Development in Prosodic Systems

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edited by

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Ad memoriam perpetuandam
Mirco Ghini

This volume arose from a workshop on Change in Prosodic Systems, which was part of the 21. Jahrestagung der Deutschen Gesellschaft für Sprachwissenschaft (DGfS) held at Konstanz University in 1999. We would like to thank Twan Geerts for his invaluable assistance in the editing of this book and we dedicate this book to one of the contributors who sadly passed away in January 2001.

Contents

Introduction

Haike Jacobs and Paula Fikkert

The prosodic system of a language can be defined as the set of organizing principles that govern suprasegmental structure, that is, the structure above the individual sounds of the language. The theory that studies prosodic systems of languages is often referred to as metrical phonology, whereas prosodic phonology is often used as a cover term for phonological adjustments involving more than one word. The studies collected in this book are all written in the framework of metrical phonology or metrical theory, deal with various aspects of change in prosodic systems, and, aim to enlarge our understanding of the range of variation and the types of change that are attested in languages.

Metrical phonology, though, does not consist of one single theory in a definite form, but rather consists of a number of alternative descriptive frameworks (such as, most prominently, the bracketed-grid theory proposed by Halle and Idsardi (1995), the trochee-iamb theory proposed by Hayes (1995)). Furthermore, phonologists have different opinions on how phonological adjustments have to be accounted for. Derivational theories (relying on the use of phonological rules transforming underlying forms into surface representation) compete with constraint-based models (most prominently, Optimality Theory) where the relation between underlying form and surface manifestation is taken care of by relying on a set of universal innate constraints that can be ranked differently in different languages.

We will not attempt to provide an overview of all the different theories currently available (a good and comprehensive overview can be found in Van der Hulst 1999), but rather point where the papers collected here deal with fundamental issues in metrical theory. Broadly, the following four different categories can be distinguished:

(1) Tone, stress and quantity, (2) Evidence from Metrics, (3) Sources of Change: Analogy and Loans, and (4) Sound change as a window on competence.

1. Tone, stress and quantity

The prosodic structure of a language can be studied and inferred from different perspectives. For one thing, typically in languages, a number of phonological phenomena occur, such as, syncope, epenthesis, diphthongization and tonal rules which are sensitive to and therefore directly related to prosodic structure. As such prosodically conditioned segmental processes thus shed light on the prosodic structure of a language.

Also, there is a close relationship between tone, stress and quantity, which becomes particularly evident in change. When tonal distinctions are lost, they are often compensated by vowel quantity distinctions. Another frequently found process involving change in tonal systems is that the loss of inflectional endings can result in new stress contours, which may in turn influence vowel length.

Of particular interest are the changes in languages that have both stress and tone, as is the case in several (southern) Dutch and Scandinavian languages/dialects. If these languages change, do they change in the direction of the standard language or is change determined by other factors such as markedness, frequency, etc? Issues such as these are addressed in the papers by Heijmans, Kwon, Lehiste and Riad.

Heijmans shows that two rather similar neighboring dialects express similar distinctions in different ways: Accent I and Accent II words of the tonal Roermond dialect are rendered by quantity distinctions in Weert.

In a similar vein, Kwon discusses the development from tonal Middle Korean to non-tonal Modern Korean and discusses how and under what conditions tonal distinctions were replaced by vowel quantity distinctions, identifying four factors involved in the prosodic change from tone to length in Korean: tone, word-initial strengthening, abrupt syllable cut and compensatory lengthening.

Lehiste's paper is devoted to a change that Estonian is currently undergoing. Historically, Estonian is assumed to be essentially identical to Finnish with respect to prosodic structure. Due to vowel deletion processes (syncope and apocope) a three-way system of oppositions occurred. Lehiste argues that Estonian is undergoing a change from a quantity language to an accent language, that is, the durational contrasts are still present, but their occurrence is dependent on stress, and their manifestation employs contrastive pitch patterns in addition to contrastive duration.

Riad delves into the diachrony of Scandinavian tone accent. Starting from the hypothesis that Accent II originated from stress clash, Riad adduces arguments supporting the archaic character of the central Swedish (CSw) dialects, both as regards tonal values and the presence of connectivity and sets up a tonal typology for the Scandinavian tones, based on a single set of functions: lexical, prominence and boundary tone.

2. Evidence from Metrics

Another way to study the prosodic structure of older stages of the language is by looking at metrical systems, particularly in poetry with an iambic meter or alliteration. Previous studies have shown that particularly complex words show a considerable amount of prosodic variation in poetry, and this may reflect the changing prosodic structure. The contributions by Cable, Redford and Zonneveld can all be placed in this perspective.

The process of resolution, known as Kaluza's Law, forms the central topic of Cable's paper. Cable discusses the intricacies of resolution in *Beowulf* and shows that vowel quantity and syllable weight follow precise patterns. The *Beowulf* meter is best described as a 'four-position' meter in which stress, quantity and syllable count interact.

Redford addresses the question whether "stress doubles", that is, words that have sometimes initial stress and sometimes final stress, in Chaucer's *Canterbury Tales* provide evidence for Middle English stress or evidence for Chaucer's metrical style. Redford shows that the distribution of stress doubles is very regular: SW line internally and

WS at line-internal phrase boundaries and at the end of a line. He then argues that this specific distribution is caused by to prominence mismatches created at the right-edge of phrasal domains due to the influence of the Romance Stress Rule at the *phrasal* level.

Zonneveld presents a very interesting case of Middle Dutch poetry (*Leven van Sinte Lutgart*). He demonstrates the existence of a constraint on the contents of S (the strong position in the iambic meter), formulated as "No Schwa in S". Normally, constraints on the contents of S co-occur with a liberal setting of the parameter for metrical position (resolution) (Hanson & Kiparsky 1996). Zonneveld shows that the constraint on S in *Lutgart* does not coincide with resolution, but, rather, that more straightforward means are used to make linguistics material match the requirements of the iambic pattern, most notably, synalepha and syncope. He shows that the distribution of determiners, and other schwa containing function words (*te*, *ge-*) is very regular, and that schwa does not occur in a strong position, unless, but very limited, in inversion situations. However, this is only true for schwa in open syllables. He further argues that prosody is independent of metrics (but not vice versa), but metrical patterns do provide insight into the prosodic system of the language, because of FIT: a poet will exploit the vocabulary of the language maximally, under prosodic constraints.

3. Sources of Change: Analogy and Loans

Insight into the prosodic structure of the older stages of the language can also be gained by studying processes that are dependent on prosodic structure, such as, for instance, high vowel deletion and open syllable lengthening in Germanic. Important questions that are addressed in this section are the following. What leads to variation and or change? What is the role of analogy? Which paradigms resist analogical change more than others? What is the role of morphology? What is the role of loans? What triggers change in a prosodic system? Can language contact directly influence prosodic systems?

Hualde, for instance, in his contribution studies the relationship and the historical evolutions of western Basque prosodic systems. Accentual systems different from the basic Gernika-Getxo type, such as the Bilbao and Antzuola, are arguably due to influence from the Spanish accentual/intonational system, and, are demonstrated to be two different manifestations of one and the same phenomenon: convergence of the prosodic system towards the Spanish model.

In her contribution, Kraehenmann traces the historical development of two Swiss German dialects showing that they reacted differently to Open Syllable Lengthening (OSL), which she argues is not due to compensatory lengthening. The differences between the two dialects are explained by the different interaction of OSL with syllable-closing process and the different role of paradigm leveling due to different application domains of OSL.

Fikkert investigates the prosodic structure of prefixed words in the different West-Germanic languages both in native words and in French loans. She argues that the native system determines how words are borrowed into the language. The fact that verbs like *persíst* and *infér* seemed to enter the English language as 'prefixed', was not due to the status of these prefixes per se, but because the language did not usually have initially stressed disyllabic verbal stems. This pattern was extended to the borrowed verbs. For (prefixed) nouns the pattern was quite different, as nouns never ended in superheavy stressed syllables if that could be avoided, and this strategy was extended to loans. The situation in Dutch and German was different: not only did those languages have superheavy stressed syllables, they also had a more varied prefix system.

4. Sound change as a window on competence

There is yet another way in which changing prosodic systems can be studied. As early as 1968, Kiparsky worded the relevance of linguistic change for linguistic theory as follows:

> What we really need is a window on the form of linguistics competence that is not obscured by factors like performance, about which next to nothing is known. In linguistic change we have precisely this window.

Rather than focussing on the motivating forces or sources of change, the contributions by McCully and Jacobs consider prosodic change in this window. McCully studies the prosodic development of English by studying the grammars before and after the changes discussed and tries to provide arguments for evaluating the empirical validity of competing descriptive models.

Jacobs claims that the stress rules of one particular period of the Latin language cannot be adequately described in a rule-based or derivational approach, but instead, require a constraint-based OT-model.

Ghini examines the historical development of the metrical system in the Ligurian (Gallo-Italian) Romance dialect spoken in Miogliola, Northwest Italy. The loss of Latin phonemic length for both vowels and consonants resulted in a new system, where new segmental contrasts developed to compensate the loss of prosodic contrasts. He observes interesting asymmetries between obstruents and sonorants: old prosodic contrasts were maintained as segmental ones among the obstruents through lenition processes. Sonorants, however, did not undergo lenition; nonetheless, they too managed to rescue old prosodic contrasts as new segmental ones, but only for the coronal ones, for an account based on underspecification is provided.

Although quite different in nature that papers in this volume bring together different methodologies and perspectives investigating the same issue – development in prosodic systems – which is still an underresearched are in historical phonology, which so far has mostly focused on sound change.

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The relationship between tone and vowel length in two neighboring Dutch Limburgian dialects

Linda Heijmans

1. Introduction

The town of Weert, in the Dutch province of Limburg, close to the provincial boundary with Noord-Brabant and some eight kilometers from the Belgian border, has traditionally been situated on the northwestern periphery of the geographical area with lexical tone (*e.g.* Peters 1936, Goossens 1968, Peeters and Schouten 1989). The dialects spoken in this region are characterized by their singsong intonation, resulting from the interaction of the intonational tones of the sentence with word tones. Two word tones occur, which are referred to in the literature as Accent I (also called 'Schärfung' or 'Stoßton') and Accent II ('Trägheitsakzent' or 'Schleifton'). Although minimal pairs are not frequent, speakers of these dialects can distinguish between two segmentally identical words by using different tones.

