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THE MARKEDNESS OF THE UNMARKED*

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Abstract: There are several phonological categories whose markedness — as inferred from typical markedness metrics — fails to match the representational complexity posited for them. More specifically, glottal stops, geminate clusters, and onsetless syllables are representationally the simplest of their category, yet other criteria, like implicational hierarchies, mark them as special. This paper aims at comprehending this paradox.

Keywords: markedness, complexity, implicational hierarchies, place of articulation, consonant cluster, syllable structure

1. Introduction

Markedness is a hot issue in phonological theory, one barely dares touch it. The reason for much of the excitement surrounding the concept of markedness is its usefulness: it is very appealing to base theory-internal considerations—like, for example, the representation of segments, or clusters—on what looks like theory-external evidence—like markedness. The greatest difficulty with the concept is the lack of a consensus on what counts and what does not count for determining whether a given cate-

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gory is marked or unmarked. This leads Hume, for example, to claim that "markedness need not be encoded in the grammar" (2003, 16).

Rice (2003; to appear) collects a long list of properties that phonologists use to characterize marked vs. unmarked categories. These include a set she refers to as nonphonological properties: e.g., language-internal and cross-linguistic **frequency** (rare categories are marked, common ones unmarked), **psycholinguistic** observations (categories acquired early and lost late are unmarked), **implicational** relations (a marked category implies the presence of its unmarked counterpart in the system), difficulty of **articulation** and more **perceptual** salience of marked categories as compared to unmarked ones. The second set of criteria is labelled phonological by Rice, this includes **neutralization,** of which marked categories are typically the target, unmarked ones the result, **epenthesis,** which typically involves unmarked segments to the exclusion of marked ones, **assimilation,** of which marked categories are the trigger and unmarked ones the target, as well as **coalescence** and **deletion,** in which marked categories are retained, unmarked ones lost.

In an ideal world, the markedness relations that are established on the basis of the empirical criteria available sketch up a uniform pattern, i.e., a given category always emerges as more marked than another category, irrespective of which of the above criteria are applied. Furthermore, if our theory dictates that a given category is more marked than another category, it would be nice to see that the discriminatory properties listed above support the theory's statement about markedness.

Our world, however, is not ideal. It happens all too often that a category is deemed unmarked by one criterion, but marked by another. To mention some well-known examples: the glottal stop, [ʔ], is a common result of the neutralization of oral plosives, hence allegedly unmarked. Yet its presence in a system almost always implies the presence of the coronal plosive, [t] — while the opposite implication does not hold —, hence the glottal stop is supposed to be more marked than the coronal one. A syllable containing only a vowel evidently contains less marks, only the properties of the vowel, than one beginning with a consonant, which also contains the properties of the consonant. It is nevertheless the latter that acquired the reputation of unmarked syllable type, since it does not imply the onsetless syllable, while languages with onsetless syllables exceptionlessly have onsetful syllables as well.

I will have very little to say about most of the contradictory verdicts of markedness criteria. My aim is only to show that in a number of

cases what appears to be the least marked category fails to take a role in a linguistic system. Thus I try to interpret the observation that some categories which fall out as unmarked in one sense, behave as marked in the other (e.g., Wilson 2001, 151), a general excuse for which is that markedness is multidimensional. I will argue instead that two concepts, markedness and complexity, are merged in such discussions. If my claim holds, a single scale of markedness can be retained. This scale coincides with that of complexity to a very large extent, but the two **may** depart at the lower end: the least complex category may or may not be equivalent to the least marked one in a given system.

I will first present three paradoxes that can be brought into parallel. Each demonstrate that minimal complexity is marked. The next section aims at clarifying the relationship of markedness and complexity. Section **4** discusses a possible complexity metric compatible with the notion of markedness and complexity presented here.

2. The problem

In the following three sections I will introduce three paradoxes that look stunning when considered from the viewpoint of markedness. The first involves the composition of segment inventories, the second that of consonant clusters. The third case offers a very similar example from the domain of syllabic constituency. All three cases demonstrate that the category at the lower end of what looks like a well-founded complexity (or markedness) scale fails to turn up in a large set of languages. This is odd if we expect unmarked categories to be very common in linguistic systems.

