Acquiring phonology is not acquiring inventories but contrasts: The loss of Turkic and Korean primary long vowels

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Abstract

Evaluating Trudgill's correlation of phoneme inventory size with social factors, this paper highlights the role of phonological structure in the acquisition of phonological contrast, with particular reference to Turkic and Korean vowel inventories. Factors such as social dominance, isolation, and community size are shown not to provide plausible explanations for the loss of primary long vowels in most Turkic languages and their preservation in a few others, nor for the neutralization which long and short vowels currently undergo in Korean. It is suggested that such changes in phoneme inventories can be better understood as a result of phonetic and phonological processes involving the contrastive features and phonological contexts that define the phonemes in question. Processes referring to vowel length in Turkic and Korean are argued to have obscured its contrastive status in the organization of phonological knowledge by the speakers of these languages.

Keywords: *acquisition, areal linguistics, Korean, language contact, phoneme inventories, Turkic, vowel quantity*

1. Introduction

Social factors such as community size, dominance, and isolation are suggested by Trudgill (target article, this issue) to be predictive of the size of phoneme inventories. This paper evaluates Trudgill's conclusions against the evidence of Turkic and Korean phoneme inventories with special attention to primary long vowels. I will approach the issue by highlighting what needs to be considered along with cognitive and social factors in order to better understand the forces that affect phoneme inventories: the role of phonological structure in acquisition, a key notion that is missing in Trudgill.

There are several problems with Trudgill's approach to the investigation of sound inventories. First, from Trudgill's presentation of phonemic acquisition and inventory change, it seems that language users possess a set of sounds that can easily be reduced or increased in any possible way. Furthermore, he correlates reduced or simplified phonological systems with imperfect learning (memory problems, in particular) in contact situations that involve adult second language acquisition. Such an approach, however, misses something rather obvious: that languages have a system of contrasts and that their acquisition is constrained by both developmental and structural factors in a principled way.

Trudgill's enterprise in accounting for inventory size from a sociolinguistic viewpoint ignores various phonological factors that may be affecting the size of reduction. For instance, the disappearance of certain phonemes from Proto-Polynesian to Proto-Oceanic can be attributed to the loss of a voicing contrast among stops. This can explain, in a systematic way, why all five voiced stops disappear when we reach Proto-Polynesian (see his Tables 3 and 4, respectively). If Proto-Oceanic possessed ten voiced stops instead of five, Proto-Polynesian might lose all ten. The marked status of voiced stops compared to voiceless ones, then, confounds the role of social factors in such a loss.

It is crucial to ask here whether phoneme counts and their correlation with social factors contributes to the intriguing question that Trudgill initially poses: Why do languages prefer to maintain certain features and get rid of others? My stand on this issue is that it is not particularly important to know how many segments are lost or acquired but WHY any such forces, whatever they may be, affect those particular segments to begin with.

There are several reasons why I have chosen to focus on long vowels in Turkic languages and Korean. First, all long vowels involve one primary contrastive feature, vowel length, which makes them distinct from other vowels. Using a single feature allows us to hold one variable constant while comparing the phoneme systems of different varieties of a language family. This is particularly because merely comparing the number of phonemes between languages, which may have equal or unequal numbers of phonemes, does not tell us whether they employ exactly the same phonemes or use different ones but yet maintain the same number. In addition, I have chosen to focus on long vowels because they are, perhaps uncontroversially, marked vowels that many languages historically got rid of. In a language employing an eight vowel system, such as that of many contemporary Turkic languages, the loss of a vowel length contrast means that the language has possibly lost fifty percent of its vowel inventory. The preservation of such a marked feature in certain varieties, therefore, directly addresses Trudgill's original question, which is also the subject of this paper: Can we correlate the reduction of almost half of a vowel inventory with social factors? Furthermore, Turkic languages show interesting characteristics due to massive geographical displacement of Turkic tribes for centuries which resulted in contact with typologically different languages. Last but not least, vowel length in Korean provides us with a case where we can observe a change in progress involving long vowels. In summary, looking at the status of long vowels in vowel inventories provides a unique approach to the issue of phoneme inventory change and social factors.

2. Turkic migrations and primary long vowels

2.1. *A brief sketch of the history of Turkic*

Turkic languages are spoken in a vast geographical area from Bosnia in the west to China in the east, from Persia in the south to the Arctic Ocean in the north. The spread of Turkic languages in such a large geopolitical area provides instructive examples for contact phenomena among languages that are typologically different and among cultures that are very distinct.

