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Phonological variation and Optimality Theory: Evidence from word-initial vowel epenthesis in Vimeu Picard

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ABSTRACT

One striking feature of Vimeu Picard concerns the regular insertion of epenthetic vowels in order to break up consonant clusters and to syllabify word-initial and word-final consonants. This corpus-based study focuses on word-initial epenthesis. It provides quantitative evidence that vowel epenthesis applies categorically in some environments and variably in others. Probabilistic analysis demonstrates that the variable pattern is constrained by a complex interplay of linguistic factors. Following Labov (1972a, 1972b) and Antilla and Cho (1998), I interpret such intricate grammatical conditioning as evidence that this variation is a reflection of a grammatical competence that generates both categorical and variable outputs, and I propose an account within the framework of Optimality Theory. An analysis of individual patterns of epenthesis by members of the community reveals that, even though all speakers share the same basic community grammar, their use of epenthesis differs qualitatively as well as quantitatively. I show that individual grammars can be derived from the community grammar, and that Optimality Theory allows us to formalize the idea that individual grammars constitute more specific versions of community grammars.

Over the past 40 years, variationist studies have documented, in case after case, how linguistic variation is minutely conditioned by linguistic structure and how it is, in many instances, intrinsically connected to various aspects of social structure. However, few studies have tried to use the tools of linguistic analysis made available by current theories to propose grammars that generate the variable patterns described. This situation is somewhat surprising, given that this endeavor was, from the very start, an important aspect of Labov's research program. In-

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deed, Labov (1972a) adapted the model of phonological rules that was then current within generative phonology by adding numerical weights to the different elements in a given rule so that these contextual elements could play a role that was more or less strong and thus generate variable rather than categorical outputs. Over the years, variationists have continued to propose quantitative analyses based on the probabilistic models provided by VARBRUL and GOLDVARB, but few have attempted to propose phonological or grammatical analyses that generate the categorical and variable patterns observed in their corpora. One reason for the "quiet demise of variable rules" (Fasold, 1991) certainly lies in the difficulties that researchers have encountered in trying to develop variable rules using the formalism of generative rules. Now that phonological theory has moved away from generative rules, the interest of many researchers has been reignited, as they see great potential in Optimality Theory (OT) for the development of grammars that generate variable outputs.

The apparently chaotic nature of variable patterns is one major reason that so few linguists have paid attention to variation. One of the central goals of variationist sociolinguistics has been to challenge the view that variation lies outside of competence and hence outside of linguistics. Labov (1966:3) proposed that "variability is an integral part of the linguistic system" and supported his position (Labov, 1972a:216–220) by showing that variable patterns such as *t/d* deletion (i.e., the alternation between [mɪst] and [mɪs] for *mist* or *missed*) in African American Vernacular English (AAVE) are systematically conditioned by phonological and morphological constraints akin to those familiar from categorical phonological phenomena, thus making the alternation between *miss'* and *missed* unlikely to result from codeswitching. However, Labov did not claim that all variation is language-internal. Later in the same chapter (1972a:220–223) he contrasted *t/d* deletion with the sporadic and unsystematic realization of 3sg *-s* (i.e., *he eat* vs. *he eats*) in AAVE and attributed the latter pattern to codeswitching between standard American English and AAVE. As Sterelny (1983:49) noted, the conclusion that the linguistic conditioning of *t/d* deletion reflects the structure of the language is inescapable

> for there is no available external account of the data: no account in non-linguistic or pragmatic terms is available. The factors operating are internal to the language, they are structural. If the effects of the favourable (unfavourable) environment were categorical rather than variable, these facts are just the sort that would compel us to rewrite the structural description of the rule in question.

The same idea underlies current efforts to develop OT analyses of linguistic variation: "Insofar as usage statistics reflect grammatical constraints, such as sonority, stress and syllable structure, they reflect competence and should be explained by the theory of competence" (Anttila & Cho, 1998:40).

For linguists trying to bridge the gap between linguistic theory and sociolinguistic studies, OT has been viewed as particularly well suited for developing linguistic analyses that account for both categorical and variable outputs. Indeed, in this new theory, crosslinguistic variation plays a central role, as phonological analysis involves the evaluation of different candidate outputs, a set

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of universal constraints, and language-specific constraint rankings that account for distinct phonological patterns across different languages. To variationists, competing outputs and constraint ranking show great promise for handling not only crosslinguistic variation, but also language-internal variation. Consequently, many different researchers, many of them sociolinguists by training as well as others trained in theoretical phonology and syntax, have seized this new opportunity to explore how OT can go beyond previous theoretical models in accounting for both categorical and variable outputs.

As is to be expected in such a new research program, various proposals have been considered by different researchers. Proposals can be initially divided with respect to their position concerning the question of whether OT, in its orthodox formulation, allows for variable outputs. Hammond (2000) argued that it does; he used this model to account for variability in stress assignment in Walmatjari (Hammond, 1994). However, most other researchers assume that OT does not, in the normal case, generate variable outputs. This position is illustrated by the following quote from Tesar (1995:3): "The idea is that by examining the marks assigned by the universal constraints to all the candidate outputs for a given input, there is one which is least marked, or optimal: this is the one and only well-formed description that may be assigned to the input by the grammar."

Researchers who assume that OT does not generate variable outputs in normal cases must thus modify or enhance the theory in order to allow for more than one optimal output to correspond to a single input. The intuition shared by all such proposals is that the requirement that all constraints must be strictly ranked with respect to each other (Prince & Smolensky, 1993:51) should be relaxed in some way so that variation between two or more output forms can result from a constraint ranking reversal that takes place within the grammar of a single language. Specifically, Prince and Smolensky rejected the possibility of crucial nonranking of constraints in a given grammar, based on the absence of evidence in favor of nonranking; however, numerous researchers have proposed that language-internal variation constitutes the type of evidence that justifies treating crucial nonranking not as a quirk of OT, but as an integral part of the theory (Anttila, 1997:48).

While they agree on the general idea of relaxing strict ranking and variation, the various proposals differ in the way that nonranking is implemented in the grammar. Reynolds (1994) and Nagy and Reynolds (1997) proposed the notion of floating constraint: one that is unranked with respect to a (possibly singleton) subset of constraints. In their system, if constraint Z is unranked with respect to A ≫ B ≫ C, this allows for four different rankings and thus for the possibility of different outputs.

Z ≫ A ≫ B ≫ C
A ≫ Z ≫ B ≫ C
A ≫ B ≫ Z ≫ C
A ≫ B ≫ C ≫ Z

In this proposal, the frequency of use of any given variant depends on how many rankings select the variant as optimal.[1]

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Rejecting the idea that constraints may be unranked in a given grammar, Boersma (1998) and Boersma and Hayes (2001) proposed that all constraints are ranked, but that constraint rankings are continuous rather than discrete. In their proposal, the relative ranking of a constraint A may overlap with that of a constraint B, thus allowing for the possibility that the relative ranking of A and B may be reversed in a certain number of cases. The amount of overlap between the two constraints determines the relative frequency of each variant. This type of model, which attributes variation to patterns involving overlap between adjacent constraints, explicitly rules out the possibility that a floating constraint may extend its range over constraints that are strictly ranked with respect to each other, thus restricting possible variable patterns more than the floating constraint system of Reynolds (1994) and Nagy and Reynolds (1997).

The idea that only adjacent constraints can be unranked is also exploited in Anttila's (1997) and Antilla and Cho's (1998) proposal for grammars that allow for subsets of constraints to be unranked with respect to each other. As in the previous two proposals, different rankings are possible involving a few constraints, with the possibility of generating different variants and predicting the relative frequency of use of a given variant. Unlike the floating constraint proposal, however, variation can only involve adjacent constraints, in the sense that all unranked constraints must belong to the same set of unranked constraints and not to different sets. In other words, for Anttila, constraints cannot float over other strictly ranked constraints. Specifically, if we have three constraints that are strictly ranked, as in A $\gg$ B $\gg$ C, a fourth constraint D can only be unranked with respect to one of the three constraints. For instance, C and D may be crucially unranked with respect to each other, so that the following two rankings are possible:

A $\gg$ B $\gg$ C $\gg$ D
A $\gg$ B $\gg$ D $\gg$ C

In this sense, Anttila's model, like Boersma's, is more constrained than that of Nagy and Reynolds. Yet it is still flexible enough to allow numerous constraints to be crucially unranked. Thus, if A, B, C, and D are all crucially unranked with respect to each other, the following twenty-four rankings are possible:

A $\gg$ B $\gg$ C $\gg$ D	B $\gg$ A $\gg$ C $\gg$ D	C $\gg$ A $\gg$ B $\gg$ D	D $\gg$ A $\gg$ B $\gg$ C
A $\gg$ B $\gg$ D $\gg$ C	B $\gg$ A $\gg$ D $\gg$ C	C $\gg$ A $\ll$ D $\gg$ B	D $\gg$ A $\gg$ C $\gg$ B
A $\gg$ C $\gg$ B $\gg$ D	B $\gg$ C $\gg$ D $\gg$ A	C $\gg$ B $\gg$ A $\gg$ D	D $\gg$ B $\gg$ C $\gg$ A
A $\gg$ C $\gg$ D $\gg$ B	B $\gg$ C $\gg$ A $\gg$ D	C $\gg$ B $\gg$ D $\gg$ A	D $\gg$ B $\gg$ A $\gg$ C
A $\gg$ D $\gg$ B $\gg$ C	B $\gg$ D $\gg$ A $\gg$ C	C $\gg$ D $\gg$ A $\gg$ B	D $\gg$ C $\gg$ B $\gg$ A
A $\gg$ D $\gg$ C $\gg$ B	B $\gg$ D $\gg$ C $\gg$ A	C $\gg$ D $\gg$ B $\gg$ A	D $\gg$ C $\gg$ A $\gg$ B

Similarly, Schütze (1997) proposed that language-internal variation should only involve ties between adjacent constraints, and that swapping between non-adjacent constraints is a very powerful device that should be avoided.

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The present article investigates vowel epenthesis in Vimeu Picard (VP), both in its categorical and variable aspects, and develops an OT analysis that makes use of Anttila's proposal that nonranking of adjacent constraints predicts where epenthesis categorically applies, where it never applies, and where it variably applies. The analysis proposed here provides strong support for this kind of approach, as it makes use of phonological constraints that have been shown to play a crucial role in the phonological systems of many natural languages and it takes into account the contribution of the most important aspects of linguistic contexts in predicting whether epenthesis takes place in VP. Examining the individual behavior of ten authors whose data make up the database used for the analysis, the article shows that all share the same basic grammar, and that the small differences between them can be accounted for if we allow the individual grammars to be derived from the general community grammar through some additional rankings that make the individual grammars more specific than the community grammar.

This article is structured as follows. First, I present the basic pattern of vowel epenthesis in VP and summarize the analysis developed in Auger and Steele (1999) and Steele and Auger (to appear). Next, I provide a quantitative description of the distribution of epenthetic vowels in VP and present the results from VARBRUL analyses. I then develop an OT analysis that accounts for the distribution of categorical and variable contexts for vowel epenthesis and predicts the relative frequencies for variable contexts. Finally, I present the individual quantitative data for ten authors from Vimeu. I argue that the individual patterns differ not only quantitatively but also qualitatively, and that, consequently, different grammars must be proposed for individual authors.

WORD-INITIAL EPENTHESIS IN VIMEU PICARD

One of the most striking features of Picard, a Gallo-Romance language closely related to French and spoken in northern France and southern Belgium,[2] concerns the regular presence of an [e] in various positions within a sentence, as shown in (1):[3]

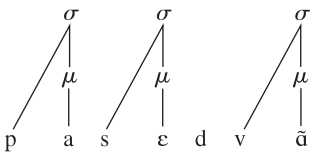
(1) *ch'n'est mie pasqué tout l'monne il aglave ẹ́d souo qu'ẹ́ch chauffeur il est forchè d'ẹ́rfuseu un piot coup à boére.* (Chl'autocar 21)
it NEG is not because all the people he dies of thirst that the driver he is forced of to-refuse a little shot to-drink
'it's not because everyone is really thirsty that the driver must refuse a drink'

In VP, many words, such as *rfuseu*/rfyzø/ 'to refuse', and word combinations, such as *d'souo*/d+swɔ/ 'of thirst' and *ch'chauffeur*/ʃ+ʃofœr/ 'the driver', contain sequences of consonants that do not constitute possible onsets according to the syllable structure of this language. Auger and Steele (1999:5–6) reported that complex onsets are allowed in VP, as long as the two consonants have different places of articulation, are arranged in order of increasing sonority, and do not occupy adjacent levels on the sonority hierarchy.[4] For instance, /kl/, /br/, /fj/, and /bj/ are possible onsets, but /tl/, /km/, /rj/, /pt/, and /ls/ are not, as revealed by the fact that *i minge bién* [i.mɛ̃ʒ.bjɛ̃] 'he eats well' and *pour cleuer*

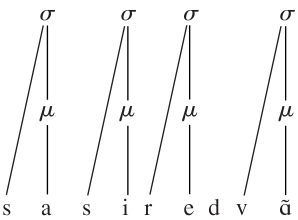
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[pur.clø.e] ‘in order to hammer’ are possible surface forms, but **i n’minge rién* [in.mɛ̃ʒ.rjɛ̃] ‘he eats nothing’ and **pour cmincher* [pur.kmɛ̃.ʃe] ‘in order to begin’ are not. When illicit onsets follow a vowel-final word, this vowel serves as a syllabic nucleus to which the edge consonant can attach, thus making it possible to parse each consonant contained in the lexical entry, as shown in (2a). If no such vowel is available, rather than deleting the consonant that cannot be syllabified, VP introduces an epenthetic vowel, as shown in (2b), making it possible to syllabify the consonant as a coda.[5,6]

(2) a. *il a passè dvant* [pa.sɛd.vɑ̃] *no barriére* (Chl’autocar 17)
he has passed in-front-of our gate
‘he passed in front of our gate’



b. *il a tè s’assir édvant* [sa.si.red.vɑ̃] *ses vagues* (Chl’autocar 52)
he has gone to-self-sit in-front-of his waves
‘he went and sat down in front of the waves’



In such cases, epenthesis is either required or prohibited, and exceptions are few. However, in other contexts, epenthesis applies variably. For instance, when the word *dvant* ‘in front of, before’ occurs in sentence-initial position, a speaker can insert an [e], but is not required to do so, as shown in (3).

