Juliette Blevins and Sven Grawunder, *KL > TL sound change in Germanic and elsewhere: Descriptions, explanations, and implications

Mouton de Gruyter

Please note that all page and line breaks are preliminary. There is no need to mark bad page breaks.

**Notes/Queries**

- References, Brommenhauer: Please add the missing data.

Christoph Eyrich
Abstract

An underdescribed sound change in Germanic is the shift of initial kl and gl to tl and dl respectively. Though not widely known, KL > TL has occurred more than once in the history of Germanic. Relevant phonetic factors include coarticulation and perceptual similarity. A third structural factor in Germanic and elsewhere is a pre-existing TL gap. KL > TL gives rise to common TL clusters, though, under many phonological analyses, TL clusters are disfavored or marked. Typological comparison suggests that TL clusters are not marked, but that contrasts between KL and TL are disfavored.

Keywords: assimilation, coarticulation, consonant clusters, Germanic, markedness, phonetic explanation, phonology, phonotactics, sound change

1. Introduction

A common feature of lesser studied varieties of German and English is the pronunciation of historic and orthographic word-initial kl and gl clusters as [tl] and [dl] respectively. We will refer to this feature throughout as a KL > TL sound change, and to dialects exhibiting this change as TL-dialects, and others as KL-dialects. As residents of an area of Saxony where friends call themselves Klaus [tlaus], and ask what you glaubst [dlaupst], we were surprised to find little phonetic or phonological documentation or description of this sound pattern. In fact, in one of the few modern discussions of the sound change in English dialects, it is claimed, incorrectly, that “[t]he change has no parallel in other Germanic languages” (Fisiak 1980: 89). One purpose of this article, then, is to fill a descriptive gap in the literature. Section 2 presents information on TL-dialects of German and English, and provides a summary of what is currently known about their history and distribution. One interesting consequence
of assembling these descriptions is the finding that a KL > TL sound change occurred at least twice in the Germanic language family: at least once in what is now central Germany, and at least once in seventeenth century England. In Section 3, we suggest three factors that played a role in this recurrent sound change. First, as a local case of anticipatory coarticulation, KL > TL is phonetically natural. Second, as KL and TL clusters are perceptually similar, they are easily confused, suggesting a perceptual basis to the change as well. Third, and most interestingly, in all cases where this sound change is attested, initial TL clusters are absent prior to the change. Under this special circumstance, there is evidence of “phonotactic perceptual assimilation” where speakers may hear [tl], [dl] as [kl], [gl] respectively as a consequence of top-down processing. The role of TL gaps in this particular type of sound change is supported by a survey of non-Germanic languages with similar changes. In all cases, an apparent precondition for initial KL > TL is the absence of contrastive TL clusters in initial position.

A final issue considered here is the implications of KL > TL sound changes for general conceptions of rare or marked sound patterns in phonological theory. A common view in modern phonological analyses is that TL onset clusters are disfavored and highly marked. This view appears to be based on a small set of Indo-European languages, and within that, on weighting of standard languages over their non-standard counterparts. As we highlight in Section 4, word-initial coronal-lateral onset clusters are not uncommon in languages which allow onset clusters with laterals as second members. An additional weakness of markedness accounts is the absence of empirical evidence supporting the view that TL clusters are articulatorily taxing or perceptually difficult. Altogether, the evidence suggests that TL clusters are not particularly rare, nor are they difficult to produce or perceive. However, the historical and experimental record does provide evidence that initial KL vs. TL clusters are easily confused with each other, especially where regular TL or KL gaps are found. This perceptual factor can explain the crosslinguistic rarity of languages with true TL vs. KL contrasts.

Overall it is hoped that by gathering together descriptions of KL > TL sound changes, exploring their phonetic and structural bases, and evaluating their status in the context of crosslinguistic consonant cluster typology, a better understanding of these sound patterns will emerge.1

1. A similar motivation is found in Haugen’s (1942) study of sltl neutralization in Norwegian (Haugen 1942: 879):

   […] no one has attempted to gather all the available data and present it in a systematic form. We still lack all but the most rudimentary attempts at mapping of the phenomena […] Any information on a specific sound change must be dug out from a multitude of monographs dealing with specific dialects. In this study the writer wishes to supply
2. *KL > TL: Description and documentation of a recurrent sound change

In this section we highlight all known Germanic languages where word-initial *kl and *gl clusters have shifted to tl and dl respectively. Section 2.1 covers a range of German dialects, while Section 2.2 includes examples from varieties of English. The majority of the descriptions summarized here are based on auditory impressions, and in many cases recordings of the noted varieties are not available. In order to document this sound pattern more fully, we have collected recordings of several German varieties where this sound change is in evidence. In Section 2.1 phonetic analysis of initial clusters for one speaker of a TL-dialect are briefly discussed. Recordings of this speaker can be heard and compared to a KL-speaker at http://www.eva.mpg.de/~grawunde/tl.html.

2.1. German dialects

A shift of initial *kl > tl and *gl > dl is described for many varieties of German, including areas in Saxony where both authors currently reside. The sound change in question has been noted, in passing, by many linguists. An early reference appears in Sievers’ (1885/1901) Grundzüge der Phonetik zur Einführung in das Studium der Lautlehre der indogermanischen Sprachen, where he notes (Sievers 1885: 160):

Die Verbindung cl mit lateraler Explosion hört man oft in Sachsen, z. B. in glauben, gesprochen clau-m oder clo-m u. dgl. Sie geht übrigens sehr oft in tl über; man spricht also auch geradezu tlo-m.

[One hears frequently in Saxony the combination cl with lateral release, e.g., in glauben, pronounced clau-m or clo-m, and so forth. This combination, by the way, very often changes into tl; thus, one says really tlo-m. – Translation JB&SG]

Extending the observation to voiced and voiceless KL clusters, and observing it in a range of dialects, Schirmunski (1962: 401) attributes the process to assimilation, writing that:

the deficiency for the sound group in question. At the same time he wishes to analyze the development and distribution of the group, and to relate it as closely as possible to its lexical, morphological, phonetic, and phonological background. By drawing in all of these attendant circumstances, it may be possible to reach a fuller conception of the complexity of this linguistic phenomenon than was permitted by the “sound law” formulation of a previous generation.

2. Here and throughout, we document the change word-initially. However, available data suggests that the change targeted all syllable-initial KL clusters.
Ein weiteres Vorschieben erzeugt Vorderzungenartikulation: \( gl (kl) > dl (tl) \). Diese Erscheinung ist registriert worden im nördlichen Teil des Ostfränkischen (zwischen Rhön und Steigerwald), im südlichen Thüringen, im Vogtland, im westlichen Teil Obersachsens (Zwickau), im Lausitzisch-Schlesischen und in einigen bairischen Mundarten.

[A further forward movement causes fronted articulation: \( gl (kl) > dl (tl) \). This phenomenon has been noted in the northern parts of Eastern Franconia (between the Rhön and Steigerwald mountains), in southern Thuringia, in Vogtland, in western Upper Saxony (Zwickau), in Lausitz-Silesian dialects, and in some Bavarian dialects. – Translation JB&SG]

As a first step in documenting this sound change, we put together information from previous sources, mostly on dialect geography, to produce a map showing the approximate geographical location of TL-dialects. In Map 1, shading shows the major German dialect areas: Low German dialects in the north, Central German dialects in central Germany, and Upper German dialects in the south. Overlaid on this are small circles representing approximate points where TL-dialects have been identified in past work: P = Protze 1957, Z = Wallner-Zimmer 1999, S = Spangenberg 1993, K = Schirmunski 1962, W = Wenker et al. (Deutscher Sprachatlas 1927–1956); and K = König 1989. Superimposed on this map are two additional data points, “A” and “B”, where we collected additional data (see below), and a shaded area with black outline showing the approximate area of the KL > TL sound change within the German dialect area. Two points are notable. First, though the TL-region includes population centers of Riesa, Meißen, Plauen, and Zwickau, it is not a general feature of speech in Leipzig, Borna, or Altenburg. Second, since the TL-area is unbroken, it is quite possible that the sound change occurred only once, and spread with population movements, or via contact with neighboring dialects.

Despite early references to a KL > TL sound change in German dialects, and its mention in the dialect surveys just noted, discussion of TL-dialects in the modern phonetics and phonology literature is almost unknown. This is all the more surprising when one looks at the sociolinguistic distribution of this feature. Unlike many other dialect features, the KL > TL shift is not particularly stigmatized.3 Wallner-Zimmer’s (1999) phonetic study of a Saxon regional standard is based on recordings of public speeches made by Saxon

---

3. The first time someone was introduced to the first author as [tlaus] ‘Klaus’, she asked that the name be repeated several times. As a linguist, and learner of German as a second language, she finally adopted the speaker’s pronunciation with initial [tl], until the name was later written down as Klaus, and she realized that this was a Saxon pronunciation. Interestingly, despite requests that the name be repeated, the speaker did not accommodate to standard pronunciation nor suggest correction to the standard. See Section 3 where we suggest that the lack of stigma associated with this feature may be due to that fact that it often goes undetected by listeners.
`KL > TL` sound change in Germanic and elsewhere

parliament members. Individuals from Chemnitz, Dresden, and Leipzig show evidence of the KL > TL sound change, with the highest rates of velar shift in speakers from Chemnitz (the southernmost “Z” on Map 1).

Map 1. *Geographical location of German TL-dialects*
Subsequent study of at least one speaker from the Chemnitz area confirms that this sound pattern is entirely regular at the level of the individual. Gunn (2005) was successful in identifying an elderly speaker of a Vogtland dialect, with clear pronunciation indicating the same *KL > TL sound change. Some data collected from this speaker is provided in (1), where it is compared with modern Standard German. Square brackets enclose IPA transcriptions of the initial clusters.

