these alternatives could yield different empirical effects. For the Picard data under investigation, however, these options can be interpreted as notational variants of each other, since the adoption of any of these four constraints would present the same results, i.e. a constraint violation for the AWRA candidate.

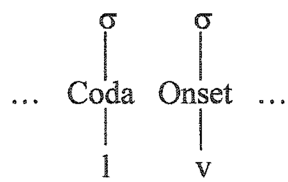
(15) S_1: ʃ o l k u r ɛ   / ʃol kurɛ /

S_2: ʃ o k u r ɛ   [ʃok kurɛ]

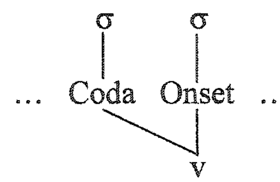
Finally, the NoCoda-Rt constraint is part of a family of constraints that captures the cross-linguistic observation on syllabic well-formedness that coda segments are marked. As originally proposed by Prince and Smolensky (1993) (i.e. Syllables do not have Codas), the general version of the constraint is inadequate to account for the range of behavior that coda consonants display cross-linguistically, since languages impose different types of restrictions on codas (in OT, see McCarthy and Prince 1993b, Benua 1995, Lombardi 1995, Kawasaki 1998, among others). Observe that NoCoda-Rt is formulated in terms of licensing; consequently, a syllable final consonant can only surface without incurring a violation of this constraint if all of its features are linked to and therefore licensed by a following onset (cf. Piggott 2001). In languages in which NoCoda-Rt is highly ranked, the only codas permitted will be geminates. This is exactly the behavior observed in some dialects of Inuit (e.g. Kalaallisut and Labrador – Bobaljik 1996). In Picard, NoCoda-Rt rules out forms in which the clitic-final coda /l/ bears and therefore licenses its own Root node, e.g. /ʃol vak/ → *[ʃol vak].[16] In cases of assimilation (AWRA), however, NoCoda-Rt is not violated because the assimilated coda's segmental content (i.e. Root node) is licensed by the onset of the following word, e.g. /ʃol vak/ → [ʃov vak]. This is shown in the representations below, using standard Onset-Rhyme theory (segments stand for Root nodes).

[16] See Chapter (4) for a variable analysis of AWRA in which it will be shown that the ungrammatical form *[ʃol vak] may sometimes surface in Picard, depending on a variety of linguistic and extralinguistic factors.

(16) a. Violation of NoCoda-Rt



b. Satisfaction of NoCoda-Rt



The segmental aspects of AWRA can be accounted for straightforwardly if we assume a constraint hierarchy in which Linearity is dominated by FAITH-Lex, MAX-IO and NoCoda-Rt, as I illustrate in the tableau below that selects AWRA as the optimal form:

(17) Tableau 2: AWRA without domain specification (preliminary ranking)

	/ʃol kurɛ/	FAITH-Lex	NoCoda-Rt	MAX-IO	Linearity
	(a) ʃol.kurɛ		*!		
	(b) ʃo.kurɛ			*!	
	(c) ʃol.lurɛ	*!			*
☞	(d) ʃok.kurɛ				*

The ranking in (17), however, cannot be maintained because it wrongly predicts that AWRA will operate across the board, e.g. internal to the Prosodic Word, as shown below (recall from Chapter 2 that ☠ indicates a wrongly selected candidate while ☹ indicates the correct form, incorrectly discarded):

(18) Tableau 3: An incorrect ranking for domain PWd

	/mal poli/	FAITH-Lex	NoCoda-Rt	MAX-IO	Linearity
☹	(a) mal . po . li		*!		
	(b) ma . po . li			*!	
☠	(c) map . po . li				*

As may have been noticed from the data in section 3.1.1, the constraints relevant for AWRA do not have the same effect in prosodic domains distinct from the one established for the process. NoCoda-Rt, for instance, cannot be highly ranked internal to the Prosodic Word, since Picard allows forms that violate this constraint to appear unrestrictedly within this domain. Some relevant data are reproduced below for convenience.

(19) The effect of NoCoda-Rt within the PWd domain in Picard

a. Monomorphemic words

$(\text{bel.ʒik})_{PWd}$	$*(\text{beʒ.ʒik})_{PWd}$	'Belgium'
$(\text{kal.fa})_{PWd}$	$*(\text{kaf.fa})_{PWd}$	'caulker'

b. Prefixation

$(\text{mal.po.li})_{PWd}$	$*(\text{map.po.li})_{PWd}$	'impolite'
$(\text{mal.ʃãs})_{PWd}$	$*(\text{maʃ.ʃãs})_{PWd}$	'bad luck'

As discussed earlier, only at the domain juncture of an unstressed syllable and the following Prosodic Word, within the Phonological Phrase, does the NoCoda-Rt constraint become relevant. For convenience, I will henceforth refer to this domain juncture as ϕ.

To account for such cases of domain-driven alternations, I adopt the domain-specific constraint approach, introduced in Chapter 2. According to this approach, the constraints responsible for AWRA, more specifically NoCoda-Rt, should be decomposed into their domain-specific counterparts (e.g. NoCoda-Rt_{σ}, NoCoda-Rt_{PWd}, NoCoda-Rt_{ϕ}, etc.), each bearing an independent status in the language's grammar. In the case of AWRA, the relevant domain is the juncture ϕ and the constraint that refers specifically to this domain will be labeled with a subscripted ϕ, indicating that the constraint is exclusively operative at ϕ. Recall from Chapter 2 that, for convenience, the constraints that lack a domain specification will not be labeled for a domain; it should be understood, however, that they operate throughout the entire Phonological Utterance (i.e. as if they were domain-specified for U).

The tableau below illustrates the hierarchy that accounts for the AWRA process and demonstrates how the ranking of NoCoda-Rt and Linearity below the other three constraints yields the correct output for Picard.

(20) Tableau 4: AWRA with domain specification[17]

	/ʃol kurɛ/	FAITH-Lex	NoCoda-Rt$_\phi$	MAX-IO	Linearity	NoCoda-Rt
	(a) ʃol.kurɛ		*!			*
	(b) ʃo.kurɛ			*!		
	(c) ʃol.lurɛ	*!			*	
☞	(d) ʃok.kurɛ				*	

Candidates (a), (b), and (c) each violate a highly ranked constraint in the grammar of Picard, and are therefore ruled out as optimal forms: candidate (a) violates NoCoda-Rt$_\phi$ due to the illicit licensing of the coda consonant /l/ at the domain juncture ϕ; candidate (b) violates MAX-IO since input /l/ is deleted in the surface form; and candidate (c) violates FAITH-Lex because it depicts a form in which a segment in a lexical word has been affected by assimilation, triggering, thus, change in the directionality of the process.

[17] Notwithstanding its position at the higher end of the hierarchy for AWRA in (20), the constraint FAITH-Lex is not undominated in Picard. In section 3.2, for instance, I will show that FAITH-Lex must be violated in order to yield Semivocalization as a strategy to resolve vocalic hiatus contexts (see section 3.2.3).

Only candidate (d) correctly illustrates the optimal output found in Picard, even though it violates the lowly ranked constraint Linearity.

For completeness, observe that the same ranking established above (with a further reranking of Linearity above NoCoda-Rt) captures both the applicability and inapplicability of AWRA across different domains in Picard: while the process applies at ϕ, it fails to apply within the domain immediately dominated by the Prosodic Word, for instance, because the effect of NoCoda-Rt$_\phi$ is irrelevant within this domain:

(21) Tableau 5: Inapplicability of AWRA in other domains (final ranking)

	/mal poli/	FAITH-Lex	NoCoda-Rt$_\phi$	MAX-IO	Linearity	NoCoda-Rt
☞	(a) mal.po.li					*
	(b) ma.po.li			*!		
	(c) map.po.li				*!	

In this section, I have provided an analysis for the domain-sensitive process of Across-Word Regressive Assimilation in Picard, which exclusively applies within the Phonological Phrase, at the domain juncture of an unstressed syllable and the following Prosodic Word (i.e. domain juncture ϕ). In order to account for the segmental aspects of the phenomenon in light of its restricted scope of application, I have proposed an analysis in which constraints are decomposable into their domain-specific counterparts. More specifically, I have shown how the interaction of independently ranked domain-specific constraints interact with other more general constraints in order to account for the domain-driven alternations inherent to the AWRA phenomenon.

3.1.4. Is AWRA telling us something?

A crosslinguistic overview of AWRA-like phenomena

In the previous sections, it was shown that Across-Word Regressive Assimilation in Picard is a phenomenon that is sensitive to procliticization, i.e. it applies exclusively at the domain juncture of an unstressed syllable and the following Prosodic Word, within the Phonological Phrase. In this section, I will show that Picard is not alone with regard to the behavior of consonant-final proclitics; for instance, similar phenomena take place in Sudanese Arabic, Cypriot Greek and South Glamorgan Welsh.[18] Is it merely coincidental that some languages opt for AWRA-like behavior in sequences of proclitics and their hosts, or is AWRA a cue that certain languages utilize to signal the prosodic constituency of clitics as being neither word-internal nor separate words? Along the lines of Kaye (1989) and Goad and Brannen (2000), I will argue for the latter here.

For illustrative purposes, I will use the term "Across-Word Regressive Assimilation" or its acronym "AWRA" as a cover term to describe any type of regressive assimilation that resembles the one observed in Picard. I will start with Sudanese Arabic (Hamid 1984) (see also Classical Arabic and other dialects of Arabic; e.g. Brame 1970). In this language, AWRA applies in exactly the same morphosyntactic context in which the phenomenon applies in Picard, i.e. in proclitic plus lexical word sequences (see (22)), while it fails to apply in other morphosyntactic configurations (see (23)). The only

[18] AWRA-like phenomena can also be observed in several other languages; e.g. in some dialects of Gascon Occitan (Claus Pusch – personal communication; see also Kelly 1973, Hualde 1992), other dialects of Arabic (Lameen Souag – personal communication; see also Brame 1972), in some dialects of Breton (Johannes Heinecke – personal communication). These languages were not included in the discussion because of insufficient data.

distinction between the two languages is that, in Sudanese Arabic, assimilation targets only the class of coronals.[19]

(22) AWRA in procliticization in Sudanese Arabic

a. The definite article /ʔal/ 'the'

/ʔal ʃamis/	→	[ʔaʃ ʃamis]	'the sun'
/ʔal tamur/	→	[ʔat tamur]	'the dates'
/ʔal zaman/	→	[ʔaz zaman]	'the time'
/ʔal raadʒil/	→	[ʔar raadʒil]	'the man'
/ʔal nimir/	→	[ʔan nimir]	'the tiger'

b. The relative pronoun /ʔal/ 'that'

/ʔal daras/	→	[ʔad daras]	'that he studied'
/ʔal nisa/	→	[ʔan nisa]	'that he forgot'
/ʔal dʒara/	→	[ʔadʒ dʒara]	'that he ran'

(23) Inapplicability of AWRA in other contexts in Sudanese Arabic

a. Word-internally: prefixation

/jal-zam/	→	[jalzam]	*[zz]	'to be necessary'
/jal-dag/	→	[jaldag]	*[dd]	'to sting'
/jal-sig/	→	[jalsig]	*[ss]	'to paste'

b. In higher morphosyntactic contexts

/jamal tawiil/	→	[jamal tawiil]	*[tt]	'a tall camel'
/ʔakil naas/	→	[ʔakil naas]	*[nn]	'food of people'

[19] For example:

(i) Non-coronal following consonant

/ʔal gamar /	→	[ʔal gamar]	*[gg]	'the moon'
/ʔal malik /	→	[ʔal malik]	*[mm]	'the king'

Lameen Souag (personal communication) pointed out that in some North African dialects of Arabic, the assimilation process can also be extended to some non-coronals such as in the example /ʔal qarniit/ → [ʔaq qarniit] 'the able'. She admits, however, that this appears to be exceptional.

Similarly, Cypriot Greek provides a process of regressive assimilation analogous to the ones found in Picard and Sudanese Arabic. In the context of a following lexical word, the final /n/ of the clitics /ton/, /tin/ 'the' and /en/ (negation) is assimilated by the following lexical word's non-plosive onset. In morphosyntactic contexts distinct from the one represented by procliticization (e.g. word-internal or across other types of words), the process is inoperative (data provided by Amalia Arvaniti – personal communication, and Arvaniti 2002).[20]

(24) AWRA in procliticization in Cypriot Greek

a. The definite articles /ton/ and /tin/ 'the'

/ton filon/	→	[tof filon]	'the friend-ACC'
/ton laon/	→	[tol laon]	'the hare-ACC'
/tin mera/	→	[tim mera]	'the day-ACC'

b. The negation particle /en/

/en θelo/	→	[eθ θelo]	'NEG-(I) want'
/en ðio/	→	[eð ðio]	'NEG-(I) give'
/en θapais/	→	[eθ θapais]	'NEG-Fut-(you) go'

(25) Inapplicability of AWRA in other contexts in Cypriot Greek

a. Word internally

/θailanði/	→	[θailanði]	'Thailand'
/kinðinu/	→	[cinðinu]	'emergency'

[20] In cases of a following plosive consonant, place (regressive) and voice (progressive) assimilation take place. Arvaniti notes, however, that in the latter case, the phenomenon is not restricted only to proclitics:

(i) Place (regressive) and Voice (progressive) Assimilation: plosives

/ton papan /	→	[tom bapan]	'the daddy – ACC.'
/ton tixo /	→	[ton dixo]	'the wall – ACC.'
/en kapnizo /	→	[eŋ gapnizo]	'NEG – (I)smoke'

b. In higher morphosyntactic contexts

/exun simbliroθi/	→	[exun simbliroθi]	'(they) have been completed'
/otan fiɣo/	→	[otan fiɣo]	'when (I) finish'

Finally, the phonology of South Glamorgan Welsh illustrates a variant of the AWRA-like processes discussed above in the form of "Nasal Mutation" (data from Thomas 1984, and Johannes Heinecke – personal communication). The process applies within the morphosyntactic domain of procliticization and involves the coalescence of the clitic-final /n/ and the host's onset, resulting in the preservation of the clitic's nasality and the place of articulation of the following consonant. Observe in (26) and (27) below that Nasal Mutation applies to the /n/-final homophonous proclitics /ən/ 'in' and /ən/ 'my, me', but it fails to operate in other morphosyntactic contexts.[21]

(26) Nasal Mutation in procliticization in South Glamorgan Welsh

a. The preposition /ən/ 'in'[22]

/**ən p**ɛmbɔnt/	→	[ə**m**embənt]	'in Bridgend'
/ə**n**/ /**k**/aernarfon	→	[ə**ŋ**]aernarfon	'in Caernarfon'
/ə**n**/ /**m**/wllheli	→	[ə**m**] wllheli	'in Pwllheli'

b. The pronoun /ən/ 'my, me'

/ə**n k**o:v/	→	[ə**ŋ**o:v]	'my memory'
/ə**n d**ala/	→	[ə**n**ala]	'catching me'
/ə**n k**ɛ:θ/	→	[ə**ŋ**ɛ:θ]	'my cat'

[21] I am unable to provide examples that show that Nasal Mutation is inapplicable word-internally; hence, this generalization is exclusively based on Thomas' (1984:220) observation that "[Nasal Mutation] may be triggered by only two syntactic environments: following the S1 pronoun [ən] 'my' and the homophonic preposition [ən] 'in'".

[22] Because the two sources represent their data in different ways, the data provided in (26) are not uniformly transcribed.

(27) Inapplicability of Nasal Mutation in other contexts in Glamorgan Welsh

/deθɔn nω/	→	[deθɔn nω]	'came they'
/klaðin ɬan/	→	[klaðin ɬan]	'buried in Llan'
/gesɔn ðɪʃglɪd/	→	[gesɔn ðɪʃglɪd]	'(we) had a cup'

Although Glamorgan Welsh displays a typical pattern encountered in word-internal NC clusters across languages (e.g. Pater 1996, 1999), what is worthy of note in this dialect of Welsh is that the phenomenon exclusively applies within the domain of a proclitic and the following word. In Picard, Sudanese Arabic and Cypriot Greek, on the other hand, the assimilation process is not only restricted to procliticization, similar to Welsh, but it is also less characteristic of what is usually observed in coda-onset clusters crosslinguistically.

The presence of AWRA-like processes in these languages supports the view that there is something inherently unique to cliticization. For instance, note that while the four languages above impose certain restrictions on the domain represented by a clitic and the following word, they are not as restrictive in other morphosyntactic domains (e.g. word-internally, across words). In procliticization, Picard, Sudanese Arabic, Cypriot Greek and South Glamorgan Welsh all have in common the application of an AWRA-like assimilation process. Going back to Zwicky's (1977) assertion that clitics present analytic difficulty because of their hybrid nature (i.e. sometimes they behave like affixes, sometimes like words; see section 3.1.2), it is conceivable that, because of their ambiguous status, AWRA serves to signal that proclitics are neither prefixes nor independent words in the phonology of these languages.

Furthermore, because proclitics prosodize neither as PWd-internal elements nor as independent Prosodic Words, AWRA behavior serves to bind these morphosyntactic units to their hosts in an attempt to signal Phonological Phrase constituency of a σ-PWd juncture and, most importantly, to indicate that edges of different morphosyntactic constituents (e.g. a clitic and the following word) are present in the concatenation of a function word with the following lexical word (see Goad and Brannen 2000 for a discussion of cues to prosodic constituency at the edge of words).

Whether this observation can be extended to a greater variety of languages remains to be investigated. My hope is that further research will be able to support the idea that there is a principled reason why AWRA-like behavior is observed across languages.

3.2. The Resolution of Vocalic Hiatus

In addition to the AWRA process discussed in the previous section, the phonology of Picard reveals a number of other domain-sensitive phonological phenomena. In this section, I will present an account for the resolution of Vocalic Hiatus in Picard, as the language exhibits a series of strategies to syllabify illicit adjacent vowels: Semivocalization, Vowel Elision and Heterosyllabification. More specifically, my analysis will concentrate on hiatus contexts in which the first vowel is high (i.e. /i/, /u/ or /y/).

As is the case for AWRA, the surfacing of VV sequences in Picard is determined by the interaction of segmental and prosodic domain factors. In addition, the deletion or non-deletion of a vowel in some cases can be determined by a semantic criterion (i.e. whether the loss of the illicit vowel would constitute loss of meaning).

Section 3.2 is divided into three main sections: in section 3.2.1, I will introduce the relevant data upon which I will base my investigation. In section 3.2.2, I will provide the domains of application for the different strategies that Picard utilizes in the resolution of Vocalic Hiatus: Semivocalization, Vowel Elision, and the non-application of these processes, Heterosyllabification. Finally, in section 3.2.3, I will present an analysis for the segmental aspects of the distinct phenomena involved in Vocalic Hiatus Resolution.

3.2.1. The data

For expository reasons, the data set for this investigation is divided into three cases: the first case deals with situations in which the first vowel in an underlying VV sequence surfaces as a glide – Semivocalization. The second case consists of data in which the result of the concatenation of two vowels is the deletion of the first vowel (Vowel Elision), or exceptional Semivocalization in particular cases. Finally, case three involves instances in which Heterosyllabification is the outcome.

3.2.1.1. Case 1: Semivocalization[23]

Semivocalization (SV) is a process in Picard by which a high vowel (/i, u, y/) becomes its corresponding semivowel (i.e. /i/ → [j]; /u/ → [w]; and /y/ → [ɥ]) in the context of a following vowel. The phenomenon is illustrated in column B below.[24]

(28) Semivocalization

A			B	
[ka.pi.'tɛn]	'captain'		[ka.'pjø]	'hat'
[ka.'u]	'male cat'	Compare with	[ka.'wɛ̃]	'hooting-cat'
[fry.'tjø]	'fruit' (Adj.)		['frɥi]	'fruit' (Noun)

When the first vowel of the underlying string is not high, the result is heterosyllabification of the two vowels, even if the morphosyntactic contexts are appropriate for Semivocalization. This is shown in (29) (where G represents a hypothetical glide for the [-high] vowel).

(29) Inapplicability of Semivocalization

/dølaɛ/	→	[dø.la.'ɛ]	*[dø.'lGɛ]	'a proper name'
/mau/	→	[ma.'u]	*['mGu]	'a deceitful person'
/noel/	→	[no.'el]	*['nGel]	'Christmas'

[23] The process of Semivocalization as a repair strategy for vocalic hiatus contexts can also be found in French. For a comprehensive analysis of the phenomenon in French, see Dell (1973), Johnson (1987), Hannahs (1995) and Noske (1996), among others.

[24] Note that the forms in (28B) are not synchronically derived from those in (28A) (and vice versa): all words in (28) are currently monomorphemic in Picard. I use these historically derived forms because of the impossibility of obtaining data that convincingly show the glide-vowel alternation within a monomorphemic word. I am aware that in Optimality Theory, the assumption that the glides in (28B) are underlyingly vowels goes against the "learning strategy" of lexicon optimization (cf. a principle of grammar; see McCarthy 2002), according to which the underlying representation for a given morpheme must be the one that gives the most harmonic mapping (Prince and Smolensky 1993, McCarthy 2002).

In addition to the segmental restrictions mentioned above, Semivocalization is only operative within the morphosyntactic contexts of a monomorphemic word or in suffixation, as illustrated in (30a) and (30b) respectively:

(30) Applicability of Semivocalization

a. Monomorphemic words

[ka.'pjø] 'hat'		[ka.pi.'tɛ̃n] 'captain', [ka.pi.'tal] 'capital'
['frɥi] 'fruit (Noun)'[25]	Compare with	[fry.'tjø] 'fruit (Adj.)'
[kɔ̃.'dɥi] 'conduit, pipe'		[kɔ̃.dyk.'tœr] 'conductor, horse driver'

b. Suffixation

['ʒɥø] 'to play'		['ʒy] 'game'
[ʒe.'zɥit] 'deceitful man'		[ʒe.'zy] 'Jesus'
[a.pre.'sjab] 'appreciable'	Compare with	[a.pre.si.'ra] 'will appreciate'
[a.'mjab] 'amiable'		[a.'mi] 'friend'
[ser.ti.'fjø] 'to certify'		[ser.ti.fi.'ka] 'certificate'

Conversely, SV does not apply in prefixation, in compounding, in procliticization and in higher morphosyntactic contexts:

[25] In the context of obstruent plus liquid clusters (e.g. /fr-/, /kl-/), Picard only allows SV if the vowel involved in the process is either /u/ or /y/ (see (i)). If the hiatus involves /i/, the result is the copying of the vowel, which will thus surface in a multiple correspondence relation being both the nucleus of a syllable and the onset of the following syllable, as shown in (ii) (data from Steele and Auger 1999 and my own):

(i) Semivocalization (involving /u/ and /y/)

[plwe.jɔ̃]	'flexible branch'
[plɥi]	'rain'

(ii) Copying (involving /i/)

[kli.jɑ̃]	*[kljɑ̃]	'customer'
[pri.jø]	*[prjø]	'to pray'

The subject requires further investigation and will not be addressed in this study.

(31) Inapplicability of Semivocalization

a. Prefixation:	/mi avri/	→	[mi.a.'vri]	*[mja. 'vri] 'mid-April'
b. Procliticization:	/ty em/	→	['tem]	*['tɥem] 'you love'
c. Compounding:	/ty om/	→	[ty.'om]	*['tɥom] 'hard work'
d. Other Contexts:	/vny avø/	→	[vny.a.vø.'flip]	*[vnɥa.vø…] 'came with Philippe'

Another important aspect of Semivocalization is that the process applies exclusively at the right edge of the word, within the domain of the last two syllables of monomorphemic and polymorphemic words – a domain that coincides with stress assignment in Picard, as can be seen in (30).[26]

To summarize, for Semivocalization to apply in a vocalic hiatus environment, the following restrictions must be obeyed: (1) the first vowel in the hiatus must be high; (2) the morphosyntactic context must be that of a monomorphemic or suffixed word; and (3) the relevant vowels must be at the right edge of the word (or internal to the Foot, as I will show later). If these conditions are not simultaneously met, Picard opts for alternative resolutions for the syllabification of the illicit vowels: Vowel Elision (as shown in (31b) above), or the syllabification of the two vowels in distinct syllables (as shown in (31a)

[26] Due to the absence of prefixation involving $V_{[+high]}$-final prefixes followed by vowel-initial monosyllabic stems in the Picard corpus, I am unable to definitively conclude that prefixes prosodize differently from suffixes, as I imply here. Based on crosslinguistic observation, I accept the well-established view that, in the unmarked case, prefixes prosodize as unstressed syllables linked to recursive Prosodic Words (e.g. Cohn and McCarthy 1994, Peperkamp 1994, 1997, van der Leeuw 1997; see also (6c) and forthcoming section 3.2.2.3), in contrast to suffixes, which usually prosodize internal to Prosodic Words (e.g. Nespor and Vogel 1986, Peperkamp 1997; see also section 3.2.2.1).

In addition, my study lacks examples of vowel-glide alternations involving the first syllable of polysyllabic monomorphemic words (e.g. /CuVCVCV/ → *[CwV.CV.CV]). These examples would confirm my claim that the applicability of SV is strictly reserved for the last two syllables of words. Note, however, that the glide plus vowel sequences [wV], [jV] and [ɥV] do occur in Picard in polysyllabic monomorphemic words (e.g. [kwe.ʃõ.'nɛ] 'brood of pigs'). Considering the learning strategy of lexicon optimization (see previous note 24), these glide plus vowel sequences must be underlyingly diphthongs (see also Auger and Steele for a similar view), which consequently have not been affected by Semivocalization.

and (31c-d) above). The resolution of vocalic hiatus via Vowel Elision (or exceptional Semivocalization) will be illustrated in the following section.