Turkic languages are the westernmost branch of the Altaic family, which is hypothesized to have come into existence around 4500–4000 BC. The original habitat of the earliest Turkic people is identified, if controversially, with the Altai region or Trans-Baikalia or with the trans-Caspian zone (Golden 1998: 16). The emergence of Ancient Turkic dates back to 4000 BC and lasted until the consolidation of the first Turk Kaghanate around the middle of the sixth century AD. Early Ancient Turkic (3000–500 BC) exhibited no stabilized dialects (Róna-Tas 1982). Ancestor dialects of later Turkic languages started to emerge at the end of early Ancient Turkish with the formation of the isoglosses r/l and z/ʃ around the sixth century AD (Poppe 1965: 59; Róna-Tas 1982, 1998: 67). The first split occurred in the western branch, identified commonly as "Oghur" (or Bulghar), an r/l language. Chuvash is the modern representative of this branch. Modern Turkic languages are, on the other hand, the descendents of "Common Turkic", a z/ʃ language. A second split is represented with Arghu Turkic, the origin of Khalaj that is still spoken in central Iran. Further splits involving complicated contact processes followed. The inscriptions in runic script and various manuscripts in Sogdian, Manichean, Brahmi, and Uighur show differences which suggest that around the eighth century AD, Common Turkic was possibly comprised of at least three dialects: Ancient Oghuz, Ancient Uighur, and Ancient Kirghiz (Poppe 1965: 60). As Turkic-speaking groups penetrated other regions in different directions, secondary branches emerged. These splits and example languages representative of each branch are provided in (1).

(1) Turkic language branches (adopted from Johanson 1998: 82)
- (a) Oghur (Bulghar) Turkic
  Chuvash
- (b) Arghu Turkic
  Khalaj
- (c) Southwestern branch, Oghuz Turkic
  West Oghuz: Turkish, Gagauz, and Azerbaijanian
  East Oghuz: Turkmen and Khorasan Turkic
  South Oghuz: Kashkay, Afshar, Aynallu, etc.
- (d) Northwestern branch, Kipchak Turkic

West Kipchak: Kumyk, Karachay, Balkar, Crimean Tatar, Karaim
North Kipchak: Kazan Tatar, Bashkir, Tura, Tümen, etc.
South Kipchak: Kazakh, Karakalpak, Noghay, etc.

(e) Southeastern branch, Uighur Turkic
Western Uighur: Uzbek
Eastern Uighur: Uighur, Taranchi, Kashgar, Aksu, etc.

(f) Northeastern branch, Siberian Turkic
North Siberian: Yakut and Dolgan
South Siberian: Sayan Turkic, Yenisey Turkic, Altai Turkic

The Turkic languages underwent considerable mixture and leveling as they came into contact with non-Turkic as well as Turkic languages around them. For instance, Karaim has evolved in isolation from other Turkic languages and has been strongly influenced by Polish and Ukrainian as well as written Hebrew (Csató 2000). Apart from well-known Turkic languages that were under heavy Russianization in the Soviet Union, heavily Iranicized languages such as Kashkay and Khalaj, and Finno-Ugric-influenced Chuvash can be given as further examples for the diversity of contact patterns.

In the following, we will only focus on Yakut, Turkmen, and Khalaj, the only languages in Turkic (among thirty-odd) that are commonly reported to retain primary long vowels in their phonemic systems.[1] These languages show remarkable social characteristics: extreme language contact, different degrees of isolation from the rest of the Turkic peoples, and different community sizes.

2.2. *Primary long vowels in Turkic*

It is widely accepted that Proto-Turkic contained two contrastive vocalic lengths in stems (e.g., Tekin 1967, 1975, 1976, 1995; Poppe 1965; Clauson 2002). Ligeti (1938) has made the observation that the presence of minimal pairs in Yakut and Turkmen and the systematic correspondences of long vowels in these languages suggest that Proto-Turkic stems contained such an opposition (e.g., Turkmen: /ɑt/ 'horse' vs. /ɑːt/ 'name' = Yakut: /ɑt/ 'horse' vs. /ɑːt/ 'name'; Turkmen: /ɑːtʃ/ 'hungry' vs. /ɑtʃ/ 'to open' = Yakut: /ɑːs/ 'hungry' vs. /ɑs/ 'to open'). Furthermore, the early Turkish texts written in Brahmi, Uighur, and runic scripts were equipped to distinguish between long and short vowels. Long vowels represented by one of these alphabets were also spelt with a long vowel in the others (Clauson 2002: 162). Based on the evidence from these texts, Proto-Turkic is assumed to possess at least sixteen vowels ((2), adapted from Róna-Tas 1998: 70 and Clauson 2002: 163).

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1. Recently, at least one other Turkic language, Pamir Kirghiz has been shown to also possess primary long vowels (Pekacar 2000).