(1) Initial *KL > TL in East Vogtland (Ostvogtländisch; Gunn 2005)

<table>
<thead>
<tr>
<th>East Vogtland</th>
<th>Standard German</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. kl &gt; tl/)#_</td>
<td>[tl]ag klag ‘charge (1sg.ind)’</td>
</tr>
<tr>
<td></td>
<td>[tl]amm klamm ‘damp’</td>
</tr>
<tr>
<td></td>
<td>[tl]ammern Klammern ‘clothespins’</td>
</tr>
<tr>
<td></td>
<td>[tl]ang Klang ‘sound’</td>
</tr>
<tr>
<td></td>
<td>[tl]appert klappert ‘worn out’</td>
</tr>
<tr>
<td></td>
<td>[tl]ein klein ‘small’</td>
</tr>
<tr>
<td>b. gl &gt; dl/)#_</td>
<td>[dl]as Glas ‘glass’</td>
</tr>
<tr>
<td></td>
<td>[dl]att glatt ‘slippery’</td>
</tr>
<tr>
<td></td>
<td>[dl]aube glaube ‘believe (1sg.ind)’</td>
</tr>
<tr>
<td></td>
<td>[dl]aub/st glaubst ‘believe (2sg.ind)’</td>
</tr>
<tr>
<td></td>
<td>[dl]eich gleich ‘straight away’</td>
</tr>
<tr>
<td></td>
<td>[dl]ocke Glocke ‘bell’</td>
</tr>
<tr>
<td></td>
<td>[dl]ück Glück ‘luck’</td>
</tr>
<tr>
<td></td>
<td>[dl]impflich gimpflich ‘mild, light’</td>
</tr>
<tr>
<td></td>
<td>[dl]etscher Gletscher ‘glacier’</td>
</tr>
<tr>
<td>c. with prefixes</td>
<td>be[t]lag beklag ‘complain (1sg.ind)’</td>
</tr>
<tr>
<td></td>
<td>ge[d]laubt geglaubt ‘believed’</td>
</tr>
</tbody>
</table>

In (1a) we see evidence that word-initial *kl clusters have shifted to /tl/. Data in (1b) shows that word-initial *gl clusters have shifted to /dl/. In both cases, the change appears to be independent of the quality of the following vowel. The forms in (1c) show that the sound change has also applied to stem-initial clusters preceded by unstressed prefixes, or generally to all KL-syllable onsets (see Footnote 2).

Here we report briefly on data collected from another speaker of a German TL-dialect. This 28 year old male (TG) from the town of Lichtenstein, southern Saxonia, identified himself as a speaker of the Erzgebirge dialect, a TL-dialect. The speaker was asked to perform a production task, typical of school grammar teaching. A verb is pronounced, first in the infinitive, then in the past tense, and then in the perfect. For example, for the verb ‘climb’, the sequence would be klettern, sie kletterte, sie ist geklettert. TG was asked to perform this task with a range of verbs beginning with /kl/ and /gl/ in Standard German, and the same
*KL > TL sound change in Germanic and elsewhere* 273

The task was performed by SG, a 37 year old speaker from Halle, Sachsen-Anhalt, who identified himself as a KL-dialect speaker. The data were recorded digitally at a sampling frequency of 48 kHz, using a solid-state recorder (Zoom H4) with built-in microphone. All recordings were made in the sound booth of the Department of Linguistics, Max Planck Institute of Evolutionary Anthropology, in Leipzig. Phonetic transcriptions were made by the second author and are shown in (2) for a subset of the data. The recordings on which these transcriptions are based can be accessed at http://www.eva.mpg.de/~grawunde/tl.html.

Data were processed and analysed using the Praat software package for signal analysis (Boersma & Weenik 2006). Measurements were made of burst duration and spectral properties of the burst. In Figure 1, burst spectra of the initial stops for speaker TG are shown in the left-hand panel, and those for speaker SG on the righthand panel. Bold lines show averages across 11 tokens for each speaker. For initial clusters heard as [tl], the stop bursts show consistent peaks at about 2.5 kHz, suggesting a lateral release of a front (coronal) closure (cf. Ladefoged & Maddieson 1996: 208). In contrast, initial clusters transcribed as [kl] show spectral tilts at approximately 2.5 kHz and 1 kHz.

Figure 2 provides waveforms and spectrograms for TG’s and SG’s productions of *klammern* (2a). In contrast to [kl] clusters, stop bursts in [tl] clusters are shorter, and are followed by a shorter liquid phase. In [tl] clusters, there is also burst intensity in a small noise band (ca. 2.5 kHz), which shows no transition into the vowel, and appears to correspond with the spectral peak noted in Figure 1.

Additional measurements of average burst duration, burst peak frequency, center of gravity, and band amplitude differences for [tl] vs. [kl] clusters can be found at http://www.eva.mpg.de/~grawunde/tl.html.

Though the auditory impression of TG’s pronunciation is one of the TL clusters, and acoustic measurements are consistent with this, we sought to verify place of articulation by static palatography. In Figure 3 two palatograms are shown of TG saying [tlo:], Standard German *Klo* ‘toilet’. In both utterances, palatograms show apico-alveolar articulation, as indicated by the thin black
Figure 1. Burst spectra of the initial stops for speaker TG (top) and for speaker SG (bottom)

line just behind the teeth. More palatograms can be viewed at http://www.eva.mpdl.mpg.de/~grawunde/tl.html.

In sum, acoustic and articulatory data are consistent with TG speaking a dialect where KL > TL has occurred, and where words like those in (2) are pronounced with initial coronal apico-alveolar stops with lateral release.

2.2. **English dialects**

A similar shift of initial *kl > tl and *gl > dl is described for many varieties of English as well. Jespersen (1909: 353) discusses this sound change in his
*KL > TL sound change in Germanic and elsewhere

Figure 2. Waveforms and spectrograms for TG’s and SG’s productions of klammern

Figure 3. Palatograms of speaker TG saying [tlo:] ‘toilet’
chapter on seventeenth century consonant changes, and notes that:

D [Drayton – JB&SG] 1640 already gives glory pronounced as dlory. The word bantling (oldest quotation 1593) is said to be from German bänkling […] Some 19th c. phoneticians (Ellis, Licky) write [tl, dl] in climb [tlim], cleave [tli:v], […] glove [dlav], glitter [dlitz], etc., and I have often heard that pronunciation […]

That this change was already widespread in the eighteenth century is supported by Kökeritz (1944: 139–141), where evidence of *kl > tl and *gl > dl is taken from Sewel 1705 and Brommenhauer 1738.

The geographical locus of the change in the seventeenth century is harder to pin down. The modern distribution of TL-dialects is suggestive of an origin in the north of England, perhaps close to present day northwest Yorkshire, near its borders with Westmoreland. In Wright’s English dialect grammar (1905: 246, 251), he notes that the pronunciation of initial cl as tl and gl as dl is found in Yorkshire, Lancashire, the Midlands and south and south-western dialects of England. Though Wright (1905: 251) specifically states that gl > dl is not found in Cumberland, Brilioth’s (1913) detailed description of the dialect of Lorton of Cumberland and Reaney’s (1927) grammar of the Penrith dialect of Cumberland present ample evidence of the completed sound change. No mention is made by Wright (1905) of the southeast, though Kökeritz (1932: 92–93) reports this as a sporadic feature of east Suffolk: many words in this glossary have both [kl]/[tl] and [gl]/[dl] variants, suggesting lexical diffusion in contrast to, or in concert with regular sound change. Other detailed dialect descriptions, including significant lexical data, are Wright 1892 on Windhill, West Riding of Yorkshire, and Haigh 1928 on Huddersfield, West Riding of Yorkshire.

4 In Table 1, data from Wright 1892, Brilioth 1913, and Reaney 1927 is presented, along with Old English (OE) and Middle English (ME) forms for comparison.

As with the German sound change examined earlier, the change targets /kl/ and /gl/ clusters in word-initial (onset) position, and is not sensitive to the

---

4. The presence of this feature in east Yorkshire is evident from recently available on-line recordings. For example, in the British Library collection “Collect Britain: English Accents and Dialects”, http://www.bl.uk/learning/langlit/sounds/text-only/english/welwick (retrieved 9 March 2009) we can hear the speech of Miss Dibnah of Welwick, Yorkshire (b. 1890), explaining how to make bread. At 39 seconds, she pronounces the word cloth with initial [tl], and just seconds later, one hears the phrase clean cloth as [tlin tlot]. Though there are notes on lexis and phonology for this dialect, the KL > TL feature is not noted.