3.2.1.2. Case 2: Vowel Elision and exceptional Semivocalization

... one and one don't make two; one and one make one.
~ Pete Townsend

The data under Case 2 involve vocalic hiatus contexts in which the concatenation of the relevant vowels results in the deletion or, exceptionally, in the semivocalization of the first vowel of the hiatus. In the examples in (32) below, I illustrate cases in which Vowel Elision (VE) takes place in the context of a vowel-final clitic and the following lexical word.[27]

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[27] In this investigation, I do not include the masculine third person subject pronoun /i/ or /il/ because its underlying form cannot be clearly determined: the proclitic always surfaces as [i] before consonants (e.g. [**i kɑ̃t**] 'he sings') and as [il] before vowels (e.g. [**il etwø**] 'he was'). Leaving aside the complementary distribution of this proclitic and focusing on two Picard processes that apply to monosegmental vowel-final proclitics (i.e. exceptional Semivocalization) and to l-final proclitics (i.e. AWRA; see section 3.1), we are still unable to resolve the problem: if /i/ is considered the underlying representation for this subject pronoun, one would expect exceptional Semivocalization, as the data in (33A) show. If, on the other hand, we assume that its input is the l-final form /il/, one would expect AWRA to apply, according to the analysis proposed in section 3.1. Note, however, that the observed output is neither exceptional Semivocalization (e.g. /i etwø/ → *[je.twø], ✓[**il etwø**]) nor AWRA (e.g. /il kɑ̃t/ → *[**ik kɑ̃t**], ✓[**il kɑ̃t**]). The issue requires further investigation and will not be addressed in this study.

The pronoun /ty/ is, thus, the only $V_{[high]}$-final proclitic in Picard that may precede a vowel-initial lexical word, with which it will constitute the domain juncture ϕ (see the discussion of this domain in the context of AWRA in section 3.1, and in the context of Vowel Elision in section 3.2.2.2). Considering that only one morphosyntactic element is involved in Vowel Elision, there are two possible directions for the analysis of the phenomenon in Picard: (1) to assume that Vowel Elision is an idiosyncrasy of the proclitic /ty/; or (2) to account for the phenomenon as a direct consequence of the domain in which the high vowel appears. Based on the AWRA process, which operates at the same domain juncture ϕ, I view Vowel Elision as a domain-sensitive phenomenon, similar to AWRA and the other domain-sensitive strategies involved in the resolution of vocalic hiatus in Picard.

(32) Vowel Elision in procliticization

/ty ariv/	→	[ta.riv] 'you arrive'		[ty.li di] 'you tell him'
/ty apresi/	→	[ta.presi] 'you appreciate'		[ty.fini] 'you finish'
/ty ekri/	→	[te.kri] 'you write'	Compare with	[ty.kãtwø] 'you sang'
/ty em/	→	[tem] 'you love'		[ty.ʒug] 'you frisk'
/ty aʒut/	→	[ta.ʒut] 'you add'		[ty.sra] 'you will be'

Surprisingly, within the same morphosyntactic context of procliticization, the monosegmental clitic /i/ 'him, her, it (dative)' does not undergo Vowel Elision. Instead, the first vowel of the hiatus, the one that belongs to the clitic or function word, is elided in the output in order to repair the illicit VV sequence, as shown in (33A).[28]

(33) Exceptional Semivocalization in procliticization

		A		B
/ʒ **i** ẽvwerɛ/	→	[ʒ**j**ẽ.vwerɛ] 'I will send him'	Compare with	[d **i**.dir] 'to tell him'
/va **i** aportø/	→	[va.**j**aportø] 'will bring him'		[mjy **i**.donø] 'better give him'
/ʒ **i** esplik/	→	[ʒ**j**es.plik] 'I explain to him'		[ʒ **i**.dirɛ] 'I will tell him'
/al **i** ekri/	→	[a.l**j**e.kri] 'she writes him'		[i.**li**.mɛt] 'he puts him'

In sum, for Vowel Elision to occur within the morphosyntactic context of procliticization, it is necessary that both the segmental and morphosyntactic contexts be met: the phenomenon applies to the clitic's vowel when it is followed by a vowel-initial lexical word. In the context of monosegmental clitics, however, Picard opts for the

[28] According to Vasseur (1963:380), /i/ is pronounced as [j] before a vowel as in (33A), and as [i] (33B) or [li] before a consonant (e.g. [ʒ **li** dirɛ] 'I will tell him'; cf. [ʒ **i** dirɛ]). Interestingly, what determines the appearance of [i] or [li] does not seem to be driven by phonology, since the two forms are observed in exactly the same segmental environments (i.e. before a consonant, in which context "*i* s'emploi concurrement avec *li*").

preservation of the clitic via the semivocalization of the first vowel, even when the segmental and morphosyntactic contexts are appropriate for Vowel Elision.

3.2.1.3. Case 3: Heterosyllabification

Under Case 3, I illustrate data in which the two relevant vowels surface in separate syllables – i.e. Heterosyllabification (HS). Observe below that in prefixation, in compounding and in higher morphosyntactic contexts, even when the segmental contexts for Semivocalization and Vowel Elision are present, Picard opts for the syllabification of the two vowels in distinct syllables.

(34) Heterosyllabification in Vocalic Hiatus contexts

a. In Prefixation

/mi avri/	→	[**mi**.**a**.vri]	'mid-April'
/bi anɥel/	→	[**bi**.**a**.nɥel]	'bi-annual'
/mi oktob/	→	[**mi**.**ok**.tob]	'mid-October'
/smi otomatik/	→	[**smi**.**o**.to.ma.tik]	'semi-automatic'

b. In Compounding

/ty om/	→	[**ty**.**om**]	'hard work'
/tisy epɔ̃ʒ/	→	[ti.**sy**.**e**.pɔ̃ʒ]	'sponge-cloth'
/sezi are/	→	[se.**zi**.**a**.re]	'garnishment'

c. In higher morphosyntactic contexts

/vny avø nu/	→	[**vny**.**a**.vø.nu]	'come with us'
/avø nu i sa degɔ̃flɛ/	→	[avø.**nu**.**i**.sa.de.gɔ̃.flɛ]	'with us, he broke his promise'
/ʒezy i lø di/	→	[ʒe.**zy**.**i**.lø.di]	'Jesus (he) told them'
/kote dli a ʃol perʃri/	→	[…**dli**.**a**.ʃop.per.ʃri]	'next to him, at the drilling-machine'

In sum, what determines the outcome of the concatenation of two vowels in Picard is a combination of both segmental and prosodic criteria (see section 3.2.2 for the latter). From a segmental perspective, a hiatus avoidance strategy will apply whenever a high vowel is followed by another vowel. Nevertheless, what determines which strategy will be adopted depends (almost) exclusively on the domain in which the relevant vowels are present: if the two vowels occur within a monomorphemic or a suffixed word, at the right edge of the word (i.e. the last two syllables), the resolution will be Semivocalization; if, however, the vocalic hiatus occurs within the domain defined by a clitic and the following lexical word, Picard will select either V_1 Elision or Semivocalization (in the case of monosegmental clitics) as repair strategies. In other morphosyntactic contexts (e.g. prefixation, compounding and higher domains), Heterosyllabification of the two vowels involved is the outcome. In (35), I summarize the different resolutions that Picard employs to syllabify VV sequences.

(35) Summary Of Vocalic Hiatus Resolutions in Picard

		Vocalic Hiatus Resolution		
CONTEXTS		SV	VE	HS
1. Monomorphemic & Suffixed Words (Right Edge)		✓		
2. Procliticization	$V_{1\text{(in a polysegmental clitic)}} + V$		✓	
	$V_{1\text{(in a monosegmental clitic)}} + V$	✓		
3. Prefixation				✓
4. Compounding				✓
5. Higher Morphosyntactic Contexts				✓

3.2.2. The Domains of Semivocalization, Vowel Elision and Heterosyllabification

In this section, I will provide an analysis to determine the prosodic domains into which the relevant morphosyntactic constituents involved in vocalic hiatus prosodize in Picard. In section 3.2.2.1, I will consider the prosodization of the morphosyntactic constituents involved in Semivocalization, i.e. monomorphemic and suffixed words. In section 3.2.2.2, I will briefly review the domain of procliticization in the context of Vowel Elision and exceptional SV (as discussed in section 3.1, AWRA applies within the same domain argued for Vowel Elision). Finally, in section 3.2.2.3, I will provide an analysis for the prosodization of the constituents involved in Heterosyllabification, i.e. prefix plus stem sequences and compounding stems.

3.2.2.1. The domain of Semivocalization:
The prosodization of monomorphemic and suffixed words

Two step formula for handling stress:
1. Don't sweat the small stuff.
2. Remember that it's all small stuff.
~ Anthony Robbins

I have shown in section 3.2.1 that Semivocalization exclusively applies within the morphosyntactic domain of monomorphemic lexical words (e.g. [ka.pjø] 'hat') and in suffixation (e.g. /ami + ab/ → [a.mjab] 'amiable'), at the right edge of the word. In this section, I will provide the prosodization of these morphosyntactic elements in order to define the domain in which SV operates.

For the prosodization of monomorphemic lexical words, it is standard in the phonology literature to assign this type of constituent the status of a Prosodic Word (e.g.

Nespor and Vogel 1986, McCarthy and Prince 1993ab, Peperkamp 1997). Recall from the discussion involving the domain of AWRA that this is the prosodic representation that I argued holds for post-clitic lexical words (i.e. the proclitic's host). From a phonological perspective, the Prosodic Word status that monomorphemic words assume crosslinguistically can be explained by the fact that these words bear stress, and are therefore footed in the phonology of (all) languages. By obeying the Constraints on Prosodic Domination, and more specifically the constraints Headedness and Layeredness (see discussion in Chapter 2), the correct results are obtained: the monomorphemic (lexical) word must be assigned the status of a Prosodic Word.

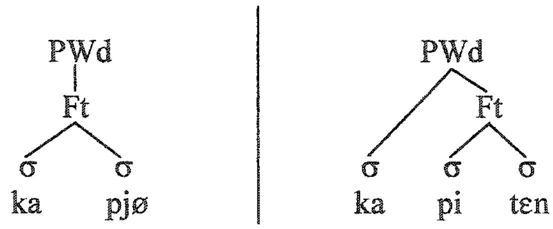
In the theory of Generalized Alignment, this observation can be captured by the alignment constraint AlignMWd/PWd (e.g. Deevy 1995, Peperkamp 1995) discussed informally in Chapter 2, which guarantees that every Morphological Word will be assigned the status of a Prosodic Word:

(36) The Morphological Word Alignment Constraint (AlignMWd/PWd)

(i) Align (MWd, L; PWd, L)
(ii) Align (MWd, R; PWd, R)

According to this well-motivated constraint, the left and right edges of every Morphological Word must be aligned with the left and right edges of a Prosodic Word. Alternatively, every word must form a Prosodic Word in order to satisfy AlignMWd/PWd. For illustrative purposes, I include below the prosodic configuration of monomorphemic words (such as the ones in (28)), in which the AlignMWd/PWd constraint has been obeyed.

(37) The prosodic representation of monomorphemic words



The prosodization of suffixed words in Picard can be established via the adoption of a set of alignment constraints based on both crosslinguistic observation and language-specific phenomena. It has been proposed that, crosslinguistically, these affixes prefer to attach to roots and consequently they prosodize internal to the Prosodic Word (e.g. Nespor and Vogel 1986, Bullock 1995, Peperkamp 1997). In order to capture this observation, I adopt a constraint that requires the abutment of the left edge of an affix (i.e. a suffix) with the right edge of a root. As proposed by McCarthy and Prince (1993b) and Bullock (1995), the AlignSuf constraint straightforwardly captures the observation that suffixes generally attach to the right edge of roots, as opposed to prefixes, which attach to the left edge of stems.[29]

(38) The Suffix Alignment Constraint (AlignSuf)
Align (Affix, L; Root, R)

I will now provide data that will illustrate how stress shift in Picard supports the notion that suffixes prosodize as internal to the Morphological Word (and consequently the Prosodic Word). In Picard, suffixation affects the location of the Foot when new

[29] I am assuming the standard view that prefixes attach to stems rather than to roots (e.g. Bullock 1995, Hannahs 1995, Zuraw 2000). This reflects the prosodic structure that I will argue holds for prefix plus lexical word sequences in Picard (see section 3.2.2.3).

material (i.e. a suffix) is added to the right edge of the word. Observe in the data set below, for instance, that stress is always word-final in monomorphemic words and in prefixation. In cases involving prefixation, note that stress is preserved on the rightmost syllable, i.e. this word-formation process does not affect stress placement in the word.

(39) Stress assignment in Picard: Word-final

a. Monomorphemic words

[os.'to]	'prison'
[per.'tʃe]	'vegetable garden'
[kra.vẽ.'ʃõ]	'(wild) plum'

b. Prefixation

['prɔp] 'clean'		[mal.'prɔp] 'dirty'
['mɛ] 'place (3rd ps)'	Compare with	[er.'mɛ] 'replace (3rd ps)'
[ø.'rø] 'happy'		[ma.lø.'rø] 'unhappy'

The effects obtained in suffixation, on the other hand, differ from those illustrated above. In order to obey the restriction that Picard imposes on stress to be word-final, stress in monomorphemic words is shifted rightwards in derived forms, as illustrated below.

(40) Stress assignment in suffixation: Word-final

Monomorphemic Words		Derived Words
['ʒnu] 'knee'		[ʒnu.'jer] 'patch (for knee area)'
[me.'zõ] 'house'		[me.zo.'nɛt] 'small, cute house'
[di.'gɔ̃] 'talkative person'	Compare with	[di.gɔ.'ɲø] 'talkative'
[ʃã.'byk] 'bump (3rd ps.)'		[ʃã.by.'kri] 'action of bumping'
['brik] 'brick'		[brik.'tri] 'brickyard'

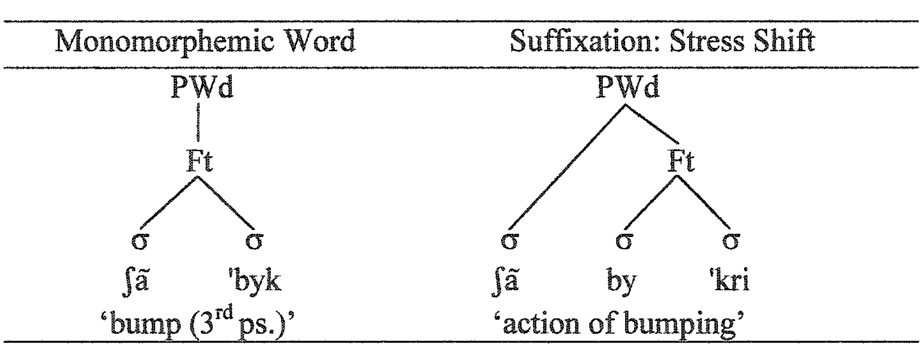
To capture the observation that word stress in Picard is consistently word-final, I adopt the alignment constraint AlignMWd/Ft, proposed by Bullock 1995 and adopted in her analysis of stress placement in French.

(41) The MWd-to-Foot Alignment Constraint (AlignMWd/Ft)

Align (MWd, R; Foot, R)

According to AlignMWd/Ft, the right edge of every morphological word must coincide with the right edge of some Foot. As this constraint is highly ranked (and probably undominated) in Picard, it ensures that the Foot will always be located at the right edge of the word in this language. In combination with a constraint on Foot shape (i.e. FtFORM(Iamb) – see forthcoming (44)), it also ensures that the word will end in a right headed Foot, i.e. $(\sigma\ \acute{\sigma})_{Ft}$, as shown in the data in (40). In addition, AlignMWd/Ft (in conjunction with AlignSuf in (38)) captures the behavior found in suffixation, in which the addition of an affix triggers a shift in stress.

(42)



As regards Semivocalization, it seems clear by now that its domain of application should be located somewhere higher than the Syllable, and somewhere below the

Prosodic Word. Clearly, the domain of SV must be higher than the Syllable because the phenomenon does not merely apply to any VV sequence (e.g. the procliticization /ty apresi/ → *[tɥa.presi], ✓[ty.apresi] 'you appreciate'). Also, we cannot assume that Semivocalization applies within the Prosodic Word domain, since the phenomenon is inapplicable in prefixation, whose constituents (i.e. a prefix and the following stem) constitute a single Prosodic Word in Picard (e.g. $((\text{mi})_{\sigma}\ (\text{a.vri})_{\text{PWd}})_{\text{PWd}}$ 'mid-April').[30] In sum, SV must apply within the Foot domain, according to the prosodic hierarchy illustrated in (5).

It is beyond the scope of this study to undertake a systematic investigation of the Foot system of Picard, but because my analysis requires reference to this prosodic domain, I provide here a brief introduction to the Foot in the language. Based on Auger and Steele (1999), discussions with Julie Auger (personal communication), and my own observations, stress assignment and Foot form in Picard are similar to that of French, a closely related Gallo-Romance language (see Chapter 1). Accordingly, the selection of the shape of the Foot for Picard will be motivated in part by arguments made for the French Foot.

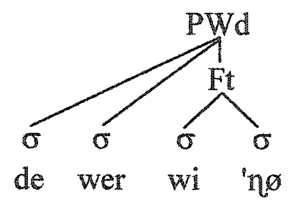
To capture the fact that (1) stress is consistently assigned to the rightmost syllable of words, and that (2) words are maximally assigned one prominent syllable, I assume that the Foot in Picard is a non-iterative iamb (i.e. right-headed), and it is assigned to the rightmost edge of the word (by AlignMWd/Ft). Assuming that feet are maximally binary

---

[30] Recall from the discussion of AWRA in section 3.1.2 that prefixes prosodize in a domain lower than the Phonological Phrase in contrast to clitics. In this context, and according to Selkirk's (1997) view on the prosodization of function words (see (6c-d)), prefixes must prosodize inside the Prosodic Word. See section 3.2.2.3 for more on the prosodization of prefixes.

(see forthcoming discussions), all stray syllables are directly linked to the Prosodic Word, as I illustrate below.

(43) Foot Form in Picard: iamb



'to disjoin'

From an OT perspective, the iambic Foot structure for Picard shown above can be accounted for through the interaction of four constraints: (1) AlignMWd/Ft, discussed in (41), which establishes the location of the Foot (i.e. at the right edge of the word); two constraints on Foot form: (2) one that requires feet to be binary (FtBIN) (Prince 1985, Hayes 1985, 1995, Prince and Smolensky 1993);[31] and (3) one that requires feet to be iambic (FtFORM(Iamb) (McCarthy and Prince 1993a). Finally, (4) I also adopt the constraint PARSE-σ (Prince and Smolensky 1993, McCarthy 2002), a more specific version of Exhaustivity (see section 3.1.2), which demands that every syllable belong to some Foot. The latter three are defined in (44). Note that, in order to satisfy the higher ranked FtBIN, PARSE-σ will almost always have to be violated in Picard, as illustrated in (43).

[31] Recall from the analysis of AWRA in section 3.1.2 that the Foot in Picard can be sub-minimal and thus violate FtBIN.

(44) Constraints on Foot structure in Picard

FtBIN	Feet are binary
FtFORM(Iamb):	Feet are iambic (i.e. right-headed)
PARSE-σ	Syllables are parsed by a Foot

I will now provide support for my argument that the Foot Form in Picard is iambic and maximally binary. I will start by reviewing two alternatives that have been proposed for languages that have a single accent per word like Picard and French: (1) unbounded feet, and (2) unary feet.

In early metrical phonology (e.g. Hayes 1980, Halle and Vergnaud 1987), it was usually maintained that languages that allow only a single accent per word constituted unbounded Foot systems. This was precisely to comply with the exhaustivity clause of the Strict Layering Hypothesis (SLH, see section 3.1.2 and Chapter 2), which requires that all syllables be licensed by the immediately dominant constituent in the Prosodic Hierarchy, i.e. the Foot. With strict compliance with the SLH, the only alternative for the licensing of the unfooted syllables in (43) above would be a structure in which all syllables are combined to form a single (unbounded) Foot, i.e. ((de.wer.wi.'ɳø)$_{Ft}$)$_{PWd}$.

An alternative to unbounded feet in keeping with an inviolable interpretation of the SLH was proposed by Selkirk (1978a), for whom each syllable constitutes a (degenerate) Foot (i.e. (de)$_{Ft}$ (wer)$_{Ft}$ (wi)$_{Ft}$ ('ɳø)$_{Ft}$).[32] There are two main shortcomings to Selkirk's unary Foot analysis: (1) the claim that both stressed and unstressed syllables are

[32] In the context of French, Selkirk claims, however, that a syllable with a schwa in its nucleus forms a left dominant (i.e. trochaic) binary Foot with the preceding syllable (e.g. (prɔ)$_{Ft}$ (tɛʒə)$_{Ft}$ ('ra)$_{Ft}$ 'will protect'), in order to delimit the domain in which E-adjustment operates (a process whereby /e/ or /ə/ becomes [ɛ]); the domain is the Foot that contains a following schwa or consonant.

assigned the same status in the phonology is not convincing when a more precise definition for the Foot is established, namely, that a Foot must contain a single strong accent (see Selkirk 1997, for instance); (2) the assumption that most feet in the language are degenerate is not very desirable when crosslinguistic data show that, in fact, languages have a preference for binary feet (see references provided in the discussion of FtBIN).

With the later weakening of the SLH, it was pointed out that unbounded and degenerate feet could easily be replaced by binary feet, thus simplifying and constraining the Foot inventory to maximally disyllabic feet (e.g. Hayes 1985, Prince 1985, 1995, McCarthy and Prince 1986, Prince and Smolensky 1993, Kager 1996a, Piggott 1996). This is reflected in the constraint FtBIN introduced in (44). Based on the discussion above and, most importantly, on the argument that exhaustive footing is no longer required in Prosodic Phonology and OT, I adopt the now standardly-held view that feet are maximally binary.

In light of the discussion above, let us now turn to Picard. For this language, I have opted for an iambic and maximally binary Foot for three main reasons:

Firstly, this is the most parsimonious of the options discussed above, since it is able to assign a binary Foot structure to all words (but see note 31), without a systematic appeal to degenerate feet in the case of vowel-final words; e.g. [de.wer.$(\text{wi.ɲø})_{\text{Ft}}$] and [kra.$(\text{vẽ.ʃõ})_{\text{Ft}}$]. Compare now these binary forms with the following degenerate Foot structures from a trochaic perspective: [de.wer.wi.$(\text{ɲø})_{\text{Ft}}$] and [kra.vẽ.$(\text{ʃõ})_{\text{Ft}}$].

Secondly, in the context of Semivocalization, the iambic analysis is able to straightforwardly account for the non-application of SV to the second vowel (V_2) of the hiatus. Considering that there are two possibilities for the surfacing of the semivowel in the VV environment (i.e. /VV/ → [GV] or /VV/ → [VG]), and that languages tend to preserve information contained in prominent positions (e.g. the head of a Foot), a right-headed Foot structure is able to account for the non-application of SV to the second vowel: being in an iambic Foot, V_2 occupies the prominent position within this constituent and thus is less likely to undergo the phonological process (e.g. ʒe.(zy.'it)$_{Ft}$ → [ʒe.'zɥit], *[ʒe.'zyjt]). In Beckman's (1998) theory of positional faithfulness, this behavior is captured by a high ranking of HEAD(FT)-FAITH, a constraint that requires strict correspondence of segments that occupy the head of a Foot (see also forthcoming note 41).

Finally, the iambic Foot Form is the one that has been most often proposed for different varieties of French (e.g. Charette 1988, 1991, Kilani-Schoch 1996, Weeda 1992, Scullen 1993, 1997, Fanselow and Féry 2000), and the one that has been motivated not only by language-specific phenomena,[33] but also by data on the acquisition of French (e.g. Archibald 1997, Paradis et al. 1997, Archibald and Carson 2000, Rose 2001). Assuming that stress assignment is similar in these two varieties of Gallo-Romance (Auger and Steele 1999, Julie Auger – personal communication), the proposal that feet in Picard are iambic can be easily maintained.

Thus far, I have supported my argument that monomorphemic words and root plus suffix sequences prosodize as Prosodic Words in Picard. I have also established the

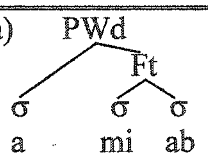
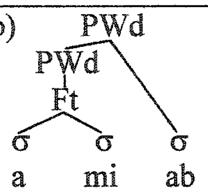
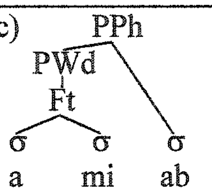
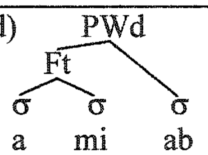
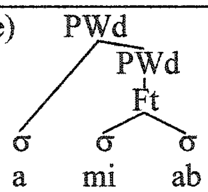
[33] For instance, in Truncation, the shortening of a polysyllabic word (e.g. /manifestasjɔ̃/ → [ma.'nif] 'manifestation') yields a Foot in French. A variant of Truncation is also found in Hypocoristic Formation (see Fanselow and Féry 2000) (e.g. /veronik/ → [ve.'ro] 'Veronique'). According to Fanselow and Féry (2000:44), these reduced forms usually correspond to the unmarked Foot form of the language, i.e. an iamb.

structure of the Foot in Picard as an iamb – the domain of Semivocalization in the language. I will now show how the interaction of the constraints discussed hitherto determines the prosodic configuration of suffixed words as Prosodic Words in Picard.

