FROM: Shared Grammaticalization, with special focus on the Transeurasian languages, ed. by Lars Johanson, Martine Robbeets, and Hubert Cuyckens, 43-66. Amsterdam: John Benjamins (2013)

CHAPTER 3

Demystifying drift

A variationist account

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The notion of drift in language change has often been given a somewhat mystical interpretation, as a sort of linguistic "invisible hand". However, it can be given substance through the recognition of proto-language variability. That is, if variable elements of a proto-language are inherited into individual languages as variation, and if that variability is sociolinguistically submerged, waiting to bubble up to the surface under different sociolinguistic conditions, then it stands to reason that related languages could show parallel developments that make an overt appearance late in their respective traditions. It is argued here that there is nothing mystical about drift and that the phenomenon can be rationalized from a sociolinguistic standpoint.

Keywords: drift, variation, sandhi, Indo-Iranian, reconstruction

1. Introduction: A recurring problem in historical linguistics

A common problem that historical linguists face when dealing with related languages is that different languages involved can show similar developments that seem to travel along parallel paths. In some instances, these are closely related languages, perhaps even dialects of the same language, at which point the linguist's inclination may be to just assume that the developments are somehow tied to the fact of relatedness, while in other cases, the languages are more distantly related languages, at which point the parallelism can be a methodological embarrassment.

A typical solution in such cases is to declare the similarities to reflect "independent but parallel developments". In some cases, there is clear evidence that shows this must be so, as with Grassmann's Law in Greek and Sanskrit, where language-particular developments in each case must precede Grassmann's Law, so

they cannot be resolved into the "same" change event.[1] What is somewhat unsettling, though, in cases where there is no compelling positive evidence, is that in a sense, resorting to this sort of account seems to be nothing more than a fancy way of saying that the parallelism is due to chance (cf. Butters 2001). And, a reliance on chance deprives an account of any real explanatory value.

It is possible to circumvent chance to some degree if it can be shown that the languages in question are simply responding to the same "difficulty" posed by some configuration of facts/features, in the case of Grassmann's Law, multiple aspirates especially occurring in successive syllable onsets. The parallelism is thus clothed in universality and "naturalness", and thereby gains some degree of explanatory value from that.

For instance, there are sound changes that show up in widely disparate languages, such as *s* > *h*, which occurred in the passage of Proto-Indo-European to Ancient Greek but also occurs in New World Spanish, or voicing of intervocalic stops, which occurred between Proto-Algonquian and Ojibwa and between Vulgar Latin and Spanish. In such cases, one can look to the physiology of speech production for insight into why certain developments should recur widely cross-linguistically. This in essence is offering a phonetic explanation for the parallel developments; lenition of *s* may have to do with difficulty in maintaining an obstructed airflow and intervocalic voicing may have to do with assimilation of the stop to the voiced vocalic environment surrounding it. Nonetheless, there are several reasons why the Grassmann's Law case is at least mildly unsettling, as opposed to these other two cases. First, to some linguists,[2] aspiration dissimilation is such an unusual development that one would not want to resort to a phonetic explanation that should in principle be able to be easily repeated in any language

1. Grassmann's Law is the dissimilatory loss of aspiration on the first of two successive aspirates in a root, e.g. Greek *puth-* 'learn' from Proto-Greek *phuth-, parallel to Sanskrit *budh-* 'know' from earlier *bhudh-, both from Proto-Indo-European *bhudh-. The devoicing in Greek is the Greek-particular change that precedes the aspiration loss in Greek. In Sanskrit, one of the language-particular developments that feed into Grassmann's Law is the change of a cluster of a voiced stop plus a "laryngeal" consonant, e.g. *ǵH_2, to a voiced aspirated consonant, e.g. *ǵh, as in the case of *duhitar-* 'daughter', from pre-Sanskrit *dhuǵhətar- from Proto-Indo-European *dhuǵH_2ter- (Greek *thugater-* with its *g* and *a* confirms that the starting point had *ǵH_2 in it and not an original voiced aspirate in the second syllable).

2. For instance, Gamkrelidze and Ivanov (1984), since they consider one virtue of their approach to Grassmann's Law to be the fact they can unify the Greek and Sanskrit developments so that they do not have to be independent developments in the two languages. See Joseph and Wallace (1994) for a refutation of the Gamkrelidze and Ivanov approach.

at any time.[3] Second, Greek and Sanskrit are related languages, unlike Ojibwa and Spanish, and so the possibility of a shared development must at least be entertained. Third, the occurrence of aspiration dissimilation in the prehistory of Greek and the prehistory of Sanskrit, while not necessarily at similar times, at least can be interpreted to mean that there is no obvious chronological chasm to overcome as there is with the *s* > *h* development found in modern Spanish and in pre-Greek.

It is not just phonological developments that raise such problems and such possible solutions. A grammatical case like Grassmann's Law that involves universality is the rise of a definite article in West Germanic (and Indo-European languages in general). Both English and German develop definite articles from demonstratives, and importantly the relevant developments occur within their attested histories; the Old English demonstrative stem *þæ-* 'that' is the source of later *the*, and the Old High German demonstrative stem *de-* 'this, that' is the source of later *der* 'the'.

But in this case, the fact that the development of definite articles from demonstratives seems to be so common crosslinguistically (cf. Greenberg 1978; Heine & Kuteva 2002) means that it is entirely plausible for a language to develop definite articles in this way on its own, so that "independent but parallel development" in each language seems to be a perfectly reasonable account of the similarity of development, and is in accord with the chronology of the developments in each line of descent from Proto-West-Germanic.

There are, of course, other possible accounts for any such similarities. In particular, the languages showing the similarity could have been affected by the same or similar contact languages. Such a situation in the lexical domain has long been recognized as a theoretical possibility in cases where similar words in different languages must be considered independent borrowings from the same source. Meillet (1970: 112), for instance, considers the words for 'silver' in Balto-Slavic and Germanic, e.g. Old Church Slavonic *sĭrebro*, Old Prussian *siraplis*, Gothic *silubr*, Old English *seolfor*, etc., to be such a case; as he puts it, the "divergences among these various words indicate that it is a question of borrowing made independently from some unknown language". Such an approach will not help with regard to Grassmann's Law, since it is hard to see how this particular sort of

3. That is, reference to "phonetic" factors should mean that the change in question could be found in any language, since "phonetic" implies a physiological basis, and the key elements of the physiology involved in articulation should be more or less constant across the vocal tracts of all speakers. Thus, this objection may not be all that cogent.

phonological process could be borrowed,[4] but there are cases involving nonlexical domains. A particularly clear example comes from parallels seen in Kupwar village, in Maharashtra state in India, among Urdu, Marathi, and Kannada, where, for instance, the gender systems in the local varieties of Urdu and Marathi have moved towards a Kannada-like semantically based marking as opposed to the more arbitrarily assigned masculine/feminine classification or masculine/feminine/neuter system found in the varieties of the languages outside of Kupwar (Gumperz & Wilson 1971). Such explanations, of course, do not hold for all cases of parallel developments, so other possibilities have been entertained.

