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Holtzmann's Law:

Getting to the *hart* of the Germanic *Verschärfung*

by

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ABSTRACT

This work presents a unified approach to Holtzmann's Law (GV), the purported strengthening of the PIE glides 'i̯ and 'u̯ to Gothic <ddj> and <ggw> and Old Norse <ggj> and <ggw> respectively. First I examine the orthography to determine the phonetic identity of the Gothic and Old Norse graphs. Based on these results I posit plausible sound changes assuming that laryngeals were extant in early Germanic when accent was still mobile. Moreover, I argue that it was the laryngeals rather than glides which underwent Holtzmann's strengthening. The sound changes, as I contend, were motivated by specific preference laws of syllable structure. This analysis accounts for parallel phonological and morphological developments of GV and non-GV forms from common PIE roots, e.g. ON snúa 'to turn' versus ON snugga 'to look askance'. Moreover it explains the existence of GV reflexes in West Germanic.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND SYMBOLS

[i̯]	palatal glide
[u̯]	labial glide
[ɒ]	low back rounded vowel
[β]	voiced bilabial fricative
[ʋ]	voiced bilabial fricative (as per Vennemann 1985b)
[ç]	voiceless palatal fricative
[ʝ]	voiced palatal fricative (also[i̯] for some linguists—context specific)
[x]	voiceless velar fricative
[ɣ]	voiced velar fricative
[χ]	voiceless uvular fricative
[ŋ]	velar nasal
<au>	Gothic [ɔ] or [au̯]
<c>	[k] in Old English
<þ>	voiceless interdental fricative
<ð>	voiced interdental fricative
<ġ>	[i̯] in Old English
<h >	transliteration for Go. [hʷ]
<Γ>	Greek and Gothic graph for [g] or before another velar [ŋ]
<q>	transliteration for Go. [kʷ]
3	third person
A	Saussure's *a*-colouring sonant coefficient
acc.	accusative
Anm.	*Anmerkung*, note
Bav.	Bavarian
C	consonant
Can.Fr.	Canadian French
cons	consonantal
Crim.	Crimean Gothic
CS	Consonantal Strength
dat.	dative
Dh	voiced aspirated consonants (especially in Sanskrit)
fem.	feminine
G	glide
gen.	genitive
Gk.	Greek
Grm.	German
GV	Germanic *Verschärfung*/Holtzmann's Law
H	laryngeal
h₁	non-colouring laryngeal

h_2	*a*-colouring laryngeal
h_3	*o*-colouring laryngeal
ḫ	Hittite graph for "laryngeal-like" segment
HG	High German
IE	Indo-European
It.	Italian
Lat.	Latin
Lith.	Lithuanian
masc.	masculine
MDu.	Middle Dutch
MHG	Middle High German
N'	rime
N"	syllable
neut.	neuter
nom.	nominative
OE	Old English
OFris.	Old Frisian
OHG	Old High German
OIcel.	Old Icelandic
ON	Old Norse
ONorw.	Old Norwegian
OS	Old Saxon
OSpa.	Old Spanish
OSwe.	Old Swedish
PIE	Proto-Indo-European
pl.	plural
Por.	Portuguese
pp.	past participle
pret.	preterite
R	resonant
S	fricative; also for Suzuki (1991) 'segment'
sing.	singular
Skt.	Sanskrit
Slav.	Slavic
Spa.	Spanish
SSP	Sonority Sequencing Principle
StNor.	Standard Norwegian
T	(voiceless) plosives
V	vowel
var.	dialectal variation
voc.	vocative
WGmc.	West Germanic
WNor.	West Norwegian

ˇv	short vowel
¯v	long vowel
v:	long vowel
v′	accented vowel
v́	accented vowel (also a long vowel in Old Norse)
v̂	long accented vowel
v̆	short accented vowel
·	reconstructed form
*	hypothetical or incorrect form
< >	orthographic form
.	syllable boundary
Ø	null
>	becomes
<	comes from
~	alternates with
—	morpheme boundary when between two segments, e.g., k-s
/	word division at end of line in manuscript
ˌ	syllabic
σ	syllable
´	accent on preceding vowel or syllable

Chapter One

INTRODUCTION

0.0   Holtzmann's Law

For more than a century linguists have sought to understand and explain the phenomenon in Germanic linguistics known as either Holtzmann's Law or the Germanic *Verschärfung* (hereafter GV). As first noted by Holtzmann, the PIE glides i and u purportedly underwent changes which led to the different developments in the three branches of Germanic. The reflexes of these changes were represented orthographically by Gothic <ddj> and <ggw> and North Germanic <ggj> and <ggw> respectively. In West Germanic, the corresponding forms or cognates contained a diphthong plus heterosyllabic glide. Historical linguists have reached no consensus beyond a basic description of the data as provided above. In some cases, they have even disagreed as to which forms can be considered actual reflexes of the change.

Linguists have also debated the genealogy of the Germanic languages based on Holtzmann's Law. Holtzmann himself was the first to argue that GV provided evidence for a common period of development between Gothic and Old Norse following their separation from West Germanic. Arguments against such implications have also been presented. In this study I will assert that although an explanation of the GV developments has implications for the genealogy of Germanic, this phenomenon provides no evidence for a common Gothic-Nordic period.

A plethora of analyses have been proposed to account for the GV developments. These have included accent, morphological, and laryngeal approaches. However, the majority of these theories have focussed strictly on the lengthening of the glides (Stage 1) and have not accounted for the strengthening itself (Stage 2). In fact the earlier explanations have failed to provide motivation for the emergence of the Gothic and Old Norse obstruents.

In this work I seek to provide a comprehensive analysis of GV. My analysis does not completely reject the work from the past. Instead it borrows from earlier studies while distancing itself from the traditional two stage approach. I will argue that together the PIE accent and laryngeals established the conditions for the phonological development to occur.

My analysis of the strengthening itself will be a syllable-based approach in the spirit of Murray and Vennemann (1983),Vennemann (1988a) and Murray (1988). Using these tools, I will also attempt to account for the parallel GV and non-GV developments, e.g., ON *snugga* 'to look askance' vs. ON *snūa* 'to turn, twist'. Thus, my explanation will not only show how and why GV did happen, but also why and where it did not.

1.0   Overview

1.1   Chapter One

Following this overview, the remainder of Chapter One will be devoted to laying the foundation for the present study. First, I will present a sample of the GV data exemplifying the basis of the GV correspondences across the three branches of Germanic. In the next section I will present the PIE theory and Germanic laws relevant to this study. I will first provide an introduction and overview of the PIE laryngeal theory and will outline the laryngeals which I will assume for this investigation. Next I will summarise and define Grimm's Law (the First Germanic Consonant Shift) and Verner's Law. The final section of this chapter will present the Preference Laws for syllable-based sound change (cf. Murray and Vennemann 1983, Murray 1988, and Vennemann 1988a). These Preference Laws provide an excellent insight into the relative preference of syllable structures within a given language and offer a means of determining the motivation of sound changes in languages.

1.2   Chapter Two

Before we can propose any sound changes to account for GV, we must first determine the phonetic identity[1] of the phones represented by the orthography of the GV segments. This inquiry is the focus of Chapter Two. In an attempt to determine these

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[1] Marchand (1973: 23) employs the expression "phonetic value". Nevertheless, the use of the term "phonetic identity" should be clarified here since there exists some dispute as to where the division between phonology and phonetics should be made. For the sake of simplicity I note the contrast between the abstract phonemic level (e.g., /pæt/ 'Pat') and phonetic level (e.g., [pʰætʔ]) (Goldsmith 1996:2). The phonetic level is in essence the real life realisation of a phoneme by its allophones since phonemes themselves are never articulated. Rogers (1991) also associates the terms "phonetic" and "allophonic". He defines "phonetic" as "emphasising detail and variation in speech" and then refers the reader to the term "allophonic" which he defines as "a variant of a phoneme". Thus, I will attempt to determine which allophones were represented by the GV graphs rather than simply identifying which phonemes were depicted by the Gothic and Old Norse orthographies.

correspondences, I will examine both the phonological systems and orthographic conventions employed in Gothic and Old Norse. The conclusions presented in this chapter will be interim results which will be verified following my phonological analysis presented in Chapter Four.

1.3   Chapter Three

In Chapter Three I provide an overview of past explanations for GV. These include the traditional, accent-based and morphological approaches to the problem. I further introduce the reader to the roles attributed to laryngeals by various approaches. Following these sections, I outline and critique two recent theories which have attempted to account for the GV developments. First I discuss Suzuki's (1991) syllabic approach. This summary and critique will be prefaced by a sketch of Jasanoff's (1978) hiatus breaking approach upon which Suzuki bases the first stage of his theory. Following this critique I present Davis and Iverson's (1996) feature spread model. Finally, I outline the critical factors which I will incorporate into my own analysis.

1.4   Chapter Four

In Chapter Four I present the phonological aspect of my GV analysis. The analysis which I pursue brings together various components of the past approaches. Rather than assuming that only accent, morphology, or syllable structure provided the motivation for the sound change to occur, I argue that all of these components played a crucial role in the development and persistence of GV.

My analysis commences with a description of the nature and placement of PIE pitch accent. This discussion is important for Germanic as well, since the evidence from Verner's Law clearly indicates that Germanic had inherited and for a time maintained the mobile accent of PIE. Furthermore, an examination of the GV forms in unlevelled paradigms, e.g. 'two', reveals that there is a correlation between GV and accent placement. However, it becomes necessary to determine how this accent could have participated in GV.

An inquiry into the effect of accent on the syllabification of intervocalic clusters reveals interesting results. I summarise the arguments and conclusions of psycholinguistic experiments, phonological studies and word divisions in Old English manuscripts. All of

these divergent investigations point to the same conclusions. In sum, an accented syllable attracts segments into its onset and coda. Based on these conclusions, I argue that the mobile accent which existed in early Germanic caused the differential syllabification of intervocalic clusters. Assuming that laryngeals were still extant in early Germanic when contiguous to a glide, I claim that the syllabification of the sequence -*VHGV*- was -*VH.GV*- when the accent preceded the cluster, but -*V.HGV*- when the accent fell on the second syllable. These different syllabifications become crucial for my analysis of GV. In short, I argue that the sequence -*V.HGV*- was responsible for GV, e.g., ON *snugga*, whereas the syllabification -*VH.GV*- produced the non-GV cognates, e.g., ON *snūa*. As I contend, the GV segments arose as the result of a series of sound changes. First, Verner's Law caused the voicing of the laryngeal, thereby creating a less than preferred syllable head according to the Preference Laws (cf. §4 Chapter One). This less preferred syllable head was then improved by slope steepening which augmented the consonantal strength of the laryngeal reflex to that of a plosive. Conversely, the non-GV developments resulted from the loss or assimilation of the laryngeal in coda position. All of these changes took place before the Germanic accent shift fixed the accent on the root syllable.

This chapter concludes with a revision of the phonological-orthographic correspondences proposed in Chapter Two. I suggest that the tentative conclusions reached in Chapter Two reflect further dialect specific developments of the GV reflexes. An account of the subsequent sound changes is also provided.

It should be stressed that the analysis provided in this chapter is strictly a phonological account. However, since not all occurrences of the GV segments can be explained on the basis of the proposed sound changes, I provide a sketch of possible morphological changes which may have determined the persistence and occurrence of GV elsewhere. This sketch can be found at the end of the thesis in the Appendix.

1.5   Chapter Five

In this final chapter I present an overview of the present study and discuss the advantages and implications of the analysis presented herein. In conclusion, I revisit the original issue raised by Holtzmann's Law more than 150 years ago, namely the genealogy

of Germanic. According to my analysis of both the sound changes and morphological developments, GV does provide evidence for the development and genealogy of Germanic. However, my conclusions are admittedly different from those proposed by Holtzmann more than a century and a half ago. Ultimately I set aside the notion of a common Gothic-Nordic period and conclude that GV was a common Germanic development.

2.0 The Germanic *Verschärfung*

Before discussing the phenomenon, it is prudent to become familiar with the data used to exemplify the change or changes in question. In this section, I introduce data cited as evidence for the GV sound changes. A brief discussion of this data follows.

2.1 Evidence for the Verschärfung

According to the traditional interpretation of the data, the PIE glides, *i̯* and *u̯*, following a short vowel underwent changes producing the GV phenomenon. In Gothic and Old Norse, these glides appear following "geminate" obstruents. By contrast, the West Germanic reflexes contain a diphthong. Examples of GV data are provided below.

(1a) PIE *i̯* > Go. <ddj>/ON <ggj>

Gothic	North Germanic	West Germanic
twaddje	ON *tveggja*	OHG *zweijo*
'two (gen.)'		
waddjus	OIce. *veggjar*	OS *wei*
'wall'	(gen. sg.)	

(1b) PIE *u̯* > Go. <ggw>/ON <ggw>

Gothic	North Germanic	West Germanic
triggws	OIcel. *tryggver*	OHG *gitriuwi*, OE *trēowe*
'true'	(nom. pl. masc.)	
skuggwa	ON *skuggi*	OHG *scuwo*
'mirror'	'shadow'	
glaggwuba	ON *gloggr*	OHG *glouwer* OE *glēaw*
'carefully'	'sharp-minded; clear'	

In its entirety, the data set is comprised of a mere sixteen to eighteen words.[2]

2.1.1   Subsequent sound changes affecting GV forms

As seen in (1a) and (1b) above, the Gothic reflexes provide clear evidence for GV. However, in some Old Norse forms, the GV reflexes underwent further sound changes before the literary tradition commenced its recording of the language. Although these changes in Old Norse obscured the apparent effects of GV, the data in that dialect still provide strong evidence for the original "sharpening" or strengthening of the PIE segments. For example, ON *skuggi* 'shadow' resulted from the application of the Old Norse u-deletion rule (i.e., $u > \emptyset$) (Voyles 1992). In another example, the glide u can be reconstructed for ON *glǫggr* based on the evidence of u/u-umlaut. Here the glide u triggered umlaut of the original vowel [a] producing the vowel [ǫ] (cf. Go. *glaggwuba* with no umlaut) and was subsequently deleted by the u-deletion rule.[3]

2.2   Genealogical implications of GV

Because of the similarity between the Gothic and Old Norse reflexes, some linguists have cited GV as evidence for a common development between the two branches. Beyond the GV data, however, the evidence for such a claim is weak (cf. Haugen 1976: 108-9). In fact a closer examination of the occurrence of GV throughout Germanic reveals the existence of many GV reflexes in West Germanic. Examples of these GV reflexes in West Germanic are provided below in (2):

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[2]These are the totals generally cited (cf. Marchand 1973, Collinge 1985: 93). A closer investigation of the ON data, however, reveals a larger number of examples for which we lack evidence of Gothic cognates (cf. Kuryłowicz 1967, Lehmann 1952).

[3]Voyles' (1992: 103-4) dating of the various phonological rules and developments in ON substantiates the ordering of rules provided, namely that u/u-umlaut was followed by the u-deletion rule. Both of these rules are preceded by the *Verschärfung*.

(2)	**Gothic**	**Old Norse**	**West Germanic**
	triggws	*tryggua*	OE (var.) *trugian, trygian* 'to believe'[4]
	————	*bryggia* 'pier'	OS *bruggia*, OHG *brukka*, OE *brycg*, OFris. *bregga*[5] 'bridge'
	————	*mygg(a)* (OSwe.)	OS *muggia*, OHG *mucca*, MHG *mucke*, OE *mycg(e)*, North Fris. *mech*[6] 'mosquito, midge'

As illustrated by the examples in (2), West Germanic cognates of some GV items also appear to contain GV-like segments. The occurrence of GV in these West Germanic forms may be best explained if GV is considered to have operated during Proto-Germanic. Two pieces of evidence can be cited in favour of West Germanic inheriting its GV items from Proto-Germanic.

First, if West Germanic's GV-like cognates existed in only one or two of its dialects, then perhaps these GV items could be explained as the result of borrowing from Old Norse or Gothic. However, the occurrence of these cognates in four and maybe more (separate and geographically distant) West Germanic dialects is not as easily accounted for by borrowing. For instance, that several dialects would choose to borrow the same lexical items, e.g., *bridge* and *mosquito*, from another language would be highly coincidental at best. Moreover, a closer examination of the examples for *bridge* casts significant doubt on the possibility that borrowing can be implicated as the reason for the West Germanic items. The Old Norse GV item *bryggia* meaning 'pier' contrasts with its non-GV cognate *brú* meaning 'bridge' (Lehmann 1952: 47). However, all of the West Germanic GV cognates

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[4]These are variant forms of the verb *trūwian* 'to believe'. The forms of this weak verb cited in (2) come from Holthausen (1934 354) where the stem *trug-* is also cited as being a variation of *truw-*

[5]Two points should be noted for these examples. First, in Old High German, *gg* often developed to *kk* (also *ck*, *cc*) (Wright 1907, Ellis 1966) This was the result of the High German Sound Shift Secondly, the OS and OHG examples are from Lehmann (1952) who reconstructs the root as PIE *+bhreXwa-* The OE and OFris. data come from Holthausen (1934).

[6]The OS, OHG, MHG and OE data are from Lehmann (1952). The NFris. form comes from Holthausen (1934).

cited in (2) mean 'bridge' not 'pier' as does the GV form. This begs two questions. First, if the West Germanic GV forms were the result of borrowing, why did the West Germanic dialects not simply borrow the Old Norse word *brú* for 'bridge'? Secondly, just how statistically probable would it be that four dialects would borrow the same word **and** would associate the same new meaning with this borrowed word (where the new meaning was different from the original sense)? It would seem highly unlikely that the four dialects would attach the same new meaning to a borrowed word (e.g., 'bridge') instead of simply borrowing the word with the desired meaning in the first place (e.g., ON *brú*). Thus, it appears very improbable that the GV items in West Germanic were the result of borrowing.

A second piece of evidence can be cited in support of West Germanic inheriting its GV items from Proto-Germanic. With the exception of the Old English verbs for 'believe', the West Germanic items in (2) appear to have undergone West Germanic gemination.[7] Evidence of the West Germanic gemination across the cognates would point to the existence of a common West Germanic etymon[8] for each item prior to the occurrence of West Germanic gemination. These etyma would have contained a plosive and a following glide (WGmc. 'C.CG < 'C.G) which would account for the geminate plosives in the dialects.[9] Thus, the plosive would have been extant in West Germanic for gemination to have occurred. Furthermore, if both West Germanic and North Germanic cognates contained the GV obstruents, then we would likely reconstruct the Proto-Germanic etymon from which these items developed as also containing the GV obstruents. This would then point to the occurrence of GV in Proto-Germanic.

These examples, therefore, may provide evidence that GV occurred in Proto-Germanic before the break up of the three Germanic branches. Thus, I will assume as do

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[7]According to Sievers (1903: 155), the graphs <cg> in Old English, e.g., *brycg, mycg(e)*, originally represented a geminate plosive. Subsequently <cg> underwent palatalisation and affrication before a palatal vowel (cf the <e> in OE *mycg(e)*) resulting in the alveo-palatal affricate [dʒ], e.g., *judge*.

[8]An etymon is a "form from which another developed, for example PIE *treys* is the etymon for NHG *drei*" (Lehmann 1992: xiv).

[9] The sequence *VC.GV* is precisely the triggering sequence which Murray and Vennemann (1983), Murray (1988) and Vennemann (1988a) reconstruct for the gemination to occur

of phonemes which are also reflexes of earlier PIE phonemes (Lehmann 1952: 22). But what were these laryngeals?

Saussure first advanced a theory of sonant coefficients to account for the PIE ablaut classes.[13] He also noted that the alternations between long and short vowels as in Gk. ἵστᾱμι: στατός were parallel to those of πείθω: ἔπιθον.[14] He accounted for this alternation by assuming a similarity in the original root structure. Saussure then reconstructed /steA/ as the etymon for στᾱ-. As Lehmann (1952: 23) states:

> Saussure's basic assumption was that a similarity — such as the similarity between (σ)ἔχω, λείπω, ἵστᾱμι and ἔσχον, ἔλιπον, στατός — of phonemic variation in morphemes of a seemingly different structure pointed to anterior forms of a similar structure.

The presence of these sonant coefficients often "coloured" the quality of contiguous vowels as evidenced by the PIE ablaut (e.g., Gk. πείθω: ἔπιθον, sing, sang, sung; eat, ate, eaten). By contrast, the loss of a laryngeal often triggered compensatory lengthening of vowels, VH > V̄, e.g., Gk. ἵστᾱμι: στατός. This theory was later confirmed with the discovery of Hittite.

In 1927, Kuryłowicz pointed out the reflexes of laryngeals in the relatively recently discovered Hittite. The reflexes ḫ and ḫḫ in this IE dialect were often found to correspond to the placement of Saussure's coefficients providing support for the existence of such segments in Indo-European.

Although linguists have proposed phonetic identities of these laryngeals, the exact number and phonetic descriptions of the laryngeals are still in dispute. In the next subsection, I will outline the series which I will assume for my analysis.

3.1.2   The phonetic identity of the laryngeal series

Countless proposals have been posited for the phonetic identity of the PIE laryngeals.

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[13]Ablaut is a vowel gradation or alternation such as that found in sing, sang, sung.

[14]These Greek items can be transliterated or romanised as follows: ἵστᾱμι = istāmi, στατός - statós, πείθω - peithō, ἔπιθον - épithon.

Most series contain at least three laryngeals corresponding to the non-colouring, *a*-colouring, and *o*-colouring sonant coefficients postulated by Saussure (Lindeman 1987). One of those many inventories of laryngeals was proposed by Lindeman who defined his series as dorsal fricatives. His series included three places of articulation;[15] H$_1$ was a dorso-palatal fricative (corresponding to the *ich*-laut or non-colouring laryngeal), H$_2$ was a velar fricative (an *ach*-laut or *a*-colouring laryngeal), and H$_3$ was a labialised velar fricative (the *u*-colouring laryngeal). Cowgill (1965) concurs with these three places of articulation for his series of laryngeals. Like Lindeman, Cowgill claims that the laryngeals were spirants. However, one issue with which Lindeman, Cowgill and others have had to deal is the question of voicing. Were laryngeals voiced? Or were there both voiceless and voiced laryngeals?

Lindeman (1987) notes that there is no direct evidence for voiced laryngeals in the non-Anatolian IE dialects. Arguments for voicing, therefore, have been based on evidence from the Anatolian dialects including Lycian, Lywian, and in particular Hittite. The main arguments in favour of a voicing contrast stem from the opposition between *ḫ* and *ḫḫ* which have been argued to represent voiced and voiceless laryngeals respectively. Evidence for this argument, however, is inconclusive.[16] Lindeman, nonetheless, posits both a voiceless and voiced series of dorsal fricatives to account for the possibility that a voicing contrast

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[15]Lindeman (1987: 113) proposes that the laryngeals constituted a system of dorsal plosives structurally comparable to the dorsal plosives traditionally reconstructed for PIE:

	palatal	velar	labio-velar
(voiceless)	k'	k	k^w
(voiced)	g'	g	g^w

[16]In the Hittite orthography, the plosives *p,t,k,* in root syllables represented the IE voiceless plosives when written double, e.g., <pp>, but depicted the IE voiced plosives when written as single segments "in positions where the Hittite syllabary made that possible, i.e. between (written) vowels", e.g., <p> = [b] (Lindeman 1987 108). This rule was observed "in a fairly consistent manner" (Lindeman 1987: 108). However, Lindeman (p. 108) states that "the notation -*ḫ(ḫ)*- indicates that the double writing of -*ḫḫ*- is in fact not carried out consistently, cf. *sa-a-k-ḫi: sa-ag-ga-ah-ḫi* (to *sak-* 'know')". Moreover, whether the graphic opposition between *ḫ* and *ḫḫ* can be interpreted as signifying the existence of voiced versus voiceless laryngeals may be moot. The single intervocalic -*ḫ*- occurs primarily following a written -*e*-(-*i*-) but rarely after -*a*-. By contrast, -*ḫ(ḫ)*- occurs regularly following the vowels -*a*- and -*u*-, but after -*e*- (-*i*-) only when -*ḫ(ḫ)*- represents the initial consonant of the verbal ending, e.g., *te-eḫ-ḫi,* i.e., *te-ḫḫi* 'I place'. Hammerlich (as cited in Lindeman 1987: 109) therefore assumes that the difference between the single and double -*ḫ*- represents the contrast between the *ich*-laut and *ach*-laut respectively. In sum, the use of single versus double -*ḫ*- in Hittite may not necessarily be indicative of a voicing contrast

may have existed. Moreover, Cowgill (1965) who had originally assumed a voiceless series of dorsal fricatives, resubmits a voiced series in lieu of his voiceless spirants. His change of mind is founded in his acceptance of Austin's (1946) proposal "that at least one of the laryngeals became *k* in Germanic before *w*. The Germanic Lautverschiebung suggests that this *k* is from *g, which in turn is most plausibly from a voiced spirant, [ɣ] or [ɣ^w]" (Cowgill 1965: 143). He further remarks that he is unconvinced that there had been a distinction based on voice and thus assumes that his laryngeal series should be voiced. However, since it seems reasonable that a voiceless laryngeal could have become voiced through assimilation to a contiguous glide or by Verner's Law (in the case they were fricatives), it could be argued that Cowgill's laryngeals may have originally been voiceless and may have undergone voicing at a later stage.

For my analysis, I will assume the following three voiceless laryngeals:

(3) $H_1 = ç$ neutral, non-colouring laryngeal
     $H_2 = x$ *a*-colouring laryngeal
     $H_3 = x^u$ *o*-colouring laryngeal

I assume primarily that these laryngeals were voiceless, since there is no strong evidence for voiced laryngeals in Germanic (Lindeman 1987) and since where Cowgill has proposed a voiced series, this voicing could be accounted for based on a voicing assimilation or Verner's Law. Moreover, other linguists who have proposed similar laryngeal-based theories have assumed voiceless laryngeals in their analyses (cf. Austin 1946, 1958, H. Smith 1941; also Penney 1988: 367).

An examination of the PIE obstruent inventory reveals that these voiceless laryngeals fit well into the inventory as shown below in (4)[17]:

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[17] I cite the traditional reconstruction only to maintain consistency with the remainder of my thesis. Citing the glottalic theory would have no bearing on the point I am attempting to illustrate (cf. also footnote 25 in this chapter).

(4) p   t   ḱ   k k^u

   (b) d   ǵ   g g^u

   bh   dh   ǵh   gh g^uh

    s | ç   x x^u |

First, this series of laryngeals corresponds to the traditionally reconstructed places of articulation for the PIE obstruent system as Lindeman remarked.[18] Moreover, the only fricative reconstructed for PIE is the voiceless dental /s/.[19] A series of laryngeals comprised of voiceless dorsal fricatives would be a natural extension of what would have simply been a voiceless fricative series in Proto-Indo-European. Thus, the series of laryngeals which I assume are well suited for the PIE obstruent system.

Nevertheless, I do leave open the possibility that these laryngeals may have also had voiced counterparts (even if strictly allophonic in nature). The possible existence of voiced laryngeals will not prove detrimental to the analysis I propose in Chapter Four. However, what will be necessary for my analysis is the assumption that laryngeals were maintained into the early stages of the IE dialects including Germanic.

3.1.3   The lifespan of laryngeals in PIE and Germanic

It has been argued that laryngeals were maintained into the IE dialects (Lehmann as cited in Jonsson 1978, Lehmann 1993, 1952, Polomé 1988).[20] Kortlandt (as cited in Polomé 1988) claims that the final loss of laryngeals in Slavic occurred by the end of the 8th century AD. Polomé (1988: 384) remarks that this would suppose the survival of laryngeals "in Proto-Germanic until at least the middle of the first millenium B.C." which would be plausible if Germanic were indeed the conservative IE dialect it has been argued to have been (Polomé 1982, Vennemann 1985a). Although we cannot pinpoint the precise time

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[18]Various glottalic theories also adopt these places of articulation (cf. Murray 1995: 46, Szemerényi 1990: 71).

[19]The reconstruction of the single fricative /s/ for PIE is supported by Vennemann (1985a), Szemerényi (1990: 71), Murray (1995: 46), Hopper (1977), etc.

[20]Lehmann (1993) cites voiceless aspirated stops in Sanskrit as evidence for laryngeals being maintained into the early dialects. The voiceless aspirated plosive series has been ascribed to the coalescence of the voiceless plosives with a following laryngeal. Since this series is only found in Sanskrit, it would point to the existence of laryngeals in the early stages of the IE dialects, including Sanskrit to be able to account for this coalescence.

when laryngeals were finally lost, the likelihood still remains that laryngeals were maintained during an early period of Germanic. Moreover, it has been noted that laryngeals "were maintained relatively late when in the neighborhood of resonants" in IE languages (Lehmann 1993: 110, cf. also Lehmann 1952) and in particular that Germanic was remarkably conservative with regards to the treatment of laryngeals when they were contiguous to a resonant (cf. Polomé 1988, Lehmann 1952).[21] These claims are supported by other linguists who have also argued for the persistence of laryngeals in Germanic (Austin 1946, 1958, Lindeman 1987, Davis and Iverson 1996, Polomé 1949). Likewise, I will assume that laryngeals were still extant during the early stages of Proto-Germanic and that these laryngeals were dorsal fricatives.[22]

I now turn to a discussion of specific "laws" which also played a role in Germanic phonology.

3.2   The Germanic "Laws"

Below I define two Germanic "laws" which will prove essential to the various analyses and discussions which follow.

3.2.1   Grimm's Law

Grimm's Law is the name traditionally given to the "systematic shift of the Indo-

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[21]Lehmann (1993: 110) indicates that the exact evidence for the claim that laryngeals were maintained longer when contiguous to a resonant is difficult to sort out. However, he provides some indicators for his claim in his earlier work (Lehmann 1952). There he cites various phenomena, particularly from Germanic, which would support the maintenance of laryngeals in precisely this position. Among the evidence to which he refers are GV, the development of Germanic /g/ and /k(k)/ from PIE /w/ when contiguous to a laryngeal, and the absence of lengthened resonants following the loss of laryngeals in Germanic. All of these phenomena have received what he judges as cogent explanations based on the assumption that laryngeals were maintained longer when in the "neighbourhood" of resonants. Evidence from other IE dialects appears to exist, however, Lehmann does not present it. Nevertheless, this maintenance of laryngeals in the "neighbourhood" of resonants contrasts with Lehmann's (1993: 110) claim that laryngeals were being lost in some environments already in late Proto-Indo-European. If we espouse Polomé's (1982) thesis that Germanic is an archaic IE language, then Germanic would certainly have inherited the laryngeals into its early stages.

[22]Arguments have been made for the conflation of laryngeals into one laryngeal following the split of Anatolian from Indo-European (cf. Lindeman 1987, Jonsson 1978). This conflation of laryngeals is linked with the phonemisation of the contrast between e, a, and o (Lindeman 1987: 114, Jonsson 1978). Since the conflation of these laryngeals could have resulted in a single dorsal fricative laryngeal according to the laryngeal series in (4), this does not present a problem for the analysis. Moreover, it would reduce the variability for which an analysis of GV would need to account.

European consonant system into Proto-Germanic" (Baldi 1983: 130). Also known as the (First) Germanic Consonant Shift (cf. Vennemann 1985a, Lehmann 1992, Prokosch 1939), it outlines the correspondences between the PIE and Germanic consonants resulting from the shift. The PIE voiceless plosives (Tenues, e.g., *p t k*) became the Germanic voiceless fricatives (Aspiratae, e.g., *f þ x*). In turn, the voiced aspirated plosives of the PIE traditional reconstruction (also referred to by Grimm as the Aspiratae) shifted to the voiced plosives in Germanic (Mediae, e.g., *b d g*). Finally, the PIE voiced plosives (Mediae) became the Germanic voiceless plosives (Tenues). These shifts are depicted schematically in the *Kreislauf*[23] below in (5).

(5)

T= Tenues, A=Aspiratae, M=Mediae
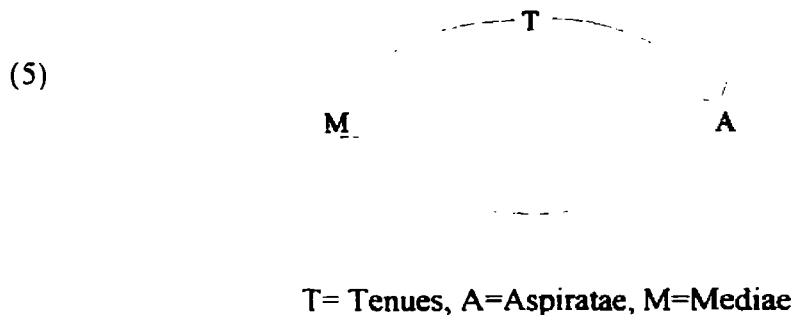
A few examples will serve to illustrate the effects of the shift on the Germanic languages. These examples are from Baldi (1983: 130-132).

(6)   a.   *Voiceless stops to voiceless fricatives*

i.	Skt.	páśu-	'cattle'	Go.	faíhu
	Lat.	pecus		OIce.	fē
				OE	feoh
				OHE	fihu
ii.	Skt.	trí-	'three'	Go.	þriya
	Lat.	tria		OIce.	þriū
	Gk.	tria		OS	thriu

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[23]*Kreislauf* is the German term for "cycle" or "circulation" indicating that the shift can be illustrated on a "circle" where the different series of obstruents shifted to the "next" point in the cycle

b. *Voiced stops to voiceless stops*

i. Skt. dántam (acc.) 'tooth'   Go. tunþus
   Lat. dentem (acc.)   OS   tand
                                 OE   tōð

ii. Skt. jânu- 'knee'   Go. kniu
    Lat. genu   OE   cnēo
    Gk. gónu

c. *Voiced aspirated stops to voiced stops*

i. Skt. bhárāmi 'I carry'   Go.   baíran
   Lat. ferō   OIcel. bera
   Gk. phérō   OHG   beran

ii. Skt. dhâma 'glory'   Go.   doms 'fame, (doom)'[24]

These examples illustrate the consistency with which the PIE consonants shifted to become the Germanic obstruents.[25] However, Grimm also noted sets of exceptions to the shifts.

3.2.2 Verner's Law

In one set of exceptions to the Consonant Shift, voiced fricatives appeared where voiceless fricatives were expected, e.g., Go. *faðar*, ON *faðer* 'father' but Skt. *pitá*, Go. OS *sibun* 'seven' but Skt. *saptá*, Gk. *heptá*. Danish linguist, Karl Verner proposed an explanation for these exceptions based on accent. According to Baldi (1983: 133), "Verner's brilliant reconstruction of the PIE stress and the concomitant explanation of these exceptions to Grimm's Law as a result of stress placement in the parent language was one of the most significant discoveries in the history of linguistics." Verner noted that in the Sanskrit and Greek cognates of the words where the exceptional voiced fricatives appeared,

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[24]This example comes from Lehmann (1992: 10).