The constraint ranking provided in Tableau 6 below accounts for the prosodization of the elements found in suffixation. In the tableau, I show the competing candidates and the optimal form for the input {root + suffix} /ami+ab/ 'amiable'. Note that, aside from (c), /ami+ab/ constitutes a single stem (and consequently a single word) in all candidates in (45).[34]

[34] Due to space limitations and to avoid a proliferation of candidates for evaluation, I do not include the constraints AlignSuf, FtBIN and FtFORM(Iamb) in the tableau because no candidates that violate these constraints are provided. For the same reasons, the constraint PARSE-σ, which is violated in all representations in (45), is not included in the ranking.

(45) Tableau 6: The prosodization of suffixes

	{ Root Suffix }	AlignMWd /PWd	AlignMWd /Ft	Align PWd	ExhC	*RecC
☞	(a) 			*	*	
	(b) 		*!	*	*	*
	(c) 	*!	*		**	
	(d) 		*!	*	*	
	(e) 			**!*	*	*

According to the ranking in (45), candidate (a) is optimal and, together with candidate (e), it is the one in which the Foot surfaces at the right edge of the word in order to satisfy the highly ranked AlignMWd/Ft constraint. In candidate (a), the suffix /ab/ is prosodized as internal to the Prosodic Word and, in order to satisfy AlignMWd/Ft, it surfaces inside the Foot, in contrast to (b)-(d). By AlignMWd/PWd, the derived word prosodizes as a Prosodic Word and the Foot containing the suffix /ab/ serves as the locus for the Semivocalization process in Picard.

The structure represented by candidate (b) is similar to the one that I will argue holds for prefixation, except that the suffix /ab/, for obvious reasons, is at the opposite end of the recursive Prosodic Word. Notice, however, that candidate (b) violates the highly ranked AlignMWd/Ft constraint because the right edge of the word (the higher PWd) does not coincide with the right edge of the Foot. Candidate (c) is the mirror image of the representation that I proposed for procliticization (i.e. the domain of AWRA - see section 3.1.2). In this configuration, the suffix prosodizes external to the Prosodic Word, directly dominated by the Phonological Phrase. Unlike the other candidates in Tableau 6, (c) satisfies the requirement that the Prosodic Word be right and left aligned with a lexical word; however, it violates constraints of higher order, namely the AlignMWd/PWd and AlignMWd/Ft constraints. Candidate (d) is the mirror image of the structure of the winning candidate (a). As a result, it depicts the Foot aligned with the left edge of the word, a fatal violation of AlignMWd/Ft. Finally, the structure in candidate (e) portrays the affix /ab/ as internal to the Prosodic Word, forming a word with the root /ami/. Unlike the discarded candidates (b), (c) and (d), the resulting word [amiab] is right-aligned with a Foot, satisfying, thus, AlignMWd/Ft. Nevertheless, such a configuration loses out to candidate (a) because the lower Prosodic Word in (e) is not right and left aligned with a lexical word, a requirement of AlignPWd.

As concerns Semivocalization, note that the prosodic structure in (e) – in contrast to those in (b)-(d) – does not impede SV from applying, since the domain in which the relevant vowels occur constitutes a Foot. The structure in (e), thus, was rejected merely due to its inadequacy as a prosodic representation for suffixed words in Picard. As I will show in the forthcoming section 3.2.2.3, the representation in (e) is the one that I argue corresponds to the prosodization of the morphosyntactic elements involved in prefixation (i.e. prefix plus stem sequences).

To summarize, I have shown in this section that Semivocalization is operative within the Foot domain and only the representation in (45a) above constitutes the correct configuration for suffixed words in the language to ensure the application of the process. Accordingly, SV does not apply in prefixation (e.g. /mi avri/ → [mi.a.vri], *[mja.vri] 'mid-April'), in procliticization (e.g. /ty ariv/ → [ta.riv], *[tɥa.riv] 'you arrive'), nor between the two members of a compound (e.g. /ty om/ → [ty.om], *[tɥom] 'hard work') because, as we will see further in the forthcoming sections, the prosodic domains that these morphosyntactic constituents assume in the phonology of Picard are outside the scope of the Semivocalization process. In the following sections, I will provide an analysis for the prosodization of proclitics (section 3.2.2.2) as well as prefixes and compounding stems in Picard (section 3.2.2.3).

3.2.2.2. The domain of Vowel Elision and exceptional Semivocalization: The prosodization of proclitics

In section 3.2.1, I showed that in the context of a (high) vowel-final proclitic and a following vowel-initial word, the resolution of vocalic hiatus in Picard is either through the deletion of the first vowel (V_1), or the exceptional semivocalization of V_1 if a monosegmental clitic is involved; see (46) and (47) respectively. Nevertheless, in the prosodic contexts of the Foot and in other domains, Picard utilizes other hiatus resolutions: SV and HS respectively, as illustrated in (48).

(46) Vowel Elision in procliticization: when V_1 is in a polysegmental clitic

/ty apresi/	→	[ta.pre.si]	'you appreciate'
/ty irø/	→	[ti.rø]	'you will go'

(47) Exceptional Semivocalization in procliticization: when V_1 is in a monosegmental clitic

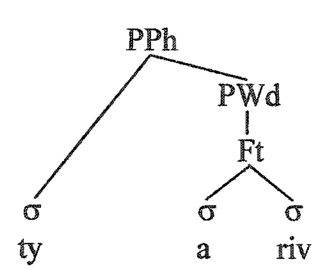
/ʒ i ẽvwerɛ/	→	[ʒjẽ.vwe.rɛ]	'I will send him'
/va i aportø/	→	[va.ja.por.tø]	'will bring him'

(48) Inapplicability of Vowel Elision in Picard

a. Within the Foot: SV	$(ʒyø)_{Ft}$	→	[ʒɥø]	*[ʒø]	'to play'
b. In other domains: HS	$(ty)_{PWd}$ $(om)_{PWd}$	→	[ty.om]	*[tom]	'hard work'

Recall from section 3.1 that the morphosyntactic domain of a clitic and the following lexical word coincides with the prosodic domain in which AWRA applies (i.e. the domain juncture of an unfooted syllable and the following Prosodic Word, within the Phonological Phrase – ϕ). For illustrative purposes, I repeat below from section 3.1.2 the prosodic configuration of proclitics and their hosts – the domain of Vowel Elision and exceptional Semivocalization:

(49) The domain of Vowel Elision and exceptional Semivocalization in Picard



→ [ta.riv] 'you arrive'

The segmental aspects of the processes illustrated in (46) and (47) as well as what determines the appearance of Vowel Elision and exceptional Semivocalization in procliticization will be addressed in section 3.2.3.2. In the following section, I will show that in the contexts of prefixation and compounding, neither Semivocalization nor Vowel Elision are possible vocalic hiatus resolutions in Picard because these morphosyntactic elements do not constitute the prosodic domains in which these processes operate: the Foot for Semivocalization, and the domain juncture σ-PWd within the Phonological Phrase for Vowel Elision.

3.2.2.3. The domain of Heterosyllabification: The prosodization of prefixes and compounds

The remaining strategy that Picard utilizes to syllabify a vocalic hiatus environment is through the heterosyllabification of the vowels involved. As shown in the data in section 3.2.1.3 (some of which are repeated below for expository reasons), whenever a high vowel is followed by another vowel in the morphosyntactic contexts of prefixation and compounding, the result is neither Semivocalization nor Vowel Elision: the relevant vowels surface in separate syllables.[35]

(50) Heterosyllabification in Picard

a. In Prefixation

/mi avri/	→	[mi.a.vri]	*[mja.vri]	*[ma.vri]	'mid-April'
/smi arid/	→	[smi.a.rid]	*[smja.rid]	*[sma.rid]	'semi-arid'

[35] Recall from (34c) that Heterosyllabification is also found in domains higher than prefixation and compounding, e.g. [ʒe.zy.i.lø.di] 'Jesus, (he) told them', [vny.a.vø.nu] 'come with us'. Since these domains are above the scope of SV and VE, I will not provide the prosodization of constituents higher than the Phonological Phrase.

b. In Compounding

/ty om/	→	[ty.om],	*[tɥom]	*[tom]	'hard work'
/tisy epɔ̃ʒ/	→	[ti.sy.e.pɔ̃ʒ]	*[ti.sɥe.pɔ̃ʒ]	*[ti.se.pɔ̃ʒ]	'sponge-cloth'

In order to delimit the prosodic domains in which HS is observed, I will now provide an analysis of the prosodization of the morphosyntactic constituents involved in Heterosyllabification, i.e. prefix plus stem sequences and compounding stems.

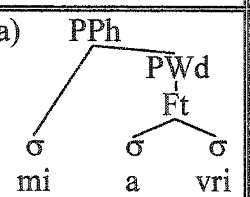
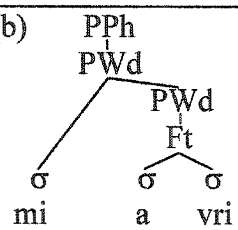
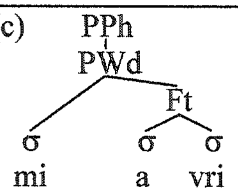
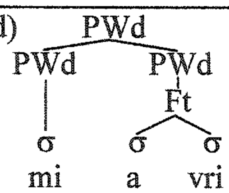
For the prosodization of prefixed words, I adopt the constraint AlignPref, proposed by McCarthy and Prince (1995) and Bullock (1995). According to AlignPref, the base to which prefixes attach is the Prosodic Word, which corresponds to the morphological constituent word in Picard (by AlignMWd/PWd). This constraint accounts for the recursive structure that is prevalently supported for prefixation crosslinguistically (e.g. Cohn and McCarthy 1994, Peperkamp 1994, 1997, van der Leeuw 1997): AlignPref demands that the right edge of each prefix coincide with the left edge of a Prosodic Word. In order to satisfy the AlignMWd/PWd constraint in (36) (i.e. Align (MWd, L; PWd, L); Align (MWd, R; PWd, R)), the word formed by the prefix and the Prosodic Word must concomitantly form a recursive Prosodic Word.

(51) The Align Prefix Constraint (AlignPref)

Align (Affix, R; PWd, L)

The same hierarchy previously proposed with the addition of the highly ranked constraint AlignPref accounts for why the prosodic structure (b) in Tableau 7 is the optimal configuration for prefix plus stem sequences in Picard. Note that, excluding candidate (a), the form [mi avri] constitutes a single stem (and consequently a morphological word) in all candidates.

(52) Tableau 7 - Prosodization of prefix plus stem sequences (prefixation)

	{ Prefix Stem }	Align Pref	Align MWd/PWd	Align MWd/Ft	Align PWd	ExhC	*RecC
	(a) 		*!			**	
☞	(b) 				*	*	*
	(c) 	*!			*	*	
	(d) 				**!*	*	**

According to the constraint ranking proposed, candidate (b) is selected among the four competing representations, as it only violates the AlignPWd constraint, lower ranked in comparison to AlignPref, AlignMWd/PWd and AlignMWd/Ft. Candidate (a), which illustrates the optimal structure for procliticization (the domain in which AWRA and Vowel Elision take place), violates the highly ranked AlignMWd/PWd because the left edge of the word [mi.a.vri] is not left-aligned with the Prosodic Word, a prerequisite for prefixation in Picard. If this were the correct configuration for prefixes, we would expect

Vowel Elision to apply, since the process is operative within this exact domain when the relevant vowels are present. Candidate (c) violates the undominated AlignPref and is therefore dismissed as the output representation of prefix plus stem sequences. Observe that the representation in (c) illustrates the mirror image of the prosodic configuration that I argued holds for suffixed words: the prefix prosodizes here as internal to the Prosodic Word. Finally, candidate (d) is discarded as the optimal form because it fatally violates the constraint AlignPWd, due to the non-alignment of the Prosodic Word constituent (i.e. the one that encompasses the prefix [mi]) with a lexical word. As I will demonstrate in the following paragraphs, it is this configuration (including a few modifications) that prosodically represents the elements involved in compounding, another domain in which Heterosyllabification is observed.

Recall from the data set in section 3.2.1 that each element in a compound constitutes a stem and consequently a word when it appears in isolation (e.g. $(\text{ty})_{\text{MWd}}$ 'kill' and $(\text{om})_{\text{MWd}}$ 'man'). By AlignMWd/PWd, each of these words must prosodize as an independent Prosodic Word (i.e. $(\text{ty})_{\text{PWd}}$ and $(\text{om})_{\text{PWd}}$). For compounding, the same rationale can be applied: each member of the compound constitutes a stem which, when combined, form a compounding word (i.e. $(\ (\text{ty})_{\text{Stem}}\ (\text{om})_{\text{Stem}}\ )_{\text{MWd}}$ 'hard work'). By a combination of AlignLex (see forthcoming (53)) and AlignMWd/PWd, the word [tyom] resulting from the concatenation of the stems [ty] and [om] forms a (recursive) Prosodic Word (i.e. $(\ (\text{ty})_{\text{PWd}}\ (\text{om})_{\text{PWd}}\ )_{\text{PWd}}$).

This proposal for the prosodization of compounds in Picard is in agreement with several analyses for this morphosyntactic constituent across languages (e.g. Inkelas 1989, Charette's 1991 analysis for French compounds, McCarthy and Prince 1993ab, Peperkamp 1997, among others). The recursive Prosodic Word structure argued to hold for compounds can be easily captured by the Lexical Word Alignment constraint (AlignLex) in (53), proposed by McCarthy and Prince (1993ab). AlignLex requires that every lexical word be both left and right aligned with a Prosodic Word, and thereby ensures that both members of the compound bear the status of Prosodic Words.[36]

(53) The Lexical Word Alignment Constraint (AlignLex)
(i) Align (Lex, L; PWd, L)
(ii) Align (Lex, R; PWd, R)

To account for the prosodization of the two (or more) members of a compound as independent Prosodic Words, dominated by a recursive Prosodic Word, I provide an updated version of the constraint ranking proposed in (52). In the final ranking in (54), AlignLex must be ranked lower than AlignMWd/PWd and AlignMWd/Ft because the prosodic structure that I provided for suffixation violates AlignLex: $((\text{a})_\sigma\ (\text{mi ab})_{\text{Ft}}\ )_{\text{PWd}}$ – i.e. the lexical word /ami/ is not both right and left aligned with the Prosodic Word that dominates the entire affixed word /amiab/. On the other hand, AlignLex must also dominate *RecC (see (7b)) because the recursive representation that I propose for

[36] Because compounds in Picard are formed from at least two stems, which in turn contain two footed Prosodic Words, two possibilities for (primary) stress assignment arise: either all the members of the compound bear (primary) stress, or only one of these words' stresses is preserved in the compounding stem. Picard opts for the assignment of stress only to the rightmost syllable of the compounding word. In order to account for this pattern across languages, Kager (1996b) proposed the constraint UNI-PEAK:

(i) UNI-PEAK: Words must have a unique stress peak.

A combination of the constraints UNI-PEAK and AlignMWd/Ft (Align (MWd, R; Foot, R); see (41) above) yields stress on the rightmost Foot of the compound in Picard.

compounding violates this constraint. The manner in which these constraints interact to yield the prosodic configuration of compounding stems in Picard is shown in Tableau 8.

(54) Constraint ranking (final version)

AlignPref, AlignSuf, AlignMWd/PWd, AlignMWd/Ft

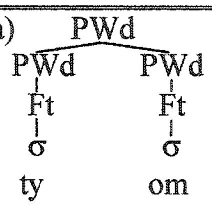
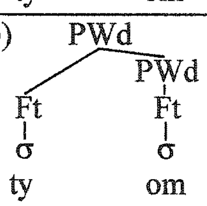
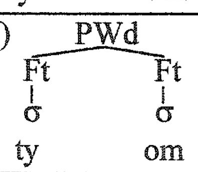
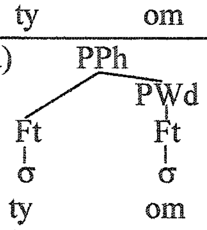
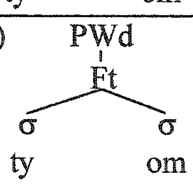
>>

AlignLex, AlignPWd

>>

ExhC, *RecC

(55) Tableau 8 - Prosodization of stem plus stem sequences (compounding)

{ Stem Stem }	Align MWd/PWd	Align MWd/Ft	Align Lex	Align PWd	ExhC	*RecC
☞ (a) 						**
(b) 			*!			*
(c) 			*!*			
(d) 	*!		**		*	
(e) 			*!*			

According to the ranking in (55), the optimal candidate (a) is selected because it only minimally violates the constraint *RecC due to its recursive Prosodic Word structure. This configuration illustrates why neither Semivocalization nor Vowel Elision applies between the two members of a compound: while the former applies within the Foot domain, the latter applies at the σ-PWd juncture of the Phonological Phrase. If these prosodic configurations are not present (as is the case for prefixation and compounding), the concatenation of the two relevant vowels results in the syllabification of the vowels into two distinct syllables. The remaining candidates (b) (which represents a slightly modified version of the domain for prefixation), (c) and (e) fatally violate the constraint AlignLex, while candidate (d) is discarded as optimal because of its fatal violation of AlignMWd/PWd.

In sum, in this section, I have provided an analysis for the prosodization of the morphosyntactic constituents involved in Semivocalization, Vowel Elision and Heterosyllabification in Picard. I have established that while Semivocalization applies within the Foot, Vowel Elision and exceptional Semivocalization are restricted to the juncture σ-PWd within the Phonological Phrase. If neither of these configurations is met (e.g. the juncture of two Prosodic Words), Picard opts for Heterosyllabification. In the following section, I will present a segmental analysis for the Resolution of Vocalic Hiatus in Picard in light of the prosodic domain analysis proposed in this section.

]3.2.3. Segmental aspects of Vocalic Hiatus Resolution

While the focus of the previous section was on the prosodization of the morphosyntactic elements involved in Semivocalization, Vowel Elision and Heterosyllabification, this section will concentrate on the segmental aspects of these three phenomena. For expository reasons and for consistency with section 3.2.1, I will divide the analysis into three cases: Case 1: Semivocalization; Case 2: Vowel Elision and exceptional Semivocalization; and Case 3: Heterosyllabification.

3.2.3.1. Case 1: Semivocalization

In (56) below, I provide most of the constraints required for the analysis of Semivocalization:

(56) Constraint definitions

ONSET	Syllables have onsets (McCarthy and Prince 1993)
INTEG	(No segment breaking) No element in S_1 has multiple correspondents in S_2 (McCarthy and Prince 1995)
MAX-IO	(No deletion) Every segment of S_1 has a correspondent in S_2 (McCarthy and Prince 1995)
DEP-IO	(No epenthesis) Every segment of S_2 has a correspondent in S_1 (McCarthy and Prince 1995)
NoDIPH	(No diphthongs) Tautosyllabic sequences of non-identical vowels are not allowed (Rosenthall 1994, Casali 1994, 1997)

The constraint ONSET expresses the cross-linguistic preference for syllables to have onsets. It is violated in cases of Heterosyllabification because the second vowel is syllabified without an onset: e.g. [ty.om].[37]

The constraint INTEG (Integrity) rules out cases of multiple correspondence of an input segment. INTEG is violated in contexts of "copying", for instance, in which an underlying high vowel surfaces as two corresponding segments, as illustrated below:

(57) A violation of INTEG

S_1: a m i a b

S_2: a m i j a b → *[a.mi.jab] 'amiable'

The constraint MAX-IO (see section 3.1.3 and Chapter 2) militates against segmental deletion and is therefore violated in cases of Vowel Elision (e.g. /ty aʒut/ → [ta.ʒut] 'you add'). DEP-IO (see Chapter 2), on the other hand, bans epenthesis (e.g. /ami ab/ → *[a.mi.Cab] violates DEP-IO – where "C" represents an epenthetic consonant, not present in the input). In the data under consideration, DEP-IO is never violated and is only included in the tableaux for completeness.

Finally, the constraint NoDIPH expresses the relative markedness of tautosyllabic sequences of non-identical vowels. The constraint is violated in cases of Semivocalization (e.g. /ami ab/ → [a.mjab], in which the high vowel /i/ becomes its

[37] A more specific version of ONSET has been proposed to account for the distribution of vocalic hiatus strategies crosslinguistically: NO-HIATUS, a constraint that prohibits sequences of vowels (McCarthy 1993, 2002, Orie and Pulleyblank 1998). Since both constraints yield the same results in the present analysis, I opt for the more general (and well-established) constraint ONSET.

corresponding glide and consequently surfaces within the same syllable as the following /a/). Based on the work of Steele and Auger (1999), I assume that this glide-vowel sequence constitutes a (light) diphthong (as opposed to the glide forming a complex onset with the preceding consonant) in Picard.[38]

Leaving the complications involving phonological alternations across domains for when they become relevant to the analysis, I propose the preliminary constraint ranking in Tableau 9,[39] which accounts for the syllabification of VV sequences in monomorphemic and suffixed words and results in the semivocalization of the first vowel in the hiatus.[40]

(58) Tableau 9: Semivocalization within the Foot domain (monomorphemic words)

	/kapiø/	INTEG	MAX-IO	DEP-IO	ONSET	NoDIPH
☞	(a) ka.pjø					*
	(b) ka.pi.ø				*!	
	(c) ka.pi$_i$.j$_i$ø	*!				
	(d) ka.pi		*!			
	(e) ka.pi.Cø			*!		

[38] Another constraint violated in Semivocalization is IDENT-Lex, a constraint subsumed under FAITH-Lex that requires identical featural values for correspondent segments contained in lexical words (see also note 17). An important consequence of the violation of IDENT-Lex for Semivocalization is that it shows that reference to prosodic domains is truly necessary for the analysis of the phenomena under focus in this thesis. In the context of Vocalic Hiatus Resolution, the low ranking of IDENT-Lex and its consequential violation confirms that FAITH-Lex is not able to replace the domain-based approach, since it is a segment in the *lexical* word that is affected in Semivocalization; compare AWRA in section 3.1 and Vowel Elision in forthcoming section 3.2.3 where faithfulness violations are incurred in function words.

[39] The ranking is preliminary because it will have to be updated to reflect the alternations observed across domains. As will be discussed in the following section, this preliminary ranking predicts incorrect results in other prosodic configurations. The final constraint ranking in (68-70), composed of domain-specific constraints, will replace all previous (preliminary) versions.

[40] This investigation lacks examples of glide-vowel alternations involving $V_{[high]}$ + V sequences in polysyllabic bimorphemic words of the shape /...CV + VCV/; therefore, I cannot provide a precise analysis for such cases. Based on the ranking illustrated in (58) and (59), where ONSET is ranked higher than NoDIPH, the prediction is that V_1 will semivocalize in order to satisfy the higher ranked constraint ONSET (i.e. [... (CGV.CV)$_{Ft}$], *[... CV(V.CV)$_{Ft}$]).

(59) Tableau 10: Semivocalization within the Foot domain (suffixation)[41]

	/ʒezy it/	INTEG	MAX-IO	DEP-IO	ONSET	NoDIPH
☞	(a) ʒe.zɥit					*
	(b) ʒe.zy.it				*!	
	(c) ʒe.zy$_i$.ɥ$_i$it	*!				
	(d) ʒe.zyt		*!			
	(e) ʒe.zy.Cit			*!		

Observe in the tableaux above that the winning candidate in each case is the one in which Semivocalization has applied, even though each optimal candidate violates the lower ranked NoDIPH constraint.

For the analysis of cases in which Semivocalization is inoperative, i.e. when the first vowel in the hiatus is non-high (e.g. /mau/ → [ma.u] 'deceitful person'; see section 3.2.1.1), I adopt the constraint HiG (McCarthy and Prince 1993a, Rosenthal 1994, Casali 1997), according to which glides must be high:

(60) HiG: Glides must be [+high]

In Picard, I assume that HiG is undominated because of its prevalence throughout the phonology of the language. I also propose that, to accommodate the occurrence of VV

[41] Because Semivocalization applies only to the leftmost vowel in the hiatus (V_1), I will not display candidates that illustrate the (unobserved) effect of SV on V_2 in cases in which both V_1 and V_2 are [high] (e.g. *[ʒe.zyj̩t]). Recall from the discussion of Foot form in Picard in section 3.2.2.1 that an iambic analysis accounts for the non-application of SV to V_2: occupying the prominent position of the iambic Foot (i.e. ʒe $((zy)_\sigma\ (\underline{it})_\sigma)_{Ft}$), V_2 is less likely to undergo the phonological process than V_1, as illustrated by the winning candidate in tableau 10 above. In this form, the constraint HEAD(FT)-FAITH (which requires strict correspondence of segments that occupy the head of a Foot) has been strictly obeyed. A crucial consequence of this type of analysis is that it presupposes the prosodization of input segments. In OT, this is a controversial assumption given that prosodic structure is generally viewed as a property of outputs (see Goad and Rose in press, however, for empirical evidence in support of the prosodization of inputs). This subject is beyond the scope of this investigation and will be left aside for future research.

sequences in certain circumstances (e.g. not to violate the undominated HiG), the constraint ONSET must be ranked lower than HiG, INTEG, MAX-IO, and DEP-IO, and higher than NoDIPH.