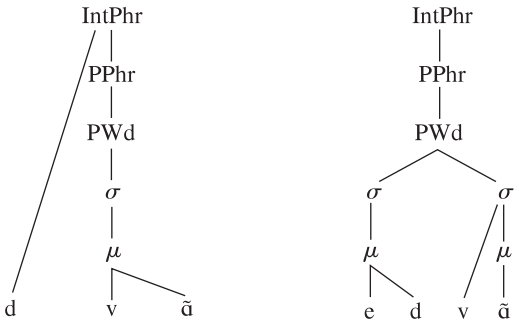
(3) a. *Dvant* [dvɑ̃] *qu’éch co i cante* (Canteraine 29)
before that the cock he sings
‘before the cock crows’
b. *Édvant* [edvɑ̃] *d’élver cho’s séance* (Canteraine 25)
before of to-close the meeting
‘before closing the meeting’

Variation between epenthesized and non-epenthesized forms does not result from dialectal differences across speakers since individual speakers can use either form in their speech, as shown in (3). In their study of epenthesis in VP, Steele and Auger (to appear) noted that the variable contexts are all located at the edges of prosodic domains (for word-initial epenthesis, the left edge of intonational phrases [IntPhr] and utterances [Utt]): that is, in environments that tend to license more segmental material (see, e.g., Noske, 1996:489, who observed that

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highly marked onsets are allowed at the beginning of stress units in French, and Selkirk, 1981:230, who reported that *i* epenthesis is optional in Utt-initial position in Iraqi Arabic). This led Steele and Auger to attribute the variation observed to the availability of two different syllabification strategies in those contexts. In contexts where epenthesis applies categorically, such as those illustrated in (2), only one strategy is available: syllabification across a word boundary if the preceding word is vowel-final and vowel epenthesis otherwise. However, at the edges of prosodic domains, epenthesis competes with indirect licensing: that is, the licensing of an extra consonant by the left edge of the IntPhr or Utt (Piggott, 1999). Steele and Auger proposed that both options are available, as shown in (4), because even though neither is perfect, these two options are the best available in the grammar of VP and, in the terms of OT, equally optimal.[7,8]

(4) *Dvant qu'éch co i cante* *Édvant d'élver cho's séance*



While the analysis proposed in Steele and Auger (to appear) accounted for the distribution of variable and invariant epenthesis, it made no predictions concerning the rate of occurrence of epenthesis in any context. The rest of this article builds on the work of Steele and Auger to develop an analysis that predicts not only the locus of word-initial variation, but also the frequency of epenthesis in specific environments. The analysis presented here is part of a research program that seeks to propose a unified account for all aspects of vowel epenthesis in VP. However, the present article focuses on only one environment: word-initial position. An analysis of epenthesis within clitic groups was presented in Auger (2001), and preliminary research on the right edge of words was reported in Auger (2000).

One final note concerns the source of the data used in this article. All the data are taken from published prose texts by ten authors from the Vimeu region. Because it might seem surprising to use written data in an investigation of a phonological phenomenon, especially in view of the fact that I have at my disposal a corpus of spoken Picard, a brief justification appears to be necessary. The decision to base this study on written rather than oral data was made because only a small portion of the spoken corpus has as yet been transcribed; that portion would not provide me with a sufficiently large and representative sample of speech to undertake the type of quantitative analysis typical of variationist studies. While the use of written texts might not be appropiate for all languages or for the study

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of all types of linguistic elements, it has proven very successful for the study of vowel epenthesis in VP for a number of reasons. First, contrary to languages like French and English, which have long literary traditions and firmly established orthographic systems that give only a gross approximation of what these languages sound like, the Picard orthography remains quite close to the actual pronunciation. This system, which was developed in the 1960s and fine-tuned since 1980 by a local publishing team called *Ch'Lanchron*, offers a systematic but flexible spelling that reflects the different pronunciations of a word as it occurs in different contexts or as it is pronounced with different accents. For instance, the past tense of the verb 'to be' in 3sg is spelled *étouot* to reflect the [etwɔ] pronunciation characteristic of some villages, *étoait* to reflect the [etwɛ] pronunciation by speakers from other villages, *étot* for the [etɔ] pronunciation common in the Nord region, or *tot* for the [tɔ] pronunciation of the Valenciennes area. As is evident from (3), this orthographic system makes it possible to note the presence or absence of an epenthetic vowel. Second, even though it is well known that spoken and written language often differ in important ways, phonological phenomena such as epenthesis, which are closely connected to the syllabic structure of a language and are less likely to reach metalinguistic awareness than lexical items or stereotyped grammatical structures, tend to vary less across the two modes of expression than other types of linguistic elements. Indeed, many researchers have established that spoken and written discourse differ greatly in their syntactic and discourse structures (see, e.g., Biber, 1988; Halliday, 1985; Miller & Weinert, 1998; Olson, 1996). Such differences make much sense in view of the different functions that speech and writing fulfill (compare, e.g., textbook writing or a newspaper article with an informal conversation with close friends). Some languages such as French are notorious for the wide gap that separates their written and oral forms (Hazaël-Massieux, 1993:36). In contrast, Picard has had little opportunity to develop literary norms similar to those of French, and much of its recent literature often expresses traditionally spoken genres (funny stories, storytelling, poetry, and descriptions of rural activities of times past); therefore, its literary texts have remained much closer to spoken Picard in grammar, lexicon, and pronunciation.

Although literary Picard differs relatively little from spoken Picard, it is not my intention here to propose that writing perfectly mirrors speech. Auger (to appear-a) described the editorial policy of a publishing team in Vimeu-Ponthieu and reported their conscious effort to favor the use of grammatical forms and constructions unique to Picard, thereby emphasizing the autonomy of this language with respect to French. Comparing oral speech and written texts by a few authors, Auger (to appear-b) found that prosodic phrasing operates quite differently in the two modes. The prosodic structure of speech, which is established primarily on the basis of auditory clues such as pauses, falls, and rises, follows patterns that clearly differ from those of written texts. Some oral utterances correspond to sentence fragments, whereas others encompass what would probably count as multiple sentences in writing. Prosodic boundaries are sometimes inserted in positions where they are not expected, such as between a verb and its

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complement. Prosodic phrasing in writing, as evidenced by the punctuation of the texts, appears to operate more predictably: most utterances correspond to complete sentences, and commas and other punctuation marks separate phrases that typically are set apart both syntactically and intonationally. Thus, prosodic phrasing in Picard texts resembles that of a literary text in French. Auger (to appear-b) attributed this difference between speech and writing to an effort by most authors to create a smooth rhythm typical of literary texts rather than to transpose the sometimes very choppy patterns of spontaneous speech. In this sense, then, written Picard is not simply a transcription of spoken Picard.

However, there is also ample evidence that, in many other respects, written Picard reflects the spoken patterns of the author. One such piece of evidence comes from the local color that characterizes every text written in Picard. The different spellings attested for the different pronunciations of the same word, the different words, and the different grammatical constructions allow readers familiar with different varieties of Picard to identify the region or even the town from which an author comes. In this respect, Picard very much resembles the Franco-provençal that is (or was, until recently) used in patois literature in eastern France (Marzys, 1998). Additional evidence for the close connection between speech and writing is provided by the testimony of authors writing in Picard. This testimony comes from two different sources: radio interviews with Picard-writing authors, conducted by Jean-Luc Vigneux and aired in the late 1980s on Radio-France Picardie, and taped interviews on the sociolinguistic histories and literary experiences of Picard speakers and authors, conducted as part of my fieldwork in Vimeu-Ponthieu in the summer of 1997. When questioned about their writing techniques, many authors stressed that they try to write as they speak, and that they regularly say things aloud to hear how they sound before writing them down. There is specific evidence that the representation of epenthesis in written texts accurately reflects the patterns of spoken Picard. Auger (to appear-b) confirmed that the distribution of categorical and variable patterns of epenthesis is identical in spoken and written texts, and that preceding phonological segments similarly affect the rate of epenthesis across both speech and writing. Finally, if any suspicions linger that the written data might be full of hyper- or hypocorrections, that the representation of epenthesis in these texts might be the result of stereotyping rather than a reflection of the authors' internal grammar, or that we might be dealing with semi-speakers who have lost the ability to insert systematically epenthetic vowels where the grammar of Picard allows them, we are about to see that the regularity with which epenthesis operates within and across speakers makes it quite implausible that this pattern is governed by anything other than grammatical competence. Indeed, it is difficult to imagine how authors could have conscious access to such deep phonological concepts as sonority hierarchy, word contiguity, or sonority contact (Auger, 2001), or that they could have worked out the syllabic structure of their language so as to be aware when epenthesis is required and which types of consonant clusters are likely to favor it more than others on the grounds that they constitute particularly bad onsets. Even though prosodic phrasing may operate somewhat differently in spoken and written Pi-

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card, I am firmly convinced that the epenthesis pattern described in this article is much too regular and natural not to constitute a reflection of the linguistic competence of the authors whose writing is investigated here.[9]

A QUANTITATIVE DESCRIPTION OF VOWEL EPENTHESIS IN VIMEU PICARD

Epenthesis phoenomena have been extensively investigated in recent years. Complex patterns have been shown to be amenable to principled analyses, and much attention has been devoted to crosslinguistic patterns of variation (e.g., Itô, 1989; Kenstowicz, 1994; Repetti, 1996; Selkirk, 1981). However, little attention has been paid to the fact that epenthesis sometimes applies variably within a single language. Selkirk (1981:230) noted that in Iraqi Arabic epenthesis is variable at the beginning of sentences, and Clements and Keyser (1983:128) pointed out that in Klamath, an Amerindian language of Oregon, epenthesis applies optionally or sporadically in some environments, but neither study examined those variable patterns in any detail. Recently, many linguists have come to recognize the role that variable phonological patterns play in choosing between competing analyses and in understanding language acquisition and language change better. Consequently, a number of researchers now seek to bridge the gap between variationist studies and theoretical phonology by developing models of linguistic competence that generate variable data (in addition to the studies previously mentioned, see Guy, 1994, 1997; Zubritskaya, 1997; see also the collection of papers in Hinskens, van Hout, & Wetzels, 1997) and by investigating how current phonological theory might constrain language-internal variation (Davis & Torretta, 1997). Côté (1999) is an excellent example of this research trend; she paid equal attention to categorical and variable environments for vowel epenthesis in Basque and proposed an analysis that accounts for all the different environments. The present article contributes to this new line of research, as it tests Anttila's (1997) model of phonological variation against a sizeable corpus of Picard texts. The corpus used for this part of the analysis consists of 8,128 contexts in which an epenthetic vowel occurs or could have occurred in word-initial position. The quantitative analysis pursues a double goal. First, it shows that the alternation between an epenthetic vowel and its absence is conditioned by the same types of linguistic factors that commonly govern categorical phonological rules, thus justifying my decision to develop a phonological analysis that can generate variable outputs rather than to attribute the variation pattern to some sort of codeswitching. Second, it provides the quantitative basis for an OT analysis that takes into account the most important linguistic factors in selecting one variant, and that predicts not only where vowel epenthesis is categorical, forbidden, and variable, but also its relative frequency of use.

As was briefly discussed earlier, prosodic structure plays a crucial role in determining whether word-initial epenthesis applies categorically or variably in VP. The prosodic hierarchy used in this article is that proposed by Inkelas and Zec

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(1995), based on work by Hayes (1989), Nespor and Vogel (1982, 1986), and Selkirk (1984); this hierarchy is show in (5).

(5) Utterance (Utt)
|
Intonational Phrase (IntPhr)
|
Phonological Phrase (PPhr)
|
Prosodic Word (PWd)

Although there is some disagreement in the literature about what the different prosodic categories correspond to and how the hierarchy can be applied to natural speech, the work of Nespor and Vogel (1982, 1986) has been very influential, and their proposals for prosodic phrasing have been adopted and adapted by many researchers, including those investigating the prosodic structure of French (Mazzola, 1993; Post, 1999; Verluyten, 1982).[10] The categories serve as a basis for the present analysis of the influence of prosodic structure on vowel epenthesis in VP. In summary, a PWd corresponds to a lexical word, its affixes, and any clitics attached to it, as in *cho't tabe* 'the table' or *j'minge* 'I'm eating'. A PPhr consists of a syntactic head and, in languages like Italian, French, and Picard, preceding modifiers, as in *cho'g granne tabe* 'the big table' or *bién minger* 'well to-eat' (i.e., 'to eat well'). It has been proposed that right-branching complements in Italian and French constitute a separate PPhr. Auger (to appear-b) found this generalization to hold for VP as well; thus *o m'donnerez cho'r réponse* 'you'll give me the answer' contains two PPhr: *o m'donnerez* and *cho'r réponse* (unless restructuring takes place). An IntPhr "corresponds to a span of the sentence associated with a characteristic intonational contour or melody" (Selkirk, 1984:27). Syntactic constituents that constitute their own IntPhr include vocatives, parentheticals, nonrestrictive relative clauses, tag questions, root sentences in conjunction, and topics (Kanerva, 1990:147). Finally, an Utt is a unit of speech that is prosodically and often but not always semantically autonomous (see, e.g., Rossi, 1999:205); in spontaneous speech, it may correspond to a full sentence, but often it corresponds to smaller or larger units than a syntactic sentence (see Auger, to appear-b). An Utt can consist of a single IntPhr or multiple IntPhr's. In this work, I assume the Strict Layer Hypothesis, which requires prosodic categories to be strictly organized into layers according to the prosodic hierarchy (Selkirk, 1984). This means that an Utt containing a single IntPhr entails an IntPhr boundary as well as an Utt boundary.

Because this article analyzes written rather than oral data, I adopt criteria based on syntactic structure and punctuation in segmenting the text into prosodic units. I assume that commas, semicolons, colons, and suspension points followed by a lower-case letter correspond to IntPhr boundaries. In addition, I assume that vocatives, dislocated phrases, preposed adverbial complements, and conjoined main clauses are separated from the rest of the sentence by IntPhr boundaries even in the absence of any punctuation (see Côté, 1999, for the view that IntPhr

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TABLE 1. *Phrase-internal epenthesis*

Following a vowel	2% (53/2,397)[a]
Following a consonant	99% (1,371/1,387)

[a]This percentage decreases to 0.4% (8/1,986) if we exclude one author who produced 45 of the 53 tokens of epenthesis after a vowel (11%).

boundaries are not necessarily accompanied by phonetic pauses). A few examples of IntPhr are given in (6). In this article, an Utt corresponds to a (potentially verbless) sentence, and Utt boundaries are marked by periods, suspension points, exclamation marks, and question marks followed by an upper-case letter.

(6) a. [$_{\text{IntPhr}}$*Il est ti leu*] [$_{\text{IntPhr}}$*mn'honme?*] (Chl'autocar 18)
he is-INT there my husband
'Is my husband there?'
b. [$_{\text{IntPhr}}$*Oui,*] [$_{\text{IntPhr}}$*j'voz ésplique*] (Chl'autocar 25)
yes, I to-you-formal explain
'Yes, I'll explain to you'
c. [$_{\text{IntPhr}}$*i sroait'té lo,*] [$_{\text{IntPhr}}$*dvant cho'p porte*] (Chl'autocar 38)
they would-be there, in-front-of the door
d. [$_{\text{IntPhr}}$*Il a pérlè d'sin poéyi*], [$_{\text{IntPhr}}$*d'ses gins*], [$_{\text{IntPhr}}$*d'ses études*.] (Chl'autocar 51)
he has spoken of his village, of his parents, of his studies

The effect of prosodic structure on epenthesis can be summarized as follows. If an illicit onset is located within a PPhr, as in (7a), or at the beginning of a PPhr, as in (7b), vowel epenthesis is nearly categorical: if a vowel precedes, no epenthesis is allowed, but if a consonant precedes, an epenthetic vowel is required. Table 1 shows that this pattern is almost categorical.