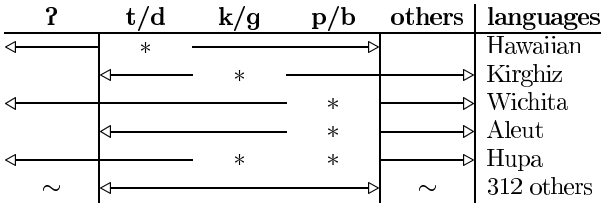
2.1. Segments

Based on the UPSID corpus (Maddieson 1984), Rebrus and Trón (2004) show that all of the 317 languages have at least three released plosives, i.e., plosives come in at least three different places of articulation without exception in a representative sample of human languages. A further generalization can be made about these three places of articulation: they are coronal, velar, and labial ([t k p]). There are only five languages (1.6% of the sample) in which we do not find all three members of this canonical triplet; one of them is missing in four — coronal in Hawaiian,

velar in Kirghiz, and labial in Aleut and Wichita—and two, both velar and labial, in Hupa. The deficiency is made up for by a glottal, a palatal, a uvular, a labialized velar stop, or some combination of these, since, recall, there are at least three in all the languages in the database.

The chart in (1)—adopted from Rebrus and Trón's (3)—summarizes the above statements. The authors claim that the chart also represents a complexity scale, where explosives to the right are more complex (that is, marked) than those to the left. Arrows indicate the range of places that feature in the given language. An asterisk marks the absence of that place, a tilde marks variability: the relevant category may or may not turn up in the language. The languages are listed exhaustively relative to the UPSID corpus.

(1)



Rebrus and Trón argue that by merging the three common places of articulation (coronal, velar, and labial) we get a complexity scale on which the principle in (2) holds. Without the merger, the five languages mentioned in (1) will exhibit exceptional inventories.

(2) The phoneme inventory of all languages is convex (not discontinuous) on any complexity scale.

Put somewhat differently:

(3) The phoneme inventory of a given language is unambiguosly defined by the elements of minimal and maximal complexity on any complexity scale.

Were it not for the fact that the presence of the glottal stop in an inventory cannot be predicted, a much stronger claim could be made, this is given in (4).

(4) The phoneme inventory of a given language is unambiguosly defined by the element of maximal complexity on a given complexity scale.

Such a principle is equivalent to the implicational hierarchies mentioned above: some categories imply the presence of others in a system, more

precisely, more complex—or more marked—categories imply the presence of less complex—or less marked—categories. E.g., [c/q] ⊃ [t/k/p] ⊃ [ʔ]. The data in (1), however, show that the stronger principle in (4), and hence the implicational chain of plosive places of articulation, cannot be maintained, since [t/k/p] ⊅ [ʔ], in fact, [ʔ] ⊃ [t/k/p].

The reverse implicational relationship of the glottal stop and the canonical plosives hints at the need to swap the two categories. Other considerations, however, militate against this: consonant lenition very often targets oral plosives and results in a glottal stop; consonant epenthesis also frequently prefers the glottal to the other places of articulation.

By surveying cases of consonant epenthesis, Lombardi (2002) aims to tackle the problem that despite the fixed place markedness hierarchy she proposes—similar to Rebrus and Trón's, shown in (5)—, a coronal may occur as an epenthetic consonant.[1]

(5) *dorsal, *labial ≫ *coronal ≫ *pharyngeal

To save the hierarchy, Lombardi argues that most cases of coronal epenthesis are not genuine, either because they are motivated by morphological factors, or because there exist further constraints on the properties of the epenthetic consonant (e.g., it must be a sonorant), so that pharyngeals do not qualify (as hinted at above: laryngeals are a subset of pharyngeals, and both [ʔ] and [h] are obstruents in Lombardi's view). Yet there remain cases where she has to assume a further constraint specifically against the glottal stop, which is somewhat simplistically labelled as *ʔ. About this constraint, Lombardi admits that it "is obviously contradictory to the unmarkedness of the major Place of the glottal stop" (*op.cit.*, 239).