The Weert dialect has been described as having such a tonal opposition by Verhoeven (1992) and Verhoeven and Connell (1992). More recently, however, other studies have questioned the existence of a lexical tone contrast in Weert (Van Moorsel 1996, Peeters and Schouten 1989, Schouten and Peeters 1996). The aim of the investigation reported here is to provide experimental evidence that the dialect of Weert is indeed non-tonal, and to show that it uses contrastive vowel length to maintain a contrast in words whose cognates are distinguished by tone in the neighboring tonal dialects. For this purpose, the dialect of Weert will be compared to the nearest dialect with a lexical tone opposition, that of Baexem. The town of Baexem is situated some eight kilometers to the east of Weert, in between Weert and Roermond. The existence of a lexical tone contrast in the latter dialect is undoubted (Gussenhoven, 2000a).

The paper is organized as follows. After a brief discussion of Verhoeven (1992) and Verhoeven and Connell's (1992) account of a tonal contrast in Weert, we will consider data from the dialects of Weert and Baexem that confirm the non-tonal status of the former. Further, a close connection will be shown to exist between vowel length in the non-tonal dialect of Weert and the word tone used in Baexem. A diachronic inspection of the data then serves the purpose of accounting for the relatively few words that fail to comply with this general rule of correspondence. In order to show that the Weert dialect can easily accommodate vowel length oppositions, this section also includes a description of its vowel system. To conclude, we give a brief sketch of how this vowel length contrast, mirroring the tonal contrast of the nearby Baexem dialect, may have arisen in Weert.

2. A lexical tone contrast in Weert?

The only phonetic account of a tonal contrast in the dialect of Weert has been given by Verhoeven and Connell (1992) and Verhoeven (1992). Their acoustic measurements revealed essentially identical pitch contours for Accent I and Accent II, only differing in their alignment with respect to the accented syllable: "tone 1 can be characterized as a rise-fall configuration which occurs proportionally late in the syllable. Tone 2 has a similar configuration, but it occurs relatively early in the accented syllable" (Verhoeven and Connell 1992: 60). This is shown in Figure 1. The average F_0 peaks of Accent I and Accent II are located at 57 and 43 per cent of the total vowel duration after the beginning of the vowel (Verhoeven and Connell 1992: 69).

Besides these differences in peak alignment, Verhoeven and Connell also found significant differences in vowel duration between the two tonal accents. Vowels with Accent II were nearly twice as long as vowels with Accent I: "Mean duration of the vowels with tone 1 is 109 ms, while vowels with tone 2 have an average duration of 209 ms" (Verhoeven and Connell 1992: 65). The authors therefore consider vowel duration and the timing of the rise-fall (relative to the accented vowel) as the main phonetic correlates of the Weert tonal opposition.

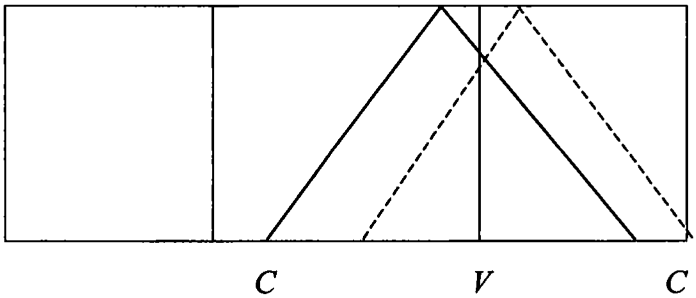


Figure 1. Alignment of the rise-fall pitch configuration in Accent I (dashed line) and Accent II (solid line). The illustration abstracts away from any slope differences. (After: Verhoeven and Connell 1992: 70)

Verhoeven and Connell calculated F_0 peak locations *proportionally* to vowel duration and concluded on that basis that the pitch peak in Accent I occurs later than in Accent II, namely when 57 per cent of the total vowel duration has elapsed (the corresponding value for Accent II is 43 per cent). By doing so, they wanted to eliminate the differences in vowel duration that exist between the two tones, so as not to confound "the location of the F0 peak (...) with the parameter of vowel of duration" (Verhoeven and Connell 1992: 69). This in turn means they assume that the location of the F0 peak is not in any way dependent on vowel duration. However, Rietveld and Gussenhoven (1995), investigating the effects of syllable structure on the alignment of pitch targets in Dutch, found that the alignment point moves rightwards as the coda contains more voiced segments. Also, for (one speaker of) English, Van Santen and Hirschberg (1994: 719) report on a "non-linear rightward stretching of the contour as the durations of onset, vowel nucleus, and coda increase". Rietveld and Gussenhoven (1995: 383) suggest that when more sonorant material is available, the phonetic implementation rules place a target more to the right so that it can be comfortably realized. The alignment of the pitch target can therefore not be discussed without taking into account the segmental structure of the syllable, since the former depends on the latter.

Applied to the Weert dialect, the findings of Rietveld and Gussenhoven (1995) and of Van Santen and Hirschberg (1994) predict that the rise-fall pitch configuration is located further to the right when vowels are longer, that is, in words with Accent II. Indeed, if the location of the pitch peak is expressed in *absolute* terms (relative to the beginning of the vowel), it occurs later in Accent II than in Accent I. This can be seen in Figure 2, which is based on figures (in italics) of Verhoeven and Connell (1992).

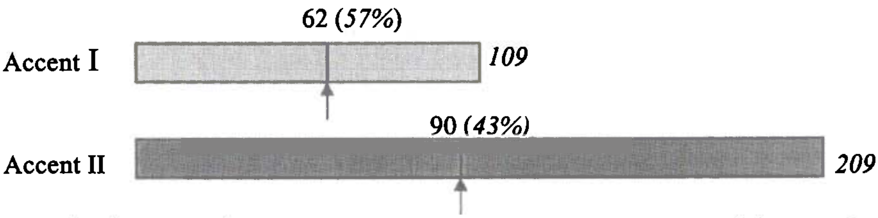


Figure 2. **Absolute pitch peak locations (indicated by the arrows) in ms after vowel onset for Accent I (light grey bar) and Accent II (dark grey bar). Total vowel durations are indicated by the numbers behind the bars.**

The somewhat later alignment of the rise-fall peak in Accent II is merely a consequence of the longer vowel duration. There is nothing tonal about it. The only acoustic correlate of the Weert lexical tone contrast in the Verhoeven and Connell data that remains intact would thus appear to be vowel duration.

However, if vowel duration is the only distinctive characteristic between Accent I and Accent II in the Weert dialect, it is hardly possible to speak of a *tonal* contrast. As a matter of fact, given the large number of vowel quantity contrasts that the dialect permits (see 4.1.), the huge durational differences that Verhoeven and Connell found might actually represent a phonological vowel length contrast. In other words, a vowel quantity opposition might have been mistaken for a lexical tone contrast, presumably because vowels in words with Accent II are well-known for being phonetically longer. Indeed, all the words with 'tone 2' that feature in Verhoeven and Connell's list of tonal pairs are transcribed as having long vowels, but short vowels are consistently used to transcribe their 'tone 1'. An example of a 'tonal' pair that they give is [kni:n]^{II} 'rabbit', [knin]^{I} 'rabbits', where leaving out the tonal specification might in fact yield more accurate transcriptions. This was also suggested in Laver (1994: 440): "An unusual use of vowel-length relationships is found in many southern dialects of Dutch, where the plural of nouns is signalled by the choice of a short vowel, and the singular by the lengthening of the vowel". Whether or not this is true for all southern Dutch dialects, the point is that the illustrations came from the Weert dialect, were provided by Verhoeven, and included the following pair: [kənin] 'rabbits', [kəniːn] 'rabbit'.

The existence of a lexical tone contrast in the dialect of Weert was questioned by Van Moorsel: "One nowadays doubts the existence of the opposition Accent II-Accent I, in a sense that there is an opposition, but not – at least no more – an intonational one" (1996: 95 transl. LH). Peeters and Schouten (1989) and Schouten and Peeters (1996) were also unable to detect a tonal contrast in the nearby village of Stramproy, some five kilometers to the south of Weert: "There seems to be nothing tonal about the distinction between abrupt [Accent I] and gradual tones [Accent II] – there seem to be only short and long vowels" (Schouten and Peeters 1996: 43). Their data furthermore show that Accent II is on average 50 percent longer than Accent I. We will now turn to the data that support Van Moorsel's claim that a tonal contrast does not in fact exist in the dialect of Weert.

3. Experimental data

3.1. Data collection

The absence of a lexical tone contrast in Weert will be demonstrated by comparing Weert to the nearest dialect with a tonal opposition, that of Baexem, some eight kilometers to the east of Weert (see Appendix 1). This dialect was selected on the basis of the results of a small-scale listening experiment that was conducted in eleven villages lying in between Weert and Roermond, covering a distance of about 15 kilometers.[1] For the dialect of Roermond, a tonal contrast had already been established by Kats (1939) which was analyzed in Gussenhoven (2000a). Per dialect, one speaker was recorded. The same speakers served as listeners some three months later, when they were presented with their own utterances. Subjects were asked to attribute the correct (singular or plural) meaning to the members of six supposedly tonal pairs, /kniːn/ 'rabbit(s)', /bɛin/ 'leg(s)', /æʀm/ 'arm(s)', /ʃoːn/ 'shoe(s)', /daːx/ 'day(s)', and /bæʀx/ 'mountain(s)'. These were known to be minimal pairs in the Roermond dialect, Accent II being associated with the singular, Accent I with the plural form. In a second set of stimuli, durational differences between the two members of a minimal pair were eliminated, by averaging the durations of the sonorant syllable rhyme. Since Accent II vowels are usually somewhat longer than Accent I vowels, this was done to prevent listeners from basing their jugdments solely on vowel duration, and not on pitch. It was assumed that if a listener could tell the two segmentally identical forms of a minimal pair apart, a lexical tone contrast must be present in his or her dialect. The performance of the Baexem subject showed a sharp increase in the number of correct judgements in comparison to the more westerly villages, *i.e.* those lying closer to Weert. She attributed the right meaning to 78 out of 96 stimuli, or 81 per cent, compared to an average score of 56 per cent in the four villages in between Baexem and Weert. The details of this listening experiment will not be further elaborated upon here; suffice it to say that a tonal contrast could easily be established for the Baexem speaker, and that the speaker of this dialect was therefore chosen as a point of reference for the putatively non-tonal Weert dialect.