(2)

Short Vowels				Long Vowels			
i	y	ɯ	u	iː	yː	ɯː	uː
(é)[2]	ø		o	(éː)	øː	oː	
ɛ				ɛː			
		ɑ				ɑː	

Many modern Turkic languages exhibit a symmetrical eight vowel system. Some languages have a reduced number of vowels (e.g., Haliç Karaim lacking the rounded front /ø/ and /y/; Uzbek showing signs of at least six vowels perhaps due to its complex spelling system), whereas certain others made further phonemic distinctions in their vowels (e.g., /æ/–/e/ in Kazakh and Noghay). Contrastive vowel length was gradually lost in almost all Turkic languages.[3] Old Turkic texts provide examples for the transition. It is possible to observe the traces of long vowels in several Turkic languages and dialects. For instance, Tekin (1995) points out that voiceless obstruents after long vowels turned into voiced obstruents in the Oghuz branch while in Chuvash /ʃ/, /j/, and /v/ emerged before these vowels (e.g., Common Turkic: /ɑːt/ 'name' = Chuvash: /jɑt/ 'name', but Common Turkic: /ɑt/ 'horse' = Chuvash: /ut/ 'horse'). While long vowels were shortened and vowels already short underwent further reductions and changes (see Johanson 1998: 93–95), Yakut, Turkmen, and Khalaj preserved all primary long vowels in stems (e.g., 'salt': /tuːs/ (Yakut), /duːð/ (Turkmen), /tuːz/ (Khalaj); cf. /tuz/ (Turkish)).

What is crucial here is that Turkic vowel inventories employ either around eight or sixteen vowels. The difference between the two poles constitutes a significant reduction of about fifty percent in vowel inventories, and its consequences for the lexicon in these languages raise an interesting question. The loss of primary long vowels did not just happen by randomly "throwing out long vowels" as Turkic tribes moved along, but rather in a gradual and straightforward way by losing the length feature in vowels, a marked quality across the languages of the world. For instance, according to Agyagási (1998: 670), in the Oghur (Bulghar)-Turkic branch shortening took place in two steps. First, instead of long vowels, an extra short introductory sound and a vowel of normal length occurred (e.g., /ɑː/ > /iɑ/; /øː/ > /ye/, etc.). Second, the initial member of such diphthongs turned into a consonant through glide formation (e.g., /i/>/j/; /o u ø y/>/w/>/v/).

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2. Some theories assume that Turkic had at least one other vowel, the so-called "closed e" ([é]), a short unrounded mid-high front vowel (see Clauson 2002: 163).

3. Naturally, secondary vowel lengthening occurs in languages such as Tuvar and Kirghiz through the loss of certain consonants (e.g., Kirghiz: /jɑː-/ < /jɑɣ-/ 'rain' (Kirchner 1998: 345), or through borrowing, such as in Turkish [hɑːnɛ] 'house' which came from Persian.

The question that needs to be explored here is why only Yakut, Turkmen, and Khalaj among the Turkic languages have preserved a relatively large phoneme inventory, despite the persistent tendency of dropping long vowels in other Turkic languages. Can such persistence be correlated with social factors *à la* Trudgill?

2.3. *Sociocultural characteristics of the Yakut, Turkmen, and Khalaj groups*

Out of the three languages that retained the largest vowel inventories in Turkic, Yakut and Khalaj show relatively long isolation from the rest of common Turkic as well as mixture with other ethnic groups. The Arghu, the predecessors of the Khalaj, are believed to have split from other Turkic communities very early, before the major Turkic southwestern migrations. Between the eighth and eleventh centuries, the Khalaj people lived in the vicinity of the Oghuz Xalaç and made Cisoxania and Khorasan their homeland. The presence of Khalaj Turks in Iran dates back to the thirteenth century, possibly after the Mongolian occupation in 1219 (Doerfer 1998: 277). Among other Turkic languages in Iran, predominantly those that are connected to the Oghuz-Turkic branch, Khalaj stands out as very different. Despite the long contact experience of Khalaj with Iranian as well as Oghuz Turkic, it hosts a great number of archaic properties of ancient Turkic. When compared to Chuvash, whose predecessor also separated from Common Turkic earlier, early splits and migrations as well as other factors such as extreme contact with other languages all fall short of explaining the preservation of Turkic features. Chuvash underwent such substantial influence from Finno-Ugric languages that it was initially believed to be a member of the Finno-Ugric family with a number of Tatar elements. The Yakut situation exhibits more similarities with the Khalaj, although they did not leave their homelands and thereby they lost contact with other Turkic tribes that followed different migration paths. Unlike Chuvash, but quite similar to Khalaj, Yakut shows definite Turkic properties despite the fact that it has been separated from the other Turkic languages for a long time: "it shows all the features of a recent development which perhaps was incipient at the time the great Jakut migrations began, but which did not actually get under way during the migrations" (Menges 1995: 53). The northern migration that started around the fifteenth century brought Yakut tribes to remote places. South-Siberian Turkic groups, Abaqan and Tuva, form a transitional link between Common Turkic and Yakut (Menges 1995).

Under the assumption that long vowels were brought along with early migrations, if the loss of contact with the main group for a prolonged period of time determined the preservation of archaic forms, we would expect Chuvash to show similarities to Khalaj and Yakut. Contrary to this expectation, we do not see long vowels in Chuvash, whose predecessors were the Bulghar Turks

who started the very first split and lost contact with the other Turkic communities very early on. Rather, Bulghar Turkic shifted the long-short opposition of vowels to diphthongs.