With the aim of discrediting the notion of markedness altogether, Hume (2003) shows that besides the usual laryngeal, coronal, and velar places of articulation, the less usual labial may also be diagnosed as unmarked. Thus all the three canonical places, as well as the glottal stop exhibit symptoms characteristic of unmarkedness. Crucially, no such evidence was provided so far for other places (like palatal, uvular, etc.).[2]

[1] ≫ means 'dominates', that is, ranks higher in the constraint hierarchy. Accordingly, it is universally worse to have a dorsal or labial consonant than to have a coronal one, and it is universally worse to have a coronal than a pharyngeal (in our case laryngeal) consonant—Lombardi stipulates a ranking *[−glottal] ≫ *[+glottal] to achieve laryngeal unmarkedness (2002, 222).

[2] If Lombardi's (2003) generalizations about epenthetic vowels hold, a very similar situation can be witnessed for vowels. The claim is that the optimal epenthetic

In order to retain the notion of markedness in phonological theory, we must face the question: why do not all languages have a glottal stop in their phonemic inventory?

2.2. Clusters

Consonant clusters do not constitute a uniform set. A major, albeit fuzzy, split across the category is defined by the sonority profile of the cluster. Clusters with a rising or level sonority profile imply clusters with a falling sonority profile (Kaye–Lowenstamm 1981, 291,[3] also cf. Charette 1992 and Cyran 2003) Let us concentrate only on the unmarked set, and within this set only clusters with a plosive in second position. Furthermore, the present discussion must limit itself to intervocalic clusters. It is well-known that clusters are context sensitive: different types occur word initially and word finally. Both initial and final clusters—and potentially even others—occur word medially between vowels.

So-called "Prince" languages (Prince 1984; Harris 1997), possess a very modest set of consonant clusters: geminates and homorganic nasal + plosive clusters. Prince mentions Southern Paiute and Japanese as belonging to this group (1984, 243). While geminates do not, homorganic nasal + plosive clusters occur in any language that allows consonants to cluster. We may conclude then that this is the least marked type of consonant cluster in intervocalic position.

In fact, types of consonant cluster can be organized on a complexity (or markedness) scale in much the same way as individual segments, that is, one can produce scales based on various considerations which others can then dispute. (6) displays an adaptation of Rebrus and Trón's similar chart, omitting some details deemed unnecessary for the current discussion.

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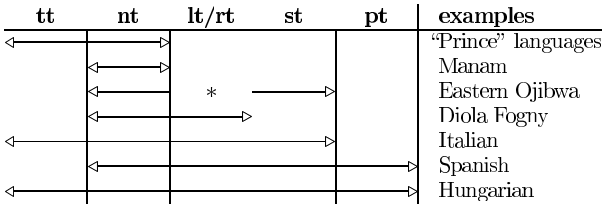
vowels are [ɨ] and [ə], the canonical triplet [i/a/u] are epenthesized only if the former are absent in the system. Vowel inventories, on the other hand, are based on the canonical three vowels, with the central ones occurring only as extensions. Thus the unmarked central vowels are missing from many vowel inventories, just like glottal consonants from consonant inventories.

[3] Kaye and Lowenstamm claim that there is an implicational relationship between the branchingness of syllabic constituents: onsets and nuclei branch only in languages in which the rhyme branches, that is, the least marked consonant cluster type is the product of a coda (the right branch of a branching rhyme) and the following onset consonant. Such clusters typically exhibit a falling sonority profile.

(6)



The clusters in the chart exemplify geminates ([tt]), homorganic nasal + plosive clusters ([nt]), homorganic liquid + plosive clusters ([lt/rt]), sibilant + coronal plosive clusters ([st]), and nonhomorganic clusters ([pt]). The chart abstracts away from a number of details, like voicing or place of articulation. Some languages allow only voiceless geminates (Kirchner 2000); in nasal + plosive clusters a voiced plosive is less marked, while in liquid + plosive, and especially obstruent + plosive clusters voiceless plosives occur more frequently. Place of articulation also lends some excitement to such a scale, but considering the simplest cases is enough for our present purposes.

To maintain the convexity of cluster inventories, Rebrus and Trón claim that the two categories liquid + plosive and *s* + plosive have to be merged, similarly to the merger executed in (1). The consequence of claiming that liquid + plosive and *s* + plosive clusters are equally complex is that neither implies the other in a given system, which is in fact the case: Eastern Ojibwa has *s* + plosive but no liquid + plosive clusters, while Diola Fogny exhibits the opposite setting.