A corpus of 145 words was collected in the dialects of Weert and Baexem (see Appendix 2). The lists were compiled on the basis of a large number of segmentally defined classes, each of which allows some generalization to be made concerning the occurrence of either Accent I or Accent II. Goossens' work (1959) on the distribution of the tonal accents in the dialect of Genk (in the Belgian province of Limburg, some 50 km to the south of Weert) served as a starting-point for establishing these segmentally defined classes. Depending on factors such as word-final schwa apocope, vowel height, and consonant voicing, Accent I and Accent II are fairly regularly distributed over the words of the Genk dialect. Presumably, these factors are also involved in the accent distribution of other tonal dialects in the Limburgian-Rhenish region. The segmental compo-sition of the words that were included in our corpus reflected these conditions, so as to provide a representative sample of the dialects. A more detailed account of the structure of the corpus is given in section 4.2 below. The words were realized as part of the declarative and interrogative carrier sentences *Ich zeg noe* (Baexem) / *noow* (Weert) *X*, lit. I say now X, 'I now say X' and *Zeg ich noe / noow X*?, lit. Say I now X?, 'Do I now say X?'. The Weert speaker was a 62-year-old male, the Baexem speaker a 70-year-old female; both were born in their home towns and had lived there all their lives. The lexical tones of the Baexem words were independently transcribed by two trained listeners. The utterances were furthermore acoustically analyzed using the software package PRAAT, available at http://www.fon.hum.uva.nl/praat/.

3.2. The non-tonal dialect of Weert: a comparison with tonal Baexem

The intonational differences between the dialects of Weert and Baexem become particularly clear when studying the pitch contours of one of the minimal pairs, such as the words for 'rabbit' and 'rabbits'. The top panel of Figure 3 illustrates the declarative and interrogative realizations of these words in the dialect of Baexem, whereas the corresponding Weert forms are represented in the bottom panel.

In the dialect of Baexem, the words for 'rabbit' and 'rabbits' have the same segmental structure, namely [kniːn], but the pitch contour of the singular is clearly different from that of the plural form, both in the declarative and in the interrogative contours. In final focused position, the declarative contour for Accent II follows a falling-rising pattern, while a fall inside the accented syllable is observed for Accent I. The interrogative realization of Accent I in phrase-final position is a rise-fall that occurs fairly late in the focused syllable. The corresponding contour for Accent II shows a rise that is preceded by a flat part in the first half of the syllable. The dialect of Baexem thus exemplifies the mechanism underlying a lexical tone contrast; by making use of these distinctions in pitch, speakers of a tonal dialect can distinguish between [kniːn] meaning 'rabbit' with Accent II and the segmentally identical form for 'rabbits' with Accent I.

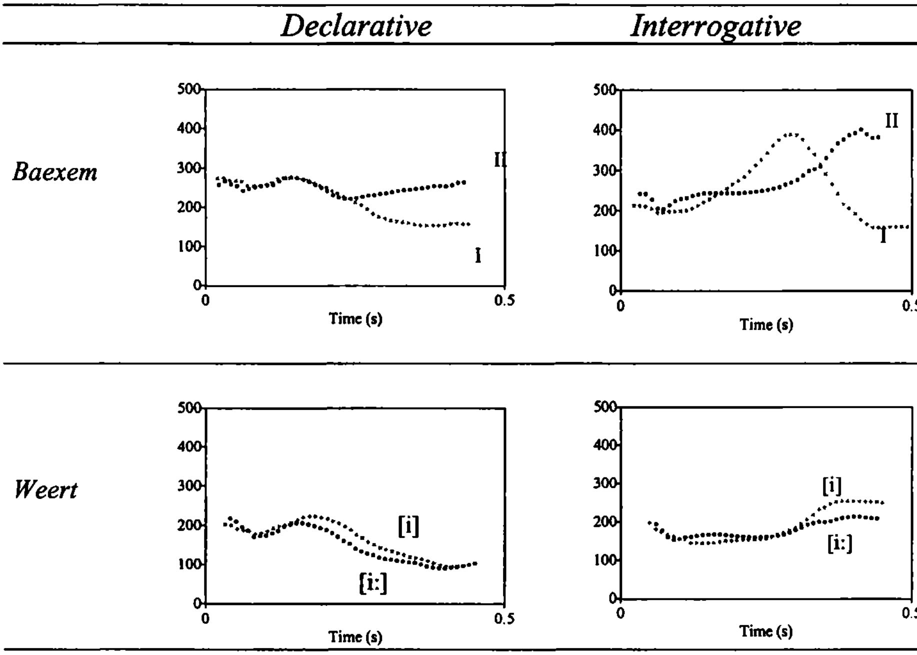


Figure 3. Declarative and interrogative F0 contours of 'rabbit' (black) and 'rabbits' (grey) in Baexem and Weert in final focused position.

The dialect of Weert does not have such a tonal opposition. As can be seen in Figure 3, the Weert F0 contours of 'rabbit' more or less match that of 'rabbits'. Clearly, a lexical tone contrast cannot be established here. However, if the singular form is barely distinguishable from the plural on the basis of F0, there still is a very salient contrast between the two: 'rabbit', [kni:n], has a long vowel in the dialect of Weert, but a short vowel appears in the plural: [knin]. This is indicated in Figure 3 by [i:] and [i], respectively. Vowel durations are given in Table 1, showing that, in Weert, the vowel of the singular form is almost eighty milliseconds longer than that of the plural. Hardly any differences in vowel duration occur in the corresponding Baexem minimal pair. Whereas Baexem has a lexical tone contrast to distinguish the singular from the plural, it is argued that Weert uses vowel length contrastively to achieve the same goal.

Table 1. Average vowel durations in Weert and Baexem (in milliseconds).

Weert		*Baexem*		*gloss*
kni:n	220	kni:n$^{\mathrm{II}}$	186	rabbit
knin	143	kni:n$^{\mathrm{I}}$	177	rabbits
stɛin	273	ʃtɛin$^{\mathrm{II}}$	254	stone
stæjn	192	ʃtɛin$^{\mathrm{I}}$	219	stones

Another illustration of the non-tonal status of the dialect of Weert – and of the tonal status of that of Baexem – is provided by the Baexem minimal pair [ʃtɛin]$^{\mathrm{II}}$ 'stone' vs. [ʃtɛin]$^{\mathrm{I}}$ 'stones' and its Weert cognates [stɛin] 'stone' vs. [stæjn] 'stones'.[2]

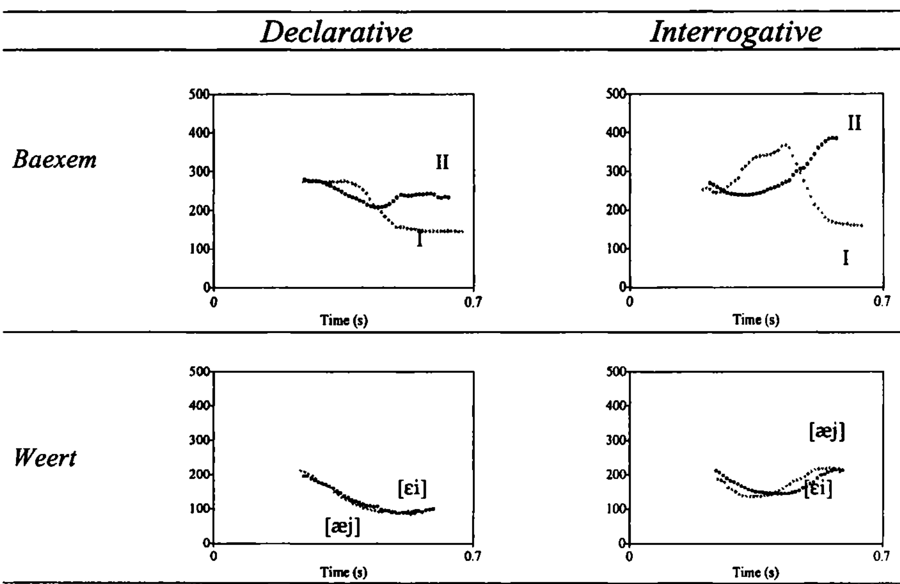


Figure 4. Declarative and interrogative F0 contours of 'stone' (black) and 'stones' (grey) in Baexem and Weert in final focused position.

Figure 4 illustrates the pitch contours of both the Baexem and the Weert words for 'stone' and 'stones', realized as part of a declarative and interrogative sentence. Again, we find Weert using a durational difference to realize these two items (*cf.* Table 1), whereas Baexem employs a tonal difference. It should be stressed that the short vowel plus glide combination [æj] that the Weert dialect uses in the plural form is clearly distinct from the diphthong [ɛi] of the singular. First of all, the first part of the diphthong is somewhat closer than the corresponding element in the short vowel plus glide. Second, the duration of the short vowel plus glide combination [æj] is substantially shorter than that of the diphthong. As a result, [æj] sounds very much as if it were the short counterpart of [ɛi], comparable to the [i] in 'rabbits' that was the short counterpart of the [iː] in 'rabbit'. The contrastive use of diphthongs and vowels that are followed by a glide is extremely rare in the world's languages though. Apart from Weert (and other Limburgian dialects such as Maastricht, Gussenhoven and Aarts, 1999), only Polish seems to contrast diphthongs with short vowel plus glide combinations (Chris Golston, personal communication).

So far, we have only looked at F0 contours of focused monosyllables that appeared in utterance-final position. But also bisyllabic words with a final ə-syllable were inserted at the end of the declarative and interrogative carrier sentences, thus yielding prefinal focused contours. These intonation patterns are illustrated in Figure 5 by means of the declarative and interrogative realizations of [ˈvɛːɣə]$^{\mathrm{II}}$ 'to sweep' and [ˈneːsə]$^{\mathrm{I}}$ 'to sneeze' for Baexem, and of [ˈvɛːɣə] 'to sweep' and [ˈneːstə] 'to sneeze' for Weert.

In the Baexem prefinal declarative contours, an early fall during the focused syllable in Accent I [ˈneːsə]$^{\mathrm{I}}$ 'to sneeze' signals the distinction with a late fall, *i.e.* after the accented syllable, in Accent II [ˈvɛːɣə]$^{\mathrm{II}}$ 'to sweep'. The interrogative version of Accent I is realized as a rise throughout the duration of the syllable, while the pitch contour stays level or slightly drops in the Accent II syllable. For Accent I, a sharp fall can be observed at the end of the intonation phrase, but not for Accent II, where the F0 contour is in the process of falling from high. As for the Weert intonation patterns of [ˈneːstə] 'to sneeze' and [ˈvɛːɣə] 'to sweep', they perfectly overlap one another. Other word pairs yield similar pitch contours, both in Baexem and in Weert. In other words, a tonal contrast is absent in Weert in the prefinal just as in the final examples, but not in Baexem.