Turkmen, the only Oghuz language to have kept primary long vowels, provides perhaps the most convincing case where we cannot attribute the preservation of vowel length to the effects of an early split or isolation. Unlike the Yakut and Khalaj people, the Turkmen split was relatively late, being a submember of Oghuz Turkic. Furthermore, Turkmen has been under the influence of Arabic-Persian and shows close similarity to Ottoman Turkish in its heavily Arabic- and Persian-influenced vocabulary. Literary Turkmen, which has been Russianized, became a national language only in 1925. That the Cyrillic alphabet does not reflect vowel length did not change the fact of the matter. Furthermore, the strong influence on Turkmen from Persian, which possesses long vowel phonemes, cannot be a factor here because all Oghuz languages were also in close contact with the Persian-Arabic world primarily due to Islam.

Furthermore, although both Yakut and Khalaj communities lived under strong ethnic influence of dominant groups (Mongolians and Russians in the case of Yakut, and several communities in Iran in the case of Khalaj), they mostly preserved their ethnic structure. According to Boeschoten (1998), the Yakuts, for instance, were superior to other ethnic groups in the area particularly because of cattle and horse breeding and production of iron until after the Russian invasion in the seventeenth century. Can this favor a situation where language change was extensively resisted in these communities? The answer is straightforward, given that both Khalaj and Yakut adopted several new linguistic properties while keeping many of the archaic features. For instance, the morphology and syntax of Khalaj have been largely Iranicized, but yet Khalaj is the only modern language that retained the archaic dative suffix *-KA* (Doerfer 1998). Similarly, the Yakut lexicon has been under substantial influence from Russian, which has no vowel length distinction, yet Yakut kept contrastive vowel length.

Having shown that isolation and dominance cannot explain the loss or preservation of large vowel inventories in Turkic, the question remains as to whether community size can play a role. After all, the preservation of a large vowel inventory in Khalaj can be said to fall from the minority status of the Khalaj (today about 28,000 people) among several other ethnic communities in Iran. Following Trudgill, small size communities represent tight network structures where we observe "the ability of such communities to encourage continued adherence to norms from one generation to another". When we look at Yakut and Turkmen, however, these assumptions cannot be upheld since both Yakut and Turkmen tribes represent relatively large communities both in the past and present. Today, there are about 3.9 million speakers of Turkmen living in Turkmenistan, Iran, and Afghanistan (Boeschoten 1998). Yakut stands in the mid-

dle of the scale with about 400,000 speakers. Given that these figures illustrate different ranges, community size cannot be said to be predictive of the vowel inventory sizes in question.

Can phoneme size reduction in vowel inventories be correlated with imperfect learning? It is instructive to approach this question in the context of Korean phonology since it provides an interesting case where long vowels are currently disappearing.

3. Long vowels in Korean

Korean has been described as having long vowel phonemes in the first syllable of words and phrases (Sohn 1999). Syllables with a rising tone in Middle Korean correspond to ones with a long vowel in Modern Korean word-initial syllables. While there are Korean dialects that do not make use of vowel length contrastively, the central dialects including the area encompassing Seoul characteristically employ such a contrast. Korean dictionaries also differ in the way they represent long vowels. For instance, long vowels are not restricted to first syllables in some dictionaries published before the end of 1960s. Dictionaries published in North Korea before 1968 indicate vowel length while those published later do not (Park 1994). Older generations of Korean speakers, particularly those older than fifty in the year 2000, are said to employ vowel length contrastively compared to younger generations who have been reported to produce long vowels as short (Sohn 1999). For instance, for many speakers of Korean, the words for 'eye' and 'snow' are homophonous (*nwun* [nun]) while the older generations use [nuːn] when they mean 'snow'. A questionnaire study (Park 1994) aimed to investigate the actual pronunciations of pairs of Korean homographs with long and short vowels showed that subjects under thirty-five who had mainly lived in Seoul consciously marked about sixty percent of homographs with long vowels as short (cf. thirty-five percent of the same homographs in the group older than forty). Interestingly, the same group reported a considerable number of homographs with short vowels as long. In relation to this, Park suggests that the tendency to mark already short vowels as long is an influence of hypercorrection resulting from school grammar knowledge that vowel length is supposed to be contrastive in Korean, not because the subjects could tell the difference of vowel lengths of the words in the questionnaire. Furthermore, subjects who were below thirty-five and lived in areas other than Seoul also showed very similar tendencies to those living in Seoul.

The change in contemporary Korean compares instructively to the loss of primary vowels in Turkic. We are here observing a language that has been losing half of its vowel inventory altogether. Attributing such a change to imperfect learning would be false because we see the change within a single society that encompasses millions of speakers who acquire the language natively. It

could be suggested here that the shift of the long-short distinction in vowels might be related to long term contact with other dialects of Korean which do not have this distinction (e.g., a great majority of areas in North and South Phyengan). This possibility is unlikely, however, since the dialects that use vowel length represent a considerable number of people in South Korea and since the Standard Korean of the Republic of South Korea is based on the variety spoken in Seoul, which is among these dialects. If social dominance directly affected the size of phoneme inventories in contact situations, we would expect a preservation of a vowel length contrast in other dialects of Korean that do not have the same social status as the standard variety.