Fisiak (1980) presents a summary of lexical data gleaned from Orton & Dieth (1962–1971), showing a continuous TL-dialect area stretching “from Cumberland, Westmoreland and Durham through Lancashire, western Yorkshire down to Cheshire, Shropshire, Derbyshire, Nottingham and western Lincolnshire” (Fisiak 1980: 88–89). From this, he concludes that the change was probably a north-eastern process which spread south.
**KL > TL sound change in Germanic and elsewhere**

Table 1. *Initial KL > TL in Windhill, Yorkshire, and Lorton and Penrith, Cumberland*

<table>
<thead>
<tr>
<th></th>
<th>Windhill</th>
<th>Lorton</th>
<th>Penrith</th>
<th>OE, ME</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>kl &gt; tl</td>
<td>tlap</td>
<td>–</td>
<td>klappjan</td>
<td>‘clap’</td>
</tr>
<tr>
<td></td>
<td>tljm</td>
<td>tlm</td>
<td>tljm</td>
<td>kljm</td>
<td>‘climb’</td>
</tr>
<tr>
<td></td>
<td>tlahz</td>
<td>tlahz</td>
<td>tlaz</td>
<td>klaðas</td>
<td>‘clothes’</td>
</tr>
<tr>
<td></td>
<td>tlah</td>
<td>tlah</td>
<td>–</td>
<td>klungen</td>
<td>‘clung’</td>
</tr>
<tr>
<td></td>
<td>tlip</td>
<td>tlip</td>
<td>–</td>
<td>klipo(ME)</td>
<td>‘clip’</td>
</tr>
<tr>
<td></td>
<td>tlud</td>
<td>tlwd</td>
<td>tlud</td>
<td>klud</td>
<td>‘cloud’</td>
</tr>
<tr>
<td></td>
<td>tlact</td>
<td>tlwt</td>
<td>–</td>
<td>klct</td>
<td>‘clout’</td>
</tr>
<tr>
<td></td>
<td>tluster</td>
<td>tluster</td>
<td>–</td>
<td>kluster(ME)</td>
<td>‘cluster’</td>
</tr>
<tr>
<td>b.</td>
<td>gl &gt; dl</td>
<td>dlad</td>
<td>dlad</td>
<td>dlad</td>
<td>‘glad’</td>
</tr>
<tr>
<td></td>
<td>dlas</td>
<td>dlas</td>
<td>dlas</td>
<td>glæs</td>
<td>‘glass’</td>
</tr>
<tr>
<td></td>
<td>dlitar</td>
<td>dlitar</td>
<td>dlit</td>
<td>gliteron</td>
<td>‘glitter’</td>
</tr>
<tr>
<td></td>
<td>dlavz</td>
<td>dlavz</td>
<td>dlavz</td>
<td>glof</td>
<td>‘glove’</td>
</tr>
</tbody>
</table>

quality of the following vowel. Though most descriptions focus on absolute word-initial position, like the German forms in (1c), there is some evidence that the sound change targets the same clusters in word-medial onsets as well. Jespersen’s (1909) example of *bantling* (< German *bänkling*) was cited above. To this, we could add prefixed forms like *con[tl]ude* ‘conclude’, *in[tl]ude* ‘in-clude’, and *en[tl]itic* ‘enclitic’ from Jones (ed.) 1967.

Another feature shared by KL > TL in English and German dialects is the lack of stigma attached to these non-standard pronunciations. Wright (1905: 246, 251) says that [tl] and [dl] pronunciations “are not confined to dialect speakers” and that they occur “as an individualism among educated people in all parts of England”. Brilioth (1913: 87) repeats this, saying the [tl] pronunciation “frequently occurs as an individualism among educated people all over England”. In fact, there is good evidence that this prestige feature made its way across the “pond”, and was characteristic of early American English of the New England area in the eighteenth and nineteenth centuries. An important, but seldom mentioned reference occurs in the preface of the first edition of Noah Webster’s dictionary (Webster 1828). There, he remarks that “the letters *cl* answering to *kl* are pronounced as if written *tl*; *clear*, *clean*, are pronounced *tlear*, *tlean*. *Gl* is pronounced *dl*; *glory* is pronounced *dlory*.” In one of the very few journal notes devoted exclusively to this topic, Tolman (1887: 222–223) confirms Webster’s description:

The extent to which initial *cl* (kl) and *gl* are pronounced as *tl* and *dl* is little appreciated. I graduated at a Massachusetts college under a President who talked about “our dlobe,” and the “dlory of God,” etc. I now sit under the preaching of a man, unusually careful and distinct in his articulation, who speaks in the same
way [...] In a small class of mine in Modern English Poetry, three out of four of the members read one of the lines in Wordsworth’s great Ode as follows:

“Ye that through your hearts to-day
Feel the di拉丁ness of the May.”

Albert Harris Tolman acquired his B.A. from Williams College in 1877, so the college President he speaks of in this passage must be Paul Ansel Chadbourne, who served in this role from 1872-1881. Mr. Chadbourne was born in 1823 in North Berwick, Maine, and attended Philips Exeter Academy, and Williams College, where he graduated as valedictorian in 1848. Before taking on the college presidency, he served as State Senator of Massachusetts. The preacher Tolman speaks of, as well as the students in his poetry class, are all likely to be those at Ripon College, in rural Wisconsin, where he was teaching at the time he wrote these notes. In short, Tolman’s remarks not only emphasize the non-stigmatized nature of TL-pronunciation, but confirm an association between this feature and the educated class in nineteenth century America, parallel to the association already noted by Wright (1905) in England.

Thornton (1917) confirms this feature of speech in upstate New York at the end of the nineteenth century.

We can only speculate here on the apparent decline of this feature in twentieth century America. Perhaps speakers of KL-dialects outnumbered others as America grew. Maybe Webster’s decision to maintain spellings with cl, kl, and gl as opposed to tl and dl played a role. Whatever the factors, in subsequent editions of Webster’s dictionary, there is no mention of this pronunciation, and modern American dialects with this feature are hardly known. There is mention, in the early twentieth century of tl for kl in the speech of educated Virginians (Shewmake 1920: 34). A more detailed description of East Texas speech from Stanley (1936: 236–237) shows regular word-initial kl > tl, gl > dl, and is said to be widespread in the community, with TL pronunciation “not limited to the illiterate”, but belonging to “the common speech”. As the last traces of this sound pattern disappear in America, the study of British English and German dialects with initial /tl/ and /dl/ clusters becomes even more central to our understanding of the factors contributing to this change.

5. The facts presented here do not support Fisiak’s (1980: 89) hypothesis that TL-dialects were substandard in eighteenth and nineteenth century England, and that it was this sociolinguistic feature that led to its elimination. If, instead of merely offering notes on pronunciation, Webster had decided to spell words with tl for cl and dl for gl, Standard American English might well be a TL-dialect today.

6. English-speaking settlement of East Texas began in earnest in the mid 1800s. It seems quite likely that the TL-dialect described by Stanley (1936) came to Texas with its speakers, though independent sound change could be argued for if there is no evidence of this dialect feature in the ancestry of these early settlers.
2.3. **Summary**

In a number of German and English dialects there is evidence of a sound change taking word-initial KL > TL, where K is a velar stop and T is a coronal stop. This sound change results in varieties of English and German where initial [tl] and [dl] clusters are common. Though it is difficult to identify a precise time and place for this sound change in the history of German, we can safely assume that it occurred before the relevant dialect descriptions of the nineteenth century, in a subpart of the shaded region in Map 1. For English dialects, there is evidence of the sound change beginning in the seventeenth century, and being completed by the eighteenth century. The change appears to have begun somewhere in north-central England, but due to its association with educated speech, soon diffused to more distant settlements, including America. In the nineteenth century, there is good evidence that TL-pronunciation was a feature of educated American speech, but by the twentieth century, perhaps due to the influence of spelling pronunciation, little trace of TL-dialects remained. Given the geographic distance between the German and English dialects known to exhibit this sound change, and the unlikely role of contact between the varieties of German and English under study, we conclude that word-initial *KL > TL occurred at least twice within the history of Germanic, and therefore qualifies as a recurrent sound change in the sense of Blevins (2004, 2006). A range of factors are associated with recurrent sound changes of different types, from articulatory and perceptual aspects of speech, to structural properties of the linguistic system as a whole. These factors are explored in the following section.

3. **Understanding the *KL > TL sound change**

3.1. **Phonetic motivations**

The most common explanation for independent parallel sound changes are phonetic and structural factors that give rise to that sound change (Ohala 2003, Blevins 2004). In the realm of phonetics, explanations may be based on aspects of articulation, perception, or some combination of the two. For example, common cases of velar palatalization in the context of front vowels have been shown to have origins in both coarticulation and misperception (Guion 1998). Structural factors can also contribute to recurrent sound change in two common ways. In the first case, priming effects of ambient contrasts are catalysts for future change (Hume 2004; Blevins 2004: 153–155, to appear). A well-studied case is that of compensatory lengthening: in over 90% of languages with this sound change, there is a pre-existing contrast between long and short vowels (Kavitskaya 2002). This strong correlation can be explained with reference to priming effects in the course of language acquisition: the long vs. short
vowel category opposition makes a learner more likely to categorize incoming tokens with vowels of phonetically intermediate duration as long vowels than in languages where a length contrast is absent. In the second case, it is the absence of contrast which gives rise to change. A well-studied case of this kind is the context-free change of *t > k which has occurred independently at least twenty times independently in the history of the Austronesian language family (Blust 1990, 2004: 122–125). An important feature of this change in nearly all languages where it occurs is that it is non-neutralizing: due to earlier sound changes where, typically, k > ?, the shift of *t > k maintains the system of pre-existing contrasts (Blevins 2004: 122–125). In the following sections we outline phonetic and structural factors that appear to play a role in the German and English *KL > TL sound changes described above, and in parallel sound changes in other non-Germanic languages.

3.2. Articulatory basis of KL > TL

The most common explanation put forward for the change of KL > TL is assimilation or phonetic coarticulation. Indeed, the most common description of this process in dialect grammars is that it constitutes assimilation or partial assimilation (Brilioth 1913: 87, 91; Reaney 1927: 126, 131). Under this account, the historical velar is coarticulated with the coronal lateral, leading to a production of the velar with a coronal component or as a pure coronal with the velar component lost altogether. (Note that in the German and English dialects where this sound change occurs, the /l/ is relatively clear as opposed to velarized.) Kökeritz (1932: 92–93) is perhaps the clearest on this issue:

Phonetically this substitution of tl and dl for kl and gl is easily accounted for. The point of articulation of l is exactly the same as that of t and d, whereas for the production of k and g the back of the tongue must touch the soft palate. Instead of making the tongue form two contacts either simultaneously or successively, the contact of the plosive consonant is shifted from the soft palate to or towards the teeth-ridge in anticipation of the l. Most likely, the contact of the plosive is made by the tip of the tongue, although, as Jespersen points out [...] a compromise between the contact of t (d) and that of k (g) is also possible. In the former case, at any rate, the sound produced is t (d) with lateral plosion.