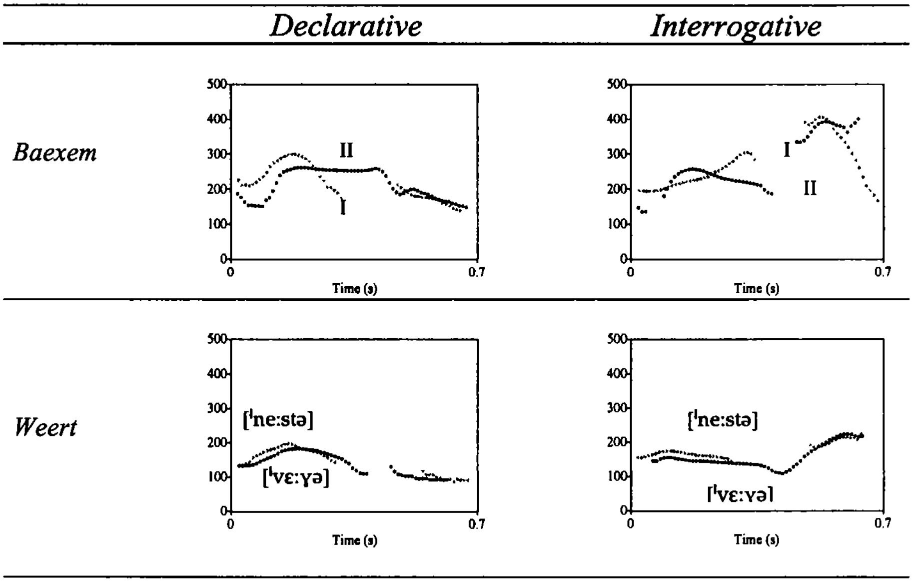


Figure 5. Declarative and interrogative F0 contours of 'to sweep' (black) and 'to sneeze' (grey) in Baexem and Weert in prefinal focused position.

3.3. Theoretical account of the Baexem tonal contrast: a comparison with Roermond

The Baexem realizations of the tonal accents in final and prefinal focused position follow the same F0 contours as in the Roermond dialect, both in declarative and interrogative sentences. The Roermond lexical tone contrast has been analyzed in an autosegmental-metrical framework by Gussenhoven (2000a). The contours of a Roermond tonal pair that is realized with focus in both final and nonfinal position are as in Figure 6.

Gussenhoven (2000a) proposes the following analysis for Roermond, where the lexical tone contrast is restricted to syllables with two sonorant moras. The boundary tones are Li for declaratives and HiLi for interrogatives. To mark focus, Roermond uses a high tone (H*) in declarative utterances, but a low tone (L*) in question intonation.

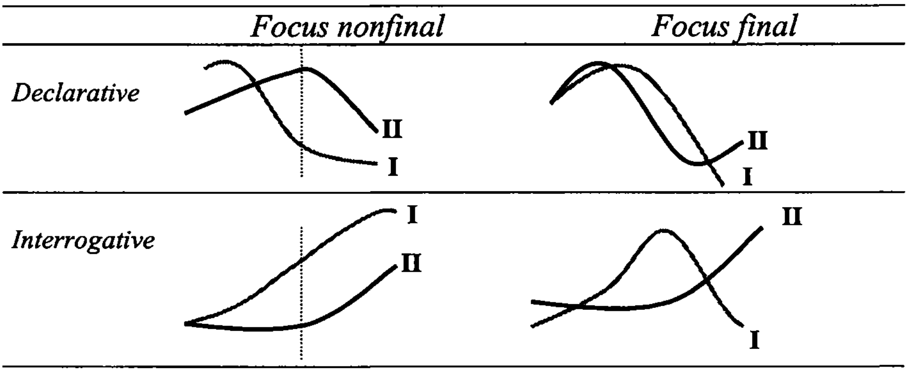


Figure 6. Schematic representations of the contrast between Accent I (grey) and Accent II (black) in Roermond in final and nonfinal focused position with declarative and interrogative intonation (based on Gussenhoven, 2000a, Table I).

The focal tones associate with the first sonorant mora of the main stressed syllable. Accent I is lexically toneless, but Accent II has a lexical H associated to the second sonorant mora.

To account for the steep, early fall in Accent I nonfinal declarative contours, it is assumed that the low boundary tone spreads to the free second sonorant mora of the focal syllable. Since a lexical H is allocated to this position in Accent II words, the nonfinal declarative fall comes somewhat later here. Assimilatory processes take place in the Accent II interrogative contours. First, the Accent II lexical H changes to L under the influence of a preceding L*. Second, if the lexical H occupies the last mora of the intonation phrase, whether in interrogatives or in declaratives, the boundary tone(s) are realized before it. This has far-reaching implications for the final Accent II contours. In declaratives, the boundary low tone is implemented before the lexical H and after the focal H*, thus yielding a falling-rising pattern. In final interrogative realizations, the Accent II lexical H comes after the HiLi boundary tone. Here, it is therefore not the lexical H, but the first element of the boundary tone that assimilates to the preceding L* focal accent. The unusual order of boundary and lexical tones is accounted for in Optimality Theory as resulting from the competition between two conflicting alignment constraints: one that aligns boundary tones at the right edge of the intonation phrase and one that aligns the lexical H at the right edge of the syllable, which is ranked higher (see also Gussenhoven, 2000c).

The analysis that Gussenhoven developed for the dialect of Roermond can also be applied to the intonation patterns that were observed for Baexem. However, a difference between the Baexem and Roermond realizations of the intonational and lexical tones would appear to be that Baexem truncates the interrogative HiLi boundary tone when a focused Accent II syllable appears prefinally (Figure 7; bottom left panel, black contour), while this does not seem to take place in the corresponding Roermond prefinal contour where a full fall occurs at the end of the intonation phrase (Gussenhoven, 2000a and 2000c). Figure 7 brings together the schematic representations of the Baexem contours as illustrated in Figure 3 to 5 as well as Gussenhoven's account of the Roermond tonal contrast as outlined above. Note that although the nonfinal contours of Baexem and Roermond look rather different, these differences can be ascribed to the fact that in Baexem, the focal syllable is actually prefinal, so that the boundary tones are included in the representations of the Baexem lexical tone contrast in Figure 7, but not in Figure 6 for Roermond.

After having elaborated on the representation of the tonal contrast in the dialects of Baexem and Roermond, we have now come to a point where a comparison with the Weert dialect would be appropriate. From the illustrations of two monosyllabic minimal pairs, 'rabbit(s)' and 'stone(s)', and two bisyllabic words carrying different tonal accents in Baexem, it seems reasonable to assume that the dialect currently spoken in Weert is not tonal at all. None of the examined words in the corpus showed intrinsically different intonation contours than those illustrated here. Also, there is no doubt that the dialect of Baexem uses contrasting lexical tones, much in the same way as Roermond. While these tonal dialects can use Accent I and Accent II to express (morphological and lexical) differences between otherwise identical forms, the dialect of Weert was shown to contrast not only short vowels with long vowels (as in [kniːn] 'rabbit', [knin] 'rabbits'), but also short vowel plus glide combinations with diphthongs (as in [stɛin] 'stone', [stæjn] 'stones') to achieve a similar distinction.

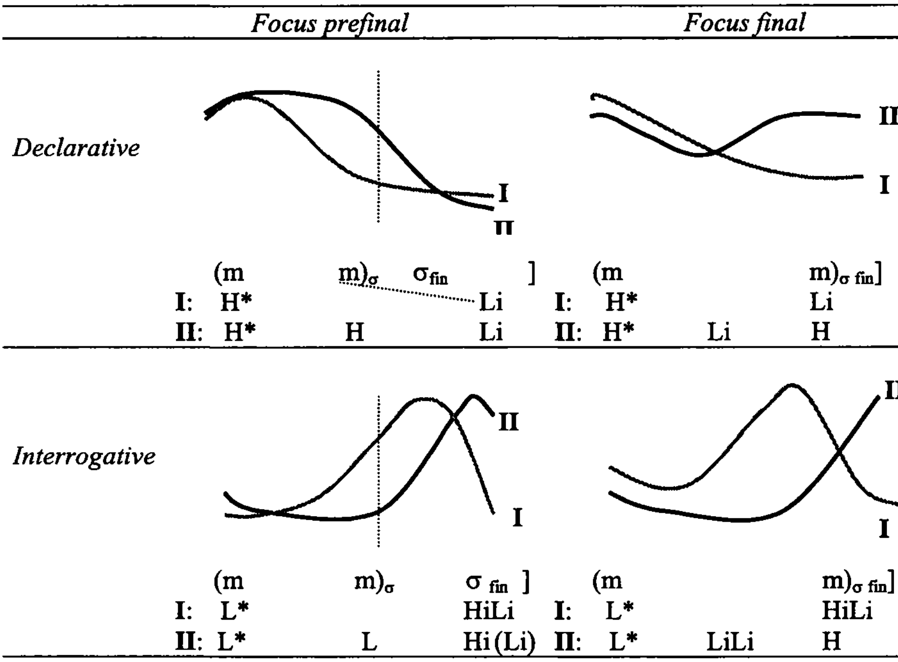


Figure 7. Schematic representations of the contrast between Accent I (grey) and Accent II (black) in Baexem in final and prefinal focused position with declarative and interrogative intonation (σ_{fin} stands for final syllable).

The data presented in this section not only illustrate the non-tonal status of the Weert dialect, they also reveal a fairly systematic correspondence between vowel length in Weert and lexical tone type (Accent I or Accent II) in Baexem. In the 'rabbit(s)' and 'stone(s)' examples, a short vowel (plus a glide) appears whenever the Baexem cognate word has Accent I, *i.e.* in the plural forms, but a long vowel (or diphthong) is used instead of Accent II. In order to see if these correspondences in fact exist on a wider scale, the remaining words of the Baexem corpus will be compared with their non-tonal Weert counterparts. The next section opens with a discussion of the Weert vowel system, so as to bring out the fact that the dialect can readily accommodate a vowel quantity difference.