As in the case of individual segments, where what is claimed to be the most unmarked stop, the glottal stop is not implied by any other place of articulation, here too geminates occur or not irrespective of the other clusters of the langauge. If markedness were based simply on implications, geminates could not count as unmarked, since they are not implied by other clusters: hosts of well-known languages with the most complex types of consonant clusters imaginable lack true geminates. Yet, the representation of geminates given in (11) below, which enjoys wide-spread popularity, hints at this type of cluster being the simplest possible. We again face the question: why do not all languages that have consonant clusters in the first place have true geminates?

2.3. Syllabic constituents

The unmarked syllable type cross-linguistically is CV. There exist languages (e.g., Hua (Blevins 1995, 219)) which only possess this type, that is, all words are of the shape $(CV)+$ (where '+' means one or more occurrences of the preceding pattern).

Although Blevins says "the unmarked case is that onsets are not obligatory" (*op.cit.*, 220), her own criteria rebut this claim. She brings up four arguments to support statements about unmarkedness in syllabic constituency. Of these three explicitly argue **for** obligatory onsets being the default case: "(3) All languages have CV syllables" — while, apparenly, only **some** have V syllables. Accordingly, CV is less marked than V. If it were the marked case to have obligatory onsets, then languages with only CV syllables would be more marked than others with both CV and V syllables. The oddity is that while the former group has only the unmarked syllable type (CV), the latter has also a marked type (V). Also, "(4) [...] there are a variety of phonological processes which take marked syllable types to unmarked types [...], but there are few if any rules which consistently result in [marked syllable types]." The avoidance of hiatus is a widespread phenomenon, which aims at getting rid of onsetless syllables (cf. Siptár 2006), while losing onsets is much less typical — though not unprecedented — a process. Blevins also says: "(2) In second language acquisition, speakers have little difficulty in shifting from a 'yes' value to a 'no' value for a given parameter, but do show difficulty in switching from a 'no' value to a 'yes' value." Yet it is hard to see any difficulty in getting from a language having both CV- and V-type syllables to one which only has the former, which allegedly is the marked type. Furthermore, the "yes" and "no" values crucially depend on the formulation of the parameter: "obligatory onset" for Blevins, hence her feeling that "no" is the unmarked setting, but it might as well be "omissible onset", in which case it is indeed the "no" setting that is unmarked.

This means that in the default case the onset in an obligatory part of the syllable (e.g., Prince–Smolensky 1993, 89). Onsets may contain more than one consonant, e.g., [tr] in English *trap* or Italian *tra* 'between'. Such more complex versions of onset are again restricted to a subset of human languages, hence count as marked.

Looking at codas on the other hand, we find that codaless syllables are omnipresent in human languages. This asymmetry clearly manifests itself in Clement's Length Hierarchy, given in (7).

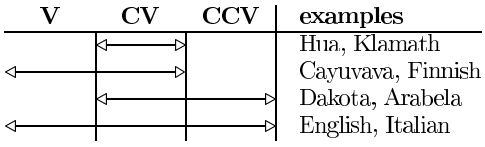
(7) The Length Hierarchy (Clements 1990, 307)

For any given type t, the presence in L(IS) of a demisyllable of length l ($l > 2$) implies the presence of a demisyllable of length $l - 1$.

According to the hierarchy, if a language after initial syllabification, L(IS), has a CCV initial demisyllable, it will also have a CV demisyllable, i.e., CCV $\supset$ CV. However, Clements has to add the constraint $l > 2$, since CV $\not\supset$ V: a two-long initial demisyllable does not imply the one-long initial demisyllable. For final demisyllables no such constraint is necessary, VCC $\supset$ VC $\supset$ V.[4] But this would require that there be two separate length hierarchies, one for initial and another for final demisyllables, the constraint holding only in the former. Instead, to gear his algorithm to linguistic facts, Clements stipulates that final V demisyllables are the least marked, while initial V demisyllables are more marked than any initial CV demisyllable. The raggedness of the theory is caused by the fact that the least complex onset type is not the least marked one.

To make the parallelism of this and the previous two cases obvious, the usual chart is sketched up in (8). The reason for the orderliness of this chart as compared to those in (1) and (6) above is simply that the identity of the consonants is ignored. If, say, the manner of the consonants were considered the result would be rather similar to the complicatedness of the other charts.