Tableau 11 illustrates how Semivocalization is inapplicable in cases in which the first vowel in the hiatus is non-high, even when the configuration in which the vowels prosodize constitutes the domain of SV, i.e. the Foot, which encompasses the last two syllables of words (recall from (29) that G represents a hypothetical glide for the [-high] vowel).

(61) Tableau11: SV inapplicability in $V_{[-high]}$ + V contexts

	mau	HiG	INTEG	MAX-IO	DEP-IO	ONSET	NoDIPH
☞	(a) ma.u					*	
	(b) $ma_i.G_iu$	*!	*				
	(c) mu			*!			
	(d) mGu	*!					*
	(e) ma.Cu				*!		

To conclude, I have proposed that the resolution of vocalic hiatus as Semivocalization is triggered by the constraint hierarchy proposed in (61). I have not shown, however, that this ranking is inadequate to fully capture the phenomenon, since it predicts that SV will incorrectly apply in all prosodic domains in the phonology of Picard, i.e. across the board. In the next section, I will demonstrate that to arrive at a comprehensive analysis of hiatus resolution in Picard, it is necessary to adopt an approach that takes into consideration the different prosodic domains in which the relevant vowels appear.

3.2.3.2. Case 2: Vowel Elision and exceptional Semivocalization

When they are alone they want to be with others,
and when they are with others they want to be alone.
~ Gertrude Stein

Case 2 involves data in which the vocalic hiatus occurs at the prosodic domain juncture of an unstressed syllable and following Prosodic Word, within the Phonological Phrase (i.e. domain juncture ϕ). Recall that in this prosodic configuration, the concatenation of the two vowels results in the elision of the first vowel (e.g. /ty apresi/ → [ta.pre.si]) or, exceptionally, in the semivocalization of V_1 if the clitic is a monosegmental morpheme (e.g. /ʒ **i** ẽvwerɛ/ → [ʒ**j**ẽ.vwe.rɛ]).

Observe in the tableau below that the constraint hierarchy established in (61) for Semivocalization is not able to account for Vowel Elision at the domain juncture ϕ: this ranking incorrectly predicts the illicit form in which SV has applied (62b), and rules out the candidate that illustrates the correct output at this domain juncture (62c).

(62) Tableau 12: An incorrect ranking for domain juncture ϕ

	/ty apresi/	HiG	INTEG	MAX-IO	DEP-IO	ONSET	NoDIPH
	(a) ty.a.pre.si					*!	
☠	(b) tɥa.pre.si						*
☹	(c) ta.pre.si			*!			

It should be clear, thus, that the constraints MAX-IO and NoDIPH do not have the same effect throughout the phonology of Picard: while MAX-IO must be ranked high within the domain of the Foot (because segmental deletion is not allowed within this domain), it must be ranked much lower within the domain in which Vowel Elision takes place (ϕ), because MAX-IO must be violated in order to produce the correct surface form – i.e. Vowel Elision. In the same way, the constraint NoDIPH must be ranked high at the domain juncture ϕ in order to rule out SV within this domain, and lower within the Foot because NoDIPH must be violated in this domain in order to yield Semivocalization.

Following the approach proposed in Chapter 2, the solution to this conundrum is the decomposition of the relevant constraints into their domain-specific counterparts, each of which will be operative exclusively within the domain for which each constraint is specified. Since the domains for Semivocalization and Vowel Elision are the Foot and ϕ respectively, MAX-IO and NoDIPH will be decomposed into the relevant domain-specific constraints below:[42]

(63) The decomposition of MAX-IO and NoDIPH

	Domain-specific versions	
MAX-IO →	MAX-IO_{Ft}	No deletion in the domain Ft
	MAX-IO_{ϕ}	No deletion at the domain juncture ϕ
NoDIPH →	NoDIPH_{Ft}	No diphthongs in the domain Ft
	NoDIPH_{ϕ}	No diphthongs at the domain juncture ϕ

The ranking of MAX-IO_{Ft} and NoDIPH_{ϕ} above MAX-IO_{ϕ} and NoDIPH_{Ft} (with ONSET ranked between the two sets) accounts for the alternations observed in the

[42] For convenience, I only illustrate the decomposition of MAX-IO and NoDIPH into domains relevant for the present analysis (i.e. the Foot and ϕ). Recall from Chapter 2, however, that domain-specific constraints that refer to domains that appear higher in the Prosodic Hierarchy have an effect in all domains below it. For instance, a constraint specified for the domain span of the Phonological Utterance (U) will have an effect in all domains that U dominates, including ϕ and the Foot. Because these higher-level domain-specific constraints have no effect in the Resolution of Vocalic Hiatus, they will not be shown in the tableaux and constraint rankings that I will propose.

domains of the Foot (for Semivocalization) and ϕ (for Vowel Elision), as illustrated in the tableau in (64).

In order to guarantee the directionality of Vowel Elision (i.e. V_1 deletion in the context of a function word plus a lexical word, e.g. /ty apresi/ → [ta.pre.si]), another constraint is necessary in addition to the ones utilized in the analysis of Semivocalization: MAX-Lex, introduced in section 3.1.3 under the more general FAITH-Lex. MAX-Lex ensures the preservation (i.e. non deletion) of segments contained in lexical words. The positioning of MAX-Lex above MAX-IO$_\phi$ in the constraint hierarchy accounts for the directionality of Vowel Elision in Picard.

(64) Tableau 13: Vowel Elision at the domain juncture ϕ (Procliticization)

	/ty apresi/	HiG	INTEG	MAX-IO$_{Ft}$	DEP-IO	MAX-Lex	NoDIPH$_\phi$	ONSET	NoDIPH$_{Ft}$	MAX-IO$_\phi$
	(a) tɥa.pre.si						*!			
	(b) ty.a.pre.si							*!		
	(c) ty$_i$.ɥ$_i$a.pre.si		*!							
☞	(d) ta.pre.si									*
	(e) ty.pre.si					*!				*
	(f) ty.Ca.pre.si				*!					

In Tableau 13, the winning candidate (d) is the one in which the vowel present in the function word [ty] is deleted, as opposed to candidate (e) that illustrates the deletion of the first vowel from the lexical word [apresi], a clear violation of MAX-Lex. Observe that, within the domain of Vowel Elision (ϕ), neither Semivocalization (represented by candidate (a)), nor Heterosyllabification (represented by candidate (b)) are the correct forms. Only elision of V_1 is the correct outcome of a vocalic hiatus context within this particular prosodic domain.

The cases involving exceptional Semivocalization in monosegmental clitics, on the other hand, clearly indicate that the delimitation of prosodic domains does not always guarantee that the expected output will be obtained. In this case, the preservation of the monosegmental clitic via Semivocalization (instead of its deletion) is most likely motivated by a functional reason: if the only segment in a morpheme is deleted, no segmental trace of that morpheme can be retrieved and comprehension (by the hearer) will thus be jeopardized. To capture the tendency for languages to preserve monosegmental morphemes, Schuh (1995) and Casali (1997) have proposed the constraint MAX-MS, which requires that underlying monosegmental morphemes be preserved in the output.[43]

(65) MAX-MS: (No deletion of monosegmental morphemes)
Every input segment that is the only segment in its morpheme has a corresponding segment in the output.

High ranking of MAX-MS accounts for why the deletion of a monosegmental clitic is not an alternative for the resolution of vocalic hiatus. Assuming that MAX-MS is

[43] The intuition behind this constraint is consistent with the Functional Hypothesis (Kiparsky 1972), according to which semantically relevant information tends to be retained in surface structure. This hypothesis, however, is easily falsifiable (see Guy 1980, 1991, Labov 1994, Cardoso 1999a, among others): many languages have phonological processes that obscure semantic information. In a framework in which constraints are violable, the preservation of monosegmental morphemes satisfies the constraint MAX-MS and captures the general tendency for languages to preserve these morphemes in the unmarked case. In fact, this is what Casali (1996, 1997) demonstrates in his crosslinguistic analysis of vowel elision in 68 Niger-Congo and 19 non-Niger-Congo languages: of the 25 languages in which a vowel-final root is concatenated with a monosegmental vowel suffix, 17 languages display preservation of the suffix, while only 8 display deletion of the suffix. Of these 8 languages, 4 display V_1 Elision with some suffixes, and V_2 Elision with others.

undominated in Picard, there are at least two possibilities for the surfacing of the monosegmental morpheme: it could either surface intact, in which case the result would be heterosyllabification of the two vowels (i.e. a violation of ONSET), or V_1 could semivocalize. Since the second alternative is the option chosen by Picard, ONSET must be ranked higher than NoDIPH$_\phi$ to rule out Heterosyllabification, which must then be ranked higher than MAX-IO$_\phi$ to ensure Vowel Elision when polysegmental clitics are involved. The updated (and still preliminary) hierarchy responsible for the resolution of vocalic hiatus is provided in the tableau below, where I show how exceptional Semivocalization is obtained within ϕ, the domain in which Vowel Elision otherwise occurs.

(66) Tableau 14: Exceptional Semivocalization at the domain juncture ϕ (Procliticization)

	/ʒ i ẽvwerɛ/	MAX-MS	HiG	INTEG	MAX-IO$_{Ft}$	DEP-IO	MAX-Lex	ONSET	NoDIPH$_\phi$	NoDIPH$_{Ft}$	MAX-IO$_\phi$
☞	(a) ʒjẽ.vwe.rɛ								*	*	
	(b) ʒi.ẽ.vwe.rɛ							*!		*	
	(c) ʒi$_i$.j$_i$ẽ.vwe.rɛ			*!						*	
	(d) ʒẽ.vwe.rɛ	*!								*	*
	(e) ʒi.vwe.rɛ						*!			*	*
	(f) ʒi.Cẽ.vwe.rɛ					*!				*	

3.2.3.3. Case 3: Heterosyllabification

Finally, Case 3 comprises data that yield neither Semivocalization nor Vowel Elision in the resolution of vocalic hiatus. As discussed in section 3.2.2.3, in the context of a syllable and the following Prosodic Word within a recursive Prosodic Word (for prefixation, e.g. ($(\text{smi})_{\sigma}$ $(\text{otomatik})_{\text{PWd}}$ $)_{\text{PWd}}$ → [smi.o.to.ma.tik] 'semi-automatic'), and at the juncture of two Prosodic Words (for compounding, e.g. ($(\text{ty})_{\text{PWd}}$ $(\text{om})_{\text{PWd}}$ $)_{\text{PWd}}$ → [ty.om] 'hard work'), the two vowels involved in the hiatus surface in separate syllables (Heterosyllabification). For convenience, I will refer to these two domains as domain juncture ω, i.e. the juncture where a Prosodic Word meets a preceding constituent within the domain of a recursive Prosodic Word.

In the context of domain juncture ω, the ranking established in the previous section cannot be maintained because it incorrectly rules out the possibility of Heterosyllabification within this domain, as illustrated below:

(67) Tableau 15: An incorrect ranking for domain juncture ω

	/smi otomatik/	MAX-MS	HiG	INTEG	$\text{MAX-IO}_{\text{Ft}}$	DEP-IO	MAX-Lex	ONSET	NoDIPH_{ϕ}	$\text{NoDIPH}_{\text{Ft}}$	MAX-IO_{ϕ}
☠	(a) smjo.to.ma.tik										
☹	(b) smi.o.to.ma.tik							*!			
☠	(c) smo.to.ma.tik										

To account for the non-occurrence of Semivocalization and Vowel Elision at the juncture ω and to ensure that the vowels in a vocalic hiatus context surface within this domain, the constraints MAX-IO and NoDIPH must be decomposed into independent ω-specific constraints: MAX-IO_{ω} (no deletion at the domain juncture ω) and NoDIPH_{ω} (no diphthongs at the domain juncture ω). The high ranking of these constraints guarantees that no segmental deletion or Semivocalization will take place at the juncture ω, and ensures that the vowels involved in the hiatus surface in separate syllables, as candidates (68b) and (69b) in the tableaux below illustrate.

(68) Tableau 16: Heterosyllabification at the domain juncture ω (prefixation)

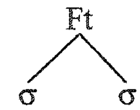
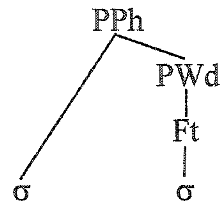
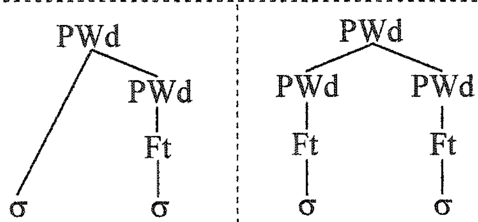
	/smi otomatik/	MAX-MS	HiG	INTEG	MAX-IO$_{Ft}$	MAX-IO$_{\omega}$	DEP-IO	MAX-Lex	NoDIPH$_{\omega}$	ONSET	NoDIPH$_{\phi}$	NoDIPH$_{Ft}$	MAX-IO$_{\phi}$
	(a) smjo.to.ma.tik								*!				
☞	(b) smi.o.to.ma.tik									*			
	(c) smi$_i$.j$_i$o.to.ma.tik			*!									
	(d) smo.to.ma.tik					*!							
	(e) smi.to.ma.tik					*!		*					
	(f) smi.Co.to.ma.tik						*!						

(69) Tableau 17: Heterosyllabification at the domain juncture ω (compounding)

	/ty om/	MAX-MS	HiG	INTEG	MAX-IO$_{Ft}$	MAX-IO$_{\omega}$	DEP-IO	MAX-Lex	NoDIPH$_{\omega}$	ONSET	NoDIPH$_{\phi}$	NoDIPH$_{Ft}$	MAX-IO$_{\phi}$
	(a) tɥom								*!				
☞	(b) ty.om									*			
	(c) ty$_i$.ɥ$_i$om			*!									
	(d) tom				*!	*		*					
	(e) tym				*!	*		*					
	(f) ty.Com						*!						

To summarize, I display below a schematic summary of the three different strategies that Picard utilizes to syllabify vowel plus vowel sequences, followed by their respective domains of application. In the rightmost column, I provide the final constraint hierarchy responsible for the distribution of vocalic hiatus avoidance strategies in Picard.

(70) Vocalic Hiatus Resolution – a summary: repair strategies, domains and ranking

<table>
<tr><th></th><th>Repair Strategy</th><th>Prosodic Domain</th><th>Constraint Ranking</th></tr>
<tr><td>CASE 1</td><td>SV</td><td>(Ft)

</td><td rowspan="3">MAX-MS, HiG, INTEG, MAX-IO$_{Ft}$, MAX-IO$_{\omega}$, DEP-IO, MAX-Lex, NoDIPH$_{\omega}$
>>
ONSET
>>
NoDIPH$_{\phi}$
>>
NoDIPH$_{Ft}$, MAX-IO$_{\phi}$</td></tr>
<tr><td>CASE 2</td><td>VE</td><td>(ϕ)

</td></tr>
<tr><td>CASE 3</td><td>HS</td><td>(ω) Other domains, E.g.

</td></tr>
</table>

3.3. Conclusion to Chapter 3

Using the theoretical tools proposed in Chapter 2, more specifically the domain-specific constraint approach, in this chapter I have provided an analysis for the domain-sensitive phenomena of Across-Word Regressive Assimilation and the Resolution of Vocalic Hiatus in Picard.

For AWRA, I have argued that the process is sensitive to the Phonological Phrase domain, at the domain juncture of an unstressed syllable and the following Prosodic Word. Within this specific configuration, I have proposed that the assimilation process is the result of the interaction of a set of domain-specific constraints that conspire to yield the correct output in Picard: AWRA.

For the Resolution of Vocalic Hiatus, I have provided an analysis in which segmental, semantic and prosodic domain factors interact. As has been cross-linguistically attested (e.g. Casali 1997), many languages do not tolerate vowel plus vowel sequences and, as a result, several vocalic hiatus resolutions are called upon to repair illicit V_iV_j strings. In order to syllabify vowels involved in a vocalic hiatus context, I have shown that Picard opts for Semivocalization, Vowel Elision and Heterosyllabification. The selection of one of these three strategies depends not only on the segmental content of the two vowels involved, but also on the prosodic domain in which the relevant vowels appear: for SV to apply, for instance, it is not only necessary that the first vowel of the hiatus be high, but also that the two vowels be within the prosodic domain of the Foot. In addition, I have shown that under certain circumstances (i.e. when the target vowel for Vowel Elision is a monosegmental morpheme), the hiatus resolution might also be determined by a semantic criterion, requiring that the illicit vowel be preserved (i.e. via SV) in order to contrast and preserve meaning.

To capture the application of a given phonological process within a certain domain and impede the same process from applying in other contexts, I have proposed the decomposition of the constraints responsible for the phenomenon into domain-specific constraints, each with an independent ranking in the hierarchy of the language. This way, I was able to account for the different strategies that Picard utilizes to resolve vocalic hiatus by adopting a single grammar or constraint ranking.

For the sake of completeness, I illustrate below the constraint hierarchy responsible for the results obtained in the domain and segmental analysis of AWRA, Semivocalization, Vowel Elision and Heterosyllabification in Picard:

$MAX\text{-}MS$, HiG, INTEG, $MAX\text{-}IO_{Ft}$, $MAX\text{-}IO_{\omega}$, DEP-IO, MAX-Lex, $NoDIPH_{\omega}$,
AlignPref, AlignSuf, AlignMWd/PWd, AlignMWd/Ft

>>

ONSET, AlignLex, AlignPWd

>>

$NoDIPH_{\phi}$, ExhC, *RecC

>>

$NoDIPH_{Ft}$, $MAX\text{-}IO_{\phi}$, $NoCoda\text{-}Rt_{\phi}$, FAITH-Lex[44]

>>

Linearity

>>

NoCoda-Rt

[44] Recall that FAITH-Lex (relevant for the analysis of AWRA) comprises the entire set of constraints on correspondent elements that refer to Lex (i.e. MAX-Lex, DEP-Lex, INTEG-Lex, IDENT-Lex, Linearity-Lex, etc.). Note, however, that the final ranking above depicts MAX-Lex as independently and higher ranked in Picard. FAITH-Lex should therefore be interpreted as the set of constraints that excludes MAX-Lex.

CHAPTER 4

THE VARIATION PATTERNS OF ACROSS-WORD REGRESSIVE ASSIMILATION[1]

Nature is an endless combination and repetition of a very few laws.
She hums the old well-known air through innumerable variations.
~ Ralph Waldo Emerson

Before the advent of Optimality Theory, quantitative variation patterns were usually regarded as the result of the operation of variable rules, à la SPE (e.g. Labov 1972, Cedergren 1973, Cedergren and Sankoff 1974, Guy 1975), or as the outcome of a selection between categorical grammars (e.g. Bailey 1973, Bickerton 1973). With the emergence of Optimality Theory and the consequent demise of variable rules in favor of constraint interaction for the analysis of variability (e.g. Reynolds 1994, Anttila 1997; see also Fasold 1996 and Bergen 2000 for a critique of variable rules), it has been argued that intra-language variation can be satisfactorily accounted for via crucial nonranking of constraints (e.g. Reynolds 1994, Anttila 1997, Taler 1997). In a constraint-based approach like OT, variability can be expressed without resorting to a separate grammar for each variant or, in the case of a process with more than two variants (e.g. AWRA), without the postulation of more than one rule for a single phenomenon: the framework

[1] Earlier versions of this chapter have appeared in *Language Variation and Change* (Cardoso 2001a), *McGill Working Papers in Linguistics* (Cardoso 2001b), *MIT Working Papers in Linguistics* (Cardoso 2000b), and *Papers in Sociolinguistics* (Cardoso 1998).

allows for variation to be encoded in (and therefore predicted by) a single constraint hierarchy. On the other hand, the theory also allows for the assignment of separate grammars for cases in which variation truly involves different grammars (e.g. different dialects, different registers).

Following the works of Reynolds (1994), Anttila (1997), Nagy and Reynolds (1997), and Taler (1997), this study supports the view that, from the predictions determined by a set of crucially unranked constraints, one is able to quantitatively establish the probability of application of each variant inherent to the variation process whenever a single dialect or register is involved. Along these lines, the analysis that I will present for the process of Across-Word Regressive Assimilation in Picard will attempt to incorporate into the language's grammar both abstract knowledge and quantitative patterns of language use. Consequently, my investigation will move away from the "ideal speaker-listener, in a completely homogeneous speech community" (Chomsky 1965:3), and will focus on systematic generalizations about language in order to capture "the broadest possible range of facts about language, including usage as well as abstract knowledge" (Guy 1997:127) within a single (competence) grammar (see Labov 1969 et seq., Wardhaugh 1994, Guy 1997, among several other variationist linguists).[2]

This study offers a variationist OT account for AWRA in Picard. More specifically, it focuses on the varieties spoken in the Vimeu region of France, delimited by the Somme river to the north and the Bresle river and Normandy to the south, the English Channel to the west, and departmental road 901 to the east. In this chapter, I

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[2] I assume the traditional variationist view that the grammar must include quantitative information and that the manipulation of frequency is part of a speaker's linguistic competence (e.g. Guy 1975, 1997, Labov 1969 et seq., Cedergren and Sankoff 1974). If the quantitative aspect of a variable grammar is ignored, variation will be reduced to random selection, similar to the notion of "free variation", which in OT is commonly claimed to result from the interaction of "freely-ranked" constraints (e.g. Clements 1997:315).

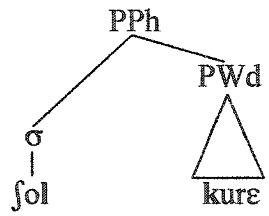
concentrate on one particular topic in the analysis of AWRA: the variation patterns observed in the application of the phenomenon. The data come from Vasseur (1963) and Debrie's (1981) articles on Picard, as well as from Auger's database consisting of written documents (e.g. private letters, Picard magazines, unpublished articles, etc.) and an oral fieldwork corpus of tape-recorded interviews with Picard speakers.

Chapter 4 is composed of three main sections. In section 4.1, I provide the data that illustrate AWRA and its variation patterns. Section 4.2 presents the data collection procedures, the independent variables employed in the study and a discussion of the VARBRUL program and its quantitative analyses for the AWRA phenomenon. Finally, in section 4.3, I propose an OT analysis for the categorical and variable results involved in AWRA, in which I invoke the use of different grammars to account for variation when regional dialects and different styles are involved, and a single grammar for cases in which variation pertains to a single regional variety or register.

4.1. The data: Variation in AWRA

The data upon which my variationist analysis of AWRA is based are reviewed in this section. Recall from Chapter 3 that AWRA is a domain-sensitive phonological process that operates exclusively at the domain juncture of an /l/-final syllable and the following consonant-initial Prosodic Word, within the Phonological Phrase domain (as indicated in Chapter 3, I will refer to this domain juncture as ϕ).

(1) The Prosodic Domain of AWRA in Picard: ϕ



→ [ʃok kurɛ] 'the/this pork pâté'

Contrary to what was illustrated in Chapter 3 (see section 3.1) and what is implied in the representation in (1), AWRA does not apply categorically.[3] In this context, three distinct patterns can be observed: (a) faithfulness of input /l/ (/l/-preservation); (b) Across-Word Regressive Assimilation (AWRA); and (c) /l/-deletion:

(2) Variants of AWRA

a. /l/-preservation

/ʃol kurɛ/	→	[ʃol kurɛ]	'the/this pork pâté'
/dol tart/	→	[dol tart]	'some pie'
/al kɑ̃t/	→	[al kɑ̃t]	'she sings'

b. AWRA

/ʃol kurɛ/	→	[ʃok kurɛ]
/dol tart/	→	[dot tart]
/al kɑ̃t/	→	[ak kɑ̃t]

b. /l/-deletion

/ʃol kurɛ/	→	[ʃo kurɛ]
/dol tart/	→	[do tart]
/al kɑ̃t/	→	[a kɑ̃t]

[3] There seems to be no variation involving the domain in which AWRA applies, i.e. the phenomenon applies exclusively within the prosodic domain indicated in (1). This issue will be returned to more generally in Chapter 5.

In the forthcoming sections, I will show that what determines the patterns observed above is an interaction of at least three linguistic and extralinguistic factors, namely (1) *the grammatical status of the l-clitic* (i.e. which of the clitics are more likely to surface as one of the three AWRA variants); (2) *the level of formality* in which the l-clitics are utilized (i.e. written, formal or informal); and (3) *the geographic location* of the speakers (i.e. whether speakers from a certain village are more likely to use one or more of the AWRA variants shown above).

4.2. The data collection and the VARBRUL quantitative results

In this section, I will present a comprehensive discussion of the data collection procedures that I adopted in order to obtain samples of non-categorical data such as those illustrated in (2) above. This is followed by a brief discussion of the VARBRUL program (Pintzuk 1988), after which I will present the quantitative VARBRUL results obtained for each variable investigated.