2. Drift as a solution

There is yet another way of dressing up cases of "independent but parallel innovations": they can be called drift, a notion famously introduced by Sapir (1921). Sapir's key insights about drift were an observation that "language moves down time in a current of its own making" and a conclusion that language "has a drift", and these have been taken to mean that parallel developments occur due to languages being set on the same "course", by virtue of, if applicable, their relatedness, their typology, and/or their common starting point. That is, some aspect of commonality, whether genetic or typological, can play a role in the path that languages can take in certain developments, leading to parallelism in outcomes.

The notion of drift has been criticized by many as being too ill-defined. One recent deconstruction of drift has been offered by Keiser (2009: 29), who sums up his study of parallel trajectories for changes in two Pennsylvania German communities that had only minimal contact with one another as follows:

> Rather, drift, if we must continue to use the term – and why not, since it makes up in lyrical allusion what it lacks in explanatory substance – is nothing more than ordinary, non-end-driven, internally-induced language change that, through a combination of universals and chance occasionally results in parallel developments in related languages, which in turn, as this case study has shown, may be bolstered by low-intensity speaker contact across surprisingly great distances.

For Keiser, then, there are drift-like parallelisms that are more a mirage induced by chance and universals than the result of some substantive process of language change or language use. While he is undoubtedly correct concerning some

4. This is not to say that phonology cannot be borrowed. Friedman and Joseph (To appear, Chapter 5) give numerous examples from the Balkans, where the intense and sustained contact and multi-lateral multilingualism have fueled convergences among several languages, including phonological convergences.

instances of apparent drift, I argue here that there is a way to specify very clearly and precisely what underlies some cases of "drift", drawing on some suggestions that Sapir himself makes. What emerges is a model of change that operationalizes the notion and thereby removes some of the vagueness it seems always to be subject to.

The particular suggestion that Sapir (1921: 126–127) made was to bring variation into the picture as a possible source of drift. In particular, he wrote:

> And if this drift of language is not merely the familiar set of individual variations seen in vertical perspective, that is historically, instead of horizontally, that is in daily experience, what is it?

However, he goes on to express a bit of skepticism as to how to work with variation to give drift:

> What significant changes take place in it [i.e. language] must exist, to begin with, as individual variations. This is perfectly true, and yet it by no means follows that the general drift of language can be understood from an exhaustive descriptive study of these variations alone. They themselves are random phenomena, like the waves of the sea, moving backward and forward in purposeless flux.

Here he seems to be stepping back from fully embracing variation as playing a role in drift, since by contrast, he suggests, "The linguistic drift has direction".

Nonetheless, variation must play a role, since it is a ubiquitous feature of natural human language, perhaps though not totally "random", as Sapir has it, but rather orderly and rule-governed, as, for instance, Weinreich, Labov & Herzog (1968) would have it. Yet, Sapir does not provide a clear picture of how one could implement the recognition of variation into a fleshed-out model of language change that gives the "direction" that he imputes to drift. Indeed, he seems to worry about some of the ways one might try to do this, as his use of the term "mystical" and his concern over "giving language a power to change of its own accord" would suggest:

> If the historical changes that take place in a language, if the vast accumulation of minute modifications which in time results in the complete remodeling of the language, are not in essence identical with the individual variations that we note on every hand about us, if these variations are born only to die without a trace, while the equally minute, or even minuter, changes that make up the drift are forever imprinted on the history of the language, are we not imputing to this history a certain mystical quality? Are we not giving language a power to change of its own accord over and above the involuntary tendency of individuals to vary the norm? (1921: 127)

Is Sapir's notion too vague to be implemented as a model of change? I argue here that it can indeed be suitably conceptualized so as to allow for a clear operationalization, and I support this view with a number of case studies, mostly from

Indo-Iranian – an Asian branch of Indo-European – showing how my interpretation of a model for implementing variation can give the outcomes that pointed Sapir towards drift and can also offer some further useful insights.

It is important here to recognize that there are multiple dimensions to variation and that all of them can in principle play a role in this approach. I take the position that in all instances, variation, to paraphrase Labov (1972), boils down to the existence of different ways of saying the same thing, where the "thing" can be a sound, a morph, a word, or a phrase or utterance, and the "different ways" can be unique determination by immediate context within a word, as is typically the case in allophony or allomorphy, or by the somewhat more indirect context of a larger unit such as a phrase or utterance, more generally connected speech, perhaps mediated by prosody, as is often found with so-called "sandhi" variants (see below, Section 5.1), or instead can be more variably realized, tied to stylistic differences, to speech register and speech tempo differences, to individual (idiolectal) differences, or to social differences such as gender, age, geography, and the like.[5] Sometimes, though, the variable realization seems to be unconditioned, giving the situation commonly referred to as "free variation", though it can be argued that there is no such thing as truly "free" variation; presumably some, perhaps as yet unidentified, factor is always at work in giving a variant.[6] Further, in my view, the existence of variable realizations, even if subtly conditioned by rate of speech or by stylistically driven careful articulation or by a relaxation of attentiveness to articulation, etc., provides the basis for the imposition of social evaluation to variants, leading to diastratic and diatopic variation. Since all sounds and forms in actual use are always realized in some context, whether before or after various other elements in an utterance, or utterance-initially or -finally, and so on, there will always be differential realizations for a given element that can feed into the evaluation process.[7] As the case studies below suggest, all of these variants likewise come into play in cases of apparent drift.

5. The terms "diastratic" and "diatopic" are often used, respectively, for social and geographic factors influencing variability.

6. Thus, to take just two instances of what might seem like free variation, cases of synonyms, an obvious situation in which there are multiple ways of saying the same thing, can be viewed more realistically as stylistically differentiated, as with *car* versus *automobile*, and the phonological variation of [wIð] versus [wIθ] as realizations of *with* (for more on which see below, Section 5.1) may now have a geographic basis.

7. It follows from this view that every utterance in principle offers the potential for variants that can be extracted from the utterance and given a "life of their own" as independent elements; that may well be the main mechanism in which variants such as *not* (originally stressed) and *-n't* (originally unstressed but now possible as part of a stressed auxiliary as in *I just cán't go there again!*) can come to coexist and compete; so also with [wIð] versus [wIθ] alluded to in footnote 6.

3. Demystifying drift

The starting point for demystifying drift and giving it an empirical basis is reference to documented cases where variation in the source for existing speech communities can be used to account for some drift-like phenomena in later relocated and derivative speech communities. Trudgill (2004) is most relevant here, as he has shown that features found in disparate southern hemisphere Englishes reflect in part the continuation of variation in the dialects spoken in of England that were the basis for the colonial dialects.[8] Trudgill's English cases involve a shallow historical depth of a few hundred years, but they provide the proper model for giving greater empirical substance to *drift* even when talking about the deeper historical time-frame that historical linguists are often concerned with and even when the source for the speech communities in question is not an attested dialect or language but rather a reconstructed proto-language. In particular, parallel developments in related languages, of the sort that have led some to posit *drift* as a basis for the parallelism, can be seen as a reflex in each language of a resolution of variation in the proto-language from which they sprang; that is, the course the languages are set on that leads them in similar directions derives from variation in their common source, in the proto-language itself.