In the following I will develop an argument that emphasizes the role of phonological evidence in the maintenance of contrast. When decreases or increases in the size of phoneme inventories are looked at from the point of view of the role of phonology in language acquisition, it will become apparent that the phenomenon is far more complex than the two causes – social factors and the difficulty of post-adolescents with learning and remembering – that Trudgill resorts to in explaining the emergence of smaller inventories in adult language contact situations.

4. The role of phonological evidence in the acquisition of segmental inventories

Under Trudgill's assumption, in situations involving adult language contact, a phoneme inventory is kept at a moderate size in the borrowing language mainly due to memory load difficulties caused by confusability and word length. However, I would like to show that the acquisition of phonemes is crucially determined by the extent to which the phonological systems involved in the contact situation differ from one another. To establish this, I will address two important issues: (i) the elements that make up the phonological system, namely phonemes, and how they are represented, and (ii) the process in which these elements are integrated in the learners' (or borrowers') phonological system. Since learners' detection of phonemic contrasts in the input is the fundamental step towards the acquisition of segmental structure in one's native language, changes in phoneme inventories should be viewed as an emergent property of the way phonemic inventories are constructed, which then provide the input for the next generation. Once we establish what acquisition of segmental structure entails and why this process is often imperfect in second language acquisition, we will be in a better position to comprehend the various consequences of language learning in contact situations for phoneme inventories.

First, phonemes, not phoneme inventories, have psychological reality, and they are not just sets of sounds that can be randomly erased from the heads of a generation. Rather, phoneme inventories are a linguist's convenience to depict

the internalized knowledge of distinctive features and the way they are combined in the phonological system by speakers to create meaningful utterances. Without constructing phonological representations, no inventories can be acquired. The shrinkage or expansion of phoneme inventories over time must, therefore, be viewed as inseparable from the way the dynamics of language acquisition hinder or ease the representation of phonological structure.

The detection of contrast in the input is crucial for the acquisition of segmental representations. The ability to distinguish non-native contrasts declines as infants acquire their native language systems (see Jusczyk, Houston, & Goodman 1998 for a review). The perception of non-native speech may, therefore, be strongly influenced by speakers' internalized knowledge about contrastive features in the first language (L1). For instance, second language speakers of English whose native languages do not contain the [lateral] distinction, such as Japanese, have enormous difficulty learning the contrast. Indeed, Japanese speakers have been shown to fail to PERCEIVE the /l/ and /r/ distinction (e.g., Goto 1971; Miyawaki et al. 1975), although they use these segments allophonically in their L1. However, Chinese speakers who do not employ the /l/–/r/ distinction either can successfully discriminate the two sounds (Brown 1998). How does one explain this? Brown correlates this behavior with the availability of the phonological features that can be employed to distinguish this pair in the L1. She suggests that a speaker may be able to perceive a non-native contrast if the feature that distinguishes the two segments is independently present in the L1 of the learner. According to Brown, the feature in question is [coronal], which distinguishes between /l/ and /r/. Thus, Chinese speakers are able to perceive the contrast by virtue of the independently needed [coronal] feature to distinguish other consonants (e.g., the alveolar fricative /s/ vs. the retroflex fricative /ʂ/) in the Chinese phoneme inventory. The Japanese phoneme inventory, on the contrary, does not employ this feature for any phoneme.

Suprasegmental information such as syllable structure constraints in the L1 also plays an important role in the perception of non-native phonological strings and, consequently, in the adaptation of loan words. For instance, Korean and Japanese listeners PERCEIVE epenthetic vowels between consonant clusters that do not conform to the syllable structure patterns of their L1, which put severe restrictions on consonant clusters (Dupoux et al. 1999; Kabak 2003). Non-native words that do not abide by rules of the native language of their borrowers are likewise subject to alteration. When loans come into a language, segmental as well as distributional properties of each sound are adjusted to fit into the host language's phonological patterns. This is particularly because host-language speakers filter the acoustic signal through their own L1 phonological systems in perception and production (Silverman 1992). This suggests that when an L1 does not employ the same set of contrastive features as the target language, speakers will adjust target language phonemes to their closest

equivalent in the L1 system of contrast. For instance, while Turkish speakers adapt English interdental fricative /θ/ as /t/, Korean speakers tend to produce the same segment as /s/. Similarly, Johanson (2002: 77) attributes the loss of the /θ/–/ð/ distinction through fusion with [t] and [d] in Inner Anatolian Greek to a lack of such a contrast in Turkish, the dominant language.

