

An Argument Against Reconstructing Glottalized Stops in PIE*

G. Michael Green

0. Introduction.

Recently, several linguists, including Bomhard (1979), Gamkrelidze and Ivanov (1973:150f.), and Hopper (1973:141f.), have proposed that the stops of Proto-Indo-European which are traditionally reconstructed as a plain voiced series be replaced by a series of glottalized stops. I present an argument here that such a move creates at least one serious problem and therefore ought not to be made.

1. The proposed analysis.

Those advancing the theory involving glottalic consonants point out that the proposed change to the traditional system solves several problems. First, a language with the following three series of stops (the labiovelar and/or palatal series are irrelevant here) seems to be typologically unnatural (Bomhard 1979:78 and the references cited there):

p	t	k
b	d	g
bh	dh	gh

However, the above system of stops is exactly what the traditional reconstruction has proposed. On the other hand, the proponents of the new theory argue, a system of stops like the following has typological parallels (Bomhard 1979:78):

p	t	k
p'	t'	k'
bh	dh	gh

And the above system is just the type that the newly proposed reconstruction suggests. Thus, the new system is argued to be typologically more probable than the traditionally reconstructed system.

The second argument for the new system is that there is very little indication that Proto-Indo-European possessed what would be reconstructed as a voiced bilabial stop in the traditional system (Bomhard 1979:78 and the references cited there). Those proposing to change the traditional system point out that it is not typologically natural for a language with the stop series of traditional Proto-Indo-European to lack a voiced bilabial stop phoneme, and the traditional reconstruction apparently leads us to claim that PIE had just such a gap. On the other hand, they argue, it is quite natural and often found that languages with glottalized stops lack

the glottalic bilabial (Bomhard 1979:78 and the references cited there). Thus, the new system is argued to be more natural in this regard, because the gap in this system is at p', which now replaces the gap at b in the traditional system.

These typological arguments are not without force, and certainly, *ceteris paribus*, we should prefer a reconstruction that is typologically natural to one that is not. I believe though, that the proposed change of the traditional voiced stops to glottalized stops, while seeming to have the advantage of greater typological probability, at the same time creates other problems which are serious enough to call its correctness into question.

2. The argument.

Bomhard (1979:68) has correctly pointed out that a proposal to revise the traditionally reconstructed system "must not only be typologically acceptable but also historically probable [*italics mine/GMG*], that is to say, it must be able to account for developments in the daughter languages at least as well as, if not better than, the old system." I propose that the new system must not only be historically probable with reference to reflexes in the daughter languages, but also with reference to facts about the proto-language itself which we can recover through internal reconstruction. To the extent that internal reconstruction can be shown to be a valid method in historical linguistics, by yielding results that are independently supportable, evidence uncovered by this method must be recognized as admissible in argumentation about comparative reconstruction. I wish to submit just such evidence bearing on the question of whether the PIE series of stops under discussion was voiced or glottalized.

There is substantial evidence, based on surface alternations in the proto-language, that PIE possessed a regressive assimilation rule for sequences of two stops. In the traditional system, this rule is a regressive voicing assimilation rule. From forms in the daughter languages, we can reconstruct PIE surface alternations like:

*werg- ~ *w_gk-to-

*leg- ~ *lek-to-

Gothic provides evidence for the alternating surface forms of PIE *werg-. The Gothic form waurkjan indicates PIE *werg-, with g, because k is the regular reflex of PIE *g in Gothic, but -waurths points to a final k in the root, thus *w_gk-to-, because h is the regular reflex of PIE *k in Gothic.² Thus, we must reconstruct two surface forms of this root in PIE, with an alternation in the two forms between g and k. For the alternating surface forms of *leg-, we may note that the reflexes in all of the daughters that retain this root point to a final *g in it, but no daughter shows any evidence for PIE *leg-to-; rather, all of the evidence points to *lek-to-. Therefore, we can firmly establish that PIE had surface alternations between voiced (in the traditional system) and voiceless stops, due to an assimilation of voiced stops to following voiceless stops. There are also cases where a voiceless stop assimilates to a following voiced stop:

full grade *ped- ~ zero grade *bd-

Such alternating forms can be reconstructed on the basis of reflexes like Avestan fra-bd-a 'fore part of foot,' Sanskrit upa-bd-a 'act of trampling, stepping on something,' and perhaps Greek ἐπίβδα 'day after the holiday,' belongs here also. -bd- in each case can be argued to be the reflex of PIE *ped- in zero grade, with *p having assimilated in voicing to *d in the proto-language. If PIE did have surface alternations like those above, and if PIE had voiced stops, not glottalized stops, then we can use internal reconstruction to argue that PIE also had a rule of regressive voicing assimilation for sequences of two stops. If, however, PIE had, not voiced stops, but glottalized stops, the above types of alternations lead us to claim that PIE had a regressive glottalization assimilation rule; that is, now the reconstructed alternations are the following:

*werk'- ~ *wrk-to-

*lek'- ~ *lek-to-

*pet'- ~ *p't'-

A rule that assimilates voicing in two stop consonants is not an unnatural one, and in fact, is so natural, that we would not be surprised to find such a rule in any language. A glottalization assimilation rule, on the other hand, does not seem to be a particularly natural rule, and in fact, I would claim that it is an extremely unnatural kind of rule, so much so that I have been unable to find an example of any language that has such a rule. This lack of examples of a glottalization assimilation rule is really what we expect when we consider what such a rule would actually entail phonetically. A voicing assimilation rule and a glottalization assimilation rule would be formally quite similar, and we might formalize the two rules in the following way (the two subrules that each rule combines are given below the rule.³)

- (1) Voicing assimilation [-continuant] → [α voice] / ___ [-continuant
α voice]
- (1) a. First subrule of 1 [-continuant] → [-voice] / ___ [-continuant
-voice]
- b. Second subrule of 1 [-continuant] → [+voice] / ___ [-continuant
+voice]
- (2) Glottalization assimilation [-continuant] → [α glottalic] / ___ [-continuant
α glottalic]
- (2) a. First subrule of 2 [-continuant] → [-glottalic] / ___ [-continuant
-glottalic]
- b. Second subrule of 2 [-continuant] → [+glottalic] / ___ [-continuant
+glottalic]

The formal similarity between rules 1 and 2 obscures the significant phonetic differences between them. Voicing is a feature that we would expect to assimilate across clusters, because such an assimilation would eliminate the need to readjust the glottis during the articulation of the stop cluster, and thus accomplishes a genuine simplification of articulation. Therefore, subrules (1a) and (1b) both accomplish exactly the same kind of result, and are both natural assimilations for precisely the same reason, and thus can be naturally combined as a single rule. On the other hand, I

would claim that rules (2a) and (2b) are quite different phonetically, even though both involve a regressive assimilation of glottalization. Rule (2a) does accomplish a simplification of articulation, because it eliminates glottalization, a complex articulatory feature, from the articulation of a glottalized stop when it is in a cluster with another stop. However, rule (2b) would achieve a very different kind of effect. This rule introduces clusters of glottalized stops, which actually increases articulatory complexity. The complication is due to the fact that articulation of a cluster of glottalized consonants would require the repetition of the glottalization process twice⁴ within a very short period of time, and glottalization is a relatively complex feature even when involved in the articulation of a single consonant. In addition, Jeffers and Lehiste (1979:6) state that glottalized consonants, because of articulatory complexities associated with them, are among the segments especially likely to be involved in dissimilations.⁵ This fact makes the assimilation of a plain voiceless stop to a glottalized stop, as in (2b), even less likely. It is quite clear then, that the newly proposed reconstruction leads us to claim that PIE had a rule like (2) above, which presents the problem of being unnatural in two respects. First, the rule combines two subrules which achieve very different kinds of results.⁶ Second, one of the subrules is quite implausible phonetically. The traditional system, on the other hand, can account for exactly the same facts that cause serious problems for the newly suggested reconstruction, and can do so with a single rule which is very plausible phonetically and which combines two subrules which achieve exactly the same result and which can thus be argued to genuinely be instances of the same rule. Thus, the internal reconstruction of an assimilation rule for sequences of two stops in Proto-Indo-European provides at least one strong piece of evidence against accepting the replacement of the traditional PIE voiced stops with glottalized stops.

