

1 *Theoretical Preliminaries*

This chapter will lay the specialized theoretical foundations for the present study. The issues to be discussed include the nature of quantity, the concept of consonant strength, and the correlation of syllable cut (Ger. *Silbenschnitt*). While the data to be analyzed in subsequent chapters are derived mainly from the historically attested stages of the Germanic languages and their modern dialects, this chapter will concentrate mostly on phonetic and phonological analysis of the modern standard languages, where we are on much firmer ground than for the history of the languages documented only in written texts. After all, for historical periods, it is only possible to reconstruct the phonology of a language and not phonetic realizations. It is assumed, however, that phonetic descriptions, including those based on instrumental data, are capable of enlightening historical study insofar as historical data are subjected to phonological analysis informed by phonetic study of modern languages.

In the Modern Germanic languages, quantity in accented syllables is characterized by the correlation of syllable cut, with or without complementary length of the vowel and the following consonant. It is the goal of this chapter to describe the functioning of this modern-day regime, while the other chapters will examine its historical development and its consequences for the postvocalic consonants in the various dialects. As a basis for discussing consonant lenition, it will also be necessary to establish the content of the feature consonant strength for use in historical study. Thus, in keeping with the premise of the book – that the interdependence of vowel and consonant is responsible for the development of quantity in Germanic – this chapter will focus equally on the quantity of both vowels and consonants in the modern languages.

1.1 The Nature of Quantity

As in most phonetic and phonological descriptions of Modern Germanic languages, this study takes it for granted that there are only two grades of quantity. Despite variation in absolute duration shown in instrumental studies,

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it is relative rather than absolute length which is important in the phonological description of a given language. There has long been consensus on this issue, even among phoneticians. See for example, the handbooks of general phonetics by Sievers (1901: 256–57), Jespersen (1913: 178–90), Dieth (1950: 431), and von Essen (1962: 117–20), or Trubetzkoy's article (1938a) on the subject, and Malmberg's (1944) study of quantity in phonetics and phonology. This is indeed how quantity functions in the languages examined in this study.

The historical analysis of vowels and consonants in this study will proceed along the lines of short versus long, without intermediate lengths being established. For the Old Germanic languages, which were mora counting, this means mono- or bimoric. In the terminology of Trubetzkoy (1939: 175–77), quantity is a privative rather than a gradual feature. He considered it incorrect to establish three or more grades of quantity, because, he said, they do not exist. Yet not all are in agreement with this view. Malmberg (1944: 51–62), for example, argued for the possibility of quantity as a gradual feature. Studies on Germanic languages generally show, however, a correlation between the labels “short” and “long” in vowels and consonants and the measurements of duration. In the present context, we will pay most attention to accented vowels and the following consonants. It is only in accented syllables, after all, where there is a phonological opposition of long and short phonemes in the Modern Germanic languages and this has been the case nearly since the onset of transmission of the Old Germanic languages. Before turning to the complementary length of vowels and consonants in accented syllables, let us first consider vowels and consonants individually.

1.1.1 Vowel Length

We will look first at vowels, which have more often been the subject of investigation with regard to quantity, in both phonetic and phonological terms. Numerous instrumental studies of vowel duration in the Modern Germanic languages support the phonological distinction between long and short. The general practice has been to compare the average duration of long versus short vowel types that occur in the same environment. So, discounting variation in the realization of the sounds in the various Germanic languages, the comparison is between the correlated pairs in the long and short vowel inventories, i.e. *i:*, *y:*, *u:*, *e:*, *ø:*, *o:*, *ɑ:* and *ɪ*, *ʏ*, *ʊ*, *ɛ*, *œ*, *ɔ*, *a*. Tension (tense versus lax), or centralization, also often separates the realizations of the two categories of vowels, but it will be considered nondistinctive in favor of length, which can better be connected to the behavior of consonants. In English, the vowel series are often described as tense versus lax over long versus short. See, for example,

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Peter Ladefoged (1975: 86–88, cf. 250), who classifies vowels in American English as tense versus lax and considers vowel length allophonic. Diphthongs are generally long, although short diphthongs occur in some dialects and apparently in historical stages of the Germanic languages.