(7) a. *Al a rbéyè longtemps* [$_{\text{PPhr}}$*pér éch carrieu*] (Chl'autocar 21)
she has looked a-long-time by the window
'She looked out the window for a long time'
b. [$_{\text{PPhr}}$*J'sus seur*] [$_{\text{PPhr}}$*éd povoér adviner*] (Chl'autocar 19)
I'm sure of to-be-able-to guess
'I'm sure I can guess'

However, at the beginning of an IntPhr, as shown in (8), or an Utt, as shown in (3), extensive variation is found. This variable pattern is summarized in Table 2.

(8) a. [$_{\text{IntPhr}}$*Leu,*] [$_{\text{IntPhr}}$*dvant sn'établi et pi sn'étau,*] [$_{\text{IntPhr}}$*aveuc sin chinoér bleu*] (Forni 48)
there, in front of his bench and his vice, with his apron blue
b. [$_{\text{IntPhr}}$*à l'intour d'éch viu puits in bos,*] [$_{\text{IntPhr}}$*édvant d'intreu à l'école*] (Forni 59)
around of the old well in wood, before of to-enter to the school
'around the old wooden well, before going into the school'

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TABLE 2. *Preceding phonological environment and epenthesis*

Utt-internal, IntPhr-initial	V__	23% (326/1,394)
	C__	80% (789/989)
Utt-initial	V__	36% (248/697)
	C__	57% (274/482)
	Ø__	43% (336/782)

Note: Within each category, the difference between segmental contexts is significant at the .001 level. Similarly, for V_ and C_, the difference between prosodic contexts is also significant at the .001 level.

In addition to showing that the type of prosodic boundary influences the rate of epenthesis, Table 2 shows that the effect of the preceding phonological environment on the use of epenthesis operates even across a prosodic boundary, but that this influence decreases as the strength of the prosodic boundary increases. In both IntPhr-initial and Utt-initial position, a preceding consonant favors epenthesis, whereas a preceding vowel disfavors it. Both effects, however, weaken as the strength of the prosodic boundary increases. In IntPhr-initial position, the influence of the preceding segment is still quite strong, with only 23% postvocalic epenthesis and 80% postconsonantal epenthesis. In Utt-initial position, this conditioning is much weaker, as revealed by a postvocalic epenthesis rate of 36% and a postconsonantal epenthesis rate of 57%. When the sentence appears at the beginning of a paragraph or a speech turn, the epenthesis rate is 43%.[11]

The linguistic factors affecting vowel epenthesis are not limited to prosodic boundaries and preceding phonological environment. Table 3 presents the results of two VARBRUL analyses for IntPhr-initial and Utt-initial position. This table confirms that the manner of the preceding phonological segment plays the most important role within each prosodic context. It also confirms that the effect of a preceding consonant, compared to that of a preceding vowel, is stronger across an IntPhr boundary than across an Utt boundary.[12] In addition, the nature of the first element of the consonant cluster plays a significant role in both contexts: epenthesis is favored only in clusters starting in a liquid. Stops have a neutral effect, as do fricatives in Utt-initial position. Finally, fricatives in IntPhr-initial position and nasals in general slightly disfavor epenthesis. The favoring effect of an initial liquid makes sense, as any initial cluster containing a liquid followed by another consonant exhibits a decreasing order of sonority, thus resulting in a cluster that constitutes a particularly bad onset, as shown in (9a) and (9b). The clusters starting with stops and fricatives that are considered here (i.e., those that constitute illicit onsets) present a profile that is not quite as bad as liquid + consonant, as they contain consonants with equal (assuming that all obstruents are equally sonorous) or increasing sonority, but with insufficient sonority distance between them, as shown in (9c) and (9d). The only surprising result in this category con-

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TABLE 3. *Epenthesis in phrase-initial position*

	IntPhr-initial Input: .47 (p = .007)			Utt-initial Input: .43 (p = .011)		
1. Preceding segment: manner						
consonant	.84	789/989	80%	.67	247/482	57%
Ø		n/a		.47	336/782	43%
vowel	.23	326/1,394	23%	.42	248/697	36%
2. Following segment: manner						
liquid	.70	182/287	63%	.59	160/281	57%
stop	.52	362/709	51%	.51	140/321	44%
fricative	.44	515/1,253	41%	.48	499/1,225	41%
nasal	.44	56/134	42%	.42	59/135	44%
3. Type of word						
pronominal clitic(s) + verb	.60	283/622	45%	*ns*	344/791	43%
monosyllabic grammatical word	.47	694/1,457	48%	*ns*	372/846	44%
monosyllabic lexical word	.44	106/232	46%	*ns*	121/284	43%
polysyllabic word	.38	32/72	44%	*ns*	21/40	52%
4. Gemination						
yes	.73	53/78	68%	.77	59/88	67%
no	.49	1,062/2,305	46%	.49	799/1,873	43%
5. 2nd following consonant: manner						
affricate	.74	21/34	62%	.51	3/7	43%
glide	.68	9/12	75%	.54	7/11	64%
fricative	.55	379/744	51%	.63	266/482	55%
liquid	.48	119/250	48%	.38	83/208	40%
stop	.47	376/853	44%	.46	264/391	40%
nasal	.45	211/490	43%	.47	235/598	39%

cerns clusters beginning with nasals, which we would expect to behave somewhat like liquid-initial clusters. In terms of sonority, we would expect nasals to favor epenthesis more than stops and fricatives. In terms of onset profile, we observe that nasal-initial clusters sometimes present bad sonority sequences, as shown in (9e), whereas at other times they only violate the minimal sonority distance between their members, as shown in (9f). In summary, none of the initial clusters in (9) form possible complex onsets and all must thus be licensed through other means, but it appears that particularly bad onsets tend to favor epenthesis more than other types of clusters.

(9) a. *Mais, rbéyeu un molé?* (Chl'autocar 19)
'but, look a little'
b. *Édon, l'temps qu'éj raconte émn avinture* (Chl'autocar 26)
'so, the time that I tell my adventure'
c. *Portant, ch'coup chi, i y avoait du bon* (Chl'autocar 19)
'however, this time here, there was some good'

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d. *Pi ti, à pérpos, cmint qu'ch'est tin nom?* (Chl'autocar 68)
and you, by the way, how that it is your name
'And you, by the way, what's your name?'
e. *N'l'acouteu point, m'paure feume* (Chl'autocar 22)
NEG him listen, not, my poor woman
'don't listen to him, my poor woman'
f. *Tiéns, ch'coup chi l'vlo, mn'adréche.* (Chl'autocar 101)
hold, this time here it here-is, my address
'Here, this time, here's my address'

Gemination plays an important role, too, with geminate consonants favoring epenthesis more than non-geminate consonants. Once again, this effect of geminates makes sense, given the preference that geminates show for intervocalic environments in VP.[13] Finally, the manner of the second element of the phrase-initial cluster also plays a role in both contexts. Only one factor group, word type, plays a role only within utterances, with clitics favoring epenthesis and all other contexts disfavoring it.

Such a complex and consistent pattern of linguistic conditioning constitutes strong evidence in favor of the position adopted in Auger and Steele (1999) and Steele and Auger (to appear): variable vowel epenthesis is an integral part of the grammar of VP. Consequently, a phonological analysis that accounts for both its categorical and variable aspects must be developed.

AN OT ANALYSIS OF VOWEL EPENTHESIS IN VIMEU PICARD

To ensure that my analysis correctly accounts for both categorical and variable environments for epenthesis, I first propose a set of general constraints that applies at all levels of prosodic structure and a set of strictly ranked constraints that operates within the IntPhr. These constraints categorically generate epenthesis or its absence, depending on whether a consonant or a vowel precedes. I then propose a set of partially ranked constraints that operates at higher levels of prosodic structure in order to account for the effect of prosodic structure and preceding phonological environment. These constraints, in addition to our initial ones, generate the variable patterns described earlier. In this article I focus on the role of these important constraints. This approach appears to be a reasonable first step in an analysis of variable and categorical patterns of vowel epenthesis in VP, given the relatively uncharted aspect of this enterprise. Should the partial analysis developed here be successful, the next step would consist of developing it into a full analysis, one which models the effects of all linguistic factors on word-initial vowel epenthesis.

Let us consider the phrase *pour écmincher* 'to start' and see how we can ensure that this output form is selected as optimal by the grammar of VP. Based on the arguments presented in note 5, it is assumed that the input form is /purkmɛ̃ʃe/. To account for the ungrammaticality of *pour cmincher* in VP, we assume that the constraints ruling out initial clusters consisting of [km] and final clusters containing [rk] must be ranked higher than DEP(ENDENCE)-V, the

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TABLEAU 1. *Input:* pour cmincher /purkmɛ̃ʃe/ *'to start'*

Candidates	*Init-App	Ons-Son-2	Bin	Dep-V
[pur.k+mɛ̃.ʃe]	*!			
[pur.kmɛ̃.ʃe]		*!		
[purk.mɛ̃.ʃe]			*!	
☞ [pu.rek.mɛ̃.ʃe]				*

constraint that forbids the insertion of vowels not present in underlying form. Specifically, Ons(et)-Son(ority)-2, which only allows complex onsets consisting of consonants from nonadjacent categories on the sonority hierarchy (obstruent < nasal < liquid < glide), permits complex onsets such as [pl] and [fj], but rules out [km]. The possibility that initial /k/ might be syllabified as an appendix indirectly licensed by the PWd must also be ruled out, and this can be done by ranking *Init(ial)-App(endix) higher than Dep-V. Finally, an output form in which /k/ is syllabified as part of a complex coda, [purk.mɛ̃.ʃe], can be ruled out if Bin(arity), the constraint that rules out branching codas, is also ranked higher than Dep-V. This proposal is summarized in Tableau 1. As none of the evidence examined so far allows us to rank *Init-App, Ons-Son-2, and Bin with respect to each other, these three constraints are left unranked in this tableau. The "+" found in the first candidate in this and other tableaux indicates that the preceding segment is an appendix rather than part of the syllable. Two more options that the grammar of VP must rule out are the possibility of deleting the initial consonant and the possibility of turning unsyllabified consonants into syllabic consonants. While many languages delete segments that cannot be syllabified (Itô, 1988, 1989), this option does not appear to be available in VP, a fact that can be attributed to a very highly ranked Max-C(onsonant) constraint in this language. VP also does not allow for consonants that lack a syllabic nucleus to which they can attach to become syllabic, because *P/C, the constraint that prevents consonants from associating with syllable nuclei, is also ranked very high. I propose that both Max-C and *P/C must be ranked higher than Dep-V, as shown in Tableau 2.

Align(ment) constraints play a crucial role in the analysis developed here. Specifically, Align Word constraints, whose role is to force the beginnings and ends of words to line up with the various prosodic boundaries, play an important role in processing, as they make it easier for listeners and readers to identify word boundaries. However, given the numerous examples of syllabification across word boundaries that we have seen so far (e.g., in Tableaux 1 and 2) and given the effect that a preceding segment has across prosodic boundaries, it is obvious that Align constraints are violable in VP. For instance, the virtual absence of epenthesis in contexts where an initial cluster follows a vowel-final word within an IntPhr is attributed to the ability of the initial consonant to be syllabified as part of the syllable headed by a vowel belonging to another word, thus providing evidence

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TABLEAU 2. *Input:* pour cmincher /purkmɛ̃ʃe/ *'to start'*

Candidates	*P/C	MAX-C	DEP-V
[pur.mɛ̃.ʃe]		*!	
[pur.k.mɛ̃.ʃe]	*!		
☞ [pu.rek.mɛ̃.ʃe]			*

TABLEAU 3. *Input:* eine tchote agache /ɛntʃɔtagaʃ/ *'a small magpie'*

Candidates	ONSET	ALIGN-L (Wd, PWd)	ALIGN-R (Wd, PWd)
[ɛ̃n.tʃɔt.a.gaʃ]	*!		
☞ [ɛ̃n.tʃɔ.ta.gaʃ]		*	*

that ALIGN-L (Wd, PWd) and ALIGN-R (Wd, PWd) are ranked very low in the grammar of VP. The *enchaînement* that characterizes such phrases as *eine tchote agache* [ɛ̃n.tʃɔ.ta.gaʃ] 'a small magpie' provides evidence that they are ranked lower than ONSET, the constraint that requires that every syllable start with a consonant (see Tableau 3).[14]

One candidate that has not been considered so far in this discussion is *[pur.ke.mɛ̃.ʃe], where the epenthetic vowel is inserted between the two initial consonants rather than at the beginning of the word. While forms of this type are attested in other varieties of Picard (e.g., one finds *quémin* 'road' in the Rouchi variety spoken in and around Valenciennes, near the Belgian border), such forms are not found in VP. This may appear surprising, given that inserting the vowel between the two consonants creates a CV syllable, whose structure is less marked than the CVC syllable found in the optimal output. The word-initial epenthesis site can be accounted for if we posit that, in VP, the WD-CONT(IGUITY) constraint that prevents the insertion of segmental materials inside words is ranked higher than the ALIGN-L (Wd, PWd), as shown in Tableau 4. The fact that word-initial epenthesis, which creates a VC syllable ([ek.mɛ̃.ʃe]), is preferred over word-internal epenthesis, which results in a CV syllable ([ke.mɛ̃.ʃe]), is not a problem, as (C)VC syllables are found word-internally and word-finally in this language (e.g., *éspérer* [es.pe.re] 'to hope', *suptile* [syp.til] 'subtle', and *inchepè* [ɛ̃ʃ.pɛ] 'clueless'), evidence that NO-CODA, the constraint that forces CV syllables, is ranked very low in VP.[15]

In the analysis to be developed shortly, a whole series of ALIGN constraints require the left and right edges of words to align with the various prosodic boundaries corresponding to the hierarchy proposed in (5). The increasing opacity of the various boundaries as we move up the hierarchy (i.e., the decreasing impact

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TABLEAU 4. *Input:* pour cmincher /purkmɛ̃ʃe/ *'to start'*

Candidates	Wd-Cont	Align-L (Wd, PWd)
[pur.ke.mɛ̃.ʃe]	*!	
☞ [pu.rek.mɛ̃.ʃe]		*

of the preceding segment on word-initial epenthesis) is attributed to the relative ranking of the Align constraints, with the Utt-level constraints dominating the IntPhr-level constraints, which in turn dominate the PWd-level constraints. This ranking is probably universal rather than particular to Picard. Côté (1999) proposed a universal prosodic ranking for phrase-final position, based on her analysis of edge effects and consonant clusters in Basque. As we shall see, the Picard data analyzed in this article provide evidence for the universality of this prosodic hierarchy in phrase-initial position, too.