4. Correspondences between vowel length in Weert and the lexical tones of the Baexem dialect

4.1. The Weert vocalic system[3]

The Weert dialect has 28 stressable oral vocalic nuclei: seven short lax vowels, three short tense vowels, twelve long (tense or lax) monophthongs, and six diphthongs, of which three are centring and three are closing. Among the short vowels, eight have approximately the same quality as their long counterparts. In addition, there is [ə], which occurs in unstressed syllables only. A typologically interesting set is formed by the long monophthongs, which include the series [iː, eː, ɛː, æː, aː, ɑː, ɔː, uː], of which [æː, aː, ɑː] are all unrounded. The vowels [ɑː] and [æː] are restricted to positions before a sonorant consonant in the coda, but in this position contrast with the other vowels, as shown by [keːl] 'smock', [kɛːl] 'throat', [bæːls] 'Belgian', [kaːl] 'bold' and [kɑːl] 'rumours'.[4] Before [ʀ] in the same word, [i, y, u], [iə, yə, uə] and [ɛi, œy, ʌu] do not occur, but all other vowels do. Recordings of the keywords in Table 2 and 3 are available at http://lands.let.kun.nl/projects/weert.html. The speech transcribed is that of a 22-year-old female speaker.

Like many southeastern dialects, Weert allows short lax vowels to be followed by [β̞, j] in the coda, by the side of long vowels. The standard language only has combinations of long vowels and glides. It does, however, not share the possibility of short vowels to be followed by a glide. When preceded by a short vowel, the glide can be followed by a tautosyllabic consonant. The combinations that can occur, figure in Table 3.

The vowel plus glide combinations [æj], [œj], [ɑβ̞] are distinct from the closing diphthongs [ɛi, œy, ʌu], whose qualities are similar to those of the corresponding diphthongs in the standard language. First, the durations of the vowel plus glide combinations are shorter than those of the diphthongs. In the context [β̞æjts] 'luxurious', [zβ̞ɛit] 'sweat' spoken in isolation, the respective durations are 180 ms and 230 ms.

Table 2. Vowels in the Weert dialect.

Short vowels			Long vowels			Diphthongs		
i	ʀit	'Mary'	i:	βi:t	'far'	iə	kiət	'hut'
y	yt	'out'	y:	zy:t	'sees'	yə	ɣʀyəts	'proud of'
ɪ	hɪtst	'heat'	e:	ʀe:t	'reed'	uə	ʀuət	'red'
ʏ	blʏts	'bump'	ø:	zø:t	'sweet'	ɛi	lɛit	'sorrow'
ɛ	ˈzɛgə	'to say'	ɛ:	ˈblɛ:cə	'leaf+DIM'	œy	kœyt	'fun'
œ	nœt	'mean'	œ:	fœ:ts	'slap'	ʌu	stʌut	'naughty'
æ	slæt	'dishcloth'	æ:	tæ:nt	'tent'			
			a:	na:t	'wet'			
ɑ	kʀɑts	'scratch'	ɑ:	lɑ:ŋk	'tall'			
ɔ	kʀɔt	'beet'	ɔ:	kβɔ:t	'angry'			
			o:	blo:t	'blood'			
u	ʀuts	'slide'	u:	ʀu:t	'pane'			
ə	ˈm:xcə	'girl						

Table 3. Vowel plus glide combinations in the Weert dialect

Short vowel plus glide			*Long vowel plus glide*		
ɪj	blɪj	'happy'	i:β	li:β	'lion'
ʏj	kʏj	'cows'	y:j	py:j	'paws'
			e:j	sne:j	'cut'
			ø:j	zø:j	'she, they'
œj	bœj	'shower'	ɛ:j	bɛ:j	'(I) pray'
æj	dʀæj	'three'	œ:j	sxœ:j	'bolts'
(ɑj)	de:ˈtɑj	'detail'	a:j	sl a:j	'lettuce'
ɑβ	nɑβ	'narrow'			
(ɔj)	hɔj	'hi'	ɔ:j	kɔ:j	'cold'
ɔβ	nɔβ	'new'	o:j	ɣo:j	'good'
			o:β	no:β	'now'
			u:j	ku:j	'cage'

Second, the short vowels are slightly more open than the first elements of the diphthongs, [œ] being considerably opener before [j] than elsewhere. The duration of the long vowel plus glide combination [a:j] is 300 ms. Because the diphthongs [ɛi, œy, ʌu] rarely occur word-finally, there are few minimal pairs with short vowel plus glide combinations in final position. An example of a near-minimal pair is [bœj] 'shower', [nœy] as in [hɛː kʀeːx ɔp sin 'nœy] 'he was given a good beating'. Preconsonantal (near-)minimal pairs can easily be found: [β̞æjc] '(the wind) blows', [lɛit] 'sorrow', [dœjts] 'German' (adj.), [kœyt] 'fun', [ɑβ̞x] 'eye', [ʌux] 'also'.

In view of our investigation, then, it is important to note that the Weert dialect has no less than eight monophthongal pairs that differ in vowel length. These are [i(ː), ɛ(ː), æ(ː), a(ː), ɑ(ː), ɔ(ː), o(ː), u(ː)]. Interestingly, also the diphthongs [ɛi, œy, ʌu] can be used contrastively with the short vowel plus glide combinations [æj, œj, ɑβ̞], respectively, and in a way this resembles length contrasts. The remaining part of this chapter examines to what extent words with short vocalic elements[5] in the non-tonal dialect of Weert have cognate words with Accent I in Baexem and, vice versa, to what extent long vocalic elements correspond to Accent II.

4.2. Examining the corpus for correspondences between Weert vowel length and Baexem lexical tone.

4.2.1. Overview of the corpus and general remarks

Out of the 147 word pairs included in our corpus, 74 Baexem words with Accent II contain long vocalic elements in their Weert counterparts. Another 36 have Accent I while having short vocalic elements in Weert. Thus, a total of 110 word pairs agreed in either one of these respects. Within these 110 word pairs, vowels are usually, but not necessarily, of the same phonological length in both dialects. This is illustrated in the four panels of Table 4.

No differences in vowel length occur in the Weert and Baexem words that figure in the lefthand column of Table 4. Here, Baexem Accent I and II associate with syllables that have short and long vocalic elements, respectively, and whose Weert counterparts have the same vowel length. The righthand column presents words that do not

Table 4. Vowel length – lexical tone type correspondences

	same vowel length			*different vowel length*		
	Weert	*Baexem*	*gloss*	*Weert*	*Baexem*	*Gloss*
short vocalic elements vs. Accent I	hɑŋ	hæɲ [I]	'hands'	bœjm	bœym [I]	'trees'
	æʀm	æʀm [I]	'arms'	yl	y:l [I]	'owl'
	stʏm	ʃtʏm [I]	'voice'	mul	mu:l [I]	'mouth'
	Weert	Baexem	gloss	Weert	Baexem	Gloss
long vocalic elements vs. Accent II	knœyp	knœyp [II]	'buttons'	sxœ:lc	ʃʏlc [II]	'debt, fault'
	i:s	i:s [II]	'ice'	bɑ:ŋk	bɑŋk [II]	'bank'
	be:k	bɛ:k [II]	'brook'	æ:ʀm	æʀm [II]	'arm'

agree in vowel length across the dialects. These constitute about a quarter of the 110 word pairs. Here, the Baexem Accent I words with long vocalic elements have Weert cognates with short vocalic elements. On the other hand, long vocalic elements are used in Weert if their Baexem counterparts have Accent II and short vocalic elements. In this way, the correspondences between Accent I in Baexem and short vocalic elements in Weert on the one hand (top row), and Accent II and long vocalic elements on the other (bottom row), hold good.

The short vowels in our Baexem examples with Accent II are always followed by a sonorant consonant in the same syllable. In the tonal systems of Maasbracht (Hermans 1985, 1994), Roermond (Gussenhoven 2000a), and Venlo (Gussenhoven and Van der Vliet 1998), the syllable rhyme has to consist of a long vowel, a diphthong, or a short lax vowel and a tautosyllabic sonorant in order for the contrast to exist. Since in the latter two dialects, the tonal contrast is defined as the presence (in case of Accent II) versus absence (in case of Accent I) of a lexical tonal marking, words whose main-stressed syllable contains only a single sonorant could also be said to have Accent I, all the more since Gussenhoven found that these syllables have similar pitch contours to bimoraic syllables with Accent I, both in the dialect of Roermond (2000a) and Venlo (Gussenhoven and Van der Vliet 1999). However, since monomoraic syllables cannot have Accent II, it does not make sense to speak of Accent I – or of a lexical tone opposition – in words of this type, which will therefore be left unspecified for tone in the present study.

The Baexem dialect does not tolerate a lexical tone contrast on monomoraic syllables either. The items 1 through 9 in Appendix 2, whose main stressed syllables contain only one sonorant mora, always pattern in the same way, i.e. like bimoraic syllables with Accent I. This is shown in Figure 8.

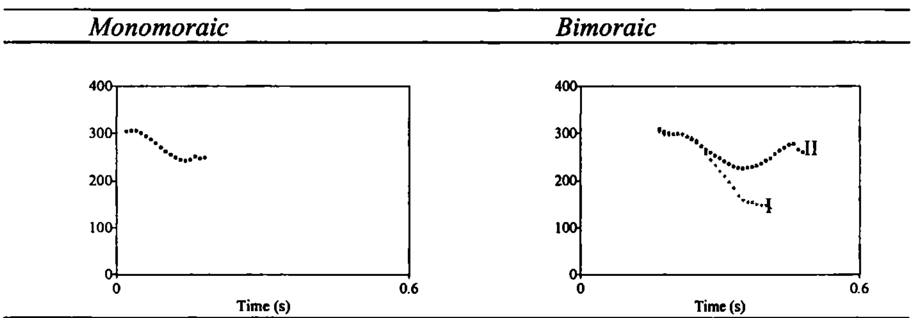


Figure 8. Declarative F0 contours of [pœt] ‘pots’ (lefthand panel) and [ʃtʏm]$^{\mathrm{I}}$ ‘voice’ (righthand panel, in grey) and [ʃʏlc]$^{\mathrm{II}}$ ‘fault, debt’ (righthand panel, in black) in Baexem.