Jespersen’s (1907: 23) observation was that assimilation may be complete, but that a more usual pronunciation may involve a complex articulation:

in which the point assumes already the [l] position while the back is in the position for [k,g]; as there is not much space left for the side-apertures implied by [l], this [l]-position often becomes practically a [t,d] closure, in which the side-contact goes back as far as the [k,g] closure. When the contact is loosened, the side-openings are not made to begin so far in front as usual for [l].
Speaking of the American TL-dialects, Tolman (1887: 223) notes similarly that:

the t and d which replace k and g in the combinations cl and gl, are not usually the pure t and d. The closure very often extends from the tip of the tongue nearly or quite as far back as that part of the tongue which approaches the palate in forming the sound of initial y, as in you […] Often, however, the t and d in ti, dl < cl, gl are quite pure, and there is no trace of their origin in the action of the muscles.

A much longer exposition on co-articulation in relation to the English sound change can be found in Schmidt 1888.

Here we mention a few modern phonetic studies which support coarticulation as one potential contributing factor to *KL > TL sound changes. First, there is experimental evidence for coarticulation in /kl/ clusters. Electropalatographic and airflow records were used to measure temporal overlap of /k/ and /l/ gestures in VklV sequences in elicited real and nonsense words for six languages: Catalan, English, French, German, and Swedish (Gibbon et al. 1993). While there were several language-specific features, all languages with the exception of Swedish, showed some instances of overlap. In electropalatographic studies of Greek spontaneous speech, co-articulation with anticipation of the alveolar gesture results in simultaneous closure (double stops) /kl/ produced as [ktl], /gl/ as [gdl] (Nicolaidis 2001). Since neither of these studies focuses on initial clusters, Bombien et al.’s (2006) study of German word-initial /kl/ clusters is of special interest. In these clusters, about 50% of the overall cluster duration is produced with gestural overlap phrase-medially. Once coarticulation occurs, coronal closure and release may mask the velar closure and release.

Though some dialects of English allow surface [t’l] clusters in words like telepathy, these pronunciations seem unrelated to the KL > TL sound change. Where KL and TL specify sequential consonantal gestures, surface [t’l] involves an interconsonantal vocalic gesture whose target may be undershot.

The purpose of this brief summary is not to argue that coarticulation is the primary or sole source of *KL > TL sound changes. Rather, we suggest that since anticipation of the alveolar gesture in /kl/ and /gl/ clusters is attested, this coarticulation provides one potential source for the evolution of *KL > TL.

3.3. Acoustic/Perceptual basis of KL > TL

Though most dialect descriptions and historical treatises mentioned above attribute *KL > TL to assimilation, a few make further remarks which suggest that perception may also play a role in this sound change. The most interesting comments are those that suggest inability of speakers of TL-dialects to perceive a difference between their speech and the speech of others who pronounce the same clusters with initial velars. In Tolman’s (1887: 222) brief note on the subject, he says that the President of the Massachusetts college he graduated from
spoke with initial tl, dl, but that “[h]e had never known that he did this until I called his attention to it”. An even more startling instance of a speaker unknowingly pronouncing [tl], [dl] where others say [kl], [gl] comes from none other than Alexander J. Ellis, phonetician and English dialectographer. In his massive five volume work *On Early English pronunciation*, there is brief mention of KL > TL as a very general pattern, “even among educated people” (Ellis 1889: 1325–1326). At this point, an autobiographical footnote is inserted. It reads:

When I was a boy at school, I suddenly became conscious that I pronounced the radical forms κλάω and τλάω in the same way. It cost me much trouble and years of practice to obtain (kl-) with ease and certainty, and the same for (gl-). As a consequence, my attention has been constantly drawn to this defect of speech in others.

Here then, are two reports of speakers who spoke TL-dialects but did not realize it. In the first case, the University President believed that he pronounced words in the same way as KL-dialect speakers, until his own TL-pronunciation was brought to his attention by a philologist. In the second case a budding phonetician realized, in his youth, that where a contrast between [tl] and [kl] was necessary in Greek, he was unable to produce it, having only [tl] in word-initial position. Up until this point, Ellis also seemed to be living under the impression that his pronunciation was similar to those around him. These two individual cases suggest that phonetic differences between [kl], [gl] and [tl], [dl] in word-initial position are not particularly salient. Speakers of TL-dialects may believe that they are pronouncing words in a similar way to speakers of KL-dialects. The same may be true for speakers of KL-dialects. Recall our observation above that both within Germany and England, there is no strong stigma attached to TL-dialects. One possible explanation for this is that the KL vs. TL contrast is simply often imperceptible. In the remainder of this section, and the next, we provide support for this interpretation with evidence relating to the perceptual similarity of initial KL and TL clusters, and the nature of phonetic processing when the clusters are non-contrastive within a language.

The perceptual similarity of [t] and [k] was already alluded to by Ellis, in his 1889 reference to *t > k* changes which occurred in some Polynesian languages (Ellis 1889: 1325). Modern studies of these changes demonstrate that *t > k* is indeed a recurrent sound change (Blust 1990, 2004), and that its likely basis is perceptual similarities between [t] and [k] stop bursts, in contrast to [p] (Blevins 2004: 122–125). These perceptual similarities are evident in the

---

7. On the contrary, recall from Section 2.2 that the TL-feature was associated with the educated classes of nineteenth century England and America.
acoustic record, where the burst spectra of dentals and velars are closer to each other than they are to labials, and further seen in high rates of [t]/[k] confusions (Hallé et al. 1998, Plauché 2001).

Many languages contrast coronal and velar stops [t, d] vs. [k, g] in prevo
calic position. This is not surprising, since significant cues for coronal vs, velar place of articulation in oral stops are provided by release bursts and formant transitions in pre-vocalic position (Lieberman & Blumstein 1988). However, in KL clusters and in some TL clusters, stop constrictions are produced at or behind the central constriction of the lateral, resulting in stops with less distinct release bursts due to coarticulation with the following lateral (Kawasaki 1982). Flemming (2002: 134) discusses the perceptual similarity of KL and TL clusters, and associates this with auditory similarities in F2 transitions and release bursts. In a more recent study, Flemming (2007) demonstrates that before [l], place of articulation for stops is distinguished primarily by burst properties. In this context, the lateral release of coronal stops results in burst properties closer to those of velar stops.

One strong piece of evidence favoring a perceptual factor in KL > TL sound changes is that mirror image TL > KL sound changes are also found. Coart
cication cannot be invoked in these dissimilatory changes, and the bidirec
tionality of TL/KL replacements is consistent with general perceptual confusion of one cluster type with the other. Indo-European languages with *TL
> KL sound changes (in any position of the word) include: Latin (Bli
ville 1990: 318), Spanish (Penny 2002: 70), Western Romansch (Montreuil 1999: 530–532), Brazilian Portuguese (Cristófaro-Silva 2003), Lithuanian and Let
tic (Schmidt 1888), Slavic (Andersen 2006), and Vlach Romani dialects of Bulgaria (Igla & Draganova 2006: 57).8 Outside of Indo-European, a parallel change is found in some Austronesian languages. Proto-Austronesian did not have initial consonant clusters, however, in some daughter languages, vowel reduction and loss of V1 takes place, with the sound change *C1V1C2V2... > C1C2V2C... producing a range of initial clusters. Consider, for example *TL

The purpose of this brief summary is not to argue that auditory similarity and perceptual confusion are the source of all KL > TL sound changes. However, acoustic studies and mirror image TL > KL changes suggest that mispercep
tion is one potential source of KL > TL, and the most likely basis of TL > KL

8. For additional cases in Romance, and similar shifts in loan word phonology, see Bradley 2006: 48–51. Interestingly, TL > KL sound changes are found only in languages with pre-existing KL clusters. Whether this is significant, or related to the small number of TL-only languages, is difficult to assess.
changes as well. This finding, together with coarticulatory explanations of KL > TL suggest that KL > TL is a natural sound change in the sense of Blevins 2008.

3.4. A structural factor: TL gaps

A final feature to be considered in the evolution of initial *KL > TL clusters in Germanic is the role of /tl/-, /dl/- gaps. Proto-Germanic is reconstructed with a range of initial clusters, including *kl and *gl, but lacks corresponding *tl and *dl clusters. The association of a recurrent sound change with a recurrent gap suggests an interesting hypothesis: perhaps TL gaps are structural factors which greatly increase the probability of KL > TL sound change. Evidence in favor of this position can be found in the experimental phonetics literature, and from broader crosslinguistic surveys of KL > TL changes.

The most relevant studies to date of the relationship between TL gaps and misperception are those of Hallé et al. (1998) and Hallé & Best (2007). In the first study, Hallé et al. (1998) demonstrate a phenomenon they refer to as “phonotactic perceptual assimilation”. Under phonotactic perceptual assimilation, speakers of a language lacking TL clusters perceive these as legal KL clusters. The explanation for this is a combination of bottom up phonetic similarity and top-down phonotactic processing. A speaker perceives TL as KL because KL is the phonetically closest licit Cl cluster. In this set of experiments, native speakers of French were presented with gated [tl] and [dl] clusters. In short gates, in which there was little or no evidence of [l] as the second member of the cluster, [t] and [d] were heard as dental sounds. In longer gates, where information allowed listeners to process the second consonant as a lateral, judgements shifted to velars, with [tl] heard as [kl], and [dl] heard as [gl]. The results were interpreted as lending strong support to a combination of low-level phonetic processing and higher-level top-down phonotactic processing in the perception of words. In a follow-up study, Hallé & Best (2007) provided evidence confirming this hypothesis. In this study, discrimination of TL vs. KL was compared for speakers of French and Hebrew. Since Hebrew allows initial contrasts of /tl/ vs. /kl/ and /dl/ vs. /gl/, the effects of phonotactic perceptual assimilation should be absent, and discrimination is expected to be better. Overall

9. The same phenomena may play a role in the pronunciation of Klingon, of Star Trek fame, with an initial [kl] cluster. Die-hard Trekkies, and its creator, linguist Marc Okrand, will tell you, however, that the name of the language is [tlh IN an xol], with an initial [tl], spelled <tlh> in the language. The Kligon language has no plain velar stops.