[25]Grimm's Law reflects the traditional reconstruction of the PIE obstruent inventory. However, the traditional inventory is replete with typological problems. More recently, linguists have attempted to reconstruct this inventory using a series of glottalic consonants. Furthermore, the voiced aspirated stops have been set aside generally in favour of a plain voiced series. In his Bifurcation Theory, Vennemann (1985a) has reconstructed the PIE and PGmc obstruent inventories which best account for both the First and Second (High German) Consonant Shifts. For the sake of simplicity, I will base my analysis on the traditional reconstruction which most of the available data employs. The choice of another reconstruction will not affect the outcome of the analysis I present in Chapter Four.

the accent did not immediately precede the consonant in question as was the case for the normally shifted fricative. This is evident in the examples cited above. In short, Verner's Law as we now know it states the following:

(7)   *Verner's Law*: A voiceless fricative became voiced in a voiced environment when not immediately preceded by the accent.[26]

Verner's Law is not only important for its explanation of the exceptions to Grimm's Law. It also provides evidence that Germanic had maintained variable accent placement for a period of time following its departure from Indo-European and prior to the Germanic accent shift which fixed the accent on the root syllable of Germanic words. In this study, Verner's Law will be cited both to explain the voicing of intervocalic fricatives and to support the argument for a period of mobile accent in Germanic. I will revisit these roles in Chapter Four §1.2.

Having introduced the pertinent PIE and Germanic theory and laws, I now turn to the theoretical framework for this study.

4.0   Theoretical Framework

Before attempting to account for the strengthening which resulted in the GV segments, it is prudent to lay the foundation for the analyses which follow. The motivation for this foundation is two-fold. First, Suzuki's (1991) analysis of GV is based on a syllabic approach in the spirit of Murray and Vennemann (1983). Secondly, as I have indicated, the approach which I will take in my explanation of the GV sound changes is also syllabic in nature, though admittedly different from Suzuki's approach. This will provide me with the opportunity to test Polomé's (1988: 405) hypothesis which claims that "recent theories on syllabification will presumably provide a better explanation [for GV], more consistent with the historical data."

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[26]Lehmann (1992: 154) states Verner's Law as follows: "Proto-Indo-European voiceless stops became Proto-Germanic voiceless fricative; in voiced surroundings these voiceless fricatives, plus the already existing voiceless fricative *s*, became voiced when not immediately preceded by the accent." The voiced surroundings to which he refers is the intervocalic position which is a voiced environment, and thereby also a *voicing* environment

In this section I will first introduce the reader to the notion of Preference Theory. Next I will discuss Consonantal Strength and the advantages it offers diachronic linguistic study. I will contrast this with the complementary yet separate philosopy of a sonority hierarchy. From this overview, I will present the Preference Laws which bear relevance to the study at hand. The Preference Laws which I assume in this work are based primarily on Vennemann's (1988a) monograph on Preference Laws for syllable structure. Each relevant law will be summarised and illustrated with examples. Finally, these laws will be contrasted with their generative counterparts in an attempt to show the advantages gained by employing the Preference Laws in diachronic analyses.

4.1   Preference theory

Syllable structure has been used to explain various phonological phenomena including stress assignment and phonotactic constraints. Kenstowicz (1994: 252) underscores the importance of syllables in phonological analysis as he states that "without the notion of the syllable, it is difficult to understand why languages should have rules to insert vowels out of nowhere into quite specific points in the phonological string. With the syllable, the mystery is explained. . ." Syllables have not only been implicated in explanations of synchronic phenomena, but they have also been employed in analyses of sound changes. Vennemann (1988), Murray and Vennemann (1983) and Murray (1993, 1991, 1988, 1987, etc.) have illustrated that syllable structure can be implicated in diachronic analyses as they have accounted for various sound changes. By appealing to the language specific syllable structures and the Preference Laws, they have been able to provide cogent analyses of once obscure problems, e.g., West Germanic gemination.

The notion of Preference Laws espoused by Vennemann and Murray focusses on the relative markedness or preference of linguistic structures, namely syllable structures. These structures are considered better or worse than other structures on a given parameter. "What is better relative to one parameter or set of parameters may be worse relative to others" (Vennemann 1988a: 1). The basic concept of this preference theory is that "'X is the more preferred in terms of (a given parameter) syllable structure, the more Y', where X is a phonological pattern and Y a gradable property of X" (Vennemann 1988a: 1).

Any sound change which improves syllable structure is considered to be a syllable structure change. Conversely, if a change worsens the syllable structure then it is not motivated by syllable structure. Rather it is motivated by some different parameter which consequently worsens the syllable structure according to Vennemann (1988a). The effects of syncope illustrate this non-syllable structure change. Syncope may be motivated by the preference for shorter words, where shorter words are more preferred than longer words (Murray 1995: 8). However, it always worsens syllable structure in the process. In the sequence CVCVCV, loss of a vowel due to syncope could result in the sequence CVCCV. Whereas the initial sequence contained a concatenation of CV, the most preferred and cross-linguistically common syllable shape, the resulting sequence does not. Instead, it contains two contiguous consonants. The resulting contact between these consonants is certainly less preferred than the original optimal sequence from which it stemmed.

Although the Preference Laws can be considered universals, natural languages will still develop their own language specific tendencies which may in turn contradict the Preference Laws. When this happens, "unnatural" or less preferred structures may arise. The example of syncope illustrates this point. In Vennemann's (1988a: 2) view, this is a natural biproduct of the human history revealing that languages are "cultural rather than natural entities." Moreover, since many different parameters are in competition with one another, improvement on one parameter may result in a structure becoming less preferred on another. Individual languages or stages of languages will determine which parameters are more important.

Before leaving this discussion, it is important to note one last point. Preference Laws cannot be violated since they do not make absolute judgments based on good or bad, right or wrong. Because Preference Laws provide a graded concept of linguistic quality with respect to a given parameter, all structures are judged relative to one another. Thus, there is no one single good or bad structure; only structures which approach more preferred or less preferred on a preference continuum.

4.2   Consonantal strength

All segments can be placed on a Consonantal Strength Scale which illustrates the

relative consonantal strength of phones. The relative consonantal strength of all phones can be compared based on the "degree of deviation from unimpeded (voiced) air flow" (Vennemann 1988a: 8). Thus, the voiceless plosives would be considered consonantally the strongest segments, whereas the low vowels which are produced with the least constricted airflow would be the weakest segments. Segments can be depicted from weakest to strongest on the continuum in (8) below based on manner of articulation.[27]

(8)	glides	r	l	nasals	voiced fricatives	voiced stops	voiceless fricatives	voiceless stops

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	1	2	3	4	5	6	7	8
	Weak						Strong	

(From Murray and Vennemann 1983: 524)
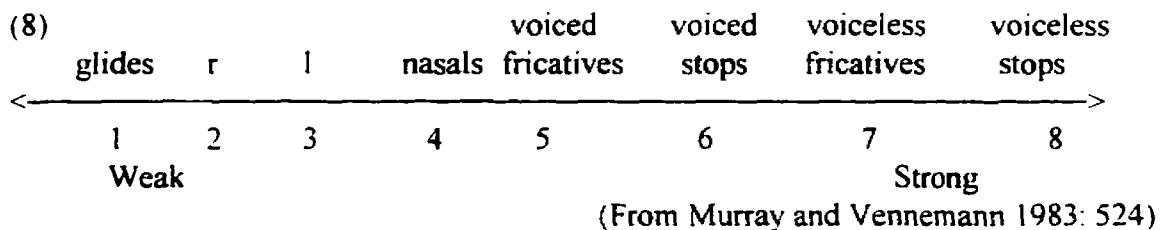
These rankings are not absolute but rather denote relative strengths between the natural classes.

Evidence from historical change also supports the ranking assigned to consonants based on an articulatory definition of consonantal strength as in (8). For instance, the intervocalic weakening of *t* *d* *ð* illustrates the progressive lenition of consonants from voiceless plosives to voiced plosives and finally to voiced fricatives (Foley 1977, Cull 1994). This confirms the relative strengths obtained between these natural classes as shown in (8).

The relations illustrated by a Consonantal Strength Scale are considered to be universal. Nonetheless, language specific variation occurs. Whereas in some languages voiceless fricatives may be stronger than voiced plosives as depicted in (8), in others, these two natural classes may be of equal consonantal strength (cf. Murray and Vennemann 1983, Murray 1988, 1991, Vennemann 1988a, and Foley 1977). Moreover, within classes, places of articulation may be assigned different consonantal strengths. For example, after studying

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[27]It should also be noted that in various versions of this Consontal Strength Scale, voiceless fricatives and voiced plosives have been placed together with reference to their relative strength (Murray and Vennemann 1983 519, Murray 1991, 1992). However, with reference to the study at hand, the scale presented in (8) appears to be more indicative of the situation in Germanic at the time of GV and lends itself well to an analysis of the sound change.

the tendency for consonants to lenite in Romance and Germanic, Foley (1977) determined that these two dialects differed with regards to consonantal strength. In Romance labials were judged stronger than both velars and dentals. However, in Germanic, the dentals emerged as consonantally stronger. Nevertheless, in both cases, the velars were found to be the weakest consonants with regards to place of articulation. Cull (1994: 8) summarises the relevance of this language specific variation. She notes that "the language-specific variation we see with respect to consonantal strength appears to take place either between adjacent classes of segments, such as nasals and liquids, or within a group with the same consonantal strength, such as voiced stops and voiceless fricatives."

The ability to compare segments based on consonantal strength enables a better evaluation of the preference of a syllable structure. The more precisely the relative strengths of segments can be determined, the better we will be able to account for language change.[28]

4.3 Sonority hierarchies

Rather than describing segments with regards to consonantal strength, some linguists have approached the question from the point of view of sonority (Clements 1990; cf. also Kenstowicz 1994). In determining sonority, Clements (1990) contrasts glides (G), liquids (L), nasals (N) and obstruents (O) as shown below.

(9)	G	L	N	O	
	−	−	−	−	vocoid
	+	+	−	−	approximant
	−	−	+	−	sonorant
	3	2	1	0	

As depicted in (9), the more 'plus'-specifications a class had, the more sonorant the class was considered to be. Thus, the glides were considered the most sonorous whereas the obstruents were the least sonorous.

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[28]That the Consonantal Strength or sonority of individual segments plays a role in sound change has been observed in various places For example, in West Germanic gemination all consonants except +r are geminated before a semivowel, e.g., Go. satjan, -skapjan beside OS settian, skeppian but Go. farjan beside OS ferian. Moreover, voiceless plosives alone undergo gemination when followed by a liquid, Go akrs, ON eple beside OS akkar, OE æppel, but Go. ligrs beside OHG legar. Thus, from these examples we see that at times we need to be able to differentiate between consonants based on smaller, more precise categories

In comparison with Murray and Vennemann's (1983) Consonantal Strength Scale, Clements' algorithm for determining sonority fails to provide significant detail. This is most notable by his grouping of all obstruents into one class with regards to sonority. Thus, no further comparisons could be made between fricatives and plosives, nor voiced and voiceless obstruents according to this theory. By contrast, the Consonantal Strength Scale provides the means to not only differentiate between fricatives and plosives, but also between voiced and voiceless segments. Its ability to discriminate this further detail is a consequence of the definition of consonantal strength, namely the level of impeded airflow. Moreover, just as Foley (1977) determined the relative strengths of various places of articulation on their tendency towards lenition, Consonantal Strength also reflects diachronic changes, such as θ, t, d, etc.

Although Clements (1990) argues that based on cross-linguistic evidence there are no grounds for a further distinction between segments, evidence from historical change would indicate that such grounds do indeed exist. Recall that the lenition t d ð is reflected in the Consonantal Strength scale in (8). Moreover, as will become evident in my analysis in Chapter Four, being able to distinguish between classes of obstruents is critical for determining the motivation for many sound changes (cf. also Footnote 28). Without such detail, Clements' sonority hierarchy above not only ignores evidence from historical change, but consequently proves inadequate to account for such sound changes.

Hence the main difference between the Consonantal Strength scale and the sonority hierarchy is the subdivision of obstruents. If the sonority hierarchy could be refined to reflect these further subdivisions, then it would become more comparable to the Consonantal Strength scale. However, since this further division is critical to my analysis, I will adopt the Consonantal Strength Scale for my study. Moreover, the Consonantal Strength scale is convenient for use with the established Preference Laws which I will employ for my analysis. Having determined this, I now turn to a discussion of the relevant Preference Laws.

4.4   Preference laws

In this section I present an overview of the Preference Laws based on Vennemann

(1988a).[29] To commence this overview I provide a summary of the Diachronic Maxim. According to this principle of language change, linguistic improvements first affect the poorest structures before generalising to the best structures.

(10) *Diachronic Maxim:* Linguistic change on a given parameter does not affect
       a language structure as long as there exist structures in the language system
       that are less preferred in terms of the relevant preference law.

For example, with regards to syllable contacts, a less preferred syllable contact will be improved before a more preferred syllable contact is affected by a syllable-based sound change.

In a similar vein, languages will not contain less preferred structures unless they also contain the more preferred structures. This is summarised in the Synchronic Maxim:

(11) *Synchronic Maxim:* A language system will in general not contain a structure
       on a given parameter without containing those structures constructible with
       the means of the system that are more preferred in terms of the relevant
       preference law.

Since changes occur along different competing parameters, a change on one parameter may produce less preferred structure on a different parameter thereby "shooting holes" through a parameter such that the transition from less preferred to more preferred structures is no longer smooth. This was the case above where syncope resulted in a less preferred syllable structure than the CVCVCV string from which it stemmed. Thus, language change does not produce a perfect language system.

The Diachronic and Synchronic Maxims help determine which structures will be ameliorated first with regards to the Preference Laws which I now outline below. These laws rely heavily on the relative consonantal strengths illustrated above in (8). I will outline each law and provide examples of the effects of each component.

The Head Law outlines the characteristics which determine the preference of a

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[29]The examples I present come from Vennemann (1988a) and Murray (1995).

syllable onset.

(12) *Head Law*: A syllable head is the more preferred: (a) the closer the number of speech sounds in the head is to one, (b) the greater the Consonantal Strength value of its onset, and (c) the more sharply the Consonantal Strength drops from the onset toward the Consonantal Strength of the following syllable nucleus.

The first component of the Head Law states the preference for only one consonant in an onset. In many cases, onset clusters are reduced to a single phone as in (13a) or separated by anaptyxis (13b).

(13) a.   Skt.   srotas   Pali   sota   'stream'

      b.   Skt.   sneha   Pali   sineha   'friendship'

According to part (b) of the Head Law, the stronger the consonantal strength of the onset, the more preferred that onset will be. Thus, a weak syllable head can be improved by increasing its consonantal strength as in (14).

(14) Lat.   i̯uu̯enis   It.   giovane [ʤ]   'young'

Part (c) of the Head Law stipulates that the greater the drop in consonantal strength, ie. slope, of an onset cluster, the more preferred that cluster will be. Thus, the greater the difference in consonantal strength of A-B where *.AB* form an onset cluster, the more preferred the syllable head will be. An example of a one type of change motivated by part (c) of the Head Law is provided below.

(15) 'mlit-i̯óh₂   >   Gk.   blittō   'I take away the honey'

In this example, the difference between the consonantal strength of *m* and *l* was minimal. In order to improve the slope, the consonantal strength of the nasal was increased to that of

a voiced plosive, by a change known as slope steepening. The resulting slope, and therefore onset, was more preferred than that of its etymon.

Moving to the opposite syllable margin, I now discuss the Coda Law.

(16)   *Coda Law*: A syllable coda is the more preferred: (a) the smaller the number of speech sounds in the coda, (b) the less the Consonantal Strength of its offset, and (c) the more sharply the Consonantal Strength drops from the offset toward the Consonantal Strength of the preceding syllable nucleus.

The Coda Law is in some respects the antithesis of the Head Law. Whereas the Head Law preferred the number of speech sounds in the onset to be one, a preferred coda is an empty coda. Coda deletion increases the preference of a coda as exemplified in (17).

(17)   a.   Lat.   sex.tus [ks]   It.   sesto   'sixth'
       b.   It.   fac   >   fa   'make!'

In (17a), the consonant cluster in the coda was simplified by the deletion of one of the consonants. Although the resulting coda still contained one consonant, this marked an improvement over the two segments in the Latin form. By contrast in (17b), the coda was entirely deleted producing the most preferred of codas, namely an empty coda.

Part (b) of the Coda Law states its preference for a weak consonant to fill the coda. This often results in coda weakening.

(18)   `cap.tivo        >     Spa. cautivo          `captive`

In this example, the coda consonant has not been lost. Rather, it has weakened from a strong voiceless plosive to a weak glide.

Part (c) of the Coda Law is the converse of part (c) of the Head Law. In the case of complex codas, it is more preferred if the consonantal strength of the final consonant speech sound in the coda is greater than that of the preceding consonant. Thus, the cluster *lt* would be more preferred than *lm* in coda position.

The final law of relevence to the present study is the Syllable Contact Law.

(19)   *Contact Law*:   A syllable contact A.B is the more preferred, the less the Consonantal Strength of the offset A and the greater the Consonantal Strength of the onset B; more precisely — the greater the characteristic difference CS(B)-CS(A) between the Consonantal Strength of B and that of A.

The preference for a weak coda followed by a strong onset is underscored by this law. Thus, the syllable contact *r.p* would be more preferred than the contact *p.r*.

4.5   Preference laws and generative approaches

At first blush it may appear that the notions of syllable structure proposed by the Preference Laws could be explained by the syllabic principles found in Generative phonology. The Sonority Sequencing Principle (SSP) appears fairly similar to part (c) in both the Head and Coda Laws. The SSP "requires onsets to rise in sonority toward the nucleus and codas to fall in sonority from the nucleus" (Kenstowicz 1994: 254). However, it seems that in the string $C_wC_xVC_yC_z$, the marginal consonant C_w can only be incorporated if it is less sonorous than C_x. Likewise, C_z can only be incorporated into the coda if it is less sonorant than C_y. These rules constitute onset and coda augmentation respectively (cf. Kenstowicz 1994: 255). Moreover, these rules specify what is permissible in these positions. By contrast, the Preference Laws do not disallow certain segments in positions. Rather they provide a means of judging how preferable those segments would be in those positions. In light of these judgments, sound changes can be imposed to improve a less than preferred language structure.

With respect to Onset Maximisation, this rule states what will form a legitimate onset. The goal is to place as many segments into the onset as is permitted by the SSP. This principle serves more as a rule of syllabification than as a reflection of syllabification in natural languages. For example, experiments testing the effects of accent placement on word medial clusters in English (cf. Chapter Four, §1.5) have shown that onsets are not always maximised when the accent precedes the cluster. This is true even when the cluster forms a possible onset in English. In contrast to Onset Maximisation, the Head Law is a theoretical principle which can account for the variability amongst all types of onsets. Because it takes into account the tension which exists between the parameters responsible

for syllable onsets (e.g., in the case of a poor onset cluster, changes can improve the onset by establishing a strong single consonant or by improving the slope), it will help motivate a maximised onset without the necessary and complicated filters required by Onset Maximisation.

Another advantage of the Preference Laws is the conception of the Syllable Contact Law. No such equivalent principle has been stated for Generative phonology. According to the SSP, the sonority from the nucleus to the offset should drop, thereby rendering a consonantally stronger segment. Since a more preferred contact entails a weak coda followed by a strong onset, then the SSP would actually contradict the notion of a preferred syllable contact. Moreover, that the syllable contact is important in historical change is evidenced by West Germanic gemination, *p.į* ⁓ *p.pį*, and metathesis, e.g., Lat. *vid.ṷa* but Spa. *viṷ.da* 'widow'.

In sum, the Preference Laws have as the main advantage the ability to compare syllabic structures against one another. In Generative phonology, where the principles are means of syllabifying strings, there exists no mechanism for comparing individual structures. This is, however, a critical aspect of explaining why sound changes have affected certain structures and not others. Moreover, the syllabification of strings falls out as a natural consequence of the theoretical principles embodied by the Preference Laws.

Before I commence my analysis of GV, it should be noted that the representation of syllabic strings in this work, e.g., *VC.VC*, does not depict a linear approach to syllable structure. I assume a non-linear approach to syllable structure. However, since the choice of a particular theory of syllable hierarchy does not have bearing on my analysis, I employ the representation above for ease of explanation. This is simply a "short-hand" notation for depicting syllable structure.

Having laid the initial foundation for this study, I now turn to my examination of the phonological-orthographic correspondences for the GV segments.

Chapter Two
A BEHIND THE SCENES LOOK AT THE SOUNDS:
DETERMINING THE PHONOLOGICAL-ORTHOGRAPHIC
CORRESPONDENCES IN GOTHIC AND OLD NORSE

0.0   Introduction

A study of Holtzmann's Law cannot be limited to an explanation of the sound changes which produced the Germanic *Verschärfung*. A complete examination presupposes an investigation of the orthography to determine the possible phonetic identity of the GV segments, namely Gothic <ddj> and <ggw> and Old Norse <ggj> and <ggw>. Once the correspondence between the orthography and phonology has been ascertained, a more thorough analysis of the sound changes can be undertaken.

The focus of this chapter will be the determination of the phonological-orthographic correspondences. I commence by reviewing past interpretations posited for the correspondences. Next I present a plausible hypothesis for the GV segments based upon the phonological systems and orthographic conventions in both Gothic (§2) and Old Norse (§3). I will argue that in Gothic and Old Norse, these graphs represented a sequence of phones and not complex segments. My tentative conclusions will then be reviewed and revised later in Chapter Four following the outline of my analysis.

1.0   The Phonological-orthographic correspondences — Past perspectives

Whether as part of an investigation of Holtzmann's Law or as an independent study of the phonologies of Gothic and Old Norse, numerous proposals have been posited for the identity of the phones depicted by the orthography. In this section, I will outline some of the various proposals.

1.1   Prokosch (1939)

According to Prokosch (1939: 92-3), Gothic <ddj> and Norse <ggj> both represented "a palatal stop followed by a spirantic glide (similar to *gy* in *Magyar*)." Moreover, he rejects

the view that the Gothic *ggw* in the GV forms is akin to *ngw* as in *siggwan*. [1,2] It can thus be inferred from his explanation of the Gothic <ddj> and Old Norse <ggj> forms that Prokosch would claim that the <ggw> form in both Germanic branches would represent a velar plosive with homorganic glide. Thus, Prokosch's interpretation of the orthography is based on the assumption that the first of geminate glides strengthened to a homorganic plosive.

1.2   Tanaka (1970)

Tanaka's proposal is based on stop-spirant allophonic variation in Gothic and Old Norse. Tanaka (1970: 70-1) asserts that the Pre-Gothic speaker would have tended to view the /j/ : /jj/[3] opposition based on a spirant-stop alternation since no quantitative differences were present in the language elsewhere. He then claims that the Pre-Gothic speaker would produce /jj/ as a stop corresponding to /j/, hence an incipient palatal affricate. The occlusion could then be produced as either a [d] or [g], with [d] likely as the normal production. Tanaka proposes that the [dj] affricate would then better contrast with its velar counterpart <ggw> which would be pronounced [gw]. He states that "the *dd* of *ddj* can then be accounted for as an orthographic device to denote a stop in what is normally a spirant environment" (Tanaka 1970: 70). This is a position for which I also argue in §§ 2 and 3. However, Tanaka indicates that [dj] and [gw] do not simply equate to /d/ + /j/ and /g/ + /w/ since the stop allophones do not occur in postvocalic position.[4] Suggestions that these two units be represented by the complex segments [dʲ] and [gʷ] seem in his opinion to be useful in indicating that these sound sequences "could potentially develop into full-fledged affricates given the proper conditions" (Tanaka 1970: 71).

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[1]Variability in data presentation will reflect the conventions used by the various authors.

[2]The significance of <gg> representing [ŋg] will be discussed in §2.3.

[3]I assume here that for Tanaka /j/ is the palatal fricative and /w/ is the fricative corresponding with /u/. He does not clearly explain whether this is indeed the case, but he indicates the possible contrast as he juxtaposes IE /y, w/ and Gmc. /jj, ww/ (Tanaka 1970:66).

[4]This last argument is debatable. Although postvocalic stops do not generally occur in this environment, this does not preclude the possibility that they could have occurred under just these conditions. After all, Holtzmann's Law is a change that affected the IE segments in ways which have eluded explanation to this point.

To explain the Old Norse form <ggj>, Tanaka states that the <jj> could have developed a velar stop analogous to Gothic's /d/ in <dd>. The double-graph in <ggj> would then be a similar orthographic convention to establish the stop allophone post-vocalically, a position where the fricative allophone would generally appear. The <ggw> would then indicate /g^w/ as above in Gothic. Thus, Tanaka indicates a strong relationship between the Gothic and Old Norse GV forms. His use of the stop-spirant allophonic variation also plays a role in my own analysis of the data in §§ 2 and 3.

1.3   Miscellaneous interpretations

Other interpretations have also been presented. In his study of the various old Germanic dialects, Robinson (1992) posits the Gothic pronunciations of <ggw> and <ddj> as [ggu̯] and [ddi̯]. For Old Norse, his claim is that <ggj> and <ggw> represented [g^{ʲ} i̯] and [gu̯] respectively.

Bennett (1980) defined his interpretation of the Gothic orthography in his *Introduction to Gothic*. In his handbook he claims that <gg> was possibly [gg] in Pre-Gothic, however by the time of Wulfila, this sequence had undergone dissimilation to [ŋg] (Bennett 1980:4). Wulfila had employed Gk. <ΓΓ> to represent what we transliterate as <gg>. Bennett therefore based his interpretation of <gg> on the usage of <ΓΓ> in Greek where it represented the sequence [ŋg] (cf. §2.3). He states that the <w> in the <ggw> sequence would then simply be articulated as a [u̯]. Thus, in Gothic the string <ggw> represented [ŋgu̯]. Bennett's argumentation for the phonetic identity of <ddj> is somewhat different. He assumes that geminate length was indicated by the doubling of graphs in the orthography. Consequently Gothic <ddj> represented the sequence [ddi̯].

One final study of Gothic is worth noting. In his book, *The sounds and phonemes of Wulfila's Gothic*, Marchand (1973) postulates the phonemic and phonetic inventories of Gothic based on internal and comparative evidence, the origin of the orthographic system Wulfila developed, and the transcriptions of loan words. He comes to the following conclusions at the end of his multi-faceted study. First, the combination <ggw> represented [ŋgu̯] based on the same reasoning used by Bennett above. With regard to <ddj>, Marchand argues differently. The phone transliterated as <j> would have had a relatively high place

of articulation with perhaps a level of oral frication.[5] Marchand then seems to indicate either a [dd] or [d] pronunciation for the double-graph, but does not clearly choose one over the other. Instead he notes that "*p, t, k, f, h, b, z* do not occur in geminate clusters in Gothic, except [for the fact] that *pp, tt, kk* occur in loanwords" and thus <dd> and <gg> would have had an unusual status in Gothic (Marchand 1973: 60).

The postulation of geminate length, however, seems problematic in all the above theories since there do not appear to be grounds for establishing a contrast between single and geminate consonants which would be necessary to confirm such a proposal.

Many other interpretations are available, however an exhaustive discussion of all possibilities is beyond the scope of the present study. Instead I now turn to my own analysis of the phonological-orthographic correspondences in both Gothic (§2) and Old Norse (§3).

2.0　Gothic

In this section, I commence with a discussion of the Gothic phonemic system and its representation in Wulfila's orthography. I will also investigate the plausibility of geminates in Gothic and whether the GV graphs represented complex segments or a concatenation of phones. In the final analysis, I will present my interpretation of the phonetic identity of the GV segments.

2.1　Phonemic inventory

The Gothic alphabet has been attributed to Wulfila, a Gothic Bishop who lived approximately between 311 and 383 AD. In order to translate the Bible into Gothic, Wulfila invented an alphabet to be able to transcribe his language. Although this alphabet was based primarily on Greek, however, he also availed himself of Latin and the Runes for some additional characters. Understanding the origin of Wulfila's alphabet has permitted linguists and philologists to decipher the Gothic texts and determine the language's phonemic system.

Numerous studies of the phonemic and phonetic inventories of Gothic have been undertaken (cf. Vennemann 1985b, Moulton 1948, Penzl 1950, Robinson 1992, Voyles

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[5]Vennemann (1985b) also posits frication of <j> in his study of Gothic, cf §2.6.2.1

1992). Some variation exists amongst all the versions and thus it is important to establish which inventory will serve as the basis for my investigation. The phonemic inventory below in (1) is a composite of the consistent phonemes and features included in the various inventories available.

(1)   Phonemic inventory of Gothic

bilabial	labiodental	interdental	alveolar	palatal	velar	glottal
p			t		k	
b			d		g	
					k^u <q>	
	f	θ <þ>	s			h
			z			
						h^u <hv>
m			n			
			l			
			r			
u**				i**		

**Some linguists argue that these glides underwent subsequent glide hardening to become fricatives (Vennemann 1985b, Murray and Vennemann 1983).

I now turn to a discussion of Wulfila's phonemic alphabet.

2.2   A phonemic alphabet

Wulfila's orthography appears to be a reasonably phonemic representation of the language. Rather than representing allophones by separate graphs, Wulfila simply employed one single graph for each phoneme and its allophones, e.g., <d> for [d] and [ð]. That allophones were not signified by independent graphs is further substantiated by the morphophonemic alternations illustrated in (2).

(2) | Initially | Medially (after V or VG) | Finally and before [s]
--- | --- | ---
| [b] | [β]/[v] | [f]
| *bairan* ˙to carry, bear' | *hláibis* (gen.) loaf | *hláif* (acc) *hláifs* (nom)
| cf. OE. OHG. *beran* | |
| Skt. *bháratu* Av. *báratu* | |
| | |
| [d] | [ð] | [þ]
| *dōms* ˙judgement, opinion' | *stada* (dat.) ˙place' | *staþ* (acc.) *staþs* (nom.)
| cf. OE *dōm*, OHG *tuom* | |
| Skt. *dhama* 'glory' | |
| | |
| [g] | [ɣ] | [x]?
| *gasts* ˙guest' | *dagis* (gen.) ˙day' | *dag* (acc. voc.) *dags* (nom)

According to phonotactic constraints in Gothic, voiced plosive allophones occurred word-initially while voiced fricative allophones surfaced word-medially following a vowel or diphthong.[6] However, voiceless fricatives appeared in word final position and before an [s] due to Gothic phonotactics. I now turn to a discussion of the significance of these distributions for determining the orthographic-phonological correspondences in Gothic.

As shown above in (2), word-medially the allophones of the plosives were voiced fricatives. These allophones were represented orthographically by the same graph used to depict the word-initial plosives. However, the voiceless fricatives, [f] and [þ], in word final position were not represented by <b> and <d>. Why not?

The morphophonemic alternations illustrated in the last two columns of (2) exemplify the phonotactic constraint banning post-vocalic voiced fricatives in word-final position or before /s/. Thus, the voiced fricative allophone in the stem (cf. "medially" column) underwent devoicing in this final position. The resulting voiceless fricatives, [f]

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[6]Fricative allophones of voiced plosives are widely accepted for the word-medial position in Gothic (cf. Bennett 1980, Robinson 1992, Moulton 1948, etc.). These allophones are claimed to occur following either a vowel or diphthong. This scenario would thus be analogous to that found in some dialects of Spanish where the allophones of voiced stops following vowels are voiced fricatives. e.g. *donde* [donde] ˙where' but *ciudad* [siuðɑð] 'city'. Further evidence for the voiced fricatives word-medially comes from the morphophonemic alternation of [z]~[s], e.g. *hatiza* (dat.) but *hatis* 'wrath' Here the phone in final position differs from that found word-medially only be voicing, providing evidence for the voiced~voiceless morphophonemic alternation in word-medial and word-final positions respectively Thus, the occurrence of <f> in *hláif* implies its voiced fricative counterpart intervocalically in *hláibis*.

and [þ], subsequently merged with the Gothic phonemes /f/ and /þ/ in this environment. Thus, these voiceless fricatives were represented orthographically by the graphs <f> and <þ> respectively and not by <b> and <d>.[7] The morphophonemic alternations in this position provide evidence for this merger.

The examples cited for <g> reveal a different story. Here there is no orthographic alternation corresponding to the situation for <b> and <d>. Nevertheless, we would expect that since /g/ forms a natural class with /b/ and /d/, that /g/ would also have undergone frication and devoicing as exemplified by the morphophonemic alternations b~f and d~þ. However, since the resulting phone, [x], did not exist as a separate phoneme elsewhere in the language (cf. (1)), no merger took place. Therefore, since there was no phoneme /x/ and no corresponding graph, [x] remained an allophone of /g/ and was represented orthographically by its graph, <g>.

Further insight into the phonological-orthographic correspondences can be found by examining the postconsonantal occurrence of <b> and <d>. Recall from (2) that word-finally and before an [s] we would expect the voiceless fricatives, /f/ and /þ/ respectively, to occur in this position. However, the morphophonemic alternations in postconsonantal position refute this expectation as an absolute. Penzl (1950: 222) cites examples illustrating the postconsonantal preservation of plosives in word final position or before [s], e.g., *lamb*, *band*, and *bands*. Here the occurrence of <b> and <d> is unexpected. According to Penzl (1950: 222), "The postconsonantal final preservation of /b/ and /d/ has been interpreted as indicating voiced stops..." Since, for instance, *banþs* does not occur, then it follows that the voiceless fricative does not occur postconsonantally, but that the plosive does. However, which allophone of the plosive would postconsonantal <b> or <d> represent? As illustrated in (2), the fricative allophone occurs following a vowel or diphthong. This postvocalic

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[7]   A similar example of orthographic variability revealing morphophonemic alternations can be cited from English, e.g., *leaf* vs. *leaves*. Here the morphophonemic alternations are the result of a voicing rule which does not create a new allophone for /f/, but rather results in the morphophonemic alternation between f~v. Both [f] and [v] remain separate phonemes differentiated by voice and depicted by two separate graphs. This is similar to the cases in Gothic where the morphophonemic alternations involved two different phonemes, e.g., f~b and þ~d.

position would account for the frication of the plosive, i.e., intervocalic frication. However, since the <b> in *lamb* is not in a post-vocalic nor post-diphthongal position, then it would appear that the graph represented a plosive in the postconsonantal position where intervocalic frication could not have occurred.

Another relevant factor for the present study is the use of <g> in Gothic since this graph has an additional use.

2.3   Wulfila's use of g   in Gothic

Wulfila uses <Γ>, the Greek symbol for <g>, to represent [ŋ], the velar allophone of /n/ in Gothic. If we recall that the origin of his alphabet comes primarily from Greek, then this interpretation is understandable. In Greek, [ŋ] was represented by the same symbol as /g/, namely gamma, when it preceded another velar, e.g. <ΓΓ> = [ŋg] in Greek. Similarly in Gothic a <g> occurring before another velar frequently represented [ŋ]. This conclusion can be stated based on comparisons with cognates from other Germanic dialects, all of which include the nasal, /n/, in the corresponding position as shown below in (3):

(3)   a)   *siggwan*   'to sing, read'   OHG OE *singan*

       b)   *siggqan*   'to sink, go down'   OE *sincan* OHG *sinkan*

       c)   *þagkjan*   'to think, meditate, consider'   OGH *denken*

(All examples and glosses from Wright 1917)

Some linguists, like Marchand (1972) and Bennett (1964) have tried to argue that <gg> in Gothic GV forms simply signified [ŋg] as it would have in Greek and in the examples in (3). This, however, is disputable on a number of grounds. First, non-GV <gg> forms have cognates which possess a corresponding nasal as shown above in (3). By contrast, no nasals are ever found in the cognates of GV forms. This would imply a divergent use of <g> in the GV and non-GV forms. Secondly, scribal errors or variations use <n> instead of <g> in various instances for the non-GV items, e.g. *bringiþ briggiþ* 'to bring' and *þankeiþ þagkeiþ* 'to think'. By contrast, no such variations occur for GV forms. Lastly, if both <ddj> and <ggw> developed from a similar process, i.e. a *Verschärfung* of some form, then why would

a nasal have developed in the GV of one glide, [u̯], but not in the GV development of the other glide, [i̯]? The simplest response to such a question is that it did not.