It will suffice to mention a few of the most important studies of this type. Among the first to measure vowel duration in this way was Ernst Meyer (1903: 49–50) in his famous study of quantity in English. He found that, on average, the ratio of the duration of long vowels to that of their short partners in monosyllables was approximately 1.5:1. For monosyllables in Icelandic, Bruno Kress (1937: 6) found that the ratio was greater, at 2.21:1. Without giving a composite ratio, Daniel Jones (1947: 216) also confirmed that English “long” vowels are longer than “short” vowels. In Icelandic, Stefán Einarsson (1927: 101) found that the ratio of long vowel to short varied from 1.32 to 2.74, but the difference was always maintained between long and short vowels of the same type. The measurements of Claes-Christian Elert (1964: 109), reported in his monograph on quantity in Swedish, also show that the phonological distinction between long and short vowels is paralleled by a difference in duration in isolated words and in sentences. In Swedish, he found that short vowel duration is on average 65 percent that of long vowel duration, basically the same as Meyer’s calculation for English. For German, Meyer (1904) found that the ratio of long to short vowels was about 2:1. Klaus Kohler (1977: 120) also reports that the relative durations of closed and open variants of German vowels in the same environment confirm the phonological distinction of quantity. Zwirner’s (1959; cf. Zwirner et al. 1956; Fourquet 1964) extensive experiments on long/short vowel ratio from thousands of speakers throughout a large part of German territory found greater ratios in the north and west than in the south and east, where they approached 1:1. As interesting as these findings are, they do not speak against the functioning of long versus short in German. From a more general perspective, Ilse Lehiste (1970: 33–34) finds that in languages with two contrastive degrees of length in accented syllables, the ratio of short vowel duration to long vowel duration is close to 50 percent.

In the studies just cited and others, it has been noted that there is great variation in the absolute length, especially of long vowels. For this reason, rather than speaking of long versus short, phoneticians have used the German terms *dehnbar*: *nicht dehnbar* (“lengthenable : not lengthenable”). This practice goes back to the nineteenth century, as we can see in Eduard Sievers’ *Gründzüge der Phonetik* (1901: 257), and the use of the terms runs like a red thread through phonetic studies written in German and Dutch. See, for

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example, Zwaardemaker and Eijkman 1928: 296; Richter 1938; Bergsveinsson 1941: 114–15; Eijkman 1955: 144–45; Michels 1957; von Essen 1962 149–50; and Ramers 1988: 79–80. This idea was sometimes taken up into general phonetics and phonology (cf. Trubetzkoy 1939: 175–76; Lehiste 1970: 33–34). In his discussion of *dehnbar* : *undehnbar*, Trubetzkoy (1938b: 117–18) wrote that shortness could be expressed by a point in time, length by a line. For Dutch, the distinction is sometimes called *open* versus *gesloten accent* (“open versus closed accent (syllable)”), or free versus checked vowels, etc. From a phonetic point of view, any of these terms can be justified, but in the historical phonological studies of this book, we will stick with long versus short.