Joseph (2006) explored this approach as an explanation for several striking parallels between English and German at widely separated times, each one taking place within the individual language line (English or German) and within documented history for that line (e.g. Middle English and Middle High German respectively for the vowel developments) and thus not directly comparable nor easily resolved into a single historical event:[9]

- vowel developments (especially: *ī* > *aj* and *ū* > *aw*)
- loss of [h]/#__R
- *sk* > *ʃ*
- *sT* > *ʃT*[10]

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8. I say "in part" since a large piece of Trudgill's account involves dialect contact and mixture in the colonies themselves, so it is not just "imported" variation. Also, to some extent, he is referring to variation across dialects serving as the input, not (necessarily) variation within a dialect. But the connection between variation at the source and the ultimate form taken in the relocated language is what is relevant here.

9. I use R for any resonant (*r*, *l*, *m*, *n*, *w*, *y*), T for any voiceless stop other than *k*. Below, I use D for any voiced stop.

10. The retraction of *s* to [ʃ] is a phonetic change that is found in many varieties of American English and elsewhere in the English-speaking world. Noted at least as early as Labov (1984: 50) for Philadelphia English, this phenomenon receives more discussion in Janda and Joseph (2003a).

It was suggested there that proto-language variation could be invoked, and that an indication that it was appropriate to do so could be seen in the fact that the development of *sk* showed irregularity in the outcome of the auxiliary verb *skal in some of the languages, ending up not as the expected *ʃ* in all varieties but rather as *s*, e.g. in southern British and American English *shall*, northern British English *sal*, Old High German *sal*. Auxiliaries are often found in prosodically weak environments, whereas nouns, for instance, presumably were always in a prosodically strong environment (so that a noun like German *Schuld* 'debt', from the same root, would show the expected outcome). This differential prosodic environment can be viewed as a type of stylistic variation, depending on the emphasis a speaker wished to convey, or as a type of phrasal sandhi, dependent on the intonational contour imposed on a phrase or sentence. The assumption is then that the variation between prosodic weakness and prosodic strength was resolved in favor of the weak variant in the case of some dialects, leading to an apparent irregular correspondence. It is a simple step to go from that to the assumption that if this word showed such variable realizations depending on what might reasonably be seen as a stylistic matter, the other more general parallel developments could well have been subject to similar sorts of variation-inducing factors but resolved in a different direction. Consequently, the parallelism in the English and the German developments that might be thought of in terms of drift would actually have its origins in parallel resolutions of early, that is, at least Proto-West-Germanic, variation.[11] Proto-language variability would thus be the starting point for drift-like developments.

4. Variation versus traditional reconstruction methodology

Before developing this approach further through the examination of further case studies where it seems to work well, it is instructive to see how variation has typically been dealt with in reconstruction. In practice, comparative reconstruction has generally been reductive in nature as far as positing elements in a proto-language is concerned, and thus the method teaches that proto-language variation should be avoided. For instance, the following correspondences in (1) between English and standard High German involving fricatives (in bold):

11. An anonymous reviewer has suggested that universal tendencies, in this case working toward alleviating the sonority violation that the *sk-* onset occasioned, may have been at work. That may well have been the case, but the differential application, affecting atonic words but not tonic ones, would still have given variation in the realization of the outcome of *skal, depending on its accentual status in a given utterance, and if universally determined, we might expect that variation to have been present in the proto-language.

(1)	English.	[haws]	German	[haws]
		[strijt]		[ʃtrasə]
		[səmər]		[zomər]

show three complementary correspondences, *s*: *s* postvocalically, *s*: *ʃ* preconsonantally, and *s*: *z* prevocalically, and the generally agreed upon solution here is to reconstruct simply *s for all three sibilant sets, thereby deriving the *s*/*ʃ* and *s*/*z* sets via conditioned developments in the line of descent that led to German. Moreover, it is typically assumed that this essentially phonemic reconstruction can be translated into a phonetic reconstruction too, thus giving uniform Proto-West-Germanic phonetics [*hūs̲/s̲trat-/s̲VmVr-] as well.[12]

Such reconstructions give the appearance of uniformity in the resulting proto-language, and this apparent uniformity is the basis for a long-standing criticism of the Comparative Method, that is, how to reconcile such uniformity in reconstructed proto-languages with the reality of variation in known, observable languages. Fox (1995: 51), in addressing this tension between idealized variation-free reconstructed proto-language and attested languages with variation, has this to say, referring to the insights of Labov, Milroy, and others concerning the role of variation in language change:

> In practical terms, it has proved difficult to incorporate them into the methodology of reconstruction, and indeed even to reconcile them with the assumptions upon which this methodology is based. In the first place, the Comparative Method assumes – indeed depends on – the uniformity of reconstructed languages, which is at odds with the inherent variability assumed by many sociolinguists.

Fox's solution (1995: 52) to this tension is to say that the two approaches are focusing on different matters:

> Comparative reconstruction and sociolinguistic work on language change are concerned with rather different phases of the process of change [the latter more with the] *mechanisms* of change [and the former more with] interpreting its *results* ... we are *not* entitled ... to mistake our idealizations [of a uniform proto-language] for reality.

My suggestion here is that the way to reconcile the two approaches is to recognize the possibility of variation in the proto-language, thus drawing on Sapir's observation about variation and drift and extending Trudgill's insights about the role of dialect developments in the emergence of recurrent features in the varieties of English he examined. In fact, even in standard sorts of cases where reductive

12. This is admittedly a risky step; Henry Hoenigswald has cautioned that all we can really reconstruct is *contrast*. Nonetheless, the methodology invites such a step, even if it is not entirely warranted.

reconstruction assumptions are in play, a type of variation may in principle be reconstructible. In particular, in the above case of *s in Proto-Germanic, variation of the sort usually treated as allophonic can be reconstructed for the proto-language, as indicated below, that is, conditioned variation where the distribution relative to other sounds is the critical factor in the variable realizations; using *s´* and *s´´* as cover symbols for whatever phonetic differences would be relevant here, the solution to reconciling the correspondences, rather than simply positing *[s] everywhere (as above), could instead be:

- *[s] /V__
- *[s´] /__C
- *[s´´] /__V

This approach would entail that the different German sounds resulted from *s*, *s´*, and *s´´*, respectively, and that these sounds merged in English.[13] It is important to realize here that allophony is a type of variation, a phonologically conditioned variation to be sure, but variation nonetheless. In principle, the prosodically controlled variation (phrasal/sentential sandhi) suggested in the case of *skal in Section 3 is not all that different from segmentally controlled variation (allophony). The important aspect of this type of reconstruction is that it recognizes that the proto-language could show at least some of the variability of realization for phonemes that attested languages show. Putting such expected positionally conditioned variation together with the less expected, but no less real, prosody/style-based variation, as suggested for *sk > ʃ/*s*, there is a clear basis for seeing where similar sorts of developments can arise from in the descendant languages from a single proto-language.