Phonotactic perceptual assimilation also allows a generous interpretation of Cooley’s (1978: 132) claim that a true KL > TL sound change never took place in the history of English. While she admits that a change in pronunciation occurred, her claim is that the phonological system remains intact, with [tl] and [dl] phonetic variants of /kl/ and /gl/. See Fisiak 1980 for counterarguments.
their findings confirmed the earlier hypothesis that language-specific gaps like the TL gap in French, can result in language-specific perceptual assimilation. We suggest that in addition to coarticulation and perceptual similarity, the TL gap in German and English dialects gave rise to phonotactic perceptual assimilation of exactly this kind. This phenomenon should increase the probability of KL > TL sound change in these languages, since coarticulated [tl] tokens are likely to be processed as instances of /kl/ onsets by KL-speakers. 

TL gaps may also facilitate KL > TL sound changes by allowing more coarticulation. A general finding of Gurevich (2004) is that there is an overwhelming tendency for phonetically conditioned lenition to preserve contrast. The expectation is that in languages with a KL vs. TL contrast, there will be less potentially neutralizing coarticulation than in a language with either a TL or KL gap. Preliminary results from Kreitman (2008) support this finding: languages like Hebrew, which contrast initial KL vs. TL, show less coarticulation in KL clusters than languages in which KL and TL do not contrast. 

If TL gaps facilitate KL > TL sound changes, then we expect that most of the KL > TL sound changes in the world’s languages will occur in languages with TL gaps. In addition to the German and English dialects described above, there are at least five additional examples of word-initial *KL > TL from four distinct language families, as summarized in Table 2. Proto-languages from which these developments occurred are Proto-Romance (Indo-European), Proto-Kuki-Naga (Tibeto-Burman), Proto-Western Hmong (Hmong-Mien), Proto-Mon-Khmer (Austroasiatic), and Proto-Ritwan (Algic). In all cases, the proto-languages from which these changes emerge are ones in which there is a TL gap. This correlation supports the hypothesis that a structural factor, namely the TL gap, plays an important role in *KL > TL sound changes, and highlights the important role of typology in explaining sound change (Blevins 2007).

In sum, speakers of languages with TL gaps show phonotactic perceptual assimilation of the kind demonstrated experimentally by Hallé et al. (1998). Evidence that TL gaps play a role in *KL > TL sound change includes a strong correlation between the two: in all known cases of *KL > TL sound change, the prior stage of the language has no contrastive TL clusters. Phonotactic perceptual assimilation may also help explain why KL- and TL-dialects of a single language may co-exist without attracting great attention: no stigma is attached to a distinct pronunciation for the simple reason that this distinction may often go unnoticed due to combined effects of perceptual similarity and top-down processing.
Table 2. Some word-initial *KL > TL sound changes

<table>
<thead>
<tr>
<th>Language/Subgroup</th>
<th>Family</th>
<th>Sound Change</th>
<th>TL-gap?</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>German dialects/</td>
<td>Indo-European</td>
<td>*KL &gt; TL</td>
<td>yes</td>
<td>See above</td>
</tr>
<tr>
<td>Germanic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English dialects/</td>
<td>Indo-European</td>
<td>*KL &gt; TL</td>
<td>yes</td>
<td>See above</td>
</tr>
<tr>
<td>Germanic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raetian dialects/</td>
<td>Indo-European</td>
<td>*KL &gt; TL</td>
<td>yes</td>
<td>Matzke 1890: 178</td>
</tr>
<tr>
<td>Romance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lushai/Kuki-Naga/</td>
<td>Tibeto-Burman</td>
<td>*KL &gt; TL</td>
<td>yes</td>
<td>Matisoff 2003: 59, 75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fenshui, Dongdi,</td>
<td>Hmong-Mien</td>
<td>*kl &gt; tl *k</td>
<td>&gt; tl</td>
<td>yes</td>
</tr>
<tr>
<td>Gaopo, etc./West-</td>
<td>(= Miao-Yao)</td>
<td></td>
<td></td>
<td>Johnson 2002: 39, 50</td>
</tr>
<tr>
<td>ern Hmonga</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Philhòa Katu/</td>
<td>Austroasiatic</td>
<td>*KL &gt; TL</td>
<td>yes</td>
<td>Wallace 1969: 72</td>
</tr>
<tr>
<td>Mon-Khmerb</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yurok/Ritwanc</td>
<td>Aligic</td>
<td>*kl &gt; tl</td>
<td>yes</td>
<td>Garrett et al.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(comps.) 2005</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


b. Wallace’s (1969: 72) description of Katu includes the following brief remarks comparing two “Low dialects” of Katu, Phuhoà, and An Diem:

Phuhoà consonant clusters /dl, tl/ correspond to Andiem /gl, kl/ (Phuhoà has no /gl/ or /kl/, and Andiem has no /dl/ or /tl/). When these words are infixed, both dialects have /kal, gal/; klâm, tlâm ‘to urinate’; kalâm, kalâm ‘urine’; gluh, dluh ‘go out’

From these comments, and Proto-Katuic reconstructions (e.g., Proto-Katuic *kloom ‘urinate’; Sidwell 2005: 203), it is clear that Phuhoà has undergone a regular sound change of *KL > TL. There is no mention of this dialect feature in Sidwell 2005, nor in Peiros 1996, which includes a short wordlist from Phu Hoa (Peiros 1996: 181–182) with three relevant forms transcribed with initial /kl/.

c. There seems to be only one morpheme yielding initial /kl/ clusters in Yurok, and that is /kl- ‘to hang, overhang, overspill’, with variants [kl], [tl], as in klewoluê, tleweluê ‘waterfall’, klaamok’s, klaamok’s ‘it leaks’. Compare Proto-Algonquian *akole: wa ‘TA hang’, *akole: wa ‘TA hang’, *akole: wi ‘II hang’ (Hewson 1993: 11,12), Wiyot -kwê-, kws-, kfw’- ‘hang’ (Teeter & Nichols 1993: 247). Another language of the American Northwest shows sporadic alternation between word-initial QI and TL (where Q is a uvular stop). In Klamath of south central Oregon we find: /q’liq/-, /tl’liq/- ‘peek, glance’ and /ql/- ‘tell a myth’, /tl-êlq/- ‘start talking’ (Barker 1963).

4. TL clusters and phonological theory

4.1. Gaps

Synchronic phonological descriptions commonly distinguish between systematic and accidental phonotactic gaps. Systematic gaps are those that have psy-
*KL > TL sound change in Germanic and elsewhere

Within the grammatical reality for speakers: they are adhered to in loan phonology, extended within the lexicon, and the basis of well-formedness judgements. Accidental gaps, on the other hand, show none of these properties. There is mounting evidence that the TL gap in Standard English constitutes a systematic gap (Moreton 2002, Hayes & Wilson 2008). Phonological analyses encode systematic TL gaps with either language-specific constraints, or with universal constraints. Language-specific syllable-based constraints of the form *TL (where * indicates ungrammaticality) have been proposed for Standard English (e.g., Clements & Keyser 1983: 43–44, Kenstowicz 1994: 257), for Standard German (e.g., Wiese 1996: 263), and for other Indo-European languages with TL gaps. Universal constraints of the form *TL have also been proposed, in order to express the crosslinguistically marked status of these clusters and to instantiate the fact that "homorganic clusters of this kind are avoided in many languages" (Gouskova 2004: 220). Despite the many analyses of TL gaps, and explanations for their marked status, we are unaware of any typological quantitative study demonstrating that initial TL clusters are underrepresented in the world’s languages. In Section 4.2 we offer preliminary typological findings within and across language families which suggests that they are not.

An additional component of some synchronic analyses is an attempt to explain the basis of TL gaps. The most widely accepted explanation makes reference to the Obligatory Contour Principle: adjacent consonants with the same place of articulation are disfavored crosslinguistically (McCarthy 1988). In the case of TL gaps, it is the sequence of coronal segments within the onset which is claimed to give rise to a violation of this principle. An additional claim is that the dispreference for homorganic consonant clusters increases as the sonority distance between the two consonants decreases. Assuming that /l/ is less sonorous than /r/, this dispreference can be used to explain TL gaps in contrast to well-formed /tr/ and /dr/ clusters in Standard English (Moreton 2002: 56–57). A more sophisticated approach to TL gaps is one that acknowledges perceptual similarity of TL and KL clusters, and attempts to account for TL and KL gaps in terms of crosslinguistic preferences for perceptual distinctiveness (Flemming 2002, 2007; Bradley 2006). Constraints are formulated to enforce

---

10. The constraint is proposed in an analysis of Faroese which prohibits /tl/ syllable onsets. However, even in studies of languages, like Georgian, which contrast TL vs. KL clusters word-initially, we find similar statements. In Butskhrikidze’s (2002) study of Georgian phonotactics we are reminded that “[i]n most languages that allow clusters of obstruents and liquids, coronal obstruents do not precede /l/, i.e. /tl/ and /dl/ are not allowed initially” (2002: 28).

11. In Greenberg’s (1978) study of consonant clusters based on a survey of 104 languages, 92 of which have initial clusters, there is no suggestion of TL as a marked initial cluster.

12. Albright (2008) attempts to provide a phonetic basis for this relativized version of the Obligatory Contour Principle. Under his analysis, sequences like TL are avoided because /l/ obscures the transitions of a preceding coronal stop (T) by having a similar acoustic target.
preferences for more distinct contrasts over less distinct ones.\textsuperscript{13} Under this model, the expectation is that languages with KL vs. TL contrasts will be less common than those with KL or TL gaps, all else being equal. In Section 4.3 we illustrate a range of languages from different language families which tolerate KL vs. TL contrasts. Languages which allow one cluster type or the other are also noted, with typological skewing attributed to the historical effects of perceptual similarity and phonotactic perceptual assimilation.