The table in the Appendix lists all the constraints required to account for the environments in which epenthesis applies categorically. It summarizes what each constraint does, provides sources for each, and describes how it is relevant for the grammar of epenthesis in VP. Since epenthesis constitutes a licensing strategy for allowing consonants that could not otherwise be syllabified, it should come as no surprise that most constraints deal with syllable structure. The Appendix also contains a brief justification of the relative rankings that have not been discussed so far.

Let us examine two examples and see how these constraints and their language-specific ranking account for (a) the absence of epenthesis when a word starting in /km/ follows a vowel-final word within the same IntPhr and (b) the insertion of an epenthetic vowel when it follows a consonant-final word.

A few notes concerning the following tableaux are necessary. First, as is customary, they include only the constraints that are directly relevant to epenthesis and that play a role in determining which candidate violates the lowest ranked constraints and must be selected as optimal. Second, following convention in OT, the absence of a line between two or more constraints indicates that these constraints have not been strictly ranked with respect to each other. Thus, the absence of lines between *P/C, Max-C, Ons-Son-2, and Bin should not be taken to mean that these constraints are not crucially ranked, but that their exact ranking could not be determined on the basis of the facts examined in this study. All four constraints are ranked above the others because their violations are always fatal in VP. Dep-V, Align-L (Wd, PWd), and Align-R (Wd, PWd) are also, at this stage, unranked with respect to each other, as none of the data examined so far allows us to determine their relative ranking. However, it is expected that future research into other aspects of VP phonology would allow a complete ranking of all these constraints. The nonranking of these two sets of constraints is noncrucial, and, as such, it is not expected to play a role in selecting optimal candidates. In our discussion of variable patterns later on, we propose that *Init-App, Onset,

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ALIGN-R (Wd, Utt), and ALIGN-R (Wd, IntPhr) are crucially unranked in the grammar of VP, and that this absence of ranking plays a crucial role in selecting multiple optimal candidates for single inputs.

Tableau 5 evaluates a number of candidate output forms for the input *il a cminchè* 'he has started'. It shows how the grammar proposed here rules out competing candidates containing illicit onsets, initial appendices (indicated by "+"), syllabic consonants, unnecessary epenthetic vowels, epenthetic vowels inserted in the wrong site, and a candidate with no initial /k/ because these candidates violate constraints that are more highly ranked than those violated by the [i.lak.mɛ̃.ʃɛ] candidate: this unepenthesized candidate, in which the initial /k/ is the coda of a syllable headed by the vowel located at the end of the word immediately preceding it, violates only two of the lowest constraints in the grammar of VP and is thus selected as optimal.

Conversely, Tableau 6, which examines what happens when word-initial /km/ follows a consonant-final word by considering the input *un morcieu d'cminèe* 'a piece of chimney', selects an output with an epenthetic vowel inserted word-initially, as this form violates only the three lowest ranked constraints.

The partial grammar just proposed accurately accounts for the distribution of epenthetic vowels within an IntPhr. To account for the cases of epenthesis found at prosodic boundaries, it is necessary to add constraints that are relevant at higher levels of prosodic structure and to determine their relative ranking. The constraints proposed all deal with the alignment of word edges with the beginning or the end of prosodic units: ALIGN-L (Wd, IntPhr), ALIGN-L (Wd, Utt), ALIGN-R (Wd, IntPhr), and ALIGN-R (Wd, Utt). These constraints are meant to account for the fact that, while the preceding segment constitutes the most influential factor influencing the rate of vowel epenthesis at the beginning of an IntPhr or an Utt, its effect decreases as the strength of the prosodic boundary increases. If, as I proposed earlier, ALIGN-X (Wd, Utt) ≫ ALIGN-X (Wd, IntPhr) ≫ ALIGN-X (Wd, PPhr) is a universal ranking, it should be more difficult to look across an Utt boundary to find a syllabic nucleus to which an initial consonant can attach than across an IntPhr,[16] which, in turn, should be harder than across a PPhr boundary. The disfavoring effect of a preceding vowel can be explained if we posit that a phrase-initial consonant can be syllabified as the coda of the final syllable of the preceding phrase, a possibility that violates the relevant ALIGN constraints. This forces us to rank all ALIGN constraints lower than *P/C, MAX-C, ONS-SON-2, and BIN, which are inviolable in VP. All three ALIGN-L constraints must also be ranked lower than Wd-CONT, as **quémin* 'road' is no more acceptable at the beginning of an Utt or a IntPhr than it is at the beginning of a word. This relative ordering is illustrated in Tableau 7. Finally, the ALIGN-L constraints are probably lower than the ALIGN-R constraints, as phrase-initial epenthesis is always possible in VP, but not phrase-final epenthesis, as shown in (10).[17]

(10) a. *Cmint/Écmint qu'a vo?*
how that it goes
'How is it going?'

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TABLEAU 5. *Input:* il a cminchè /ilakmɛ̃ʃɛ/ *'he has started'*

Candidates	*P/C	MAX-C	ONS-SON-2	BIN	Wd-CONT	*INIT-APP	ONSET	DEP-V	ALIGN-L (Wd, PWd)	ALIGN-R (Wd, PWd)
[i.la.kmɛ̃.ʃɛ]			*!							
[i.la.k+mɛ̃.ʃɛ]						*!				
☞ [i.lak.mɛ̃.ʃɛ]									*	*
[i.la.ek.mɛ̃.ʃɛ]							*!	*	*	
[i.la.ke.mɛ̃.ʃɛ]					*!			*		
[i.la.mɛ̃.ʃɛ]		*!							*	
[i.la.k.mɛ̃.ʃɛ]	*!									

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TABLEAU 6. *Input:* un morcieu d' cminèe /ɛ̃mɔrsjødkminɛ/ *'a piece of chimney'*

Candidates	*P/C	MAX-C	ONS-SON-2	BIN	Wd-CONT	*INIT-APP	ONSET	DEP-V	ALIGN-L (Wd, PWd)	ALIGN-R (Wd, PWd)
[ɛ̃.mɔr.sjød.kmi.nɛ]			*!							*
[ɛ̃.mɔr.sjød.k+mi.nɛ]						*!				*
[ɛ̃.mɔr.sjødk.mi.nɛ]				*!						**
[ɛ̃.mɔr.sjø.de.k+mi.nɛ]						*!		*		*
☞ [ɛ̃.mɔr.sjø.dek.mi.nɛ]								*	*	*
[ɛ̃.mɔr.sjød.ke.mi.nɛ]					*!					*
[ɛ̃.mɔr.sjød.mi.nɛ]		*!								*
[ɛ̃.mɔr.sjød.k.mi.nɛ]	*1									

TABLEAU 7. *Input:* Té vlo, ti! Cmint qu'a vo? /tvlɔtikmɛ̃kavɔ/
'Finally here, you! How are you doing?'

Candidates	Wd-Cont	Align-L (Wd, Utt)	Align-L (Wd, IntPhr)
☞ [te.vlɔ.tik.mɛ̃.ka.vɔ]		*	*
☞ [te.vlɔ.ti.ek.mɛ̃.ka.vɔ]		*	*
[te.vlɔ.ti.ke.mɛ̃.ka.vɔ]	*!		

b. *A chl'arrét d'Imbreuville, a fzoait juste/*juste.* (Chl'autocar 33)
at the stop of Imbreuville, it made tight
'At the Imbreuville stop, there was not much time'

The partial grammar presented in Tableau 7 selects two optimal candidates. This brings us to the issue of variable epenthesis in phrase-initial position. Until now, the rankings proposed were all strict and thus predicted invariant outputs. We must now find a way to account for the variability of vowel epenthesis in phrase-initial position. Anttila (1997) proposed that the requirement that all constraints must be strictly ranked within a particular grammar should be relaxed to allow some unspecified rankings and multiple optimal outputs within a single grammar. Following this view, I now try to determine whether some constraints might be crucially unranked in the grammar of VP. Two constraints, Onset and *Init-App, have not yet been ranked.[18] To these two constraints, we should add Align-R (Wd, IntPhr) and Align-R (Wd, Utt), which have been ranked only with respect to some higher and lower constraints. What I propose here is that, while the relative ranking of the two Align-R constraints is universally determined, with Align-R (Wd, Utt) being ranked higher than Align-R (Wd, IntPhr) (Côté, 1999), their collective ranking with respect to both Onset and *Init-App is free, and that it is this flexible ranking that is responsible for generating the variable patterns observed in phrase-initial position.

The grammar proposed for VP is summarized in Table 4.[19] The constraints are presented in decreasing order, with the constraints in Set 1 being undominated and never violated and the constraints in Set 6 being ranked lowest. As mentioned earlier, additional research should provide evidence allowing us to rank the constraints in Sets 1 and 6. However, and this is an essential component of the analysis proposed here, no additional research is expected to yield evidence that would force us to rank the constraints in Set 3, as the crucially unranked status of these constraints is precisely what generates competing optimal outputs characteristic of language-internal variation.

The grammar summarized in Table 4 accounts for the variable pattern observed at the beginning of an IntPhr. Let us consider an example such as that in Tableau 8, where an illicit onset occurs at the beginning of an IntPhr and where the preceding segment is a vowel. Tableau 8 corresponds to one of six possible rankings of the three crucially unranked constraints from Set 3: Align-R (Wd,

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TABLE 4. *Constraint rankings in Vimeu Picard*

Set 1 (ranking undetermined)	*P/C, MAX-C, ONS-SON-2, BIN
Set 2	Wd-CONT
Set 3 (crucially unranked)	{ALIGN-R (Wd, Utt) ≫ ALIGN-R (Wd, IntPhr)}, ONSET, *INT-APP
Set 4	ALIGN-L (Wd, Utt)
Set 5	ALIGN-L (Wd, IntPhr)
Set 6 (ranking undetermined)	DEP-V, ALIGN-L (Wd, PWd), ALIGN-R (Wd, PWd)

IntPhr), ONSET, and *Init-App.[20] This tableau, in which the lines between these three constraints indicate that ALIGN-R (Wd, IntPhr) is ranked higher than ONSET, which in turn is ranked higher than *INIT-APP, selects the output with an initial appendix as its optimal candidate. The other five rankings are not illustrated here, but a summary of their outcome is provided in Table 5. The nine cells surrounded by a box in Tableau 8 represent the area where variation occurs. That is, all six possible rankings select one of only three candidates as optimal, depending on which constraint is ranked highest in each particular case. All other candidates are ruled out on the grounds that they violate high-ranking constraints.

Table 5 summarizes the predictions made by this analysis: the candidate with an initial appendix [d] is selected as the optimal output in two out of six tableaux, including Tableau 3; the candidate in which the initial consonant is syllabified as the coda of the preceding syllable is selected in two tableaux; and the candidate with an onsetless syllable headed by an epenthetic vowel is selected in two others. The grammar proposed here predicts that epenthetic vowels should be inserted 33% of the time in this environment. As shown in Table 5, this prediction matches reasonably well the 23% frequency observed in the corpus. Conversely, in the context where an initial cluster occurs at the beginning of an IntPhr and follows a consonant-final word, as in Tableau 9, the ranking proposed in Table 4 correctly predicts that epenthesized outcomes should be more frequent than non-epenthesized ones. Tableau 9 illustrates one of the six possible rankings, and a summary of the optimal candidates selected in all six possible rankings is provided in Table 6.

In Utt-initial position, the effect of the preceding phonological segment on vowel epenthesis is, as we have seen, much weaker than in phrase-internal and IntPhr-initial position. The analysis developed here predicts this reduced effect, thanks to the ranking of the various ALIGN constraints. Because ALIGN-L/R (Wd, PWd) are ranked so low in the grammar of VP, candidates involving syllabification across word boundaries are often selected as optimal outputs to satisfy more highly ranked constraints such as ONSET and *INIT-APP. As ALIGN-L (Wd, IntPhr) and ALIGN-L (Wd, Utt) are ranked lower than ONSET and *INIT-APP, candidates violating either or both ALIGN constraints are selected as more optimal than candidates that violate one of the latter two constraints. However, since ALIGN-R (Wd, IntPhr) and ALIGN-R (Wd, Utt) are crucially unranked with re-

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TABLEAU 8. *Il étouot bértcheu, dpis l'âge d'onze douze ans*
'he had been a shepherd, since the age of eleven twelve years old'
Input: /…berkødpi…/

Candidates	*P/C	MAX-C	ONS-SON-2	BIN	Wd-CONT	ALIGN-R (Wd, Int-Phr)	ONSET	*INIT-APP	ALIGN-L (Wd, Int-Phr)	DEP-V	ALIGN-L (Wd, PWd)	ALIGN-R (Wd, PWd)
[ber.tʃø.de.pi]					*!					*		
[ber.tʃø.dpi]			*!									
[ber.tʃødp.i]				*!		*	*		*		*	*
☞ [ber.tʃø.d+pi]								*				
[ber.tʃød.pi]						*!			*		*	*
[ber.tʃø.ed.pi]							*!		*	*	*	
[ber.tʃø.pi]		*!							*		*	
[ber.tʃø.d.pi]	*!											

TABLE 5. *Epenthesis in IntPhr-initial postvocalic position*

Input: /berkødpi/	Number Optimal	Percentage Predicted	Percentage Observed	Probability
[ber.tʃø.d+pi]	2/6	67%	77%	.77
[ber.tʃød.pi]	2/6			
[ber.tʃø.ed.pi]	2/6	33%	23%	.23

spect to ONSET and *INIT-APP, this means that the requirement that word and phrase right boundaries must be aligned sometimes overrides the requirement for a syllable onset or the prohibition against initial appendices. In addition, because ALIGN-R (Wd, Utt) is ranked higher than ALIGN-R (Wd, IntPhr), the ALIGN-R (Wd, Utt) constraint is ranked higher than ONSET and *INIT-APP more often than ALIGN-R (Wd, IntPhr) is, thus predicting that few cases of syllabification across an Utt boundary would be selected as optimal. In other words, the requirement that an Utt boundary must correspond to a word boundary overrides the need for onset consonants or the prohibition against word-initial appendices more often than the requirement that an IntPhr boundary must be aligned with the beginning of a word. One of the twelve possible rankings for the Utt-initial position is illustrated in Tableau 10, and the predictions and observations concerning epenthesis in Utt-initial position are summarized in Table 7. As we can see, this analysis correctly predicts that preceding vowels and consonants should have little influence over epenthesis in Utt-initial position. In addition, it predicts that, in the absence of any preceding phonological segment, such as at the beginning of a paragraph or a speaking turn, epenthesis and absence of epenthesis should be found in fairly equal numbers.