(8)



The example languages in the chart in (8) are from Blevins (1995, 219). Note that decisions on what a branching onset is are theory specific: some researchers consider any word-initial consonant cluster a branching onset, others would disagree with that. Irrespective of the actual examples (of whether Dakota and Arabela, or in fact any language with obligatory onsets indeed have branching onsets), the point holds: again the first column of the chart is independent of the others: the least complex type of onset is not implied by more complex onset types.

[4] The fact that codas are so easily dismissable has led to dispensing with it as a theoretical category in, for example, government phonology (Kaye et al. 1990).

Adherents of theories where not only onsets but also nuclei can be nil will notice that the same case can be made with respect to nuclei: the least complex nucleus, the empty one, is far from being unmarked. Thus, while a branching nucleus implies a nonbranching one — which is present in all languages —, the possibility of empty nuclei is not implied by either type of nucleus.

The paradox is well illustrated by the chart Kaye–Lowenstamm (1981, 292) produce for calculating the markedness of syllabic constituents. It is reproduced here in (9).

(9)

onset	rhyme	markedness
C	V	0
$\emptyset$	$\emptyset$	1
CC	VC	2
CCC	VCC	3
$C_1 \ldots C_n$	$VC_1 \ldots C_{n-1}$	n

While generally the more consonants in the onset the more marked the onset is, the lapse is clearly visible at the beginning of the scale: zero consonant is more marked than one consonant.

⋆ ⋆ ⋆

To summarize: we have seen three independent cases in which categories placed on a complexity scale defy the expectation that the least complex one (glottal stop, geminate consonant, onsetless syllable) be the least marked one as well. We have also seen that some of these facts have caused problems for researchers: the quest for the unmarked place of articulation resulted in four candidates — laryngeal, coronal, velar, and labial —, which made Hume, for example, conclude that markedness should be ousted of linguistic discussion.

3. What is marked?

The notion of markedness in linguistic theory goes back to Trubetzkoy,[5] who uses the term **mark** basically to mean distinctive feature (discriminative elements — in Baltaxe's translation). The four marks characteristic of *k*, for example, are "(1) complete occlusion" (noncontinuant), "(2) blocking of the entrance to the nasal cavity" (nonnasal), "(3) tightening of the

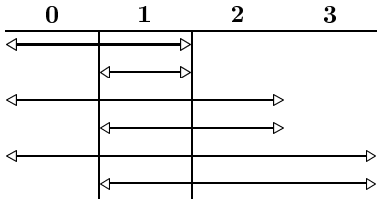
[5] Trubetzkoy attributes the term "mark" to Karl Bühler.

muscles of the tongue and simultaneous relaxation of the muscles of the larynx" (fortis), and "(4) participation of the dorsum" (dorsal) (1969, 66). Losing a mark will neutralize the difference between [k] and some other (group of) sound(s). For Trubetzkoy marks are language specific, since phonological contrasts vary from language to language. In contemporary models of phonological representation, however, the set of marks (also known as features, components, elements, gestures) is universal, and as a result the statements about markedness relations must also be universal.

While phonological models applying binary features are capable of encoding markedness considerations—as Chomky–Halle (1968, 402ff) and especially Kean (1975), as well as theories of underspecification show—a much more trivial interpretation of mark is available in models using privative features. In such a theory, each feature is a mark, accordingly the complexity (number of features) of a segment can be equated with its markedness.

The charts in (1), (6), and (8) can be merged as in (10).

(10)



The numbers stand for the complexity index of the given categories. Categories with complexity index 1 (including the canonical places of articulation, nasal + plosive clusters, CV syllables, etc.) are expected to turn up in all systems. As regards frequency and implicational relations, these are the most unmarked categories of the system. Categories with higher complexity indexes always imply categories with lower complexity indexes. Categories with complexity index 0 (glottals, geminates, onsetless syllables), on the other hand, are not implied by other categories, but they imply cateogries with complexity index 1. Thus many markedness diagnostics do not select them as unmarked, in fact, implicational hierarchies predict categories of complexity 0 to be more marked than categories on complexity 1. Yet if we consider their representation, i.e., their complexity, they do appear to be totally unmarked.[6]

[6] As a somewhat frivolous parallel, one can think of the distribution of matter in our universe. By far the most widespread form is hydrogen, which has an atomic

