# Metathesis of Obstruent Clusters

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Obstruent metathesis is an infrequently observed metathetical process, and it is accounted for less frequently than it is observed. In this paper I will summarize the few descriptions of obstruent metathesis which have come to my attention, give examples illustrating the process, discuss experimental work on the perception of the clusters, and conclude with observations of my own regarding the process.

The concern of this paper is limited to metathesis of contiguous sibilants and stops.

## 1. Accountings of the process

1.1. There are three publications which deal at length with obstruent metathesis. Malone (1971) presents eleven cases of morphophonemic metathesis of tS > St (where S is s, ṣ, ś, š, or z) in the history of Mandaic. He notes that the metathetical process occurs twice, on the two occasions when t and S are pushed together by other processes. The first time is when the reflexive prefix t- is adjoined to S- initial stems, and the second time is when stress shift and syncope have brought the t- prefix and a second radical S together. Malone's article suggests that the phonological structure of a particular language will determine whether or not a particular metathesis will apply in it. He shows that the cluster tS was generally disfavored in the Semitic languages.

1.2. Grammont (1965) includes obstruent reordering in a category he refers to as <u>interversion</u>. He suggests that the stop-sibilant reordering is that of changing from a difficult to 'comfortable' order in terms of ease of articulation. Grammont cites fifty-five examples of obstruent metathesis, taken from fourteen languages. All of the sets of examples except two (comprising five examples) illustrate a change from stop-sibilant to sibilant-stop. No distinction is made regarding ease of articulation for initial, medial, or final position, except when it is noted that one of the languages (Old English) with a sibilant-stop metathesis has a different syllable division from the other languages considered.

1.3. Ultan (1971) observes that there is a general preference for sibilant-stop clusters over their stop-sibilant counterparts. He brings nine examples of stop-sibilant metathesis and five of sibilant-stop. He found no examples of clusters of sibilant plus dental or alveolar stop which reordered, and offered the following

statement as a tentative universal:

> clusters with the order dental (or alveolar) stop + sibilant (i.e. spirant) may metathesize but those with the inverse order do not. The more interesting generalization to the effect that dental + sibilant implies the presence of sibilant + dental may prove to be valid for phonological (as opposed to phonetic) clusters if dental, alveolar and palatal affricates are viewed as unit phonemes. (15)

Ultan concludes that metathesis is (1) a segment-or feature-preserving process, (2) subject to the interference of more dominant processes (i.e., reduction, assimilation, dissimilation, and epenthesis or anaptyxis), (3) more likely to affect a relatively sonorant segment than a less sonorant one. He finds the causes of metathesis to be as follows:

(1) The threatened or imminent reduction of a segment or feature (by apocope, syncope, or apheresis) due to accentual shift or other ultimate causes.

(2) The actual reduction of a segment or feature, also due to accentual shift, grammatical process..., lenition ...or other causes.

(3) A change from a mixed to a predominantly open syllable canon produced by several processes, one of which is metathesis. The ultimate cause of such a change would seem to stem from unusually weak articulation of syllable-final consonants.

(4) The necessity for maintaining a specific syllable or word quantity.

(5) Phonological constraints of a morphophonemic nature violated by accidents of morphological juxtaposition, introduction of noncanonical sequences in loan words, etc.

(6) Analogical processes reflecting existing models of dissimilation, palatalization, glottalization, diphthongization, favored sequences, and the like.

(7) Attraction and repulsion of phonetically similar and dissimilar, respectively, segments or features.

(8) Anticipation of disfavored sequences. (36-7)

1.4. In addition to the three works referred to above, there are two recent publications which attempt to account for obstruent metathesis in terms of articulation. Bailey (1970) suggests that the preference for an st cluster over a ts may be due to physiological reasons. He presents a case for the consideration of nonapicals plus apicals and dorsals plus nondorsals as unmarked clusters, and proposes that 'In line with the tendency of languages to move from marked to unmarked situations, we can legitimately explain metatheses which place the apical or the nondorsal last on the basis of universal linguistics facts' (349).

1.5. Hjelmslev (1970) claims that metathesis 'always takes place in such a way that elements not appearing in the order of expiration are transposed so that they do. (Order of expiration is the order of movements of speech organs from the interior to the exterior--from throat to lips.)' (50). Since there are cases of ks > sk, this is not true.

2. The data

The following examples have been culled from grammars and dictionaries; in most cases other examples can be found on the pages cited. The collection is intended to be a sampling of the types of obstruent metatheses this paper is concerned with, rather than an exhaustive presentation.