2.4   Determining the phonological-orthographic correspondences

In light of these system based factors, we can start positing the GV correspondences. I argue that <dd> and <gg> were strictly writing conventions employed to indicate a stop articulation in what was normally a fricative environment. Wulfila does not indicate allophonic or morphophonemic variation unless he already has the "tools" (symbols and system for using these symbols) for doing so, e.g., *bringiþ* vs. *briggiþ* and *stada* vs. *staþ, staþs*. Clearly he does:

(4)   a)   <d> =   [d]   initially
            [ð]   medially following a V
            [d]   non-initially following a C

    b)   <g> =   [g]   initially
            [ɣ]   medially following a V
            [x]   finally and in prefinal position before a fricative, e.g., [s]

If Wulfila wanted to indicate [d], he could use <d>. However, since the GV environment is "medially following a vowel", we would expect it to be articulated as [ð]. He has another option—by inserting a consonant before <d>, the <d> would be pronounced as [d] rather than [ð]. But what consonant could be inserted without introducing another phone to the sequence? A second <d> could be inserted rendering the [d] pronunciation. The same could be applied to <gg> for [g] medially.

Minor support for a medial plosive in the GV forms comes from *ada* in Crimean Gothic. I briefly summarise this datum.

2.4.1   Medial stops -- Crimean Gothic 'ada'

In 1560 Busbecq, a Flemish diplomat, "discovered" a language spoken in the Crimean peninsula. Significant similarities between this language and Gothic were noted, and thus the language became known as Crimean Gothic. From the sample words Busbecq collected comes the word for 'egg' *ada*. When compared against other Germanic cognates

such as ON *egg* and OHG *ei* (gen. pl. *eiiero*), then it becomes evident that *ada* resulted from Holtzmann's Law. As Busbecq recorded the words by what he heard and not from pre-existing written sources, his use of <d> is noteworthy. Based on the pronunciation of <d> in various West Germanic dialects, this graph would have represented [d]. It is not likely that there would have been confusion with [ð] since where this sound existed at this time in other West Germanic dialects it was distinguished orthographically from [d] (cf. Robinson 1992). If this is indeed the case, then the Crimean Gothic pronunciation of this GV word would have included a plosive medially. Furthermore, since no glide was present in this form, then we can also further assume that the <j> of the <ddj> sequence in Gothic was later lost.

Although this word could have undergone further changes during the millenium between the time when Gothic was recorded and when Busbecq happened upon these Crimean Gothic speakers, this datum does correspond to the proposal of a word medial plosive in the GV forms. Thus, although it cannot provide conclusive evidence, it does fit with my arguments presented thus far.

2.5   Geminates?

Although a large proportion of analyses argue that <ddj> and <ggw> contained geminates (cf. Voyles 1968, 1992, Polomé 1970, Suzuki 1991, Cathey 1970, Davis and Iverson 1996) the existence of geminates in Gothic is still open for debate. According to markedness theory, geminate consonants are more marked than their unmarked single counterparts. Thus, the existence of a geminate consonant would imply the existence of its single counterpart in the same environment. Since <d> and <g> represent voiced fricatives word-medially, then there would be no single plosive counterpart with which the geminate plosives could contrast.[8]

Further evidence against a geminate status for the GV double-graphs can be found

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[8] As I suggested in §2.4, <dd> and <gg> represented the single plosives [d] and [g]. Thus, I have accounted for the double-graphs. However, by assuming geminate plosives for <dd> and <gg>, then the same argument for single plosives is set aside since both are based on the GV double-graphs, <dd> and <gg>. Therefore, assumptions of medial plosives and geminate plosives are mutually exclusive. By assuming the one based on the double-graphs precludes the assumption of the other.

by examining where geminates have been noted in Gothic. According to Braune and Ebbinghaus (1981), geminates are primarily restricted to the liquids and nasals although they also occur somewhat less frequently with [s]. The other consonants display geminate graphs only in a few cases such as GV or where <gg> represents [ŋg]. Other examples of non-GV(-like) geminate obstruents are primarily loanwords borrowed into Gothic, generally from Greek, e.g. Go. *Filippus*, or are the result of assimilation, e.g., *h-p: wasuh-pan > wasuppan* 'but it was'.

Thus, geminates are not common to the Gothic obstruents. Without a precedence in Gothic to assume geminates then I dismiss the possibility that the GV double-graphs represented geminates.

2.6   *Sequences or complex segments?*

Another issue with which Germanists have had to struggle is whether the GV segments constituted a sequence of segments or whether they represented one complex segment. The question may be posed as to why this would be considered important. Simply stated, the phonetic identity of the GV segments could provide direction for the analysis of the sound changes proposed for GV itself. For instance, if the GV segments represented a single complex segment, e.g., the affricate [dʒ], then it could indicate which segments and sound changes were involved in GV. Italian provides an example. In Italian, the glide [i] strengthened to the affricate [dʒ], e.g., Lat. *iuuenis* but It. *giovane* 'young'. This strengthening affected a single segment, namely the glide [i], and resulted in a single complex segment, [dʒ].[9] However, if the GV segments were determined to represent a sequence of segments (where the glide was a separate segment in the sequence), then it could indicate that it was not simply the PIE glide involved in GV; rather it could suggest that it was a sequence of segments which underwent GV. In this section I will outline several arguments in support of the claim that the GV segments formed a concatenation of phones rather than complex segments.

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[9] In Spanish, the glide [u] strengthened to [b], Lat. *uiuo* but Spa. *vivo* 'live'. Although the ouput of the strengthening was not an affricate, it still provides a similar example to the Italian example for two reasons. First, the original segment was a single glide. Secondly, the output was a single segment, albeit a simplex segment.

2.6.1   Another idiosyncrasy: the adoption of ·ħ· and ·q·

There is reason to assume that the graphs <ħ> and <q> signified the complex segments [hᵘ] and [kᵘ] respectively. That Wulfila devised separate graphs for complex phonemes rather than using the pre-existing graphs available to him to indicate the secondary articulation provides an important insight into Wulfila'a orthography. Moreover, it supports the notion that the GV segments were a sequence of phones. Below I present arguments in support of this interpretation. I commence with an examination of <q> followed by an investigation of the identity of <ħ>.

Examples for <q> are provided below in (5) with their Germanic cognates:

(5) a) Go. *qinō*   ON *kvinna*   Run.Sw. *kuina* OE *cwene* OHG *quena* 'woman, wife'

     b) Go. *qiþan* ON *kveða*   OE *cweþan*   OHG *quedan* 'to say, tell'

     c) Go. *qius*   ON *kvikr*   OE *cwic*   OHG *quek*   'quick, alive, living'

The etymology for (5c) has been traced to PIE ·gᵘi-gᵘo (de Vries 1962). In as much as Gothic has been argued to deviate very little from the original Germanic consonantism (Prokosch 1939) then it is reasonable to assume that the phone represented by <q> would have undergone few if any changes from its Germanic etymon. Since all the cognates show a labial quality following the velar, we could then hypothesise that the Gothic equivalent, <q>, would also reflect this labial quality. The claim that <q> signifies [kᵘ] is supported then by the following four points. First, the PIE reconstruction indicates ·gᵘ for the word initial phone for the data in (5c). Thus, these obstruents have come from the labialised series in PIE. Secondly, if <q> were simply [k], Wulfila already had the grapheme <k> which he could have used. Thirdly, if <q> represented the concatenation of [k] and [u], Wulfila could have employed either <ku> or <kw>.[10] Instead he adopted a new symbol and transliterated this sound by <q> in an alphabet where each symbol represents its own phoneme. Lastly, it is evident that <q> is a velar because <g> can represent [ŋ] only when

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[10]At this point, I do not argue for one over the other nor for the value of <u> versus <w> (cf. §2.6.2.1)

it precedes velars. As is shown in (3b), this "nasal" <g> is in fact found before <q> which could only occur were this symbol to represent a velar.

Our conclusions can be verified by investigating the other idiosyncratic grapheme in Gothic, namely <ƕ>. Examples of Gothic words including this graph are compared with their Germanic cognates below in (6):

(6) a) Go. *ƕaiteis* ON *hveiti* OSw *hwǣte* OE *hwǣte* OHG *hweizi* 'wheat, corn'

   b) Go. *ƕar* ON *hvar* OSw *huar* OE *hwǣr* OHG *hwār* 'where'

   c) Go. *ƕassei* ON *hvass* OSw *hwas* OE *hwǣss* OHG *hwas* 'sharp'

   d) Go. *ƕē* ON *hvé* OE *hwȳ, hwī* 'with what, how'

The etymology for (6d) indicates the PIE reconstruction $k^{\underline{u}}\bar{e}$ (de Vries 1962). The First Germanic Consonant Shift would have brought about the change PIE k^u > PGmc h^u. As with <q>, these initial sounds appear to be based on the PIE labialised series. Braune and Ebbinghaus (1981) provide several arguments for this claim while refuting the possibility that <ƕ> represented the sequences <hv> or <hw> which were used earlier by historical linguists to transliterate <ƕ>. First, <ƕ> is never mistakenly written as <hw> in the texts. Secondly, <ƕ> is never used to represent -*h* and *w*- at morpheme boundaries, e.g., *þairhwakandans*. Third, in the process of reduplication, <ƕ> is treated as a single consonant, e.g., *ƕaiƕōp*.[11] Braune and Ebbinghaus also argue that if <ƕ> were transcribed by <hw>, then the <w> in the transliterated cluster would be behaving differently than when <w> occurred elsewhere. For example, the [u̯] in <ƕ> is never vocalised word finally, e.g., *saƕ*, or before a consonant, e.g., *saƕt*. However, these are precisely the environments where [u̯] is normally vocalised. Moreover, this non-vocalising [u̯] would only be encountered tautosyllabically after [h]. Even the assumption of a second *u̯*-phoneme could not explain

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[11]Some preterites were formed using reduplication. With the exception of words commencing with *sC* or *HC*, reduplication normally repeated only the first consonant of a cluster, e.g., Go. *fraisan* (non-reduplicated) vs. *faifrais, faifraisum* (reduplicated) 'tempt' (Vennemann 1996 301, Beekes 1995). Thus, if <ƕ> represented <hw>, then the outcome of reduplication with <h> would have been, for example <haiƕōp> and not <ƕaiƕōp> as is evidenced

a different behaviour of [hu̯] when represented by <h̯>. Essentially, <hw> or <hu> should be treated separately from <h̯>.

One final observation can be made with regards to the graph invented by Wulfila to represent what Braune and Ebbinghaus conclude to be [hʷ]. The graph itself bears no resemblance to either of the graphs transliterated as <h>, <w> or <u>.[12]

The following conclusions can be drawn from this discussion. Both <q> and <h̯> were reflexes of the PIE labialised series. As such, Wulfila did not employ a sequence of his pre-existing graphemes to signify these complex segments but rather utilised new symbols as though they were separate phonemes.[13] Thus, the complex segments, [kʷ] and [hʷ], were represented by their own graphs in Wulfila's Gothic alphabet. By extension, if the GV reflexes were complex segments, and therefore if the glides <j> and <w> were simply secondary articulations as some have claimed (cf. Davis and Iverson 1996), then why did Wulfila not create new symbols for <ddj> and <ggw> reflecting the secondary articulations as he had done for <h̯> and <q>? Why did he use a sequence of graphemes? My answer to this question is that Wulfila employed a sequence of graphs because the GV segments were a sequence of phones and not complex segments.[14]

Further evidence for a sequence of phones comes from word divisions in Gothic.

2.6.2 Word divisions in Gothic

Although Gothic shares many features with the Latin and Greek orthographies, it differs significantly as to how it divides words at the ends of lines in manuscripts. In Latin

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[12]The graph for <h> resembles an h. The u is represented by a graph similar to an upside-down and reversed u Moreover, the graph for w resembles a capital Y By contrast, Wulfila's symbol for <h̯> as illustrated by (•)(Codex Ambrosiani) or ⊙(Codex argenteus), bears no similarity to <h>, <u>, or <w> Although this does not provide stark evidence for a contrast between <h̯> and <hw> or <hu>, it does show that Wulfila was not trying to depict a similarity between them.

[13]I assume that there was something different about the labialised series from the plain voiceless stops that Wulfila seemed to sense and that is was for this reason that he treated their complexity as a cohesive unit

[14]Although there is no law stating that Wulfila must be consistent throughout his orthography, the evidence would indicate that Wulfila was indeed fairly consistent Each phoneme had its own grapheme Moreover, where secondary articulations were part of the phoneme itself as in [kʷ] and [hʷ], the graphs <q> and <h̯> respectively represented the secondary articulation without requiring a string of graphs to do so

the "rule was to divide clusters before the last consonant, with the exception of liquids and glides after stops. . .compare Latin *lin'gua* [liŋ.gya] to Gothic *ussugg wuþ* [suŋg.uuþ]" (Vennemann 1985b: 211). By contrast, the division of clusters in Greek put as many consonants on the next line as could begin a word (Vennemann 1985b: 211). However, in Gothic the rule was simply: "The last and only the last consonant letter of an intervocalic consonant letter group is transferred to the new line" (Vennemann 1985b: 211). From among the hundreds of word divisions, there were only a few exceptions to this rule as the statistics in (7) indicate.

(7)	i)	C/j	316x		/Cj	1x	*(fra þja)*
	ii)	C/w	78x		/Cw	none	
	iii)	CC/j	51x (Codex Argenteus)[15]				
			16x (Codices Ambrosiani)	/CCj	1x	*rkj*	
	iv)	CC/w	6x (Codex Argenteus)				
			5x (Codices Ambrosiani)	C/Cw 1x		*g gw*	

(Adapted from Vennemann 1985b)

An examination of the word divisions listed in Hechtenberg Collitz (1906) from which Vennemann draws his data, reveals that the words containing the GV segments were divided according to the rule above which applied to a sequence of consonants, e.g., *idd jedun, affidd ja, usbligg wandans, usblugg wun, þairhidd jedun, trigg wos*, etc. [16] By contrast, the complex segments, <hv> and <q> were syllabified according to the single consonant rule with a high level of consistency, e.g., *sai 'hviþ, insai 'hvandans, ne 'hvundjan, ai 'hvatundjai, fair hvau, ri qis*. When there was only one intervocalic consonant, this single consonant was placed on the next line. In other words, the division was made V/CV. These word divisions

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[15] The Codex Argenteus is considered to be the best sample of Gothic and as shown above in (7), no variations in word divisions occur within that manuscript.

[16] Only one counterexample has been found, namely *trig gwa*. However, this was found in the Codices Ambrosiani which is known to be less consistent and less accurate than the Codex Argenteus. Thus, it does not provide strong evidence against the other syllabifications which are numerous and consistent elsewhere

provide further evidence that the GV segments represented a sequence of phones. Had the GV segments been perceived as a complex segment like <hv> and <q>, then we would expect them to have behaved more similarly to the complex segments with regards to word division, e.g., /CCG where the entire complex segment started the new line. However, quite the contrary situation is found. The GV segments are consistently treated as a sequence of consonants and not as a complex segment. This provides further proof that the GV segments formed a sequence of phones.

These word divisions have been argued to reveal the syllable structure of Gothic (Hechtenberg Collitz 1906, Vennemann 1985b, 1988a, etc.). Based on this syllable structure, Vennemann (1985b) and Murray and Vennemann (1983) have argued that glide strengthening took place in Gothic. Such a sound change could provide further evidence for a sequence of GV phones. If a glide were simply a secondary articulation for another consonant then it would be less likely to undergo a general sound change than would its simplex counterpart. I discuss Vennemann's (1985b) analysis of Gothic glide strengthening below.

2.6.2.1 Glide strengthening in Gothic

Vennemann (1985b) asserts that the Gothic glides *i* and *u* strengthened to the fricatives [j] and [ʋ][17] respectively. He provides a number of arguments in favour of the occurrence of glide strengthening. First, he argues that the division of words C/j and C/w coincides with the syllable boundaries in Gothic. According to the Syllable Contact Law, these syllable contacts would be more preferred if *j* and *w* represented spirants rather than if they represented glides.

Secondly, the morphophonological alternations of *w* and *u* reflect the likelihood that the PGmc. glide *u* was simply the vowel *u* in syllable margin position, e.g., *skadus*

[17]Vennemann (1985b) argues for *u* > *v* (bilabial fricative) and not *v*. He states that in the devoicing positions of a paradigm where we would expect *b* we find *f* (cf (2)) It would then follow that the postvocalic allophone of *b* was a labiodental spirant, [v], corresponding to its devoiced counterpart, *f*. Therefore, the strengthened *u* could not be *v* or else it could have been represented by <b> Vennemann also claims that it could not have been [ɣ] since this was already represented by <g> Therefore, he concludes that the strengthened glide was the bilabial fricative, [ʋ].

'shadow', *ufar-skadweid* 'overshadows'; *þiwi, þiujos* (nom., gen) 'female servant'. In these cases *'u* had merged with a preceding short vowel creating a diphthong (or perhaps monophthong). However, no alternations occur elsewhere: *lēw, lēwa* (acc., dat.) 'occasion'; *hlaiw, hlaiwa* (acc., dat.) 'grave'; *wilwan, fra-walw* 'rob(bed)'; *triggws, triggw, triggwai* (nom. and acc. sg., nom. pl.) 'reliable'. Vennemann notes that for the forms, *-walw, gaidw, triggw(s)* and *waurstw*, a vowel in word final position would have been indicated here by *u*. However, the vowel never appears in these forms as in **-walu, *gaidu, *triggu(s),* and **waurstu*. Since Vennemann rejects the likelihood <w> represented a "vocalic counterpart" in this position, he attempts to determine what <w> would have represented. He states that a fricative would be more likely to occur in these positions. In a syllable final margin, a cluster of sounds is more preferred the greater the difference in Consonantal Strength between the second phone and the first phone. Since the difference would be greater between TS than TG (where T=plosive, S=fricative, and G=glide) Vennemann concludes that *w* represented a bilabial fricative in Gothic thus providing a more preferred coda. He then claims that the strengthening of *u̯* to a (semi-)fricative would favour the assumption of a similar development for *i̯ · j*.

Another piece of evidence cited by Vennemann focusses on the contrast between *j* and *i* in loanwords. The personal name *Marja* stood in opposition to the name of the Virgin, *Maria*. Vennemann posits the syllable structure [mar.ja] and [ma.ri.a] respectively. *Maria* would have been maintained alongside *Marja* in an attempt "to render the sacred name faithfully on the Greek model, cf. also the sacred names *Iēsus, Iōsēf, Iōhannēs* (never Jēsus etc.)" (Vennemann 1985b: 215; cf. also Braune and Ebbinghaus 1981). Established loans contained <j>, e.g., *aikklēsjō* 'church', however, less common names and words retained <i>, e.g., *Zakarias, Gabriēl*. Vennemann (p. 215) claims that these facts indicate "that *j* and *i* represented appreciably different sounds" in Gothic. From this he concludes that they represented a palatal fricative and palatal vowel respectively.

One final argument forwarded by Vennemann involves the claim that if Gothic simply had a nuclear and marginal *u* and *i*, then the graphs Wulfila used for the vowels would have sufficed. Vennemann argues that the fact that Wulfila did introduce separate

graphs indicates that he did perceive them as appreciably different phones.[18]

The glide strengthening for which Vennemann argues would have first been motivated by a poor syllable contact, i.e., *C.G.* In Gothic, the glide strengthened to a fricative thereby improving the contact, i.e., *C.S.* Glide strengthening was then subsequently generalised from the contact position to all other positions by phonetic analogy (Vennemann 1985b: 217).

Vennemann's arguments for glide strengthening have implications for the argument that GV segments represented a sequence of phones. First, in his example *triggw(s)*, Vennemann argues that <w> represented [ʊ]. Thus, <w> represented an "individual" segment in a string of consonants. Moreover, for such a generalised sound change to have occurred, we would only expect that glides which were "individual segments" and not secondary articulations would have been affected. That no glide strengthening has been noted for the secondary articulations of [kʷ] and [hʷ] also supports such an argument. In sum, the strengthened glides in GV, <j> and <w>, could only have resulted if the original Gothic glides had been separate phonemes and not secondary articulations.

2.6.3   Summary of arguments for a sequence of segments

In this section I have argued that these GV sequences were a concatenation of segments rather than complex segments. First, if these sequences were to have represented complex segments, why did Wulfila not simply create a new sign as he had done for <ƕ> and <q>? Moreover, the frequency with which GV forms were divided as CC/j (e.g., *idd·jedun*) and CC/w (e.g., *trigg wos*) provides overwhelming evidence that GV segments were treated as a sequence of segments and not as single complex segments. Furthermore, if these segments were in fact complex segments, then it would be difficult to argue for glide strengthening in Gothic as do Vennemann (1985b) and Murray and Vennemann (1983) since it would be difficult to motivate a general sound change to affect a secondary articulation within a complex segment. Inasmuch as there is strong evidence that the GV segments

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[18]Vennemann (1985b: 215-6) also notes that Wulfila had borrowed the Greek *Y* to represent what we transliterate as <w>. By the fourth century, this graph no longer represented [u] in Greek but some consonant which is now [v] in Modern Greek. Vennemann takes this as further evidence for his [ʊ].

included a strengthened glide, then this would provide support for the claim that the glides were separate phones and not secondary articulations.

2.7   Preliminary conclusions

In this section I have attempted to reconstruct various aspects of the Gothic phonology as it relates to the GV segments. This investigation has been made on the basis of the written evidence, the only evidence which we have of Gothic. In light of the discussion from the above subsections, the following conclusions can be drawn with regards to the phonetic identity of the GV segments:

(8)   i)   <ddj> =   [dj]   (where [j] is a palatal fricative)
       ii)   <ggw> =   [gʋ]

These correspondences are established based on three conclusions drawn from the discussion in §2. First, the GV segments constituted a concatenation of phones (cf. §2.6). Secondly, the double-graphs represented simple voiced plosives occurring word-medially following a vowel (cf. §2.4). Lastly, I follow Vennemann (1985b) by assuming that <j> and <w> represented fricatives in Gothic which resulted from glide strengthening.

In the next section I investigate the phonological system and orthographic conventions in Old Norse to determine the phonological-orthographic correspondences for the GV segments there.

3.0   Northern Germanic — Old Norse

The language of the Common Nordic period is evidenced by Runic monuments and inscriptions from the 3rd to 8th centuries. Subsequently written records in Old Norse began to emerge. Old Norse and its descendant, Old Icelandic, have played a key role in determining the Northern Germanic development for GV. Their rich literary traditions have left behind a vast amount of documentation providing the necessary data. Moreover, since there are living languages which have stemmed from Old Norse, our knowledge of the language is significantly better than for Gothic. Furthermore, Modern Icelandic is well

known to be a very conservative language with regards to language change and therefore also facilitates an interpretation of the earlier stages of the language.

Although Old Norse better represents allophonic variation than does Gothic, Old Norse differs from Gothic by its lack of orthographic standardisation (Valfells and Cathey 1981:8). This variation can be explained by the long period of time over which texts were copied and recopied. Moreover, unlike Gothic where the texts stem from one main source, namely Wulfila's Bible, Old Norse texts were written by many people in many different regions. These texts also reflect, therefore, the regional variation of the dialects in which they were recorded.

In this section I will first present the phonemic inventory of Old Norse. Next I will focus on the obstruents in order to better determine what the GV double-graphs represented. I will then investigate the phonetic identity of the glides and will provide evidence supporting the claim that the GV segments represented a sequence of phones and not complex segments in Old Norse. In conclusion, I will outline my tentative conclusions for the phonological-orthographic correspondences in this dialect.

3.1   Phonemic inventory

The inventory presented below as adapted from Faarlund (1994:42) bears strong agreement with the multitude of inventories posited by other scholars (cf. Voyles 1992, Valfells and Cathey 1981, Robinson 1992).

(9)   Phonemic inventory of Old Norse

labial	*interdental*	*dental alveolar*	*palatal*	*velar*	*glottal*
p		t		k	
b		d		g	
f	þ	s			h
m		n			
		l			
		r			
u̯/v[19]			i̯		

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[19] I have indicated the variation between the different inventories proposed by including both *u̯* and *v*. For a discussion of this variation, cf. §3.2.

3.1.1 The obstruents

No voiced opposition exists within the fricatives at the phonemic level. However, /f / and /þ/ had voiced allophones word medially and finally. In the case of /þ/, its voiced allophone was represented by its own grapheme, <ð>. By contrast, only one graph, namely <f>, signified both [f] and [v]. This may have been to differentiate between the two v's, namely the allophone of /f/ and the strengthened glide <v>.

With regards to voiced stops, some have claimed that /b/ and /d/ had only voiced stops as allophones (cf. Robinson 1992). Voyles (1992), however, argued for a more varied behaviour of these voiced stops:

(10) /b/ →   [v]/   V, l or r____
         →   [b] elsewhere and in gemination

      /d/ →   [ð]/   V or r____
         →   [d] elsewhere and in gemination

      /g/ →   [ɣ]/   V____V
         →   [g] elsewhere and in gemination

It becomes clear that the stop allophones would have occurred word medially for <gg>. Rask (1976: 25) also claims that the double consonants of Old Norse were pronounced "plain and hard".

Velars have a special behaviour in Old Norse in general. Both /k/ and /g/ underwent palatalisation before a front vowel, especially i or j [i̯].

(11) /k/ →   k ʲ/____   V
                          [+front]
      /g/ →   g ʲ/____   V
                          [+front]

Moreover, gemination of velars following V̆ and before <j> (and sometimes w) also occurred:

(12) a) VSC__: *heyra* 'hear'   cf. Go. *hausjan* 'hear'
      b) VSK__: *yrkja* 'work'   cf. Go. *waurkjan* 'work'
      c) VS___: *setja* 'set'   cf. Go. *satjan* 'set'
      d) VK___: *leggja* 'lay' (< *'lagja*) cf. Go. *lagjan* 'lay'
                                                (from Suzuki 1991: 174-175)

The results of this gemination shown by the form (12d) are identical to the results of GV. Suzuki argues that velars are of intermediate strength which contribute to their different behaviour in comparison to that of other stops.

3.1.2   Velars or palatals?

The above discussion illustrates some of the idiosyncrasies of <g> and <k> in Old Norse. One question that warrants investigation is whether the <g> preceding the <j> in the GV forms was in fact a velar. Although velars are shown to palatalise in this environment, did [g] take on more than simply a palatal secondary articulation? Or did the velar articulation become a palatal stop articulation?

Numerous linguists claim that the Old Norse pronunciation was in fact at the velar point of articulation (cf. Rask 1976, Glendening 1993, Valfells and Cathey 1981, Voyles 1992, Robinson 1992). Such a pronunciation is substantiated by later pronunciations of many GV lexical items. For example, the word *egg* has the following cognates: Swedish *ägg*, Danish *ægget* ('the egg'), and Icelandic *egg*. All forms are related to the Old Norse verb *eggja* 'to egg on'. All the modern reflexes have a velar articulation according to the sources found (cf. Bredsdorff 1956, Vickner 1914, Glendening 1993).

Not all scholars concur, however, with the above claim of a velar articulation. Noreen (1970: 40-41) states that <g> was a velar stop in gemination, however, when it preceded a palatal vowel or glide, it took on a palatal articulation even when it formed part of a geminate, e.g., *leggia*. By contrast, when <gg> preceded a bilabial vowel or glide, it retained its velar pronunciation, e.g., *hǫggua*. Noreen (1904) continues this argument in his grammar for Old Swedish.

Even Gordon (1957:269) indicates that there was a period of palatal articulation. His statement on the subject, however, is one that indicates that a change was in process. According to Gordon (1957: 269), the velar plosive was "in the process of palatalization in

the later half of the thirteenth century." Thus, the palatal articulation, where it did take place, was a later development following the operation of Holtzmann's Law.

3.1.3 Geminates

Having established that <gg> did in fact signify a stop consonant, it is important to consider consonant length. Although my conclusions for Gothic did not include geminate obstruents, the same results cannot be assumed for Old Norse. Today, consonant length is basic or underlying in Modern Icelandic. Many linguists also argue that consonant length was also contrastive much earlier in Old Norse (cf. Glendening 1993, Robinson 1992, Noreen 1970, Gordon 1957, Noreen 1904,). If this is indeed the case, then it would follow that <ggj> and <ggw> comprised geminate stops followed by glides.

3.2 Glides

The glide <j> is uncontroversial in its representation of [i̯] in the literature. This glide along with its vocalic counterpart were able to cause *i*-umlaut. Furthermore, <j> patterned with the front vowels in triggering the palatalisation of velars as shown in (11).

The "glide" <v> is, however, controversial. Two interpretations exist along side one another. The first claim is that <v> originally represented the labiovelar glide [u̯]. Traditionally, the development of GV was assumed to be u̯ > u̯u̯ ggu̯. This sequence of changes maintained the glide [u̯]. The second interpretation argues that <v> was the labiodental fricative [v]. This argument is based strictly on the orthography, e.g., *hǫggva* (Schrijver 1991). The contrast in interpretations of this phone explains why linguists seem uncertain as to how to classify this "glide". Some group [v] with [i̯] in their inventories (cf. Valfells and Cathey 1981) while others consider it to have strengthened adequately that they group the "former" glide with the obstruents (cf. Voyles 1992).

Both Voyles (1992: 128) and Robinson (1992: 84) posit the development of [u̯] to [v]. Robinson tracks the development of [u̯] as strengthening first to [β] and then to [v]. Likewise I will assume that in Old Norse the original GV glide was [u̯]. However, I will adopt Voyles' and Robinson's proposals of strengthening from [u̯] to [v] and that this dialect

specific change occurred subsequent to GV.[20] Noreen (1970: 181; cf. also Vennemann 1988b, Glendening 1993) notes that *hw* > *kv* by the beginning of the fourteenth century in West Norwegian. This development illustrates that there was a change in the North Germanic languages which strengthened the labiovelar glide, *u̯* · *v* (cf. Chapter Four §2.4).

Having tentatively determined the phonetic identity of the velar plosives and semi-vowels, the next question to be addressed regards whether the GV segments were complex segments or a concatenation of phones.

3.3   Complex segments or sequence of segments?

Old Norse does not have any complex segments phonemically. Palatalised and aspirated consonants are predictable and therefore allophonic rather than phonemic in nature. Without the precedence for phonemic complex segments in Old Norse, then it would appear that the GV segments did not constitute complex segments. Any secondary articulations which would appear as part of the GV segments would thus be predictiable and allophonic. Further evidence for a string of segments in GV comes from the subsequent sound changes that altered or affected the GV output.

First, the Proto-Germanic glide [u̯] has been argued to have strengthened to the fricative [v] in a development subsequent to GV. As I have argued for Gothic, glide strengthening affected individual segments and not secondary articulations.

Secondly, some root vowels of GV underwent umlaut, e.g., ON *glǫggr* 'sharp-minded', cf. Go. *glaggwuba*, OHG OS *glau*. According to Voyles (1992: 119) "/a/ > /ǫ/ if followed by /u(:), w/ in the next syllable." An original /a/ can be posited for the Old Norse stem based on a comparison with its Germanic cognates. This vowel then underwent *u* *u̯*-umlaut, a partial non-adjacent assimilation whereby the vowel took on the labial quality of the following glide (cf. Lehmann 1992: 213). The [u̯] was subsequently lost as part of a general deletion of [u̯] which occurred late in Old Icelandic (cf. Voyles 1992). This umlaut and glide loss would support the argument that the glide was a separate segment in a

[20]Such an interpretation fits with the development of the PIE -*u̯* in GV. It also fits with the reflexes of GV in Gothic (which underwent strengthening later) and the West Germanic reflex diphthong + heterosyllabic glide. The strengthened glide can then be explained as the reflex of a general strengthening of *u̯* · *v* that occurred later in North Germanic.

concatenation of phones and not a secondary articulation.

3.4   Preliminary conclusions

Based on the discussion and arguments outlined above, the following preliminary conclusions can be drawn:

(13)   <ggw>   =   [gg ʋ]   (later [ggv])
        <ggj>   =   [gg̑ʲi̯]

The postulation of geminates is based on the existence of geminates in Old Norse and Modern Icelandic as noted above in §3.1.3. The glides are then fully articulated and maintained in many instances following the velars. Only the form <ggj> will be considered to have a secondary articulation in addition to a fully articulated glide. This conclusion is based on the prevalence of palatalisation in Old Norse as illustrated above in §3.1.1 (11). No similar assimilatory process is argued for the labial glide.

4.0   Summary

Any analysis of the sound changes involved in Holtzmann's Law must include a phonological interpretation of the graphs involved. In this chapter I have attempted to establish the preliminary destination for my analysis of GV. By investigating Wulfila's orthography, I hypothesised that the stop double-graphs in Gothic were merely an orthographic convention to indicate to the reader that medially following a vowel, a stop articulation was required. Since Gothic had no geminates, I argued that these stops were of simple rather than geminate length. Moreover, I attempted to prove that the GV segments constituted a concatenation of phones rather than a complex segment. I drew evidence from a variety of sources including the adoption of <ƕ> and <q> to represent complex segments in Gothic, word divisions in manuscripts and Vennemann's (1985b) arguments for glide strengthening. The glides were argued to have undergone strengthening to a fricative articulation. Based on the evidence, I concluded that in Gothic, <ddj> represented [dj] whereas <ggw> signified [gʋ].

Since Old Norse still lives on today in its descendant Scandanavian languages,

evidence for its phonology is stronger and agreement is more widespread than it is for Gothic. For this language, I argued that the forms <ggj> and <ggw> signified [ggɥ] and [ggᵏj] respectively. In light of the prevalence of palatalisation in Old Norse, there still remains the question as to whether or not the palatalisation was a later development.

The results outlined in this chapter represent an investigation of the "synchronic" (and partially diachronic) details of the languages involved. The discussion has raised some issues related to the phonological-orthographic correspondences in Old Norse and Gothic. First, did the geminates in the Old Norse GV forms reflect a secondary process of gemination? Or should the simplex stops posited in Gothic be considered geminates? Secondly, the <dd> in the Gothic forms appears to be an anomaly. Could it be that the original strengthening produced velars which then underwent subsequent fronting to the alveolar/dental point of articulation under the influence of the palatal glide? Furthermore, could the secondary articulation in the Old Norse <ggj> be considered a later development? If any of these scenarios are true, then they have implications for the analysis of GV.

Rather than assuming that the forms described in this chapter are the forms which resulted from Holtzmann's Law, I accept that they may best be considered further developments from the reflexes of GV. It may become expedient to revise these conclusions based on my analysis of the *Verschärfung* in Chapter Four. Nevertheless, any revisions that are required must still be congruent with the issues outlined herein.

I now turn to a review and critique of past approaches and theories posited for the sound changes which produced these segments.