Counter to the general practice of recognizing the fundamental distinction between long and short vowel phonemes, several grades of length are sometimes recognized, especially in Dutch phonetics. Some phoneticians distinguish three or more grades of length phonetically (cf. Sievers 1901: 257–59; Jones 1947: 215; Dieth 1950: 432), even if they accept the basic distinction between long and short. Sievers, for example, established six grades of length, owing to rhythmic circumstances: short, long, half-short, half-long, over-short, and over-long. Dutch handbooks of phonetics and sometimes of phonology (cf. Zwaardemaker and Eijkman 1928: 298–99; Blancquaert 1953: 127; Eijkman 1955: 147–48; van den Berg 1972; Hermkens 1975: 36; Donaldson 1983: 45–49; cf. Michels 1957; Nooteboom 1971: 397) routinely distinguish three grades of length. The formulation of the rule varies but, generally speaking, vowels are short or half-long, corresponding to long vowels in most positions in other languages, and only long before *r* or finally. The view of three distinctive vowel lengths was given a historical application by Ten Brink (1884: 7–8) in his Chaucer handbook. He called what he considered half-long vowels to be “soaring” (Ger. *schwebend*) and posited an important role for this class in the development of English quantity (see Section 3.2.2.2). More recent handbooks of Dutch phonology, however, tend to distinguish only two grades of length or attribute the opposition to tense/lax in vowels (Cohen et al. 1971: 16; van den Berg 1972: 19; van Bakel 1976: 104; Booij 1995: 13–16). In a study of vowel length in German dialects, Ternes (1981) finds two areas where dialectologists distinguish three grades of length: short, long, and over-long. The first is a large area in Low Saxon and Mecklenburgish in northern Low German, while the second is a smaller one in Riparian and bordering Mosel Franconian.

Although it is not decisive for the historical studies of the present work, it is important to at least mention factors which can influence the absolute duration of vowels in the Modern Germanic languages. Aside from individual

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differences, speech tempo, and rhythm, which will not be discussed here, vowels are longer in monosyllables than in disyllables, as are the consonants. All of the segments are shorter, the longer the word is (cf., for example, Meyer 1903: 82; Jones 1947: 217; von Essen 1962: 117–20; Lehiste 1970: 40–41). There is also the influence of following consonants, which will be discussed further below. Finally, differences in vowel height play an important role in phonetic studies of vowel length. In German, the variation in duration based on the height of the different vowel types is known as *Eigendauer* (“intrinsic duration”). The term seems to derive from Ernst Meyer (1903: 39–40), who established the rule for English that the higher a vowel is, the shorter it is. Other phoneticians also note this rule or remark that high vowels are more susceptible to shortening (cf. Jespersen 1913: 178–79; Dieth 1950: 433–34; von Essen 1962: 118–19; Elert 1964: 122–23; Lehiste 1970: 18–19; Nooteboom 1971: 399–401; Kohler 1977: 119). Much has been made of the tendency for the high vowels – *i*, *ü*, *u* – to remain short, especially in German and English dialect study (see Section 3.2), but it seems clear that high vowels function as long and short vowels in syllable structure, despite their absolute duration.

1.1.2 Consonant Length

Much less attention has been paid to consonant length than to vowel length. This no doubt has to do with the minimal role consonant length plays in the phonology of the modern standard Germanic languages. Consonant length generally plays a role in phonology, insofar as geminated consonants are present. Among the modern standard languages under consideration, this means only Swedish, Norwegian, Icelandic, and Faroese. Other than the Scandinavian languages, only South Upper German dialects, particularly High Alemannic and South Bavarian, still have geminates today. In the other areas, the consonants can at best be phonetically long versus short. Consonant length is also a factor in the understanding of consonant strength, but this discussion will be reserved for Section 1.2, where nondistinctive differences in length will be discussed. The origin of geminates in Germanic is the subject of Sections 2.1 and 2.2, while the loss of geminates will be treated in Section 4.2.

The long consonants discussed here are mostly geminated and formerly geminated consonants. Those which do not derive from geminates are due to final strengthening and will be discussed in Section 2.3.2. The definition of gemination is well established in phonetic handbooks. Sievers (1901: 211–15) wrote that geminates are heard as two sounds, because they are spread over two syllables, the first part falling at the end of one syllable and the second at the

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beginning of the next. The syllable boundary is made apparent by an air-pressure boundary (Ger. *Druckgrenze*) in the middle of the consonant. It is most obvious in geminated stops and geminated affricates. Yet there is no opening of the closure in the middle of the consonant, so there is no doubling of the consonant. The true home of geminates is thus intervocalic position. Geminates which have come to stand in final position through apocope can be long, but have lost gemination, since the final syllable has been lost. Thus Sievers (1901: 259–60) specified that the difference between geminate and simplex is not one of quantity, but of syllable division. Similar, though less detailed, definitions of gemination may be found in other handbooks of general phonetics (Sweet 1877: 91; Dieth 1950: 415–16; von Essen 1962: 139–44). As von Essen notes, and as we will see in the Section 1.1.3, Standard German has no geminates, but phonetically long consonants may still contain a syllable boundary. His observation applies to all of the Modern Germanic languages that have lost gemination.