While the match between predicted and observed epenthesis rates is quite satisfactory at such an early stage of the analysis, a few words are warranted concerning the frequency and probability numbers that are provided as observed values. As is well known in variation studies, probabilities are generally assumed to constitute more accurate reflections of a community's grammar and its individuals' linguistic competence (Cedergren & Sankoff, 1974:343): probabilities abstract away from any skewing in the data that might inflate the community average frequency due to the overrepresentation of one type of speaker or one type of linguistic context that strongly favors one variant over the other. Since OT analyses correspond to competence rather than performance, we should compare our predictions with our probability values rather than with percentages. For instance, in the corpus analyzed in this article, a disproportionally large number of tokens from authors with low rates of epenthesis in Utt-initial position after a vowel may well explain why the observed frequency of epenthesis in this context is 36%, six percentage points below the expected 42%. The probability value assigned to this context, .42, corresponds more closely to the prediction made by

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TABLEAU 9. *qui dit Gnace, édvant partir*
'says Gnace, before leaving'
Input: /…ɲasdvã…/

Candidates	*P/C	MAX-C	ONS-SON-2	BIN	Wd-CONT	ALIGN-R (Wd, Int-Phr)	ONSET	*INIT-APP	ALIGN-L (Wd, Int-Phr)	DEP-V	ALIGN-L (Wd, PWd)	ALIGN-R (Wd, PWd)
[ɲas.de.vã]					*!					*		
[ɲas.dvã]			*!									
[ɲasd.vã]				*!		*			*		*	*
☞ [ɲas.d+vã]								*				
[ɲas.ed.vã]							*!		*	*	*	
[ɲa.sed.vã]						*!			*	*	*	*
[ɲas.vã]		*!							*		*	
[ɲas.d.vã]	*!											

TABLE 6. *Epenthesis in IntPhr-initial postconsonantal position*

Input: /ɲasdvã/	Number Optimal	Percentage Predicted	Percentage Observed	Probability
[ɲas.d+vã]	2/6	33%	20%	.16
[ɲas.ed.vã]	2/6	67%	80%	.84
[ɲa.sed.vã]	2/6			

the analysis. Similarly, in contexts without preceding phonological segments, the predicted rate of 50% epenthesis is well matched by the observed probabilities of .47 and .53. Unfortunately, though, when the previous sentence ends in a consonant, the match between our predictions and the observed probabilities is less good (predicted: 58%; probability based on the observed data: .67). One possibility is that the type of preceding consonant plays a role in favoring or disfavoring epenthesis, and that a more detailed analysis of the preceding segment that differentiates between different types of consonants would make predictions that match our data more closely.

In this section, I have shown that OT can accurately model the role played by prosodic structure and preceding phonological segment in determining whether and how often epenthetic vowels are inserted in VP. In the next section, I consider the question of whether the community grammar developed in this article can also account for the epenthesis patterns of individual members of the community.

COMMUNITY GRAMMAR AND INDIVIDUAL VARIATION

A very important and interesting question in variation studies concerns the extent to which the variation patterns described for a given speech community reflect the individual patterns of the community's members (see, e.g., Bickerton, 1973; Cedergren & Sankoff, 1974; Guy, 1980; Kay, 1978; Kay & McDaniel, 1979; Naro, 1981; Romaine, 1981; Rousseau & Sankoff, 1978; Sankoff & Labov, 1979; Sterelny, 1983, for various approaches to this issue). As there is never any guarantee that any given speech community is completely homogeneous with respect to some variable pattern, every variationist study must—and most do (see Sankoff & Labov, 1979, for a sample of such studies)—examine the individual data very carefully to ensure that the speakers whose data are grouped really belong together, and that the analyses proposed reflect the grammars of individual community members as well as that of the community. However, as many published articles forgo any discussion of individual variation and only present results that apply to the whole speaker sample investigated, it is easy to see how one might get a sense that variationist studies focus on groups and ignore individual speakers. This emphasis on group patterns rather than individual data in variationist studies is in part attributable to the quantitative designs used, which require large

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TABLEAU 10. *Mais Misére i s'édvisouot tout seu. Cht homme il étouot parti…*
'But Misery he himself spoke all alone. The man he was gone…'
Input: /…tusøtɔm…/

Candidates	*P/C	MAX-C	ONS-SON-2	BIN	Wd-CONT	ALIGN-R (Wd, Utt)	ALIGN-R (Wd, Int-Phr)	ONSET	*INIT-APP	ALIGN-L (Wd, Utt)	ALIGN-L (Wd, Int-Phr)	DEP-V	ALIGN-L (Wd, PWd)	ALIGN-R (Wd, PWd)
[tu.sø.ʃtɔm]			*!											
[tu.søʃt.ɔm]				*!		*	*	*		*	*		*	*
[tu.sø.ʃe.tɔm]					*!							*		
[tu.sø.ʃ+tɔm]									*					
[tu.sø.eʃ.tɔm]								*!		*	*	*	*	
[tu.søʃ.tɔm]						*!	*			*	*		*	*
[tu.sø.tɔm]		*!								*	*		*	
[tu.sø.ʃ.tɔm]	*!													

TABLE 7. *Predictions and observations for epenthesis in Utt-initial position*

V__: *Mais Misére i s'édvisouot tout seu. Cht homme il étouot parti* … (Histoéres 15)
'But Misery he himself spoke all alone. The man he was gone …'

Input: /…søʃtɔm…/	Number Optimal	Percentage Predicted	Percentage Observed	Probability
[søʃ.tɔm]	3/12	58%	64%	.58
[sø.ʃ+tɔm]	4/12			
[sø.eʃ.tɔm]	5/12	42%	36%	.42

C__: *pour él Bon Diu qu'tu viens m'ameneu t'vaque? Ej' térmércie!* (Histoéres 37)
'for the Good God that you come to-me bring your cow? I you thank'

Input: /…vakʒtrmersi…/	Number Optimal	Percentage Predicted	Percentage Observed	Probability
[vak.ʒ+ter.mer.si]	5/12	42%	43%	.33
[va.keʒ.ter.mer.si]	2/12	58%	57%	.67
[vak.eʒ.ter.mer.si]	5/12			

Ø__: *J'vas vos esplitcheu* (Grand-mére 20)
'I am-going-to to-you explain'

Input: /ʒvɔ…/	Number Optimal	Percentage Predicted	Percentage Observed	Probability
[ʒ+vɔ]	6/12	50%	57%	.53
[eʒ.vɔ]	6/12	50%	43%	.47

data sets to achieve meaningful results. This is what made Labov observe that "the grammar of the speech community is more regular and systematic than the behavior of any one individual" (1972b:124) and advocate "that the aim of linguistic analysis is to describe the regular patterns of the speech community, rather than the idiosyncrasies of any given individual" (1972b:95).

Sociolinguists have always known that individual speakers and subgroups may differ within certain limits that are assumed to be defined by the community grammar (see, e.g., Chambers, 1984, 1995; Guy, 1980; Horvath & Sankoff, 1987; Labov, 1972a, 1972b; Naro, 1981; Rousseau & Sankoff, 1978). Following the publication of a number of works expressing their concerns regarding the study of variable patterns based on group data (see, e.g., Bickerton, 1973), many researchers took the time to demonstrate that their speaker samples form homogeneous speech communities. Two studies, Guy (1980) and Naro (1981), tackled this problem directly through their detailed comparisons of data from individual speakers with group data from the same community. Guy's (1980) examination of *t/d* deletion in English and Naro's (1981) study of subject–verb agreement in

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Brazilian Portuguese both demonstrated that, when enough data are collected for each speaker, individual and collective patterns of variation correspond very closely. However, as should be obvious, while these researchers showed that it is possible for individual and community patterns to coincide, so that the latter can be taken to reflect the former, they do not establish that community grammars always mirror individual grammars. Indeed, even with respect to *t/d* deletion in English, Labov (1972a) and Guy and Boyd (1990) revealed that it is possible for members of the same community to share the same basic patterns (the effect of the surrounding phonological segments), but to differ with respect to the role played by a specific constraint (the morphemic status of /t,d/) and thus to make use of slightly different grammars. Rousseau and Sankoff (1978) examined three variables of Montréal French and found that, for two of these variables, the French-speaking community of Montréal does not behave homogeneously. Their conclusion was based on the fact that, for these two variables, a better fit between model and data could be achieved by dividing the total sample of speakers into two subgroups rather than by treating them as a homogeneous set. More recently, Mougeon and Nadasdi (1998) reviewed many "discontinuous" patterns in speech communities (i.e., examples in which different groups of speakers exhibit slightly different social, stylistic, or structural constraints bearing on the application of a variable rule) and concluded that such patterns are rather common in sociolinguistic studies. As we shall see, vowel epenthesis in VP constitutes one more example of a discontinuous pattern, as some of the constraints that influence the insertion of epenthetic vowels operate slightly differently in the writings of different authors.

Over the past 40 years, many examples of homogeneous or relative homogeneous communities have been studied,[21] and we have accumulated a reasonable sum of knowledge concerning this type of community grammar. We can feel confident that, in such communities, community grammar and individual grammars are identical (see, e.g., Cedergren & Sankoff, 1974:335). Unfortunately, much less is known about the relationship between community and individual grammars in communities that exhibit discontinuous patterns of variation. First of all, the very notion of community grammar becomes debatable in situations where community members exhibit a number of different linguistic behaviors, which may or may not reflect a single grammar. In such situations, it becomes necessary to show that the individual grammars contain a common denominator that cannot be reduced to the basic linguistic facts attributable to Universal Grammar (UG). If evidence for a common grammar can be uncovered, then it becomes necessary to examine the relationships between the grammars of the subgroups and the grammar of the community, as well as the different subgroup grammars themselves. Finally, we should try to determine whether there are any advantages to positing a community grammar at all, for in the absence of any such advantages, Occam's Razor dictates that we do without it. This section addresses these questions through an examination of individual patterns of word-initial vowel epenthesis in the VP speech community. I present quantitative data from ten authors, consider to what extent each individual epenthesis pattern mirrors the com-

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munity grammar proposed earlier, and discuss how the OT analysis developed here allows us to derive individual patterns of variation from the community grammar. As we shall see, the analytical tools provided by OT make it possible to formalize our intuitions about community and individual grammars and to predict limits upon the type of variation that can be expected to take place across speakers belonging to the same speech community.

The opposition between community-wide and individual linguistic patterns is at least as old as modern linguistics. So, too, is the impression that the high degree of heterogeneity that characterizes individual grammars disappears once we consider language at the community level. This idea was expressed by Humboldt (1936:129, cited in Chambers, 1995:26): "Language comprehends in fact two contrasting properties: namely, it is divided up into an infinity as the sole language in one and the same nation; and at the same time these many variants are united into one language having a definite character." It is also found in the opposition between *langue* and *parole* proposed by Saussure. While some of the heterogeneity associated with individual grammars may be only apparent, as listeners and readers are struck by irregularities found in small data samples from individual speakers (see Guy, 1980; Naro, 1981), we have seen that many examples of heterogeneity are real and must be accounted for. One possibility, suggested by Flikeid (1994:417), is that heterogeneity within the community may be due to the fact that individual grammars constitute more specific versions of community grammars in that they make use of only some of the options made available by the community grammar: that is, different individual grammars may implement different possibilities offered by the community grammar. This proposal not only is intuitively appealing, but also has the merit of being testable. The OT grammar developed earlier provides us with an excellent opportunity to test this conception of the relationship between community and individual grammars. By examining the individual epenthesis patterns of ten different authors, we should be able to determine whether individual grammars can be derived from the community grammar, and whether individual grammars qualify as more specific instantiations of this general grammar.

Individual patterns of use of epenthetic vowels are reported in Table 8. The literary sample analyzed for this table exceeds that used in the preceding sections, as it was deemed essential to work with a sizeable sample for each individual author. Wherever possible, a minimum of 500 tokens of epenthesis sites at phrase boundaries was collected for each author. This goal was achieved for seven out of ten authors. For the other three authors, all available texts were perused, yielding over 400 tokens in two cases and slightly over 300 tokens in one case.[22] The corpus used for this analysis thus contained a total of 9,325 tokens, including 5,401 tokens in phrase-initial position.

A rapid look at Table 8 reveals extensive variation across authors, with total epenthesis frequencies varying between 17% and 74%. A closer look at the numbers allows us to identify both very striking similarities and differences across all authors. The similarities strengthen our conviction that these authors are indeed members of the same speech community, as they all share the same basic gram-

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TABLE 8. *Individual patterns of vowel epenthesis*

Author	IntPhr-internal		IntPhr-initial		Utt-initial			Total (IntPhr-initial + Utt-initial)
	V__	C__	V__	C__	V__	C__	Ø__	
Lecat	1% 3/224	97% 106/109	52% 108/206	96% 115/120	84% 59/70	79% 38/48	85% 91/107	74% 411/554
Chivot	1% 2/179	100% 132/132	43% 109/255	88% 189/214	75% 43/57	85% 35/41	75% 67/89	68% 443/656
Touron	1% 2/224	98% 122/124	33% 44/135	73% 79/109	57% 59/104	70% 45/64	50% 65/130	54% 292/542
Vigneux	0% 0/227	98% 158/161	26% 46/177	93% 127/136	34% 38/111	51% 43/85	49% 36/73	50% 290/582
Devismes	11% 45/411	98% 228/232	36% 62/173	68% 93/136	42% 26/62	64% 28/44	44% 19/43	50% 228/458
Deglicourt	0% 1/227	99% 163/164	22% 28/125	66% 64/97	37% 27/74	51% 26/51	45% 38/85	42% 183/432
GVasseur	0% 0/223	100% 119/119	5% 9/186	89% 121/136	18% 16/89	71% 44/62	29% 50/172	38% 240/645
Depoilly	0% 0/205	100% 107/107	10% 21/211	73% 91/124	15% 18/123	37% 25/68	33% 32/98	30% 187/624
Leclercq	0% 0/199	100% 115/115	4% 8/186	76% 98/129	7% 8/108	41% 37/90	20% 19/94	28% 170/607
JVasseur	0% 0/278	98% 121/124	6% 6/109	49% 30/61	8% 4/48	22% 9/41	9% 4/45	17% 53/304
Total	2% 53/2,397	98% 1,371/1,387	25% 441/1,763	80% 1,007/1,262	35% 298/846	56% 330/594	45% 421/936	46% 2,497/5,401

mar for epenthesis. Indeed, while some inter-author similarities, such as the degree of opacity of the various prosodic boundaries, can be attributed to UG, the fact that all authors variably epenthesize in phrase-initial position, and that they epenthesize more often in postconsonantal than in postvocalic contexts, can only be attributed to a specific pattern of nonranking that is likely unique to VP and not a reflex of UG. However, the differences across authors may cast doubt on the conclusion that we are dealing with a single speech community. Indeed, in homogeneous speech communities, differences across authors concern only the relative frequencies of application of a rule but not the type of effect that linguistic constraints have on the application of the rule (Guy, 1980:11; Sankoff, 1988:992). In other words, only quantitative differences are predicted to exist in homogeneous communities. The differences in Table 8 cannot simply be described in terms of different frequencies of use by different authors, as individual authors display different preferences in specific contexts that cannot all be predicted from the community grammar. I return to these differences to propose that they do not jeopardize the notion of a community grammar, but rather can be derived from it.