Chapter Three
ACCOUNTING FOR THE *VERSCHÄRFUNG*:
PAST PERSPECTIVES

0.0   Introduction

Over the past century and a half since Holtzmann first drew attention to the *Verschärfung*, numerous attempts have been made to account for the phenomenon. This chapter will examine the proposed sound changes for GV. I will first provide an overview of past explanations forwarded for GV including the traditional, accent-based and morphological approaches to the problem. In §2 I will introduce the reader to some of the roles attributed to laryngeals by various approaches. Following these sections, I will outline and critique two recent theories which have attempted to account for the GV developments. Section 3 will discuss Suzuki's (1991) syllabic approach followed by Davis and Iverson's (1996) feature spread model in §4. Finally in reflection of the analyses presented in this chapter, I will outline critical factors which I will investigate in my own analysis which follows in Chapter Four.

1.0   The Germanic Verschärfung — Past Perspectives

This section outlines earlier explanations assigned to Holtzmann's Law. First, the two stage traditional explanation is described. This discussion is followed by a brief overview of past approaches which have tried to account for the GV data including accent-based explanations and morphological treatments.

1.1   Traditional explanation of GV

A traditional description of the Germanic phenomenon breaks the development into two stages (Suzuki 1991, Collinge 1985, Beekes 1972, Tanaka 1970, Austin 1958, H. Smith 1941). First, the PIE glides *į* and *ų* geminated or lengthened intervocalically when the preceding vowel was short. This development is illustrated in (1):

(1)   Stage One
      i)   į> įį/ V̆_V   (where V represents either V̆ or V̄)
      ii)   ų> ųų/ V̆_V

In Stage Two, these geminate glides underwent further changes. In Gothic, $\underset{\sim}{jj}$ and $\underset{\sim}{uu}$ became <ddj> and <ggw> respectively, whereas Old Norse developed the reflexes <ggj> and <ggw>. By contrast, the West Germanic geminate glides underwent no further changes. Thus, the West Germanic reflex of GV was simply a sequence of a diphthong plus glide. The Stage Two developments are outlined below in (2):

(2)   Stage Two

	Gothic	Old Norse	West Germanic
$\underset{\sim}{jj}$	<ddj>	<ggj>	V$\underset{\sim}{jj}$
$\underset{\sim}{uu}$	<ggw>	<ggw>	V$\underset{\sim}{uu}$

Most discussion of GV centres around the Gothic and Old Norse developments because of the obstruent reflexes. This trend will become more apparent throughout the remainder of this chapter.

1.2   Alternative approaches to the traditional description

Other approaches have been forwarded to account for the two stage development. Among these are accent-based and morphological explanations.

1.2.1   Accent approaches

The earliest "explanations" posited for the *Verschärfung* focussed primarily on Stage One of the traditional description. These early approaches implicated PIE word-accent as the motivating factor behind the sound changes (Collinge 1985: 94). Holtzmann's original hypothesis claimed that the glides geminated after a long preceding vowel when followed by an accented syllable (Collinge 1985: 94). The opposite environment was contended by Kluge who argued that the conditioning environment was a preceding accent on a short vowel (cf. Collinge 1985:94). Nevertheless, any explanation which relied strictly on accent was refuted by Gothic strong verbs such as *hliggwan*, *hlaggw*, *bluggwum* and *bluggwans* where accent placement was variable and thus incapable of accounting for all parts of the verb (Collinge 1985: 94). GV effects on such strong verbal paradigms have since been attributed by many linguists to regularisation by analogy and levelling (cf. Lehmann 1952:38, Collinge 1985, Lindeman 1964). In this latter scenario, GV may be

linked to both accent placement and levelling where the GV segments were extended to the principle parts of the verb which had not undergone GV by virtue of accentuation.

One further blow has been wielded at strict accent based theories. Streitberg (as cited in Lehmann 1952) argued that the Germanic accent and not the PIE accent was responsible for the glide lengthening. However, if the Germanic rather than PIE accent is implicated in GV, no account could explain the occurrence of a "single resonant after the first syllable, such as Go. *awi-lup* 'thanks'" where glide lengthening would have been expected nor "why *w* and *j* were lengthened in some words but not in others with the same accentuation, such as *triggws* and *ǣr*'" (Lehmann 1952: 38-9). From this discussion, it becomes clear that no explanation based solely on accent is capable of accounting for all the GV data.

1.2.2 Morphological approaches

Various attempts have been made to explain Holtzmann's Law based on morphology. In this subsection I discuss Kuryłowicz' (1967) oft cited approach as well as Fulk's (1993) more recent revival of morphology applied to GV.

In his three step process, Kuryłowicz (1967) argues that the sequences *-ij̄-* and *-uw̄-* were the zero grades of Sievers-Edgerton reflexes (Collinge 1985: 97). To illustrate his hypothesis, he claims that the zero-grade sequence *CuwV* corresponded to the full-grade sequence *CewV²* (cf. Collinge 1985: 97, Fulk 1993: 343). According to Kuryłowicz, this zero-grade sequence was incorrectly associated with the full grade sequence *CewwV* which was subsequently levelled throughout the paradigm. The second step of his hypothesis, which is the only phonetic aspect, claims that the positional variants *eRR(V)* [3] (e.g. *euwV*) and *eR(#)* (e.g., *eu*) emerged word-medially and word-finally respectively. In step three, *RRR*

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[1]Lehmann (1952: 36) proposes the development +*awiz* · *ǣr* 'sheep'

[2]The full ablaut alternation would be *eu* (e-grade)/*au* (o-grade)/*uw* (zero-grade), e.g., +*brewan* +*braw(e)* +*bruwana* 'to brew' from the root +*bhreu*. The zero grade is based on the change *R* > *uR* in Germanic

[3]Kuryłowicz uses *R* to represent the resonant or glide, e.g., [w], and *R̥* to represent its nuclear counterpart, i.e., its corresponding vowel, e.g., [u].

(e.g., *uŋ̣u̯V*) replaces *R̥R* (e.g., *uu̯*) in a purely morphological development (Collinge 1985: 97).

Kuryłowicz's theory has received little if any support. I concur with Fulk's (1993: 343) criticism that there is no "motivation for such an analogical development." In his critique of Kuryłowicz's hypothesis, Fulk cites the example *+bruu̯-*. According to Kuryłowicz' theory, this form was levelled into the full grade forms *+hreu̯-* and *+hrau̯* producing *+breuu̯-* and *+brauu̯-*. He then claims that the ablaut alternation *+breu̯-/ · brau̯-/+bruu̯-*[4] is fully parallel to other ablaut alternations such as *-stel- · stal- -stul-*. The existence of such parallels counters any possible motivation behind Kuryłowicz's claim of a special analogical development for GV.

Despite his criticism of Kuryłowicz' morphological hypothesis, Fulk (1993) tenders his own morphological solution. He discredits the possibility of a purely phonological answer to GV and claims that "morphology surely holds the key. The motivation for morphological restructuring is particularly clear in verbs with *Verschärfung*" (Fulk 1993: 343). Fulk's (1993: 344) theory is founded on the claim that Proto-Germanic likely underwent paradigm regularisation "since it was a language that apparently had very little of this sort of alternation to begin with. There simply are not many places in Proto-Germanic morphology where a diphthong could have alternated with a biphonemic sequence".

Fulk treats verbs ("conjugations") and nouns/adjectives ("declensions") separately. He claims that GV affected strong verbs which subsequently went "over to weak conjugations"(1993: 344). Since allomorphic alternations between diphthongs and biphonemic sequences were not common in Proto-Germanic, the geminate glides were levelled through the paradigms. Two examples of GV, however, did not result from such levelling. Fulk argues that the verbs Go. *daddjan* and OSw. *dæggja* 'suckle' were originally weak. These verbs were assumed to stem from PGmc. *+daii̯-* which was supposedly a reflex of PIE *+dhoi̯-ei̯e*. Thus, the geminate glides were already present in the stem

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[4]According to Kuryłowicz' theory, there would be one final stage of development, namely *hruu̯ > hruuu̯-*.

inherited from Proto-Germanic.

In his account of GV in nouns and adjectives, Fulk claims that gemination did not result from one single cause. Data must be examined on a case by case basis. Etymology suddenly plays an important role in determining the analysis of each piece of data. However, relying on etymologies is difficult since many of them are in dispute. One clear cut case is cited. The Proto-Germanic paradigm for 'two' contained "true diphthongs"[5] in many of its forms, e.g., +*twai*[6] masc. nom. and +*twaimiz* masc. dat. (cf. Go. *twaim*, OE *twǣm*). The genitive form, however, +*twajōn* did not originally contain a "true diphthong". A diphthong was levelled through the paradigm producing the geminate glides found in the genitive form. These geminate glides were then purported to undergo GV strengthening in Stage Two, e.g. +*twajj-* · Go. *twaddje*.

Fulk's other examples are non-controversial. His assertion that ON *þriggja* 'of three' was formed by analogy with ON *tveggja* 'of two' is well supported in the literature (cf. also Lehmann 1952: 45). Moreover, "deverbative"[7] nouns and adjectives containing the GV segments arose after GV caused the lengthening of glides in the verbs from which the nouns and adjectives were derived, e.g. ON *hnøggr* 'stingy' was derived from the verb *hnøggva*.

Although these latter explanations are convincing, several problems weaken Fulk's hypothesis. First, a different treatment of verbs and adjectives/nouns reduces the explanatory power of his theory. Why would the lexical classes to which the words belong create different developments which ultimately produced identical GV segments in both "conjugations" and "declensions"? Simply, they would not be expected to do so. Secondly, Fulk fails to provide examples illustrating how the paradigm regularisation would have worked from start to finish in either the conjugations or declensions. Instead, for instance,

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[5]Fulk distinguishes diphthongs from biphonemic sequences where VG are treated as two separate segments. He claims that there are very few examples in Proto-Germanic morphology where diphthongs and biphonemic sequences alternate with each other, e.g. +*twa(i)jōn* (Fulk 1993: 344).

[6]This is precisely the form found in Gothic

[7]I cite here the term used by Fulk (1993), however, thanks to Doug Walker who noted that this term is better known as "deverbal"

he discusses cases such as how *w* was levelled through the OE paradigm for 'knee', e.g., *cnēo(w)* (nom.), from the genitive and dative forms. He then states that "while the weak stems thus extended *w* to the strong ones, the latter could extend their diphthong to the former." Fulk then concludes, "Thus from a paradigm that originally had nongeminate -*w*- throughout, Old English developed one that was indistinguishable from a paradigm with original -*ww*- throughout" (p. 344). Although informative, he does not then apply this levelling to a GV example. Moreover, in his most transparent example which he takes from GV, namely that of Go. *twaddje* and ON *tveggja*, Fulk presents the source of the levelled diphthong, but never actually outlines the development. He simply states (p. 346), "These contained true diphthongs, while gen. **twajōn* (*-ēn*?) did not, with the result that the diphthong was levelled into the genitive" and then moves on to the next example. Such examples of a complete development could have strengthened his arguments, but unfortunately he does not avail himself of these examples. Moreover, this proposal fails to provide any generalisation for the problem at hand.[8]

Both morphological approaches discussed above fail to provide a plausible solution to the Germanic *Verschärfung* for one major reason. Even if the reader accepts the explanations they propose for the gemination of the glides implicated in GV, such hypotheses only cover the development covered by Stage One of the traditional view. Neither approach attempts to account for the subsequent strengthening of the glides to obstruents in Gothic and Old Norse. Without a plausible proposal for the subsequent development of the GV obstruents, any analysis remains incomplete. Thus at this stage, a strictly morphological approach to GV does not appear to be promising.

This leads us to search elsewhere for a solution. Other linguists argue that laryngeals hold the key to GV. I now turn to a discussion of laryngeals and GV.

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[8] This article as it deals with levelling is nevertheless one of the few studies of its kind relating to Germanic. Although Fulk's arguments leave the strengthening aspect of GV unexplained, they do provide insight needed for the post-GV developments of a GV analysis (cf. Appendix).

2.0 Laryngeals and GV

Laryngeals have played an important role in IE phonology as they have been applied to various problems. GV is no exception. Numerous laryngeal approaches have been posited to account for the GV developments. For the most part, however, these approaches have provided little more than a description of the posited placements of these segments in the PIE reconstructions of the Germanic reflexes (cf. Lehmann 1952, Lühr 1976, H. Smith 1941, Rasmussen 1990 and Jasanoff 1978). Two exceptions are noteworthy. H. Smith (1941) and Jasanoff (1978) attempt to explain how the loss of these laryngeal segments provided the conditions for the GV developments to occur. These accounts are provided below.

2.1 H. Smith (1941)

H. Smith (1941: 94) argues that under certain accentual conditions, the loss of the laryngeals produced a new series of semi-vowels. These new glides were articulated as "long voiceless semi-vowels with strong aspiration" where the aspiration preceded the articulation of the glides. According to Smith, these new semi-vowels, *hw* and *hj* were responsible for the development of GV illustrated below in (3).

(3a)
$$\text{IE } hj > \text{Gmc. } [\gamma \mathring{\text{i}}] \begin{cases} \text{West Gmc. } [\mathring{\text{i}}\mathring{\text{i}}] > [\text{I}\mathring{\text{i}}] \\ \text{Old Norse } [\text{g}\mathring{\text{i}}] \\ \text{Gothic } [\text{g}\mathring{\text{i}}] > [\text{dd}\textation{3}] \text{ or } [\text{d}\textation{3}\mathring{\text{i}}] \end{cases}$$

(3b)
$$\text{IE } hw > \text{Gmc. } [\gamma \mathring{\text{u}}] \begin{cases} \text{West Gmc. } [\mathring{\text{u}}\mathring{\text{u}}] > [\text{ɒ}\mathring{\text{u}}] \\ \text{Old Norse } [\text{g}\mathring{\text{u}}] \\ \text{Gothic } [\text{g}\mathring{\text{u}}] \end{cases}$$

The strengthening of [h] to the voiced velar fricative [ɣ] is attributed to Verner's Law.[9] This voiced velar in [ɣi̯] and [ɣu̯] then strengthened further to a plosive producing

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[9]This argument contradicts the assumption that Verner's Law is a lenition process. The development *h* ɣ, however, would be more plausible if *h* were considered to be a fricative rather than simply aspiration (cf Chapter Four, §2) This would presuppose a weakening of the laryngeals and not a complete loss of these segments.

the sequences [gi̯] and [gu̯] respectively. In Old Norse and Gothic, [gu̯] was represented orthographically as <ggw>. Gothic and Old Norse differ, however, with respect to the reflex [gi̯]. In Old Norse this was simply written as <ggj>. In Gothic, however, the orthography <ddj> reflects later assimilative changes resulting in the clusters [ddʒ] or [dʒi̯], according to H. Smith.

Smith succeeds in accomplishing two things with his theory. First, he clearly maps out the phonological developments of the GV reflexes. Moreover, he provides a plausible identity of the phones depicted by the orthography. Unfortunately, Smith fails to provide any motivation for the sound changes which he postulates.[10] Without motivation his proposed changes, although plausible, remain unsubstantiated.

2.2   Jasanoff's (1978) hiatus breaking approach

Jasanoff's (1978) theory is motivated by the loss of laryngeals intervocalically in Proto-Germanic. An example of his development is illustrated below in (4) (adapted from Suzuki 1991: 165-166):

(4)	**Process**	**Example**		**Explanation**
(i)	-AU.HA-	PIE	ˉbheuh₂e i̯e-	
(ii)	-AU.A-	PGmc.	ˉbeu.i̯-	laryngeal loss
(iii)	-AU.WA-		ˉbeu̯u̯i̯-	glide insertion
(iv)	-AW.WA-		+beu̯u̯i̯-	u̯u̯ reinterpreted as u̯u̯
(v)		ON	byggvi 'dwell'	

(A = any V, U = i or u, H = laryngeal, W = glide, . = syllable boundary)

The loss of the intervocalic laryngeal in (4ii) would have produced a hiatus. Jasanoff (1978: 80) argues "that there is no need to suppose that such a sequence would automatically have developed further to *bewi̯-, with a transfer of the second element of the diphthong to the

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[10]Although H. Smith ascribes the initial strengthening of [h] > [ɣ] to Verner's Law, no other motivations are provided for the remainder of the changes he posits

following syllable."[11] The hiatus created by the loss of the laryngeal is thus filled by a "euphonic glide" (p. 80). The result of this glide insertion in (4iii), namely *-eu̯u̯i-, would have contrasted with the phonologically plausible sequence *-eu̯i-, where only the former sequence would undergo GV development. The intervocalic sequence -u̯u̯-, according to Jasanoff (p. 80) may then have been reinterpreted as the geminate glides -u̯u̯-.

Jasanoff's explanation as discussed thus far accounts for the development outlined in Stage One of the traditional view. His approach is innovative and well motivated. The idea of a hiatus is mentioned briefly in Kuryłowicz (1967); thus Jasanoff's proposal is not alone in its recognition of a possible hiatus. However, like many other linguists, Jasanoff fails to motivate the developments of Stage Two where the geminate glides strengthen to become obstruents. Suzuki (1991) modifies Jasanoff's approach to explain Stage One of GV and then attempts to motivate the problematic Stage Two developments. This latter theory is discussed below in §3.

In the sections which follow, I outline and critically examine two recent theories proposed to account for Holtzmann's Law: Suzuki's (1991) syllabic approach and Davis and Iverson's (1996) feature spread theory. In conclusion I sketch the foundations of my own analysis in response to the shortcomings and strengths of the theories discussed herein.

3.0 Suzuki's (1991) syllable based approach to GV

3.1 Background Theoretical foundations

Suzuki (1991) assumes a two stage development analogous to the traditional description of GV. Stage One (GV1) is based on Jasanoff's (1978) laryngeal account. In Stage Two (GV2), Suzuki investigates the individual dialect developments of glides as a key to GV. He attempts to motivate all stages of the phonological developments based on the Preference Laws outlined by Murray and Vennemann (1983), Murray (1988) and Vennemann (1988a). Suzuki's explanations of the motivations for the sound changes outlined in what follows rely heavily on the Head Law, the Coda Law and the Syllable

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[11] I maintain Jasanoff's (1978) use of '*' in this quote to denote a reconstructed form. In all other instances I use '+' to indicate reconstructions.

Contact Law. He also refers to the Consonantal Strength Scale to determine the relative strength of the segments in question (cf. Chapter 1, §4 for an outline of the Preference Laws and Consonantal Strength Scale).

3.2   Stage One -- Building on Jasanoff's (1978) theory

Stage One of Suzuki's theory is based on Jasanoff's (1978) hiatus breaking approach (cf. §2.2). Suzuki agrees with Jasanoff's characterisation of GV, but also notes three important issues left unresolved by this approach. First, why were only the glides i and u involved in the gemination? Since glides form a natural class with the other sonorants, +r, +l, +m, and +n, why were these latter phones not also subject to similar treatment? Secondly, why did GV1 only occur when the preceding vowel was short? And third, why did the loss of the laryngeal not simply trigger resyllabification producing the sequence -A.WA-? In an attempt to address these unresolved issues, Suzuki employs the Preference Laws.

3.2.1   Glides and resyllabification

Recall that the disappearance of the intervocalic laryngeal created a hiatus which was filled by the insertion of a glide, according to Jasanoff (1978: 80). Suzuki reinterprets this "gemination" in terms of the Syllable Contact Law and the PIE ablaut to explain why this process only affected glides in short diphthongs.

When a laryngeal was lost following a consonant, the following sequences would have resulted (where T=obstruents, R=resonants, and G=glides):

(5)   Less preferred <————————————————————> More preferred
             -VT.V-   -VR.V-   -VG.V-

Although none of these contacts represent an ideal or preferred contact, they were not equal in their degree of preference as shown in (5). The less preferred syllable contacts were easily ameliorated by resyllabification creating the sequences, -V.TV- and -V.RV-. By contrast, the resyllabification of the glide would not have marked a tremendous improvement. Furthermore, the establishment of a glide in the syllable head would have created a less than preferred syllable head. Thus, the glides were treated differently than

their resonant counterparts.

Further evidence for the differential treatment of glides and resonants is found in the Germanic transformation of the PIE ablaut system. The syllabic resonants were restructured as a sequence of *u* + the nonsyllabic resonant, *i.e.*, -r̥ · · ur, +l̥ · · ul, -m̥ · · um, and · n̥ · · un. At this stage, the resonants ceased to function on par with glides and vowels and became further dissociated from them. Thus, "there was no longer phonological motivation available for subsuming *R* under a class including *V* and *G* on the criterion of potential syllabicity" (Suzuki 1991: 169). Resonants lost their ability to form a syllable nucleus. Conversely, glides continued to exist within the zero grade of ablaut indicating that their nuclear status had persisted. Suzuki cites this as further motivation for retaining -*VG*- as a tautosyllabic cluster and analysing *G* as an integral part of the stem vowel. This unitary status of -*VG*- helped the sequence -*VG.V*- resist the resyllabification which the other sequences underwent.

Maintaining the integrity of -*VG*-, however, creates a less than optimal structure with regards to the Head Law and the Syllable Contact Law. Suzuki is thus faced with finding a solution to improve the less than preferred structure. He notes that the resyllabification of the structures -*VC.V*- > -*V.CV*- (where C=T or R) meant the complete assimilation of these sequences to pre-existing -*V.CV*- structures. Suzuki argues that the glide sequences may have also undergone a similar assimilation. The sequence -*VG.V*- may have been restructured based on -*V.GV*- but with one stipulation: the preservation of the tautosyllabicity of -*VG*-. Gemination of the glide would have produced the desired effect; the integrity of -*VG*- would be maintained, the syllable contact would be improved, and a similar restructuring based on a pre-existing sequence would be experienced. The result of this gemination was the output of GV1.

3.2.2 Short vowels and GV

The next issue that Suzuki must resolve is why gemination ensued only following a short vowel. An examination of the relevant sequence reveals the development -*VVG.HV*- · -*VVG.V*-. Like the sequence -*VG.V*-, -*VVG.V*- was under considerable pressure to "conform" to an optimal *CV* shape. Unlike the -*VG*- cluster, however, there was no similar

motivation for unifying the G with the preceding long vowel in -$VVG.V$- (Suzuki 1991: 171). Based on this latter structure, Suzuki provides three reasons explaining why only a preceding short vowel constituted the GV environment.

First, as stipulated by the Coda Law, the smaller the number of segments in the coda, the more preferred the coda will be. Thus, the sequence -$VV.GV$- would be more preferred than -$VVG.V$- since it contains no segments in the coda. Secondly, Proto-Germanic had no long diphthongs in contrast with short counterparts in stressed position. Thus again it provided no justification for tautosyllabifying the glide with the long vowel of the first syllable. Finally, Proto-Germanic lacked an ablaut alternation ÷VVG G analogous to VG/G. The nonexistence of such an alternation provides further evidence against maintaining the unitary status of VVG. Thus, with no compelling reason to retain the integrity of VVG, the simplest repair for the poor syllable contact resulting from the laryngeal loss would be the resyllabification of -$VVG.V$- > -$VV.GV$-.

Suzuki fails to utilise the bimoric preference as further evidence for his arguments discussed above. Tautosyllabification of -VG- is supported by the preference for bimoric stressed rhymes in Germanic as outlined by the Stressed Syllable Law (Murray 1991: 213). All things being equal, the bimoric cluster -VG.- would be more preferred than the monomoraic -V- resulting from the heterosyllabification of -$V.G$-, and ultimately, -$VV.G$- would be more preferred than -VVG-. Likewise, the bimoric syllable -VG.- would be more preferred than the trimoric -VVG-. Thus, Suzuki's developments for GV1 are substantiated by both syllable structure and syllable weight.

3.3   Stage Two - Independent dialect developments

Suzuki argues for independent developments of the geminate glides in each of the dialects. Although superficially the changes affecting Gothic and Old Norse appear to be the same, Suzuki immediately dispels such a claim. Instead he demonstrates how the dialect specific treatments of glides help elucidate the motivations for the sharpening effects in each of the three branches of Germanic.

3.3.1 Gothic

Suzuki associates the development in Gothic to the well known yet controversial glide strengthening in that language. He refers to Vennemann's (1985b) glide strengthening account where strengthening was claimed to have originated as a means of improving poor syllable contacts (cf. Chapter Two, §2.6.2.1). Recall that the contact -*VC.GV*- rendered a negative value signifying a poor contact. The consonantal strength of the semi-vowel increased until it became indistinguishable from the obstruents, thereby ameliorating the contact (Suzuki 1991: 173). This glide strengthening was subsequently generalised to all glides in all positions including geminate glides. Although the syllable contact *G.G* was by no means as poor as that in the original scenario above, it was in no regard optimal.[12] Nevertheless, this generalised strengthening would have produced the geminate obstruents, according to Suzuki.

One key issue, however, is left unresolved. According to Vennemann's (1985b) theory, *i* strengthened to the palatal fricative *j*. If GV2 in Gothic was simply the result of

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[12]Vennemann (1985b 213) provides a table outlining the preference of various syllable contacts

preferred syllable contact

		V V	V G	V.R	V.L	V.N	V S	V T
		G.V	G.G	G.R	G.L	G.N	G.S	G T
decreasing		R.V	R.G	R.R	R.L	R.N	R.S	R.T
offset		L.V	L.G	L.R	L.L	L.N	L.S	L.T
strength		N.V	N.G	N.R	N.L	N.N	N.S	N.T
		S.V	S.G	S.R	S.L	S.N	S.S	S.T
		T.V	T.G	T.R	T.L	T.N	T.S	T.T

——————————————————————> preferred syllable

increasing onset strength contact

T=plosives, S=fricatives, N=nasals, L=lateral liquids, R=central liquids, G=glides, V=vowels

Here the least preferred syllable contact would be *T.V* whereas the most preferred syllable contact would be *V.T*. Recall from Chapter One (§4.4) the formula used to determine the relative preference of contacts, CS(B)-CS(A). If we were to assign values to the various manners of articulation, (V=0, G=1, R=2, L=3, N=4, S=5, T=6, these values are simply for the sake of illustration), we would see that *T.V* (0-6=-6) would have a significantly less preferred contact than *V.T* (6-0=6). In fact, it would differ by 12 points. An examination of the contact *G.G* (1-1=0), however, would reveal that it is 6 points away from both the least preferred contact (*T.V*) and the most preferred contact (*V.T*). In other words, a contact with a value of 0 would be a stable contact since it would be half-way between the least preferred and most preferred contacts.

generalised glide strengthening, why was the final outcome of the development not *j* or *jj*?[13] How is it that *ddj* emerged from this apparent Gothic glide strengthening? One possibility could be the development $V_{\underline{i}}.\underline{i}V$ - $V_{j}jV$ (glide strengthening) > $V_{j}.d^jV$ (head strengthening) > $Vd.d^jV$[14] (full regressive assimilation). The same strengthening would also apply to *ɥ* which hardened to *v*. Nevertheless, Suzuki fails to fully develop and motivate the changes required for the "final product" in Gothic.

3.3.2 Old Norse

Despite the apparent similarities with Gothic's Holtzmann segments, Suzuki's involved explanation of glide behaviour in Old Norse immediately reveals a different story. The data below in (6) illustrates an interesting phenomenon in Old Norse which sheds light on glide behaviour in that dialect.

(6) a. VSC__: *heyra* 'hear'   glide disappears
     b. VSK__: *yrkja* 'work'   K = velar, glide retained
     c. VS__: *setja* 'set'   glide retained
     d. VK__: *leggja* 'lay' (< +*lagja*)   gemination of velar plosive

(S=any segment C= consonants other than *k* or *g*, K=velar)

In Old Norse, glides disappeared following the sequence -*VSC*- except when *C* was a velar plosive (6a,b) (Suzuki 1991: 174). Conversely, when *C* was *k* or *g*, the glides were retained (6b). The sequence -*VS*- added an interesting twist to the account. When *S* did not represent a velar plosive, the glide was maintained as in (6c). However, when *S* signified a *k* or *g*, there emerged what appeared to be a geminate velar stop as in (6d). It becomes

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[13]Interestingly, Vennemann (1985b: footnote 26) notes that if Gothic *j* represented a voiced palatal affricate [ɟ], then it would be placed on the strengthening scale as follows: [i] > [j] > [ɟ]. He further states that Holtzmann's Law would be easier to explain using this development. Although Suzuki (1991: 172) borrows Vennemann's argument for glide strengthening, he assumes that <ddj> represented "a cluster of voiced obstruents with whatever secondary articulations are represented by *j* and *w*." It thus appears that Suzuki has conveniently borrowed Vennemann's glide strengthening, but has not assumed the concomitant phonetic outcome of GV specified by his theory. Thanks to Robert Murray who directed me to a search of Vennemann's chronology of glide strengthening vs. GV which led me to discover this discrepancy.

[14]I have adopted Suzuki's interpretation of the graphs for this development (cf. Suzuki 1991:172).

evident that the shape and size of the sequence preceding the glide and the final segment of that sequence played a determining role in the retention or deletion of the glide (Suzuki 1991: 175). This phenomenon is a purely Nordic affair. Cognates in Gothic retained the glide in all environments and indicated no signs of gemination.

Suzuki attempts to uncover the reasons for this unusual development in Old Norse. Once again, he examines the syllable structure of the sequences. He divides -*VSGV*- between *S* and *G*. Similarly he syllabifies the longer sequence before the glide as in -*VSC.GV*-. Unfortunately, determining the syllable boundaries of -*VS.GV*- and -*VSC.GV*- fails to provide immediate insights into the problem at hand. No generalisation capable of explaining the extraordinary gemination of velars in -*VK.GV*- is captured.

Suzuki explores the possibility of an explanation parallel to that of West Germanic gemination. In this later process, consonants in the sequence -*C.G*- underwent gemination as a means to improve the poor syllable contact. However, after reviewing the conflict regarding the consonantal strength of velar plosives, Suzuki proposes that the Old Norse gemination did not involve velars as had been traditionally believed, but rather involved glides. He describes this process as a complex operation of glide strengthening (Suzuki 1991: 177). In brief, a short syllable induced strengthening by retaining the glide. Strengthening was also caused by a syllable terminating in a velar. When both of these conditions, namely a short syllable and a syllable terminating in a velar, were implicated together by the series *VK.GV*, then the result was a double strengthening. This extra process or double strengthening was the apparent gemination which Suzuki reinterprets "as an augmented effect of strengthening, whereby the affected glide, in addition to being retained, gained in consonantal strength and became what was graphemically represented by a stop sign" (Suzuki 1991: 177). The following chart outlines the possible strengthening combinations.

(7)	After nonvelar	After velar
After long syllable	0	1
After short syllable	1	2

(0 = glide loss; 1 = simplex glide strengthening; 2 = complex glide strengthening)

The sequences implicated in this discussion can be represented on a continuum illustrating their conduciveness to glide strengthening:

(8)   -VSC.__   -VSK.__   -VK.__
                      -VC.__

       ─────────────────────────────────────→ more conducive to
                                               glide strengthening

To determine why these two factors, both segmental and syllabic in nature, converged to create this strengthening, Suzuki investigates sound changes affecting the codas in Old Norse. The data he cites is provided in (9).

(9)   a.   Vns > Vs: *fást* 'love', Go. *ansts*
       b.   Vþl > Vl: *mál* 'speech', Go. *maþl*
       c.   -mp > -pp: *kapp* 'contest', OE *camp*
       d.   -nt > -tt: *stuttr* 'short', OE *stunt*
       e.   -nk > -kk: *rekkr* 'man', OE *rinc*
       f.   -rs >ss: *foss* 'waterfall', beside *fors*
       g.   -rn > -nn: *honn* 'hron', beside *horn*
       h.   -rl > -ll: *kall* 'man', beside *karl*
       i.   -ht > -tt: *nátt* 'night', Go. *nahts*

The nature of the changes affecting the examples above was to reduce the segmental complexity of the coda. In each case, a simpler coda resulted where a single consonant (9 a,b) or rather a single consonantal value (9c-i) followed the nucleus. Prior to the simplification, the coda contained two separate consonants. The change induced the complete assimilation of the prefinal consonant to either the nucleus (9 a,b)[15] or to the final

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[15]This reasoning is according to Suzuki. It also seems likely that C_1 of C_1C_2 in the coda was deleted with subsequent vowel lengthening.

consonant (9c-i). Such changes produced a more preferred coda with regards to the Coda Law. This examination illuminates the fact that the Coda Law was a very important and critical Preference Law in Old Norse.

Returning to the sequences discussed earlier in this section, Suzuki can now propose an analysis for the strengthenings or lack thereof as appropriate. With regards to the Coda Law, the cluster -CC- from -VCC.GV- constituted a less than preferred coda. The resyllabification of this sequence improved the coda and removed the glide from onset position. Once removed from syllable initial position, the glide is prevented from undergoing glide strengthening and becomes more susceptible to deletion.

The question remains, however, as to why velars invoked a different change. The sequence -VCC.GV- was subject to two competing preference laws: the Coda Law and Syllable Contact Law. According to the Coda Law, "the greater the consonantal strength of the final C, the more preferred the coda"[16] (Suzuki 1991: 180). Conversely, the greater the consonantal strength of the final consonant, the less preferred the syllable contact will be. The result of these two conflicting laws is that "extreme violation along one parameter or the other [was] remedied in accordance with the relevant requirements" (Suzuki 1991: 181). Segments located at either extreme of the Consonantal Strength Scale involved resyllabification. By contrast, velar plosives remained unaffected and did not undergo resyllabification because of their intermediate consonantal strength on the scale. Since resyllabification established the conditions for glide loss, the exceptional behaviour of velar plosives provided the environment for glide retention and strengthening.

In response to his discussion of the Old Norse GV2 development, two questions arise. First, instead of attributing the "strengthening" (glide retention and "gemination") to the velar plosives, Suzuki ascribes this "bizarre" behaviour of the sequences in (6) to the influence of the glides. This view is taken after a brief consideration of gemination processes such as West Germanic. By rejecting a parallel with West Germanic gemination,

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[16]Recall from the Coda Law (Chapter One, §4.4) that a simple coda is more preferred the less the consonantal strength of the segment (Part (b)). However, when the coda is filled by a consonant cluster, C_1C_2, the greater the increase in consonantal strength from C_1 to C_2 the more preferred the coda (Part (c)). It is to Part (c) that Suzuki appeals in this instance

Suzuki does not take advantage of previously established explanations. Since -VC_jV- is the triggering environment for gemination, resyllabification (with compensatory lengthening) and lastly glide strengthening (cf. Murray and Vennemann 1983), it seems plausible that a different consonantal strength could have invoked a different process where velars are concerned. For instance, the stronger labials could have undergone resyllabification, i.e., -Vp_jV- > -$V.p_jV$- where the slope of the head is large and therefore indicative of a more preferred complex head. Conversely, the weaker velar could have invoked gemination to improve the syllable contact since it was not strong enough to cause resyllabification. In this proposal, only voiced and voiceless velars would necessarily invoke gemination as Suzuki claims in his version of the Old Norse development. His claim that only k and g invoked the special glide strengthening in Old Norse due to their intermediate consonantal values is problematic. The consonantal strength of these two segments would not be equal (cf. Chapter 1 §4.2) due to their different placements on the Consonantal Strength Scale, i.e., voiceless stops versus voiced stops. Thus, it would be expected that the other segments of similar intermediate consonantal strength would have exhibited similar behaviour. No such provision is made by Suzuki for other consonants of similar consonantal strengths to trigger this double strengthening.

One greater question is still left unanswered by Suzuki. Although he illustrates his analysis of simplex and complex glide strengthening in Old Norse, he does not outline how this could be extended to an analysis of GV. Instead, he assumes that by showing this glide strengthening, he has sufficiently accounted for the purported strengthening in GV. Clearly, however, the geminate glides constitute a completely different environment. In the sequence -GG-, there is no velar to trigger the complex glide strengthening to an obstruent (cf. (7)). Thus, the question remains, how did the GV glides undergo strengthening to obstruents in this dissimilar environment? Unfortunately, Suzuki does not attempt to provide an answer.