Perhaps the most extensive instrumental studies of geminated consonants were performed by Eugen Dieth and Rudolf Brunner (1943; see also Dieth 1950: 415–23) on Swiss German, which belongs to the South Alemannic area. In studies of German in Switzerland, it is typical to divide consonants according to fortis/lenis (“strong/weak”; see below). They found that the ratio of medial (geminated) fortis to medial lenis in Swiss dialects is 3:1. In postvocalic position, the fortes were comprised of geminated and formerly geminated consonants. The geminated fortes could be distinguished from simple fortes by a syllable boundary, visible through a minimum between peaks on air pressure curves. After short vowels, the pressure minimum was more distinct and the geminates were longer, by a ratio of 1.2:1, than after long vowels. Based on the relative height of the peaks, Dieth and Brunner could establish three categories of geminated stops: level, rising, and falling. The categories were not as apparent among fricatives, which are thus not considered to be true geminates by some Swiss linguists. Using the distinctness of the pressure minimum as a guide, the authors could also establish three types of dialect in Swiss German, namely strongly geminating, weakly geminating, and nongeminating.

More recent studies have been performed on Swiss dialects. Urs Willi (1996: 147–49) examined the Zürich dialect. Using average values, he found that in a voiced environment fortes are 67 percent longer than lenes. Specifically following short vowels in intervocalic position, he found that fortis stops are 1.6–2.7 times longer than lenes. His measurements are somewhat different than those of Dieth and Brunner, but still confirm a significant difference in length

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between long and short consonants in Swiss German. He did not find a significant difference in consonant duration following long and short vowels. This finding can be tied to the quantity type of Swiss German, to be discussed in Section 5.1.2. Astrid Kraehenmann (2001; 2003: 114–16) conducted experiments on the Thurgau dialect. She found the following differences in mean duration for fortis and lenis: 155.2 ms. to 64.0 ms. medially and 116.1 ms. to 70.1 ms. finally. Interestingly, she also found durational differences initially in borrowed words, which she termed gemination.

Other instrumental studies of geminates have been performed on Scandinavian languages. Reporting the findings of a few of the more recent ones will give a good idea of the results. For Swedish, Elert (1964: 141–42) found that the difference between short and long consonants after accented vowels corresponds to a difference in average duration, although this difference is somewhat less than for short and long vowels. The C/C: ratio for isolated words is about 80 percent, while for words in sentences it is about 75 percent. On Swedish, see also Malmberg (1971: 117–18), Löfqvist (1976), and Garlén (1988: 125). For Norwegian, Trampe Bødtker (1941) found the geminated stops were longer than the corresponding simplex stops. With regard to *pp*, *tt*, *kk* versus *p*, *t*, *k*, for example, he found that medially the difference was 16.6 to 13.1 hundredths of a second and finally 16.1 to 13. Particularly for Eastern Standard Norwegian, Arne Vanvik (1972: 148–55) also found an average difference in duration for short and long consonants, although, as in Swedish, the difference was not as great as for vowels. The C/C: ratio for monosyllables was 92 percent and for disyllables 70 percent. There were minimal differences compared to the speech of Trondheim (cf. Vanvik 1966). Vanvik found some overlap in short and long consonant duration in monosyllables using average values, but as with the vowels, we must restrict comparisons to consonants of the same type in the same environment. The greatest difference in short and long consonants was always to be found in intervocalic position, where the consonants are geminated. Fintoft's (1961) findings were in agreement with those of Vanvik. Fretheim (1969: 77; cf. Fliflet 1978) remarks that consonant length is phonetically more “elusive” or less stable than vowel length in Norwegian.