4.2.1. The data collection

The study consisted of 2,783 tokens of variants of AWRA collected in the field by Julie Auger for the Picard project during the summers of 1996 and 1997, which were further transcribed by four research assistants (including me) and later rechecked for consistency.[4] The data collected were stratified among six independent variables (see Appendix 1) and later analyzed by the VARBRUL program: three extralinguistic factor

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[4] The rechecking process was necessary because at the initial stage of the transcription task, the research assistants were not aware of the AWRA phenomenon. Besides, they were following a less conservative approach in the transcription (mostly syntax-oriented), and therefore little or no attention was given to assimilation processes.

groups: (1) *level of formality*, (2) *speaker* and (3) *geographic location*; and three linguistic factor groups: (1) *grammatical status of the l-clitic* (or status of the l-clitic), (2) *place of articulation of the following consonant* and (3) *manner of articulation of the following consonant*.

The subjects (Speakers 1-9) were nine male adult native speakers of Picard, with an average age of more than 70 years old; they inhabited five villages in the Picardie region in northern France: Feuquières, Fressenneville, Bienfay, Bouillancourt and Nibas. Women and younger speakers were not included in the investigation because the vast majority of native speakers of Picard who still use the language routinely are older men. Languages such as Picard, which die out gradually via the progressive failure of intergeneration transmission, usually retreat in the final generations to a few spheres of use: they persist in domestic settings among the older (usually male) generation, and they are used for casual interaction among contemporaries who were schoolmates or coworkers in their younger years (Dressler 1972, Dorian 1977, Dressler and Wodak-Leodolter 1977, Dressler 1988; see also Chapter 1 for the status of Picard in present-day France).

In order to collect tokens from a wide range of stylistic levels, the data collection methodology used in this study provides a three-level distinction in a formality hierarchy: (1) informal interview, (2) formal interview, and (3) collection of written documents.

(1) The informal interview consisted of tape-recorded conversations between the field worker and the interviewee or between the interviewee and other native speakers of Picard. To avoid more careful (or less informal) speech produced through the influence of the observer's paradox, the first ten to fifteen minutes of each conversation was ignored, and whenever possible, preference was given to data from the intercourse when only speakers of Picard were involved. Also, tokens present in discussion topics that could elicit more formal speech or code-switching (e.g. politics, history, professional and educational activities, etc.) were excluded from the analysis.

(2) The formal interview consisted of a tape-recorded translation task (designed for the purpose of this study) in which the subjects were asked to orally translate French sentences into Picard. The only way to elicit more formal oral data was through the translation task because Picard, as a dying language, is characterized by monostylism (see Chapter 1). As has been attested in the sociolinguistic literature (e.g. Dressler 1972, Dressler and Wodak 1977, Dorian 1977, Dressler 1988), languages in the process of decay are mostly used in a single formality style (either in a casual style, or in religious contexts such as church services, scripture readings, etc.). In the case of Picard, its use is limited to more casual styles, i.e. for routine topics in oral situations and for intimate interaction with close friends and at home.

(3) The collection of written documents consisted of the selection of such documents from at least one speaker from each region investigated. These documents were extracted from articles from the Picard magazine *Ch'Lanchron*, books (including compilations), and unpublished material (including short stories, articles and a few private letters).

The transcription of the data was not an uncomplicated task because of intense bilingualism involving French and Picard in the communities investigated and high levels of code-switching, which is an inevitable consequence of an environment of bilingualism (Hudson 1996).[5]

The distribution of subjects according to Age, Geographic Location, and the Level of Formality from which the data were elicited is illustrated below.[6]

[5] I am aware of the consequences of Picard-French code-switching for my analysis. As mentioned in the discussion of how tokens from the informal interview were collected, AWRA variants present in discussion topics that could elicit code-switching from Picard to French (e.g. the status of Picard in France, politics, history, professional and educational activities, etc.) were excluded from the analysis. In addition to the possible effect of the discussion topic, Wardhaugh (1994) suggests that the environment also plays a decisive role in determining which code will be selected in a bilingual situation. For instance, Picard speakers would be more likely to speak French if they were engaged in a conversation with Picard speakers at a bank than they would if they were shopping in a food market. The author describes two types of code-switching, both of which can be used to characterize code-switching in the speech community under investigation: (a) situational, in which the languages used change according to the situations in which the conversants find themselves; and (b) metaphorical, when a change of topic requires a change in the language used.

[6] Speaker 9 was deceased at the time of the data collection. Observe that his sample consists exclusively of written data. His inclusion among the other speakers (from whom informal and/or formal tokens were elicited) serves the purpose of contrasting variable from categorical grammars: while speakers 1-8 present a variable grammar, Speaker 9's grammar is a categorical one in which only one of the variants of AWRA (i.e. AWRA) is allowed. In the context of this study, this distinction is important because it will allow us to delimit and illustrate two possibilities for grammars: (1) one in which the outcome is restricted by a fixed-ranked grammar, whose result is a (categorical) single output (as seen in section 3.1 in Chapter 3); and (2) one in which multiple outputs (i.e. variation) are allowed as a result of nonranking of constraints (see discussion in 4.3).

At first glance, it appears that the categorical results for speaker 9 might have arisen due to the fact that only written data were collected from this speaker. I will show in section 4.3.1.2, however, that this speculation is easily falsified because no other speaker presented similar results when the written stylistic register was analyzed in isolation.

(3) Table 1: Distribution of subjects according to Age, Location, and Level of Formality

Speaker	Age	Geographic Location	Level of Formality		
			Informal	Formal	Written
Speaker 1	60s	Feuquières	No	✓	✓
Speaker 2	70s	Feuquières	✓	✓	No
Speaker 3	60s	Fressenneville	✓	No	No
Speaker 4	84	Fressenneville	No	✓	✓
Speaker 5	60s	Bienfay	✓	✓	✓
Speaker 6	84	Bouillancourt	✓	✓	✓
Speaker 7	37	Nibas	✓	✓	✓
Speaker 8	80s	Nibas	✓	No	No
Speaker 9	-	Nibas	No	No	✓

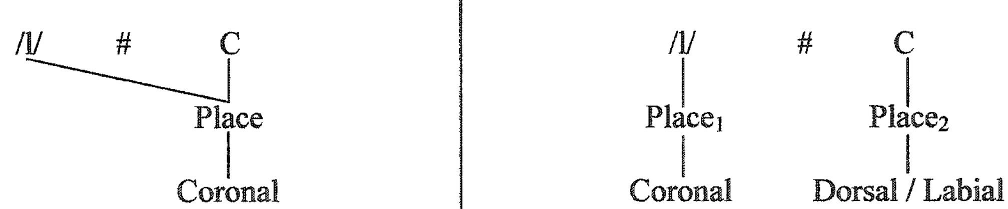
Finally, three linguistic factor groups were also included in the AWRA investigation: (1) *status of the l-clitic*, (2) *place of articulation of the following consonant* and (3) *manner of articulation of the following consonant*.

(1) Status of the l-clitic factor was selected based on Debrie's (1981) description and my initial observation that the AWRA process does not apply in an identical fashion throughout the repertoire of l-clitics: while the typically Picard forms /ʃol/ and /dol/ are more likely to assimilate, the determiner and complement pronoun /l/ are more likely to surface as faithful to the input, i.e. with /l/ preserved.[7] The factors included in this group are: (a) determiner /ʃol/, (b) preposition /dol/, (c) subject pronoun /al/, (d) preposition /al/, (e) complement pronoun /l/ and (f) determiner /l/.

[7] Recall from section 3.1.1 that the proclitic /l/ sometimes surfaces with the epenthetic vowel [e] in order to allow for the surfacing of otherwise unsyllabifiable consonants; e.g. /pur l savwer/ → [pur el savwer] 'to know it'.

(2) Place of articulation of the following consonant factor was included in this investigation based on the hypothesis that the place of articulation of the following lexical word's initial segment could have an effect on the outcome of the AWRA process. As has been well documented in the literature on syllable structure, heterosyllabic coda-onset restrictions are sensitive to place (e.g. where the coda /l/ licenses its own place vs. where place is shared with the following onset consonant) (e.g. Prince 1985, Itô 1986, 1989, Clements 1990, Yip 1991, Rice 1992). Since the clitic final consonant /l/ is coronal, it could be the case that /l/-preservation would be more likely to occur if the following consonant is also coronal, in which case both the coda and the onset could share the same place of articulation; see (4a). This is in contrast to cases where the coda is followed by a non-coronal segment. In the latter case, assimilation or /l/-deletion could be more likely to occur because otherwise the coda would be required to license its own place; see (4b).

(4) (a) /l/-preservation expected | (b) AWRA or /l/-deletion expected



E.g.: /ʃol tab/ → [ʃol tab] | E.g.: /ʃol fɛt/ → [ʃof fɛt] or [ʃo_fɛt]

Based on the discussion above, the factor group *place of articulation of the following consonant* included the following factors: (a) labial, (b) coronal and (c) dorsal.

(3) Manner of articulation of the following consonant factor was selected based on the cross-linguistic observation that heterosyllabic coda-onset restrictions are sonority driven (i.e. onsets must be less sonorous than codas) (Hooper 1972, Murray and Vennemann 1983, Clements 1990, Rice 1992). The prediction for Picard is that the AWRA and /l/-deletion variants could be used to repair a relatively bad sonority profile (for example, while an /l-p/ coda-onset sequence may be preserved, an /l-m/ sequence may surface as [mm] or [m] because of the bad sonority profile of [lm]).

(5) The Sonority Scale (e.g. Clements 1990)

Vowels > Glides > Liquids > Nasals > Obstruents

/l/ /m/ /p/

Based on the Sonority Scale above, the factors included in the independent variable *manner of articulation of the following consonant* are: (a) glide, (b) liquid, (c) nasal, (d) fricative and (e) other obstruent (i.e. stops and affricates). For a complete listing of all of the factor groups along with their respective factors, see Appendix 1.

4.2.2. The VARBRUL program

This section consists of a brief introduction to the VARBRUL 2 program for DOS (Pintzuk 1988) used in the analysis of the Picard corpus. This program has been extensively used in variationist studies in linguistics because, along with GoldVarb for Macintosh computers (Rand and Sankoff 1990), it is the only one explicitly designed to handle the types of data derived from studies of language variation.[8] In Young and Bayley's (1996:258) terms, VARBRUL is able to manage "the distributional imbalances of linguistic features in sociolinguistic data."

The results of a VARBRUL study should be interpreted as holding over the whole of the data corpus that is being investigated and, to the extent that this is a representative sample, to all similar speakers and linguistic and extralinguistic contexts. The output of a typical VARBRUL analysis contains the following information (see Appendix 2): (1) The *raw number* (N) and the *percentage* of rule application involving each factor. These results, however, do not provide enough information since they do not express the influence of each factor independently of the others. (2) The *factor weight* measures the influence that each factor has in the process under investigation, based on the corpus analyzed. It provides the most accurate view of the likelihood of variant occurrence. It consists of a list of values associated with each factor independently of other factors in the same factor group. The value indicates the degree to which a factor promotes the occurrence of each variant for the process being investigated. The higher the value, the higher the influence of that factor in the selection of the variable output. A value of either 1.00 or 0.00 indicates that a given factor has a categorical influence on the phenomenon under investigation: in the context of a group factor for which the program assigned a categorical value, a weight of 1.00 indicates that a certain variant will always occur, while a weight of 0.00 indicates that that variant will never appear. Because the AWRA phenomenon consists of three variants, the factor weight of .33 was established as the watershed between the weights that enhance the likelihood of a certain variant's

[8] Other probabilistic tests such as ANOVA were designed to handle data collected from controlled experimentation that result in rather balanced data.

occurrence (above .33) and those that inhibit its appearance (below .33) (see also Major 1996 and Preston 1996). (3) The *input probability* (also more descriptively called Overall Tendency or Average Tendency) is the likelihood that each variant has of occurring in general, regardless of the specific contribution of particular factors. In other words, it represents the general propensity of the process to apply on its own, without the interference of the other factors included in the investigation.

The first VARBRUL run includes all the original factors as they were initially conceived based on the investigator's hypothesis. It is not uncommon, however, to find that a certain group or factor does not contribute substantially to the observed variation, or that the analysis contains either categorical (or near categorical) results (called 'knockouts') or factor groups consisting of a single factor (called 'singletons'). Because the VARBRUL program cannot calculate the weights of factors or factor groups consisting of knockouts or singletons, it is necessary to modify the analysis, either by removing these problematic factors or factor groups, or by regrouping them with other related factors or factor groups, a process known as recoding. In order to refine the model of variation, subsequent VARBRUL runs should be conducted until the final results contain no knockouts or singletons, and until all factors that do not contribute to the observed variation are regrouped or even removed from the analysis.

4.2.3. The VARBRUL quantitative analysis: results and discussion

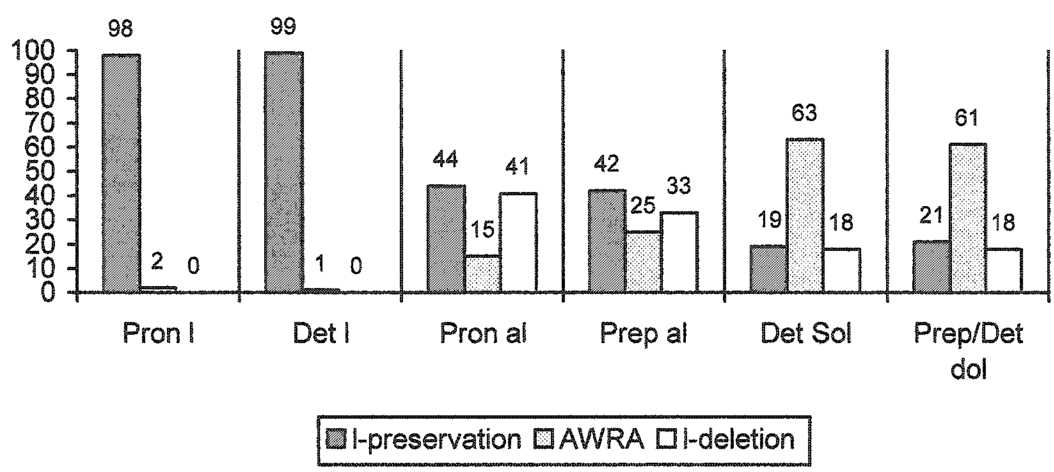
Not everything that can be counted counts,
and not everything that counts can be counted.
~ Albert Einstein

I now provide the results of the trinomial quantitative analysis of the AWRA data conducted by the VARBRUL 2 program. From all the linguistic and extralinguistic factors that I initially included in the investigation (see 4.2.1), VARBRUL's probabilistic results indicate that the external variables *level of formality*, *speaker* and *geographic location* and the internal variable *status of the l-clitic* have significant conditioning effects on determining the output of the AWRA phenomenon. On the other hand, the internal factors *place of articulation of the following consonant* and *manner of articulation of the following consonant* did not play a major role in the selection of the three variants. Because of persistent knockouts toward l-faithfulness (categorical results), the pronoun and determiner /l/ were excluded from subsequent runs. Speaker 9 was also eliminated from further VARBRUL analyses because of his near categorical use of AWRA (98%). In the next sections, I briefly discuss the results obtained for the linguistic and extralinguistic factors included in the investigation of the AWRA phenomenon. An analysis of these results within the framework of Optimality Theory is provided in section 4.3.2.

4.2.3.1. Results of the linguistic factors

The internal factor *status of the l-clitic* displays a pattern in which the determiner and complement pronoun /l/ present no significant variation and /l/-preservation is categorically observed. Because of their near categorical behavior, the results of the analyses in which they were included can only be given in percentages. In Figure 1, I illustrate the overall pattern detected in the first VARBRUL analysis of the six items included in this factor group.

Figure 1: Status of the l-clitic (%)



Observe the existence of three distinct patterns concerning the behavior of l-clitics: (1) as mentioned above, in the context of the complement pronoun and determiner /l/ (Group {el}), one observes near categorical /l/-preservation (98% and 99% respectively), few tokens with AWRA (2% and 1%) and categorical non-existence of /l/-

deletion (0% in both cases);[9] (2) in the context of the pronoun and preposition /al/ (Group {al}), there is a higher percentage of /l/-preservation (44% and 42% respectively) and /l/-deletion (41% and 33%) and a lower tendency toward the AWRA variant (15% and 25%);[10] (3) the determiner /ʃol/ as well as the determiner and preposition /dol/ (Group {ol}), on the other hand, displays a pattern in which AWRA is highly observed (63% and 61% respectively), and /l/-preservation (19% and 21%) and /l/-deletion (18% and 18%) are relatively equally distributed.

Because of the categorical results obtained for /l/, these clitics were excluded from further VARBRUL runs. The final results for this factor group are shown in Table 2, in probabilities.[11]

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[9] For ease of exposition and to avoid ambiguity, I will occasionally refer to the pronoun and determiner clitic /l/ as "{el} clitics" (or Group {el}) in order to differentiate them from the general term "l-clitics", which includes all /l/-final clitics (i.e. /ʃol/, /dol/, /al/ and /l/).

[10] Recall from section 3.1.1 in Chapter 3, however, that in the context of /al/ + consonant-initial clitic + lexical word sequences (e.g. /al m fzwø/ 'she made me'), one observes more /l/-preservation (66%, N=31) than AWRA (19%, N=9) and /l/-deletion (15%, N=7). The expected higher incidence of /l/-preservation involving /al/ + clitic sequences can be accounted for straightforwardly by the domain-analysis provided in Chapter 3: because this sequence of clitics does not constitute the domain juncture ϕ, the variants AWRA and /l/-deletion should not operate within this prosodic configuration. This analysis, however, does not account for the fact that AWRA and /l/-deletion are still attested (albeit not very often). Adopting Auger's (in press:1) view that some "preverbal clitics are affixes rather than syntactic clitics [e.g. /m/ 'me', /t/ 'you-non-nom']", it could be the case that these intervening words (e.g. /m/ in /al m fzwø/) could at times be interpreted as elements affixed to the following word and, as such, constitute single Prosodic Words with their host stems (e.g. (m (fzwø)$_{PWd}$)$_{PWd}$). The resulting structure would then conform to the domain juncture required for the AWRA phenomenon to apply (e.g. ((al)$_{\sigma}$ ϕ (m (fzwø)$_{PWd}$)$_{PWd}$)$_{PPh}$). The issue requires a more comprehensive investigation.

[11] All the probabilistic results provided in the study derive from the final VARBRUL run without the redundant factor group *speaker* and the factors that presented categorical results, i.e. determiner and pronoun /l/ and Speaker 9. The reason for the recodings and reanalyses will be explained as they become relevant.

(6) Table 2: Status of l-clitics and AWRA

		/l/-preservation	AWRA	/l/-deletion
Group {ol}	Det. /ʃol/	.19	.58	.23
	Prep. /dol/	.22	.55	.22
Group {al}	Pron. /al/	.45	.13	.42
	Prep. /al/	.42	.20	.39

Observe that while the AWRA variant is favored by both the determiner /ʃol/ and preposition /dol/, the pronoun and preposition /al/ favor /l/-preservation and /l/-deletion. In order to account for the distinct patterns observed in these two sets of clitics, I will opt for morpheme-specific constraints (rather than distinct constraint rankings), which will interact within a single grammar to yield the results illustrated above. In the case of the pronoun and determiner /l/, I will argue that its segmental shape (i.e. monosegmental) has an effect on the categorical results obtained for this group of clitics. This will be discussed in sections 4.3.1.1 and 4.3.2.2.

The numerical results achieved for the second linguistic factor *place of articulation of the following word's onset* were not consistent with my initial hypothesis, since the statistical program did not render significant the factor group or any of the factors included. Notice in Table 3 that according to the nature of the following consonant's place of articulation, all three variants of AWRA are equally likely to occur.

(7) Table 3: Place of articulation and AWRA

	/l/-preservation	AWRA	/l/-deletion
Labial	.38	.35	.33
Coronal	.32	.33	.35
Dorsal	.34	.34	.32

Finally, the third linguistic variable *manner of articulation of the following word's onset* was selected as non-significant by the VARBRUL program, as expressed in the quantitative values in Table 4. Based on the weights assigned to each factor, the manner of articulation of the following consonant does not interfere in the selection of the variants involved in AWRA, because the likelihood that each factor will have an effect on the process is relatively equal. Again, my initial hypothesis that the assimilation phenomenon could be affected by sonority was not confirmed.

(8) Table 4: Manner of articulation and AWRA

	/l/-preservation	AWRA	/l/-deletion
Glide	.35	.32	.33
Liquid	.34	.35	.31
Nasal	.30	.32	.38
Fricative	.34	.33	.33
Other obstruent	.34	.35	.31

An explanation for the fact that segmental properties (i.e. place and manner of articulation) do not seem to affect the outcome of the AWRA process may lie in the prosodization of the elements involved in the process. Most research on sonority/place profile has focused on coda-onset sequences internal to the Prosodic Word, i.e. involving roots and affixes. As was demonstrated in Chapter 3 and (1) above, the AWRA phenomenon is exclusively sensitive to the Phonological Phrase domain, at the juncture of a syllable and the following Prosodic Word. Because the consonant-initial lexical word prosodicizes as a Prosodic Word, the l-C sequence is not contained within this domain. Following the rationale behind the domain-specific constraint approach developed in Chapters 2 and 3 and empirical evidence from AWRA, it seems reasonable to suppose that constraints that apply within the Prosodic Word may not have the same strength in other prosodic domains.

4.2.3.2. Results of the extralinguistic factors

The social dependent variable *level of formality* exhibited a significant effect on the AWRA phenomenon, as can be observed in Table 5.

(9) Table 5: Level of formality and AWRA

	/l/-preservation	AWRA	/l/-deletion
Written	.38	.23	.39
Formal	.41	.36	.23
Informal	.22	.40	.38

Notice that the three variants of AWRA did not behave similarly in the three stylistic levels under consideration: while the informal environment favors less faithful forms (i.e. AWRA and /l/-deletion), a more formal environment favors a more faithful output (i.e. /l/-preservation and AWRA).[12] Contrary to my expectations, the written style favors both the most faithful (i.e. /l/-preservation) and the least faithful (i.e. /l/-deletion) of all three variants, which seems to constitute a counterexample to van Oostendorp's (1997: 209) proposal that "[t]he more formal the style level, the higher ranked the faithfulness constraints." In addition, the less faithful AWRA variant is unexpectedly favored in both the formal (.36) and informal (.40) styles. That AWRA is favored in an informal stylistic

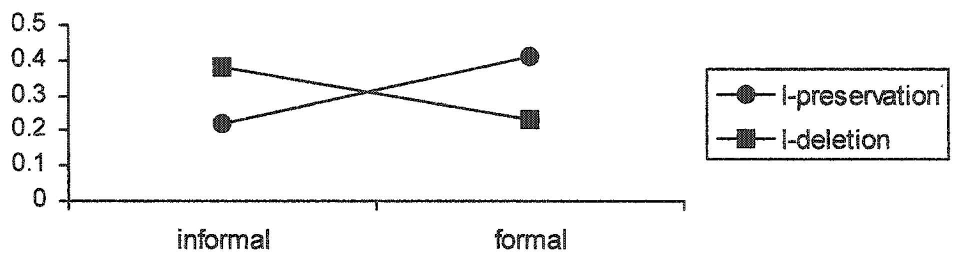
[12] For expository reasons, I consider three degrees of faithfulness: /ʃol fɛt/ → (1) [ʃol fɛt] (/l/-preservation) > (2) [ʃof fɛt] (AWRA) > (3) [ʃo fɛt] (/l/-deletion), in which the first form is more faithful to the input than the second, which is in turn more faithful than the third. Technically, the AWRA variant violates *featural* faithfulness while /l/-deletion violates *segmental* faithfulness.

environment is not surprising; what is surprising, however, is the relative high probability of AWRA occurrence in more formal stylistic contexts.

A viable explanation for the unexpected likelihood of AWRA application in more formal environments is group identity toward the AWRA variant, a characteristic marker of Vimeu Picard. Because of the current revival of Picard in the region of Vimeu (see Chapter 1) and the upward progressive social status it is assuming in a community in which French prevails, some characteristically Picard forms are sometimes overused and, thus, the selection of the AWRA variant may constitute a form of expression of solidarity and a marker of group identity. This clearly seems to be the case for speaker 7, for instance, who curiously produced a higher percentage of AWRA in formal situations (67% AWRA, 19% /l/-deletion and 14% /l/-preservation), and a lower percentage of AWRA in informal situations (26% AWRA, 41% /l/-deletion and 33% /l/-preservation). As for the written style, the result may reflect the fact that, unlike the oral data, the written corpus derives from written documents that span a period of approximately 30 years, and besides, it includes formal as well as informal documentation. Because of the unreliable results achieved for the style "written", I will not take this stylistic factor into consideration in the OT analysis. Nevertheless, the issue requires further investigation.

Focusing on the formal and informal styles separately (and excluding the written style and the variant AWRA), observe the opposite trends for /l/-preservation and /l/-deletion: while /l/-preservation increases as the context becomes more formal, /l/-deletion decreases in the same context; this is illustrated in Figure 2. As I will discuss in section 4.3.2.2, this scenario suggests the existence of different (stylistic) grammars for the AWRA phenomenon. The idea that stylistic levels constitute separate grammars is not an original claim of this investigation: as Van Oostendorp (1997:207) correctly points out, generative phonologists have traditionally taken recourse to the notion "style level" or "register" as separate grammars (e.g. Selkirk 1972, Morris 1998, Boersma 2001).