2.1. ps > sp

2.1.1. Cl. Greek ψάλιον > Attic σπάλιον 'part of the bridle'

Dialectal variant. Liddell and Scott (1894, 1751). Note: Grammont says that this is a diachronic process, from Old Attic to Vulgar Attic (240). Buck (1955, 74), however, suggests that the sp- variant may be of a colloquial and transitory nature.

2.1.2. Old Irish *acsnam (ad-cosnam) > ascnam verbal noun 'strives after'

Diachronic development. Thurneysen (1966, 113).

2.1.3. Old English cops > cosp 'fetter, bond'

Possibly a dialectal variant. Wright (1925. 161).

2.2. ts > st

2.2.1. pre-Hebrew *hitsabbila > Heb. histabbél 'he dragged himself'

Diachronic development. Malone (1970, 397).

2.2.2. pre-Mandaic *ʔeϑár > Mand. esϑár 'he was bound'

Diachronic development. Malone (1970, 405).

2.2.3. English kitchen > Irish cistin 'kitchen'

Borrowed form. Meyer (1906, 376; also 134 and 169).

2.2.4. Finnish peitseä ~ peistä 'spear'

Forms in free variation. Tauli (1966, 211).

2.3. st > ts

2.3.1. Luiseño wa-niʃ-tal ~ wa-ni-t|al 'river (loc.)'

Forms in free variation. Malécot (1963a, 93).
Note: See also Malécot (1963b, 203).

2.4. ks > sk

2.4.1. Slavic *xvoja > Lit. skujà, Lett. skuja 'pine needle'

Diachronic development. Stang (1966, 95).

2.4.2. Uralic *kč > kš ~ šk in Erza Mordvin mokšana, Mokša mokšonda, Cheremis moškõndõ, muškõndõ 'fist'

Diachronic development. Collinder (1960, 90).

2.4.3. Old English dox > Middle English dosc, dusk 'dusk'

Diachronic development. American Heritage Dictionary.

2.4.4. French luxe > Colloquial French lusque 'luxury'

Dialectal variant. Guiraud (1969, 103).

2.4.5. Skt. pakṣa > Māgādhī paśka 'wing, side'

Diachronic development. Pischel (1965, 226)

2.5. sk > ks

2.5.1. Old English asce > late West Saxon axe 'ashes'

Diachronic development. Wright (1925, 165).

2.5.2. Uralic šk (as in Lappish boaske 'the small of the leg') > (?) Mordvin pukšo 'the thick flesh; thigh, buttock'

Diachronic development. Collinder (1960, 105). Note: Collinder refers to *sk > ks in Ostyak, Southern Samoyed, and perhaps in Mordvin, but gives examples only of the questionable Mordvin cases. He also notes (101) PU *sk > ks in Ob-Ugric, but again there are no examples.

2.6. I have not found any examples of sp to ps, and only the Luiseño examples for st to ts. Sk to ks, however, is found at least in English and some of the Uralic languages. Ultan cites a morphophonemic process in Lithuanian (15), where there appears to be a metathesis of IE *-sko to Lit. ks. I have not used this Lithuanian case, since there is the possibility that an epenthetic k before medial sC clusters could be involved. (See Stang, 108-13, regarding this epenthesis.)

3. Perception of consonant clusters

3.1. The psycholinguist observes that consonant clusters are perceived somewhat differently from a CV sequence. The experiments carried out by Bond (1971) for perception of the clusters ps, sp, ts, st, ks, and sk showed that (1) the most common error of perception is the reversal of the cluster, and (2) the stop-fricative cluster is perceived correctly more often than the corresponding fricative-stop cluster.

The clusters were tested for correct identification in a series of three tests, with differing levels of signal degradation. Since the testing was carried out in English, all of the clusters were syllable-final or across syllable boundaries. In the series of tests with the greatest signal degradation, the clusters involving bilabial and velar stops show approximately the same amount of confusion, no matter in which order the cluster is given; sp was correctly perceived 29.9% of the time, ps 36.4%, sk 37.3%, and ks 38.4% of the time. For the st/ts clusters, however, the difference was greater. St was heard correctly 32.2% of the time, and ts 57.2% of the time.