Let us begin with the epenthesis patterns shared by all authors. First, it is apparent that the categorical or near-categorical patterns described for the phrase-internal context characterize the speech of each individual author in this sample. For the postconsonantal context, epenthesis rates range from 97% to 100% for all authors. In postvocalic contexts, epenthesis rates oscillate between 0% and 1% for nine out of ten authors. The only exception, Devismes, has a notably higher epenthesis rate of 11%. One hypothesis is that Devismes's work reflects a spoken intonation that is more spontaneous and "choppy" than the work of his more "intellectual" colleagues, and that his punctuation does not always accurately reflect prosodic boundaries.[23] Second, a comparison of the three prosodic contexts reveals that for all authors the influence of the preceding segment decreases as the strength of the prosodic boundary increases. That is, for every author, the frequency of epenthesis in postvocalic context increases as the strength of the prosodic boundary increases, whereas the frequency of epenthesis in postconsonantal context decreases as we move from IntPhr-internal to IntPhr-initial to Utt-initial context. In almost all cases (i.e., for all ten authors, IntPhr-internally and initially, and for eight speakers, Utt-initially), a preceding consonant favors epenthesis more than does a preceding vowel; in no case does a preceding vowel favor epenthesis more than a preceding consonant.[24]

The fact that the community grammar accounts for the basic patterns of each community member constitutes the first piece of evidence in support of the notion of community grammar (see also Cedergren & Sankoff, 1974:347; Guy 1980:12) and against the position of detractors who view community grammars as simply averaging out individual differences and thus not reflecting the linguistic competence of any individual members (see, e.g., Bickerton, 1973; Sterelny, 1983:62). The second piece of evidence comes from the fact that it has been possible to develop a fully natural analysis for the community grammar. If the sum of the linguistic patterns of individual community members only amounted to a meaningless collection of disparate patterns, it would be impossible to propose a phonological

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analysis capable of generating this kind of pattern. However, if individual members all shared compatible patterns, the community grammar that averaged individual patterns would be simply and plausibly stateable (cf. Naro, 1981:88).

The OT grammar developed earlier correctly predicts that these patterns should be found in each author. However, it does not predict the following differences. First, it appears that, while Lecat shows a strong preference for epenthesis, with over 50% epenthetic vowels in postvocalic position in IntPhr-initial position (up from only 1% phrase-internally) and approximately 80% in all Utt-initial positions, JVasseur shows the opposite preference, with a drop from 98% epenthesis postconsonantally in phrase-internal position to 49% IntPhr-initially and between 8% and 22% Utt-initially. If OT grammars predict not only where variation is possible, but also the relative frequency with which the variants are used, we must conclude that Lecat and JVasseur have different grammars.[25] Another important difference between Lecat and Chivot, on the one hand, and all other authors, on the other, is that for the former Utt boundaries seem to be opaque enough to prevent any influence from the preceding phonological segment, thus producing epenthesis rates that are relatively stable across Utt-initial positions. On the contrary, for GVasseur, an Utt boundary remains quite transparent, as epenthesis is almost four times more frequent in his texts if the preceding utterance ends in a consonant than if it ends in a vowel.

These individual differences present a serious challenge for the community grammar that was developed earlier. In the rest of this section, I show that the notion of a community grammar remains a useful concept even in situations such as this one, and I argue that it presents a definite advantage over the idea that communities simply consist of collections of idiolectal grammars.

We saw that OT proved very well suited for analyzing the variable pattern of vowel epenthesis that characterizes the VP community as a whole. As this theory was originally designed for the analysis of crosslinguistic variation, it should easily account for minute dialectal differences such as the ones revealed in Table 8. I propose that variable OT grammars allow us to implement the intuition that individual grammars are more restricted versions of the community grammar by specifying some of the rankings left unspecified in the community grammar. Let us assume, in grammars derived from the community grammar, that constraints that are already strictly ranked conserve their strict ranking, and that unranked constraints can remain unranked or be ranked with respect to the neighboring constraints but cannot change their relative ranking with respect to constraints already ranked. Any grammar whose rankings cannot so be derived from the more general grammar does not constitute a possible individual grammar within this speech community.

Based on these assumptions, I propose that the individual grammars of VP are allowed to differ from the community grammar only with respect to the relative ranking of its four crucially unranked constraints: {ALIGN-R (Wd, Utt) ≫ ALIGN-R (Wd, IntPhr)}, ONSET, and *INIT-APP, as long as all four constraints remain lower than Wd-CONT and higher than ALIGN-L (Wd, Utt).

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An initial, nonexhaustive list of possible individual grammars is provided in (11). In all these grammars, constraint ranking remains partial, which means that some variable patterns can be generated. Additional possible grammars are provided in (12). As all of them fully rank all four constraints, their output will not allow variation, and epenthesis will apply or will not apply categorically.

(11) {ALIGN-R (Wd, Utt) ≫ ALIGN-R (Wd, IntPhr)} ≫ ONSET, *INIT-APP
{ALIGN-R (Wd, Utt) ≫ ALIGN-R (Wd, IntPhr) ≫ ONSET}, *INIT-APP
{ALIGN-R (Wd, Utt) ≫ ALIGN-R (Wd, IntPhr)}, {ONSET ≫ *INIT-APP}
{ALIGN-R (Wd, Utt) ≫ ALIGN-R (Wd, IntPhr)}, {*INIT-APP ≫ ONSET}
{ALIGN-R (Wd, Utt), ONSET, *INIT-APP} ≫ ALIGN-R (Wd, IntPhr)
{ALIGN-R (Wd, Utt), ONSET} ≫ *INIT-APP ≫ ALIGN-R (Wd, IntPhr)
{ALIGN-R (Wd, Utt), *INIT-APP} ≫ ONSET ≫ ALIGN-R (Wd, IntPhr)

(12) ALIGN-R (Wd, Utt) ≫ ALIGN-R (Wd, IntPhr) ≫ ONSET ≫ *INIT-APP
ALIGN-R (Wd, Utt) ≫ ALIGN-R (Wd, IntPhr) ≫ *INIT-APP ≫ ONSET
ALIGN-R (Wd, Utt) ≫ ONSET ≫ *INIT-APP ≫ ALIGN-R (Wd, IntPhr)
ALIGN-R (Wd, Utt) ≫ ONSET ≫ ALIGN-R (Wd, IntPhr) ≫ *INIT-APP
ALIGN-R (Wd, Utt) ≫ *INIT-APP ≫ ALIGN-R (Wd, IntPhr) ≫ ONSET

While these lists of possible individual grammars are not exhaustive, they illustrate the types of patterns that we could expect to find in the speech of VP speakers. What is crucial here is that, even though the number of grammars derived from this one grammar may be large, it is limited, as the number of possible partial and complete rankings available for these four constraints is limited,[26] and that many other grammars are not possible grammars within this speech community. Some excluded grammars are, according to the analysis presented here, not possible natural grammars, as they violate universal rankings provided by UG. This is the case, for instance, with the grammar in (13) or any other grammar that ranks ALIGN-R (Wd, IntPhr) higher than ALIGN-R (Wd, Utt), as I propose that the ALIGN-R (Wd, Utt) ≫ ALIGN-R (Wd, IntPhr) ranking is a universal ranking, and that it is thus not specific to Picard.

(13) ALIGN-R (Wd, IntPhr) ≫ ALIGN-R (Wd, Utt), ONSET, *INIT-APP

However, other grammars, such as those in (14), are possible natural grammars that we could find in other varieties of Picard, in French dialects, or in unrelated languages that also exhibit (variable) vowel epenthesis in phrase-initial position. But as the rankings they contain cannot be derived from the grammar proposed here for VP, we do not expect them to be found within this speech community.

(14) {ALIGN-R (Wd, Utt) ≫ ALIGN-R (Wd, IntPhr)}, ONSET, *INIT-APP ≫ PWd-CONT
ALIGN-L (PWd, Utt) ≫ {ALIGN-R (Wd, Utt) ≫ ALIGN-R (Wd, IntPhr)}, ONSET
DEP-V ≫ ALIGN-L (PWd, Utt) ≫ {ALIGN-R (Wd, Utt) ≫ ALIGN-R (Wd, IntPhr)}

Let us now examine the grammars of the individual authors described in Table 8. One reason frequently invoked for abandoning the notion of community grammar is that such grammars do not reflect any individual patterns. The present

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TABLE 9. *Community grammar and the individual patterns of three authors*

	IntPhr-initial		Utt-initial		
	V__	C__	V__	C__	Ø__
Community	33%	67%	42%	58%	50%
Touron	33%	73%	57%	70%	50%
	44/135	79/109	59/104	45/64	65/130
Devismes	36%	68%	42%	64%	44%
	62/173	93/136	26/62	28/44	19/43
Deglicourt	22%	66%	37%	51%	45%
	28/125	64/97	27/74	26/51	38/85

article argues against such a position, as the community grammar proposed here not only accounts for the basic patterns of all ten authors under investigation, but also makes predictions that quite closely match the patterns observed for three of them: Touron, Devismes, and Deglicourt. As shown in Table 9, the match is particularly striking for Devismes. While this analysis cannot predict the quantitative differences observed among the three authors, we must remember that the grammar developed here is partial, one which only models the role of the two most important constraints on vocalic epenthesis in VP, and that the precision with which we predict relative frequencies is limited by the fact that only a few constraints are crucially unranked with respect to each other. Once more constraints are taken into account, it may be possible to make more accurate predictions and to account for small differences among speakers.

Even though the community grammar predicts patterns that do not quite match those of the other seven authors, it is possible to derive most individual grammars from the community grammar by specifying the relative ranking of some of the crucially unranked constraints or by reranking some adjacent constraints. Let us start with GVasseur. The most striking aspect about his pattern is the strength of the effect of the preceding phonological segment across all prosodic boundaries. This is something that the community grammar does not predict, as the effect of the preceding segment decreases significantly as the strength of the prosodic boundary increases, resulting in the relatively weak effect across an Utt boundary (see Table 9). Thus, a slightly different grammar that plays down the blocking effect of prosodic boundaries must be proposed for GVasseur. This can be done by demoting ALIGN-R (Wd, IntPhr) and proposing that GVasseur's grammar differs from the community grammar only by this additional ranking: ONSET, *INIT-APP, and ALIGN-R (Wd, Utt) all dominate ALIGN-R (Wd, IntPhr). The frequencies predicted by this grammar and the actual frequencies observed are compared in Table 10. The grammar proposed for GVasseur correctly predicts a strong effect of the preceding phonological segment across all prosodic boundaries, but fails to predict that some variation is possible at the left edge of an IntPhr. As a matter of

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TABLE 10. *Predicted and observed epenthesis frequencies for GVasseur:* {ONSET, *INIT-APP, ALIGN-R (Wd, Utt)} ≫ ALIGN-R (Wd, IntPhr)

	IntPhr-initial		Utt-initial		
	V__	C__	V__	C__	Ø__
Predicted	0%	100%	33%	67%	50%
Observed	5%	89%	18%	71%	29%

fact, it predicts that IntPhr boundaries behave just like any lower prosodic boundaries in allowing syllabification across word boundaries. With the present grammar, in which three constraints are crucially unranked, it is impossible to achieve a better fit, since only six different rankings are available and each constraint is ranked at the top in two out of six tableaux. Any other possible individual grammar is similarly limited: with a maximum of four partially ranked constraints and twelve possible tableaux, no individual grammar can predict a frequency of epenthesis lower than 17% or higher than 83%.

Two different solutions to this problem come to mind. One solution views constraint rankings as somewhat fuzzy rather than completely strict, thus making it possible for a small number of tokens, even as low as 5% or 10%, to result from a small area of overlap between two adjacent constraints (see, e.g., Boersma & Hayes, 2001, who proposed that constraint ranking is gradual rather than discrete, thus allowing language-internal variation of this type). However, this solution would involve abandoning the type of partial ranking that has been adopted so far in this article. A second solution, fully compatible with the present analysis, might emerge from a more complete analysis, one which takes into account the types of consonants involved, the geminate versus nongeminate character of the phrase-initial cluster, and the type of discourse relationship that connects prosodic phrases and utterances.[27] As more constraints are added to our system, the possibility of predicting fine frequency distinctions and percentages approaching 0% and 100% increases. For instance, if we add to the four existing constraints one more that is not crucially ranked with respect to the others, we obtain 60 different rankings, allowing us to predict epenthesis frequencies as low as 8% and as high as 92%.[28]

JVasseur's grammar for epenthesis differs from that of his father, GVasseur, in two important ways. First, JVasseur clearly disfavors epenthesis as a syllabification strategy, as his low 49% rate of epenthesis after a consonant in IntPhr-initial position and his low frequencies in Utt-initial position show. Second, he does not like to look across an Utt boundary to find a possible nucleus for syllabifying an Utt-initial consonant, as revealed by the small difference between the postvocalic and postconsonantal contexts. He too, then, requires his own grammar. We can account for his dispreference for epenthesis by ranking ONSET higher than *INIT-APP and ALIGN-R (Wd, IntPhr), thus predicting no epenthesis in postvocalic

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TABLE 11. *Predicted and observed epenthesis frequencies for JVasseur:* ONSET ≫ *INIT-APP, {ALIGN-R (Wd, Utt) ≫ ALIGN-R (Wd, IntPhr)}

	IntPhr-initial		Utt-initial		
	V__	C__	V__	C__	Ø__
Predicted	0%	50%	0%	33%	0%
Observed	6%	49%	8%	22%	9%

contexts and 50% epenthesis in postconsonantal contexts at the left edge of an IntPhr. If we also rank ONSET higher than ALIGN-R (Wd, Utt), then we correctly predict that, in Utt-initial position, only postconsonantal contexts should allow for more than 10% epenthesis,[29] as shown in Table 11.