3.3.3   West Germanic

Stage Two in West Germanic was marked by no further developments. In sum, the reflexes from Stage One, namely -$VG.GV$, were maintained in West Germanic. The cluster -VG- was realised as a diphthong as Suzuki contends above, e.g., *zweiio*. Suzuki attempts

to explain why West Germanic did not undergo any subsequent strengthening in GV2 as the other two branches did. In both Gothic and Old Norse, strengthening was employed to improve poor syllable contacts. However, the repair strategy for poor syllable contacts in West Germanic was gemination as evidenced by the well known West Germanic gemination. This change induced the gemination of every consonant before a syllable initial j in the sequence -$VC.j$V-, except where C represented -r-. Gemination failed to occur before -r- since the contact -$r.G$- was not poor enough to trigger gemination as would have been the case with, for instance, -$p.G$- where the value of $G - p$ would be a "large" negative value. Thus, there would be greater pressure to improve this latter poor syllable contact. However, the contact, $G.G$ does not provide an example of a very poor contact, but is rather a stable contact. Thus, $G.G$ undergoes no further changes.

3.4   Criticisms of Suzuki's approach

Suzuki presents an innovative syllabic approach to the Germanic phenomenon. His particular dialect specific developments for GV2 mark clear improvements upon other such theories which have preceded his analysis. By examining how individual dialects treated glides, Suzuki claims to be able to reach more accurate and appropriate conclusions for each dialect. Such a separate dialect-specific treatment is supported by Voyles (1968), Jasanoff (1978) and H. Smith (1941). Furthermore, it makes use of widely accepted theoretical assumptions, processes and Preference Laws. These aspects make it far less problematic than the Davis and Iverson (1996) model which follows.

Despite Suzuki's strengths, however, several problems come to the fore. First, Suzuki does not address any exceptions to GV. This point could, however, constitute an advantage for his theory since it would indicate that Suzuki considers GV to be a phonological problem alone. From this perspective, "deviant" forms or exceptions would be outside the phonological realm. These exceptions would then be better explicated as having resulted from borrowing, analogy or some other phonological or morphological process whose effects have obscurred the original GV reflexes.

With reference to Suzuki's developments, Davis and Iverson (1996) criticise the intermediate stage, -$VC.V$-, which would have arisen following the loss of the laryngeal.

Rightfully so, this stage is prosodically quite impossible even as an intermediate stage on the way to -*V.CV*- and should thus not have arisen at all. Moreover, the simplest repair strategy for this less preferred syllable contact could simply have been resyllabification regardless of the natural classes to which the consonants belonged. Such a resyllabification would have resulted in the immediate improvement of the poor syllable contact.

The most pointed criticism of this approach is one not reserved strictly for Suzuki's theory. This issue is something which all two stage theories must face. The question remains as to how we can motivate the strengthening of *G.G* in the dialect specific developments. Although *G.G* does not constitute the most preferred of syllable contacts, it does nevertheless depict a stable contact (cf. Footnote 12 this chapter). The difference in the consonantal strength of the two segments is a neutral value of zero. As already argued for Gothic, even if there was motivation for strengthening, Suzuki still fails to motivate the specific strengthening involved in GV. For instance, the precedence for strengthening in Gothic would result in *j.j*, not the evidenced *d.dj*. Although I have tried above to motivate this further development to plosives, this should have been explicitly described by Suzuki. Moreover, the Old Norse GV forms remain unmotivated. Once again Suzuki is able to account for the dialect specific treatment of glides, but he does not account for how this knowledge can be implemented in explaining the GV segments themselves. The velars in Old Norse are shown to behave differently from other consonants in that they trigger what appears to be a form of gemination. One key difference between this gemination and GV is that there is already an extant velar to trigger "gemination" in the non-GV examples from (6d). By contrast, GV starts simply with glides and no triggering velar. How could Suzuki account for this gemination/hardening when no velars were originally present as required for his dialect specific discussion? Suzuki must be able to answer this question to provide credibility for that development. Unfortunately, Suzuki does not attempt an explanation of GV itself. Nor does he tender an account for the differential treatment of glides in Gothic and Old Norse where strengthening is employed to improve the contact and syllable onset, versus in West Germanic where no ameliorations are undertaken. Moreover, no examples were provided to substantiate such a difference in the treatment of glides in West Germanic.

Even in the face of these problems, Suzuki's approach still marks a major improvement upon earlier theories posited to explain the Germanic phenomenon. I now turn to another recent innovative proposal for GV.

4.0   Davis and Iverson's (1996) Feature Spread Theory

The alternative proposed by Davis and Iverson (1996) (hereafter D&I) appeals to the theories of feature spread and compensatory lengthening. This proposal is based on two assumptions; first, laryngeals were extant in the early Proto-Germanic period and secondly, it was during this Proto-Germanic period rather than later in the individual dialects that the GV development occurred. The theory that follows builds on these two assumptions.

4.1   The model of GV

The model proposed by D&I is very straightforward. In brief, the feature [consonantal] spread leftward from the laryngeal to the glide causing it to harden to a voiced plosive. This plosive retained its glide-like quality as a secondary articulation. In conjunction with the spread of [consonantal], the laryngeal was delinked from its timing or skeletal slot. It was into this empty slot that the hardened glide, *viz.* the plosive, spread creating the "geminate" obstruent. This process is illustrated in (10) below:

(10) Germanic Verschärfung

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V           C          C          V
            |          ⇒                    Compensatory Lengthening
          Root       Root
                                            VjSHV>VdSd'V
          [cons]      Place                 Spread of [consonantal]
                        |
                   Pharyngeal
```
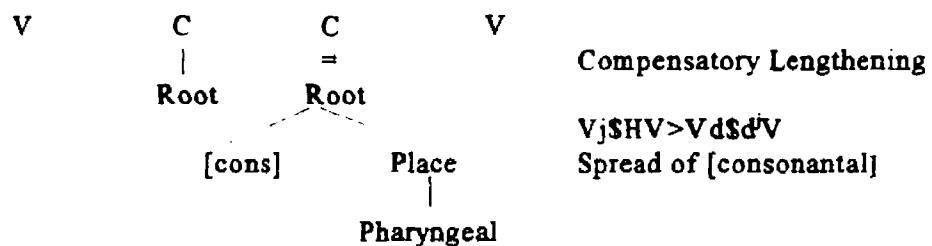
D&I (1996: 111) claim that the two processes of their theory, hardening of the glides and lengthening of the strengthened glides into the empty onset, are best viewed "as complementary aspects of the same Proto-Germanic phenomenon." Since a feature can only spread to a segment not already specified for that feature, then the hardening could only

selectively affect glides which were not specified for [consonantal] (D&I 1996: 111). Moreover, glides were marked as [high] under V-place in their feature geometry. This was another method to stipulate that only glides, and not vowels in general, could undergo sharpening.

4.1.1 West Germanic-Further innovations?

In order to account for the diphthongs in the West Germanic dialects, D&I propose that West Germanic underwent one further development. The lack of GV forms in West Germanic can be explained by the delinking of the feature [consonantal] from the root node. This delinking is depicted below in (11).

(11) V C C V   V C C

Root Root   Root Root

[cons] Place   =   Place

Pharyngeal   Pharyngeal
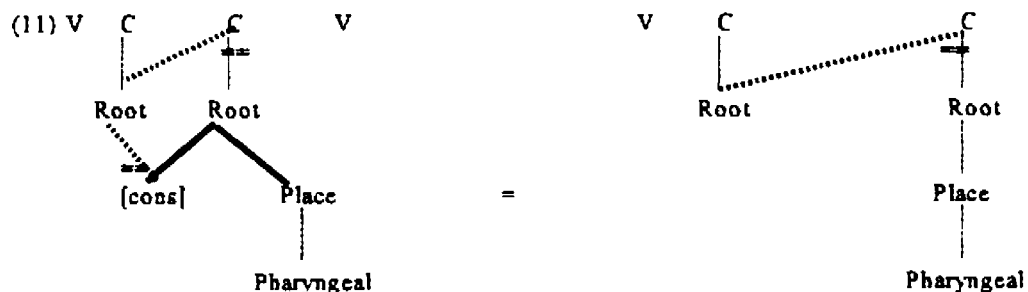
This delinking would have served to weaken the obstruents to glides, thus reestablishing the presence of glides in the GV cognates.

Contrary to the assumption of earlier theories (cf. Suzuki 1991, Prokosch 1939, Jasanoff 1978), D&I (1996: 112) reject both the coincidental development of GV in only Gothic and Old Norse and the "special affinity which obtained" just between these two branches. Moreover, the GV relics in West Germanic are accounted for by assuming that the development of GV occurred in the Proto-Germanic period and that subsequent delinking as in (11) did not apply to every GV example in West Germanic.

4.1.2 Support for feature spread from Kaisse (1992)

D&I (1996) cite Kaisse' (1992) article as evidence for their claim that [consonantal] can spread thereby triggering glide hardening. Kaisse' own evidence includes data from

Cypriot Greek and Räto-Romansch. These languages provide examples which illustrate that a segment marked [-consonantal], *viz.* a glide, becomes [+consonantal] when situated next to another consonant (Kaisse 1992: 316). Kaisse tries to argue that in both sets of examples [consonantal] is the only possible feature of the trigger segment causing assimilation.

In Cypriot Greek, the semi-vowel *i* "is realized as a voiceless palatal or velar stop after most consonants" (Kaisse 1992: 316). Examples of this strengthening are provided below.

(12)   a.   *aderfi*   'brother'
            /aðerfi + a/ → *aderfia* → *aderfka*   'brothers'

       b.   *teri*   'one of a match'
            /teri + azo/ → *teryazo* → *terkazo*   'I match'

At first glance, it would appear that the onset position, wherein the glide is placed, could be argued to be the causal factor.[17] That the syllable onset position is neither sufficient nor necessary for the strengthening of these glides, according to Kaisse, is supposedly illustrated by the data from Bergüner Romansh where the glide is in the syllable rhyme.

In this dialect of Romansh, a *Verschärfung* effect reminiscent of Holtzmann's Law "sharpens" both *i* and *u* to a voiced velar plosive [g]. Glide hardening in Bergüner Romansh differs from that in Cypriot Greek by the direction of feature spread. Whereas the direction of spread in Cypriot Greek was leftward, it is rightward in Bergüner Romansh.

Kaisse (1992: 320) concludes from her investigation "that the usual output of consonantalization is an obstruent." Furthermore, she claims that the syllable position of the glide itself plays no role in the hardening. Instead, the sharpening of glides to obstruents is triggered by the spread of the feature [consonantal]. Her findings provide the evidence needed for D&I to propose their own version of feature spread for GV. However, her results

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[17]It would appear at first that the Cypriot Greek examples reflect typical contact strengthening where the onset increased in consonantal strength to ameliorate a less than preferred contact, e.g., *mat.ia* > *mat.ka* (Kaisse 1992: 317). However, the example *vienno* ·· *fcenno* calls this assumption into question since the glide has not strengthened in contact position, but in the syllable onset position where it created a less than preferred onset.

may not be as "airtight" as D&I require.

Kaisse cites examples from Shona where the glide [u̯] appears to alternate with [k], e.g., -rapka (Zezuru dialect) and -rapx'a[18] (Karanga dialect) /rap+u̯a/ 'to be treated'. However, she notes that this derived stop or fricative can also appear with a contiguous [u̯] in a position where there is no [consonantal] feature to spread. She further states, "In fact, the underlying w normally shows up on the surface along with the velar stop or fricative. . . It seems most likely, then, that Shona has a process intruding a velar stop or fricative before w in a cluster. The w itself does not harden"(p. 322). Thus, a non-original obstruent does not necessarily result from the spread of [consonantal] causing a glide to strengthen. This would be the case in the "hardening" of the glides in Italian, e.g., Lat. iu̯enis but It. <giovane> 'young' and Lat. u̯iu̯o but It. <vivo> 'live'. These examples are indicative of head strengthening which improves a syllable onset (Murray 1995, Vennemann 1988).

In one final criticism of Kaisse' Romansh argument, I note that not all occurrences of non-original obstruents can necessarily be related to original glides. According to Harris and Vincent (1988), in the Surmeiran and Puter dialects of Romansh the main environment for Verschärfung was a syllable closed by /r/ where no glide was necessarily present, e.g., dūrum > Puter /dykr/, Surmeiran /dɛkr/ 'hard' and dormīre > Puter and Surmeiran [durmɛkr] 'to sleep'. In the latter example, it is questionable whether it can be argued that an intermediate diphthongisation occurred en route to the Verschärfung, e.g., /i/ > [ii̯] > [ik]/[ɛk]. Thus, the Romansh obstruents may not necessarily be the result of glide strengthening per se.

4.2   Problems and criticisms of D&I (1996)

D&I's feature spread theory is indeed an innovative approach to this elusive Germanic problem. Moreover, it avoids the difficult task of motivating glide strengthening from the poor yet stable syllable contact of the traditional Stage One. Unfortunately this theory still leaves several issues unresolved.

One key problem for this approach is the use of the term "compensatory

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[18]Kaisse uses [x'] to denote a prevelar fricative

lengthening". This process generally applies to syllable rhymes, NOT syllable heads (cf. Kenstowicz 1994: 295). However, according to D&I the strengthened glide spread from the coda to the head of the following syllable. This proposal is further challenged by the fact that Proto-Germanic has been argued to be a weight sensitive and mora counting language (Murray and Vennemann 1983). Such a language would not require that the syllable head be filled subsequent to the loss of a segment in that position since syllable heads do not affect mora count. Furthermore, if the syllable head were to be filled, two Preference Laws could be used to motivate this development: the Head Law and the Coda Law. We would expect these laws, however, to motivate resyllabification upon loss of the laryngeal, NOT gemination as proposed by D&I, e.g., VG.HV > VG.V > V.GV.

In a similar vein D&I do not account for the placement of a laryngeal before a glide thereby availing themselves of a potentially less controversial scenario. Two different developments could be proposed depending on the assumption made regarding the strength of the laryngeals in question. These scenarios are outlined below.

(13) a. If H had a "strong" consonantal strength, e.g. [ɣ]:
    VH.GV > VH.djV > Vd.djV

  b. If H had a "weak" consonantal strength, e.g. similar to [h][19]
    VH.GV > VG.GV > Vd.djV

If the laryngeal had had a "higher" value on the Consonantal Strength Scale, then the development could have emerged according to (13a). Glide strengthening could have resulted from the spread of [consonantal] from the laryngeal to the glide. Subsequently, this would have improved the syllable contact. The laryngeal could then have been fully assimilated to the strengthened glide. This development would fit with their present model of GV. By contrast, if laryngeals were "weak" consonants, then D&I could have proposed full regressive assimilation of the laryngeal to the glide. The glides could then have

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[19]Iverson (p.c.) assumes "that laryngeals were 'weak' or relatively high in sonority." This claim would "jibe" well with their hardening according to the Head Law.

undergone hardening producing D&I's final output Vd.djV. However, as discussed above, finding a motivation behind strengthening the glides in the stable syllable contact G.G is difficult. Moreover, this last proposal would require reworking of D&I's model.[20]

Another problem facing D&I is the simultaneous feature spread and delinking. How can they motivate such a simultaneous application of processes?[21] Moreover, laryngeal loss would remove the environment for feature spread to occur. D&I try to defend their claim by assuming that the feature spread would have occurred just prior to delinking of the laryngeal. Were this the case, it would create an unlikely intermediate stage, namely Vdj.HV (> Vd.djV), where the syllable contact would be less than preferred. Ironically, D&I criticise Suzuki for a similar "sin", namely his development VC.V (<VC.HV) which they claim is not a plausible intermediate stage in Germanic.

One of the most troublesome aspects of their analysis is the following concern: if it was a question of spreading [consonantal] from the laryngeal, then why did other contiguous consonants not also trigger GV? D&I make no attempt to explain why laryngeals alone should be implicated in the strengthening of glides by the spread of [consonantal].

One final criticism is based in D&I's interpretation of the orthography. According to D&I, the GV segments signified plosives with glide-like secondary articulation, i.e., complex segments. Such an interpretation ignores other studies which have shown <j> and <w> to represent more fricative-like segments in Gothic (cf. Vennemann 1985b, Murray and Vennemann 1983). Moreover, tentative conclusions from my own study in Chapter Two indicate that these segments may have represented concatenations of plosives and glides (cf. Chapter Two, §§2.7 and 3.4). According to my conclusions, the glides do not appear to be

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[20]One further proposal has been suggested to me by Robert Murray (p.c.), namely VH.GV > VH.HGV > Vd.djV Here the poor syllable contact is improved by gemination of the laryngeal in a process akin to West Germanic gemination. Thus, a laryngeal results in syllable onset position of the second syllable. Subsequently, this laryngeal could have been strengthened according to the Head Law. The laryngeal in the preceding coda could then have assimilated to this strengthened laryngeal in the onset of the following syllable. However, again this proposal would require a complete reworking of D&I's theory and would have proceeded from a stable contact.

[21]Thanks to Ed Cook (p.c.) who confirmed for me that these simultaneous processes would not be permitted according to the phonological theories of feature geometry and feature spread

secondary articulations, but rather fully articulated phones.

4.3   A response from Iverson (p.c.)

Iverson (p.c.) continues to defend the notion of a direct *Verschärfung* as opposed to intermediate syllabifications. He maintains this theory of compensatory lengthening into syllable heads although he concurs with Hayes (1989; as cited by Iverson, p.c.) "that compensatory lengthening regularly derives from disappearing 'moraic' segments, so (nonmoraic) onset consonants would not be expected to have this result". However, there are cases of onsets which exhibit "characteristics of syllable weight-bearing ability" (Iverson, p.c.). Unfortunately, these onset-sensitive stress systems do not belong to the Germanic language family. Nevertheless, their discovery would appear to provide a precedent for onsets having some form of weight-bearing function or being properly represented by some kind of timing unit (Iverson, p.c.). It is upon this phenomenon which D&I rely for their own theory. This is however a shaky foundation.

I still find this concept of onset-sensitive stress systems problematic with regards to GV. Indeed Germanic has been found to be a weight-sensitive language but only with reference to syllable rhymes, not heads. Why then would we expect this compensatory lengthening to apply to syllable heads when there is no precedence for such a claim in Germanic? This question still remains to be answered.

5.0   Conclusions — Towards an Analysis of GV

In this chapter I have presented and critiqued various theories proposed to explain GV. These approaches have been based on accent placement, morphological levelling and analogy, laryngeals, syllable structure and feature spread. Although none of these theories have been accepted and adopted as the definitive answer to GV, all provide insight into the problem.

As I embark upon the pursuit of my own analysis of GV in the following chapter, I must critically evaluate the theories and data which have been presented in this chapter. In light of both the strengths and weaknesses of these theories the critical aspects which I will investigate become apparent. Below I outline what I take to be the critical factors which will

play a role in my analysis of the phenomenon.

First, a review of the theories forwarded by Suzuki, D&I and others illustrates one important weakness in the analyses of GV. Many apparent exceptions exist for GV, e.g., ON *snūa* 'to turn' vs. ON *snugga* 'to look askance'. These parallel developments demonstrate that GV occurred in some items, but not in others. An examination of these environments could shed important light upon this elusive phenomenon. Moreover, it is plausible that such an unusual phonological development was not the result of one sound change but rather was the consequence of a complex interplay of factors. Perhaps the PIE accent did play a role in GV as Holtzmann first argued. An examination of the PIE accent will be undertaken in an attempt to determine if accent can be implicated to any degree in an analysis of GV. If so, then this variable PIE accent may shed light on the occurrence and non-occurrence of GV as noted above.

Furthermore, it is plausible that the voiceless series of laryngeals had an impact on the outcome of GV. I will assume that laryngeals were still extant in Proto-Germanic. This assumption is not problematic according to Polomé's (1982) argument for the archaic nature of Germanic. Since remnants of laryngeals still linger in the Germanic ablaut series, for example, it becomes evident that laryngeals were a part of the PIE phonological system when Germanic split off. Consequently, these laryngeals would have persisted for a time in Proto-Germanic before they were ultimately lost. However, where would laryngeals have fit into the GV picture?

Most laryngeal theories of GV have had to face the problem of determining the placement of the laryngeals in GV. H. Smith (1941) bases his analysis of GV on a sequence *HG* whereas Jasanoff (1978) assumes the order *GH*. However, Jasanoff argues for a metathesis of the inherited sequence *HG* to the secondary sequence *GH* which he requires for his theory. According to Winter (1965 and as quoted in Jasanoff 1978), the inherited sequences *-Hi-* and *-Hu-* were metathesised to *-iH-* and *-uH-* when followed by a consonant. Nevertheless, Jasanoff assumed the inherited sequence to be *HG*. But why should Jasanoff require this metathesis?

One of the arguments wielded by Jasanoff (1978) against the order *HG* is the

purported lengthening of vowels subsequent to the loss of a following laryngeal, e.g., VH>

v̄. However, no compensatory lengthening would occur if the laryngeal were in the onset of the following syllable (ie., V.H) rather than in the coda of the preceding syllable (ie.,VH.). If for some reason the laryngeal could be placed in onset position, then there would be no reason for the sequence *HG* to undergo metathesis to avoid laryngeal loss with concomitant compensatory lengthening. Assuming that *HG* would also be more favourable in terms of Occam's razor since it would not require the further step of metathesis, then it emerges as a more desirable order. A successful analysis of GV could prove to substantiate this laryngeal placement and ordering with respect to the glides, thereby confirming or improving present PIE reconstructions, particularly those of GV etymons.

My analysis will also include syllable-motivated sound changes based on the Preference Laws. Such an approach may help provide the needed motivation which earlier theories lacked. Moreover as noted above, my approach will provide evidence either for or against Polome's suggestion that syllabification theories may provide a cogent explanation for GV.

The analysis which follows will thus examine the Germanic *Verschärfung* from a purely phonological perspective. Moreover, my phonological study may require me to adjust my conclusions regarding the phonological-orthographic correspondences. Nevertheless, my interim conclusions will provide direction for my examination of the sound changes. Since it is important that both the reflexes of the changes and the changes themselves be congruent and complementary, the next chapter will revise as necessary the tentative conclusions reached in Chapter Two while remaining faithful to the issues raised there.

In sum, my analysis will combine the features of accent, laryngeal, and syllable-based approaches to GV to provide a more comprehensive analysis of the events which created the phonological aspect of the phenomenon. Together, these considerations may furnish a more complete account of GV.

Moreover, since there appears to be some validity to the claim that morphological levelling affected the persistence of GV forms within paradigms, I also provide suggestions with regards to subsequent morphological developments in the Appendix.

Chapter Four

BUILDING ON THE PAST: A NEW ANALYSIS

0.0 Introduction

Although GV has been analysed from a multitude of perspectives within numerous frameworks (cf. Chapter 3), no single theory thus far has provided a satisfactory explanation and motivation for the phenomenon. In this chapter I will present a new unified account for GV. Rather than completely rejecting the theories of the past, my analysis will bring together various aspects of accent, laryngeal and morphological[1] approaches previously posited while distancing itself from the traditional two stage approach. By combining various elements from these past theories with the Preference Laws for syllable structure (cf. Murray and Vennemann 1983, Murray 1988 and Vennemann 1988a) a new account emerges. As part of my analysis, I will further argue that the variable "Pre-Germanic" accentuation caused differential syllabification of the sequence -*VHGV*-. This differential syllabification, as I will assert, established the environments for the GV and non-GV developments, e.g., ON *snugga* 'to look askance' vs. ON *snūa* 'to turn, twist'. My approach as outlined below has implications for the development of Germanic before its break up into the dialects.

1.0 Accent and differential syllabification

In this section I will first outline the nature and position of the accent in Proto-Indo-European and Germanic. I will then discuss the link between GV and the mobile PIE/Germanic accent. Next I will examine how the differential syllabification of the sequence -*VHGV*- could have resulted from this variable accent.

1.1 Indo-European pitch accent

Throughout the literature, PIE accent has generally been characterised as one of pitch and mobility (cf. Hirt 1931, Prokosch 1938, Bennett 1980, Ramat 1981, Baldi 1983, Szemerenyi 1990, and Beekes 1995). This pitch accent was realised by a high tone on a

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[1] See Appendix for suggestions regarding subsequent morphological developments.

single syllable within a word (Baldi 1983: 16). Evidence for the musical or pitch accent in PIE comes from Vedic, Greek and Balto-Slavic (especially Lithuanian) (Lehmann 1993: 58, Szemerenyi 1990, Wright 1917). During the Proto-Germanic period, Germanic, like Romance and Celtic, underwent a change to a fixed stress accent system and therefore provides no direct support for the mobile pitch accent in early PIE. However, the maintenance of unaccented vowels throughout the early dialects is consistent with a pitch accent system (Prokosch 1939, Wright 1917).

Of greater importance to the study at hand is the mobility of the PIE accent. This accent has often been referred to as "free" (Beekes 1995, Ramat 1981, Szemerenyi 1990, Prokosch 1939) however, this label should be qualified. Unlike languages such as French or Polish where the accent is "mechanically determined" and placed on all final or penultimate syllables respectively[2], the accent in IE was not fixed on one specific syllable in the language. The PIE accent could fall on either the root syllable or the affix/ending of the word. Accent placement could even vary within a paradigm, e.g. Gk. *patḗr* (nom.) 'father', *patéra* (acc.), but *patrós* (gen.) (Ramat 1981: 17). Szemerenyi (1990: 77) refers to languages such as Greek, Sanskrit and Lithuanian, from which we gain much insight into PIE accent, as *beschränkt frei* (free but with restrictions). More detail regarding some of these "restrictions" on PIE accent placement will be provided in §1.3.

1.2   Germanic stress accent

According to Prokosch (1939: 118), "all Indo-European languages went through some form of accent regulation." By the time the first records of Germanic were written, Germanic, like Romance and Celtic had developed a stress accent where primary stress was placed on the root syllable, e.g., OE *fæder* 'father' (all cases) but Gk *patḗr* (nom.), *páter* (voc.), etc. (Bennett 1980: 55). This shift of accent to the root syllable has been implicated in the weakening or loss of vowels in unaccented syllables (Wright 1917, Bennett 1972, and

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[2]The characterisation of French as cited above comes from Szemerényi (1990: 76). This statement should be qualified. In cases where the final syllable contains a schwa (or syllabic resonant depending on the dialect), the accent falls on the penultimate syllable, e.g., *libr(e)* 'free', *applicábl(e)* 'applicable'. This may also account for the complete loss of such final syllables in the rapid speech of some dialects. Can. Fr *table* [tab] vs [tábl(ə)] 'table'. Thanks to Doug Walker who brought my attention to the fact that schwa provides an exception to the accent always being placed on the ultimate syllable in French

Ramat 1981) and ultimately in the decay of inflectional affixes (Ramat 1981: 17).

However, what is of most interest to the present study is what took place during preliterary times following the split of Germanic from IE. It has been argued that following this split, Germanic had mobile pitch accent similar to the accentual mobility of Indo-European (Salmons 1990:141, Bennett 1972). Some scholars have posited a period of free accent in Germanic lasting anywhere from several centuries to a millennium (Bennett 1972: 100).

That Germanic had indeed inherited IE's mobile accent is best evidenced by Verner's Law. This law accounts for apparent exceptions to Grimm's Law (cf. Chapter One, §3.2.1). Recall from Chapter One that Verner's Law states that the voiceless fricatives in Germanic became voiced when they were not immediately preceded by the accent (Lehmann 1992: 154). The examples in (1) help illustrate this point.

(1)   'brother'   'father'   Grimm's Law: *t* *þ*

    Skt.   *bhrātar-*   *pitár-*

    Gk.   *phrātēr-*   *patēr-*

    Go.   *brōþar*   *faðar*

    OE   *brōþor*   ON *faðir*

The Germanic cognates for 'brother' all indicate the voiceless fricative, *þ*, as expected from Grimm's Law. However, when the IE accent did not immediately precede the spirant as in the examples for 'father', the voiced fricative, ð, resulted in the Germanic cognates in accordance with Verner's Law.

Since Germanic thus maintained the IE mobile accent for a period of time, an examination of IE accent placement may provide insight into the accent of early Germanic before the accent shift placed stress on the root syllable. A discussion of accent placement in IE follows.

1.3   Accent placement in PIE

Contrary to what the label "free" seems to signify, there did exist a certain level of order in the placement of the accent in PIE. Although the complete details of this accent placement have yet to be worked out, much is known from studies of Greek, Sanskrit, Balto-

Slavic and the effects of Verner's Law in Germanic. Before outlining the proposed accent placement for PIE and early Germanic prior to the accent regularisation, I now outline some of the evidence that has been cited for the reconstruction of the accent placement in PIE and early Germanic. This evidence includes accentuation in Greek, Sanskrit and Balto-Slavic, Verner's Law, and ablaut grades in words.

Sanskrit, Greek and Balto-Slavic provide important insights into the placement of the accent in PIE. Szemerényi (1990) claims that the agreement in accent placement between Greek and Sanskrit in isolated lexical items as well as within paradigms reveals the PIE accentuation. For example, a comparison of Skt. *pāt*, acc. *pādam*, gen. *padás* 'foot' with the corresponding Gk. πούς, πόδα, ποδός reveals a common accent placement. Moreover, it reveals a mobile accent, where the accent is not fixed strictly on the root or the suffix. In the genitive case in both Greek and Sanskrit the accent falls on the suffix. By contrast, in the nominative and accusative forms, the accent is placed on the root syllable. Szemerényi (1990: 79-80) also states that sometimes Balto-Slavic helps confirm accent placement where it agrees with Sanskrit and Greek, e.g., Skt. *nábhas*, Gk. νέφος, Russ. *nébo* 'heaven, sky' (cf. also Gamkrelidze and Ivanov 1995).

The reconstruction of the PIE accent placement can often be verified indirectly by Verner's Law in Germanic. Recall from the discussion above (cf. Chapter One, §3.2.2 and this chapter §1.2) that when the voiced fricatives occurred in place of their expected voiceless counterparts, the accent in Sanskrit and Greek did not fall on the immediately preceding syllable, Skt. *bhrātar-*, Gk. *phrātēr-*, Go. *brōþar*, OE *brōþor* 'brother' but Skt. *pitár*, Gk. *patēr-*, Go. *fadar*, and ON *fadir* 'father'. This correspondence between accent and the occurrence of voiced fricatives has also been used to determine the placement of accent on the principle parts of verbs in early Germanic. Many verbs show the effects of Verner's Law in the plural preterite[3] but not in the present stem nor singular preterite. Examples from Middle High German illustrate this alternation (listed as pres./sg.pret.~pl. pret.): *zīhen~zigen* 'pull', *slahen~sluogen* 'slay', *wesen~waren* 'be' and *verliesen~verlurn* 'lose' (Pafenberg

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[3]The past participle also tends to reveal the effects of Verner's Law (Prokosch 1939, Voyles 1992). Modern German still provides examples, e.g., *ziehen* (pres.), *zog* (pret.), *gezogen* (p.p.) 'pull'

1993).[4] This would point to root accent in the present and singular preterite forms, but suffix accent in the plural preterites (and past participles). These conclusions would enable an account of the voiceless and voiced fricatives (and their reflexes) in these verbal principle parts. Thus, Verner's Law provides indirect evidence for the PIE accent placement.

Further evidence for the placement of the PIE accent can be cited from vocalic ablaut grades. Gamkrelidze and Ivanov (1995: 166) note the relationship between accentuation and the vowel ablaut system in IE. Prokosch (1939) suggests a similar relationship in his discussion of PIE and Germanic accentuation. He cites several examples of accent placement based on the ablaut grade of a word and notes that full-grade vowels were accented. By contrast, when the accent did not fall on a particular vowel, then it "surfaced" as the reduced ablaut grade. For example, Go. *steigan, staig, stigum, stigans* 'climb' reveals a reduced ablaut grade in the last two principle parts of the verb, namely the plural preterite and past participle. This would indicate that the root vowel in these two stems was not accented, thereby supporting the proposal that in the last two principle parts of the verb, the accent fell on the inflectional suffixes. Such a claim is supported by Verner's Law above which also provides evidence for suffixal accent in the last two principle parts of verbs. Likewise, the full grade and *a*-grade vowels in the first two principle parts of the verb would point to root accentuation. Again, this is confirmed by Verner's Law.

Prokosch cites other examples of vocalic alternations which provide evidence for accent placement. For instance, he (p. 151) notes that verbs with *j*-suffixes may have the suffixal alternation *eje ejo~je jo*. He states that "when the root was accented the suffix was reduced to *je jo*", e.g., Lat. *sāgiō*. By contrast, "when the suffix has the normal grade, *éje éjo*, the root as a rule shows the *o*-grade", e.g., Lat. *moneō* 'admonish' < *'mon-éjō,* root *men-* (Prokosch 1939: 151). Thus, the PIE accent can also be ascertained by the ablaut grade or the appearance of a suffix in either its reduced or full form.

With this evidence in mind, I will now outline some of the PIE accent placements. I provide only those points which are relevant for my analysis of GV since a more complete

examination of the details is beyond the scope of the present study.

1.3.1   Nouns and adjectives

Since nouns and adjectives share inflectional suffixes, they are grouped together (Voyles 1992: 238-241). According to Voyles (1992: 19-20), accent was placed on the stem in the nominative, accusative and vocative of "[masculine] and neuter nouns and adjectives of the *a-, wa-, ja-,* and the *az iz-*class". Otherwise, the suffix was accented in the genitive, dative and oblique cases of these noun and adjective classes. For all other noun and adjective declensions, the accent pattern was different. In these latter paradigms, the root received the accent in all singular forms as well as nominative and accusative plurals. The remaining genitive and dative forms in the plural were then accented on the inflectional suffix. Although Voyles (1992) makes these claims early in his study, his paradigms which appear later in the appendix indicate that the only consistent case which takes suffix accent is the genitive. The best example of this is the IE paradigm for 'two' for which all forms given are in the plural (p.243)[5]:

(2)   nom. masc.   +*dwói*   fem.   +*dwâs*   neut.   +*dwâ*
      gen.   +*dwojõm ʔêm*   +*dwâisõm*   +*dwojõm ʔêm*
      dat.   +*dwóimis*   +*dwâimis*   +*dwóimis*
      acc.   -*dwóns*   +*dwâs/ʔns*   +*dwâs*

1.3.2   Adverbs

Since adverbs were usually derived from the oblique case of nouns and adjectives, they received accent on the suffix (Voyles 1992: 20), e.g., Go. *triggwa* 'covenant' and *triggwaba* 'truly, assuredly'.

1.3.3   Verbs

In the weak verbs the endings were accented throughout the paradigms. By contrast, strong verbs took root accent in the first two principle parts, namely the present indicative stem and the preterite singular. The endings of the last two principle parts, the preterite

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[5]Although I subscribe to the reconstruction of this stem with a laryngeal, e.g. +*duoh₁* (Beekes 1995: 214) or +*dwoXw* (Lehmann 1952: 45), the paradigm given above from Voyles, nevertheless, serves to illustrate the point that the genitive case is the most consistent with regard to placement of accent on the inflectional suffix.

plural and the past participle, received the accent (Voyles 1992: 20). Prokosch (1939) notes that the aorist present verbs placed the accent on the ending. He further claims that these aorist verbal forms were more common in Pre-Germanic than in the historical forms found in the Germanic languages.

With these details on IE accent placement, a closer examination of the relationship between accent and GV can now be undertaken.

1.4   Accent and GV

The earliest explanations posited for GV implicated PIE word accent as the motivating factor behind the GV sound changes (Collinge 1985: 94). Holtzmann's original hypothesis claimed that the syllable following the GV segments was accented (as cited in Collinge 1985; based on Holtzmann 1870). Kluge (1913: 75) contended that the opposite environment, namely a preceding accented syllable, was at the heart of the matter. An examination of the paradigms provides an interesting insight into the question of accent placement with regards to GV.[6] Of particular interest are the paradigms which include both GV and non-GV forms. These paradigms may provide insight into the original state of affairs at the time of GV before levelling obscured the "conditioning" environment. The paradigm for 'two' is one such paradigm. It might be the case that the potentially high frequency of the word 'two' would have helped this paradigm resist levelling thus enabling a better insight into the GV conditioning environment (cf. Chapter Five, §2.2). This paradigm is provided below in (3). In light of the plurality/duality denoted by the number 'two', the paradigm only contains plural forms.

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[6] In many cases the GV form has been levelled through the entire paradigm or has been eliminated by levelling.

(3)   'two'

a.   **Gothic** (from Wright 1917: 117)

	Masc.	**Fem.**	**Neut.**
N.	twái	twōs	twa
G.	twaddjē	——[7]	twaddjē
D.	twáim	twáim	twáim
A.	twans	twōs	twa

b.   **Old Norse** (from Noreen 1970: 304)

	Masc.	**Fem.**	**Neut.**
N.	tueir	tuǽr	tuau
G.	tueggia	tueggia	tueggia
D.	tueim	tueim	tueim
A.	tuā	tuǽr	tuau

In both the Gothic and Old Norse paradigms, the only forms exhibiting GV are in the genitive case. This restricted occurrence of GV to the genitive case is not limited to the paradigm for 'two' in Gothic and Old Norse. OIcel. *beggja* (gen.) 'of both' (cf. Go. *bai* (nom.), *bans* (acc. masc.), *baim* (dat.)) also provides another example where GV only occurs in the genitive case (Lehmann 1986).

The question now arises: What is the significance of the genitive form with regards to GV? Recall from §1.3.1 that the genitive and dative cases of nouns and adjectives were the only cases which could receive suffix accent in the plural. In the examples given, only the genitive case placed accent on the inflectional ending (cf.(2)). All things being equal, namely that non-GV forms also had inflectional endings, the only distinctive difference between the genitive which underwent GV and other cases which did not was accent placement. The genitive form had suffix accent whereas the other cases had root accent.

Another example illustrating a link between accent and GV comes from Old Norse verbs. The verbs *hǫggua* 'to hew' and *búa* 'to live' display both GV and non-GV forms in their principle parts. These verbs are shown below in (4) and (5) respectively. The key

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[7]No such form has been attested (Wright 1917, Braune and Ebbinghaus 1981).

forms for the discussion are highlighted.[8]

(4)		Infinitive	Sing. Preterite	Pl. Preterite	Past Participle
	ON	hǫggua	**hió**	**hiuggom**	**hǫgg(u)enn**
but	OE	hēawan[9]	hēow (preterite)		
	OHG	houwan	hīo (preterite)		

(5)	ON	**búa**	**bió**	**biogg(i)am/biuggom**	búenn
but	OE	būan			gebū(e)n
	OHG	bū(w)an			

The contrast between the (highlighted) GV and non-GV forms in (4) and (5) is correlated with accent placement. Recall from §1.3.3 that the first two principle parts, namely the infinitive (present stem) and singular preterite, receive root accent. By contrast, the plural preterite and past participles are accented on their inflectional endings. For the highlighted items in (4) and (5), the correlation between GV and suffix accent is once again illustrated.

Such a claim of suffix accent is not without precedence. As stated above, various scholars, including Holtzmann himself, have correlated the effects of GV with an IE accent following the resulting obstruents (cf. Austin 1946, 1958, Mikkola 1924, Polome 1949, and H. Smith 1941). In his article on GV, Mikkola (1924: 267-8) devotes his energy to demonstrating that the placement of accent in non-Germanic GV cognates points to an immediately following accent in the GV forms:

> Ich will im Folgenden zeigen, daß der Übergang von intervokalischem *j* zu *ddj* im Gotischen und zu *ggj* im Altnordischen und von intervokalischem *w* zu *ggw* bzw. *ggv* im Gotischen und Altnordischen unmittelbar vor einer ursprünglichen betonten Silbe stattfindet. . . .Altnord. *egg* (G. pl. *eggja*),

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[8] ON *hǫggua* and *búa*, as well as their West Germanic cognates, show strong similarities across the principle parts provided in (4) and (5). However, *hǫggua* differs in that it displays the GV segments in the present stem. This GV form could be the result of later levelling. Support for levelling comes from the fact that *hiogga* has also been noted as a possible singular preterite form in some dialects (Noreen 1970 338). This GV singular preterite may also have been levelled through based on the GV of the other parts of the verb. In the same stead, the past participle *hiemn* in (5) does not display GV where expected when compared with *hǫggua*. Since these forms are anomalous within their paradigms, I will not discuss them further (cf. Appendix).

[9] This data is based on Lehmann 1986 181 It indicates the parallel between Old Norse and Old English and Old High German in an attempt to indicate that the ON infinitive could be the result of levelling.

krimgot. *ada*, das *ad'a* zu lesen ist, „Ei". Die Endbetonung wird durch gr. ᾠόν und slav. **jǣjé* bezeugt.[10]

For the accent to have followed the GV obstruents, then GV must have operated during the period of mobile accent prior to the Germanic accent shift. Since correlations do not equate with causes, then the question that arises is: What role did this accent play in the Germanic *Verschärfung*?

In order to determine the role of accent in GV, I now turn to an examination of the impact of accent on the syllabification of the sequence $\bar{V}CGV$ in Germanic.

1.5   Differential syllabification

That accented or stressed syllables attract segments into their heads and codas is well documented. Evidence for this differential syllabification based on stress accent comes from phonological studies, psycholinguistic experiments and historical documents. I will now survey some of the evidence.

1.5.1   Borowski (1990)