4.2. Are TL clusters rare?

Our starting point is a review of the facts discussed above. Although not stated explicitly, it should be clear from the descriptions of German and English dialects presented in Section 2, that describing initial TL as an illicit cluster in German or English would not be entirely accurate. There are KL-dialects and TL-dialects of German and English, and in both languages, the standard variety is a KL-dialect, corresponding to the written form of the language. The fact that the standard languages are KL-dialects appears to be a historical accident, and should not be taken as an indication that TL clusters are rare in Germanic. Furthermore, no phonetic explanation has been proposed for the rarity of TL clusters. Although the Obligatory Contour Principle has been suggested as a phonological explanation for TL markedness, since TL clusters may share place of articulation, they should be simpler than non-homorganic clusters, requiring fewer articulatory gestures. In terms of perceptual factors, it might be suggested that the coronal stop in TL clusters is obscured by the homorganic lateral release. Under this account, TL > l changes are expected, independent of the presence or absence of KL clusters. This account says nothing of the KL > TL sound changes discussed above, nor of mirror-image TL > KL changes. In short, where articulation is concerned, homorganic TL clusters are less complex than heterorganic KL clusters. Where perceptual saliency is involved, the stop in TL clusters may be less salient than that in KL clusters. Overall, there is no reason to think that TL clusters should present more phonetic difficulty than KL clusters when articulation and perception are taken into account.

\textsuperscript{13} A recent variation on this approach is Bradley 2006, which incorporates a universal ranking of constraints based on perceptual distance, along with a language-specific place-of-articulation hierarchy. In KL-dialects, the place hierarchy ranks dorsal over coronal, while in TL-dialects, the ranking is reversed. Bradley (2006) seems unaware of TL-dialects of English. Further, the only clear prediction made by his model seems to be falsified by the data. The claim is that (Standard) English lacks TL clusters because dorsal consonants are less marked than coronals, and supports this claim with reference to place assimilation: “coronals, but not velars, are targeted in place assimilation elsewhere in the language” (Bradley 2006: 40). However, TL- and KL-dialects of English, have similar patterns of coronal place assimilation, making this analysis untenable.
In order to assess whether TL clusters are rare, we must investigate languages where (i) consonant clusters are allowed word-initially, (ii) T (a coronal stop) is a possible initial member of a biconsonantal cluster, and (iii) /l/ (a lateral liquid) is a possible final member of a biconsonantal cluster.\(^{14}\) We start with the Indo-European family, since it is here that the impression of TL markedness appears to have originated.

Proto-Indo-European is reconstructed with a wide range of initial consonant clusters, including KL, as in \(*glewb\)^{15} ‘to split’, \(*klep-\) ‘to steal’, TL sequences, where the lateral is syllabic, e.g., \(*dhl_{1}gh_{2}h_{3}os\) ‘long’, \(*tl_{1}-h_{2}-\) ‘lift.present’ (cf. \(*telh_{2}-\) ‘lift’) (Ringe 2006), and perhaps rarer TL onsets, as in \(*tl_{1}-ro-\) ‘high’ (Orel 1998: 214). From this starting point, a universal bias against TL clusters might show itself in terms of (i) sound changes eliminating TL clusters; or (ii) the absence of TL cluster evolution.\(^{15}\) In fact, there appear to be more cases of TL maintenance (3a) and TL genesis (3b) combined than TL elimination (3c) in the known history of Indo-European, as outlined in (3).\(^{16}\)

\begin{enumerate}
\item Reflexes of initial \(*TL\), and TL innovation in Indo-European
\begin{enumerate}
\item TL maintenance
\begin{enumerate}
\item Proto-Albanian (Orel 1998: 130)
\item Proto-Celtic (Matasović to appear)
\end{enumerate}
\end{enumerate}
\end{enumerate}

---

\(^{14}\) Bickel (2008) suggests a general method for the statistical evaluation of typological distributions and universal principles. We currently do not have a database of the appropriate size and structure to evaluate the potential markedness of TL clusters in this way. As a substitute, we offer two case studies from distinct historical starting points: a proto-language allowing a wide range of initial CC clusters, and one allowing none.

\(^{15}\) However, because Proto-Indo-European may not have had TL clusters where /l/ was non-syllabic, an initial bias to reinterpret TL as TVL (as occurred, e.g., in Proto-Germanic) may be expected.

\(^{16}\) Proto-Indo-Iranian is not included in (3) as a language having lost \(*TL\) clusters, since, in most Indo-Iranian languages, the contrast between Proto-Indo-European (PIE) \(*l\) and \(*r\) was neutralized, leaving only TL clusters. Proto-Balto-Slavic and Proto-Germanic and Proto-Hellenic are also left out of (3), since in these languages there is evidence that PIE \(*TL\), with syllabic \(*l\), is reinterpreted as a \(*TVL\) sequence, as in, e.g., PIE \(*dhl_{1}gh_{2}h_{3}os\) ‘long’, Proto-Balto-Slavic \(*d\bar{l}g\bar{s}\), Ancient Greek \(\delta\lambda\varsigma\) (Derksen 2008: 133), Proto-Germanic \(*tulgz\) ‘firm’ (cf. Gothic \(tul\) ‘firm, steadfast’) (Ringe 2006: 82), or PIE \(*t\bar{i}h\bar{o}-\) ‘ground’, Proto-Balto-Slavic \(*t\bar{u}l\) (Derksen 2008: 504). Since the reinterpretation of PIE syllabic sonorants as VR sequences is not limited to \(*l\), this development appears to be independent of purported TL markedness.
290 Juliette Blevins and Sven Grawunder

b. TL genesis

Proto-Celtic  *TVL > TL, vowel loss (Matasović to appear)
Ancient Greek  *TVL > TL, vowel loss (Beekes 2008)
Slavic languages  *CVL. > CLV., metathesis (Derksen 2008)
German dialects  *KL > TL (see above)
English dialects  *KL > TL (see above)
Raeto-dialects  *KL > TL (see above)
Mexican Spanish  TL via loans (Hualde & Carrasco to appear)
Pashto  TL, source unknown
        (cf. Morgenstierne 2003: 81)

As a consequence of TL maintenance and TL genesis, numerous modern and ancient Indo-European languages have TL clusters, from Russian (East Slavic), Polish (West Slavic), and Serbo-Croatian (South Slavic), to Irish (Celtic), and Pashto (Indo-Iranian). While a *dl > gl sound change has been proposed for Albanian, and cluster simplification suggested for Romance, these sound changes are out-numbered by processes creating TL clusters in Indo-European languages. Most initial TL clusters in Celtic and Greek are due to vowel elision, while the majority of those in Slavic arise from regular VC metathesis. *KL > TL changes in Germanic were discussed above. In addition to these regular sound changes, initial TL clusters can arise through loanwords, and its seeming spontaneous evolution from initial /l/, perhaps on analogy with semantically related forms, as in Czech tlapa, dlapa, Slovak laba, tlapa, Polish lapa, dlapa < Proto-Balto-Slavic *láˈpɑ̂ ‘paw’.

An additional way of investigating the question of a potential universal dispreference for *TL clusters in contrast to KL clusters is to look at a language family where no initial consonant clusters are reconstructed for the proto-language. With this neutral starting point, one can investigate whether there is any clear dispreference for the evolution of TL clusters over KL clusters in the historical record. This exercise has been carried out for the Austronesian language family, and yields interesting results. Proto-Austronesian is reconstructed without word-initial consonant clusters (Blust 1995; Greenhill et al. 2003–2008, abbreviated as ABVD in Table 3). In most of the approximately 1,000 Austronesian languages, the constraint against initial consonant clusters
*KL > TL sound change in Germanic and elsewhere

is maintained. However, in some of these languages complex onsets do develop word-initially. The most common sources of initial clusters are loss of unstressed vowels in the first syllable, and loans.

Table 3 shows 24 Austronesian languages or subgroups where initial CL clusters have evolved. Of these 24 instances, 17 (approximately 70%) show development of TL clusters, while 7 (30%) show possible accidental gaps (e.g., Jakarta Malay), avoidance of TL clusters (Thai, Aceh), or shifts of TL > KL, like those discussed in Section 3.3 (e.g., Chamic, Moklen dialects, and Nila-Serua).

In sum, while it is difficult to estimate the probability of a language developing word-initial CL or TL clusters from a clusterless state, a theory which claims that TL clusters are marked predicts that there will be obvious tendencies for such clusters to be avoided. Such tendencies are not visible in the Austronesian historical record, nor were they in the Indo-European languages discussed earlier. We conclude that, as of yet, there is no clear evidence for TL markedness. TL clusters are not particularly rare in languages which allow CL clusters, nor is there any clear tendency to avoid them in common pathways of sound change.

4.3. Are languages with KL vs. TL contrasts rare?

Recall from Section 3.4 that one phonetic explanation for KL > TL sound change is the combination of perceptual similarity and presence of a TL gap, triggering phonotactic perceptual assimilation. Within Dispersion Theory (Flemming 2002, 2007; Bradley 2006), TL and KL gaps are accounted for in terms of crosslinguistic preferences for perceptual distinctiveness, with universal constraints formulated to enforce preferences for more distinct contrasts over less distinct ones. Under this model, the expectation is that languages with KL vs. TL contrasts will be less common than those with KL or TL gaps, all else being equal.

17. This estimate is based on data included in Blust 1995 and Greenhill et al. 2003–2008. Table 3 is a summary of relatively well described languages with TL clusters. Within each subgroup or area mentioned, it is likely that there are other languages not mentioned which share this feature.