As noted earlier, Lecat's grammar differs quite drastically from that of JVasseur: Lecat favors epenthesis about as strongly as JVasseur disfavors it. This strong preference for epenthesis plausibly results from a high ranking of *INIT-APP. Lecat also differs very clearly from GVasseur in showing no effect at all of the final segment of the preceding Utt on Utt-initial epenthesis.[30] This effect can be ascribed to a relatively high ranking of ALIGN-R (Wd, Utt). However, while a grammar ranking *INIT-APP over ONSET and ALIGN-R (Wd, IntPhr) makes acceptable predictions for IntPhr-initial position, as shown in Table 12, it fails to predict a constant rate of approximately 80% epenthesis in Utt-initial position. None of the possible rankings for the four constraints contained in Set 3 makes the right prediction in this case.[31] We need to predict some CC-initial sentences, and one way to do this is by upgrading the ALIGN-L (Wd, Utt) constraint, which is ranked just below the Set 3 constraints. Thus, if we propose that, for Lecat, ALIGN-L (Wd, Utt) belongs to the same set of partially ranked constraints, and that it is ranked lower than both *INIT-APP and ALIGN-R (Wd, Utt), we correctly predict that epenthesis applies in most, but not all, Utt-initial positions, as shown in Table 13. As can be seen in this table, this grammar makes quite accurate predictions concerning the distribution of epenthetic vowels in the texts of another author: namely, Chivot.[32]

It was proposed earlier that individual grammars could be derived from the community grammars through a more specific ranking of the crucially unranked constraints, one which does not affect any of the higher or lower ranked constraints. The grammar just proposed for Lecat and Chivot forces me to relax this proposal, as it upgrades the ALIGN-L (Wd, Utt) constraint so it can be included in the set of partially ranked constraints. While this new possibility increases the number of possible individual grammars that can be derived from a single community grammar, minimal changes in ranking between adjacent constraints, such as the one posited here, are not really unexpected, as they are likely to play an important role in language change and dialect differentiation. In this case, the

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TABLE 12. *Predicted and observed epenthesis frequencies for Lecat:* *INIT-APP, ALIGN-R (Wd, Utt) ≫ ONSET, ALIGN-R (Wd, IntPhr)

	IntPhr-initial		Utt-initial		
	V__	C__	V__	C__	Ø__
Predicted	50%	100%	100%	100%	100%
Observed	52%	96%	84%	79%	85%

TABLE 13. *Predicted and observed epenthesis frequencies for Lecat and Chivot:* *INIT-APP, {ALIGN-R (Wd, Utt) ≫ ALIGN-L (Wd, Utt)} ≫ ONSET, Align-R (Wd, IntPhr)

	IntPhr-initial		Utt-initial		
	V__	C__	V__	C__	Ø__
Predicted	50%	100%	67%	67%	67%
Lecat	52%	96%	84%	79%	85%
Chivot	43%	88%	75%	85%	75%

hypothesis of language change is not particularly plausible, as Lecat and Chivot belong to the same generation as GVasseur, Depoilly, and Touron (all five were born between 1898 and 1907); however, the possibility of geographical variation exists, as Lecat and Chivot come from different villages within the Vimeu region than the other three authors.

So far, I have shown how the individual grammars of seven authors can be derived from the community grammar. Three authors remain to be accounted for. Of these, two have very similar patterns: Depoilly and Leclercq. Both have rather low overall epenthesis rates, with almost no epenthesis after a vowel at the beginning of an IntPhr and a substantial decrease from 100% to 75% for postconsonantal contexts. Utt-initially, their patterns are similar to that of JVasseur, except that their frequencies in absolute initial position (and possibly also in postvocalic position for Depoilly) are slightly higher and thus could not be generated by a grammar that predicts no epenthesis in those positions. Given the number of partially ranked constraints that we currently have, it does not appear possible to make accurate predictions in these two cases. While the grammar shared by Depoilly and Leclercq is expected to be very similar to that of JVasseur, at least one constraint must have a different ranking to yield higher epenthesis rates in postconsonantal and absolute initial position but not in postvocalic position. As for Vigneux, more data are required in order to determine how opaque an Utt bound-

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ary really is for him. For the moment, the rate differences observed among the three Utt-initial contexts are not statistically significant ($\chi^2 = 6.62$; $p > .2$), but it is possible that additional data might show that the postvocalic context is significantly different from the other two contexts. Vigneux also exhibits a unique pattern in IntPhr-initial position, with quasi-categorical epenthesis in postconsonantal contexts but a somewhat high epenthesis rate in postvocalic contexts. While his epenthesis rates in IntPhr-initial position fall within the same range as those of the top three authors in Table 8, his Utt-initial rates are much lower than theirs. Given the complexity of his pattern, a complete analysis of Vigneux' grammar must await further research.

In this section, I returned to an old problem in variationist sociolinguistics: the question of community versus individual grammar. An examination of the individual epenthesis patterns of ten authors provided evidence that every member of this community shares the same basic grammar, but that some individuals differ in specific aspects such as the importance of the role played by the preceding segment. It was proposed that these individual differences can be attributed to slightly different individual grammars, which were derived from the community grammar through additional ranking involving the crucially unranked constraints of the community grammar and/or a minimal shift in the ranking of two adjacent constraints.

The notion of community grammar has proved difficult to accept for many researchers. While some linguists have expressed their doubts that grouping data from different individuals constitutes a legitimate approach to the study of language in its social structure, others have raised questions concerning the locus of this grammar, given the absence of a community brain. Many studies, including this one, have carefully demonstrated that the first objection often does not hold, and that community patterns of variation can mirror individual patterns very closely. The issue of locating community grammars constitutes a much thornier issue. Nevertheless, I would like to argue that the advantages of recognizing the existence of a community grammar justify keeping it. Indeed, deriving individual grammars from a community grammar predicts that only some individual grammars are allowed to coexist within the same community, and that the differences between these grammars are subject to constraints. In the absence of a community grammar, we would expect variation to be somewhat limited to ensure successful communication between community members, but we could not predict grammar co-occurrences and restrictions on interindividual variations. These predictions can be empirically tested, and the OT framework adopted in this article and in much research on phonological and morphophonological variation proves particularly well suited for this enterprise.

CONCLUDING REMARKS

The main objective of this article has been to show that the categorical and variable aspects of word-initial vowel epenthesis in VP are the product of

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language-internal variation, and that it is possible to develop a phonological analysis that not only accounts for these categorical and variable aspects, but also predicts the relative frequency with which epenthesis applies in specific environments. The OT analysis proposed here makes use of widely accepted constraints in phonological theory, ranks many of them strictly, but leaves the ranking of a few constraints undetermined, making it possible to generate more than one optimal output in some environments. The analysis remains partial, as it only accounts for the two most important phonological factors governing the choice between epenthesized and non-epenthesized variants in word-initial position (i.e., prosodic structure and preceding phonological segment), but the results obtained in this investigation are very promising. They provide a basis for a more complete analysis of word-initial epenthesis that would account for the role played by consonant type, gemination, and discourse structure. In addition, they constitute a starting point for an investigation of vowel epenthesis in word-final position (see Auger, 2000, for a preliminary study), in pronominal clitic sequences (Auger, 2001), as well as word-internally. The ultimate goal is a unified analysis of all vowel epenthesis phenomena in VP.

As studies combining OT and phonological variation constitute a new area of research, much remains to be learned concerning what constitutes possible language-internal variation and what does not. If the analysis developed here is correct, then Davis and Torretta's (1997:23) hypothesis that variation should reflect a reranking or an indeterminacy of the lowest-ranked constraints cannot be correct (see also Anttila, 1997; Boersma & Hayes, 2001; Côté, 1999; Schütze, 1997, for other examples), as the crucially unranked constraints involved in vowel epenthesis in VP are all ranked relatively centrally in this grammar. The point they raised, though, is a very interesting and important one, and we should pursue more research of this type to determine whether language-internal variation is constrained in any ways that OT is particularly well equipped to handle. Another interesting and promising way in which OT can constrain variation was proposed by Schütze (1997) and Boersma and Hayes (2001), who restricted language-internal variation to partial rankings involving adjacent constraints rather than constraints that are separated by one or more other constraints. Since, as Schütze pointed out, constraint swapping is a very powerful device that can affect any two constraints within a grammar, it makes sense to think that language-internal variation should be limited to cases involving adjacent constraints. A proposal along these lines was, as a matter of fact, developed by Lee (2001), who proposed two different ways in which OT could be made to yield multiple outputs from a single input. The first way, ranking reversal, allows two adjacent constraints to have their ranking reversed within a given grammar, so that outputs that violate either constraint are considered equally optimal. Thus, in Tableau 11, both X and Y are selected as optimal, depending on whether B or C is ranked higher than the other (the dotted line separating the two constraints indicates their reversibility). For Lee, this ranking reversal is what generates language-internal variation patterns (or optionality, in her terms), such as the epenthesis pattern described in this article.

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TABLEAU 11. *Ranking reversal (Lee, 2001)*

	A	B	C	D
☞ X		*		*
☞ Y			*	
Z	!*			*

In Lee's work, multiple outputs can also involve a switch in the relative ranking of two nonadjacent constraints. According to her, such cases can be handled through the notion of constraint reranking. Constraint reranking, which deals exclusively with the swapping of nonadjacent constraints, does not allow the generation of multiple outputs within a single tableau or grammar. Instead, different tableaux with different constraint orderings must be invoked. For Lee, reranking is responsible for variation across different social and regional dialects of the same language, as illustrated in Tableau 12.

A model that restricts language-internal variation to phenomena involving ranking reversals has the advantage of being more constrained than a model with no such restriction, and it allows us to predict where language-internal variation is possible. It also provides us with formal tools for distinguishing between language-internal variation and codeswitching between closely related linguistic varieties, such as dialects or registers of the same language. Obviously, this proposal remains to be tested. The analysis of epenthesis in VP detailed here presents one piece of supporting evidence in favor of language-internal variation resulting from crucial nonranking of adjacent, but not necessarily low-ranked, constraints.

Another crucial issue addressed in this article concerns the relationship between community and individual grammars. Even though this issue is as old as modern linguistics itself and has been, at times, the object of much debate, very few attempts to approach it empirically have been made. I argued that the community grammar developed for the Vimeu speech community is a legitimate natural grammar that reflects the basic patterns shared by all community members, and I proposed that OT allows us formally to derive individual grammars from this community grammar and to restrict the types of constraint rerankings that can affect the original ranking of the community grammar to yield licit individual grammars and thus to predict which individual grammars are allowed to coexist within a community. While this approach to community and individual grammars is new and must be tested further by examining other variables in VP and in other languages, it presents definite advantages over an alternative approach that rejects the notion of a community grammar and thus lacks any formal means of predicting how speech communities should differ from groups of speakers who share the same native language but come from different communities. Indeed, even though English speakers from Chicago and Philadelphia, French speakers from Paris and Bordeaux, and Picard speakers from Abbeville and Amiens share many, if not most, rules of their respective grammars and typically communicate

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TABLEAU 12. *Reranking of constraints B and D (Lee, 2001)*

Dialect I	A	B	C	D
☞ X			*	*
Y		*!	*	
Z	*!			
Dialect II	**A**	**D**	**C**	**B**
X		*!	*	
☞ Y			*	*
Z	*!			

without much difficulty, we expect their grammars to differ in ways that are less predictable and probably more far-reaching than the grammars of members of the same speech community.

NOTES

1. The concept of floating constraints was also applied to the study of morphosyntactic variation in Nagy and Heap's (1998) study of null subjects in Francoprovençal.

2. The Picard language investigated in this article differs from the regional French spoken in the same area, as Picard is characterized by a number of phonological and grammatical features, as well as lexical items, not used by the majority of the speakers living in this area. Picard, which is clearly distinct from French in the minds of speakers and nonspeakers alike, is now spoken mostly by elderly persons, but also by a few younger speakers.

3. The data used in this article are drawn from texts in Picard written by ten different authors from the Vimeu region. I return to the issue of using written data for this investigation of a phonological phenomenon.

4. The sonority hierarchy assumed in this article is: obstruent < nasal < liquid < glide < vowel (see, e.g., Clements, 1990).

5. Auger and Steele (1999) presented evidence supporting an epenthesis analysis over a metathesis analysis. This evidence included minimal or near-minimal pairs showing that words beginning in /CeC/ contrast with words that alternate between [CC] and [eCC] forms. Such examples include those in (i).

(i) a. *dégouteu* [degutø] 'to disgust'
b. *(é)dgoutteu* [(e)dgutø] 'to drip'
c. *ménageu* [menaʒø] 'to spare'
d. *(é)mnaceu* [(e)mnasø] 'to threaten'

Thus, if we posited that the underlying form for *(é)dvant* is /devɑ̃/ and that *édvant* is the result of metathesis, we would wrongly predict that *dégouteu* 'to disgust' should be able to surface as *édgouteu*.

An anonymous reviewer pointed out that syncope is an alternative analysis for the alternation described in this article. Indeed, it is possible that an underlying vowel is present between the first and the second consonant of a word, and that a syncope rule deletes this vowel and creates an environment for word-initial epenthesis. This possibility gains in plausibility if we consider that French cognates of the words considered so far all contain a vowel following the initial consonant: VP *cmint* ~ F *comment* 'how', VP *dvant* ~ F *devant* 'in front of', VP *d* ~ F *de* 'of', and so on. As a matter of fact, a few words in Picard can be analyzed as instances of syncope followed by epenthesis. As shown in (ii), *déjo* 'already' can appear as *déjo*, *djo*, or *édjo*:

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(ii) a. *Oz arrivons déjo* [deʒɔ] *dsu cho'p plache* (Chl'autocar 24)
we arrive already on the square
'We're already arriving at the square'
b. *J'ai djo* [dʒɔ] *passè dvant in bicyclètte.* (Chl'autocar 48)
I have already passed in-front-of on bicycle
'I already rode by on my bike'
c. *Éj m'otchupe édjo* [edʒɔ] *d'éch minger* (Chl'autocar 68)
I myself occupy already of the food
'I already am responsible for the food'

However, just as we saw in (i), this syncope rule does not affect all words of this class (e.g., *[mnaʒø] for *ménageu* 'to spare'). On the contrary, it appears that only a few frequent words are affected by syncope, and that this phenomenon is lexically restricted. We should note that, even though French does not possess a regular syncope rule, the French cognate of *déjo*, *déjà*, is also affected by syncope, as *djà* is very frequently heard in colloquial speech. Furthermore, while there is ample evidence for the form *déjo* in VP, no instances of *quémin* 'road' or *dévant* (apart from the lexicalized phrase *pér-dévant* 'ahead of') are found in this variety of Picard.

Finally, Auger and Steele (1999) considered and ruled out the possibility that initial /e/ might be present underlying and deleted to avoid hiatus when following another vowel. Words such as *dvant* 'before', *cmin* 'road', and *cmincher* 'to begin' behave differently than Picard words whose underlying form starts with /eCC/. (iiia) and (iiib) exemplify the prevocalic and preconsonantal versions of the morphemes corresponding to 'the.sg' and 'he'. (iiic) and (iiid) show that *cmin* and *cminche* select preconsonantal forms of these two grammatical morphemes, whereas *éscayer* 'stairs' and *éspérer* 'to hope' select prevocalic forms.