5. Case studies

I turn now to the presentation of several case studies that showcase this approach in which proto-language variation is taken as a basis for understanding how chronologically distinct similarities can emerge in related languages. And what is relevant is recognizing the kinds of factors that can condition or at least be associated with variation in a language. Most of the cases discussed here are based on Indo-Iranian, drawing largely on Sanskrit, covering the Indic side, and Avestan

13. These *s*'s may well be slightly different even in English today, in these different environments; I leave that to phoneticians to explore (or confirm, if already known). It is true too, as an anonymous reviewer has noted, that southern German varieties today have [s-] in initial position, suggesting a different resolution to the proto-language variation presumed here from that found in other dialects, including the standard language.

and Old Persian on the Iranian side. While the bulk of the discussion illustrates this variation-based approach with material from phonology, some instances of morphological similarities that can be attributed to or that point to proto-language variation are discussed as well. In doing this, I contend that we gain a handle on parallel but (seemingly) independent developments, thus giving substance to the notion of drift.

5.1 Germanic fricative voicing

The case of *skal discussed briefly in Section 3 highlighted a linguistically conditioned variation that was conditioned by phrase- or sentence-level prosodic factors, that is, a type of sandhi variation dependent on the occurrence of a form in a given larger context. But that larger context can also be just adjacent forms in connected speech that determine changes in a particular form. The occurrence of [gat] for *got* in contexts such as *I got one* as opposed to the occurrence of [gatʃ] for *got* in *gotcha* (from *got* + *ya* (= *you*)) would be a segment effect determined by a sandhi development in connected speech. This is a well-recognized form of contextually determined variation, that may well be behind the voiced/voiceless – alternatively lenis/fortis – variation [wɪð̲]/[wɪθ̲] found for *with* in American English, if this variation is to be attributed originally to the types of sounds that may have followed this word, i.e. [wɪð̲] *gusto* vs. [wɪθ̲] *care*.

The differential outcome of *sk in some West Germanic speech communities was proposed above as a case where variable prosodic prominence could be invoked as an explanation. But that case was somewhat speculative in nature, depending on an assumption of the prosodic characteristics of auxiliaries, so it is fair to consider whether there is more direct evidence supporting the use of this type of variation in reconstructed proto-languages. The answer is that there is, and the voicing of fricatives in English function words is the case in point.

The deictic function words in English, a group taking in, *in toto* (though excluding derivatives such as *themselves* or *therefore*),[14] *than*, *that*, *the*, *thee*, *their*, *theirs*, *them*, *then*, *thence*, *there*, *these*, *they*, *thine*, *this*, *those*, *thou*, *though*, *thus*, *thy*, all unexpectedly show a voiced, or lenis, fricative as the outcome of an earlier English *þ* ("thorn"), originally a voiceless (fortis) sound in initial position. The regular outcome is a voiceless (fortis) fricative, as in *thank*, *think*, *three*, *thwart*, and numerous other such words. The best account of this variable realization of initial thorn is that the voiced outcome can be attributed to these words being in a position of low sentence- or phrase-accent, as would be expected with function words,

14. I exclude here also *thither*, as many speakers pronounce that with a voiceless initial, perhaps due to dissimilatory pressure from the medial voiced fricative.

and in essence showing lenition, realized through voicing, due to being phrasally unaccented and stressless. Where this becomes interesting from the perspective taken herein is a fact noted by Prokosch (1938: 62), regarding Scandinavian, that "beginning in the thirteenth century ... initial *þ* appears regularly as *t* (*þing* > *ting*) but as *d* in the same type of words that have *ð* in English (*de*, *dem*, *den*, *det*, *der*, *da*, *dig*, *din*, etc.)". Given the chronology of these developments, occurring post-Old English and post-Old Norse respectively, they cannot, under usual assumptions of the Comparative Method, be treated as the same change (as with Grassmann's Law – cf. Section 1 and footnote 1); rather, they must be seen as independent developments or, in different terms, part of the phonological drift evident within Germanic.

Still, a different approach is possible here, namely attributing this effect not to individual developments in these two Germanic dialects, but rather to sandhi developments at work in Proto-Germanic, essentially saying that in the proto-language, an initial voiceless fricative could be voiced under conditions of low sentential prominence, a conditioning environment that is at once stylistic and sandhi-related, a matter of combination of words into phrases and sentences.

It is telling that the words affected by this voicing in English and in Scandinavian are essentially the same – the same type and the same etymologically too (cf. *der* and *there*, *den* and *then*, for instance). Unless the assumption of proto-language variation is made, then despite the considerable congruence in form and the cognacy between some, or even all of the forms, this strikingly parallel development of unexpected voicing in two different branches of Germanic becomes totally accidental.

In a sense, the conclusion reached here involves using the same methodology as traditional reconstruction, i.e. finding matching elements across two or more related languages and positing that the matching is derived from a commonality in the proto-language. In this case, though, the commonality is the prosodically induced lenition/voicing in sandhi. Thus, recognizing variation and using traditional comparative methodology need not be at odds with one another (recall the discussion in Section 4). And, the parallel development that appears to be a matter of drift becomes understandable as the reflex of proto-language variation and specifically of parallel resolutions of that early variation.

5.2 Indo-Iranian final -s developments

Taking advantage of sandhi proves to be a powerful tool that allows for an explanation of drift-like similarities on a massive scale that are found in ancient Indo-Iranian languages with regard to various developments affecting word-final

*-s. The facts are presented first, followed by the interpretation in line with the model that recognizes proto-language variation.

In the ancient Indic language Sanskrit and the ancient Iranian languages Avestan and Old Persian, outcomes of word-final *-s depend on what the next word begins with; these developments are thus sandhi phenomena, determined by conditions at the phrase- or sentence-level.[15]

In Sanskrit, there is a rather complicated set of developments affecting original *s in final position. The following are the key changes:

- *s# is preserved before *t* and *th*, so that sequences of *-s # t/th-* occur;
- *s# assimilates to (palatal) *ś* before the (voiceless) palatal stops *c* and *ch*, giving sequences of *-ś # c(h)-i*;
- s# turns into an *h*-like "breathing" (*visarga*)[16] before other voiceless stops, e.g. *-ḥ # p(h)-*;
- *s# joins with a preceding short *a* to give *o* word-finally before voiced consonants and *a-*, e.g./-as # d-/> *-o d-*; in the oldest layer of Sanskrit, the language of the Rigveda (Vedic), there is one apparent relic form *sūre* 'of the sun', where *-e* occurs rather than *-o*.