18. Robert Blust (personal communication, November 2008) notes that in intervocalic position, the situation may be different. Consider reflexes of Proto-Malayo-Polynesian (PMP) “qiteluR ‘egg’ . In many Philippine languages, medial schwa deletion has occurred giving rise to heterosyllabic t.l clusters. Of the 43 Philippine minor languages in Reid 1971, 20 show syncope in reflexes of “qiteluR. Of these 20 languages 7 retain t.l, while 13 show elimination of this cluster, via TL > KL (e.g., Agta qiklug), other dissimilation (e.g., Guinaang Kalinga qip’lug), assimilation (e.g., Atta illuk), metathesis (e.g., Palawan Batak tiqlug), or cluster simplification (e.g., Gaddang qilog). However, in initial position, there is no evidence of this kind. In all known Philippine languages where *tel... > t.l, the t.l cluster is maintained: cf. PMP *telu ‘three’, Koronadal Blaan tlu, Sarangani Blaan tlu, Tagabili tluh.
Table 3. Initial CC cluster evolution in Austronesian, with attention to TL clusters (WMP = Western-Malayo-Polynesian, CMP = Central-Malayo-Polynesian)

<table>
<thead>
<tr>
<th>Subgroup/area</th>
<th>Language(s)</th>
<th>CL?</th>
<th>TL?</th>
<th>TL/KL Contrast?</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formosan*</td>
<td>Atayal dialects</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>Egerod 1980, ABVD</td>
</tr>
<tr>
<td>Formosan</td>
<td>Kavalan</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>Li &amp; Tsuchida 2006</td>
</tr>
<tr>
<td>Formosan</td>
<td>Thao</td>
<td>yes</td>
<td>no</td>
<td>(no)</td>
<td>Blust 2003</td>
</tr>
<tr>
<td>WMP/Malayo-Chamic</td>
<td>Jakarta Malay</td>
<td>yes</td>
<td>no</td>
<td>(no)</td>
<td>Adelaar 1985: 31–33</td>
</tr>
<tr>
<td>WMP/Malayo-Chamic</td>
<td>Aceh</td>
<td>yes</td>
<td>no</td>
<td>(no)*</td>
<td>Thurgood 1999: 93–99</td>
</tr>
<tr>
<td>WMP/Malayo-Chamic</td>
<td>Proto-Chamic, Western Cham, Phan Rang Cham</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>Thurgood 1999: 93</td>
</tr>
<tr>
<td>WMP/Malayo-Chamic</td>
<td>Rade</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>Thurgood 1999: 93–99</td>
</tr>
<tr>
<td>WMP/Malayo-Chamic</td>
<td>Jarai</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>Thurgood 1999: 93–99</td>
</tr>
<tr>
<td>WMP/Malayo-Chamic</td>
<td>Chru</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>Thurgood 1999: 93–99</td>
</tr>
<tr>
<td>WMP/Malayo-Chamic</td>
<td>Northern Roglai</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>Thurgood 1999: 93–99</td>
</tr>
<tr>
<td>WMP</td>
<td>Javanese</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>Suharno 1982: 7–8</td>
</tr>
<tr>
<td>WMP/Moken-Moken</td>
<td>Moken dialects</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>Larih 1999: 332–334</td>
</tr>
<tr>
<td>WMP/Moken-Moken</td>
<td>Moklen dialects</td>
<td>yes</td>
<td>no</td>
<td>(no)</td>
<td>Larih 1999: 332–334</td>
</tr>
<tr>
<td>WMP/Kayan-Murik</td>
<td>Punan Kelai</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>ABVD</td>
</tr>
<tr>
<td>WMP/Kayan-Murik</td>
<td>Modang</td>
<td>yes</td>
<td>yes</td>
<td>rare*</td>
<td>ABVD</td>
</tr>
<tr>
<td>WMP/Philippines</td>
<td>Bilaan; Tagabili</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>ABVD</td>
</tr>
<tr>
<td>CMP/SW Maluku</td>
<td>Taba</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>Hajek &amp; Bowden 1999</td>
</tr>
<tr>
<td>CMP/SW Maluku</td>
<td>Roma</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>Hajek &amp; Bowden 1999</td>
</tr>
<tr>
<td>CMP/SW Maluku</td>
<td>Leti</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>Hajek &amp; Bowden 1999</td>
</tr>
<tr>
<td>CMP/SW Maluku</td>
<td>Nila-Serua*</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>Taber 1993</td>
</tr>
<tr>
<td>CMP/SE Maluku</td>
<td>Selaru</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>ABVD</td>
</tr>
<tr>
<td>Oceanic/Western/ Northwest Solomonic</td>
<td>Isabel subgroup (Cheke-Holo, Blablanga, etc.)</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>ABVD; White 1988</td>
</tr>
</tbody>
</table>
Table 3. Initial CC cluster evolution in Austronesian, with attention to TL clusters (WMP = Western-Malayo-Polynesian, CMP = Central-Malayo-Polynesian) (cont.)

<table>
<thead>
<tr>
<th>Subgroup/area</th>
<th>Language(s)</th>
<th>CL?</th>
<th>TL?</th>
<th>TL/KL Contrast?</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oceanic/Central-Eastern</td>
<td>Neve’ei</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>Musgrave 2007: 16</td>
</tr>
<tr>
<td>Oceanic/Central-Eastern</td>
<td>Sye</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>Crowley 1998: 18</td>
</tr>
<tr>
<td>Oceanic/Central-Eastern</td>
<td>Ifira-Mele</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>Elbert 1965, Clark 2002</td>
</tr>
</tbody>
</table>

a. If initial C/C sequences in Sediq are analysed as underlying /CC/ as in Holmer 1996, then this Formosan language patterns in the same was as the Atayal dialects with initial clusters.
b. Some CL clusters in Jakarta Malay are the result of borrowing from languages (e.g., Dutch) which lack TL clusters. The gap here, then, may be accidental.
c. Aceh reflexes of Proto-Chamic *kl-, *gl- are /lh-/. In Post-Chamic borrowed clusters, source language /fl/ is realized as Aceh /gl/ or /jl/, depending on dialect.
d. In Chru, /hl/ contrasts with /gl/, with place and voicing differences.
e. In Northern Roglai, /kl/- contrasts with /dl/-, with place and voicing differences.
f. In Modang and Punan-Kelai TL and KL clusters are the result of vowel syncope, but there is also evidence of *TL > KL in Punan Kelai. Compare Proto-Malayo-Polynesian *qala‘R ‘egg’, Modang tloh, Punan Kelai klo; Proto-Malayo-Polynesian *dila‘i ‘tongue’, Modang tla‘, Punan Kelai klah. Even so, an initial /hl/ vs. /kl/ contrast seems to remain, as in Punan Kelai klo ‘egg’ vs. kla‘ ‘rope’ (< Proto-Malayo-Polynesian *talih).
h. Only one stem in Neve’ei is reported with this initial cluster: /klel/ ‘secret’.
i. Only four /kl/-initial words are found in the Sye dictionary (Crowley 2000: 10). Three are clear loans from Bislama, and the fourth is /klumit/ ‘freshwater fish with yellow tail’. In general, Bislama borrowings in Southern Vanuatu languages are the source of many /kl/ (and /kr/) clusters.

Table 4 shows that contrasts between KL and TL clusters are found in some of the world’s largest language families. One subgroup or language is taken from each family as representative, though in some cases, the TL vs. KL contrast is found in many subgroups, e.g., within Austronesian where such clusters may be reconstructed for the proto-language (Shorto 2006).

One interesting feature of Table 4 is that it includes languages from six of the largest language families in the world: Niger-Congo, Austronesian, Trans-New Guinea, Indo-European, Sino-Tibetan, and Afro-Asiatic. The larger the family, the more potential sound changes. Probability for the development of a TL vs. KL contrast are greatly increased by increased probabilities of all sound change types, from vowel elision (Semitic, Austronesian, Ok) to metathesis (Slavic,
Pingding), and patterns of loan phonology (Western Abenaki\(^{19}\)). In some cases, like the Pingding retroflex-lateral infix, the resulting TL and KL clusters are unlike any in the entire Sinitic family; similarly, within Afro-Asiatic, the TL vs. KL contrast appears to be limited to Modern Hebrew and Arabic dialects (e.g., Iraqi, Jordanian, Lebanese, Palestinian, and Syrian)\(^{20}\).

Another notable feature of Table 4 is that, though a TL vs. KL contrast is reconstructed for Proto-Gbe and Proto-Skou, none of the daughter languages in these groups have a TL vs. KL contrast. In the Gbe languages, the synchronic patterns are extremely regular: word-initial CR clusters, where “R” is a liquid, show a lateral liquid when C is a grave (labial, velar, or labio-velar) stop consonant, and a rhotic liquid when C is a coronal stop consonant. In Skou languages, on the other hand, 4/6 languages reduce *tl > t, while two others show a change of *tl > hl. However, viewing *kl as “unmarked” in this family would be inaccurate, since this cluster is also simplified in two languages (Skou /l/, Leitre /k/ < *kl), and debuccalized in three others (Wutung, Dumo Dusur /hl/ < *kl).

Overall, the results of this preliminary survey indicate that TL vs. KL contrasts are indeed crosslinguistically rare. The only family in which they are robustly attested is Austroasiatic. However, in Austroasiatic \(C_1C_2V\ldots\) words are often described as sesquisyllabic, with \(C_1\) and a following predictable transition vowel making up a weak presyllable, followed by a stressed final syllable \(C_2V\ldots\) Transition vowels in \(C_1\) clusters will make coarticulatory assimilation less likely, inhibiting KL > TL sound changes. At the same time, transition vowels will provide stronger perceptual cues for place of articulation of \(C_1\), so that the perceptual confusion discussed in Section 3.3 will also be less likely.