The following quote from Lombardi offers some explanation for the reason why zero complexity is discouraged in language:

> "I assume that this constraint [her aforementioned *ʔ] is due to the perceptual difficulty of glottal stop [...]. The conflict between the formal unmarkedness of the Place of the glottal and its perceptual markedness accounts for the fact that while glottal stop is relatively unmarked, not all languages have it in their inventory, since they may resolve this conflict in different ways." (2002, 239)

We can conclude that (at least some of) the confusion surrounding the notion of markedness is terminological. Empirical diagnostics of markedness usually single out categories of complexity 1, but occasionally they point to categories of complexity 0. Complexity is a theoretical notion, the complexity of a category is theory dependent. Markedness, on the other hand, is an empirical issue. Theories can be assessed by the degree of accordance between the results of markedness diagnostics and the complexity values the theory posits.

4. Representation

The complexity metric for syllabic constituents is self-evident: it is not difficult to accept that the complexity of a (two-way) branching onset is 2, that of a nonbranching onset is 1, while that of a missing onset is 0.

In the case of clusters, measuring complexity is less trivial. It is generally accepted that in the representation of a true geminate consonant it is to the second position that all melodic material (call them features) are anchored, it is this consonantal position that licenses features (Goldsmith 1990, 128ff). The first position parasitically links to the features held by the second, but does not license any on its own. This is indicated by the dashed association line in (11), where α stands for any (bundle of) features defining some segment.

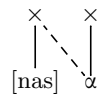
(11)

number (let us say complexity) of 1. The second most common element is helium, with a complexity of 2. An element of complexity 0 can also be hypothesized, but is it so rare in our universe that there is only some faint empirical evidence of its existence (http://en.wikipedia.org/wiki/Tetraneutron).

To produce zero complexity for this structure, we must consider the number of features anchored to the first position independently of the second.

In a homorganic nasal + plosive cluster most features are licensed by the second position, only one, nasality, is anchored solely to the first—hence the name partial geminate for this type of cluster. (12) shows such a cluster.

(12)



Following the algorithm given above, the complexity of a homorganic nasal + plosive cluster turns out to be 1 (the [nas] feature anchored to the first position).

The current proposal predicts that the representation of homorganic liquid + plosive and *s* + plosive clusters will involve two features independently anchored to the first consonantal position. Demonstrating whether this is indeed so, or whether the algorithm given for calculating the complexity of a consonant cluster is oversimplified is a task for future research.

If what has been said above is to stand, a model of consonantal representations must be sought according to which the glottal stop contains no features at all, the canonical places of articulation are composed of a single feature, while other places of articulation contain more than one feature. Without delving into the details of such models, let us note that it is not without reason that glottal consonants are considered placeless (Lass 1984, 179), in fact, the glottal stop is mere consonantalness (Szigetvári to appear). It is also noteworthy that in lenition processes affecting place of articulation the canonical plosives typically turn into a glottal stop—and not into each other—, while more complex places of articulation turn into the canonical types: e.g., Proto-Greek labiovelar plosives turn into labial and coronal plosives in Ancient Greek (cf. AG *penta* vs. Latin [k^{w}]*in*[k^{w}]*e* 'five'), while this place of articulation is retained in Latin, but reduced to velar in non-prevocalic position (*co*[k^{w}]*o* 'I cook' ∼ *co*[k]*tus* 'cooked'). If lenition is seen as loss of features (e.g., Harris 1997), then plosives of canonical places of articulation can lose their only feature (becoming glottal), but cannot acquire another one (except through assimilation), hence a canonical plosive cannot turn into another canonical plosive without some external source of place of articulation. On the other hand, other places of articulation become canonical by losing some of their features (the one responsible for labiality or ve-

larity in the examples given above). Such phenomena provide evidence for the claim that the glottal stop is of complexity 0, canonical places of articulation are of complexity 1, while other places of articulation are more complex.

5. Conclusion

This paper offers a workaround for the situation bugging a number of researchers who notice that standard markedness metrics yield contradicting results. The solution proposed claims that markedness and complexity are almost the same, but not quite: the least complex categories in languages are often dispreferred and hence count as more marked than categories that are slightly more complex, but in other respects unmarked.

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