In Avestan, there are several developments that are somewhat parallel to what is seen in Sanskrit; in particular:

- *s# is preserved before *t*, so that sequences of *-s # t-* occur;[17]
- sequences of *s* before the (voiceless) palatal stop *c* (in enclitics such as *ca* 'and') occur, e.g. *-as # ca* 'and ...'; the exact history poses some challenges (see below);
- –*s turns into *h* initially and word-internally (subject to various conditions);
- *s joins with a preceding short *a* to give *ō* word-finally before all sounds except *t* and *c*; this development is found in the oldest layer of Avestan, the language of the Gāthas (Gathic), and is the norm in Younger Avestan, but the details are not completely straightforward (see below).

Thus, there is rough congruence between Sanskrit and Avestan with regard to how final *-s is treated, but there are also some language-particular developments, especially involving the palatal outcomess in Avestan, that make it appear that these have occurred independently in each language. For instance, the change of *s to *h*

15. This case and the next were mentioned briefly in Joseph (2012) but with very few details given; I appreciate the opportunity that the present paper offers for further development of the relevant discussion and argumentation.

16. This sound is usually notated <*ḥ*> in the conventional transliteration of Sanskrit into Latin characters.

17. Avestan does not have the voiceless aspirated stop (*th*) of Sanskrit, so that only the unaspirated *t* is relevant here.

is widespread across Avestan while it is more restricted in Sanskrit, and in any case, the Sanskrit visarga is not identical to the Avestan *h*. And, both branches of Indo-Iranian have *-o* in the outcome of *as before a voiced consonant (Avestan *ō* and Sanskrit *o*, which counts as a long vowel in the Sanskrit phonological system).[18] However, these vowel developments do not match up as well as it might seem, and instead may be more like the seeming parallel of the German and English diphthongization of earlier *ī* (> *aj*) and *ū* (> *aw*) noted above in Section 3; that is, they each may be later developments within their respective traditions.

Regarding the *-ō* outcome, it must be noted that in Gathic there is also an outcome *-ə*: that occurs in pronominal nominatives, in some adverbs, and in some *a*-stem and *s*-stem nominatives, although *-ō* also occurs as a variant in some of these forms; this distribution has led Beekes (1988: 28) to say, "It is clear that the *-ə*: is typical of Gathic, *-ō* of late Avestan. Probably we must assume that *-ə*: was ousted by L[ate]Av. *-ō* except in a few cases." Thus, the older outcome is the *-ə*: and the *-ō* is the more recent one, yet it is the one that matches a Sanskrit outcome. Similarly, as noted above, in Vedic Sanskrit there is one form that points to *-e* as an outcome of *-as # [+cons/+voice] and it is usually taken to be a relic form, and thus a form that must be taken seriously; if a relic, then it suggests that the widespread *-o* of later Sanskrit is either a later development, even though parallel to the (later) Avestan, or an originally variable outcome. Thus both Avestan and Sanskrit at their oldest layers may well show variation in the treatment of final *-as. It is a reasonable assumption that the round vowel outcome in both Sanskrit and Avestan was originally conditioned by a following labial, and then generalized from there; the single Vedic *-e* outcome, as it happens, occurs in a nonlabial context, *sūre duhitar-* 'sun's daughter'. Rather than treating the *-ō*/*-o* similarity as an accidental convergence, or a "drift-induced" parallelism in later Indic and later Iranian respectively, given that there is some variation even at the oldest layers, this is another situation where projecting the variation into the proto-language makes sense and captures the similarities across the two branches of Indo-Iranian.

The situation with *s* before palatals similarly has some difficult aspects to it that ultimately point towards the same sort of solution as with final *-s preceded by *-a-. Avestan appears at first to simply have retained original *s in that environment since *-s # c- ends up as just that. However, in the Old Persian materials, the outcome of *-s before a palatal, especially *-s # č-, is *-š # č*, when enclitics are involved, e.g. *kaščiy* 'anyone' (literally: 'who + at-all'), *manaš-č[ā]* 'mind-and', though it must be noted that according to Kent (1953), this development may be Median and not Old Persian proper. Moreover, Avestan independently turns Proto-Indo-Iranian (PIIr) palatal *ś (from Proto-Indo-European palatal *ḱ) into *s*,

18. In most instances, though most likely not here, Sanskrit *o* derives from an earlier diphthong.

as in *sraēšta-* 'fairest' (cf. Sanskrit *śreṣṭ ha-* 'best', from PIE *ḱrei-) or *sāh-* 'teach' (cf. Sanskrit *śās-*, from PIE *ḱēs-). Thus, what seems to have really happened here is that original *-s # c- developed into *-ś # c-, and from that *-ś, the Avestan *-s* in this position developed. The question to ask is to which stage this *-ś # c- can be assigned, and it seems reasonable to take the Sanskrit–Avestan–Old Persian developments collectively as pointing to a PIIr sequence of *-ś # c- as a sandhi development and thus assigning some sandhi variation to the proto-language.[19]

Thus, careful comparison reveals that there certainly are points of similarity between Sanskrit and Avestan in the treatment of final *s, but also key differences. The handbooks for Avestan usually present these as developments out of *s (or *h from *s) and so also for Sanskrit, but it seems rather that sandhi, i.e. positionally determined phrasally based variation, at the Proto-Indo-Iranian level should be reconstructed here:

– *-s # t- > [s # t]
– *-s # c- > [ś # c] (> Avestan -s # c- by regular development of *ś)
– *-s # [-voice] > -h #
– *-as # X > -ō # ...

The similarity as to the emergence of *-ō* in Avestan and *-o* in Sanskrit can then be attributed not to some vague drift but rather to a resolution of inherited variation in favor of *-ō*/*o*. Moreover, even though *s* > *h* is a crosslinguistically common development, as discussed above in Section 1, here the contexts – word-finally, only before voiceless consonants, and as part of a complex of developments affecting *-s#* – are specific enough to make it compelling to attribute even this development to common inheritance from a common starting point (Proto-Indo-Iranian, in this case) rather than to individual developments perhaps guided by drift-like tendencies in the respective branches. In a sense, then, this is a more realistic reconstruction, giving not just contrasts but surface phonetic forms as well, and reconstructing not isolated segments but rather segments in context, in the equivalent of connected speech.

19. A possible problem for this account arises if one takes the PIIr outcome of PIE *ḱ to be a palatal fricative *ś (as Kent did), since Old Persian has *θ* as the regular outcome of *ḱ. Thus, the *θ* development from a *ś would be at odds with the *š* outcome posited here for *-ś # c-. Fortunately, there are two solutions here. Either the outcome posited here is a special preconsonantal development (whereas *θ* is prevocalic) or else the outcome of PIE *ḱ in PIIr was not *ś; it can be noted that Fortson (2009) posits PIIr affricate *ć here, presumably due to Nuristani evidence. Thus assuming a PIIr *-ś in this sandhi context that gave Sanskrit *ś*, Avestan *s*, and Old Persian (Median) *š* need not conflict with other known developments in Indo-Iranian.