Figure 2: Formal and informal styles



The second extralinguistic factor speaker was selected as significant by the VARBRUL program. Due to the absence of /l/-preservation (knockout) in the speech of Speaker 9 (0% of /l/-preservation, 98% of AWRA and 2% of /l/-deletion), he was excluded from further probabilistic analyses. The results involving the remaining eight speakers are illustrated in Table 6 below.

(10) Table 6: Probabilities in the speech of eight speakers

	/l/-preservation	**AWRA**	**/l/-deletion**
Speaker 1	.35	.31	.34
Speaker 2	.35	.31	.34
Speaker 3	.30	.30	.40
Speaker 4	32	.28	.40
Speaker 5	.36	.26	.37
Speaker 6	.34	.30	.36
Speaker 7	.30	.45	.25
Speaker 8	.31	.48	.21

Notice that two general patterns can be observed, as indicated by the dotted line between Speakers 6 and 7: one in which all three variants are relatively equally distributed (speakers 1 through 6); and another pattern in which AWRA is favored as opposed to /l/-preservation and /l/-deletion (speakers 7 and 8).

Because of the relevance of the social factor *speaker,* the third social variable *geographic location* should as well constitute a major effect in determining the variants of AWRA, for one factor inherently includes the other. The results for this factor group are illustrated in Table 7.

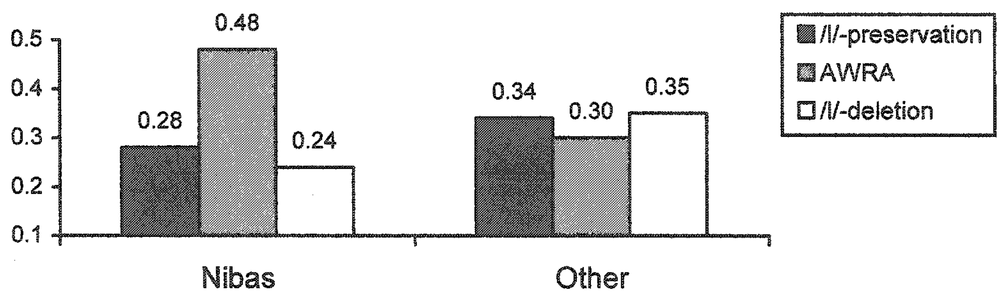
(11) Table 7: Probabilities in five geographic locations

	/l/-preservation	**AWRA**	**/l/-deletion**
Nibas	.28	.48	.24
Feuquières	.31	.30	.39
Fressenneville	.38	.29	.32
Bienfay	.30	.32	.38
Bouillancourt	.38	.30	.32

Observe that in the village of Nibas, the AWRA variant is more likely to appear (.48), while the two other variants are equally distributed (and equally disfavored). In the other villages, on the other hand, each variant is relatively equally expected to occur (average around .33).

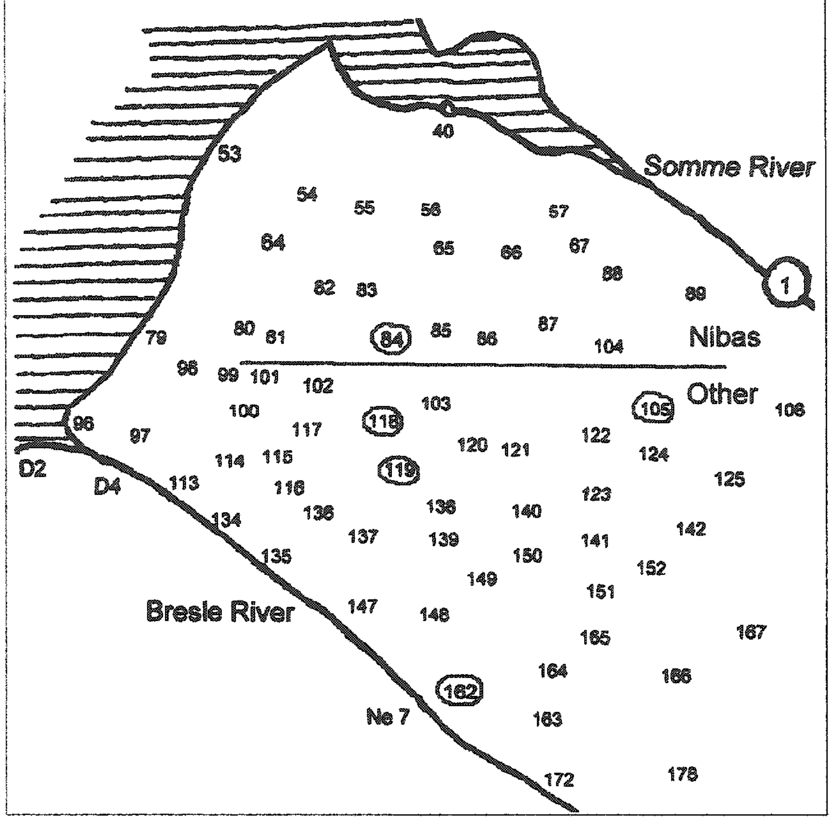
Not surprisingly, this pattern conforms to the facts found in the factor group *speaker*: recall from Table 1 in section 4.2.1 that speakers 7 and 8 are from the village of Nibas while the other speakers are from different locations in Vimeu. For ease of exposition (and because exactly two patterns can be observed), I will regroup this factor group into two major categories: Nibas and Other (including all the remaining villages). The results (in probability) are illustrated in Figure 3.

Figure 3: AWRA and Geographic Location



Some readers could argue, however, that the variation patterns involving the factors *speaker* and *geographic location* merely demonstrate intraspeaker variation, especially in the context of a limited number of tokens and subjects. A brief look at previous studies on regressive assimilation in Picard leads me to conclude that, even though intraspeaker variation is a logical alternative for describing the AWRA phenomenon in the language, more needs to be said about the effect of geographic variation as a determining factor in the results observed above. In the introduction to his *Dictionnaire des parlers picards du Vimeu* and in his grammar *Grammaire des parlers picards du Vimeu (Somme)*, Vasseur (1963:8 and 1996:7-8 respectively) refers to the region in which regressive assimilation applies "always and without exception" as the "region of Nibas". He also acknowledges that assimilation occurs in other regions, but to a lesser extent and sometimes only involving the determiner /ʃol/. Likewise, Debrie (1981:455) observes that regressive assimilation "is concentrated to its maximum intensity in Nibas and in other neighboring villages: 65 [Arrest], 66 [Mons], 86 [Franleu], 87 [Quesnoy] and 122 [Toeufles]" (see Figure 4). It is no coincidence that our results display a relatively similar pattern for the AWRA phenomenon: of the five villages included in this investigation, it is in Nibas that the AWRA variant is more likely to appear. In Figure 4 below (adapted from Dubois 1957), I show the geographic location of the five villages in the region of Vimeu. The numbers that relate to the villages investigated are circled: 84 = Nibas; 105 = Bienfay (which belongs to the commune of Moyenneville); 118 = Fressenneville; 119 = Feuquières; and 162 = Bouillancourt. The straight line on the map indicates an isogloss-like geographical boundary between two probable dialects: one in which AWRA is highly favored (represented by the region of Nibas – 84), and one in which the three variants are equally likely to appear (represented by the other villages).

Figure 4: Five villages in Vimeu (Picardie)



Because the results for both factors *speaker* and *geographic location* along with the discussion above seem to indicate that the influencing factor in the variation pattern involving these two groups is *geographic location*, the variation analysis that I will present is based on the results illustrated in Figure 3. As has been proposed for the analysis of distinct dialectal varieties (e.g. Selkirk 1997, Alber 2001, Boersma 2001), I will argue that these two sets of villages define separate dialects, which are formally represented by two grammars: one for the village of Nibas, in which the AWRA variant is favored as opposed to the other two variants, and one for the other villages in which the three variants are equally predicted.

In order to account for the variation patterns illustrated in this section, the analysis that will be proposed in forthcoming section 4.3 employs the following theoretical tools: (1) crucial nonranking of constraints, in cases in which variation involves *one* specific speech community or register (e.g. the variation patterns in the village of Nibas, in which case AWRA is more likely to occur versus the other two variants); and (2) different grammars, for cases in which variation is determined by dialectal or register differences (e.g. the variation involving the village of Nibas versus the other villages, and the patterns found in the formal and informal registers). Finally, for an account of the idiosyncrasies involving the three sets of clitics included in the investigation, I adopt the morpheme-specific constraint approach (e.g. McCarthy and Prince 1993b, Hammond 1995, Russell 1995, Urbanczyk 1999, Anttila 2000a, among others), which captures morpheme-specific behavior (e.g. while AWRA is more likely to occur within the {ol} group of clitics, it never applies when the clitic involved belongs to the {el} group of clitics), via the use of a single constraint ranking or grammar.

4.3. The analysis

In this section, I propose an OT analysis to account for both the categorical and variable aspects of AWRA in Picard. Before we proceed, recall from previous sections that the output of the AWRA phenomenon consists of three variants: (a) /l/-preservation (e.g. /ʃol kurɛ/ → [ʃo**l** kurɛ] 'the pork paté'), (b) AWRA (e.g. /ʃol kurɛ/ → [ʃo**k** **k**urɛ]), and (c) /l/-deletion (e.g. /ʃol kurɛ/ → [ʃo_ kurɛ]). In addition, recall that what determines the likelihood of each variant to occur is an interaction of linguistic and extralinguistic factors (i.e. *the status of the l-clitic*, *level of formality* and *geographic location*).

In order to account for the categorical and variable aspects of AWRA, I adopt the same set of constraints utilized in the analysis of the phenomenon in Chapter 3, which I repeat below for expository reasons.

(12) Constraint definitions [13]

MAX-IO	Every segment of the input has a correspondent in the output
Linearity	The input reflects the precedence structure of the output, and vice versa
NoCoda-Rt	A Coda cannot license a Root node

Within the domain-specific constraint approach introduced in Chapter 3, I proposed that these three constraints be decomposed into their domain-specific counterparts (e.g. MAX-IO → MAX-IO_{σ}, $\text{MAX-IO}_{\text{PWd}}$, MAX-IO_{ϕ}, etc.) in order to account for the domain-driven alternations found in AWRA: for instance, while regressive assimilation is possible at the σ-PWd domain juncture within the Phonological Phrase (ϕ) (e.g. /ʃol kurɛ/ → $[$**ʃok** $_{\phi}$ **kurɛ**$]_{\text{PPh}}$), it is inapplicable within the Prosodic Word (e.g. /kalfa/ → *$[$**kaffa**$]_{\text{PWd}}$, ✓$[$**kalfa**$]_{\text{PWd}}$). Because this issue has been addressed in Chapter 3, I will not make reference to domain-driven variation in the forthcoming discussions of the AWRA phenomenon. Accordingly, it should be understood, unless otherwise stated, that the upcoming analyses pertain exclusively to the domain in which AWRA operates, i.e. the juncture ϕ.

[13] For a comprehensive discussion of these constraints, see Chapter 3. Due to space limitations, I will only use the constraints MAX-IO, Linearity and NoCoda-Rt in the variation analysis of AWRA. As discussed in section 3.1.3 (Chapter 3), another relevant constraint that predicts the directionality of the assimilation process is FAITH-Lex. Undominated FAITH-Lex prevents cases of progressive assimilation (e.g. /ʃol kurɛ/ → *[ʃol lurɛ] vs. ✓[ʃok kurɛ]) and deletion (e.g. /ʃol kurɛ/ → *[ʃol urɛ]) from the word. Note that there is no variation on this dimension.

4.3.1. The categorical results

In this section, I provide analyses for the categorical results obtained for {el} clitics and for Speaker 9: while the determiner and pronoun /l/ displayed categorical /l/-preservation, Speaker 9 demonstrated categorical results toward the AWRA variant.

4.3.1.1. The determiner and pronoun /l/

The categorical results obtained for the {el} group of clitics may suggest that, due to the similarity between the Picard form /l/ and the French equivalent /lə/,[14] these results might have been affected by code-switching to the French grammar in which AWRA and /l/-deletion (in the determiner and pronoun /lə/) do not occur, and the French form surfaces. I am not denying the possibility of code-switching affecting some of the results obtained in this study. In the context of the present investigation, however, this hypothesis can be easily disqualified because code-switching is not a phenomenon that operates within any arbitrary domain – it is grammatically conditioned (Myers-Scotton 1997, Hammink 2000).[15] Besides, if code-switching were interfering with these results, one would still expect the variants AWRA and /l/-deletion to surface at times, a pattern that has not been systematically observed.

The most likely explanation for the categorical non-application of /l/-deletion and AWRA to this set of clitics is their segmental shape: being monosegmental morphemes,

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[14] The similarity between Picard [l] and French [lə] is even more striking in cases of vocalic hiatus in French. In such instances, the vowel from the French clitic is deleted (i.e. /lə ivɛr/ → [li.vɛr] 'the winter') and the output becomes similar to the one found in Picard, especially if the clitic /l/ is preceded by a vowel-final word (i.e. /tu l iver/ → [tu.li.ver] 'all winter').

[15] For instance, it is very unlikely that Picard speakers would code-switch to French between a vowel-final word and the following (vowel-initial) clitic, since intrasentential code-switching applies at higher morphosyntactic levels (e.g. at clausal and phrasal boundaries).

the deletion or assimilation of the only segment (i.e. /l/) in the morpheme would leave no trace of the clitic. Following from this, Picard opts for the preservation of /l/ and all of its features in order to maintain semantic content. Its presence, therefore, is forced by a functional constraint that requires that monosegmental morphemes be preserved in the output. This behavior can be captured by a more general version of the constraint MAX-MS (Schuh 1995 and Casali 1997), introduced in Chapter 3: FAITH-MS. FAITH-MS requires that the outputs of monosegmental morphemes be identical to their inputs, and are thus violated in cases of /l/-deletion or AWRA.[16] Assuming that FAITH-MS is highly ranked in Picard, we can account for both the absence of /l/-deletion and AWRA (represented by candidates (14a) and (14c) respectively) when the monosegmental clitic /l/ is involved. Note that the ranking in (14) is based on the one established for AWRA in Chapter 3.

(13) FAITH-MS

The output of a monosegmental morpheme is faithful to its input.

(14) Tableau 1: Monosegmental /l/ and categorical /l/-preservation

	/l fis/	FAITH-MS	NoCoda-Rt	Max-IO	Linearity
	(a) fis	*!	*	*	
☞	(b) l.fis		**		
	(c) f.fis	*!	*		*

[16] I have adopted the more general version of FAITH-MS for convenience. It should be understood that FAITH-MS encompasses all faithfulness constraints, e.g. Linearity-MS, MAX-MS, DEP-MS, Integrity-MS, etc.

4.3.1.2. Speaker 9

The second factor that did not present variation in the AWRA investigation was that represented by Speaker 9's corpus. The results observed for this speaker (98% of AWRA, 2% of /l/-deletion and 0% of /l/-preservation) point in the direction of a categorical grammar, where only one output, AWRA, is expected. Recall that Speaker 9's data come exclusively from the most formal level in the stylistic hierarchy adopted in this study, i.e. written. Since different styles have been argued to constitute separate grammars (e.g. Selkirk 1972, van Oostendorp 1997, Morris 1998; see also discussion in 4.2.3.2 above), it is reasonable to assume that the results obtained for Speaker 9 characterize a distinct grammar.

As mentioned in note 6, one could argue that the absence of variation in Speaker 9's corpus is a consequence of the fact that only written data were collected from this speaker. A closer look at the overall results, however, suggests that there is something particular about Speaker 9, since no other speaker presented such a great discrepancy between the three output forms found in written material. This can be seen in the results of the stylistic level *written* in which the distribution of each variant's occurrence is relatively similar for Speakers 1-8: 36% of /l/-preservation, 32% of AWRA and 32% of /l/-deletion – see Appendix 2.

The results obtained for Speaker 9 (i.e. categorical AWRA) coincide with the preliminary analysis conducted for the AWRA phenomenon in Chapter 3. For the sake of exposition, I provide below the constraint ranking responsible for the AWRA variant (with the addition of FAITH-MS) and the corresponding tableau that illustrates how the optimal variant is selected among the competing forms.

(15) Speaker 9 - a categorical grammar

FAITH-MS >> NoCoda-Rt, Max-IO >> Linearity

(16) Tableau 2: AWRA in Speaker 9's grammar

	/ʃol kurɛ/	FAITH-MS	NoCoda-Rt	MAX-IO	Linearity
	(a) ʃol . kurɛ		*!		
	(b) ʃo . kurɛ			*!	
☞	(c) ʃok . kurɛ				*

To conclude, the categorical results obtained for both {el} clitics and Speaker 9 (/l/-preservation and AWRA respectively) result from the interaction of a set of constraints whose crucial ranking yields only one output. In the following section, I will argue for a different type of constraint ranking to account for variation in AWRA. I will demonstrate that the distinction between categorical and variable phenomena lies in the demands that a variation grammar imposes on ranking, namely the crucial nonranking of constraints (cf. ranking that is crucial, e.g. FAITH-MS >> NoCoda-Rt; and ranking that is indeterminate, e.g. NoCoda-Rt, MAX-IO in (15)).

4.3.2. The results of variation

In this section, I introduce the topic of how variation can be analyzed in the framework of Optimality Theory. Subsequently, I will provide an analysis for the variable results obtained for the AWRA phenomenon.

4.3.2.1. Variation in Optimality Theory

Prior to the advent of Optimality Theory, variable phenomena such as AWRA were usually expressed in SPE format.[17] Within this approach, variability was formally represented by angled brackets either surrounding the output of the rule (e.g. X → <Y> / A _), or both the output and the environment (e.g. X → <Y> / <A> _) (e.g. Labov 1969, 1972, Cedergren and Sankoff 1974, Sankoff 1978; see also Guy 1975 for the use and application of the variable rule program). The convention for encoding the quantitative aspects of each conditioning factor was to put the overall and variable weightings in a table, somewhat similar to what was done in section 4.2.3 and in Appendix 2.

In the context of variation in AWRA, the inability of the rule-based approach to allow for the possibility of more than two variants or outputs without the postulation of more than one rule is a serious limitation of the approach. In the case of AWRA in Nibas, for instance, two rules would be required to describe the process, i.e. (1) /l/ → <C_i> / _C_i (AWRA), and (2) /l/ → <∅> / _C (/l/-deletion), each containing the respective linguistic and/or extralinguistic environments that favor the occurrence of each variant involved in the AWRA phenomenon. Since these two rules, like any two rules, are formally independent from each other, the observation that there are three variants in AWRA,

[17] For a historical perspective on the treatment of variation in phonological theory, see Reynolds (1994).

rather than the two illustrated above (each of which alternates with /l/-preservation), is not adequately captured (for a critique of the rule-based approach from a variationist perspective, see De Jong 1989, Dittmar 1996, Fasold 1996, and Bergen 2000).

In brief, I adopt OT for the analysis of variation in AWRA because: (a) as discussed above, the framework allows for multiple outputs within a single grammar through crucial nonranking of constraints (Reynolds 1994, Anttila 1997), without the need to resort to separate rankings or rules for each distinct output. Consequently, an OT-based analysis is able to account for the distinction between a categorical (i.e. crucially ranked) and a variable (i.e. crucially unranked) grammar: the distinction is in the form of the grammar; (b) it is capable of expressing, via constraint ranking, when a certain factor or environment favors or does not favor the application of a phonological process; and (c) it allows for quantitative values to be directly encoded in (and therefore predicted by) the grammar via nonranking of constraints (see forthcoming discussions for the mechanisms involved).

Optimality Theory emerged in the early 1990s abolishing rules in favor of constraints and constraint interaction. While not being designed for the investigation of variation, the notion of crucial nonranking of constraints can easily be expressed within this framework by a mere weakening of the OT hypothesis that there is a total order of domination on the constraint set (Prince and Smolensky 1993) (see forthcoming discussions). By allowing a set of constraints to remain crucially unranked in a grammar, we are able to express variation via a single constraint ranking.

The first account of variation within the OT framework was proposed by Kiparsky (1993). Within Kiparsky's approach, which follows a stricter view of constraint domination (i.e. a view in which constraints are crucially ranked), variation is seen as a result of competing grammars (or distinct constraint rankings). For instance, in order to account for t/d deletion in English, he assigns a separate constraint ranking for each set of environments favoring the application of the phenomenon.[18] Adapting Kiparsky's approach to the AWRA context, his view would require the assignment of three separate grammars to account for the variation patterns encountered in the village of Nibas:[19]

(17) Kiparsky's approach to variation and AWRA in Nibas

Grammars (constraint rankings)		**Output**
(a) MAX-IO, Linearity >> NoCoda-Rt	→	/l/-preservation
(b) MAX-IO, NoCoda-Rt >> Linearity	→	AWRA
(c) Linearity, NoCoda-Rt >> MAX-IO	→	/l/-deletion

Recall from Chapter 2 that Kiparsky's approach to variation resembles the cophonology approach, which also appeals to separate grammars to account for different types of variation (e.g. those triggered by different morphological or prosodic constituents, by a class of specific morphemes). Consequently, his approach inherits one of the shortcomings of the use cophonologies, namely, the proliferation of grammars. Furthermore, Kiparsky's approach to variation is unable to predict the likelihood of occurrence of each variant involved in AWRA. Based on the rankings shown in (17), each variant of AWRA is equally likely to appear, which is inconsistent with the results

[18] See Reynolds (1994) for a comprehensive discussion and critical assessment of Kiparsky's analysis of t/d deletion in English.

[19] The constraints between commas should not be interpreted as crucially unranked. Recall that in standard OT, the nonranking of these constraints indicates that the ranking is indeterminate.

illustrated in section 4.2.3: AWRA is more likely to apply (.48) than the other two variants (.28 and .24 for /l/-preservation and /l/-deletion respectively).

In an effort to account for variation by assuming the existence of a single grammar, Reynolds (1994) and Anttila (1997, previously 1995 ms.) pursued an idea hinted at by Prince and Smolensky (1993) in a footnote, about the possibility of crucial nonranking of constraints. In the early stages of OT, it was not evident why the crucial nonranking of constraints, an essential assumption for the concept that variation can be encoded within a single grammar, should be tolerated in a framework that advocates a *strict dominance hierarchy* (i.e. that each constraint must have absolute priority over all the constraints lower in the hierarchy):

> It is entirely conceivable that the grammar should recognize nonranking of pairs of constraints, but this opens up the possibility of *crucial* nonranking (neither can dominate the other; both rankings are allowed), for which we have not yet found evidence (Prince and Smolensky 1993:51).

In the context of constraint ranking in OT, there could exist a situation in which a constraint set imposes crucial non-dominance (i.e. nonranking) of its components. When a given grammar is unable to categorically yield one of two or more rankings allowed by a set of constraints, the result is the possibility of two or more acceptable forms or outputs in that grammar, i.e. variation per se.

Based on the notion of crucial nonranking, two different proposals have been made in the OT literature: (1) Reynolds' (1994) floating constraint approach; and (2) Anttila's (1997) partial ranking of constraints approach.[20]

In Reynolds' view, a variation grammar consists of variably ranked constraints (or *floating* constraints, using the author's terminology). In this approach, the grammar is defined by a single constraint hierarchy in which one or more constraints may float with respect to another constraint or set of constraints. For example, in a constraint set (call it S), some subset S' may float with respect to some other subset S''. Within each subset, constraints may float with respect to each other, as is the case in subset S'' below.

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[20] An alternative approach to variation that I have not yet explored in much detail was proposed by Boersma (1997, 1998, 2000) and Boersma and Hayes (2001): the Gradual Learning Algorithm (GLA), a stochastic version of OT. GLA is an extended version of Tesar and Smolensky's (1998) Constraint Demotion Algorithm, which was not originally designed to handle variation. Within the GLA approach, variation (i.e. "gradient well-formedness") is accounted for by a probabilistically determined reranking of constraints at certain intervals during evaluation time (i.e. during the process of speaking). Briefly, the GLA model postulates a continuous scale of constraint strictness in which constraints (e.g. Con_1 and Con_2) are annotated with arbitrary numerical strictness values. The probability of reranking (i.e. variation) is determined by the distance between Con_1 and Con_2 on the strictness scale and by the amount of evaluation noise (i.e. standard deviation, typically 2.0) added to the strictness values. This way, constraints not only dominate other constraints (as is the case in standard OT), but they are also specific distances apart. The two figures below illustrate the distinction between a categorical grammar (in which *crucially ranked* constraints are distant) and a variable one (in which *crucially ranked* constraints overlap) (the dotted gray area in Figure B indicates the area in which Con_1 and Con_2 overlap).