In her dissertation, Borowski (1990) examines various aspects of lexical phonology in English. As part of her analysis of the phenomena, e.g., flapping and palatalisation, Borowski introduces the concept of resyllabification. She claims that "not only does [resyllabification] draw onset consonants into the coda of stressed syllables, it must also draw coda consonants into stressed onsets" (p.337). To illustrate Borowski's argument, I provide an example from her explanation of flapping.

(6)   a.   á[D]öm   but   a[t]ómic
       b.   mór[D]äl   but   mor[t]álity
       c.   butter [bʌDɾ]; writer [ráyDɾ]; party [párDiy]

As evident from (6), "flapping occurs obligatorily in the environment v̆__v̆" (p. 268).

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[10]"I want to show in the following, that the transition of intervocalic *j* to *ddj* in Gothic and to *ggj* in Old Norse as well as of intervocalic *w* to *ggw* or rather *ggv* in Gothic and Old Norse takes place immediately before an original accented syllable. . . . Old Norse *egg* (gen. pl. *eggja*), Crimean Go. *ada*, which is to be read *ad'a*, 'egg' The suffix (ending) accent is evidenced by Gk. ᾠόν and Slav. **jǣjé*" (translated by L.C Smith)

Borowski assumes an initial syllabification of V.C V̆. However, when the accent falls on the preceding vowel, the sequence undergoes resyllabification as in (7):

(7)

(R=rhyme, O=onset)   (from Borowski 1990: 269)
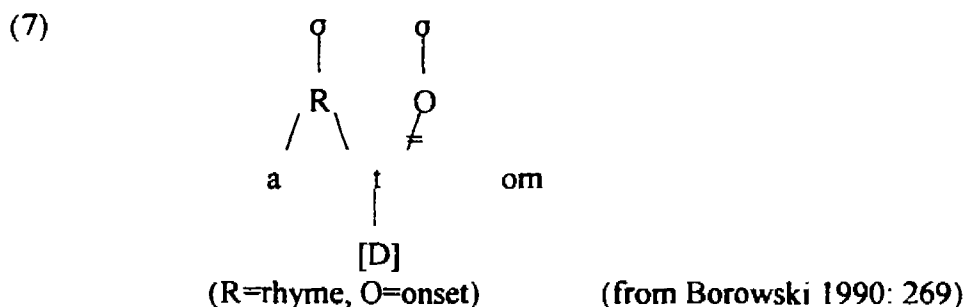
Once located in the syllable final position, the *t* or *d* is in the critical position of weakening and lenites to the flap [D] (p. 269). Thus, flapping in English provides an example of differential syllabification based on accent placement. Furthermore, it links this resyllabification with lenition processes.

1.5.2 Psycholinguistic evidence from English

Psycholinguistic experiments testing the intuitions of native speakers of English regarding syllable structure[11] provide further support for the claim that accent affects syllabification. Experiments have revealed small yet reliable effects of stress where a stressed syllable is "more likely to attract an extra consonant than [is] an unstressed syllable" (Treiman and Zukowski 1990: 72).

Another important finding relevant to the present study is the effect of vowel length on syllabification of word medial clusters.[12] Treiman and Zukowski (1990: 76) found that subjects placed non-/s/ clusters in the onset "of the second syllable almost 80% of the time when the second syllable was stressed." They also noted that clusters were placed significantly more frequently in second syllable onsets than in first syllable codas for the V̄'CCV sequences. Thus, when the preceding vowel was long, word medial clusters were

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[11]Experiments include production tasks and providing feedback regarding where the subject feels the syllable boundary to be. In production tasks, subjects are asked to manipulate syllables or their components, e.g., *ponuff* but *ponponuff* or *pontiffiff* (Treiman and Zukowski 1990: 72).

[12]Old English word divisions provide further corroboration for this fact (cf. Vennemann 1988a: 59)

generally syllabified in the onset of the second syllable regardless of stress placement. However, the first consonant of an intervocalic cluster was more likely to be syllabified in the coda of the first syllable when the preceding vowel was short and stressed.

Psycholinguistic studies have also revealed that the consonantal strength of a (simplex) segment plays a role in the "resyllabification" of onset consonants into the coda of a preceding stressed syllable (Treiman 1984, Treiman and Danis 1988, Treiman and Zukowski 1990 and Derwing and Neary 1991). Results indicate that the weaker the consonantal strength of a segment, the more likely it will be syllabified into the coda of the preceding stressed syllable.

Thus, the placement of syllable boundaries are affected by a number of factors including the position of (stress) accent, the consonantal strength of the segments and the length of the preceding vowels. These experimental findings regarding the effect of stress on syllabification further corroborate the evidence from phonological analyses of English phenomena and word divisions in historical documents.

I now turn to a discussion of these word divisions in Old English manuscripts.

1.5.3 Old English manuscripts

Citing evidence from word divisions in Old English manuscripts, Vennemann (1988a: 59) states, "Evidently an accented first syllable tends more strongly to attract part of the cluster toward itself than an unaccented first syllable, and the resulting difference in syllabication is reflected in the different division ratios". Vennemann illustrates his conclusions by citing data from Lutz (1985, 1986). From a corpus of approximately 65,000 word divisions at the end of lines in manuscripts, Lutz observed that the intervocalic cluster *dr* was divided 49 times as d/r, but left undivided on the next line (i.e., *dr*) 48 times. Despite their random appearance, these statistics provide interesting insight. For example, the occurrences of *nǽdrV́-* (where the accent immediately precedes the cluster) in comparison with the occurrences of words such as *wéredre* and *unfulfrémedre* (where the accent does not immediately precede the cluster) reveal the following frequencies and

patterns.[13, 14]

(8) a.   *nædrV-* (—x)   d/r 12x   /dr 1x
     b.   [xx]—xx   d/r 4x   /dr 7x

When the accent immediately preceded the cluster as in (8a), then the cluster was heterosyllabified. However, when the accent was not on the accent immediately preceding the cluster, then the cluster tended to be tautosyllabified in head position of the second syllable as in (8b). Thus, according to the word division of Old English manuscripts, accent played a role in the differential syllabification of intervocalic clusters.

1.6   Differential syllabification in Early Germanic and GV

As I have shown above, differential syllabification of medial clusters can result from variable accent placement. Recall from the discussion in §1.2 that following its split from Indo-European, Germanic experienced a period of mobile accent before the Germanic accent shift ultimately fixed stress on the root syllable. It would follow that during this period of mobile accent in Germanic, differential syllabifications of word medial clusters may have arisen. This is significant for my analysis of GV. As I noted in §1.4 there appears to have been a correlation between accent and GV. When GV occurred, the accent was following the segments in question, however, GV did not occur when the accent was placed on the root. It is thus possible that two separate syllabifications arose in the etymon from which the GV and non-GV developments proceeded, one based on suffix accent (GV producing), the other based on root accent (non-GV).

The question now arises as to which sequence could have produced the differential syllablifications implicated in GV according to the hypothesis above. In summarising Chapter Three, I noted that GV may have arisen when the implicated glide was preceded by a laryngeal as in the cluster -*HG*- (cf. also H. Smith 1941, Austin 1946, 1958, Polome 1949).

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[13] I cite Vennemann's (1988a: 59) format for the presentation of the data in (8). In (8a), the accent immediately precedes the cluster. By contrast, although the accent precedes the cluster in (8b), it does not do so in the immediately preceding syllable.

[14] Gothic also provides an example of a language where word divisions in manuscripts have been cited as providing insight into the syllabification of a language (cf. Hechtenberg Collitz 1906, Vennemann 1985b).

Support for this claim comes from the reconstructed PIE roots of the GV reflexes, e.g., Go. *glaggwō* < PIE ' *ghleHu̯-*. Go. *daddjan* < PIE '*dhoHi̯*, etc. Moreover, since GV occurred following a short vowel (cf. Chapter One §2), then the relevant sequence for our purposes is V̆*CGV*, and in particular *-V̆HGV-*. A possible output of the differential syllabification of these sequences is illustrated below in (9).[15]

(9)   -V̆CGV-

Stage 1	A (Non-GV)		B (GV)
	-V̆C.GV-		-V̆.CGV́-
e.g.	-V̆x.i̯V-	e.g.	-V̆.xi̯V́-
	-V̆t.i̯V-		-V̆.ti̯V́-

H represented by [x]; non-laryngeal segment represented by [t]; G represented by [i̯]

These two syllabifications, (A) and (B), would have arisen during what I will refer to as Proto-Germanic Stage 1 where accent was still mobile prior to the Germanic accent shift. When the accent preceded the medial cluster, -(´ᶜ'ᵣ, it attracted the first consonant of the cluster, (ᵢ, into the coda of the previous syllable as was "typical" when the preceding vowel was short (cf. §1.5.2). By contrast, when the accent followed the cluster, then (´ᵢ was attracted into the head position of the second syllable. Thus, the accent pulled medial consonants into the accent bearing syllable. In an early analysis of GV, Polomé (1949: 183) contends "that the laryngeal regularly belongs to the syllable which bears the stress" as this syllabification portrays.

Modem parallels of such accent-based differential syllabification can be cited from English words. The pair *a.ttráctive* and *át.rophy* illustrates the effects of accent placement

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[15] I have noted that the relevant sequence for our purposes contains a short vowel as in (9) above. However, the sequence V̄HGV would also be syllabified as V̄.HGV regardless of accentuation since word medial clusters were generally syllabified in the onset of the following syllable when the preceding vowel was long (cf. this chapter §1 5 2) We could then expect that this sequence may have also undergone GV as Kluge (1913) first suggested. However, I am unaware of any such examples at this time.

on syllabification in Modern English. A preceding accent results in the heterosyllabification of clusters as in *át.rophy*. By contrast, clusters are tautosyllabified in the onset of a following accented syllable, e.g., *a.ttráctive*. Thus, parallel examples from Modern English support the differential syllabification proposed in (9).[16]

Further support for the (A) syllabification comes from Murray and Vennemann (1983) and Murray (1988, 1991, and 1993). The syllabification argued for in each of these works is -V̆C.GV- where the accent precedes the word medial-cluster. This reconstruction of the Proto-Germanic syllable structure provides a cogent interpretation of some of the major phonological changes that affected early Germanic such as Gothic glide strengthening, West Germanic gemination, North Germanic resyllabification and Sievers' Law.[17] However, it is reconstructed for the period of time following the accent shift to the root vowel and therefore cannot account for the syllable structure of (9B) which would have arisen during the period of mobile accent in Germanic (cf. §4.1 for an overview of the development of Proto-Germanic syllable structure based on the development of the accent system in Germanic). Nevertheless, Murray and Vennemann do indicate that the syllabification of Germanic was very marked. This differential syllabification would further prove this to be the case.

In my analysis of the sound changes involved in the development of both GV and non-GV forms, I will assume the differentially syllabified sequences presented in (9). I will show how the differential syllabification of the sequence -V̆HGV- established the environments for the variable development of GV and non-GV items. All sound changes for which I will argue will be based on the Preference Laws for Syllable Structure (cf. Chapter 1). I will commence my analysis by examining the GV sound changes. In the following section I will then discuss how the non-GV forms developed from the (9A)

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[16]Thanks to Robert Murray who brought my attention to these examples.

[17]For Gothic glide strengthening, cf. Chapter Two, §2.6.2.1 The account of West Germanic gemination is based on -V̆C.GV- where the contact is poor (cf. Chapter Three Footnote 12). The coda consonant underwent gemination as a means of improving the contact, -V̆C.CGV- (cf. Chapter Three, §3.3.3) Old Norse resyllabification resulted in vowel lengthening in that dialect, e.g., -V̆C.GV- > -V̄.CGV- (cf. Murray and Vennemann 1983)

syllabifications.

2.0   The development of GV forms

As I have suggested above, the GV forms may have developed from the syllabified

sequence -V̆.HGv́-. In this section, I now turn to an analysis of the sound changes

responsible for the GV strengthening in this sequence. My analysis implicates voicing of

the laryngeal with subsequent slope steepening to improve a less than preferred syllable

onset in accordance with the Head Law. I will argue that it was the laryngeal that

strengthened and not the glide as has generally been claimed. However, before I present my

analysis of the GV strengthening, I will first differentiate -V̆HGv́- from -V̆Hv́- to eliminate

any question as to why this latter sequence did not also experience GV.

2.1   Laryngeals in Germanic[18]

Just as Germanic maintained the IE mobile accent for a period of time following its

departure from IE, I assume as noted above that Germanic likewise maintained the IE

laryngeals for a period of time before they were ultimately "lost" in the language. These

laryngeals however did not persist equally in all environments. It is widely believed that

laryngeals were maintained longer when contiguous to a glide than when they were not.

According to Lehmann (1993: 110) it is apparent that laryngeals were maintained relatively

late when contiguous to resonants (cf. also Lehmann 1952). Moreover, Germanic has been

noted to have been particularly conservative in the maintenance of laryngeals in the

neighbourhood of resonants (cf. Polomé 1988, Lehmann 1952). Thus, it would appear that

laryngeals were maintained longer in Germanic when they were contiguous to a resonant

(here a glide). Consequently, laryngeals were maintained in the sequence -VHGV- longer

than in -VHV- where no resonant was present. This maintenance represents a type of

strengthening where the laryngeal was able for some reason to resist loss in this

environment. It would then be plausible that GV occurred following the loss of laryngeals

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[18]For a discussion on laryngeals, cf. Chapter 1. I will be using Lindeman's (1987) series of laryngeals as outlined in Chapter 1 § 3.1.2. Laryngeals will be represented in examples as the voiceless velar fricative [x]

in the string -*VHV*-, but while laryngeals were still extant when contiguous to a glide. I now turn to a discussion of GV from this latter sequence.

2.2   *Verner's Law and GV*

While the accent was still mobile in Germanic, Verner's Law caused the voicing of all voiceless fricatives which were not directly preceded by an accent. This meant that all word medial voiceless fricatives of the (9B) syllabification became voiced, e.g. PIE +*patér* 'father' > +*faþár* (Grimm's Law)[19] > Go. *faðar* (Verner's Law). Since we can assume that laryngeals were also voiceless fricatives, we can also assume that they too would have undergone the voicing of Verner's Law as shown below in (10):

(10)   -V̆.xi̯V́- > -V̆.γi̯V́- (voicing due to Verner's Law)

Thus, the laryngeals would have behaved as the other voiceless fricatives by also undergoing voicing in this environment.[20]

This raises two questions at this point. First, why was the sequence -V̆.γi̯V́- alone responsible for GV? And secondly, how did this sequence produce the GV forms? These questions can be answered following an examination of the relevant Syllable Preference Laws and the Consonantal Strength Scale of Murray and Vennemann (1983).

2.3   *GV as a syllable structure motivated sound change*

By virtue of its composition, the sequence -V̆.γi̯V́- is subject to the Head Law and Contact Law. Since this syllabic string contains no codas, the Coda Law is not applicable. For ease of explanation, I have reproduced the Head Law, Contact Law and the Consonantal Strength Scale below in (11) through (13):

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[19]Grimm's Law is responsible here for *p* :*f* and *t* :*þ*.

[20]As I stated in Chapter One §3.1.2, this line of argumentation would not be undermined if there were voiced laryngeals in Germanic. The voicing of the voiceless laryngeals would have rendered them identical to the voiced series in exactly this environment. Thus, it could be argued that the voiced laryngeals, whether inherited or derived by a voicing rule, subsequently underwent the same developments from this stage forward.

(11)   *Head Law*: A syllable head is the more preferred: (a) the closer the number of speech sounds in the head is to one, (b) the greater the Consonantal Strength value of its onset, and (c) the more sharply the Consonantal Strength drops from the onset toward the Consonantal Strength of the following syllable nucleus.

(12)   *Contact Law*: A syllable contact A.B is the more preferred, the less the Consonantal Strength of the offset A and the greater the Consonantal Strength of the onset B; more precisely — the greater the characteristic difference CS (B) - CS (A) between the Consonantal Strength of B and that of A.

(13)

glides	r	l	nasals	voiced fricatives	voiced stops	voiceless fricatives	voiceless stops
1	2	3	4	5	6	7	8
Weak							Strong

<——>
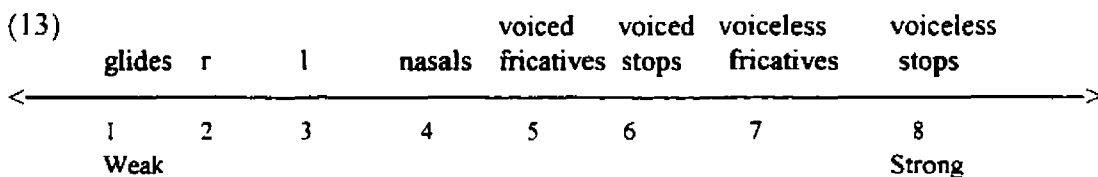
According to the Contact Law, the syllable contact in -$\breve{v}$. $y_i \acute{v}$- is good. However, an examination of part (c) of the Head Law in (11) reveals that the syllable head . y_i forms the least preferred of the *obstruent* + *glide* onsets (cf. §2.3.1). This aspect of the Head Law deals with Slope, the difference in the Consonantal Strength of A-B where .*AB* form an onset cluster. According to the Head Law, the greater the slope of the cluster the more preferred the syllable head will be. Thus, the onset, .*t*i, would be more preferred than . y_i.

2.3.1   Determining the preference of . y_i

The relative strength of [ɣ] and therefore the relative preference of . y_i can be determined even more precisely with regards to other obstruents based on place of articulation. Gamkrelidze (1981) states that the voiced velar plosive [g] is more marked and therefore weaker than both [d] and [b]. He bases his conclusions on the universal distribution of these phonemes where the most marked segments are less likely to occur in the world's languages.

Foley (1977) approaches this question from a different vantage point. He examines

the relative strength of segments based on their tendency towards weakening across languages. Foley then focusses on these specific tendencies towards lenition in Germanic and makes the following conclusion illustrated in (14).

(14)   Relative strength of consonants in Germanic based on place of articulation

velars	labials	dentals
		———>
1	2	3
weaker		stronger

(Based on Foley 1977: 145)
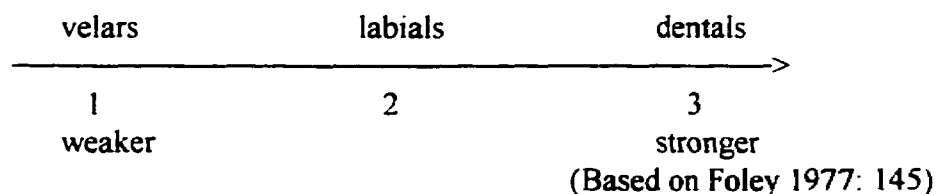
These conclusions coincide with the professed weakness of the laryngeals in relation to other obstruents (cf. §2.6).[21, 22] Assuming Foley's conclusions that the velar articulation is a weaker place of articulation, we can determine the relative preference of the onset . y_i with regards to some of the other possible onset clusters reflecting . C_i. We can place these on various preference continua as in (15) illustrating their relative preferences within their natural classes.[23] The depictions allow for possible overlap of members of one natural class

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[21]Without indicating what he considers the laryngeals to have been, Greg Iverson (p.c.) also assumes that laryngeals would have been (relatively) weak consonants

[22]It would seem to follow that the other laryngeals, namely [ç] and [xʷ], would also be judged as weak since they are all dorsal fricatives. The labial and dental places of articulation would therefore contrast with this weaker "area" of articulation. Support for such a claim may be substantiated by models of underspecification where the contrasts for place of articulation are between [coronal], [labial], and [dorsal] (cf. Clements and Hume 1996; Archibald and Vanderweide 1997; L.C. Smith 1997). The models adopted by both L.C. Smith (1997) and Archibald and Vanderweide (1997) indicate that [dorsal] would be the most marked place of articulation for consonants.

[23]I present individual preference continua to illustrate the relative preferences of C_i within their natural classes. Simply breaking down the Consonantal Strength Scale by places of articulation, as shown below would present a misleading depiction of these relations.

y_i	v_i	g_i	b_i	d_i	x_i	f_i	s_i	k_i	t_i	p_i
<———										———>

Less preferred   More preferred
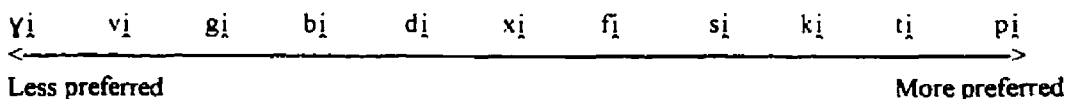
Although in general terms voiced fricatives are weaker than voiced plosives which are weaker than voiceless fricatives, etc., these divisions are not strict. For instance, some overlap between classes exists when place of articulation is considered. e.g., x may actually be weaker than or equal to the consonantal strength of d even

with members of the next natural class.

(15) a.   ɣi̯   vi̯   zi̯   voiced fricatives

<————————————>

Less preferred   More preferred

b.   gi̯   bi̯   di̯   voiced plosives

<————————————>

Less preferred   More preferred

c.   xi̯   fi̯   si̯   voiceless fricatives

<————————————>

Less preferred   More preferred

d.   ki̯   pi̯   ti̯   voiced plosives

<————————————>

Less preferred   More preferred

Since voiced fricatives constitute the weakest natural class of obstruents with regards to consonantal strength, its weakest member, the voiced velar fricative ɣ, would therefore be the weakest obstruent. Thus, as the weakest obstruent, its slope would be the least preferred as depicted in (15). By contrast, $ti̯$ would form that most preferred onset as shown by its most preferred status in (15d) (where t has the greatest consonantal strength of the Germanic obstruents.

According to the Diachronic Maxim (Chapter One, §4.4 (9)), the less preferred structures are the first targeted to undergo improvements or changes. Since the cluster . ɣi̯ is the least preferred onset cluster, then it would be the first to be targeted for changes. This answers the first question: Why were the sequences with the laryngeal reflexes the only sequences to undergo GV? But how was the slope of the .HG sequence improved?

2.4   Slope steepening

Several repair strategies are available to ameliorate complex syllable heads including

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though voiceless fricatives are considered stronger than voiced plosives. Thus at either end of the continua related to individual natural classes, there may be overlap with members of the "next" natural class

deletion of one of the cluster consonants, anaptyxis, vowel prothesis and slope steepening. The one process that neither deletes nor adds a segment to the structure is slope steepening. Instead, this process simply improves a poor slope by either weakening the second consonant, C_2, or strengthening the first consonant, C_1, of the cluster.

Romance provides numerous examples of slope steepening where the slope of either word initial or medial clusters is augmented by the weakening of the second consonant.

(16)   Lat. plānum   It. pi̯ano   'floor'
       Lat. tem.plum   It. tem.pi̯o   'temple'
       Lat. placēre   Por. prazer   'to please'

If the slopes of the examples in (16) are placed on a preference continuum, then it becomes more apparent as to how the slope has been ameliorated in each of these cases.

(17)   .pl   .pr   .pi̯
       <————————————————————————————————————>
       less preferred   more preferred

Since C_1 was already the strongest consonant, a voiceless bilabial plosive[24], then the only means of improving the slope for the Romance examples was to weaken the C_2.

The converse is true in Germanic. In West Norwegian dialects the C_2 had already undergone unconditional strengthening from u̯ · v. The resulting cluster, hv, would have been a very poor onset cluster thereby necessitating the strengthening of the first consonant, C_1. This change of hu̯ · kv is illustrated in (18).

(18)   WNor. kvat   StNor. huat   'what'
                  kvítur   huítr   'white'

Thus, the strengthening of h · k would have improved the slope of the onset cluster.

This example from West Norwegian dialects provides an excellent parallel to the

[24]Foley (1977: 145) claims that in Romance the places of articulation from weakest to strongest are: velar > dental> labial

situation in early Germanic.[25] The slope $\gamma\underline{i}$ could only be improved by strengthening the C_1 since the C_2, as a glide, was already very weak and therefore could not be weakened further without becoming vocalic. Thus, the only method for improving the slope of this cluster was to increase the consonantal strength of the voiced velar fricative, [ɣ], to that of a voiced velar plosive, [g] as in (19).

(19) $\gamma\underline{i} > g\underline{i}$ Slope Steepening

Although this strengthening only increased the Consonantal Strength of C_1 by one step on the Consonantal Strength Scale, this increase would have been adequate to improve the slope thereby rendering it a more preferred syllable onset.

2.5   A sample derivation

Based on the sound changes discussed above, the development of the GV forms can be summarised as follows:

(20)   a. $-\breve{V}.x\underline{i}\acute{V}-$

        b. $-\breve{V}.\gamma\underline{i}\acute{V}-$ Verner's Law

        c. $-\breve{V}.g\underline{i}\acute{V}-$ Slope Steepening — Head Law

As shown in (20), the sequence $-\breve{V}.x\underline{i}\acute{V}-$ produced the GV forms. The first step in the GV development was the voicing of the voiceless laryngeals by Verner's Law. Since this voiced velar fricative + glide onset cluster was the least preferred according to the Head Law, the slope of this cluster was improved through slope steepening whereby the consonantal strength of the first consonant of the cluster was increased. Together these changes produced the GV forms. A sample derivation of Go. *bluggwans* is shown in (21).

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[25]The same slope steepening is evidenced today in Modern Icelandic, e.g., *hvað* 'what' commonly [kvalð], less commonly [xwað] (Glendening 1993).

(21)　PIE　+bhliHw - ón[26]　　Root + past participle ending — Ending receives accent as per §1.3.3

----------　　Loss of laryngeals when no contiguous glide

bhlV.xųv́n　　Syllabification (B) (H=x)

blV.xųv́n　　Germanic Consonant Shift (Grimm's Law: *bh* > *b*)[27]

blV.γųv́n　　Verner's Law

blV.gųv́n　　Slope steepening

blV.gųv́ns　　Miscellaneous developments

[blugųans]　　<bluggwans>

In (21) the derivation commences with the reconstruction of the PIE stem and inflectional ending. Since the past participle ending would have attracted accent, the accent is placed on the vowel of the ending. The accent placement tautosyllabified the cluster, *xų*, in the onset of the accent bearing second syllable. Next, the laryngeal would have undergone voicing due to Verner's Law since the accent was not directly preceding the laryngeal. The lenition of *.xų* to *.γų* would have thus rendered the cluster as a less preferred syllable onset. As the least preferred onset and therefore the first to be targeted for improvement, the slope was increased by strengthening the velar fricative to a voiced velar plosive, thereby providing the output of Holtzmann's Law. At some point during this development the past participle ending, *ans*, would have developed from PIE *-ón*. However, since it bears no importance to our analysis, I introduce the Gothic ending at the close of the derivation.

2.6　A question of chronology

One question can be posed at this stage: Could the sequence of changes *x·k·g*, rather than *x·γ·g*, not have been responsible for the development of the GV segments?

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[26]The reconstruction of the root, +bhliHw - ón is based on Schrijver (1991). The past participle ending is found in Voyles (1992). For the sake of illustration, I will use V to represent the vowels until the output of the derivation to avoid any possible dispute regarding the chronology of vocalic changes. Furthermore, since the vocalic changes from IE to Germanic are not of importance to the study at hand I will focus strictly on the GV developments.

[27]Grimm's Law is placed in this position in the derivation preceding Verner's Law. However, it could have been placed earlier in the derivation. Its exact position is inconsequential as long as it precedes Verner's Law

This alternative series of changes would presuppose the chronology: slope steepening followed by voicing. At first blush, this chronology seems another possible explanation of events. However, a number of points cause me to dismiss this as a likely alternative.

If we assume the Proto-Germanic obstruent inventory in (22)[28],

(22)   f   þ   h   h$^\text{u}$
              b   d   g   g$^\text{u}$
              p   t   k   k$^\text{u}$

then we immediately encounter a problem in motivating the change $x \cdot k$. By assuming $x \cdot y$ due to Verner's Law, the final outcome of this voicing created a cluster with the least preferred slope and therewith onset in the cluster . y_i. Thus, this cluster (and other laryngeal clusters) would have been first targeted for slope steepening. However, if we tried to argue for $x \cdot k$ before voicing had occurred, then we would still need to explain why the voiced plosives, an even weaker series of obstruents in Germanic according to the Consonantal Strength Scale, did not also undergo some form of strengthening. Recall from (15) that in general these voiced plosives formed less preferred onsets than their voiceless fricative counterparts and therefore according to the Diachronic Maxim would have been first targeted for improvements.[29] This leaves us with the question as to why only the laryngeals would have strengthened when they did not form the poorest slope.

One possible explanation for this discrepancy could be found in the unusually weak consonantal strength of laryngeals in comparison to the other voiceless fricatives. Support for this argument can be found in several sources. First, various linguists propose the [x] of the Germanic inventory in (22) was really [χ] (Kluge 1913, Hirt 1931, Lehmann 1992: 149) or [h] (Baldi 1983). These phones, [χ] and [h], may have reason to be placed with (or to the right of) the glides on the weaker end of the Consonantal Strength Scale because of their

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[28]This inventory is based on the manners and places of articulation in Lehmann (1992) and Vennemann (1985a: 528). I have also included the labial series as does Voyles (1992).

[29]Since there do not appear to be any similar strengthenings for the voiced plosive clusters, this alternative explanation seems unlikely

tendency to lenite even to the point of being lost.[30] If the laryngeals were exceptionally weak unlike other voiceless fricatives, then there would have been grounds for the laryngeals alone to have undergone strengthening in the .*HG* cluster with or without the voicing of Verner's Law. Had the laryngeal developed all the way to [k], this might have been the result of maintaining the voiceless quality of the consonant while the spirant underwent occlusion. Although there is evidence for coda *x*   *k* this is possibly the result of dissimilation.[31] Moreover, this change is sporadic in Germanic.

However, the main weakness with the alternative chronology is the second phase of the change, *k*   *g*. First, since Verner's Law applied only to fricatives, then we cannot attribute the lenition to Verner's Law. Although the intervocalic environment is typical for voicing, this particular change is not commonly found in Germanic. Moreover, the syllable onset is generally a position of "strengthening".[32] In other words, the change from .k_i > .g_i would mean worsening the onset slope. Although it is true that not all sound changes in a given language are motivated by syllable-based improvements, it is true that Germanic did tend to improve its syllable onsets. These include cluster simplification, ON *skugge* (Go. *skuggwa*) 'shade' and glide strengthening in Gothic and Old Norse, e.g., Go. *Marja* next to

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[30]Robert Murray (p.c.) first pointed out this unusual weakness of [χ] and [h] to me. The phones [h] and [χ] may be placed between the glides and liquids on the Consonantal Strength Scale based on the weakness of these phones. The series of lenitions, *k* · *x*   *χ* · *h* · *Ø* underscores the relatively weak Consonantal Strength of these phones The change *x*   *h* ·*Ø* has been attested in Germanic (e.g.. OE *hwæt*   Eng. *what*, OE *sēon* 'to see' beside OHG *sehan* and Go. *saihvan*) and elsewhere (OSpa. [x]*ablar* 'to speak' > Spa. ablar (adapted from Murray 1995)). If we use Foley's (1977) criteria of relative strength being based on the relative tendency to lenite, then the laryngeals would be extraordinarily weak. This view of the relatively weak strength of laryngeals is supported by Greg Iverson (p.c.) as noted above. Moreover, the basic assumption of the laryngeal theory is that these segments were ultimately lost by some means in the daughter languages of IE (cf. Lehmann 1952, Jonsson 1978. Beekes 1988. etc.) That the laryngeals were so "easily" lost in all IE dialects would further support the notion of a very weak Consonantal Strength.

[31]Some cases exist where coda /h/ in Germanic sporadically hardens to *k*. e.g.. Grm. [zɛxs] *sechs* but Eng. [sɪks] (Joe Salmons, p.c.). However, this might be the result of the dissimilation of two contiguous fricatives in the coda. Moreover, this strengthening is found in the coda. not the head position If we were to assume that H was in the coda, then this would contradict the evidence for syllabification based on accent and by extension the suffix accent associated with the GV forms

[32]In order to achieve a more preferred syllable onset several processes have been observed, e.g., simplex head strengthening (Lat. *iudicium* but It. *giustizia* [ʤ]. cf Chapter One §4.4 (14)) and slope steepening (cf. §2 4). where the final goal is a "stronger" onset.

Maria. However, the greatest problem for this stage of development is simply the direction of change, *k* ˙ *g*. According to Noreen (1970), Old Norse *g* has only two sources, Proto-Germanic *ʒ* and *g*. Conversely, Old Norse *k* has a number of sources including *g* from Proto-Germanic. All things being equal (ie. not considering the laryngeals as a potential source of either phone), then the expected direction of change would be *g* *k*, not the requisite *k* ˙ *g* for this alternative series of changes. Even if Proto-Germanic *k* were still argued to be the source of GV *g*, then it could not explain why numerous examples of *kG* did not become *gG* in the dialects, e.g., Go. *brakja* 'struggle' beside OIcel. *brakan* 'creaking'; Go. *us-wakjan* 'wake up', OIcel. *vekja*, OS *wekkian*, OGH *wecchen* and OE *weccan* 'to cause to wake up'.

In light of the weak and questionable evidence in support of the series of changes, *x* *k* ˙*g*, I am not convinced that this development could serve as a preferable alternative to the chronology suggested and argued for earlier in this section. I therefore continue to assume the development *x* *ɣ* *g*.

3.0 Non-GV developments[33]

As noted earlier, parallel developments have in some cases produced both GV and non-GV reflexes. Below in (23) I provide examples to illustrate these parallel developments.

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[33]In some cases, non-GV cognates may have developed from a different ablaut grade. However, I will attempt to focus primarily on the non-GV cognates that would have developed from the same root. To find evidence of this differing development from one common IE form, one need only look at the paradigm for Go. *twaddje* and ON *tveggja*.

(23) Parallel developments

GV	Non-GV	WGmc.
Go. *triggwa* 'covenant'	*trauan*** 'to trust'	OE *trūwian* OHG/OS *truwi* 'trust' OHG *trūfwjēn* 'to believe'
ON *tryggua* 'to make calm'	*trū* 'belief' *trūu* 'to trust'	
Go. ——————————	*hawi*** 'hay'	OHG *houwan* OFris. *hāwa* 'to hew' OS *gi-ho(u)wan* 'hewn' (p.p.)
ON *hoggua* 'to cut'	*hey* 'hay'	

** The vowels in the Gothic non-GV words are short.[34]

Recall from §1.6 that I argued for the differential syllabification of the sequence $\check{V}CGV$ based on variable accent placement. I then argued in §2 that the GV forms developed from the (B) syllabification, namely $\check{V}.H(iv$, and that the sound changes could be accounted for based on syllable structure motivated sound changes and the Preference Laws. Since the non-GV forms in paradigms such as 'two' developed from the same root, then as I have proposed, the main difference was accent placement and consequently syllabification of the medial cluster. Thus, the non-GV forms would have stemmed from the (A) syllabification, namely $\check{V}^{?}H.(iV$. But how did these non-GV forms evolve from $\check{V}^{?}H.(iV$?

In what follows I will present two alternatives for this change and will then argue for the second of these two explanations based on a similar change in Proto-Germanic.

3.1   Option One: Coda weakening and compensatory lengthening

As I have observed above, the syllable final position, i.e. the coda, "is a position in which phonological 'weakening' occurs" (Borowski 1990: 261). This fact is articulated by the Coda Law where the fewer the speech sounds in the coda and the weaker the consonantal strength of its offset, the more preferred the coda will be. Examples of coda weakening are found cross-linguistically.

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[34]As noted above, the vowels in these non-GV forms in Gothic are short as opposed to the long vowels in the West Germanic and Old Norse non-GV items. The exact explanation for the Gothic short vowels is unknown. Perhaps these forms developed from a different ablaut grade or from different stem allomorphy.

(24) a. Skt. apāḥ (nom.)   apasam (acc.)   'active'
          Skt   āsīḥ (nom.)   āsīsam (acc.)   'prayer'
          Sp.   salas   salah (dialect)   'halls'
          Sp.   estilos   ehtiloh (dialect)   'styles'

      b. Fr.   cre.de.re > cred.re > creị.re > croire   'to believe'
          It.   in.teg.ru > in.teị.ro> in.te.ro   'entire'
          Sp.   cap.ti.vu > caụ.ti.vo   'captive'
          Bav. bɑl > bɔị   'ball'

      c. Haussa +ta.lak.ʧi > ta.law.ʧi 'poverty'; ta.la.ka 'a poor one'
          + hag.ni > haw.ni 'left side'; ba.ha.go 'a left-handed one'

(All examples from Vennemann 1988a)

The examples in (24) illustrate first of all, that coda weakening is not restricted to any one language family. This is a law with universal applicability. Moreover, in (24a) Sanskrit and Spanish manifest lenition of fricatives to the point where they have lost their oral articulation (Vennemann 1988a: 25). In (24b) and (c), both IE and non-IE languages undergo coda weakening where the resulting phone is a glide.

Coda weakening becomes relevant for non-GV forms as a possible explanation for the "disappearance" of the laryngeals in these forms. If we accept that the laryngeals were extremely weak, as there is reason to believe (cf. §2.6), then these laryngeals could have undergone further lenition in the coda position. However, what form would this lenition have taken?

The laryngeals could either have been deleted altogether as in (25a) or weakened to glides as shown in (25b):

(25) a.   V́H.GV   b.   V́H.GV
           V́:.GV   V́G.GV

In (25a), the loss of the laryngeal would have triggered compensatory lengthening of the preceding vowel. The vowel would have spread into the timing slot left vacant following the loss of the laryngeal as shown in (26).

(26)   a.