5.3 Indo-Iranian vowel length

There is yet another set of parallel developments in Indic and in Iranian that provides a further basis for positing proto-language, in this case again Proto-Indo-Iranian, variation, rather than invoking drift as a basis for the parallels. In particular, there are fluctuations in vowel length found in both Sanskrit and Avestan involving *a* ~ *ā*, and, especially also, involving the high vowels *i* ~ *ī*/*u* ~ *ū*.

For instance, Sanskrit has occasional long vowels for expected shorts, e.g. *ca*/*cā* 'and' (where Latin *-que* 'and' and Greek *te* 'and' point to an original short vowel, *-k^{w}e), *vi*/*vī* 'apart, away', *puru*/*purū* 'much' (cf. Greek *polu* 'much' for evidence of an original short vowel). This fluctuation is evident especially in Vedic, but there is some carryover into Classical Sanskrit, as in the long vowel prefix found in *vī-hasta-* 'having hands apart; clumsy', where *vi-* is the more usual form in other words. Whitney (1888: §244) notes this "concerns especially *i* and *u*" (though *a* shows it too) and he characterizes it as "irregular and sporadic". In Vedic, it is found mainly with word-final vowels, and in general these Vedic lengthenings occur in metrical positions that favor metrically long syllables. Nonetheless, it is likely not the case that the meter induces the lengthening, but more likely instead that poets were exploiting the existence of long-vowel variants and utilizing them in metrically long positions. Significantly, the long-vowel forms occur "sometimes even where the metre opposes the change" (Whitney: §248), so it cannot be just a metrically induced phenomenon.

In Avestan, a similar fluctuation is found, though with different conditions. There may have been a phonetic basis to some long vowels via a lengthening in open syllables (de Vaan 2003), but though common in open syllables, the Avestan V/V: variation is not restricted to open syllables, and does not (generally) occur in word-initial open syllables. There are some regularities – for instance, all final vowels are long in Gathic Avestan (Old Avestan) and final lengthening is found only in monosyllables in Younger Avestan – but these do no cover all cases. Thus, there is some sporadicity in this lengthening in Avestan and moreover, there are also some unexpected shortenings of original long vowels.

Complicating this picture in both Sanskrit and Avestan is the fact that some vowel quantity alterations can be tied to Proto-Indo-European laryngeals (*H) which lengthened preceding vowels but could be lost without any lengthening effect when occurring before a vowel, i.e. *VH # C => V: # C but *VH # V => V # V. Still, the unconditioned variability of length with *i*/*u* and sometimes *a* in both Sanskrit and Avestan is a parallel development that is noteworthy. It is true, though, that the Indo-Iranian vowel system is impoverished in regard to qualitative distinctions among the monophthongal vowels, with only a low mid vowel *a* and the two high vowels *i* and *u*, so that one might suppose that quantitative distinctions

would be likely to emerge in such a system. But rather than attributing these developments to a systemically induced drift in the way each branch developed, one could just as easily reconstruct length variability (perhaps unconditioned)[20] with these vowels as a Proto-Indo-Iranian phenomenon that was then inherited into each branch.

The assumption of such proto-language variation can be exploited to explain some recalcitrant facts about certain long vowels in Sanskrit. In particular, if Sanskrit inherited variation with regard to vowel length, then some unexpected lengthenings in certain grammatical contexts become somewhat more understandable as the resolution of this inherited variation. For instance, the root *guh-* 'hide' shows an anomalous present stem with a long root vowel (*gūha-*); it is generally said to have taken over this length from the past participle (*gūḍha-*) where a long vowel occurs regularly via compensatory lengthening (*ghuǵh-to- > *guẓḍha- > *gūḍha-*), but it is not clear why a past participle would influence the present stem. Such "influence" makes more sense if there were long variants "in the air" and available, so that a root variant *gūh-* could be reinforced by the regularly derived long vowel in the participle but not necessarily caused by it. The same holds for the long vowel outcome *ī* from PIE **ə* (the vocalized form of a laryngeal consonant, found when the laryngeal occurred between consonants), instead of the expected short vowel outcome *-i-* (as in *pitar-* 'father', from **pəter-*), e.g. *bravī-* 'say' with consistent length on the **ə* reflex; again, the possibility of lengthening being something independent, even if variable, means that *bravī-*, and other forms like it, could show the effects of whatever process induces these long vowels. Such an account does not explain why a long-vowel variant was generalized in these forms, but if such long vowels were more widely available and tolerated than has typically been admitted, then their appearance in any given form is less problematic.

5.4 Some morphological cases from Indo-Iranian

The case studies presented here so far have been from phonology, but there is no reason to suppose that the proto-language variation must be restricted to this domain of grammar. In fact, there are instances involving morphology where the possibility of proto-language variation has been invoked in dealing with difficult comparisons. A classic case of this sort where proto-language regional dialect variation has been assumed is the situation within Indo-European with the comparison between Balto-Slavic and Germanic on the one hand, with oblique dual/plural cases in *-m-, and Indo-Iranian, Armenian, and Italo-Celtic on the other hand, with *-bh- in the same cases; one "solution" has been simply to posit a dialect split

20. Though, see Section 2 and footnote 6 concerning (apparent) "unconditioned" variation.

within Proto-Indo-European (e.g. Bloomfield 1933), with the assumption therefore that the proto-language must have exhibited variation of a regional nature. While other explanations have been proposed in this case that do not depend on variation,[21] the point is that some scholars have been inclined towards thinking that such a reconstruction strategy is possible and methodologically feasible and defensible.

5.4.1 *Merger of genitive and dative in Indo-Iranian*

Joseph (2012) discusses a change involving case usage that occurs late in both the Iranian and the Indic branches of Indo-Iranian, namely the merger of genitive and dative functions in both Younger Avestan and Classical Sanskrit. It is not found in the respective older stages Gathic Avestan and Vedic Sanskrit, so that it fits the criteria discussed above for a situation in which one might think of drift as being involved in the parallel developments but where instead proto-language variation might be envisioned. In particular, in this change, the genitive case takes on the indirect object marking function of the dative, so that, for instance, in Sanskrit *tasya dadāmi* 'I give to him' (literally: 'of-him I-give') supplants earlier *tasmin dadāmi* (with dative *tasmin*). This very change is found in other Indo-European languages, such as post-Classical Greek, raising the possibility of it simply being a "natural" change, but the Greek situation is qualitatively different from the Indo-Iranian one, with genitive replacing dative in a whole host of functions, including use as the object of various prepositions and as a locative, functions not found in Indo-Iranian. Moreover, there is reason to believe that this later change is carrying on a development found earlier, in that in Vedic and Gathic Avestan, as the result of an innovation,[22] the dative and genitive forms of the enclitic first- and second-person personal pronouns are identical, as in (2):

(2)			Vedic	Gathic		Vedic	Gathic
	GEN/DAT	1SG	me	mē	1PL	nas	nə:
	GEN/DAT	2SG	te	tē	2PL	vas	və:

This means that the merger of genitive and dative began earlier in each branch, but was only completed later, at least as far as the marking of indirect object is concerned. It is not much of a jump methodologically or conceptually to suggest

21. See Hock (1991) for an account that depends on distant assimilation of *-bh- in the nucleus of a case ending to an *-m contained in a particle affixed to that ending.