It would be inappropriate, however, to lump together words like [pœt] ‘pots’ and [ˈkʀɔ.lə] ‘curls’ with those of the type [ʃtʏm]$^{\mathrm{I}}$ ‘voice’ and [ˈhʏɲ.cə]$^{\mathrm{I}}$ ‘little dog’, because the tonal contrast in the Baexem dialect too, is apparently excluded on syllables with one sonorant mora. Hence, both [ʃtʏm]$^{\mathrm{I}}$ ‘voice’ with Accent I and [ʃʏlc]$^{\mathrm{II}}$ ‘fault, debt’ with Accent II are actual words in Baexem, distinguishable not only from their segmental structure but also from their pitch contours, but a word like [pœt] ‘pots’, which has no second sonorant mora, has no such tonally different counterpart. Following Hermans (1994), Gussenhoven (2000a), and Gussenhoven and Van der Vliet (1999), the term Accent I will not be used for words of the type [pœt] or [ˈkʀɔ.lə], even if these have contour shapes resembling those of Accent I, since it counterfactually implies that Accent II is also possible.

The remaining words in Appendix 2 have at least two sonorant moras, so that Baexem permits a lexical tone contrast here. Below is a more detailed account of the structure of the corpuses that were collected in the dialects of Weert and Baexem, and of the overall tendency that could be observed: when a word has Accent II in Baexem, the chances are that it will have a long vocalic element in its Weert cognate and, conversely, when it has Accent I, a short vocalic element is to be expected in Weert. Attention will also be paid to the relatively small number of words that do not obey this general principle, and at the same time an explanation will be offered for their deviant behavior.

4.2.2. West Germanic[6] short vowels in closed syllables with a sonorant coda

As for the Baexem words with short vowels that are followed by a tautosyllabic sonorant, they either have Accent I or Accent II (see Appendix 2, #10-49). The distribution of the tonal accents in this class of words can be adequately described by making use of two parameters: consonant voicing and schwa apocope. Accent I is commonly found in words where a schwa was apocopated in a weak syllable with a voiced onset. An example illustrating this is the following. From a purely synchronic perspective, it is not clear why [bæʀx]$^{\mathrm{II}}$ 'mountain' (Appendix 2, #16) and [bæʀx]$^{\mathrm{I}}$ 'mountains' (Appendix 2, #42) have different tonal accents. But diachronically, the form /bæʀ.ɣə/ is at the basis of Accent I [bæʀx]$^{\mathrm{I}}$ 'mountains'. Once the final schwa had been apocopated, the voiced onset of /bæʀ.ɣə/ became the final coda consonant of /bæʀɣ/, which subsequently devoiced. However, in forms where apocope did not apply, like the singular [bæʀx]$^{\mathrm{II}}$ 'mountain', Accent II is most common.

On the other hand, if schwa apocope took place in a syllable with a voiceless instead of a voiced onset, we do not find Accent I. For instance, [bæŋk]$^{\mathrm{II}}$ 'banks', which derives from /bæŋ.kə/, has Accent II, as well as the monosyllabic singular [bɑŋk]$^{\mathrm{II}}$ 'bank' (Appendix 2, #11 and 10, respectively), where the final coda consonant is also voiceless underlyingly. Table 5 generalizes the observations that were made regarding the distribution of the tonal accents in the class of words with short vowels that are followed by a sonorant in the same syllable.

Table 5. Distribution of Accent I and Accent II in words with West Germanic short vowels plus tautosyllabic sonorants

	no apocope	*apocope*
underlying voiceless obstruent	Accent II: [baŋk] $^{\text{II}}$ 'bank'	Accent II: [bæŋk] $^{\text{II}}$ 'banks'
underlying voiced obstruent	Accent II: [bæʀx] $^{\text{II}}$ 'mountain'	Accent I: [bæʀx] $^{\text{I}}$ 'mountains'

To get back to the main point of this chapter, with the exception of a few items[7], the Weert cognates of the Baexem words with Accent I contain short vowels. But on the other hand, so do the Baexem words. For this reason, the Accent II words that have a short vowel in Baexem[8], but are realized with a long vowel in the dialect of Weert are more interesting. For instance, the Weert counterparts of the Accent II examples from Baexem in Table 6 are [bɑːŋk] 'bank', [bæːŋk] 'banks', and [bæːʀx] 'mountain', but [bæʀx] 'mountains'. Thus, while [bæʀx]$^{\text{II}}$ 'mountain' and [bæʀx]$^{\text{I}}$ 'mountains' are tonally distinct in the dialect of Baexem, in Weert, they are distinguished on the basis of vowel length alone.

4.2.3. West Germanic short vowels in open syllables

A similar classification of the tonal accents as that of the West Germanic short vowels in syllables with a sonorant coda obtains to the next couple of items on our list (Appendix 2, #50-74).[9] Although the contemporary forms all have long vowels, both in Baexem and in Weert, these were short in their West Germanic precursors, where they appeared in open syllables.[10] Here, as well as with the abovementioned short vowels that had a (sonorant) coda, it can be observed that the words that have Accent I are the ones where schwa apocope occurred in a syllable with a voiced onset. If apocope did not apply or if the consonant was voiceless all along, or both, Accent II is most likely to occur. An overview of this and some examples are given in Table 6.

Table 6. Distribution of Accent I and Accent II in words with West Germanic short vowels in open syllables

	no apocope	*apocope*
underlying voiceless obstruent	Accent II: [ˈɛːtə]^{II} 'to eat'	Accent II: [zaːt]^{II} 'drunk'
underlying voiced obstruent	Accent II: [ˈʀɛːɣən]^{II} 'rain'	Accent I: [daːx]^{I} 'days'

Whether the West Germanic short vowels appeared in open syllables or were followed by a tautosyllabic sonorant consonant (see 4.2.2.), the same principles of apocope and consonant voicing underlie the patterning of the lexical tones. By contrast, short vowel lengthening took place in open syllables only.

This brings us to the following. It is fairly uncontroversial that short stressed vowels in open syllables were pervasively changed into long vowels during the thirteenth and fourteenth centuries in all West Germanic languages, a process called Open Syllable Lengthening (OSL) (Lahiri and Dresher 1999). Not surprisingly, the Dutch Limburgian dialects of Baexem and Weert also underwent it. OSL took place independently of the tonal word accents: both dialects have long vowels in the class of words that once had short vowels in open syllables, as illustrated in items 50 through 74 of Appendix 2. As a result, the earlier observed correspondence between Baexem Accent I and Weert short vowels does not apply to the words that underwent OSL. OSL accounts for about a fifth of the non-corresponding cases, which have Accent I in Baexem, but a long vowel in Weert (Appendix 2, #67-74).

4.2.4. West Germanic high long vowels

Moving on now to the West Germanic long vowels on our list, the bulk of them have stayed long in their modern Baexem reflexes, but much less so in Weert. Within the class of long vowels, another factor, vowel height, comes into play. The lexical tones realized on old high long vowels pattern in the same way as the short vowels, that is, Accent II occurs unless the vowel was followed by a voiced consonant in the onset of the next, unstressed syllable of which the word-final schwa was lost. This is further illustrated in Table 7.

Table 7. Distribution of Accent I and Accent II in words with West Germanic high long vowels

	no apocope	*apocope*
underlying voiceless obstruent	Accent II: [ʃtʀuːk]^{II} 'shrub'	Accent II: [ʃtʀyːk]^{II} 'shrubs'
underlying voiced obstruent	Accent II: [kniːn]^{II} 'rabbit'	Accent I: [kniːn]^{I} 'rabbits'

The items 75 to 114 in Appendix 2 show a perfect relationship between vowel length in Weert and tonal accent in Baexem. Although they all have vowels that were once long, Weert now has short vowels in words, which have Accent I in their Baexem cognates, but kept the old long vowels otherwise. Compare for instance the Baexem word for 'rabbits' in Table 7, to its Weert counterpart, [knin], number 103 in Appendix 2. Also short vowel plus glide sequences are used in Weert as short counterparts of Baexem Accent I diphthongs, such as [ʀæjs] 'journey' and [bœjm] 'trees', corresponding to [ʀɛis]^{I} and [bœym]^{I}.

4.2.5. West Germanic non-high long vowels

The final portion of Appendix 2 (#115-147) is full of Accent I words. This tonal accent seems to occur in these words regardless of the (voiced or voiceless) nature of the following consonant, and schwa apocope does not seem to play a role either. If not the segmental structure, the nature of the vowel may be involved: all these Accent I forms have vowels that derive from West Germanic non-high long vowels. Apparently, Accent I is inherently linked up with these vowels.[11] Examples are given in Table 8 below.

Table 8. Accent I in words with West Germanic non-high long vowels

	no apocope	*Apocope*
underlying voiceless obstruent	Accent I: [boːk]^{I} 'book'	Accent I: [ʃœːp]^{I} 'sheep'
underlying voiced obstruent	Accent I: [ʃtoːl]^{I} 'chair'	Accent I: [ʃtøːl]^{I} 'chairs'

As a general rule, the vowel quantity of the West Germanic non-high long vowels was not affected either in Baexem or in Weert (see Appendix 2, #115-147). Take, for instance, the Weert words that correspond to the Baexem examples given in Table 8. These are [boːk] 'book', [sxœːp] 'sheep', [stoːl] 'chair' and [støːl] 'chairs'. Both dialects have kept the old long vowels, except sometimes when they appear in front of a glide (often word-finally), as in Baexem [blɔβ̞]^{I} 'blue' and [kyj]^{I} 'cows', and their Weert cognates [blɑβ̞] and [kʏj]. At the same time, this class of words shows up with Accent I in Baexem. This means that Accent I correlates with long vocalic elements in the corresponding Weert words, despite its usual cooccurrence with short vocalic elements. The Weert descendants of the West Germanic non-high long vowels failed to be shortened under the influence of Baexem Accent I.

This leaves us with the following question: why is it that the West Germanic high long vowels, unlike the non-high ones, show short outcomes in Weert when the corresponding Baexem word has Accent I? In other words, why does the Weert dialect tolerate [knin] 'rabbits', [yl] 'owl', and [mul] 'mouth', but not the short vowel variants of [zeːk] 'ill', [vøːt] 'feet', [pɔːl] 'pole'? A partial explanation could be that [e] and [ø] are not part of the Weert phoneme inventory. However, [ɔ] is. Except for [e, ø, o, a], the dialect has short counterparts for all long vowels, including the non-high ones (see section 4.1). The different behavior of the high and non-high vowels can therefore better be explained by looking at their intrinsic properties. It is a well-known fact that high vowels tend to be shorter than low vowels. The latter require more time to be pronounced, since the degree of tongue and jaw lowering is greater than in producing high vowels (Catford 1977: 196-97). This natural tendency of high vowels to be short may have contributed towards the shortening of the West Germanic high long vowels, but not of the non-high vowels, that took place in the dialect of Weert when they had Accent I cognates in Baexem.

