Perceptually Weak and Strong Unmarked Patterns: A Message-based Approach

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Perceptual factors have been drawn on to provide insight into sound patterns (e.g. Ohala 1981; Lindblom 1990; Flemming 1995; Jun 1995; Hume 1998; Steriade 2008) and commonly serves as a diagnostic for markedness (e.g. Hamilton 1996, Boersma 1998). However, a puzzling situation has emerged: patterns associated with strong perceptual distinctiveness and those with weak distinctiveness are both described as unmarked. For example, it is widely assumed that the unmarked position for most consonants is in prevocalic/onset position (e.g. [**t**a]), a pattern commonly associated with multiple inherent and/or contextual phonetic cues (Wright 1996). Yet, unmarkedness is also associated with weak cues, as in positions of neutralization (Silverman 2012). In coda position, for example, Korean plain voiceless, aspirated and tense consonants (e.g. [t t^h t']) surface as the plain consonant (Cho 1990), the unmarked member of the opposition (Trubetzkoy 1939, Rice 1999). Context is important in understanding why strong and weak cues can both be unmarked: prevocalic/onset position hosts unmarked consonants with strong cues and postvocalic/coda position hosts unmarked consonants with weak cues. Yet *why* should the unmarked sound in coda position be commonly associated with weak cues while the unmarked consonant in onset position be associated with strong cues? Or, more fundamentally, what does it mean for a pattern to be unmarked?

We suggest that insight into the unmarked nature of the patterns and into markedness more generally can be gained when we take seriously the view of language as a system of communication. Like all communication systems, language involves transmitting messages (i.e. morphemes, words or higher levels of meaning) from one person/place/thing to another. Building on recent work by *[withheld]*, unmarked patterns are those that effectively balance two competing pressures: (a) contribution of the phonological unit in context (PUc) to accurate message transmission, and (b) resource cost of the PUc to identifying the signal (Figure 1).

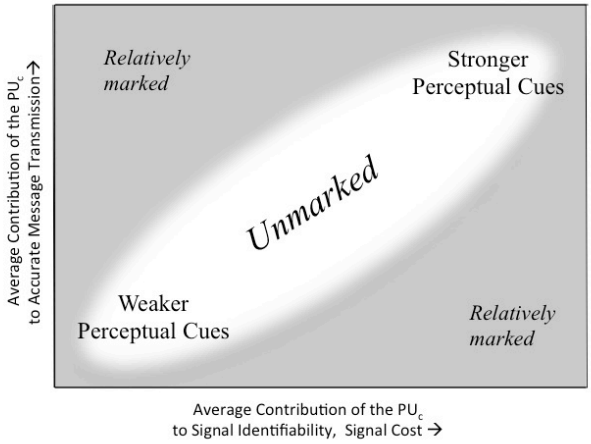

Figure 1. Communicative effectiveness and its relation to phonological patterns

The space delimited by the axes in Figure 1 can be thought of as the abstract space occupied by different possible signals (phonetic signals, in the present case) used to communicate messages. The horizontal axis represents the amount of redundancy present in a particular signal, with less-redundant signals to the left and more redundant signals to the right. Less redundant signals are lower in cost, yet at the same time associated with a lower likelihood of accurate signal identification and message transmission (Shannon 1948). The vertical axis represents the possible

contribution that a particular signal makes toward achieving error-free communication, with less important signals near the bottom and more important signals near the top. Thus, signals can have different overall potential contributions to the robustness of message transmission; that is, they are more or less important for communicating the message.

Communicative effectiveness is optimized when resource cost is allocated to positions in the message that make a greater contribution to the message's identification and minimized in positions that contribute little. This region is labeled 'unmarked' along the diagonal in Figure 1. Framed in this way, we are able to predict the conditions under which sound patterns are likely to be considered unmarked. Specifically, patterns with strong perceptual cues should typically occur toward the top right quadrant of Figure 1; that is, in contexts which contribute more to message identifiability, i.e. toward the beginning of the word, or in segmentally and/or prosodically prominent contexts. For consonants, this includes prevocalic/onset position. Similarly, patterns with weak perceptual cues are predicted to occur in contexts that provide little benefit to message identification, such as toward the end of the word or in segmentally and/or prosodically non-prominent contexts, e.g. for consonants: postvocalic/coda position. Thus, what have emerged in the literature as "unmarked" values are unified by the observation that they optimally balance the competing pressures of resource cost and accuracy when it comes to communicating messages. In some cases this balance corresponds to being phonetically weak and in others, to being phonetically strong.

Evidence from perceptual distinctiveness suggests that sound patterns emerge as a result of pressures on higher-level units of meaning. Thus, while linguistic structure provides the conditioning context for sounds at a sub-lexical level, the role of phonology within a communication system strongly influences the shape of sound patterns in a phonological system.

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