22. Greek, for instance, distinguishes these forms, e.g. 1/2SG *moi*/*soi* (DAT) – *meu*/*seu* (GEN). These comparisons show that in the singular in Indo-Iranian it was the dative form that was generalized, since *oi, as in the Greek dative, gives the attested vocalism in Avestan and Sanskrit. Later it is the genitive form that serves in the dative function, but once there was a merger in the pronouns, the original forms could not be separated or restored.

further that the merger started even earlier and that there was just a single innovation, in Proto-Indo-Iranian, that led to the enclitic forms cited above. In that case, then, the overlap of genitive and dative would have been variably realized in Proto-Indo-Iranian, occurring in these enclitic forms first but not in other types of pronominals and nominals, and would then have spread later in Younger Avestan and Classical Sanskrit to full pronouns and to ordinary nouns. Admittedly, this early development pertains to the form of the genitive and the dative in this one category of inflection, enclitic personal pronouns, but the formal overlap here would necessarily mean that the same form was used in genitive and dative functions, including the marking of indirect object. In this case, then, an early innovative variant, namely a genitive form serving for the indirect object function, was resolved later in favor of the innovation, so that there was an encroachment of the genitive form into what had been originally dative "territory".

5.4.2 *First-person singular verbal ending in Indo-Iranian*

As a further case of morphological variation that can be projected back into a proto-language, the fluctuation in the marking of first person singular in the Sanskrit and Avestan verbal systems can be considered. In this case, both Vedic and Gathic show variation in so-called thematic verbs, those whose stem ends in *-a-* (historically, *e or *o) between a first person singular present ending *-ā* and one with a further extension, the exact form of which depends on the category in question in each language. That is, in Gathic, both *-ā* and *-āmi* are found in the indicative for first person singular present tense forms, while in Vedic both *-ā* and *-āni* are found in the subjunctive. It is relevant to note that Gathic has *-āni* in the subjunctive, with no variation, and Vedic has *-āmi* in the indicative, also with no variation. In later stages, the variation is leveled out in both branches, with Younger Avestan generalizing *-āmi* in the indicative and keeping *-āni* in the subjunctive, and Classical Sanskrit generalizing *-āni* in the subjunctive and keeping *-āmi* in the indicative. Thus in both traditions, early variation is resolved in favor of the longer ending.

The important background for these developments is that in Proto-Indo-European, it is generally accepted that there were two markers for first person singular, *-H_2 and *-mi, where the reconstructions are based on such cogent comparanda as Greek *-ō* vs. *-mi*, Latin *-ō* vs. *-m*, and Hittite *-ḫi* vs. *-mi*; the long vowels of Greek and Latin result from the combination of the thematic vowel (*o in the first person singular) with the laryngeal ending (preserved as the consonant *-ḫ-* in Hittite). In the separate languages, these endings are distributed in what is essentially a lexically idiosyncratic way, so that there is no factor that can be readily identified as conditioning the variation. Consequently, no clearly motivated basis, for instance pertaining to some function or to some phonological factor, can be found for the *-H_2 and *-mi variation in Proto-Indo-European. Different

languages treated this variation in different ways: Greek and Latin mostly generalized the reflex of the *-H_2 ending (*-ō* in each language), though the *-mi reflex (respectively *-mi*/*-m*) was retained to a greater extent, that is, with a greater number of verbs and/or grammatical categories, in Greek than in Latin; in Indo-Iranian, by contrast, the lexically determined variation was turned into facultative extension of the *-ā* by an additional element, the PIE ending *-mi in the case of the Avestan indicative, and the innovative subjunctive ending *-ni* in the case of the Sanskrit subjunctive. The change in the nature of the *-ā* vs. *-ā* + X variation can be taken to be an innovation of Proto-Indo-Iranian, given that it is found in each branch, so that this line of argumentation provides direct evidence for reconstructing variation in the proto-language underlying Avestan and Sanskrit.

This is clearly a case, therefore, where recognizing proto-language variation is called for, and the variation at the oldest attested stages merely reflects the continuation, with some alteration, of that variation. The indicative variation has been resolved in Vedic Sanskrit, but the *-ā* ending competes in the subjunctive with an innovative ending *-āni*, also found in Avestan and thus most likely an Indo-Iranian innovation (of somewhat obscure origin). Gathic shows indicative variation but not subjunctive variation. The fact that the longer variant ultimately wins out in each branch would appear to be a parallel but independent development that could be attributed to a drift that underlies how each language develops. However, the background of what is known about these endings from elsewhere in Indo-European makes it clear that the indicative variation and the subjunctive variation are connected to one another. Moreover, they appear to be reflexes of the same trends and the same sort of competition that must be assumed for Proto-Indo-European; this might not be recognized without the additional external evidence about the endings from Greek, Latin, and Hittite. Thus this case offers a particularly cogent model for understanding the need to allow for variability in the reconstruction of proto-languages and for looking to resolutions of variability as a basis for seemingly independent developments in different related linguistic traditions.

6. Conclusion

The discussion here has investigated what sorts of situations might lead one to reconstruct variation in a proto-language and what the consequences of such reconstructions are. In general, variation in related languages that matches up in some crucial way is a good basis for reconstructing proto-language variation, as are situations where elements across related languages match in one way, say function, but not in all ways, e.g. not as to their form. All of these situations are ones in which the notion of drift, as developed by Edward Sapir, might well be invoked,

but questions can be raised about the explanatory value of simply labeling a set of developments as being due to a language's drift. It has been attempted here to give some teeth to drift by taking seriously Sapir's own suggestion that variation must be involved and developing the idea that recognizing proto-language variation gives a basis for how parallel developments can emerge in related languages, even if they are chronologically removed from one another, say by occurring late within respective lines of descent, within respective linguistic traditions. Besides offering some substance to drift, positing variation in proto-languages brings their reconstruction more in line with what is known about natural languages in general, by allowing for a range of different types of variation to be reconstructed.

The model of proto-language variation and of subsequent development that is assumed here looks like this: there was variation in a proto-language – thus giving a more realistic reconstruction – and the variation can be inherited into later stages as continued variation, but it can be modified, e.g. generalized, as with the *ō* outcome of *-as in Avestan, or it can stay "submerged", e.g. sociolinguistically restricted for a while before re-surfacing, "bubbling up to the surface", as it were. This model allows one to make sense of the chronology in many instances, e.g. genitive for dative occurring late within each tradition within Indo-Iranian, while at the same time allowing one to capture the similarities in development that attract the comparativist's eye in the first place. More importantly, perhaps, this model provides some substance, of a non-mystical nature, to the notion of "drift" by locating drift in parallel resolutions of proto-language variation.