Figure A: Categorical ranking

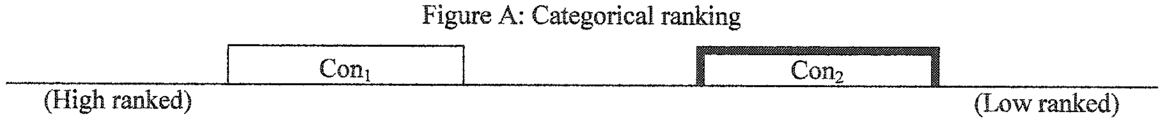
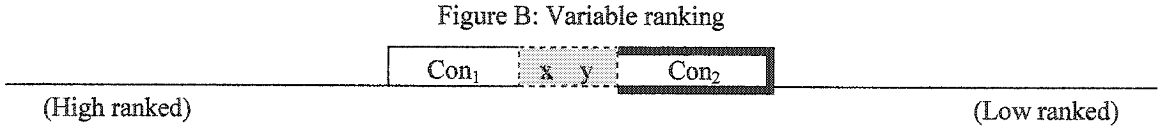


Figure B: Variable ranking



In the context of a variable ranking, as shown in Figure B, the grammar might select any point within the overlap of Con_1 and Con_2. Most likely, the grammar will select the ranking $Con_1 >> Con_2$ because of the higher ranking of Con_1 over Con_2. However, it is also possible for the grammar to select a point within the leftmost (higher ranked) area of Con_2 (i.e. x in Figure B) and the rightmost (lower ranked) area of Con_1 (i.e. y in Figure B). In this case, Con_2 (x) is ranked higher than Con_1 (y) and a different candidate is selected.

(18) Reynolds' floating constraints[21]

$\{A \gg \{\{B\}_{S'}\ \{C\ D\}_{S''}\} \gg E\}_S$

From the number of rankings allowed by a set of variably ranked constraints, distinct outputs can be predicted. For instance, from the variable ranking of S' and S" above, four different rankings and therefore potentially different outputs are expected:

(19) A	>>	**B**	>>	C	>>	D	>>	E
A	>>	**B**	>>	D	>>	C	>>	E
A	>>	C	>>	D	>>	**B**	>>	E
A	>>	D	>>	C	>>	**B**	>>	E

Anttila (1997) demonstrates that the probability of each variant's occurrence is the result of the number of rankings for which each variant wins, divided by the total number or rankings (or tableaux) generated by the variably ranked constraints.

(20) Variant probabilistic prediction (Anttila 1997)

(a) A candidate is predicted by the grammar iff it wins in some tableaux.

(b) If a candidate wins in *n* tableaux and *t* is the total number of tableaux, then the candidate's probability of occurrence is *n/t*.

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[21] This is a simplified (and I believe clearer) version of Reynolds' (1994) original illustration for floating constraints. As originally stated,

> … a particular constraint X may be classified as being ranked somewhere within a certain range lying between two other constraints W and Z, without specifying its exact ranking relative to a certain other constraint Y (or constraints Y_1, Y_2, etc.) which also falls between W and Z.

…………………ConX………………

ConW >> $ConY_1 \gg ConY_2 \gg \ldots \gg ConY_n$ >> ConZ

To illustrate, suppose that in a given grammar, GRAM, two constraints B and C float with respect to each other. This is indicated by the semi-colon (to distinguish crucial non-ranking from cases of indeterminate ranking, indicated by a comma) between the two constraints involved, with the curly brackets delimiting the set of floating constraints. As a result, two different rankings are possible:

(21) A variably ranked grammar

(a) Constraint ranking: A >> {B; C} >> D

(b) Possibilities of rankings:
- A >> **B** >> **C** >> D
- A >> **C** >> **B** >> D

Imagine that two optimal forms are possible in GRAM, i.e. $Cand_1$ and $Cand_2$. $Cand_1$ is selected when B is ranked higher than C, while $Cand_2$ is selected in the reverse situation. This is illustrated in the two tableaux below.

(22) Tableau 3: Variation in GRAM

Tableau (a) = A >> B >> C >> D

	A	B	C	D
☞ $Cand_1$			*	
$Cand_2$		*!		

Tableau (b) = A >> C >> B >> D

	A	C	B	D
$Cand_1$		*!		
☞ $Cand_2$			*	

Following Anttila's (1997) variant probabilistic prediction, the variable ranking of constraints B and C results in a pattern in which two outputs are possible, and the probability of each output occurrence can be predicted by (20). For example, candidates 1 and 2 in (22) win in exactly one tableau each (*n*=1), and two is the total number of tableaux (*t*=2). $n/t = 1/2 = 0.5$ or 50%. Each candidate's probability of occurrence is thus 0.5 and each variant is likely to occur 50% of the time in the same grammar.

The constraint ranking in (21a) and the tableaux in (22) emphasize a crucial distinction in the context of variation in OT, i.e. the distinction between grammars and tableaux. While in (21a) one ranking or grammar yields two tableaux and consequently two outputs (see Tableau 3 in (22)), a categorical grammar such as the one argued for Speaker 9 in (15) yields only one tableau and consequently only one output (i.e. no variation).

Reynolds' approach to variation can be straightforwardly applied to the investigation of AWRA.[22] For instance, to account for the variation patterns observed in the village of Nibas (where AWRA is more likely to apply (.48) than /l/-preservation or /l/-deletion – .28 and .24 respectively), two subsets of domain-specific floating constraints would be required:

(23) Floating constraints and AWRA (Village of Nibas)

{ { MAX-IO$_\Phi$; NoCoda-Rt$_\Phi$}; Linearity$_\Phi$ }

The hierarchy in (23) yields four rankings, two of which select AWRA as the optimal candidate, while the other two rankings select either /l/-preservation or /l/-deletion as the output. The application of Anttila's (1997) variant probability prediction (*n/t*) in (20) yields probabilistic results that tightly match the ones observed in the village of Nibas.

[22] In fact, I have adopted Reynolds' floating constraints approach for the analysis of variation in AWRA in an earlier version of this investigation (see Cardoso 2001a).

(24) Floating constraints: output selection for Nibas

Possible Rankings	Output	Observed	Predicted
MAX-IO >> NoCoda-Rt >> Linearity NoCoda-Rt >> MAX-IO >> Linearity	AWRA AWRA	.48	2/4 = .5
Linearity >> MAX-IO >> NoCoda-Rt	/l/-preservation	.28	1/4 = .25
Linearity >> NoCoda-Rt >> MAX-IO	/l/-deletion	.24	1/4 = .25

In sum, from an empirical perspective, Reynolds' approach can satisfactorily account for the AWRA phenomenon in Picard, as indicated above. However, the approach is flawed from a conceptual perspective.[23] Most importantly, the model is too permissive in the possibilities of rankings allowed within the grammar. For instance, to account for a variation pattern in which four constraints (A, B, C, D) interact to yield two distinct variants (X, Y), several possibilities of rankings (from which I include only five) are possible within Reynolds' approach (assume that X violates A and B, while Y violates C and D) (adapted from Taler 1997):

(25) Reynolds' floating constraint approach: a permissive model

Possible Constraint Rankings: *several*	Predictability *(n/t)*
a. { A; B; C; D }	X = .5; Y = .5
b. { { A; B }; { C; D } }	X = .5; Y = .5
c. { { A; C }; { B; D } }	X = .5; Y = .5
d. { { A; B >> C }; D }	X = .5; Y = .5
e. { { B; A >> C }; D }	X = .5; Y = .5

The second approach to variation was proposed by Anttila (1997). Instead of the use of sets of floating constraints, each of which may contain one or more constraints (see

[23] For a comprehensive discussion of the empirical and conceptual flaws of the floating constraints approach, see Taler (1997).

(18) and (25b-e)), Anttila's model accounts for variation by means of a more restricted version of crucial nonranking. In his approach, the only partial rankings allowed are those composed of single constraints. For instance, to account for the variation pattern illustrated in (25), only the crucial nonranking of all of the constraints A, B, C and D (i.e. (25a)) is permitted in an Anttila-like approach.

(26) Anttila's partial ranking of constraints approach: a constrained model

Possible Constraint Rankings: ***1***	**Predictability** ***(n/t)***
{ A; B; C; D }	X = .5; Y = .5

Comparing the options that are possible in the two approaches, Anttila's is more advantageous for the analysis of variation. Firstly, Anttila's model is more constrained because it is less permissive on the possibilities of rankings allowed by the grammar. In fact, Anttila's approach constitutes a subset of Reynolds' (compare (25) and (26) above). Secondly, Reynolds' model presents problems from a learnability perspective because the range of options that the language learner will entertain when confronted with the numerous ranking possibilities that his model predicts is too vast. In other words, the hypothesis space in Reynolds' approach is too large in comparison to Anttila's in (26).

A desirable effect of Anttila's approach in comparison to Reynolds' is that it reinforces the notion that different rankings produce different results. More importantly, his model determines the shape of a variable grammar – a partial order composed exclusively of unranked constraints. For the aforementioned reasons, I will adopt Anttila's approach to investigate the variation patterns of AWRA in Picard.

4.3.2.2. The grammar of variation

In this section, I present the OT analysis for the variation aspect of the AWRA phenomenon. As previously discussed, two extralinguistic factors were selected as significant by the VARBRUL program: *geographic location* and *level of formality*, while the independent variable *status of the l-clitic* was the only one selected amongst the linguistic factor groups.

(a) Geographic location

The first significant factor group in the AWRA investigation is *geographic location*, according to which two distinct patterns could easily be delineated: while AWRA, /l/-preservation and /l/-deletion are all equally expected to occur in the villages of Feuquières, Fressenneville, Bienfay and Bouillancourt ("Other" henceforth), in the region of Nibas, the AWRA variant is more likely to appear with the two other variants being equally distributed (and equally disfavored). The probabilistic results are reproduced below for convenience:

(27) Table 8: AWRA in Other and Nibas

	/l/-preservation	**AWRA**	**/l/-deletion**
Other	.34	.30	.35
Nibas	.28	.48	.24

To account for the disparity of results observed involving the factor *geographic location*, I propose the two distinct variable grammars below, composed of domain-specific constraints: (1) one grammar for Other, in which the nonranking of three constraints yields 6 tableaux; and (2) one grammar for the village of Nibas, in which the crucial nonranking of five constraints yields 120 tableaux. As mentioned in section 4.2.3.2, the proposal that regional varieties or dialects must constitute different grammars is not innovative to this work. Several authors have argued that the difference between two or more dialects amounts to a difference in constraint ranking, i.e. a difference in grammars (e.g. Selkirk 1997, Rose 1997, Oostendorp 1997, Alber 2001, Boersma 2001).

(28) Geographic location and AWRA

a. Other Grammar (speakers 1–6):

{ MAX-IO$_\phi$; NoCoda-Rt$_\phi$; Linearity$_\phi$ } >> MAX-IO, NoCoda-Rt, Linearity

b. Nibas Grammar (speakers 7–8):[24]

{ MAX-IO$_\phi$; MAX-IO; NoCoda-Rt$_\phi$; NoCoda-Rt; Linearity$_\phi$ } >> Linearity

Following Anttila's (1997) notion of crucial nonranking, the distinct behavior observed in the two sets of villages can be accounted for if we assume that the variation patterns in Other and Nibas are the result of the crucial nonranking of the relevant constraints involved in each geographic region: in the constraint ranking responsible for

[24] Comparing the set of variably-ranked constraints in the Reynolds-like grammar in (23) ({{MAX-IO$_\phi$; NoCoda-Rt$_\phi$}; Linearity$_\phi$}) to the one that I propose in (28b) ({MAX-IO$_\phi$; MAX-IO; NoCoda-Rt$_\phi$; NoCoda-Rt; Linearity$_\phi$}), it appears that Reynolds' approach is more constrained because it accounts for the same pattern of variation without the need to resort to redundant constraints, i.e. to two versions of the same constraint that differ in domain specification such as MAX-IO$_\phi$ and MAX-IO. While this is true in the particular case of Nibas, in other contexts, the two approaches require exactly the same set of constraints. For instance, in my earlier investigation of AWRA adopting Reynolds' approach (Cardoso 2001a), I arrive at a variable grammar that is indistinguishable from the one adopted in the present study to account for the variation that characterizes the formal stylistic register in Picard (see forthcoming (35b), i.e. { MAX-IO$_\phi$; MAX-IO; NoCoda$_\phi$; Linearity$_\phi$} >> …). The selection of each of these approaches, thus, comes at a cost: while Reynolds' can *sometimes* restrict the types of constraints that appear in a variable grammar, the approach is too permissive in the possibilities of rankings allowed to capture a single variable phenomenon (see section 4.3.2.1). Anttila's approach, on the other hand, restricts the shape of the grammar (see section 4.3.2.1), sometimes at the expense of having to add what appear to be redundant constraints to the ranking.

the output in Other (28a), the three constraints MAX-IO$_{\phi}$, NoCoda-Rt$_{\phi}$ and Linearity$_{\phi}$ are all crucially unranked with respect to each other; in the village of Nibas (28b), on the other hand, the expected variable patterns result from the crucial nonranking of five constraints, i.e. MAX-IO$_{\phi}$, MAX-IO, NoCoda-Rt$_{\phi}$, NoCoda-Rt and Linearity$_{\phi}$.

Recall from Chapter 3 that the decomposition of MAX-IO, Linearity and NoCoda-Rt into the domain-specific constraints included in the hierarchy of these two sets of villages was not motivated for the purpose of probability matching: the adoption of these constraints is required by the analysis of AWRA and other domain-sensitive phenomena in Picard (see Chapter 3). Thus, probability matching is achieved in this investigation via crucial nonranking of (well-motivated) constraints. In the case of Nibas, for instance, the absence of the more general Linearity from the set of crucially unranked constraints (and its low ranking) in (28b) yields a pattern in which AWRA is more likely to be the outcome than the other two variants. According to the results in (27), this is correct for Nibas.

The application of Anttila's variant probability prediction in (20) yields the results illustrated in Table 9. Observe that under each variant, the left column indicates the predicted probability of each variant's occurrence, calculated by *n/t*, and the parenthesized numbers illustrate the number of rankings (or tableaux) for each subset of villages (i.e. Other or Nibas) in which that candidate is the winner.[25] The values in the right column, on the other hand, indicate the actual probability observed for each variant (from Table 8 in (27)).

[25] The tableaux merely illustrate the number of rankings allowed by a set of constraints. What is crucial in the analysis is the number of possible rankings produced by the crucially unranked constraint set.

(29) Table 9: Predicted & observed probability of variant occurrence by geographic location

Geographic location	Total # of tableaux	/l/-preservation		AWRA		/l/-deletion	
		Predicted	Observed	Predicted	Observed	Predicted	Observed
Other Grammar	06	.33 (02)	.34	.33 (02)	.30	.33 (02)	.35
Nibas Grammar	120	.23 (28)	.28	.53 (64)	.48	.23 (28)	.24

For illustrative purposes, I will now demonstrate how the ranking responsible for the results in Other determines the selection of each of the three variants involved in the AWRA phenomenon, and predicts the probability of each variant to occur 33% of the time in the same grammar. According to Table 9, the crucial nonranking of MAX-IO$_{\phi}$, NoCoda-Rt$_{\phi}$ and Linearity$_{\phi}$ yields six rankings. From these, two rankings yield the /l/-faithful candidate (i.e. /l/-preservation) (*t/n* → 2/6 = .33) because NoCoda-Rt$_{\phi}$ is dominated; two rankings result in the selection of the AWRA candidate (*t/n* →2/6 = .33), due to the low ranking of Linearity$_{\phi}$; while the remaining two rankings result in /l/-deletion (*t/n* → 2/6 = .33) because MAX-IO$_{\phi}$ is dominated. Below, I illustrate the corresponding rankings and tableaux for each variant selected by the variable ranking established for Other.

(30) Table 10: Variable output selection for Other

Constraint Set: { MAX-IO$_\phi$; NoCoda-Rt$_\phi$; Linearity$_\phi$ } >> …

• **Corresponding Tableaux: 6**	**OUTPUT SELECTION**		
	/l/-pres.	**AWRA**	**/l/-del.**
a. NoCoda-Rt$_\phi$ dominated:			
Linearity$_\phi$ >> MAX-IO$_\phi$ >> NoCoda-Rt$_\phi$	✓		
MAX-IO$_\phi$ >> Linearity$_\phi$ >> NoCoda-Rt$_\phi$	✓		
b. Linearity$_\phi$ dominated:			
MAX-IO$_\phi$ >> NoCoda-Rt$_\phi$ >> Linearity$_\phi$		✓	
NoCoda-Rt$_\phi$ >> MAX-IO$_\phi$ >> Linearity$_\phi$		✓	
c. MAX-IO$_\phi$ dominated:			
Linearity$_\phi$ >> NoCoda-Rt$_\phi$ >> MAX-IO$_\phi$			✓
NoCoda-Rt$_\phi$ >> Linearity$_\phi$ >> MAX-IO$_\phi$			✓

(31) Tableau 4: /l/-preservation, rankings in (30a)

	/ʃol kurɛ/	Linearity$_\phi$	MAX-IO$_\phi$	NoCoda-Rt$_\phi$
☞	(a) ʃol . kurɛ			*
	(b) ʃo . kurɛ		*!	
	(c) ʃok . kurɛ	*!		

	/ʃol kurɛ/	MAX-IO$_\phi$	Linearity$_\phi$	NoCoda-Rt$_\phi$
☞	(a) ʃol . kurɛ			*
	(b) ʃo . kurɛ	*!		
	(c) ʃok . kurɛ		*!	

(32) Tableau 5: AWRA, rankings in (30b)

	/ʃol kurɛ/	MAX-IO$_\phi$	NoCoda-Rt$_\phi$	Linearity$_\phi$
	(a) ʃol . kurɛ		*!	
	(b) ʃo . kurɛ	*!		
☞	(c) ʃok . kurɛ			*

		NoCoda-Rt$_\phi$	MAX-IO$_\phi$	Linearity$_\phi$
	(a) ʃol . kurɛ	*!		
	(b) ʃo . kurɛ		*!	
☞	(c) ʃok . kurɛ			*

(33) Tableau 6: /l/-deletion, rankings in (30c)

	/ʃol kurɛ/	Linearity$_\phi$	NoCoda-Rt$_\phi$	MAX-IO$_\phi$
	(a) ʃol . kurɛ		*!	
☞	(b) ʃo . kurɛ			*
	(c) ʃok . kurɛ	*!		

	/ʃol kurɛ/	NoCoda-Rt$_\phi$	Linearity$_\phi$	MAX-IO$_\phi$
	(a) ʃol . kurɛ	*!		
☞	(b) ʃo . kurɛ			*
	(c) ʃok . kurɛ		*!	

In sum, the crucial nonranking of the constraints MAX-IO$_\phi$, NoCoda-Rt$_\phi$ and Linearity$_\phi$ in the grammar assigned for Other results in a pattern in which each of the three variants of the AWRA phenomenon is equally expected to surface (probability .33). In the grammar assigned for Nibas, on the other hand, the crucial nonranking of the constraints MAX-IO$_\phi$, MAX-IO, NoCoda-Rt$_\phi$, NoCoda-Rt, and Linearity$_\phi$ yields a pattern in which the variant AWRA is more often favored (.53) in relation to the other variants (.23 for both /l/-preservation and /l/-deletion).[26] As shown in Table 9, the predictions made here closely correspond to the observed results.

(b) Level of formality

The second significant factor group selected by the VARBRUL program was *level of formality*. The probabilistic results indicate a pattern in which /l/-deletion as well as the AWRA variant is favored in more informal environments, while /l/-preservation

[26] For space limitations, I will not discuss how the 120 tableaux (generated by the crucial nonranking of MAX-IO$_\phi$, MAX-IO, NoCoda-Rt$_\phi$, NoCoda-Rt, and Linearity$_\phi$ in the grammar of Nibas) yield a pattern in which AWRA is more likely to occur than /l/-preservation and /l/-deletion.

along with AWRA is favored as the context becomes more formal. The results are reproduced below for convenience.

(34) Table 11: Level of formality and AWRA

	/l/-preservation	**AWRA**	**/l/-deletion**
Informal	.22	.40	.38
Formal	.41	.36	.23

In order to account for these variation patterns, I propose the constraint rankings in (35) for each of the stylistic levels investigated. Note that in the informal grammar, the number of faithfulness (i.e. MAX-IO$_{\phi}$ and Linearity$_{\phi}$) and markedness constraints (i.e. NoCoda-Rt$_{\phi}$ and NoCoda-Rt) is equal within the set of unranked constraints. In the Formal grammar, however, the crucially unranked hierarchy is composed of three faithfulness constraints (i.e. MAX-IO$_{\phi}$, MAX-IO and Linearity$_{\phi}$) and only one constraint on markedness (i.e. NoCoda-Rt$_{\phi}$). Considering that speakers are more concerned with the listener's perception in formal situations, it is reasonable to establish that faithfulness constraints predominate in such contexts for the convenience of the addressee (see also van Oostendorp 1997 and Taler 1997 for a similar view); in less formal situations, however, the fact that they become less prominent is not surprising.

(35) Level of formality and AWRA

---

a. Informal Grammar:

{ MAX-IO$_{\phi}$; NoCoda-Rt$_{\phi}$; NoCoda-Rt; Linearity$_{\phi}$ } >> MAX-IO, Linearity

---

b. Formal Grammar:

{ MAX-IO$_{\phi}$; MAX-IO; NoCoda-Rt$_{\phi}$; Linearity$_{\phi}$ } >> NoCoda-Rt, Linearity

---

Observe in (35) that I adopt two distinct grammars to account for variation determined by level of formality. Along the lines of Selkirk 1972, van Oostendorp 1997, Morris 1998, and Boersma 2001 (see also section 4.2.3.2), I assume that each stylistic level constitutes a discrete grammar between which Picard speakers code-switch according to the context of the discourse. In the context of AWRA in Picard, recall from Figure 2 in section 4.2.3 that the two patterns observed for the informal and formal styles are the inverse of one another on the /l/-preservation and /l/-deletion dimension. As mentioned previously, this suggests the existence of two distinct grammars: one in which /l/-preservation is favored (formal), and one in which /l/-deletion is favored (informal).

The application of Anttila's variant probability prediction *n/t* in (20) results in the numerical values illustrated in Table 12 below. Observe that the values provided by VARBRUL closely correspond to the ones predicted by the crucial nonranking of the constraints in each stylistic level.

(36) Table 12: Predicted & observed probability of variant occurrence by level of formality

Level of Formality	Total # of tableaux	/l/-preservation		AWRA		/l/-deletion	
		Predicted	Observed	Predicted	Observed	Predicted	Observed
Informal Grammar	24	.17 (04)	.22	.42 (10)	.40	.42 (10)	.38
Formal Grammar	24	.42 (10)	.41	.42 (10)	.36	.17 (04)	.23

(c) Status of the l-clitic

The only linguistic factor group selected as significant by VARBRUL was the *status of the l-clitic*. According to the results, the six clitics included in this investigation can be grouped into three classes according to their behavior with respect to the AWRA phenomenon: (1) those in which /l/-preservation is categorically expected (discussed in sections 4.2.3.1 and 4.3.1.1), i.e. the determiner and complement pronoun /l/ (Group {el}); (2) those in which AWRA is highly favored and the two other variants are equally less favored, i.e. the determiner /ʃol/ and the preposition /dol/ (Group {ol}); and (3) those in which /l/-preservation and /l/-deletion are equally highly favored, while AWRA is less likely to occur, i.e. the pronoun and preposition /al/ (Group {al}). The numerical results for the {ol} and {al} groups of clitics are illustrated below:

(37) Table 13: Status of l-clitics and AWRA

Clitic status	/l/-preservation	AWRA	/l/-deletion
Group {ol}	.21	.56	.23
Group {al}	.43	.17	.41

Recall from section 4.3.1.1 that for the analysis of categorical /l/-preservation for the {el} group of clitics, I proposed a ranking in which FAITH-MS is ranked above MAX-IO and NoCoda-Rt, and Linearity is dominated. If the same ranking is adopted for the analysis of the {ol} and {al} groups of clitics, the result will be the categorical selection of the AWRA variant, shown in (38). This output, however, does not correspond to the variable results illustrated in (37).

(38) Tableau 2: Incorrect results for {ol} group of clitics:

	/ʃol kurɛ/	FAITH-MS	Max-IO	NoCoda-Rt	Linearity
☹	(a) ʃo kurɛ		*!		
☹	(b) ʃol kurɛ			*!	
☞	(c) ʃok kurɛ				*

It appears, thus, that the variable patterns observed for these two groups of clitics are idiosyncrasies of the morphemes themselves: while the clitics shaped as {ol} are marked to undergo AWRA more often than /l/-deletion and /l/-preservation, conversely, the clitics in group {al} are marked to undergo /l/-preservation and /l/-deletion more often than AWRA.

In OT, there have been at least two proposals for the analysis of exceptional morpheme-specific phenomena such as those observed for these groups of clitics: (1) the adoption of morpheme-specific constraint rankings (or cophonologies) for each set of idiosyncratic morphemes (e.g. McCarthy and Prince 1993a: appendix, Inkelas et al. 1995, Itô and Mester 1995ab); or (2) the adoption of the morpheme-specific constraint approach, which advocates that all information specific to a given (set of) morphemes(s) (e.g. the {ol} and {al} groups of clitics) should be encoded into constraints, within a single phonology or grammar (e.g. McCarthy and Prince 1993b, 1995, Hammond 1995, 1997, Russell 1995, 1997, Pater 1996, Urbanczyk 1999; also the framework of Declarative Phonology – e.g. Bird 1990, Russell 1993, Scobbie, Coleman and Bird 1996).

As discussed in Chapter 2, the main problem with the first proposal is that it leads to the proliferation of grammars (or cophonologies). For instance, to account for the categorical behavior of {el} clitics and the variable results obtained for {ol} clitics, Picard would require two constraint rankings, one for each set of morphemes.