19. The contrast between Western Abenaki /kl/, /gl/ and /tl/, /dl/ is the direct result of loan-word adaptation. The only native liquid in Western Abenaki is /l/. Loans from French and English undergo shifts from rhotic to lateral liquids. As a consequence, French and English /tr/, /dr/, /kr/ and /gr/ onsets are all realized as TL and KL clusters in Western Abenaki (Day 1994). Some examples include:

- dlap ‘club, in cards’ < French treflle
- dlaps ‘steel trap’ < English traps
- glosli ‘grocer’ < English grocery (store)
- klaka-siz ‘cracker-dm’ < English cracker
- klegwal (Proper name) < French Grégoire
- tltoso ‘quarter of a dollar’ < French trente-sous

20. For Proto-Tibeto-Burman Matisoff (2003) reconstructs *kl and *gl clusters, but comments that “*tl dl/ remain as foreign to PTB as to English” (Matisoff 2003: 59–60). Within Afro-Asiatic, an initial *TL vs. *KL contrast is reconstructible for Proto-Chadic assuming zero-grade stems (Wolff 2008), but for proto-West-Chadic, we find only *TL- reconstructed with evidence of *KL- > *TL- (e.g., Ngizim tlà ‘cow’ < Proto-Chadic *kla), and retention of inherited *TL (e.g., Ngizim tla ‘stand up’ < Proto-Chadic *tla).
Table 4. TL- vs. KL- contrasts in a range of languages families. * indicates that no daughter languages maintain the contrast.

<table>
<thead>
<tr>
<th>Family/Size-Rank</th>
<th>Subgroup/Language</th>
<th>TL- vs. KL-</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afro-Asiatic (6)</td>
<td>Semitic/Modern Hebrew</td>
<td>yes</td>
<td>Kreitman 2008</td>
</tr>
<tr>
<td>Algic</td>
<td>Algonquian/Western Abenaki</td>
<td>yes</td>
<td>Day 1994</td>
</tr>
<tr>
<td>Austroasiatic (10)</td>
<td>Munda/Gta’</td>
<td>yes</td>
<td>Anderson 2008</td>
</tr>
<tr>
<td>Austro-Asiatic (2)</td>
<td>Southwest Maluku/ Taba, etc.</td>
<td>yes</td>
<td>See Table 3 above</td>
</tr>
<tr>
<td>Indo-European (4)</td>
<td>Slavic/Polish, Russian, etc.</td>
<td>yes</td>
<td>See (3) above</td>
</tr>
<tr>
<td>Niger-Congo (1)</td>
<td>Proto-Gbe</td>
<td>*yes</td>
<td>Capo 1991: 151</td>
</tr>
<tr>
<td>Sino-Tibetan (5)</td>
<td>Mandarin/Pingding</td>
<td>yes</td>
<td>Yu 2004</td>
</tr>
<tr>
<td>Skou</td>
<td>Proto-Skou</td>
<td>*yes</td>
<td>Donohue 2002: 191–192</td>
</tr>
<tr>
<td>South Caucasian</td>
<td>Georgian</td>
<td>yes</td>
<td>Butskhrikidze 2002: 110</td>
</tr>
<tr>
<td>Trans-New Guinea (3)</td>
<td>Ok/Mian b</td>
<td>yes</td>
<td>Smith &amp; Weston 1974</td>
</tr>
</tbody>
</table>

a. The size of language families is based on numbers of languages included for each family in Gordon (ed.) 2005. They are, of course, only approximate.

b. I am grateful to Sebastian Fedden for bringing the Mian facts to my attention. Inherited initial CL clusters in Mian appear to be the result of vowel loss, as indicated by comparisons with Telefol, a closely related Mountain Ok language (Healey & Healey 1977): Mian tl- Telefol télem- ‘come’; Mian tlé-, Telefol tilm- ‘chew’; Mian kl- ‘make’, Telefol ku-lá ‘let’. Two forms indicate that a shift of TL > KL may already be underway: Mian kla, Telefol telé ‘properly, well’; Mian klom, Telefol tuliam ‘eat’. Similar developments are evident in Kalam, a Trans-New Guinea language of the Madang subgroup, giving rise to phonological TL/KL contrasts as well.

5. Summary and implications

General implications of this study range over descriptive, theoretical, and historical subdisciplines. At the level of description, non-standard dialects of German and English have phonetic features which are central to a general understanding of KL > TL as a recurrent sound change. We hope this study will encourage researchers in phonetics and phonology to document other sound patterns which may be overlooked due to the dominance of a standard language or standard description. With this in mind, we emphasize that many of the dialects mentioned in this study are highly endangered, moribund, or, already gone.

Where theoretical proposals are concerned, universal markedness constraints
should be adopted with great caution, and should not be based on facts from one or two standard languages. Standard languages may poorly reflect dialect diversity, as in the case of *TL gaps in Germanic, and are unlikely to reflect crosslinguistic tendencies, even within the same family, as demonstrated by the Indo-European developments summarized in (3).

Where a sound change is recurrent, as in the case of KL > TL, phonetic and structural factors can often be identified. In this study, we suggest that there are three contributing factors to KL > TL sound change: (i) coarticulation, resulting in place assimilation; (ii) perceptual similarity, resulting in potential confusion of KL and TL clusters; and (iii) structural perceptual assimilation, where TL gaps give rise to top-down parsing of phonetic TL clusters as KL clusters. The latter two factors predict that TL > KL sound changes should also occur, and, as shown above, they do.

The family-level studies of Indo-European and Austronesian are useful in highlighting relationships between sound patterns, sound change, and proposals of universal markedness. If a sound pattern like TL is claimed to be universally marked, there should be some historical record of a dispreference for it. While TL > KL sound changes are found, there is, as yet, no evidence that such changes are more common than the KL > TL changes of central interest here. On the other hand, the perceptual similarity of KL and TL, and the role of phonotactic perceptual assimilation are evident in the historical record: in five of the greatest language families on earth, only a handful of languages show robust initial KL vs. TL contrasts. These findings suggest that probabilities for the evolution and maintenance of KL vs. TL contrasts are relatively low.

Even the one exception to this finding supports the general approach. Austronesian is the only large family where KL vs. TL contrasts appear to be inherited in multiple subgroups. In this case, a phonetic explanation for contrast maintenance is possible: consonant release in sesquisyllabic structures will simultaneously decrease the probability of KL > TL coarticulation, and increase the perceptual contrast of K vs. T in this context, making neutralization less likely.

Implications for grammatical description are few. The structural perceptual assimilation described for speakers of KL-only languages is absent for speakers of Hebrew, as expected, since Hebrew speakers learn to distinguish contrasting TL vs. KL clusters (Hallé et al. 1998, Kreitman 2008). In contrast to the work of Flemming (2002) and Bradley (2006), we see no reason to build universal...
phonological constraints enforcing preferences for more distinct contrasts over
less distinct ones into phonological grammars. The same work is done by in-
voking perceptual similarity and phonotactic perceptual assimilation as forces
in KL > TL sound change and general phonetic processing.

Received: 16 October 2008
Revised: 9 March 2009

Correspondence addresses: (Blevins) Department of Linguistics, Max-Planck-Institut für evolu-
tionäre Anthropologie, Deutscher Platz 6, 04103 Leipzig, Germany; e-mail: blevins@eva.mpg.
de; (Grawunder) Department of Linguistics, Max-Planck-Institut für evolutionäre Anthropologie,
Deutscher Platz 6, 04103 Leipzig, Germany; e-mail: grawunder@eva.mpg.de

Acknowledgements: An earlier version of this article was delivered by the first author as a plenary
talk, “Implications of velar to coronal shifts in Germanic “KL clusters” to the Germanic Linguistics
Annual Conference 13, Penn State University, April 2007, and as an invited talk at Fonhispania
2009, Madrid. We are grateful to both audiences for useful feedback. Additional thanks go to
Olle Engstrand for sharing results of his internet query on /tl/ clusters in the world’s languages, to
Andrew Garrett for notes on English dialects with TL clusters, to F. Roger Higgins for his helpful
“oddments” from English and German dialect grammars, and to Yoram Meroz, Bob Blust, and
three anonymous reviewers for comments and corrections to earlier versions. The second author
collected and analyzed German dialect data as described in Section 2.1. The first author performed
all other research and analysis, and wrote the article.

Abbreviations: 1/2 1st/2nd person; ABVD Greenhill, Blust & Gray (2003–2008); C a consonant;
dim diminutive; ind indicative; K a velar stop; sg singular; T a coronal stop; V a vowel.

References
Adelaar, Karl Alexander. 1985. Proto-Malayic: The reconstruction of its phonology and parts of
its lexicon and morphology. Alkmaar: Kanters.
Albright, Adam. 2008. From clusters to words: Grammatical models of nonce-word acceptability.
London: Routledge.
cal Dictionary, Department of Comparative Indo-European Linguistics, Universiteit Leiden.
http://www.indo-european.nl/
Manuscript, Universität Leipzig.
Blevins, Juliette. 2004. Evolutionary phonology: The emergence of sound patterns. Cambridge:
Cambridge University Press.
Blevins, Juliette. 2006. A theoretical synopsis of evolutionary phonology. Theoretical Linguistics
32. 117–166.
Blevins, Juliette. 2007. The importance of typology in explaining recurrent sound patterns. Lin-
298 Juliette Blevins and Sven Grawunder


Brommenhauer, XXX. 1738. XXX: XXX.


*KL > TL sound change in Germanic and elsewhere  299

300 Juliette Blevins and Sven Gravunder


Kökeritz, Helge. 1944. Mather Flint on early eighteenth-century English pronunciation (Skrifter utgivna av K. Humanistiska Vetenskapssamfundet i Uppsala 37(1)). Uppsala: Almqvist & Wiksell.


Thurgood, Graham. 1999. From Ancient Cham to modern dialects: Two thousand years of language contact and change. Honolulu: University of Hawai’i Press.


Juliette Blevins and Sven Grawunder