We have established that adult learners do not necessarily fail to acquire new segments because language learning is imperfect. The role of the native language phonological system that funnels acoustic signals must crucially be considered along with cognitive factors such as learning and memory when investigating how phoneme inventories are constructed. Along these lines, I will suggest possible phonological explanations as to why certain languages in question endeavored to sustain contrastive vowel length while others got rid of it.

5. Possible scenarios for the loss of vowel length contrast in Turkic and Korean

Essentially, a vowel length contrast is constructed by formalizing distinctive vowel features (e.g., Dorsal, Coronal, Labial, etc.), which also define short vowels, as occupying two moras in the rhyme as opposed to one. Just like losing a feature, the loss of such a representational option correlates with the disappearance of long vowels in the vowel inventory. Despite the acoustic saliency of long vowels due to their prolonged phonetic presence compared to short ones, what exactly can cause learners to fail to represent them? As to Turkic, we can find potential answers to this question by suggesting possible scenarios for the phonological system of Ancient Turkic before long vowels started to disappear.

As mentioned before, many Turkic languages have undergone various phonetic and phonological changes that stem from vowel length, where we can observe the traces of primary long vowels. For instance, diphthongization and the formation of onsets (e.g., /y/, /h/, /v/, etc.) as well as the gemination of consonants following open syllables with long vowels have been noted in the literature as common ways of compensating lost vowel length (see Tekin 1995: 123–166). Naturally, such compensatory changes can be explained by markedness. In the following, however, I will only focus on a few phonetic and phonological reflexes of long vowels that may have led to the accumulation of insufficient cues for vowel length in some Turkic languages, since my main aim is to establish that sufficient and sound psycholinguistic cues for phonological contrast are essential for the acquisition and maintenance of phonemic contrast.

First, it could be that, through time, the evidence for the vowel length contrast diminished as the phonetic cues for length were instead associated with other features already existing or emerging in certain phonological contexts.

One such association is related to the widespread tendency for vowels to be shorter before voiceless obstruents than before voiced ones (e.g., Chen 1970). For instance, in American English vowel length is approximately fifty percent greater before a voiced consonant than before its voiceless counterpart (e.g., Naeser 1970). Perceptual studies have shown that vowel duration serves as an important perceptual cue to the "voicing" contrast of the following obstruent (see further Chang 2002). In general, perceptual findings suggest that subjects tend to perceive word-final consonants as "voiceless" when the preceding vowels are short and as "voiced" when they are long.

Such an association also exists in Turkic between what used to be long vowels and voiced plosives that follow these vowels (Poppe 1965: 176; Clauson 2002: 162). Modern Turkish carries traces of this where roots that end in final voiced stops correspond to those that contain a long vowel in Ancient Turkic (e.g., *od* < *oːt* 'fire', cf. *ot* 'hay'; *ad* < *aːt* 'name', cf. *at* 'horse'; Poppe 1965: 177). As such, it is possible to say that vowel duration was perceived as an indicator of voicing on the following consonant. Consequently, at the level of phonology, this psychophysical difference could have been interpreted as a systematic rule that predicts vowel length before voiced consonants. Such a phonological rule has in fact been suggested for English vowel length before voiced consonants (e.g., Hyman 1975: 172). While some Turkic languages gained voiced segments through such secondary means, spirantization conspired against already existing voiced stops in the same position. Voicing of final consonants after originally long vowels is perhaps clearer in Oghuz languages (e.g., Azerbaijanian: *od* 'fire'; *gøg* 'heaven', *adʒ* 'hungry'; *dib* 'bottom'; examples from Johanson 1998: 98). Spirantization affected non-initial consonants in several steps. For instance, a final /b/ shifted to /v/, /w/, or zero (e.g., Turkmen: *θuw*; Turkish: *su* 'water'), whereas a final /d/ changed to /ð/ (East Old Turkic: **boːd* > *boð* 'clan/stature'), to /j/ (e.g., Turkish: *boj* 'stature'), or to /z/ (Yellow Uyghur: *poz* 'body'). Therefore, it is possible to speculate that the evidence for vowel length before voiceless segments (i.e., /Vː $C_{[-\text{voice}]}$/) gradually disappeared as voiceless stops after long vowels became interpreted as voiced, also causing the opposition between voiced and voiceless stops in word-final positions to be neutralized. These steps are hypothetically illustrated in Table 1, where *D, T* stand for a voiced and voiceless stop, respectively, and *ð* for a voiced interdental fricative.