For Icelandic, Sveinn Bergsveinsson (1941: 116, 124) found that the difference in duration between simple and geminated consonants is minimal and that the difference between “long” and “short” consonants is hardly audible. Yet, as with vowels, it is not the degree of measured difference, which is important, but the functioning of length in the system of the language. The other complicating factor in Icelandic is the preaspiration of NGmc. *pp*, *tt*, *kk*, which takes up the

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first phase of the stop closure. More recent studies have made similar findings. Sarah Garnes (1973; cf. 1976: 2) found that, contrary to short versus long vowels, there was no consistent difference in consonant duration. In these studies, only closure duration was taken into account, not pre- or postaspiration. Further, only *p*, *t*, *k* versus *pp*, *tt*, *kk* were measured and not *b*, *d*, *g* versus *bb*, *dd*, *gg*. Other studies by Janez Orešnik and Magnús Pétursson (1977; Pétursson 1976 and 1978: 43–44; cf. Árnason 1978: 141) have found a difference in consonant quantity between North and South Icelandic. The closure of the preaspirated stops was longer in the north than in the south, but the closure of preaspirated stops in both areas was found to be short, confirming Pétursson's earlier results. Yet it seems that one should count both pre- and postaspiration in the duration of the stops. They are, after all, not independent segments (cf. Section 1.2).

In anticipation of the discussion of lenition, we can note here that in dialects with lenition, no significant difference in length has been noted between former geminate and simplex, as in the Swabian dialect of Reutlingen (Wagner 1889–91: 182). For Standard Danish, which also has lenition, consonants are always short, as is reflected in handbooks of Danish phonetics (Jespersen 1906: 96–97; Hansen 1956: 108–10; Diderichsen 1957: 66; cf. Basbøll 2005: 79–81). Standard languages with degemination still have a difference in the duration of long versus short consonants, but it is not as great as languages with gemination. In Meyer's (1903: 16) studies of English quantity, he found the difference in duration of postvocalic long and short consonants to be 1.15 to 1, which he considered insufficient for the establishment of an opposition between long and short. We will return to this problem in the discussion of consonant strength.

Regarding the phonological status of geminates, the question is whether they are to be regarded as consisting of one phoneme or two. André Martinet (1959) remarked that of the two possible phonological interpretations of geminates – as monophonemic or as biphonemic – either is acceptable and that the evaluation depends on the structure of the language in question. N. S. Trubetzkoy (1938, 1939: 156–57), on the other hand, argued for monophonemic evaluation of geminates in every language, except when they arise only in sandhi. His definition of geminates is very similar to that of Sievers, namely that geminates are consonants whose beginning and end belong to two different syllables, that is, they contain a syllable boundary and a potential morphological boundary. For High Alemannic, Naiditsch (1997: 260) considers geminates to be prosodic variants of fortis. Callender (2010) points out that the more recent autosegmental approach shares a lot in common with that of Trubetzkoy. In the Old

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Germanic languages, where mora counting was still in effect, geminates were bimoric consonants. Final consonants can be long, as we have said, but not bimoric and do not contain a syllable boundary.

The idea of double consonants rests primarily on the orthographic image: doubling is the only way to express length in standard writing systems, at least those in question here. There is no doubling of closure and release. Since the articulation of geminated consonants is completed in one gesture and is not two repetitions of the same gesture, geminates must be viewed as monophonemic, despite the view of some phonological approaches. Malmberg (1944: 83) noted that languages with relevant quantity usually have geminates in intervocalic position (cf. below). This statement generally holds true for the Germanic languages. In his phonology of German, Richard Wiese (1988: 78–80) writes that ambisyllabic consonants in German behave like true geminates in other languages and therefore he finds no phonological difference between the two. Their status, according to him, is ambiguous since they exist as one segment, but are associated with two syllables. However, the phonetically long consonants of German are not as long as geminated consonants of other languages, nor dialects of German, and German does not retain complementary length to the same extent as languages with gemination.