(39) Two cophonologies for the analysis of {el} and {ol} clitics in Picard:[27]

(a) Cophonology for {el}: FAITH-MS >> MAX-IO, NoCoda-Rt >> Linearity

(b) Cophonology for {ol}: FAITH-MS >> { MAX-IO; NoCoda-Rt; Linearity }

[27] Note that the difference between the hierarchies in (39a) and (39b) is that, while the former represents a crucially ranked grammar (in which case only one output is expected), the latter illustrates a variable grammar (in which the three variants of AWRA are likely to occur). What is crucial in this discussion is that each cophonology consists of a different ranking for the same set of constraints responsible for categorical /l/-preservation in {el} clitics and variation in {ol} clitics.

The second proposal for handling lexical exceptions, the morpheme-specific constraint approach, accounts for the phenomenon illustrated above by placing the burden of explanation on a single constraint component (i.e. the grammar). Instead of a separate cophonology for each morpheme, the grammar allows for morpheme-specific versions of the general constraints involved in the phenomenon under investigation. This approach will be utilized in the investigation of the variable patterns inherent to l-clitics, and will be illustrated in the context of the analysis that follows.[28]

As mentioned above, in OT, several studies have adopted constraints that refer to a specific (set of) morpheme(s). Nevertheless, based on one of the early premises of OT, i.e. that constraints are universal and of general formulation (Prince and Smolensky 1993:5), this approach appears not to be in the spirit of OT. In order to incorporate morpheme-specific behavior into the framework, significant amendments have been

[28] I am adopting the morpheme-specific constraint approach to account for the variable results involving the {ol} and {al} groups of clitics as a last resort. I am aware that this move could undermine the domain-based analyses that I proposed in Chapter 3. To capture the difference in behavior between prefixes and clitics in AWRA, for instance, I could have simply appealed to morpheme-specific constraints. Given that both prefixes and clitics are closed class morphemes, an analysis for AWRA along these lines could simply have assigned rankings to particular classes of morphemes, thereby avoiding the need to make reference to domains. Based on some of the variable results observed, however, I strongly believe that AWRA is a domain-sensitive phenomenon and, thus, it should be analyzed from a domain-based perspective: first, a domain analysis for the behavior of clitics in Picard is consistent with a variety of crosslinguistic data that show that proclitics have a special status in the grammar and, therefore, they can distinguish themselves from other words or affixes via *domain-sensitive* AWRA-like phenomena (see section 3.1.4 in Chapter 3). Second, considering the variable results obtained for pronoun /al/ in Chapter 3, it may be the case that the domain in which the pronoun prosodizes is interfering with the outcome of AWRA. Recall from Figure 1 in Chapter 3 that there is a relatively higher percentage of /l/-preservation for the subject pronoun clitic /al/ (i.e. 44%; cf. AWRA: 15%). Based on Auger's (1993:159) argument that "Picard provides clear evidence of [a] case where subject pronouns have become agreement markers prefixed to finite verbs", it is possible that some Picard speakers no longer recognize /al/ as a clitic but instead as an affix and, as a result, AWRA is not applicable – recall from Chapter 3 that AWRA does not affect affixation. To account for the similar pattern observed for the preposition /al/ (i.e. /l/-preservation: 42%; AWRA: 33%), it is possible that the higher incidence of /l/-preservation is due to the phonetic identity between the two forms. By analogy, it could be that Picard speakers analyze the two l-clitics as having the same prosodic status in the grammar. In sum, the *domain* in which /al/ prosodizes could have had an effect on the results observed for AWRA. This effect, however, can only be confirmed by an investigation of data from individual subjects. It could well be the case that, once the option that the pronoun /al/ is a prefix has been investigated more carefully, an analysis can be offered without the need to resort to morpheme-specific constraints.

proposed, the most evident being the Generalized Alignment schema for creating constraints (McCarthy and Prince 1993b; see also Chapters 2 and 3). As Russell (1995:17) has pointed out:

> In the earliest representations of OT, it was often claimed that the constraint hierarchy used by some individual grammar was simply a language-specific ranking of universal constraints. It came to be realized that this pure conception of the constraint hierarchy could not be maintained, leading to McCarthy and Prince's (1993) discussion of the universal constraint *schema* ALIGN, which allows individual grammars to construct any number of language-specific constraints.

To account for the two contrasting sets of results involving {ol} and {al} clitics, and to maintain the hypothesis that there is a single grammar involved in the outcome of the AWRA phenomenon relating to these clitics, the constraints responsible for AWRA should be specified for the morphemes for which they are relevant (subscripted forms represent constraint specification).

(40) Morpheme-specific constraints

Group {ol}-specific constraints: NoCoda-$Rt_{\{ol\}}$, MAX-$IO_{\{ol\}}$, $Linearity_{\{ol\}}$

Group {al}-specific constraints: NoCoda-$Rt_{\{al\}}$, MAX-$IO_{\{al\}}$, $Linearity_{\{al\}}$

The interaction of morpheme-specific constraints with other general constraints will yield the variable results observed for these two groups of clitics and at the same time account for categorical /l/-preservation for {el} clitics. The ranking responsible for the results involving l-clitics is illustrated in the hierarchy in (41), composed of morpheme-specific and crucially unranked constraints:

(41) Constraint ranking for l-clitics: categorical and variable results

FAITH-MS

>>

{ MAX-IO$_{\{ol\}}$; MAX-IO; NoCoda-Rt$_{\{ol\}}$; NoCoda-Rt; Linearity$_{\{ol\}}$ }

{ MAX-IO$_{[al]}$; NoCoda-Rt$_{[al]}$; Linearity$_{[al]}$; Linearity }

Applying Anttila's variant probability prediction *n/t*, the results illustrated in Table 14 are obtained, which closely correspond to the ones observed for these two groups of clitics.

(42) Table 14: Predicted & observed probability of variant occurrence by clitic status

Clitic Status	Total # of tableaux	/l/-preservation		AWRA		/l/-deletion	
		Predicted	Observed	Predicted	Observed	Predicted	Observed
Group {ol}	120	.23 (28)	.21	.53 (64)	.56	.23 (28)	.23
Group {al}	24	.42 (10)	.43	.17 (04)	.17	.42 (10)	.41

In sum, the factor group *status of the l-clitic* indicates the existence of a two-fold variation pattern: one in which AWRA is highly favored while the remaining variants are equally less likely to occur (i.e. Group {ol}), and one in which the variants /l/-preservation and /l/-deletion are more likely to occur as opposed to the AWRA variant (i.e. Group {al}). Through the crucial nonranking of the constraints in (41), I was able to account for the distinct patterns found involving the groups of clitics {ol} and {al} via the use of a single constraint hierarchy (i.e. a single grammar). Based on predictions determined by the crucial nonranking of these constraints, I was also able to establish the probability of application of each variant.

4.4. Conclusion to Chapter 4

In this study, I have demonstrated how Optimality Theory can satisfactorily serve as a framework for analyzing variability: it not only allows for variation to be directly encoded in the grammar, but it also incorporates into the same grammar a mechanism that captures the quantitative aspect of variable phenomena: the crucial nonranking of constraints. The claim that the probability of each variant's occurrence may be encoded in (and therefore predicted by) the grammar yields important consequences for the study of variation and linguistic theory in general, because it constitutes an attempt to narrow down the distinction between what is traditionally labeled as competence versus performance.

In traditional (non-variationist) linguistics, the focus of linguistic theory lies almost entirely on the "ideal speaker-listener, in a completely homogeneous speech community" (Chomsky 1965:3), and data collection procedures rely almost exclusively on grammaticality judgments given by individual speakers that may sometimes be biased toward more prescriptive forms. In variationist linguistics, on the other hand, the focus has been on the analysis of large corpora of spontaneous or controlled discourse, in which "errors" can be (and sometimes are) classified as systematized ways of saying the same thing. In order to achieve the correct description and/or explanation of linguistic data, systematic quantitative generalizations about language should be included in what is usually referred to as competence. In agreement with Stefan Frisch (personal communication), we should be seeking the correct explanations for language facts regardless of their quantitative or categorical character – "the facts determine what the grammar looks like."

By proposing an analysis in which variation as well as the predictability of each variable output is encoded in the grammar (and therefore into competence), we obtain a more accurate and comprehensive approach to the study of language. My analysis (among many others in the sociolinguistic literature) presupposes that variation is an inherent part of what is normally referred to as competence. As a consequence, the competence that I have strived to account for in this study includes much more than what Chomsky (1965) proposes to be competence. As Labov (1972: 226) points out,

> [t]he ability of human beings to accept, preserve, and interpret rules with variable constraints is clearly an important aspect of their linguistic competence or *langue*. But no one is aware of this competence, and there are no intuitive judgments accessible to reveal it to us. Instead, naive perception of our own and others' behavior is usually categorical, and only careful study of language in use will demonstrate the existence of this capacity to operate with variable rules.

In this study, I have provided an account for the variation patterns found for the AWRA process involving the significant factors *status of the l-clitic*, *level of formality* and *geographic location*. In order to preserve the hypothesis that variation can be accounted for via the use of a single constraint ranking or grammar, I have adopted an approach that allows previously-alleged monolithic constraints to be decomposed into their domain-specific and morpheme-specific counterparts.

For the analysis of the categorical and variable results of AWRA, I have utilized the following theoretical tools: (1) the use of different grammars to account for variation when regional dialects and different styles are involved (e.g. Nibas vs. Other and Formal vs. Informal), as is the case in traditional generative linguistics; and (2) the use of a single (variable) grammar for cases in which variation is associated with a single dialectal grammar (e.g. the variation patterns observed in the community of Nibas), or a single stylistic grammar (e.g. the Formal stylistic level).

I have also shown that what distinguishes a categorical grammar (e.g. Speaker 9) from other variable grammars is that, while a crucially ranked categorical grammar yields only one tableau (and consequently only one output), a crucially unranked grammar generates two or more tableaux (and consequently two or more outputs – i.e. variation).

Appendix 1. The Coding of Factor Groups for VARBRUL Analysis

Factor Group	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9
① Dependent Variable	/l/-preservation	AWRA	/l/-deletion						
② Clitic Status	Det. /ʃol/	Prep. /dol/	Subj. Pron. /al/	Prep. /al/	Pron. /l/	Det. /l/			
③ Following Consonant (Place)	Labial	Coronal	Dorsal						
④ Following Consonant (Manner)	Glide	Liquid	Nasal	Fricative	Other Obstruent				
⑤ Level of Formality	Written	Formal	Informal						
⑥ Geographic Location	Nibas	Feuquières	Fressenneville	Bienfay	Bouillancourt				
⑦ Speakers	Speaker 1	Speaker 2	Speaker 3	Speaker 4	Speaker 5	Speaker 6	Speaker 7	Speaker 8	Speaker 9

Appendix 2. Final VARBRUL results for the relevant factor groups*

Factor Groups	Factors	/l/-preservation			AWRA			/l/-deletion		
		N	%	*p*	*N*	%	*p*	*N*	%	*p*
(1) Clitic Status	*Det. /fol/*	158	19	.19	526	63	.58	153	18	.23
	Prep. /dol/	39	21	.22	112	61	.55	34	18	.22
	Pron. /al/	335	44	.45	117	15	.13	314	41	.42
	Prep. /al/	151	42	.42	90	25	.20	120	33	.39
(2) Following Consonant (Place)	*Labial*	273	31	.38	366	42	.35	240	27	.33
	Coronal	274	33	.32	273	33	.33	272	33	.35
	Dorsal	136	30	.34	206	46	.34	109	24	.32
(3) Following Consonant (Manner)	*Glide*	39	30	.35	57	45	.32	32	25	.33
	Liquid	74	35	.34	80	37	.35	60	28	.31
	Nasal	151	30	.30	172	34	.32	177	35	.38
	Fricative	182	34	.34	180	34	.33	166	31	.33
	O. Obstruent	237	30	.34	356	46	.35	186	24	.31
(4) Level of Formality	*Written*	411	36	.38	362	32	.23	368	32	.39
	Formal	143	36	.41	183	46	.36	70	18	.23
	Informal	129	21	.22	300	49	.40	183	30	.38
(5) Geographic Location	*Nibas*	110	26	.28	227	53	.48	88	21	.24
	Feuquières	110	32	.31	128	37	.30	109	31	.39
	Fressenneville	155	35	.38	160	36	.29	124	28	.32
	Bienfay	180	33	.30	164	30	.32	196	36	.38
	Bouillancourt	128	32	.38	166	42	.30	104	26	.32
Input probability			.32			.41			.27	

* The probability weights (rounded up to two digits) result from the final VARBRUL analysis conducted without Speaker 9 and the determiner and pronoun /l/, and with the removal (recoding) of the redundant factor group *speaker* (N = 2,149 tokens).

CHAPTER 5

CONCLUSIONS

Nothing we do is complete, [...]
No statement says all that could be said. [...]
We cannot do everything
and there is a sense of liberation in realizing that.
~ Oscar Romero

The French poet Paul Valéry (1871-1945) once wrote, "A poem is never finished, only abandoned". I cannot refrain from adapting Valéry's citation to the context of the present work: "A *thesis* is never finished, only abandoned". This is true not only because there are still so many topics to investigate in the phonology of Picard, but also because some issues had to be left behind as they were outside the scope defined for this thesis. I start this chapter with the certainty that what was presented in the previous chapters is merely the beginning of a long journey to a better understanding of Picard and, more generally, the range of options and constraints that phonologies display. In this way, this concluding chapter will address some of the issues that were not dealt with in the thesis.

This chapter is organized in the following way: in section 5.1, I will present the general conclusions to the thesis. In the final section 5.2, I will discuss some of the relevant issues that were not investigated in the thesis, as well as point out possible directions for future research.

5.1. Conclusions to the thesis

In this thesis, I have provided a comprehensive investigation of the Picard phenomenon of AWRA and its variation patterns, and the three strategies that the language employs to syllabify sequences of vowels, namely Semivocalization, Vowel Elision and Heterosyllabification. For the analysis of the data that involved phonological alternations at the level of prosodic domains, I have utilized the PP-based domain-specific constraint approach, introduced and motivated in Chapter 2. For the analysis of the variable results, on the other hand, I have embraced a variation-oriented version of OT (e.g. Reynolds 1994, Anttila 1997).

More generally, this thesis has dealt with two types of "variation" in Picard. The first type involves variation that is affected by prosodic domains; e.g. AWRA applies at the domain juncture ϕ, but it fails to apply within the domain span PWd. The second type involves variation that is limited to a specific prosodic configuration; e.g. at the juncture ϕ, one observes the variants /l/-deletion, /l/-preservation and AWRA (i.e. /l/-assimilation), a pattern that is not observed in other domains. Through the decomposition of general constraints into their domain-specific counterparts, I was able to account for the across-domain phonological alternations observed in AWRA and in the strategies involved in the Resolution of Vocalic Hiatus, i.e. Semivocalization, Vowel Elision and Heterosyllabification. For the analysis of the variable results in AWRA, I have adopted an OT approach that is capable of accounting for variation not simply by allowing variation to be included in the grammar, but also by providing tools that allow us to encode probabilistic effects in the grammar itself. In the "variationist OT" approach utilized, this was accomplished via the crucial nonranking of sets of constraints.

This study has also examined and utilized two types of constraint rankings: categorical and variable. I have shown that these two types of rankings can be distinguished by the way in which constraints are organized in the grammar: in a categorical ranking, in which case only one output is possible, constraints are crucially ranked with respect to each other. In a hierarchy characterized by variable ranking, in which case more than one output is expected, constraints are crucially unranked and variation becomes a mere consequence of the absence of ranking. Assuming that this is the right direction for the analysis of variation, I believe that the task of the variationist, once the data have been carefully collected and analyzed, should at the very least involve the following: (1) to identify the relevant constraints and their rankings; (2) to specify the nature of the grammar (i.e. categorical or variable); and finally, (3) to establish the crucial nonranking of a specific set of constraints that will yield the probabilities observed in the data under investigation.

In this thesis, I have contributed new data from Picard to the study of domain-sensitive phenomena and variation. For the analysis of domain-sensitive phenomena such as AWRA and those found in Vocalic Hiatus Resolution, I have elaborated and utilized a PP-based version of the domain-specific constraint approach, based on insights from McCarthy and Prince (1993b), Buckley (1995ab) and Pater (1996). In order to delimit domains in which phonological processes can operate, I have provided analyses for the prosodization of morphosyntactic constituents such as affixes, proclitics and words, which have also tested Selkirk's (1997) proposal on the prosodization of function words. In the context of variation in AWRA, I have provided support for the proposal of Reynolds (1994) and Anttila (1997) that variation can be satisfactorily accounted for in an OT framework. Finally, this study has also shed some light on the line of research concerning the idiosyncratic behavior of proclitics with respect to their hosts crosslinguistically.

5.2. Residual issues and directions for future research

In this section, I will discuss some of the issues that were not thoroughly addressed in the thesis, as well as point out possible directions for future research. The topics are organized according to the sequence in which they appeared in the thesis, starting from Chapter 2.

In Chapter 2, I introduced a constraint-based approach to Prosodic Phonology to account for phonological alternations across domains: the PP-based domain-specific constraint approach. For the analysis of domain-sensitive phenomena, I proposed the decomposition of general constraints into their domain-specific counterparts, each referring to a specific edge, span or juncture of a prosodic constituent. Consequently, in Chapters 2 and 3, I argued that both markedness and faithfulness constraints must be specified for (i.e. decomposed into) prosodic domains.

In the context of reranking of constraints in the approaches of Cophonologies (Itô and Mester 1995ab, 1997) and OT-LP (or Serial OT; Kiparsky 1999, 2000), it has been argued that only faithfulness constraints should be allowed to be reranked across domains. The positive consequence of such a move is that it renders the theory more constrained, since it imposes stronger limitations on what can be reranked or, in the case of constraint decomposition, on what can be decomposed (see Itô and Mester 1995a for their motivations in favor of an approach that only allows the reranking of FAITH constraints).

In contrast, in the framework of "positionally-based" constraints, Zoll (1998:5) has argued that both positional markedness and positional faithfulness constraints are necessary (cf. positional faithfulness only – e.g. Casali 1996, Beckman 1998). This view is also implicitly shared by other OT phonologists, based on their use of both markedness and faithfulness positional constraints; e.g. McCarthy 2002 uses the constraints $]_\sigma$/*VOICE (no voiced obstruents syllable-finally) and $\text{DEP}_{\text{INIT-}\sigma}$ (no epenthesis syllable-initially); Buckley 1996b uses the constraints *V:]_{PWd} (no long vowels PWd-finally) and $\text{Q-IDENT}^{\{1\}}$ (the quantity of each input segment must be identical to its output quantity in domain {1}).

If the analysis that I have proposed for Picard is a step in the right direction, empirical evidence provided in this thesis also favors the decomposition of both markedness and faithfulness constraints. For instance, recall from Chapter 3 that while Semivocalization operates exclusively within the Foot domain, Vowel Elision applies at the juncture of a syllable and the following Prosodic Word, within the Phonological Phrase (i.e. ϕ). For Semivocalization to occur, the *markedness* constraint NoDIPH must be ranked lower in the hierarchy, e.g. below MAX-IO (i.e. MAX-IO >> NoDIPH). Conversely, for the application of Vowel Elision, the *faithfulness* constraint MAX-IO must be ranked lower than NoDIPH (i.e. NoDIPH >> MAX-IO). Assuming that there is only one grammar involved in the two processes, both markedness and faithfulness constraints must be decomposed into domains in order to adequately capture, within a single constraint ranking, the domain-driven alternations that characterize Semivocalization and Vowel Elision. In Picard, the decomposition of both NoDIPH and MAX-IO into their domain-specific counterparts is able to account for the two processes, via a single hierarchy: NoDIPH$_{\phi}$, MAX-IO$_{Ft}$ >> NoDIPH, MAX-IO. It is still too early, however, for us to determine conclusively which approach to the decomposition of constraints best serves the purpose of explaining phonological alternations across domains crosslinguistically. Is the approach adopted here too permissive or, instead, are the approaches discussed previously too restrictive? Based on the Picard data provided in this thesis, at this point in time, it seems that the theory must allow for both options for the decomposition of constraints.

Another subject that requires more comprehensive investigation was introduced in Chapter 3, and it involves the crosslinguistic patterning of consonant-final proclitics and their hosts in languages as unrelated as Picard, Arabic, Greek and Welsh. In these languages, an AWRA-like process operates between a clitic-final consonant and the following word's initial consonant. Since words tend to be consonant-initial while syllables typically have a CV shape crosslinguistically, the fact that proclitics in these languages have the marked C-final structure is puzzling, especially when one considers the observation that markedness can often only be tolerated in strong positions, i.e. in the head of a constituent (e.g. Harris 1997, Goad and Rose in press). As was shown in Chapter 3, proclitics usually prosodize as unstressed and thus unfooted syllables, in a "weak" position of the Phonological Phrase.

Based on the C-final shape of proclitics, the phonology has at least two options for syllabifying the clitic-final consonant: (1) to syllabify the CC cluster as is in two separate syllables, or (2) to use the strategy that Picard, Arabic, Greek and Welsh utilize, i.e. regressive assimilation (AWRA), so that features from the clitic-final consonant can be licensed by the word-initial onset. A priori, however, comparing AWRA with other types of phonological processes (e.g. Vowel Harmony, which is usually bounded by the Prosodic Word and thus tends to ignore clitics), one would expect the assimilation to be blocked from applying across the proclitic plus word sequence, and thus result in the syllabification of the consonant cluster as is, as described in option (1).

What then motivates the assimilation in procliticization? In the spirit of Kaye (1989) and Goad and Brannen (2000), it was hypothesized that, despite being unrelated, languages like Picard, Arabic, Greek and Welsh all have in common a requirement to indicate, via assimilation, edges of different types of constituents. The resulting assimilation processes may thus serve as a cue to the prosodic constituency of the proclitic plus word complex in the phonology of these languages. Considering Zwicky's (1977) view that clitics are ambiguous because they behave neither like affixes nor like independent words, it could be the case that the assimilation observed is a strategy that the phonologies of these languages use to disambiguate the status of proclitics, and consequently ensure that they be parsed as syllables directly dominated by the Phonological Phrase, as I argued for proclitics in Picard. In Kaye's (1989:49-50) view, AWRA-like assimilation phenomena might "fulfill a function similar to that of spacing and punctuations in written texts [… as] they give information about domain boundaries (words, phrase, sentence)." Given that the number of languages and the data utilized in this research are considerably small, it would be desirable to attempt to verify these observations in the context of a larger corpus and more crosslinguistic evidence.

Let us now turn to Chapter 4, which was devoted to the topic of variation involving AWRA in Picard. In the analysis of the variable patterns observed for the factor *geographic location*, the existence of two dialects was detected among the five villages investigated: that of the region of Nibas, and that of Other (i.e. the villages of Feuquières, Fressenneville, Bienfay and Bouillancourt). Despite arguments based on AWRA favoring the existence of two dialects for the data under investigation, I believe that it is still early for a conclusive assertion until more speakers (and consequently more data) are taken into consideration and, more importantly, until other phonological phenomena from these two varieties of Picard are included in the study. In sum, the two-dialect hypothesis proposed in Chapter 4 must be substantiated by a larger corpus study based on spontaneous data collected from a larger number of speakers, as well as with the inclusion of other phonological processes.

Finally, we should now address a more general question that relates to the concept of "variation" in the broadest sense of the word, as introduced in Chapter 1 and discussed throughout the thesis. In this study, it was shown that two types of variation exist: (a) domain-internal variation, which takes place (variably) within a single prosodic domain (e.g. the variable patterns of AWRA at the juncture ϕ); and (b) across-domain variation, which operates (categorically) across different domains (e.g. the application of Semivocalization within the Foot and its inapplicability at the juncture ϕ). A third type that is predicted by the approach that I adopted for the analysis of these types of variation, although it was only briefly introduced in a footnote, is one in which type (a) variation is attested *across* domains; for instance, while a given process must apply obligatorily in domain X, it may apply variably or optionally in domain Y. Recall from section 2.2.4 in Chapter 2 that this is exactly the pattern found in Nasal Deletion in Demotic Greek (Nespor and Vogel 1986), a process that categorically applies at the domain juncture ϕ, and optionally applies internal to the Prosodic Word:

(1) Categorical Nasal Deletion at the juncture ϕ

/tin θea/	→	(ti_ θea)$_{\phi}$	*(tin θea)$_{\phi}$	'the view-ACC'
/tin vlepo/	→	(ti_ vlepo)$_{\phi}$	*(tin vlepo)$_{\phi}$	'(I) see her'

(2) Optional Nasal Deletion in the Prosodic Word

/anθropos/	→	(anθropos)$_{PWd}$	or (a_θropos)$_{PWd}$	'human being'
/simvivazmos/	→	(simvivazmos)$_{PWd}$	or (si_vivazmos)$_{PWd}$	'compromise'

Given that the majority of variationist studies have focused primarily on variation at the segmental level, as described in type (a) above, and that most analyses in Prosodic Phonology have ignored variability or optionality and have thus emphasized variation at the domain level (i.e. type (b)), the absence of discussions of data that resemble the Greek case is not surprising. Are the patterns illustrated in (1) and (2) common across languages, or are they simply an idiosyncrasy of Demotic Greek? Further investigation is required.

These (and others that were humbly expressed in footnotes throughout this thesis) are just some of the issues that had to be "abandoned" because they would lead me into areas beyond the scope defined for this study.

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