4.2.6. OSL and West Germanic non-high vowels: one and the same exceptional category?

Summarizing the diachronic developments, short vocalic elements in the Weert dialect as it is currently spoken can derive from two sources: either they were short already in West Germanic where they appeared in closed syllables (with a sonorant coda)[12] or their West Germanic precursors were long high vowels. In either case, the corresponding forms in the Baexem dialect have Accent I. Conversely, the West Germanic short vowels followed by a tautosyllabic sonorant could also be long in the dialect of Weert, as well as the West Germanic high long vowels. The corresponding words in Baexem, then, have Accent II, but not necessarily a long vowel. However, regardless of the word tone used in Baexem, long vocalic elements turn up in Weert when they are the products of OSL or when they belong to the class of non-high long vowels.

A closer look at the word lists reveals that in the current forms where OSL applied (Appendix 2, #50-74), high vowels never occur, neither in Baexem nor in Weert (except for the Weert form [zuən] 'son'). Indeed, the West Germanic high short vowels ĭ and ŭ that appeared in open syllables were lengthened to ē and ō (Van Loey 1968: 2), thus coalescing with the short mid vowels ĕ and ŏ that underwent the same process. Some examples from standard Dutch illustrating this are listed in (1) for the front vowels and in (2) for the back vowels.

(1) a. *nemen* /ˈneːmən/ < OS *nĕman* 'to take'
b. *schepen* /ˈsxeːpən/ < MD *scĭp* 'ships'

(2) a. *geboden* /ɣəˈboːdən/ < OS *gibŏdan*
'commandments'
b. *zoon* /zoːn/ < Goth. *sŭnus*
'son'

The lowering of high short vowels in open syllables also took place in the dialects of Weert and Baexem. For instance, the long mid vowels in the words [s(ʃ)meːt] 'smith', [zoːn] 'son' and [ˈvøːɣəlkə] 'little bird' (Appendix 2, #54, 55, 66) derive from the short high vowels ĭ, ŭ and ŭ (through umlaut), respectively.

Correpondences between Baexem Accent I and Weert short vocalic elements could, for different reasons, not be established in the class of words with West Germanic non-high long vowels (4.2.5.) and with the products of OSL (4.2.3.). Given that high OSL vowels apparently do not exist in the dialects under investigation, it is not clear why OSL and West Germanic non-high long vowels should be considered as two independent conditions that prohibit Weert long vowels to be shortened when Accent I occurs in its Baexem cognate. One category in which the two are collapsed suffices to catch all the non-corresponding cases: non-high long vowels (whether resulting from OSL or originally long) remain unchanged for vowel length. In this respect, non-high long vowels behave differently from high long vowels (which never result from OSL), in that the latter become short in Weert words that have Accent I cognates in the Baexem dialect (4.2.4.).

In order to show that vowel length is retained in OSL products independently of vowel height, we would have to find a word pair with a high lengthened vowel in its Weert member and Accent I in its Baexem counterpart. Words with high OSL vowels are hard to find in the Weert variety spoken just outside the city center and in the surrounding parishes on which the present investigation is based, but not in the variety spoken in the city center, also called 'Stadsweerts'. In 'Stadsweerts', the long mid vowels of the more rural variety correspond to high centring diphthongs, as in [sxeːm, sxiəm] (< MD scēme < OS skĭmo) 'shadow' and [stoːf, stuəf] (< MD stōve < OHG stŭba) 'stove'. In these examples, the original high vowel is retained (or has been restored) in the 'Stadsweerts' OSL products, a rather common development in Limburgian dialects according to Van Loey (1968: 41). Since a schwa was apocopated in a syllable with a voiced onset, Accent I occurs in the corresponding words of Baexem: [ʃeːm]^{I} 'shadow', [ʃtɔːf]^{I} 'stove'. Also the high OSL vowels (as opposed to the originally long high vowels) would therefore appear to be long in the current 'Stadsweerts' forms, regardless of which word tone they have in their Baexem cognates. As a result, OSL products and the class of words with West Germanic non-high long vowels are as yet to be considered as two independent categories in which correspondences with the tonal accents of Baexem cannot always be observed.

4.3. The art of mimicking tonal dialects

Inspection of the data presented in the preceding paragraphs seems to warrant the conclusion that vowel length and word tone in the dialects of Weert and Baexem, respectively, link together in the following way: a word with Accent II in Baexem has a long vocalic element in its Weert counterpart, and conversely, a short vocalic element occurs when corresponding to Accent I (although long vocalic elements showed up despite Accent I either with the products of OSL or with the non-high modern reflexes of the West Germanic non-high long vowels).

The question arises as to how the Weert vowel length contrast, whose distribution can in large part be predicted from the Baexem word tones, came about. One possibility is that Weert at some point reanalyzed a prior tonal opposition as a quantity contrast, as suggested by Schmidt: "Aus vokalischen Dauer- und Qualitätsunterschieden, die der diachronischen Besetzung der Tonakzente entsprechen, läßt sich ehemals oder noch heute vorhandene RhA [Rheinische Akzentuierung] (…) erschließen" [One could trace back the differences in vowel quantity and quality that reflect the diachronic distribution of the tonal accents to a former or still existing tonal opposition] (1986: 138-39). Nevertheless, this does not tell us why Accent II words should show up with a long vowel in the Weert cognates instead of with a short vowel (the reverse applies to Accent I). It is a well-known fact, however, that vowel duration differences co-occur concomitantly with the lexical tone contrast, Accent II vowels being usually longer than Accent I vowels (*e.g.* Jongen 1972, Schmidt 1986, Gooskens and Rietveld 1995). In this view then, these durational differences that came with the tonal accents may have been reinterpreted as a vowel quantity contrast in the Weert dialect. This linguistic change has in fact been attested in the Huldingen dialect spoken in Northern Luxembourg, where younger dialect speakers have replaced the tonal opposition used by older speakers with a phonological vowel length contrast (Goudaillier 1987).

Alternatively, Weert may never have been tonal at all. Instead, the use of contrasting vowel length in this dialect might have been socially motivated. It could have sprung from the desire to sound like speakers of the neighboring tonal dialects. This might have been achieved by phonologizing one very salient acoustic property of the word tones: vowel duration. In this view, the phonetically longer Accent II vowels of the nearby dialects were interpreted as phonologically long in Weert while the somewhat shorter Accent I vowels of the same phonological length were perceived as phonologically short by the Weert language users.

At this point, we have no indications whatsoever that the Weert dialect had a lexical tone contrast in the past, nor that it did not have tone. At the very least, both accounts offered here explain why the correspondences are the way they are and not the other way around: short vocalic elements in Weert are closely linked to Accent I, long vocalic elements to Accent II. Whether the contrastive use of vowel length in Weert arose as a purely linguistic reinterpretation of a lexical tone contrast or as a socially-induced imitation of it, it was the intrinsically longer vowel duration of Accent II in comparison with Accent I that triggered this change.

5. Conclusion

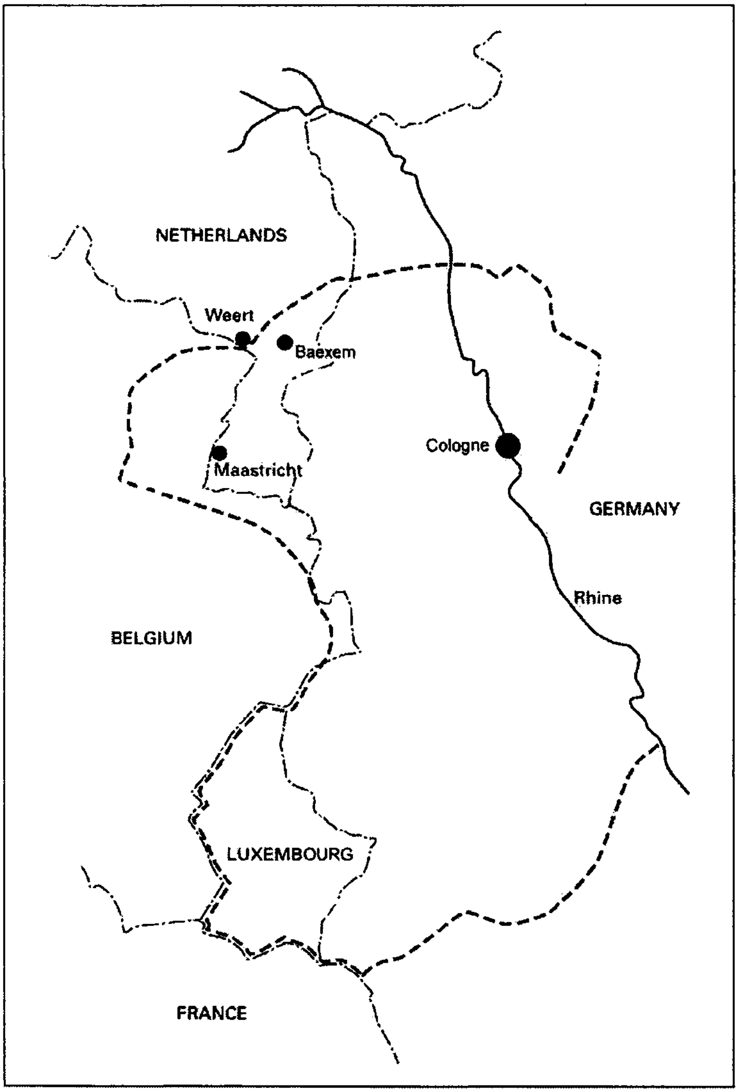
Although Weert has usually been grouped with the tonal dialects of the Limburgian-Rhenish region, it should in fact not be considered one. Its non-tonal status was demonstrated by comparing pitch contours of minimal pairs with those of their Baexem counterparts. Clearly, in Baexem, members of a minimal pair were tonally distinct, but segmentally identical. By contrast, vowel length turned out to be the only contrastive feature in the Weert word pairs. Spectacularly, short vowels followed by a glide in the coda are used as short versions of diphthongs in the Weert dialect.