1.1.3 *Complementary Length*

Accented syllables in the modern standard Germanic languages are, as a rule, always long. Either the vowel or the following consonant is long, but not both. If the vowel is long, the following consonant is short. If the following consonant is long, the vowel is short. This mutual complementation of length in accented syllables is present everywhere, except for Danish, which, like some German dialects, has consonant lenition (see Chapter 4). Unaccented words in the sentence do not follow this rule. Complementary length has been documented, like the length of the individual segments in question, in numerous instrumental studies. The situation is clearer in languages that retain geminates, but in the languages without gemination, phonetic length of the consonants is still apparent. An important question seems to be whether vowel length or consonant length is distinctive in a given language, but in the synchronic state it is not possible to decide for one or the other: the durations of the two segments in question are interdependent. Historically, consonant length has been responsible for regulating the length of preceding vowels (cf. Section 3.1.2). Long consonants are, in most cases, derived from gemination.

The complementary length of VC sequences in accented syllables in the Germanic languages has been well known to practitioners of general phonetics

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since the time of Sievers (1901: 259–60). Discounting syllables with short vowel plus short consonant in unaccented words like Ger. *man*, *hat*, Sievers pointed to a general tendency to V: + C, V + C:. In his words, the length of the postvocalic consonant serves to “fill the syllable quantity” (cf. Section 3.1.1). Let us mention just a few examples of how the phenomenon is treated in later handbooks of general phonetics and studies of quantity. Malmberg (1944: 84) noted that certain languages have long vowel + lenis (short) or short vowel + fortis (long) and that it is difficult to decide if the opposition lies in the quality of the vowel or the consonant. Dieth (1950: 434–35) referred to what he calls the *Silbenausgleichsregel* (“rule of syllable balance/compensation”) in V: + C and V + C: sequences. Lehiste (1970: 42, 49–50) states that there exists an “inverse relationship” between the quantity of accented vowel and that of the following consonant, so that short vowel is followed by long consonant, and vice versa.

The way the phenomenon is treated with regard to the individual languages betrays different traditions. For English, mutual complementation is routinely mentioned (cf. Sweet 1877: 154–55; Meyer 1903: 15, 22, 25–26; Grant 1914: 84–85; Western 1923: 28–29; Kruisinga 1935: 52–53; Jones 1947: 219–20). For Dutch, as we saw in Section 1.1.1, the emphasis is on open versus closed syllable, but phonetic studies sometimes mention complementary length (cf. Nooteboom 1971: 399–40). In German phonetics, the main interest in this context is in fortis versus lenis, but there was a minor controversy surrounding mutual complementation of duration in the word pair *bitte* versus *biete* (“please, (I) offer”), beginning with a note by Wilhelm Viëtor (1900) in the journal *Le maître phonétique* and a response by Meyer (1901) with later commentary by Harry Rositzke (1944; 1947), who denied length in consonants. Even if German has no phonologically long consonants, numerous studies have shown greater duration of fortis versus lenis consonants, as will be discussed in Section 1.2. For Middle Bavarian dialects (cf. 4.5.1), which have no general lenition, the mutual complementation is undeniable, as shown by numerous instrumental studies, particularly by Robert Bannert (1973; 1975; 1976: 38–42). Here, the longer duration of former geminates is better preserved than in Standard German.

For the Scandinavian languages, where consonant length coincides with gemination in medial position, complementary length is more or less taken for granted in handbooks and quantitative studies of the various languages: Icelandic (Goodwin 1908; Ófeigsson 1920–24: xviii–xix; Guðmundsson 1922: 1; Kress 1937: 3; Einarsson 1945: 4–6; Guðfinnsson 1946: 67–72; Malone 1953; Benediktsson 1959; Pétursson 1978b: 74); Norwegian (Broch and