3. Conclusion.

As outlined in the beginning of this paper, there are typological arguments which can be made for the proposal that what have traditionally been reconstructed as voiced stops in Proto-Indo-European should actually be reconstructed as glottalized stops. As I have argued above, there is good reason to believe that such a proposal is actually incorrect. We must ask then, since arguments exist both for and against the proposal, how we are to decide which arguments are to be given the most weight. Actually, I believe that there are other reasonable arguments which could be advanced against this proposal, though I will not go into these here. I suspect that conflicts between typological arguments and other types of arguments may eventually cause a reassessment of the relative weight that typological evidence should be given in deciding questions about reconstruction. I cannot provide sufficient argumentation at this time to make this suspicion any more than a suspicion, but I would nevertheless maintain that the main argument that I have given in this paper must be reckoned with in deciding whether to reconstruct voiced or glottalized stops in Proto-Indo-European.

Footnotes

*I wish to thank Brian Joseph for much helpful discussion of the ideas presented in this paper. I would also like to thank Rob Fox for his comments concerning the phonetic issues involved.

¹I am indebted to Brian Joseph for these and the following examples of alternating forms in PIE.

²Though it is clear that we should consider the Gothic verb waurkjan to continue PIE *werg-, because neither the semantics nor the required sound changes are problematic, Gothic waurhts is not actually attested in simple form, but only in compound verb forms, for example, fra-waurhts and us-waurhts (Feist 1923:422). Even these compound forms are clear evidence for the alternation in PIE, however, because the forms fra-waurkjan and us-waurhts also occur (Feist 1923:422), and in these compound forms, there is no question that -waurkjan and -waurhts derive from the same PIE root. Thus, though Gothic waurhts does not actually occur in simple form, the evidence for the alternation in the proto-language is still secure.

³I have treated glottalization as being expressed by a single feature for the purposes of these rules. Whether such a treatment is actually correct or not makes no difference for the argument that I am giving.

⁴Some kind of repetition of the articulatory movements involved in glottalization would be required whether the proposed glottalic stops were ejectives, as Gamkrelidze and Ivanov (1973:150f.) and Hopper (1973:141f.) propose (a proposal with which Bomhard (1979:68) apparently agrees), or were voiceless stops followed by a glottal stop, or articulated with a simultaneous glottal stop, or even if they were some other type of glottalized stop (if other types actually exist). The point here is that having glottalization in both stops in a two stop cluster does not simply involve holding some articulatory factor constant throughout the articulation of the cluster, which is all that is involved in having the same voicing value for both stops in a cluster. Assimilation of voicing eliminates the need for an articulatory readjustment in the middle of a cluster; assimilation of glottalization, when it produces two consecutive glottalic consonants, creates the need for an extra readjustment. It is this fact that makes rule (2b) so phonetically implausible.

⁵Actually, Jeffers and Lehiste make this remark in talking about sound change, not about synchronic rules. However, there is every reason to believe that sound change should reflect natural synchronic rules. Therefore, it seems reasonable to conclude that if glottalized consonants are often prone to dissimilation in sound change, then they should exhibit the same kind of behavior in synchronic rules.

⁶In order to resolve this particular difficulty, it might be said that the two rules (2a) and (2b) should not be combined, but should be independent. This move does not really solve the problem though, for then the claim would be that PIE had two independent rules which achieve virtually opposite kinds of results, which is really no better (or only trivially better) than saying that the two were subrules of the same rule. Even if this problem could be resolved, the fact that rule (2b) is so implausible phonetically seems to be irresolvable.

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