The findings further inspired us to investigate on a larger scale whether the distribution of vowel length in Weert is somehow connected to the word tones of the Baexem dialect. To this end, we searched a large word corpus for correspondences between on the one hand Accent I and short vocalic elements, and between Accent II and long vocalic elements on the other. These could easily be established. To be more precise, they applied to 75 per cent of the words in the corpus. Strangely enough, the exceptional cases were all instances of words, which in Weert have long vowels or diphthongs, while their counterparts in the Baexem dialect are realized with Accent I and have long vowels or diphthongs as well. A closer look at these exceptions revealed that they either belong to the class of words where open syllable lengthening took place or where West Germanic non-high long vowels occur, which in contrast with the West Germanic high long vowels were never shortened. Due to these interfering developments, the picture may seem less straightforward than it in fact is: the occurrence of long vocalic elements in Weert closely corresponds to that of Accent II in Baexem; in principle, Accent I and short vocalic elements are similarly interrelated.

Since the distributions of vowel length and word tone in the dialects of Weert and Baexem, respectively, are inextricably intertwined, the question was raised whether the Weert vowel quantity opposition could have arisen by reanalyzing a prior lexical tone contrast (a longer vowel duration has often been claimed to cooccur with Accent II) or by merely imitating these durational differences that come with the word tones. As yet no evidence could be provided to support either one of these explanations. In other words, "the art of mimicking tonal dialects" can either be interpreted diachronically, in which case the "tonal dialect" is Weert, or synchronically if referring to the more easterly tonal dialects, among which Baexem.

Appendices

Appendix 1. The Limburgian-Rhenish lexical tone area (adapted from Gussenhoven and Bruce 1999, which was drawn on the basis of reports in the literature)



Appendix 2. Word corpus (non-correspondent cases are indicated in bold figures).

#	Weert	Baexem	gloss
1	zɑk	zɑk	'bag'
2	bɛt	bɛt	'bed'
3	hɪtst	hɪts	'heat'
4	pœt	pœt	'pots'
5	vɛs	vɛs	'fish'
6	ˈsɔkəʀ	ˈsʊkəʀ	'sugar'
7	ˈkʀɔlə	ˈkʀɔlə	'curls'
8	ˈkɑlə	ˈkɑlə	'to talk'
9	ˈlækə	ˈlækə	'to lick'
10	bɑ:ŋk	bɑŋk ^{II}	'bank'
11	bæ:ŋk	bæŋk ^{II}	'banks'
12	mæ:lk	mɛlk ^{II}	'milk'
13	hɑ:nt	hɑɲc ^{II}	'hand'
14	klo:mp	klʊmp ^{II}	'wooden shoe'
15	ɣæ:lc	ɣælc ^{II}	'money'
16	bæ:ʀx	bæʀx ^{II}	'mountain'
17	ʀe:ŋk	ʀɪŋ ^{II}	'ring'
18	ho:nt	hʊɲc ^{II}	'dog'
19	sxœ:lc	ʃʏlc ^{II}	'debt, fault'
20	kæʀs	kɛ:ʀs ^{II}	'candle'
21	zɔ:t	zɔ:t ^{II}	'salt'
22	hʌut	hʌut ^{II}	'wood'
23	ɔ:t	ɔ:t ^{II}	'old'
24	bɑ:l	bɑl ^{II}	'ball'
25	æ:ʀm	æʀm ^{II}	'arm'
26	hɑ:mpəl	ˈhɑmpəl ^{II}	'handfull'
27	ˈæ:ʀmo:j	ˈæʀmo:j ^{II}	'poverty'
28	ˈβ̞ɛ:ʀə	ˈβ̞ɛ:ʀə ^{II}	'to become'
29	ˈmæ:ʀɣə	ˈmœʀɣə ^{II}	'tomorrow'
30	ˈbœʀstəl	ˈbœʀstəl ^{II}	'brush'
31	ˈklø:mpkə	ˈklʏmkə ^{II}	'wooden shoe + DIM'
32	ˈkɛ:ʀcə	ˈkɛ:ʀcə ^{II}	'card + DIM'
33	ˈe:ŋkəl	ˈɪŋkəl ^{II}	'ankle'
34	ˈdœ:ʀpəl	ˈdœʀpəl ^{II}	'treshold'

35	ˈkæːʀməs	ˈkɪʀməs II	'fun fair'
36	væːʀkə	ˈvæʀkə II	'pig'
37	ˈplæːɲcə	ˈplæɲcə II	'plant + DIM'
38	ˈveːnstəʀ	ˈvɪnstəʀ I	'window'
39	mɪns	mɪns I	'human'
40	æʀm	æʀm I	'arms'
41	stʏm	ʃtʏm I	'voice'
42	bæʀx	bæʀx I	'mountains'
43	ɛːʀt	ɛːʀt I	'earth'
44	ˈhøːmə	hɛːmc I	'shirt'
45	hɑŋ	hæɲ I	'hands'
46	ˈhæɲcə	ˈhæɲcə I	'hand + DIM'
47	ˈdɪŋske	ˈdɪŋskə I	'thing + DIM'
48	ˈhʏɲcə	ˈhʏɲcə I	'dog + DIM'
49	ˈzoːndəx	ˈzʏɲɪx I	'Sunday'
50	zaːt	zaːt II	'drunk'
51	daːx	daːx II	'day'
52	β̞eːx	β̞ɛːx II	'road'
53	beːk	bɛːk II	'brook'
54	smeːt	ʃmeːt II	'smith'
55	zuən	zoːn II	'son'
56	ˈɛːpkə	ˈɛːpkə II	'monkey + DIM'
57	ˈɛːtə	ˈɛːtə II	'to eat'
58	ˈlaːjə	ˈlaːjə II	'to load'
59	ˈhɛːməʀkə	ˈhɛːməʀkə II	'hammer + DIM'
60	ˈlɛːvəʀ	ˈlɛːvəʀ II	'liver'
61	ˈʀɛiɣən	ˈʀɛːɣən II	'rain'
62	ˈvɛːɣə	ˈvɛːɣə II	'to sweep'
63	ˈvaːdəʀ	ˈvaːdəʀ II	'father'
64	ˈeːzəl	ˈɛːzəl II	'donkey'
65	ˈkoːkə	ˈkɔːkə II	'to cook'
66	ˈvøːɣəlkə	ˈvøːɣəlkə II	'bird + DIM'
67	daːx	daːx I	'days'
68	β̞eːx	β̞ɛːx I	'roads
69	zaːl	zaːl I	'saddle'
70	zɛːx	zɛːx I	'saw'

71	vla:j	fla:j I	'flan'
72	ˈzɛ:lkə	ˈzɛ:lkə I	'saddle + DIM'
73	bɛ:ʀ	bɛ:ʀ I	'bear'
74	bɛ:j	bɛ:j I	'(I) pray'
75	kβ̞i:t	kβ̞i:t II	'lost'
76	stʀu:k	ʃtʀu:k II	'shrub'
77	stʀy:k	ʃtʀy:k II	'shrubs'
78	vlɛis	vlɛis II	'meat'
79	knʌup	knʌup II	'button'
80	ˈzβ̞ɛitə	ˈʒβ̞ɛitə II	'to sweat'
81	ˈzu:pə	ˈzu:pə II	'to drink'
82	ˈʀʌukə	ˈʀʌukə II	'to smoke'
83	knœyp	knœyp II	'buttons'
84	ˈʀy:kə	ˈʀy:kə II	'to smell'
85	ˈbli:və	ˈbli:və II	'to stay'
86	kni:n	kni:n II	'rabbit'
87	i:s	i:s II	'ice'
88	be:j	bi: II	'with'
89	hu:s	hu:s II	'house'
90	no:β̞	nuə II	'now'
91	bo:ʀ	bu:ʀ II	'farmer'
92	bɛin	bɛin II	'leg'
93	klɛit	klɛit II	'dress'
94	stɛin	ʃtɛin II	'stone'
95	bʌum	bʌum II	'tree'
96	vø:ʀ	vø:ʀ II	'fire'
97	mo:ʀ	mo:ʀ II	'wall'
98	ˈi:zəʀ	ˈi:zəʀ II	'iron'
99	ˈdʀu:və	ˈdʀu:və II	'grapes'
100	ˈbʀy:cə	ˈbʀy:cə II	'bride + DIM'
101	ˈzɛivəʀ	ˈzɛivəʀ II	'drivel'
102	ˈʌuɣə	ˈʌuɣə II	'eyes'
103	knin	kni:n I	'rabbits'
104	mul	mu:l I	'mouth'
105	yl	y:l I	'owl'
106	stæjn	ʃtɛin I	'stones'

107	bœjm	bœym ^{I}	'trees'
108	bæjn	bɛin ^{I}	'legs'
109	ʀæjs	ʀɛis ^{I}	'journey'
110	hæj	hɛj ^{I}	'moorland'
111	vʀɑβ̞	vʀɔβ̞ ^{I}	'woman'
112	blɪj	bli ^{I}	'happy'
113	dœjts	dœyts ^{I}	'German (adj.)'
114	ˈœjxskə	ˈœyxskə ^{I}	'eye + DIM'
115	slɔːp	ʃlɔːp ^{I}	'sleep'
116	sxœːp	ʃœːp ^{I}	'sheep'
117	pɔːl	pɔːl ^{I}	'pole'
118	vøːt	vøːt ^{I}	'feet'
119	bloːt	bloːt ^{I}	'blood'
120	stoːl	ʃtoːl ^{I}	'chair'
121	støːl	ʃtøːl ^{I}	'chairs'
122	boːk	boːk ^{I}	'book'
123	zeːk	zeːk ^{I}	'ill'
124	beːʀ	beːʀ ^{I}	'beer'
125	kiəs	kiəs ^{I}	'cheese'
126	blɑβ̞	blɔβ̞ ^{I}	'blue'
127	kʀæj	kʀɔːn ^{I}	'crow'
128	β̞æjc	β̞æjc ^{I}	'(wind) blows'
129	kɔβ̞	ku ^{I}	'cow'
130	kʏj	kyj ^{I}	'cows'
131	bɪj	bij ^{I}	'bee'
132	ziə	ziə ^{I}	'sea'
133	duət	duət ^{I}	'dead'
134	vluːj	vluə ^{I}	'flea'
135	liːβ̞	liəβ̞ ^{I}	'lion'
136	pyːj	pyət ^{I}	'paws'
137	dʀyəx	dʀyəx ^{I}	'dry'
138	uːʀ	uəʀ ^{I}	'ear'
139	ˈyːʀkə	ˈyəʀkə ^{I}	'ear + DIM'
140	ˈduːjə	ˈduəjə ^{I}	'to thaw'
141	ˈbyənkəs	ˈbyənkəs ^{I}	'beans + DIM'
142	ˈneːstə	ˈneːsə ^{I}	'to sneeze'