From Table 1, it can be seen that at Stage II, voiced and voiceless stops are in complementary distribution such that they occur only after long and short vowels, respectively. Furthermore, long vowels are restricted to contexts preceding voiced consonants (stops and fricatives). That no long vowel exists before voiceless consonants makes vowel length appear predictable. That is, we have two predictable phonological phenomena that are interconnected: (i) voicing specification of the final stop, which is determined by vowel length,

Table 1. *The change of word-final consonants*

	Ancient Turkic	Stage I: Spirantization	Stage II: Voicing
Long vowels	V: ___ T	V: ___ T	V: ___ D
	V: ___ D	V: ___ ð	V: ___ð
Short vowels	V ___ T	V ___ T	V ___ T
	V ___ D	V ___ ð	V ___ ð

and (ii) the length of the vowel, determined by the voicing specification of the postvocalic obstruent. It could be suggested that long vowels also existed before other consonants such as sonorants, not just stops. While it is true that the presence of sonorants after both long and short vowels can provide independent evidence for contrastive vowel length, it is more likely that vowel length, rather than voicing, was made into a more general phonological rule because the voicing specification of the post-vocalic obstruent cannot be predicted from vowel length at Stage II. That is, it is not the case that an obstruent is voiced if and only if it follows a long vowel. This condition, however, is true for vowels: a vowel is long if and only if it precedes a voiced obstruent.

The above argument, however, makes the prediction that in languages where contrastive vowel length was preserved, post-vocalic stops took a different developmental path. Indeed, this is what we observe. Instead of spirantization, there is evidence that Yakut and Khalaj tended more towards devoicing of their voiced sounds in word-medial and word-final positions (Yakut: *ket-* 'wear', cf. Turkish: *gij-* 'dress', possibly from **-$d > ð > j$* (Johanson 1998: 96)). The presence of such a tendency suggests that Yakut and Khalaj maintained the vowel length contrast independent of voicing, while in the other dialects this evidence for the contrast overlapped with secondarily emerging voiced stops. Contrary to our prediction, however, Turkmen tended to spirantize final voiced stops just like other Oghuz dialects. Perhaps the case of Turkmen long vowels can be evaluated through other phonological processes that may have contributed to the maintenance of long vowels in Turkic.

One such phonological process concerns the emergence of SECONDARY long vowels. Poppe (1965: 178) mentions that Ancient and Middle Turkic did not have these vowels. Synchronically, secondary long vowels in most modern Turkic languages typically result from compensatory lengthening when an underlying voiced velar fricative /ɣ/ (orthographically represented as *ğ* in Modern Turkish) is deleted in coda position (e.g., Turkish: /dɑɣ/ → [dɑː] 'mountain') or intervocalically (e.g., /ɑɣɯr/ → [ɑɯr] → [ɑːr] 'heavy'), as the two vowels coalesce after the deletion of the consonant (Sezer 1986). It could be suggested that as more and more cases of secondary long vowels emerged in Turkic languages, this might have obscured the contrastive status of primary

long vowels. Ultimately, this confusion might have led to their reanalysis as short vowels since vowel length has, to a great extent, become predictable. Interestingly, Modern Turkish speakers tend to interpret long vowels that came with loan words as containing a /ɣ/ (*ğ*). Thus, it is not uncommon to see the spellings of such words with a *ğ* (e.g., *mağlum* for [maːlum] 'apparent'; *çağre* for [tʃaːre] 'solution', etc.). The *ğ*-insertion can be considered as a reflection of speaker's intuitions about the predictable status of vowel length in Turkish.

Such an analysis, however, makes the prediction that in those languages where primary long vowels have been preserved, secondary long vowels should be absent. Indeed, this is what we observe. Poppe (1965) notes that Turkmen lacks secondary long vowels altogether. Yakut, on the other hand, according to Poppe, does have them only in a few instances along with primary long vowels, but the language represents them differently (**aːtʃ* > *aːs* 'hungry' vs. **taɣ* > *tɯa* (but not *taː*) 'mountain'). This is further evidenced by the fact that, while in most Turkic languages final /ɣ/ often disappeared, both Turkmen and Khalaj preserved final /ɣ/ (e.g., Turkmen: *daːɣ* 'mountain', cf. Turkish: *daː*; Khalaj: *arɯɣ* 'pure', cf. Turkish: *arɯ*).

Syllable structure rules can also be seen to affect the status of long vowels. Modern Turkish, for instance, allows at most two moras in the rhyme (e.g., Kabak & Vogel 2001: 345–353). Thus, loan words consisting of rhymes of the form CVVC are subject to vowel shortening (e.g., /mɛraːk/ → [mɛrak] 'curiosity'). When the same words are followed by a vowel-initial morpheme, however, the final consonant becomes an onset, thereby respecting the two-mora restriction (e.g., /mɛraːk/ + /-(y)I/ → [mɛ.raː.kɯ] 'curiosity-ACC', but mɛ.raːk/+ /-DA/ → [mɛ.rak.ta] (*[mɛ.raːk.ta]) 'curiosity-LOC'). Given that long vowels primarily occurred in roots, which are typically monosyllabic in Turkic, closed syllables containing long vowels constantly violated the bimoraic requirement. It should be noted that the majority of Turkish monosyllabic roots consist of closed syllables. The syllable structure condition may have led to the shortening of vowels initially from closed syllables, which consequently led to the neutralization of the vowel length contrast altogether.