In the interests of full disclosure, so to speak, it must be admitted that there are various aspects of development still left unexplained in this model. That is, although the resolution of the variation is a key part of the model and is what leads to some of the curious and compelling comparisons that fuel the speculation about "drift", what promotes the resolution of the variation is not readily explainable, nor is it clear what leads to the generalization of one variant, or for that matter what keeps the variation "submerged" in some instances. To some extent, however, these sorts of issues are left unexplained in almost all accounts of change, whether involving drift or not, as Weinreich, Labov & Herzog's (1968) famous listing of key questions for historical linguistics indicates. One's sense here is that social factors particular to each case are what govern these sorts of issues for a given speech community, and that when dealing with such factors for a proto-speech community, one is relatively limited as to what can be learned; much will depend solely on the ability to make reasonable inferences and not on hard facts, as with any reconstructive historical pursuit.[23]

23. The implicit caveat in the oft-cited statement of Labov (1994: 11) that "historical linguistics can ... be thought of as the art of making the best use of bad data" recognizes this brittle aspect of all historical pursuits. See Janda and Joseph (2003b: 14) for discussion of the nature of data in historical linguistic investigation.

A final question pertains just to the approach advocated here, namely what the limits are on its application to a given set of comparisons. In particular, it may reasonably be asked whether a single interesting mismatch between two related languages is enough to trigger the positing of proto-language variation or whether, as suggested here in both Indo-Iranian and West Germanic, one needs a clustering of variable features to make positing proto-language variation appear to be the right way to go. A single case could easily, and quite reasonably, be considered a matter of chance parallel independent developments, but when one has to invoke chance in case after case, there is more cause to look to a different scenario, especially since invoking drift alone is, as argued here, hardly compelling in and of itself.

Such unanswered questions, it is hoped, do not detract from the model put forward here; they are simply the realistic side issues that necessarily and inevitably accompany a model of this sort as it tries to offer a realistic view of what proto-languages can be like and how languages develop out of them.

References

Beekes, Robert S. P. 1988. *A Grammar of Gatha-Avestan*. Leiden: Brill.

Bloomfield, Leonard. 1933. *Language*. New York NY: Holt, Rinehart, and Winston.

Butters, Ronald R. 2001. Chance as cause of language variation and change. *Journal of English Linguistics* 29(3): 201–214.

de Vaan, Michiel. 2003. *The Avestan Vowels*. Amsterdam: Rodopi.

Fortson, Benjamin W., IV. 2009. *Indo-European Language and Culture: An Introduction*. 2nd edn. Oxford: Blackwell Publishers.

Fox, Anthony. 1995. *Linguistic Reconstruction: An Introduction to Theory and Method*. Oxford: Oxford University Press.

Friedman, Victor A. & Joseph, Brian D. To appear (2014). *The Balkan Languages*. Cambridge: Cambridge University Press.

Gamkrelidze, Thomas V. & Ivanov, Vyacheslav. 1984. *Indoevropejskij jazyk i indoevropejcy: Rekonstrukcija i istoriko-tipologicheskij analiz prajazyka i protokul'tury* [The Indo-European Language and the Indo-Europeans: The Reconstruction and Historico-Typological Analysis of the Proto-language and Proto-Culture]. Tbilisi: Izdatel'stvo Tbilisskogo Universiteta.

Greenberg, Joseph. 1978. How does a language acquire gender markers. In *Universals of Human Language*. Vol. 3, Joseph Greenberg (ed.), 47–82. Stanford CA: Stanford University Press.

Gumperz, John J. & Wilson, Robert. 1971. Convergence and creolization: A case from the Indo-Aryan/Dravidian border. In *Pidginization and Creolization of Language*, Dell Hymes (ed.), 151–168. Cambridge: Cambridge University Press.

Heine, Bernd & Kuteva, Tania. 2002. *World Lexicon of Grammaticalization*. Cambridge: Cambridge University Press.

Hock, Hans Henrich. 1991. *Principles of Historical Linguistics*. 2nd edn. Berlin: Mouton de Gruyter.

Janda, Richard D. & Joseph, Brian D. 2003a. Reconsidering the canons of sound-change: Towards a big bang theory. In *Historical Linguistics 2001: Selected Papers from the 15th International Conference on Historical Linguistics, Melbourne, 13–17 August 2001*, Barry Blake & Kate Burridge (eds), 205–219. Amsterdam: John Benjamins.

Janda, Richard D. & Joseph, Brian D. 2003b. On language, change, and language change – Or, of history, linguistics, and historical linguistics. In *Handbook of Historical Linguistics*, Brian D. Joseph & Richard D. Janda (eds), 3–180. Oxford: Blackwell Publishing.

Joseph, Brian D. 2006. On projecting variation back into a proto-language, with particular attention to Germanic evidence. In *Variation and Reconstruction* [Current Issues in Linguistic Theory 231], Thomas Cravens (ed.), 103–118. Amsterdam: John Benjamins.

Joseph, Brian D. 2012. A variationist solution to apparent copying across related languages. In *Copies vs. Cognates in Bound Morphology* [Brill's Studies in Language, Cognition and Culture 2], Lars Johanson & Martine Robbeets (eds), 151–164. Leiden: Brill.

Joseph, Brian D. & Wallace, Rex E. 1994. Proto-Indo-European voiced aspirates in Italic: A test for the glottalic theory. *Historische Sprachforschung* 107: 244–261.

Keiser, Steven Hartman. 2009. When 'speech islands' aren't islands: Parallel independent development, drift, and minimal levels of contact for diffusion. *Diachronica* 26(1): 1–35.

Kent, Roland. 1953. *Old Persian. Grammar, Texts*, *Lexicon*. New Haven CT: American Oriental Society.

Labov, William. 1972. *Sociolinguistic Patterns*. Philadelphia PA: University of Pennsylvania Press.

Labov, William. 1984. Field methods of the project on linguistic change and variation. In *Language in Use: Readings in Sociolinguistics*, John Baugh & Joel Sherzer (eds), 28–53. Englewood Cliffs NJ: Prentice-Hall.

Labov, William. 1994. *Principles of Linguistic Change*. Vol. 1, *Internal factors*. Oxford: Basil Blackwell.

Meillet, Antoine. 1970. *General Characteristics of the Germanic Languages* (translated by William P. Dismukes). Coral Gables FL: University of Miami Press.

Prokosch, Edouard. 1938. *A Comparative Germanic Grammar*. Baltimore MD: Linguistic Society of America.

Sapir, Edward. 1921. *Language. An Introduction to the Study of Speech*. New York NY: Harcourt, Brace & World.

Trudgill, Peter. 2004. *New-Dialect Formation: The Inevitability of Colonial Englishes*. Edinburgh: Edinburgh University Press.

Weinreich, Uriel, Labov, William & Herzog, Marvin I. 1968. Empirical foundations for a theory of language change. In *Directions for Historical Linguistics: A Symposium*, Winifred Lehmann & Yakov Malkiel (eds), 95–195. Austin TX: University of Texas Press.

Whitney, William D. 1888. *Sanskrit Grammar*. Cambridge MA: Harvard University Press.