3.2. Bond observes that the greater degree of accuracy in identifying stop-fricative clusters may be due to the higher frequency of stop-fricative clusters in English. An examination of the distribution of word-final clusters (excluding inflectional endings) in Wood's Complete Rhyming Dictionary shows the following frequencies of occurrence.

| cluster | no. of forms | cluster | no. of forms |
|---|---|---|---|
| sp | 12 | ps | 10 |
| st | 102 | ts | 26 |
| sk | 33 | ks | 35 |

There is a marked difference between the frequencies of occurrence

for the st and ts syllable-final clusters. It should be noted, furthermore, that the ts clusters accounted for in this data are subject to dialect variation, i.e., false, waltz, quartz, prince, once, bounce, science, etc., are pronounced with a final s and no preceding stop by many speakers.

The frequency distribution of st and ts clusters would be considerably different, with a preponderance of ts clusters, if the frequency of inflected forms ending with ts was taken into account. This would be in accord with Bond's observation regarding the possible cause for greater perception of ts clusters. If inflected forms were considered, however, then ps and ks should show considerably more frequent distribution than sp and sk. It is not the case, however, that bilabial and velar stop-sibilant clusters are more readily perceived than their sibilant counterparts, so it does not appear likely that a greater degree of accuracy in identifying stop-sibilant clusters can be attributed to a higher frequency of these clusters.

3.3. Bond finds her data compatible with a theory proposed by Wickelgren (1969a and 1969b), which suggests that a consonant cluster is coded in terms of an element resembling an allophone of an unordered cluster. The explanation of this kind of coding is as follows:

> When a listener is presented with a consonant cluster, e.g. sk, he knows that it is composed of two elements, but he does not encode these elements in order; rather, the cluster is coded as an unordered sequence, with each element identified for what precedes and follows it. Schematically, the coding would be something like the following: $s^{k\#}$ $\#^{s}k$. These elements can be assembled in the correct order, and the listener can arrive at the intended sequence. (48)

Bond concludes that

> If a consonant cluster is coded in terms of allophones, then the allophone of s before p will be slightly different acoustically, from the allophone of s after p. This difference, however, will be the most subtle part of the signal; particularly, it will be smaller than the acoustic information differentiating consonants from each other. These small acoustic differences will be the first to disappear when the signal is degraded by noise; consequently reversal errors will be the most common in a degraded signal. (75)

4. Conclusion

4.1. The examples of obstruent metathesis that have been observed indicate that the reordering of a stop-sibilant cluster occurs in

a greater number of languages and with more frequency than the reordering of a sibilant-stop cluster. The languages that are observed to have the sibilant-stop reordering are English, Ostyak, Southern Samoyed, Vogul, Mordvin (perhaps), Luiseño, and possibly Lithuanian.

4.2. The evidence for the English speaker's greater readiness to identify the stop-sibilant cluster ts, and the similarity of the ts cluster to the voiceless palatal affricate č, prompted an inquiry into the phonological inventories of the metathesizing languages. It would seem natural for speakers of a language with a č to have access to a sibilant-stop reordering, since they should find the stop-sibilant order phonetically and phonologically admissible. And it is the case that all of the languages which have so far been shown to have a metathesis of sibilant-stop clusters do have č, except for one of the Ob-Ugric languages, Vogul, which has a palatalized affricate ć. Whether the presence of č in the sound system of the language preceded or followed the sibilant stop metathesis is difficult to ascertain in the case of English, since opinions conflict as to when it came into the language. Wright says:

> Some scholars assume that palatal c and nc became t∫ (= ch in NE. chin), nt∫ in Mercian, WS. and Ken. in the earliest period of the language, but this is an assumption which cannot be proved.... All that can be said for certain is that the change had already taken place by the beginning of the Middle English period. (162-3).

The Uralic affricates can be traced to both Common Uralic and Common Finno-Ugric. The Luiseño process is synchronic, and co-occurs with a č. Modern Lithuanian also has a č, which dates back at least to the earliest Lithuanian documents available, those of the 16th century; this fact is likely relevant to the appearance of k before sC clusters medially, whether this is due to metathesis or epenthesis.

For the languages in section 2 that do not show a sibilant-stop reordering, there is little or no trace of an affricate at the time of the reordering to a sibilant-stop cluster. The trace, as far as the languages considered in this paper are concerned, appears in Finnish; it has a ts or s in medial position as a remnant of *ć, and a t or h as a remnant of *č.

4.3. We have evidence that the occurrence of a sibilant-stop reordering implies the presence of (or, in the case of Old English, at least the strong potential for) an alveolar or palatal affricate within the sound system of a language. The inverse of this is not true, however, since there are many languages with č that have no recorded sibilant-stop reordering; both Spanish and Lake Miwok, for example, have č, but neither exhibits a sibilant-stop reordering.

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