```
       N"              N"                        b.    N"              N"
       |               |                               |               |
       N'              N'                               N'              N'
      / \              |                               / \             |
     /   \            /|                              /   \           /|
    X  X  X  X                  ⇒                   X  X  X  X               ⇒
    |  |  |  |                                       |  |  |  |
    V  H  G  V                                       V     G  V
```

c.

```
       N"      .       N"
       |               |
       N'              N'
      / \              |
     X  /X    X    X
      \ /     |    |
       V      G    V
```
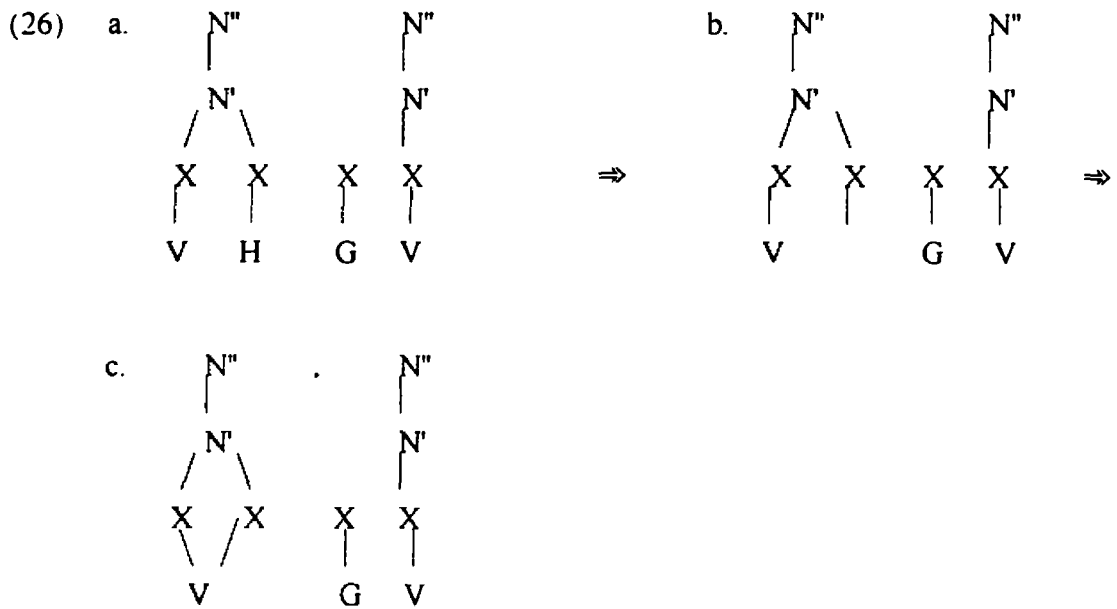
(Based on Kenstowicz 1994: 434-6)

This theory of the development of non-GV forms adheres to the expectation that loss of a laryngeal triggered compensatory lengthening in IE (cf. Beekes 1988, Jonsson 1978, etc.) Examples of non-GV data which could have resulted from this development include OE *būan*, OHG *bū(w)an*, ON *būa* 'to dwell'.

Examples can also be cited for the alternative illustrated in (25b) where the coda had weakened to a glide but did not delete, e.g., OHG *zweijo* 'of two'; OHG *houwan* 'to cut'; OHG *glouwer* OE *glēaw* 'clear'.

3.2 Alternative two: Assimilation

The second alternative explanation is based on the assimilation of the laryngeal to the glide as in *v́H.GV v́G.GV*. Although the outcome is the same as in (25b), the motivation behind this change is significantly different. The development *H G* in (25b) would have resulted from coda weakening due to the weak Consonantal Strength of the laryngeal. However, this does not take into consideration the poor syllable contact, *H.G*, nor does it necessarily guarantee that the laryngeal will weaken to the same glide as what appears in the following onset.

Interestingly, the non-GV forms characteristically contain what appear to be

geminate glides, e.g., OHG _ʒweijo_ (_i̯i̯_); OHG _glouwer_ (_u̯u̯_); OHG _gitriuwi_, OHG OS _triuwi_ (_u̯u̯_), etc. Since this seems to be consistent across the data[35], it would appear that an ad hoc solution as in §3.1 where the result of lenition could be either a glide or the loss of the laryngeal, would be inadequate.

Assimilation offers a plausible solution to the problem. The syllable contact in the sequence V̌H.GV is poor. Although the laryngeal is weak, it still has a slightly greater Consonantal Strength than that of the following glide (cf. §2.6). Assimilation would repair the poor contact by removing any difference in Consonantal Strength between the two segments.

(27)   -V́H.GV-

           -V́G.GV-   complete, regressive, adjacent assimilation

This change is supported by the Strength Assimilation Law which states that "if Consonantal Strength is assimilated in a syllable contact, the Consonantal Strength of the stronger speech sound decreases" (Vennemann 1988a: 35).

Assuming assimilation as the primary means of repairing the contact and eliminating the laryngeal is in harmony with similar changes taking place in Proto-Germanic. Vennemann (1988a: 38-9) provides numerous examples of other occurrences of assimilation in the pre-history of Germanic:

(28)   a.   ˙d.l > l.l, ll, l
              ˙mad.la- > ˙mal.la-;
              Grm. Lat. _mallus_ 'law court', _mallare_ 'to accuse, prosecute';
              ˙stad.la- > +stal.la;
              ON _stallr_, OE _steall_, OHG _stal, stalles_ 'stall, stable'

     b.   ˙z.l > l.l, ll, l
              ˙hruz.lan > ˙hrul.lan;
              OIcel. _hrolla_ 'to tremble, shiver'

---

[35]Certain exceptions do exist, however, most of these are only superficially different as I will show, e.g., ON _hūa_, OE _hūan_, etc.

c. ⁺z.m > ⁺m.m, mm, m
    ⁺ez.mi > ⁺em.mi;
    Goth. *im* '(I) am'

Thus, complete regressive adjacent assimilation was occurring elsewhere as a means of repairing poor contacts. Such a proposal for the non-GV data then fits in with other explanations of phenomena occurring elsewhere in Proto-Germanic.

A derivation of the OHG *bliuwan* 'to strike' is provided below to illustrate the development.

(29) ⁺bhliH.u̯an[36]
      bliH.u̯an   First Germanic Consonant Shift (Grimm's Law)
      bliu̯.u̯an[37]   Complete, regressive assimilation
      <bliuwan>

This derivation provides further evidence that the laryngeal was not simply lost through lenition. Since loss of the laryngeal would have triggered compensatory lengthening as has been noted in Indo-European, no explanation based on laryngeal loss could account for the appearance of the <u> in this and other similar examples.[38] Only by assuming that the laryngeal completely assimilated to the following glide can this <u> receive a proper explication. Other examples of non-GV items which can be accounted for based on this change include among others OHG *zweiio* 'of two', *glouwer* 'intelligent', *triuwi* 'trust',

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[36]Reconstruction of the root +bhliH-w comes from Schrijver (1991). I have employed the infinitival ending commonly found in Old English, Old High German, Old Saxon, etc. for the ease of explanation.

[37]This verb may have undergone a further step where the coda glide was vocalised. Such a development would not detract from this explanation, but in fact could help provide support since the appearance of the vowel [u] could not be explained by any theory of straight laryngeal deletion.

[38]To illustrate the advantage of an explanation based on assimilation rather than compensatory lengthening, we need only examine the derivation of ⁺bhliH.u̯an based on compensatory lengthening.

      ⁺bhliH.u̯an
      bliH.u̯an   First Germanic Consonant Shift
      bli.u̯an   loss of laryngeal
      blii.u̯an   compensatory lengthening
      *blīu̯an *blīw̄an

Derivation by compensatory lengthening creates incorrect forms at times and therefore could not account for the "geminate" glides in OHG *zweiio, glouwer, gitriuwi,* etc.

triuwa 'faith', *eigir* [ejjir] 'egg, pl.', MHG *riuwe* 'sadness, worry', *bruuwen*[39] 'to brew', OS *gibreuuan* 'brewed', and ON *hey* 'hay'.

This analysis of non-GV forms can also be extended to account for items such as ON *būa* and OE *trūwian* without the need to assume loss of the laryngeal with concomitant compensatory lengthening of the root vowel. The appearance of long vowels in some non-GV forms could subsequently be explained by the coalescence of *uu̯* · *ū.* Prokosch (1939: 105) says that the first element of a diphthong tended to absorb the semi-vowel when the diphthong was stressed. Since stress was on the resulting diphthong as shown above, then the environment existed wherein this coalescence could occur.[40] The example OHG *bū(w)an* 'to dwell' is provided in (31) to illustrate this non-GV development and coalescence.

(30)   bheH.u̯an   'to live, dwell'
                     bhuH.u̯an   Vowel gradation due to laryngeal
                     buH.u̯an   First Germanic Consonant shift
                     buu̯.u̯an   Complete regressive assimilation
                     bu:.u̯an   Coalescence
                     <būwan>

In this example, I have again assumed complete regressive assimilation of the laryngeal to the following glide. Although the long vowel could be argued to simply be the result of compensatory lengthening following the loss of the laryngeal, I assume that there is consistency in the way that Germanic treated these non-GV laryngeals. As shown above in (29), the "loss" of the laryngeal and the appearance of [u] can only be explained by the assimilation of the laryngeal to the glide. I therefore extend this process to the example in (30) as well as all other GV-forms. Next, I attribute the long vowel in the stem to the coalescence of the vowel with the contiguous glide in the coda. This subsequent process can

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[39]A GV form ON *brugginn* 'brewed, p.p.' has been noted. For this reason I provide the West Germanic non-GV forms.

[40]Although coalescence is a type of compensatory lengthening in that it maintains the mora count following the coalescence of the two vowels (Robert Murray. p.c.), this is not identical to that which occurs as the result of segmental loss, such as the loss of a laryngeal.

therefore be used to account for the forms OE *twēg(e)a*[11] 'of two', *snōwan* 'to hurry', OHG *scūwo* 'shadow', MHG *brūwen* 'to brew', MDu. *brūwen* 'to brew', *blūwen* 'to deal blows', ON *snūa* 'to turn, twist', *brū* 'bridge', etc.

Thus, complete, regressive, adjacent assimilation of the laryngeal to the following glide provides a cogent account of the development of the non-GV froms. It can account for the two sets of non-GV items, namely those containing diphthongs, e.g., OHG *zweiio*,etc, and those containing long vowels, e.g., ON *būa*. Rather than assuming these to be the result of two separate processes, they can be considered different stages of the same development. The examples containing diphthongs would be the conservative forms which maintained the geminate glides which arose from the assimilation of the laryngeal to the glide. The second set of non-GV forms contain long vowels. These items are innovative with regards to their vowels. Rather than simply maintaining the geminate glides, *VG.G*, the first glide located in the coda of the first syllable coalesced with the preceding vowel. The result was the long vowel evidenced in ON *snūa*. Middle High German provides an example of the different stages of development in its pair of verbs, *briuwen* and *brūwen* 'to brew'. The existence of both the conservative and innovative forms provides evidence for the relationship between the long vowels and diphthongs in the non-GV forms. This could be cited as support for the proposal that the long vowels simply arose as a subsequent development to the diphthongs from the assimilation.

4.0   Putting the pieces together

4.1   The development of Germanic - An overview

The discussion in this chapter has focussed on the GV and non-GV sound changes. However, these developments figure into a more comprehensive development, that of Germanic. This larger development is illustrated in (31). As indicated earlier, the parallel developments took place during Stage 1 when accent was variable. However, the Germanic

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[11]In Old English, <ġ> often represented the palatal glide [j] when followed by a palatal vowel. This is often denoted by dot over the *g*

(31)   -V̆CGV-

Stage 1   A (Non-GV)   B (GV)
                 -V̆C.GV-   -V̆.CGV́-
        e.g.   -V̆x.i̯V- (> -V̆i̯.i̯V-)   -V̆.xi̯V́- > -V̆.y̯i̯V́- > -V̆.gi̯V́-
                 -V̆t.i̯V-   -V̆.ti̯V́-

Stage 2   -V̆C.GV-
        e.g.   -V̆x.i̯V-
                 -V̆t.i̯V-
                 -V̆g.i̯V-   **Germanic accent shift fixes accent on root
                                                 syllable
                                                 **(B) forms conflate with (A) forms due to
                                                 change in stress and therefore syllabification
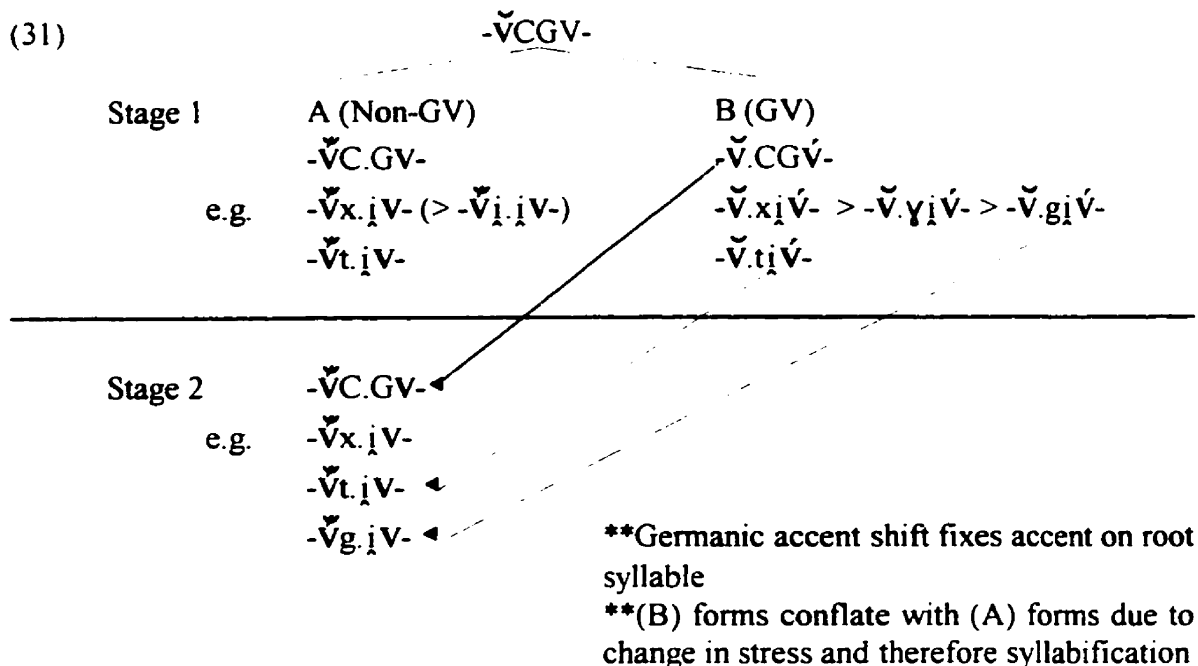
accent shift which fixed stress on the root syllable of words, caused the (1B) forms to conflate with the forms in (1A). This change in accent initiated a resyllabification of the (B) forms to that of the (A) forms where the initial segment of the second syllable onset was attracted into the coda of the preceding syllable. This conflation precipitated by the Germanic accent shift resulted in Proto-Germanic Stage 2. Syllabification for this stage is supported by Murray (1988, 1993), Murray and Vennemann (1983) and Vennemann (1988a). They have shown that Proto-Germanic Stage 2 was characterised by a very marked system cross-linguistically. Subsequent dialect developments such as Gothic glide strengthening, Old Norse velar gemination and West Germanic gemination would have been a means of ameliorating this marked system.

Two points should be noted here. First, the non-GV developments could have occurred at any time during Stage 1 or early Stage 2 since the conditions were already in place for the assimilation of the laryngeal to the glide. By contrast, the GV developments could only have occurred during Stage 1 when accent was still variable. This accounts for the limited number of GV forms in comparison with the more common non-GV cognates. The second point of chronology relates to the fact that before the dialects split, laryngeals

would have been completely lost either through assimilation or strengthening.

In the final analysis, the approach I have outlined in this chapter has three significant strengths. First, it accounts for the parallel developments of GV and non-GV forms in Gothic and Old Norse in particular. This has not been treated in the preponderance of earlier theories. Secondly, it accounts for the "loss" of laryngeals in Germanic following its departure from PIE. And finally, this analysis combines various documented factors and changes such as accent and slope steepening, in a new way to explain this old problem.

4.2   Accounting for the orthography in Gothic and Old Norse

Having completed an analysis of the sound changes, it is now appropriate to reconcile the results of this analysis with the results of the phonological-orthographic correspondence investigation. I have reproduced the interim conclusions as to the correspondences study from my earlier in Chapter 2 below in (32):

(32)   Go.   \<ddj\> = [di̯] (or [ddi̯])   ON   \<ggj\> = [ggʲi̯]
\<ggw\> = [gu̯] (or [ggu̯])   \<ggw\> = [ggu̯]

The outputs of the GV developments according to my analysis above are [gi̯] and [gu̯]. In Gothic, the form [gi̯] could be argued to have undergone further changes. The velar plosive could have assimilated to the palatal glide resulting in either [di̯] or [ɟi̯] which would correspond to Wulfila's \<ddj\>. In the event that the pronunciation was indeed [ɟi̯], the palatal plosive may have been perceived as an allophone of /d/ since no palatal series existed in Gothic. With regards to [gu̯], Gothic simply adapted this cluster into the language without any further developments. In Old Norse, on the other hand, the velar of the GV clusters would have undergone velar gemination producing the geminates found there as in [ggi̯] and [ggu̯]. Recall that this gemination was responsible for the velar geminates elsewhere in Old Norse such as in the words *leggia* (Go. *lagjan* 'to lay down'), *huggia* (Go. *hugjan* 'to think'), and *bekkr* 'stream' (Noreen 1970: 203). The palatal glide would also have triggered palatalisation of the velar further producing [ggʲi̯]. Thus, the final analysis of the development of the GV forms is supported by the correspondences between the orthography and phonology. In turn, the analysis of GV presented in this chapter helps to

better define what the correspondences were. In both languages, further developments of the GV clusters took place, with the exception of Gothic's wholesale adoption of [gu̯] without any further modifications.

5.0   Summary

In this chapter I have presented my phonological analysis of both the GV and non-GV forms. The chapter commenced with a discussion of the nature and placement of the IE accent. I claimed that prior to the Germanic accent shift, Germanic had continued to share many of the accent characteristics with IE including accent mobility. Upon examining paradigms in both Gothic and Old Norse which maintained both GV and non-GV forms, I noted that the occurrence of GV was correlated with a suffix accent as Holtzmann had first argued over 150 years ago. In an attempt to understand the role accent could have played in GV, I summarised historical, phonological and psycholinguistic arguments which contend that accent placement affects syllabification. Based on these arguments I proposed a differential syllabification for early Proto-Germanic during which the accent was still mobile. This stage I christened Proto-Germanic Stage 1. I then went on to argue that the syllabification -V̆.HGV́ provided the environment in which the GV changes took place. These changes, I argued, were ..xG̓ . ɣG̓ gG̓ and were the result of Verner's Law followed by the syllable-based sound change, slope steepening. An alternative chronology was presented but subsequently dismissed.

Next I proposed that the non-GV forms, e.g., ON *būa* and OHG *zweijo* could be accounted for by the complete assimilation of the laryngeal to the following glide, thereby improving the poor contact *H.G*. I presented examples of similar changes taking place in early Germanic illustrating that this sound change was in operation elsewhere in the language in the early stage. Finally, I attempted to bring the various components of my analysis together. I diagrammed the development of Germanic by combining Proto-Germanic Stage 1 with Stage 2 when the accent became fixed on the root syllable. Moreover, I charted the developments and conflations of syllable structures from Stage 1 to 2. Lastly, I verified the conclusions of my analysis with the results of my phonological-

orthographic study in Chapter 2. In turn this helped to then reconcile my tentative conclusions of the phonological-orthographic study and come to a more precise conclusion. In short, GV did not produce geminate obstruents as has been argued by various scholars (cf. Suzuki 1991, Davis and Iverson 1996, etc.). Rather it produced [gi̥] and [gu̥] from *Hi̥* and *Hu̥* respectively with all other variations as subsequent language specific modifications and developments.

Chapter Five

CONCLUSION

0.0 Summary

Numerous studies have been undertaken in an attempt to provide an understanding of Holtzmann's Law. Unfortunately, most of these theories have suffered from the same weakness. Simply they have only provided an account for part of the problem. Where theories were posited to account for the spread of geminate glides, they did not provide an explanation for the strengthening of the glides. Likewise, where phonological analyses were presented there was no discussion as to how or why GV appeared in "non-GV conditioning" environments. Moreover, many of these analyses either provided no clear phonetic identity of the GV graphs, or they did not explain how they arrived at the phonetic identities which they assumed.

In light of these shortcomings, I have attempted to provide a comprehensive analysis of the Germanic *Verschärfung*. The present study commenced in Chapter Two with an examination of the phonological-orthographic correspondences. The rationale for this investigation is simple. It becomes very difficult to account for sound changes without some concept of what the reflexes of those sound changes were. GV is no exception. To determine the phonetic identity of the GV graphs, I examined both the phonological systems and orthographic conventions of Gothic and Old Norse. The interim results of this chapter provided direction for the analysis I undertook in Chapter Four.

Next, in Chapter Three I examined past analyses presented for GV. These theories were based on accent, morphology, laryngeals, syllable structure (cf. Suzuki 1991) and feature spread (cf. Davis and Iverson 1996). Yet despite the breadth of theoretical frameworks applied to solutions, all of these theories have fallen short of the mark as I stated above. Simply, they have only accounted for one aspect of the problem. Rather than rejecting all of the frameworks as inadequate, I attempted to take elements from each of these theories and to see if together they could provide insight into the whole problem. And they did.

For instance, an examination of paradigms which contained the GV allomorphs, e.g.,

'two', revealed that the variable accent which Germanic had inherited from PIE did correlate with GV. It appeared that GV resulted when the original accent followed the strengthened segments. But how could this accent have been responsible? Evidence from psycholinguistic experiments, phonological analyses of English, and word divisions in Old English manuscripts indicated that intervocalic consonant clusters were differentially syllabified based on accent placement. The common conclusion from these varied sources revealed that an accented syllable attracted consonants into its onset and coda. This implied the different syllabifications of the sequence, -VHGV-, ie. -V́H.GV- and -V.HGV́-. Consequently, the GV developments could be traced to the syllabification -V.HGV́-, whereas the non-GV forms developed from -V́H.GV-.

The GV and non-GV developments which ensued from these syllabifications were not complex. The GV obstruents were the result of a succession of changes. First, the laryngeal in -V.HGV́- underwent voicing due to Verner's Law resulting in -V.ɣGV́-. The resulting syllable head was less preferred than other *obstruent-glide* onsets according to the Head Law and thus underwent a further change, slope steepening. This process increased the consonantal strength of the laryngeal reflex, thereby improving the slope and syllable onset. The outcome of this final change was -V.gGV́-. By contrast, the non-GV forms resulted when the laryngeal in -V́H.GV- was assimilated to the following glide. Thus, the differential syllabification of the common sequence -V́HGV- provided the variable environments which can thus account for parallel GV and non-GV developments, e.g., ON *snugga* versus *snúa*. This analysis of the phonological aspects of GV marks an improvement over earlier analyses which, with few exceptions (most notably Polome 1949), have ignored these parallel non-GV developments.

1.0 Advantages and implications of the present approach

The approach presented in this study has three significant strengths. First, it accounts for the parallel developments of GV and non-GV forms which have not been treated in the

preponderance of earlier theories. Since many such cognates exist, it behooves linguists to be able to account for these divergent developments. Secondly, it accounts for the "loss" of laryngeals in Germanic following the departure of Germanic from PIE. Rather than simply being inexplicably lost in all environments, these segments may have been incorporated into the language in the GV examples by way of strengthening or assimilation. Thirdly, this analysis provides a unified explanation of GV. First, it commences by determining the phonetic identity of the segments involved in GV. Next it combines various documented factors and changes such as accent, syllabification and slope steepening, in a new way to explain this old problem.[1]

A number of implications fall out from the analysis presented in this work. First, this analysis assumes that GV took place at an intermediate stage between the split of Germanic from PIE and the fixing of the Germanic accent on the root syllable. Consequently, this means that the syllable structures reconstructed by linguists such as Murray and Vennemann to account for subsequent dialect specific changes do not account for an earlier period of variable stress in Germanic prior to the accent shift. Their reconstructions account for the stage of Germanic following the accent shift to the root syllable. This begs the question as to where other changes such as Siever's Law and the Germanic sound shifts fit into the puzzle. Further study will provide answers to these queries.

One other phenomenon in particular may benefit from any insights provided by the analysis presented in this work. Austin (1946, 1958) first tried to account for the occurrence of k(k) in West Germanic (and Old Norse) from PIE glides (and laryngeals), e.g., ON *nǫkkue*, OE *naca*, OS *naco* and OHG *nacho* 'boat' but Skt. *naú*, Lat. *nāvis* 'ship'. Although this phenomenon is not dealt with as a part of GV, it may prove to be an extension of a more general GV process at work in Germanic. My analysis may therefore serve as a stepping stone to an explanation of the "intrusive" voiceless velar plosives in West Germanic.

One final implication can be cited.

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[1]Moreover, since not all examples of GV resulted from a phonological development, then a further morphological examination is indispensable. The sketch found in the Appendix is a springboard for future research.

2.0   Implications for the Germanic genealogy

When Holtzmann first observed the GV phenomenon more than a century and a half ago, he claimed that it had implications for a common Gothic-Nordic period. The traditional assumption has been that GV was a sound change which resulted in obstruents only in Gothic and Old Norse. West Germanic by contrast was not considered to have undergone the same GV strengthening. This traditional perception of the problem has been contradicted by only a few linguists, including Davis and Iverson (1996).

According to the analysis presented in this work, the occurrence of GV was not isolated in only Gothic and Old Norse. Rather, the series of sound changes which I proposed occurred during an early stage of Proto-Germanic. Whereas past theories have claimed that West Germanic did not undergo the strengthening of GV, I have provided evidence of GV reflexes in this branch, e.g., OE *trugian*, OE *mycg*, OS *muggia*, OHG *mucca*, OS *bruggia* and OHG *brukka*. These examples support the claim that GV operated before West Germanic parted company with the other branches of Germanic. Subsequently, West Germanic may have levelled out the majority of GV forms or derived new lexical items in favour of the non-GV stems (cf. Appendix).

Thus, GV does not serve as a witness for a common period of development between Gothic and Old Norse as Holtzmann once believed. Instead it provides evidence for a common period of development between all three branches of Germanic. At long last it appears that GV may finally have found its appropriate place in the history of Germanic.

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Appendix

DISCUSSION OF SOME RELEVANT
MORPHOLOGICAL CONSIDERATIONS

0.0   The problem

Not all GV and non-GV forms can be accounted for by a strictly phonological analysis. At times GV forms occur where non-GV forms would be expected or non-GV forms occur where GV would be expected. The Old Norse verbs *hǫggua, hió hiogga, hiuggom, hǫgg(u)enn* 'cut, hew' and *búa, bió biugga hiogga, biogg(i)am hiuggom, búenn* provide examples of this problem. In these cases, GV would be expected only in the last two principle parts of the verbs, namely the plural preterite and past participle. Likewise, GV segments are found throughout the ON paradigm for *egg* rather than simply in the genitive and dative where they would be expected. Many more such examples exist.

In what follows, I will suggest some morphological strategies which the Germanic dialects may have employed to either extend or eliminate the effects of GV. My purpose will not be to account for every piece of data, but rather to illustrate the main strategies which might have been employed in Proto-Germanic and the dialects to cope with the allomorphy created by GV. Although additional morphological processes may have been used, the strategies I outline here appear to account for the preponderance of data. These include wholesale maintenance of allomorphy, levelling, parallel developments of weak and strong verbs, inflectional (and lexical) split, and derivation. I will commence with a brief presentation of Bybee's criteria for morphological change and will then turn to a discussion of the morphological processes.

1.0   Morphological change — Bybee (1985)

Drawing on evidence from child acquisition, historical change and experimental linguistics, Bybee (1985) assesses the criteria employed in the maintenance and levelling of lexical items. She claims that the autonomy[1] of a form will determine whether it is

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[1] An autonomous form will have its own entry in the lexicon and will not need to be derived from another form.

maintained in or eliminated from a paradigm containing morphophonemic variation. Three factors help determine the autonomy of a form.

First, a semantically unmarked item (e.g., garden) will likely have its own entry in the mental lexicon whereas a more marked or derived form is less likely to do so (e.g., gardener).

The second factor, frequency, receives the most attention from Bybee. In sum the higher the frequency of an item, rote learning will likely result in a higher degree of autonomy. Thus, in a very frequent paradigm, there may be many autonomous forms, such as in the irregular English paradigm *to be*. Frequency also determines the resistance of a form to morphophonemic regularisation. If a form is autonomous, then it would be stored separately in the lexicon, and would thus be less likely to fall to paradigmatic restructuring.

Thirdly, the morphophonemic irregularity of a form also plays a role in autonomy. An irregular form which cannot be derived from its base form will be autonomous even if it is semantically more marked. Suppletive paradigms such as *to go* in English where the preterite is *went* rather than *goed*, present extreme examples of this factor. However, since only frequent paradigms can tolerate high levels of morphophonemic irregularity, then the importance of the frequency factor is again underscored.

With these criteria in mind, I now turn to a discussion of the morphological strategies which Germanic may have employed.

2.0 Morphological developments of GV and non-GV reflexes

The strategies which I will discuss in this section include maintenance of GV, levelling, parallel weak and strong verbs, inflectional (and lexical) splits, and derivation. In some cases, two explanations may be possible for items. For instance, OHG OS *glau* may have resulted from levelling out the GV segments or it may have been derived from a non-GV verbal stem following the operation of GV. Unfortunately, an exhaustive analysis of every development of both GV and non-GV forms is beyond the scope of the present study. Moreover, deciding between two possible developments is not always possible. Thus, my purpose will simply be to propose possible strategies used in Germanic.

2.1   High frequency paradigms   'two'

To commence this discussion of morphological developments of GV forms, I provide an examination of the most commonly cited GV datum, 'two'. For ease of presentation, the Gothic and Old Norse paradigms are reproduced below in (1).

(1)   'two'

    a.   **Gothic** (from Wright 1917: 117)

	Masc.	**Fem.**	**Neut.**
N.	twái	twōs	twa
G.	twaddjē	----	twaddjē
D.	twáim	twáim	twáim
A.	twans	twōs	twa

    b.   **Old Norse** (from Noreen 1970: 304)

	Masc.	**Fem.**	**Neut.**
N.	tueir	tuǽr	tuau
G.	tueggia	tueggia	tueggia
D.	tueim	tueim	tueim
A.	tuá	tuǽr	tuau

It is only in this declension that we find the maintenance of GV strictly in the genitive form.[2] Even Old Swedish, a daughter language of Old Norse, maintained GV in the genitive forms of this paradigm, e.g., *twæggia, twiggia,* Old Gutnish *tyggia.* In none of these paradigms, therefore, had the GV form been eliminated by levelling. But why not?

Recalling Bybee's (1985) explanation that highly frequent forms or paradigms resist regularisation, it could be argued that frequency played a role in the maintenance of the allomorphy in the paradigm for 'two'. First, Germanic maintained the dual form in its verbal conjugations for a period of time (Voyles 1992), thus the concept of 'two' was of significant cultural importance.[3] Moreover, since it is a small number, it would have been used frequently in trade. With specific reference to the irregular genitive form, its use in the

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[2]In the paradigms for 'both' and 'three' in Old Norse, Old Swedish and Gothic (except for 'both'), the genitive forms also exhibit GV reflexes. However, all these forms are generally explained as the result of analogy based on 'two' (for 'both' cf. Lehmann 1952, Braune and Ebbinghaus 1981; for 'three' Noreen 1904, Lehmann 1952).

[3]The dual was also maintained in Gothic (cf. Braune and Ebbinghaus 1981)

Old Norse indefinite pronoun *huár(r)tuegge* 'each of two, both' (also *huár(r)tueggia* or *tueggia huárr*) illustrates that this GV form was in wide use in this dialect (Noreen 1970: 325).[4] Thus, the relatively high frequency and wide spread use of both the paradigm and genitive form may have caused the paradigm, especially the genitive form, to become autonomous. Furthermore, as Bybee (1985) also notes, morphophonemic alternation is another cause of lexical autonomy. After the GV sound changes ceased to operate, there would have been no way to derive the GV obstruents in the genitive form. As an autonomous form, the genitive could therefore have resisted regularisation.

Thus, the maintenance of the GV segments in the genitive form of 'two' resulted from the high frequency and morphophonemic alternations of this paradigm. These factors caused the paradigm, and in particular the genitive form, to become autonomous thereby resisting elimination by levelling.

2.2   Levelling and analogy

Levelling tends to eliminate alternations between closely related forms (Bybee 1985). The more closely related the forms, the more likely the alternation will be eliminated. For example, regularisation will operate within a verbal tense rather than within forms for the first person across the tenses of a verb. Moreover, the tendency is to regularise infrequent forms. Bybee (1985: 119) cites Old English strong verbs as an example of this predilection. The strong class of verbs reduced in size since verbs with a lower frequency tended to be regularised whereas those with a high frequency tended to resist regularisation. But what determined the direction of levelling?

Mayerthaler (1987) attempts to account for the specific direction of levelling. He argues that "paradigmatic leveling typically involves leveling of the semantically more marked ('derived') form in favour of the semantically less marked ('basic') form" (Murray 1995: 27). The following list outlines what Mayerthaler considers to be the relevant 'basic' versus 'derived' categories (taken from Murray 1995: 27, based on Mayerthaler 1987: 48).

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[4]Reflexes of this indefinite pronoun have also been noted as late as Old Swedish, e.g., *hwärtwæggia* or *hwarriggia* (Noreen 1904 423)

(2)   'Basic'   'Derived'
            <<semantically less marked _____ semantically more marked>>
            singular   -singular
            first person   -first person
            nominative   -nominative
            indicative   -indicative
            present tense   -present tense
            active voice   -active voice
            standard   -standard
                                             (comparative, superlative)

At times, however, the listing in (2) makes incorrect predictions regarding the direction of levelling. For example, in the Old English strong verb paradigms[5] levelling of the vowels could occur from either the singular to the plural preterite, e.g., *drīfan, drāf, drifon, drifen* (Class I) · *drive, drove, driven*, or from the plural to the singular (preterite), e.g., *bite* also of Class I > *bite, bit, bitten*. Moreover, the stem vowel of the past participle was also known to level through to the preterite, e.g., *beran, bær, bǣron, boren* (Class IV)> *bear, bore, borne*. Furthermore, the vowel could be levelled in one direction while the consonants were levelled in the opposite direction, e.g., *cēosan[6], cēas, curon, coren* > *choose, chose, chosen*. Here the [tʃ] and [z] of the present form were levelled through the paradigm. However, the vowel of the past participle was levelled through the paradigm in the opposite direction. Thus, levelling did not always occur in the same direction even within the same paradigm. This prompts Mayerthaler (1987: 55) to note that "by taking into account richer sources of information, such as system-independent markedness together with system-dependent normality" the theory will be better able to account for the data in the world's languages.

Levelling of GV segments has been evidenced in both nominal and verbal paradigms. I will commence by examining the persistence of GV in nominal paradigms with the example 'egg' and will then move to a discussion levelling in verbal paradigms.

2.2.1 Levelling in nominal paradigms – 'egg'

An examination of the Germanic paradigm for 'egg' provides evidence for the

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[5]The examples presented here are from Lehmann (1992).

[6]In Old English, <c> was palatalised before a front vowel or glide and <s> underwent intervocalic voicing.

direction of levelling in the dialects. Below in (3), I have reconstructed two stages of development for this paradigm in Germanic: before GV and after GV.[7]

(3) **PGmc. ˙aH i̯- 'egg'**

	Pre-GV		Post-GV	GV ON/Go(?)[8]	non-GV WGmc.
nom. sg.	˙áH.i̯a	>	˙ái̯ia	↑	
gen.	˙a.Hi̯és	>	˙agi̯és	↑	
dat.	˙a.Hi̯ê	>	˙agi̯ê		
acc.	˙áH.i̯a	>	˙ái̯ia	↓	
nom. pl.	˙áH.i̯u	>	˙ái̯iu	↑	
gen.	˙a.Hi̯ô	>	˙agi̯ô	↑	
dat.	˙a.Hi̯ámz	>	˙agi̯ámz		
acc.	˙áH.i̯u	>	˙ái̯iu	↓	↓

Immediately following the GV sound changes, the Proto-Germanic paradigm for 'egg' would have had allomorphic variation consisting of GV segments in the dative and genitive but non-GV segments elsewhere in the paradigm as illustrated in (3). This allomorphy was subsequently levelled out in the dialects.

In the West Germanic dialects, no reflexes of GV persisted, e.g., OS OHG *ei*, pl. *eigir*.[9] The elimination of the GV segments in West Germanic resulted from the levelling of the non-GV nominative singular stem throughout the paradigm as predicted by Mayerthaler's semantically-based markedness relations in (2). Although the GV form *egg* still exists in English, this is generally attributed to a later borrowing from Old Norse

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[7]Lehmann (1952:44) reconstructs the Germanic stem for 'egg' as *aXj-*. The inflectional endings in (3) are taken from Voyles (1992: 228-9). I have only provided nominative, genitive, dative and accusative forms for ease of presentation since the other forms, i.e., locative, instrumental and vocative, disappeared in the dialects. The assumption of accentuation is also from Voyles (1992: 19-20, cf. also Chapter Four §1 3). Lastly, I have only noted the conservative non-GV assimilation where the output is a "geminate" glide (cf. Chapter Four §3.2).

[8]Crimean Gothic *ada* is attested more than a thousand years after Biblical Gothic was recorded. It could be assumed that the GV segments had been levelled throughout the paradigm, but evidence is inconclusive. Although still probable, I use the term 'inconclusive' because of the minimal data base collected by Busbecq from which we must draw. Although we can assume that the form elicited represented the "basic" form of the noun and therefore depicts the result of levelling, the truth still remains that no information is provided with regards to the paradigmatic forms. Without such a view and the ability to see this item in context, levelling must remain an assumption, not a proven fact.

[9]The <g> in OHG *eigir* represented the palatal glide [i̯].

(Davidson et al. 1986, Kispert 1971).

Conversely, in Old Norse, levelling occurred in favour of the GV allomorph as illustrated by the paradigm in (4) (from Noreen 1970).

(4)   ON   *egg*   'egg'   neuter noun (-ja Stem)
       nom. sg.   *egg*   pl.   *egg*
       gen.   *eggs*   *eggia*
       dat.   *egge (-i)*   *eggiom*
       acc.   *egg*   *egg*

The levelling required for 'egg' in Old Norse would have been from the dative and genitive forms (cf. (3)). This levelling would be unexpected according to the semantically-based markedness relations (cf. (2)). However, Old Norse had been known to level in this direction to build new nominal paradigms based on the genitive form, e.g., nom. *sær* (original form *sjór*) based on gen. *sævar* 'sea' (Fulk 1993). Although its direction of levelling contradicts that which is predicted by the semantically-based markedness relations, it appears to conform to the system-dependent developments in Old Norse.

2.2.2   *Levelling in verbal paradigms*

Old Norse provides support for idiosyncratic levelling in Germanic strong verbs, e.g., the forms cited below in (5). However, the direction of this levelling was not necessarily the same for each verb despite their shared membership in the Class II reduplicating verbs. I have indicated above the forms which principle parts would have been "GV forms" and which would be expected to have been "non-GV forms". This is based on the accent placement on the principle parts of verbs.[10]

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[10]Sample derivations of *hoggua* are provided below. The GV and non-GV processes may have been at work at the same time, e.g., Verner's Law/Slope steepening and Assimilation, so their chronology relative to one another is not crucial. Other processes operated following these changes and may have occurred in a slightly different order than that provided. Since this is not critical for my analysis, I do not provide further discussion. The Germanic stem is based on PIE stem from Lehmann (1986) and verbal inflection is based on Voyles (1992).

(5)   non-GV   non-GV   GV   GV

a. ON *hǫggua*   *hió/hiogga* (ONorw.) *hiuggom*   *hǫgg(u)enn*

     'cut, chop'

     <———— ——————————

     "early" ON   later dialectal levelling

b. ON *búa*   *bió·biugga biogga*   *biogg(i)am biuggom* *búenn*

     'live'   (GV forms in ONorw.)   Ø

                 <------------------------   (GV eliminated)

                 later dialectal levelling

As depicted in (5a), Old Norse levelled the GV segments of the last two principle parts of this verb to the present stem. However, the non-GV singular preterite *hió* continued to persist. This is also evident in the singular preterite, *bió*, which likewise resisted levelling. However, regularisation continued to operate in Old Norwegian until the GV segments were extended to every principle part of the verb including at last the singular preterite.

What defies explanation is the extension of GV to the present stem, *hǫggua* before its extension to the singular preterite, *hió*.[11] Neither Bybee (1985) nor Mayerthaler (1987) can account for this anomaly. The semantically-based morphological relations in (2) would predict levelling from the present to the past stems and from the singular to the plural. Therefore, they provide no insight. Moreover, Bybee has stated that levelling first takes place within major categories before it affects other portions of a paradigm. Thus, we would

	Gmc.	ʰᵛH.ua	ʰiᵛH.uV	ʰiV.Huʋm	ʰV.Huʋn
Verner's Law	— — —	— — —	hiV yuʋm	hV yuʋn
Slope steepening	— — —	— — —	hiV guʋm	hV guʋn
Assimilation of H to G	hvu.ua	hivu.uV	— — —	— — —
u-umlaut	hou.ua	hiou.uV	hio.guʋm	ho.guʋn
Loss of inflectional suffix	— — —	hiou	— — —	— — —
Miscellaneous vowel chgs	— — —	hió	hiuguom	hǫguen
Old Norse gemination	— — —	— — —	hiugguom	hǫgguen
u-deletion	— — —	— — —	hiuggom	hǫgg(u)en
	[houua]	[hió]	[hiuggom]	[hǫgg(u)en]

Old Norse gemination and *u*-deletion could have preceded or followed the levelling of the GV segments to the present stem. Based on the above derivations, the following principle parts of the verb *búa* (< PIE 'bhVH u-) would be expected according to my phonological analysis: *bú(u)a,bió,bioggom, hǫgg(u)en.*

[11] The concomitant question is why the present stem did not also resist levelling based on analogy with other verbs in the same class. The answer to these questions is unclear.

expect levelling of the GV form first from the plural preterite to the single preterite and then to the present stem. Instead, the "opposite direction" of levelling has occurred. If we were to try to argue that the present stem resulted from the GV sound change and not from levelling to avoid this apparent conflict, it would present an unlikely scenario since its counterpart *búa*, which would have provided the same environment for GV to occur, did not produce the effects of GV. Simply stated the Old Norse present stem resulted from levelling, the direction of which proceeded contrary to expectation.

By contrast, the levelling in West Germanic proceeded according to Mayerthaler's prediction, from the present to the past stems, thereby eliminating the effects of GV, e.g., OE *hēawan*, pret. *hēow*[12], OFris. *hāwa*, OS *gi-ha(u)wan*, OHG *houwan*, pret. *hīo*. A comparison of these forms with those in the non-GV derivations (cf. Footnote 10) reveals a striking similarity, cf. hv̥u.u̥a (pres.), hi̥v̥u.u̥V (sg. pret.). The Old Saxon and Old High German present forms maintained the conservative form of assimilation of the laryngeal, namely the diphthong and heterosyllabic glide. By contrast, the Old Frisian present stem underwent the additional stage of coalescence of the glide with the preceding stressed vowel, i.e., ˈhau̥.u̥a > hā.u̥a. The Old English and Old High German singular preterites were also derived as in Old Norse. However, since no GV-reflexes are evidenced in the last two principle parts of the West Germanic verbs, then it may be stated that West Germanic eliminated this GV allomorphy.

The second example (5b), *búa*, provides another interesting scenario. First, GV was eliminated from the past participle. This was perhaps due to analogy where it was remodelled based on the regular construction of past participles in this verb class, i.e., present stem - *enn*. Secondly, the present stem resisted levelling of the GV segments. Three possible factors may have increased the resistance of this form to levelling: a relatively high frequency of occurrence[13], the influence of verbs from the same class, and lastly the formation of a second verb from the GV allomorphs or weak inflection of the same

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[12]"The regular equivalent of West Germanic **au** is West Saxon ēa" (Sievers 1903:40).

[13]This verb has also been associated with the verb *be* (Lehmann 1986).

root, ie., *byggja* 'to live' (cf. §2.3). One final observation is noteworthy. The GV segments spread to the singular preterite by levelling in Old Norwegian. This exemplifies the ongoing process of regularisation in the dialects. Moreover, it concurs with the prediction that levelling takes place first within major categories, i.e., in this case the preterites.

As a stark contrast to the "idiosyncratic" levelling just noted, regularisation in the other dialects tended to favour the non-GV allomorphs in the cognates of the above verbs. In Gothic and the West Germanic dialects, the non-GV stem was levelled through the paradigm for 'live' resulting in the verbs, Go. *bauan* [14], OE OS *būan*, OFris. *buwa*, and OHG *bū(w)an*. The principle difference was that in Gothic the verb was maintained as a strong verb (Class VII) whereas in West Germanic, they became weak verbs and took on the additional meaning 'dwell, cultivate'.

One final piece of data warrants discussion. The Gothic verb *bliggwan, blaggw, bluggwum, bluggwans* 'hit, strike' provides an admittedly troublesome example. According to the accent placement, GV would have been expected in the plural preterite and past participle, but not in the first two principle parts of the verb. Unlike the variability in the direction of levelling in Old Norse and West Germanic, Gothic levelled out allomorphy in favour of the present stem, cf. OE *snīþan* 'to cut', *snidon, sniden* but Go. *sneiþan, sniþum, sniþans* (Wright 1917). Wright (1917: 63) notes that only two or three examples exist where Verner's Law was not levelled out in favour of the voiceless spirant. In these cases, e.g., *þarf* 'I need', pl. *þaúrbum* and *fraþjan* 'to understand', *frōdei* 'understanding', no levelling took place at all. Thus, if GV were the result of levelling in Gothic, then its direction was without precedent. However, if the GV forms throughout the paradigm were not the result of levelling, then some other explanation for these anamolous forms must be found. [15]

2.3   Strong and weak verbs in Germanic

It may be possible that strong and weak forms of verbs co-existed in Proto-Germanic

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[14] Gothic <au> is the reflex of PGmc. *ū*.

[15] One possible explanation may be that Gothic maintained the aorist present form of this verb. These verb forms were accented on the suffix throughout their conjugations, therefore providing the environment to occur (cf. Prokosch 1939).

(Robert Fulk, p.c.). These weak verbs would have been accented on the suffix thereby providing the environment for GV to occur (Prokosch 1939). Thus, the ON weak verb *byggua* could have developed in parallel with its strong counterpart, *búa*.

(6) byggua[16] 'to live, build'

'bV.Hμá	Germanic root
bi.Hμá	*i* stem vowel
bi.ɣμá	Verner's Law
bi.gμá	slope steepening
by.gμá	*u*-umlaut
bygμá	Stem = **byg**

byggμa[17] (pres.)　　**bygg(u)e** (sg.pret.)　　**bygþa** (pl.pret.)　　**bygþr** (p.p.)

The last three principle parts of the verb would have been formed on the basis of the present stem. Moreover, the development of this weak verb would account for the stem vowel, *i*.

Another similar example can be noted in the contrast between the GV and non-GV verbs OSwe. *dæggia*, Go. *daddjan* 'to suckle' and OSwe. *dīa* and OE *dīon* 'to suck'. Both GV and non-GV reflexes persisted in the dialects. All of these are verbs of the third weak class.[18] However, it is plausible that the non-GV verbs are the reflexes of a formerly strong verb.[19] The development of a former strong verb may be schematised as follows:

(7) PGmc. 'dv́H.ịV(n)　　'dv́H.ịV　　'dV.Hịv́m　　'dV.Hịv́n
　　　　dị.ịV(n)　　　　dáị.ịV　　　do.gịVm　　do.gịv́n
　　　　dīV(n)　　　　　dáịịV　　　dogịVm　　dogịv́n

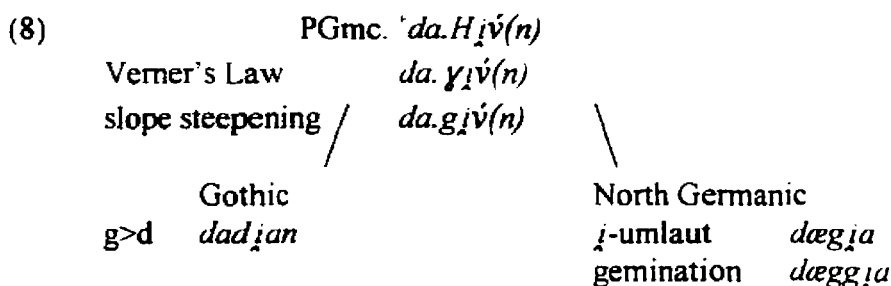The present stem could have been levelled through the paradigm and subsequently a new

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[16]Some verbs of the third weak conjugation in Old Norse which end in *-gw* or *-kw* also have alternative infinitive forms ending in *-ia* (Noreen 1970: 346).

[17]I have included gemination in the present and singular preterite stems as they appear in Old Norse (Noreen 1970: 346). Since it is not crucial to the analysis at hand. I do not provide a discussion. Moreover. I have used the stem vowel *i* in this example since other GV verbs of this verbal class have been cited by Noreen as developing from the root vowel *i* and subsequently undergoing *u*-umlaut.

[18]The third ablaut grade had the following vowel gradation: PGmc. *e: a: u* (with ON *e,i: a: u,o*) (Noreen 1970).

[19]The ablaut grade of these non-GV verbs points to a possible strong verb etymon.

weak verb may have been formed on this stem. However, the stem vowels in OSwe. *dæggia*, Go. *daddjan* cannot be accounted for based on the forms in (7). For this reason, I suggest that a weak verb may have developed in parallel with the "strong" verb above based on an early Germanic stem allomorph containing the vowel [a]. This verb would have belonged to the *ja*-stem class of verbs as noted above. Its development may have been as follows:

(8)   PGmc. *'da.Hįv́(n)*
        Verner's Law   *da. γįv́(n)*
        slope steepening /   *da.gįv́(n)*   \

                Gothic   North Germanic
        g>d *dadįan*   *į*-umlaut   *dægįa*
                                          gemination   *dæggįa*

The vowels in the GV forms receive a cogent account by assuming a different vowel grade in the root.

One further note could be made with regards to the semantics of these verbs. In the case of Old Swedish, not only were both the GV and non-GV verbs maintained, but a semantic contrast obtained between these two verbs. The use of the GV verb indicated one half of the activity, namely the providing of nourishment for a baby or simply the suckling action. By contrast, the non-GV form in this dialect came to represent the sucking action of the infant. Thus, the maintenance of the GV~non-GV contrast enabled Old Swedish to contrast these two complementary actions.

Parallel weak and strong verbs could also account for some inexplicable correspondences between verbs such as OE *scieran* OFris. ON *skera* 'to cut, hew' next to Norw. *skeggja* 'to shave, mow', OE *tō-sciecgan* 'to be separated, removed'.[20] The GV obstruents would have developed in the weak verbs due to suffixal accent in weak verbs. Subsequently, all GV forms in the non-GV verbs would have have been levelled out possibly to maintain the contrast between the two verbs.

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[20]These words have been associated by Holthausen (1934).

2.4   Inflectional split

Another morphological change which may have extended the occurrence of GV segments was inflectional split. Bybee (1985:91) defines inflectional split as "any situation in which two inflectionally-related words lose their inflectional relation." For example, the pair *brother~brethren* split when the irregular plural form was replaced by the regularised plural, *brothers*. Thus, the displacement of an original irregular form by a new regularised form can provide the impetus for a split to occur. The displaced form may then be maintained in certain contexts taking on a specialised meaning, in this case 'the men of the church'. Inflectional split is conditioned by frequency, semantic markedness, and especially the phonological distance and morphological irregularities of the forms in question. The greater the phonological difference between the two forms, as well as the greater the morphophonemic irregularity (the less easily derived it is from a base form), the greater the chances will be that a split will occur.

Fulk (1993:344) provides an example of inflectional split from the history of Germanic. Through a phonological change, "the word for *sea* developed an alternation reflected in OIcel. nom. *sjór*, gen. *sævar*, and this prompted the analogical completion of two separate paradigms, including gen. *sjóvar* for one paradigm, and nom. *sær* for the other." Fulk's example may be illustrated as in (9).

(9)   'sea' — original paradigm   innovative paradigms
                                           (a)   (b)
       nom. sjór   (> (a))   sjór   sær
       gen. sævar (> (b))   sjóvar   sævar

Thus, two separate yet parallel paradigms can arise from allomorphy.

Inflectional split may account for the parallel developments which produced the non-GV noun ON *brú* 'bridge' and the GV nouns OIcel. *bryggia* 'pier', OE *brycʒ*, OS *bruggia*, and OHG *brukka* 'bridge' (examples from Lehmann 1952: 47).[21] The possible development

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[21] In Old Icelandic where both the GV and non-GV forms were maintained, there was also a split in the meanings of the words The non-GV form took on the sense 'pier' whereas the GV form was assigned the meaning 'bridge'

could be illustrated as in (10) below:

(10)　　　　Pre-GV　　　　　　Post-GV

nom.sg.	ˈbrúH.u̯u	>	ˈbrū.u̯u	
gen.	ˈbrúH.u̯oz	>	ˈbrū.u̯oz	
dat.	ˈbrúH.u̯ē	>	ˈbrū.u̯ē	
acc.	ˈbrúH.u̯ō	>	ˈbrū.u̯ō	
nom.pl.	ˈbrúH.u̯ōz	>	ˈbrū.u̯ōz	
gen.	ˈbru.Hu̯ó	>	ˈbru.gu̯ó——————> *brug-* displaced
dat.	ˈbru.Hu̯ōmz	>	ˈbru.gu̯ōmz————> *brug-* displaced
acc.	ˈbrúH.u̯ó	>	ˈbrū.u̯ó	

V

levelling out GV

The displaced forms from the genitive and dative plurals would have provided the stem *brug-* from which a new *jo*-stem noun was created. This change to the *jo*-stem class accounts for the *i* in OIcel. *bryggia* and OS *bruggia*. It also accounts for the *i*-umlaut in OIcel. *bryggia* and OE *brycȝ* and for the gemination in all the West Germanic forms. Thus, inflectional split may have contributed to the extension of the GV effects.

Inflectional split may also account for some GV verbs where the GV verb was formed on the basis of a displaced GV allomorph, e.g., Go. *trauan*, ON *trúa* OE *trīwian* 'to trust' in comparison to ON *tryggua/tryggja* 'to make calm', OE *trugian* 'to trust, confide in'[22]; ON OS *glōa*, OE *glōwan*, OS *glōw(i)an* (all weak verbs) 'glow' in contrast with Swe. Norw. *glugga* 'to look, spy' where the GV verb has undergone significant semantic changes over time; OS *hreuuan*, pret. *hrau*, OHG *riuuuon*, pret. *hrau, rou*, whereas another branch has preserved the GV form, ON *hryggua* (weak verb) 'to make sorrowful'.

2.5 Derivation

One last major morphological strategy can be cited to explain a large number of forms eluding phonological explanation. This process is derivation. Citing examples from Old Norse, Fulk (1991: 347) states that "suffixless *a*-stem nouns and adjectives derived from

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[22]According to Holthausen (1934: 354) the stem *trug-* stands beside *truw-*.

strong verbs in Proto-Germanic are rather common."[23] Fulk illustrates his claim with the following examples. Recall from (5a), that ON *hǫggua* 'strike, hew' underwent levelling in favour of GV. The ON word *hǫgg* 'blow' was derived from the GV stems of this strong verb. The Old Norse strong verb *hnǫggua* 'push' also completely levelled GV through its paradigm, i.e., *hnǫggua, hnǫgg, hnuggenn*. The Old Norse adjective *hnǫggr* 'mean, stingy' could thus have been a later development from this Old Norse verb which had remained strong (Fulk 1991). The adjective then underwent a semantic shift perhaps based on the notion that "s/he who pushes is mean". The last example cited by Fulk (1993: 347) is ON *hryggr* 'afflicted' which he associates with the verb *hryggva* 'to sadden, distress'. Although this verb has become weak, Fulk relates it to the strong verbs OS *hreuuan* and OHG *riuwan* 'to sadden'.

Further cases of derivation can be cited. For example, it appears that there existed a period in Gothic and Old Norse, when the GV stem *skugg-* was productive as in (11).

(11)

ON *skugge*	'shadow'	<	*skugg-e*	masc. *an*-stem noun
ON *skyggia*	'to overshadow'	<	*skugg - ia*	*ia* — weak verb suffix added to adjectival or nominal stems
ON *skygna*	'to spy'	<	*'skuggwinōn*	*n*-suffixed verbs derived from adjective or nominal stems
ON *skygn*	'clear-seeing'	<	*skugg-n*	adjective
ON *skuggsia*	'mirror'	<	*skugg-sia*	compound of 'shadow' and 'see' — literally 'an object in which to see one's shadow (figure)'
Go. *skuggwa*	'mirror'	<	*skugg-ua*	*ua*-stem noun

Compare these lexical items with the weak non-GV verbs OHG *skouwōn* and OS *skauwōn* 'to look at' and the nouns OE *scuwa* and OHG *scuwo, scū* 'shadow'. An examination of the

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[23]Derivation from strong verbs is common in Gothic (for nouns, cf. Wright 1917) and Old Norse (cf. Valfells and Cathey 1981).

glosses of these cognates reveals the extent of lexical split which occurred wherever the derivatives took on completely new meanings.

Further examples of derivation by affixation can be cited for GV and non-GV forms. The Gothic adverbs *glaggwaba* and *triggwaba* were formed by adding the adverbial suffix *-ba* to the adjectival stems, *glaggw-* and *triggw-* respectively (Wright 1917: 166). Moreover, the non-GV Gothic noun *trauains* 'confidence, trustworthiness' was derived from the weak III class verb *trauan* 'to trust'. Since the suffix *-ains* was "used in forming verbal abstract nouns from the first three classes of weak verbs" (Wright 1917: 175), then the derivation of *trauains* can be stated to have simply been *trau- ains*. Moreover, some "new" lexical items were simply formed from verbal stems, e.g., ON *trú* (fem. noun) 'faith, belief' and *trúr* 'true', by adding the appropriate inflectional endings.

3.0   Summary

I have attempted to provide an overview of some of the major morphological processes which determined the maintenance or elimination of the GV segments in the Germanic dialects. These included maintenance of mixed paradigms containing both GV and non-GV forms, levelling, the parallel development of both strong and weak verbs, inflectional split, and lastly derivation. Since space did not permit me to outline every piece of data, I attempted to simply illustrate these processes and the effects they had on the longevity of GV in Germanic. More work is needed to sort out all examples. However, perhaps this sketch will provide a starting point for future research of this problem.

IMAGE EVALUATION
TEST TARGET (QA-3)

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3.2 2.2
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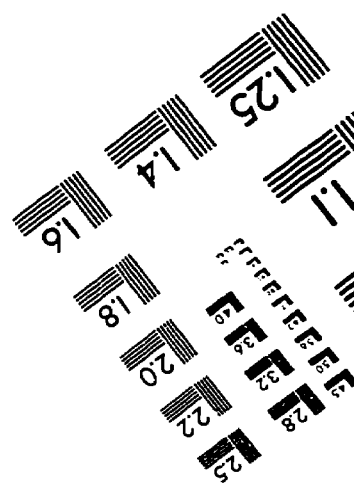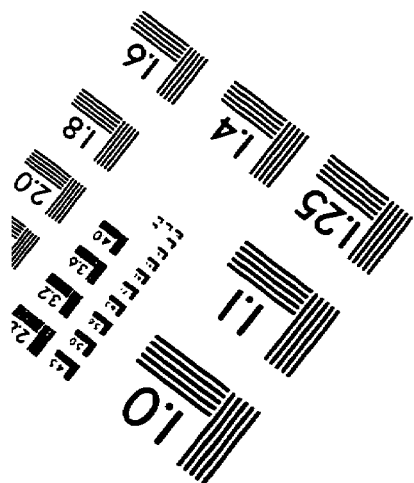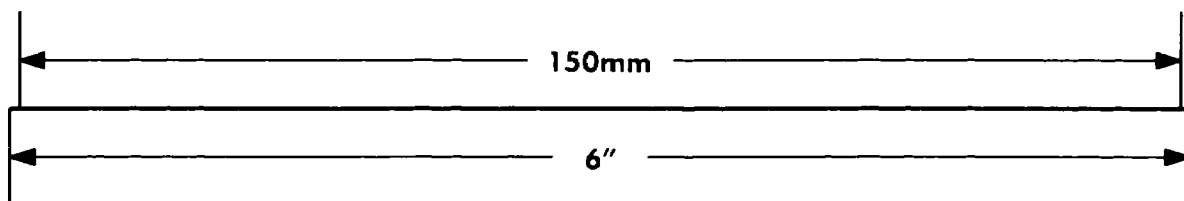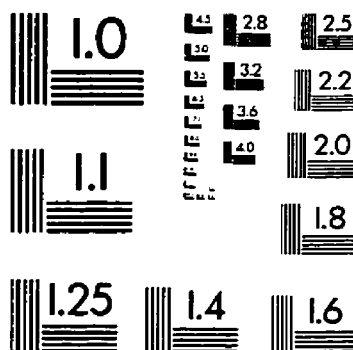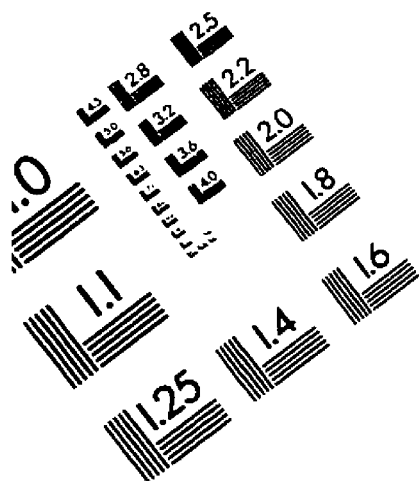
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