(iii) a. *chl'apréseut* 'the autumn' versus *chu bal* 'the bal'
b. *il arrivoait* 'he ran' versus *i couroait* 'he ran'
c. *chl'éxcés* [ʃlekse] 'the excess' versus *chu cmin*/*?*chl'écmin* 'the road'
d. *il éxcite* [ileksit] 'be bothers' versus *i cminche*/*?*il écminche* 'he starts'

If we posited an underlying form with an initial /e/ for words like *cmin* and *cmincher* and a rule that deletes the initial vowel so we could use preconsonantal forms of the definite article and 3sg subject pronoun, we would wrongly predict **chu scés*, **i xcite*, and *chu scayer* rather than *chl'éscayer* 'the staircase' and **i spére* rather than *il éspére* 'he hopes'.

6. Similar patterns have been reported for varieties of French. Morin (1987:837) examined schwa deletion in lower middle class Parisian French and reported syllabification patterns similar to those proposed here for VP. Picard (1991:45) described an identical alternation between word-initial VCC and CC patterns for verbs starting with the prefix *re-* in Québec French. While he also treated the initial schwa in *pour regarder* [puʁəʁgaʁde] 'in order to look at' as epenthetic, his analysis differed from the one adopted here for VP, as he proposed that the underlying schwa in forms like *regarde* /ʁəgaʁd/ is obligatorily deleted. See note 5 for arguments against this analysis in VP.

7. Evidence that the /d/ in *dvant* is licensed by the IntPhr rather than by some lower level of prosodic structure comes from the fact that this consonant is allowed inside a PPhr or at the beginning of a PPhr only if it is preceded by a vowel, so it can be syllabified as the coda of the syllable headed by that vowel. As we will see later, /d/ is not eliminated by Stray Erasure because the MAX-C constraint is ranked very high in Picard, thus preventing deletion of consonants that are difficult to syllabify and forcing epenthesis in order to provide them with a syllabic nucleus to which they can attach.

8. As we shall see, we get *édvant* rather than *dévant* because the Wd-CONT constraint, which prevents the insertion of phonological material inside words, is ranked quite high in VP.

9. Written texts have proved to be a valid and valuable source of data for numerous studies on the phonology of languages that are no longer spoken, such as Latin (Joseph & Wallace, 1992), Late Latin and Gallo-Romance (Gess, 1998a, 1999), and Old French (Gess, 1998b), as well as the syntax of languages such as Biblical Hebrew (Myhill, 1992), Old English (Pintzuk & Kroch, 1989), 19th-century English (Arnaud, 1998), and Early African American English (Poplack & Tagliamonte, 1989; Tottie & Rey, 1997).

10. I am not claiming that what goes for French goes for Picard. As already mentioned, Picard and French are separate languages with distinct grammars. However, they are very closely related vari-

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eties, and preliminary research (Auger, to appear-b) has confirmed that they share similar prosodic patterns.

11. The tendency to epenthesize less often when the preceding phrase or sentence ends in a vowel than in a consonant suggests that the same syllabification strategy is available across IntPhr and Utt boundaries as within IntPhr's. If one adopts the point of view that the prosodic hierarchy is strictly layered, that the syllable is part of this hierarchy, and that the phonological phrase constitutes the largest possible domain for syllabification (see Blevins, 1995:227), this finding is surprising. The results in Table 2 support the alternative view that syllabification falls outside of the prosodic hierarchy and can take place at any level of prosodic structure.

12. As an anonymous reviewer pointed out, the favoring or disfavoring effect of the second following consonant appears stronger in Utt-initial position than in IntPhr-initial position, at least for some types of segments:

	IntPhr-initial	Utt-initial
fricative	.55	.63
liquid	.48	.38

While this is the opposite of what is observed for the effect of the preceding segment, I would like to argue that this reversal actually makes sense. Indeed, since it is more difficult to look across an Utt boundary than across an IntPhr boundary, one expects epenthesis to be influenced more strongly by segments within the same prosodic domain in Utt-initial than in IntPhr-initial position. This explanation also accounts for the fact that the influence of a geminate-initial cluster appears to be slightly stronger in Utt-initial than in IntPhr-initial position (.77 in Utt-initial position vs. .73 in IntPhr-initial position).

13. Pronominal clitics and verbal suffixes containing geminate consonants (e.g., /ll/ for the 3sg.acc clitic, /zz/ for the 3pl.acc clitic, and /tt/ for the 3pl verbal suffix) are degeminated next to a consonant or in word-final position.

14. An anonymous reviewer asked what independent evidence is available for this type of syllabification. At this point, the only such evidence comes from the fact that one hears the final consonant of *tchote* as the onset of the following syllable, just as one typically hears *une petite hirondelle* 'a small swallow' with *enchaînement* in French: [yn.pti.ti.ʁɔ̃.dɛl] or [yn.pə.ti.ti.ʁɔ̃.dɛl]. This question is a truly important one, as many linguists have attributed such phenomena as the higher rate of retention of consonants in prevocalic position to syllabification across morpheme or word boundaries. Labov (1997) examined this issue in detail in a small corpus of African American English and found little evidence for resyllabification in cases where *t/d* deletion did not take place. Labov thus questioned this type of analysis. The position adopted here, according to which initial consonants belonging to an initial cluster that is not a possible onset are syllabified as codas when they follow vowel-final words, is based on the fact that (a) *enchaînement* is known to occur in at least some contexts in Picard and is frequently heard inside IntPhr's, and (b) the same consonants require the insertion of an epenthetic vowel when they follow a consonant-final word within the same phrase. This is taken as evidence that such consonants cannot be part of a complex onset or indirectly licensed as some sort of appendix, as they need a vowel to provide them with a syllabic nucleus. Unfortunately, independent evidence for resyllabification from other phonological phenomena characteristic of VP is not available, due in part to the fact that very little is known at this point about the phonology of this variety and in part to the fact that syllabification patterns applying across word boundaries often behave differently than word-internally. For instance, in Québec French, high vowel laxing, exemplified in (iva), is not (necessarily) undone when *enchaînement* removes the consonantal coda that triggers it and syllabifies it as on onset, as the contrast between (ivb) and (ivc) shows.

(iv) a. *petit* [p(ə)tˢ i] 'small.masc' versus *petite* [p(ə).tˢɪt] 'small.fem'
b. *petitesse* [p(ə)tˢ i.tɛs] 'smallness'
c. *petite île* [p(ə)tˢɪ.tɪl] or [p(ə)tˢɪ.tˢɪl] 'small island'

(ivc) also shows that affrication before high front vowels, a process that applies categorically word-internally in Québec French, need not apply across word boundaries. Thus, the search for such independent evidence for resyllabification in VP remains to be carried out.

15. For this analysis, we need to invoke a Wd-Cont constraint rather than a Morph-Cont (see Kenstowicz, 1994), as epenthetic vowels are inserted at the edges of words rather than between

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morphemes even when prefixes and suffixes are involved. For instance, we obtain *érbacheu* rather than **rébacheu* when we combine the prefix /r/ meaning 'again' and the verb *bacheu* 'to lower' to create a verb meaning 'to lower again'. Similarly, the 3pl form of the verb *vnir* 'to come' is *i viénn ʼté* [ivjɛ̃nte] rather than **i viénnét* [ivjɛ̃net] 'they come' despite the morpheme boundary between /ivjɛn/ and the 3pl suffix /tt/.

16. See Vogel (1986) for an example of syllabification across an Utt boundary in English.

17. In VP, stress is consistently assigned to the last syllable of an IntPhr (see Steele & Auger, to appear). Thus, it is quite possible that a constraint against inserting epenthetic vowels in positions in which they would receive phrasal stress also contributes to the prohibition on phrase-final epenthetic vowels. See Alber and Plag (1999), who proposed a MAX-STRESS constraint that forbids stress shift from the base to the output.

18. Four constraints, *P/C, MAX-C, ONS-SON-2, BIN, have not been fully ranked either, but their inviolability makes it impossible for them to play any role in generating the variable pattern that I am trying to describe in this analysis. Three other constraints, DEP-V, ALIGN-L (Wd, PWd), ALIGN-R (Wd, PWd), are ranked too low to play a role at this level of structure.

19. ALIGN-L (Wd, PPhr) and ALIGN-R (Wd, PPhr) are not included here as their effect on word-initial epenthesis is not distinct from that of PWd-level ALIGN constraints. Their precise ranking will be determined in my work on word-final epenthesis, as a preliminary investigation has revealed more frequent word-final epenthesis inside PPhr's than at the end of PPhr's (see Auger, 2000).

20. ALIGN-R (Wd, Utt) plays no relevant role at this level of structure. We will see that in Utt-initial position different rankings exist for the relevant constraints. The six possible rankings that are available at the IntPhr level are:

ALIGN-R (Wd, IntPhr) ≫ ONSET ≫ *INIT-APP (illustrated in Tableau 3)
ALIGN-R (Wd, IntPhr) ≫ *INIT-APP ≫ ONSET
ONSET ≫ *INIT-APP ≫ ALIGN-R (Wd, IntPhr)
ONSET ≫ ALIGN-R (Wd, IntPhr) ≫ *INIT-APP
*INIT-APP ≫ ONSET ≫ ALIGN-R (Wd, IntPhr)
*INIT-APP ≫ ALIGN-R (Wd, IntPhr) ≫ ONSET

21. See Chambers (1995:100) concerning the possibility that the homogeneous groups that have been investigated so far might be made up of numerous small groups whose distinct patterns are more difficult to discern than those of true outsiders.

22. I decided to include this author in spite of his relatively small number of tokens because he is the son of another author, GVasseur.

23. Devismes is a retired peasant who has spoken Picard all of his life. He did not complete high school, and he writes so that old ways of life and occupations will be documented, not to produce literary pieces. All of the other authors in my corpus have completed at least high school, and many have gone beyond. Many are retired school teachers, one was a linguist, and another is a pharmacist.

24. Lecat is only an apparent exception, as the difference between the postconsonantal context and the other two contexts in Utt-initial position is not statistically significant ($\chi^2 = 0.876$; $p > 0.99$).

25. I am not claiming that all quantitative differences must be generated by different grammars. We might want to propose a single grammar when all speakers show the same preferences in all contexts and the only differences between them concern the frequency with which each of them uses one or the other variant. It remains to be seen whether the OT model adopted here can do this.

26. If we allow only individual grammars that group constraints into sets as I have been doing in this article, 31 different grammars can be derived from the community grammar. I thank Scott Martin for writing the program that made it possible to establish this. If we do not require grouping constraints into levels and allow for all possible ranking relations among pairs of constraints, the number of possible grammars increases to 66. I thank John Paolillo for writing this second program.

27. Vogel (1986) reported that the likelihood of finding a linking [r] across utterance boundaries in *r*-less varieties of English depends on the discourse link between two utterances: utterances implicitly connected by *and*, *therefore*, *because*, or some other type of pragmatic relationship are more likely to give rise to utterance restructuring and to allow *r*-linking. I expect to observe a similar effect of discourse structure on Utt-initial epenthesis in VP.

28. Thanks to Kevin Atkins for calculating this for me.

29. With such a small number of tokens, the epenthesis rates associated with the different Utt-initial contexts are not statistically different ($\chi^2 = 4.59$, $p > .5$); however, I expect that, as new texts become available and provide me with additional data, this difference might reach significance.

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30. We should remember that the 5% difference between C_ and the other two contexts is not significant ($\chi^2 = 0.876$, $p > .99$).
31. A grammar that ranks both *Init-App and Onset higher than both Align constraints predicts an epenthesis rate of 25% Utt-initially following a vowel, but still predicts 100% epenthesis following a consonant and in absolute initial position.
32. The difference between the three types of Utt-initial contexts is not statistically significant for Chivot ($\chi^2 = 1.849$; $p > .8$).

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APPENDIX

Initial constraints for categorical epenthesis

Constraint	Description	Source	Role in Vimeu Picard
BIN	prosodic constituents are maximally binary	Kaye (1990); FT-BIN in McCarthy and Prince (1993a)	maximally binary branching rhymes rule out branching codas
MAX-C	do not delete underlying consonants	MAX-IO in McCarthy and Prince (1995)	avoid erasure of unsyllabified consonants
DEP-V	avoid vowel epenthesis	McCarthy and Prince (1995); Singler (1996)	epenthesis applies only when necessary
Wd-CONT	do not insert segments within a word	M-CONT in Kenstowicz (1994) and NO INTRUDE in Alber and Plag (1999)	epenthetic vowels are inserted at word boundaries rather than inside words
*P/C	consonants may not associate to Peak (Nuc) nodes	Prince and Smolensky (1993)	no syllabic consonants

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APPENDIX

(continued)

Constraint	Description	Source	Role in Vimeu Picard
ONSET	syllables must have an onset	Prince and Smolensky (1993)	liaison and *enchaînement*
ONS-SON-2	the minimal distance between consonants syllabified within the same onset is 2	Clements (1990)	some onset clusters are allowed, but not all (C_2 obstruent ≠ nasal)
*ONS-C_1C_2-PLACE	2 consonants that are part of the same onset cannot share the same place of articulation	Rice (1992)	in /CL/ onset clusters, C_1 must be noncoronal
*INIT-APP	initial appendices are disallowed	*APPENDIX in Wiltshire (1994)	epenthesis is obligatory word-initially within Int-Phr's
ALIGN-L (Wd, X)	the left edge of a word (Wd) should be aligned with the left edge of a prosodic domain X (where X = Utt, IntPhr, PPhr, PWd)	McCarthy and Prince (1993b)	syllabification across a prosodic boundary is not always possible, and epenthesis is dispreferred in some contexts
ALIGN-R (Wd, X)	the right edge of a Wd should be aligned with the right edge of a prosodic domain X (where X = Utt, IntPhr, PPhr, PWd)		

While it is not possible, without examining many other aspects of the phonology of VP, to rank all the constraints discussed in this article, a relative ranking of most of the constraints can be proposed.

As we saw in the text, the fact that epenthetic vowels are inserted at word boundaries rather than within words (compare VP *écmin* with Rouchi Picard *quémin* 'road') establishes that Wd-CONT is ranked quite high in VP. However, it is ranked lower than ONS-SON-2 and other constraints that are never violated in VP, as Wd-CONT is violated in contexts where sequences of consonants are found too far from word edges to make it possible to respect this constraint. This situation is found with inflected words such as *o nin rpèrlḛrons* 'we will about it again' (from /r/ + /perl/ + /rɔ̃/), derived words such as *simplḛmint* 'simply' (from /sɛ̃pl/ + /mɛ̃/), as well as in compounds such as *porté-bagage* 'luggage rack' (from /pɔrt/ + /bagaʒ/).

The data concerning phrase-initial epenthesis provide evidence that ONSET interacts with constraints that are ranked higher than DEP-V; consequently, ONSET is ranked higher than DEP-V.

The relative ranking of DEP-V, ALIGN-L (Wd, PWd), and ALIGN-R (Wd, PWd) cannot be determined, because violations of these constraints always involve violations of more highly ranked constraints. However, it is assumed that this ranking is noncrucial.

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