A similar attempt can also be made to explain the contemporary Korean case. Korean is known to employ a vowel shortening rule that affects underlying long vowels in either morphologically or phonologically conditioned environments. First, long vowels in stem-final syllable of a verb are shortened before a vowel-initial suffix (3a, b) or a causative or a passive suffix (3c, d) (examples from Sohn 1999: 193).

(3)	a.	/məːl/-/əsə/	→	[mə.rə.sə]	'as it is far'
	b.	/kuːlm/-/ə/	→	[kul.mə]	'by starving'
	c.	/cuːl/-/i/-/ta/	→	[cu.ri.da]	'reduce'
	d.	/miːl/-/li/-/ta/	→	[mil.li.da]	'be pushed'

The second type of vowel shortening is phonologically driven and takes place when long vowels occur in NON-PHRASE INITIAL position at the phonological phrase level. The phrases in (4) illustrate the non-application (4a, c) and the application (4b, d) of this rule (examples from Sohn 1999: 176).

(4)	a.	/nuːn/	→	[nuːn]	'snow'
	b.	/hij-n/ + /nuːn/	→	[hinnun]	'white snow'
	c.	/saːlam/	→	[saːram]	'person'
	d.	/k^{h}ɨn/ + /saːlam/	→	[k^{h}ɨnsaram]	'tall person'

Through such active shortening processes, it seems that Korean speakers encounter situations where words with underlyingly long vowels are pronounced short potentially at the cost of causing ambiguities. As such, the cues for vowel length as a contrastive feature become insufficient given that words are less likely to be pronounced in isolation. Therefore, it could be that Korean learners fail to detect vowel length as contrastive, one of the crucial requirements for the acquisition of phonemes.

Another factor that must be considered is the influence of orthography. Hankul, one of the most ingenious writing systems in the world, adopts a morphophonemic spelling convention that reflects the underlying forms of Korean morphemes from which surface pronunciations are produced by applying a series of phonological rules. Despite its phonemic basis, contemporary Hankul does not reflect long vowels. In the context of a systematic orthographic convention that fails to reflect long vowels, which are not phonologically predictable, the cues for the contrastive status of vowel length in contemporary Korean become very poor for learners.

In sum, the loss of primary long vowels can be explained through various phonetic and phonological processes whose traces can be observed in the phonological system of modern languages. Essentially, in all possible explanations that I mentioned above for both Turkic and Korean, insufficient or obscured evidence for a contrast was suggested to trigger the loss of long vowel phonemes. Naturally, when the effect of each factor outlined above is considered in combination with one another, the loss of primary long vowels finds substantial phonological explanation.

6. Conclusions

I have suggested that long term contact with other groups of different linguistic affinity fails to explain the difference between those Turkic languages that kept primary long vowels and those that did not. There are representative examples for both types of languages which equally underwent intense language contact. Likewise, community size and network structure cannot readily explain the

preservation of such an archaic feature since we observe both small and very large communities among these languages.

Furthermore, I have highlighted the role of phonological structure of both the recipient and the source language in the acquisition of segments and suggested that adult language acquisition does not necessarily result in simplification of inventories because of memory problems. As phonemes cannot be randomly dropped or gained, the acquisition of segmental inventories should be viewed as a systematic construction process that involves the mental representation of phonological features from the input. I have suggested that this process is better understood when the role of structural constraints involved in acquisition is considered.

The loss of Korean vowel length provides a contemporary example for an inventory change in progress. I have suggested that its dynamics lies within the phonological system of the language itself and language speakers' internalized knowledge of active processes that refer to vowel length. It seems that the phonology of Korean in addition to the superficial effect of the Korean orthography result in insufficient cues for the detection of contrast, the primary requisite for the acquisition of phonemes. I have drawn similar scenarios for Turkic, where several phonological patterns refer to long vowels. Diachronic changes such as the voicing of plosives after primary long vowels and compensatory lengthening seem to offer potential causes for the loss of vowel length contrast where such predictable phonological patterns have obscured the contrastive status of primary long vowels in most Turkic languages.

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Phoneme inventories, language contact, and grammatical complexity: A critique of Trudgill

by PETER BAKKER

Abstract

There is no support for Trudgill's thesis. There are languages with exceptionally high numbers of consonants that are spoken by large groups, sometimes by millions as a second language. A pilot survey of contact languages (pidgins, creoles, and mixed languages) does not reveal unusual numbers of phonemes. Non-creole languages that have simplified their verbal inflection due to contact and second language learning appear not to decrease phoneme numbers either. Even most mixed languages that arose among fully bilingual groups fail to show exceptionally high numbers of consonants, even though some may display more complicated structures than their component languages. There is no correlation between language contact and phoneme inventories.

Keywords: *bilingualism, creole, language contact, mixed languages, phoneme inventories, pidgin, social structure*

1. The claim

In the target article, Trudgill suggests that language contact can be responsible for small phoneme inventories if adults acquired them in learning a second language (simplification or pidginization), and for large phoneme inventories if there was mostly first language bilingualism. This is a challenging idea, but I doubt that there is enough evidence to support it.