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Subjective perception of affixation: A test case from Spanish

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Abstract

Cross-linguistically, prefixes and suffixes differ in both frequency and in phonological behavior. These differences could plausibly have their source in listeners' subjective perceptual experiences of prefixes and suffixes, an idea that we pursued using a noise-rating task in Spanish. Participants heard minimally-different Spanish words such as *me patea* 's/he kicks me' versus *patéame* 'kick me', where the clitic pronoun *me* behaves phonologically like a prefix versus a suffix, and rated the loudness of white noise overlaid on either the pronoun or the verb stem. Results demonstrated that participants assigned significantly different ratings to noise occurring on prefixes versus suffixes, and on prefixed versus suffixed stems, even when the signal-to-noise ratio remained constant across conditions. That is, listeners' subjective perceptual experience of the noise differed according to what morpheme type the noise occurred on, suggesting that morphological structure can act as a cognitive variable affecting perceptual clarity.

Keywords: Spanish; Morphology; Prefix; Suffix; Perception; Typology

1. Introduction

Prefixes and suffixes act as morphological equivalents in many ways. Both types of affix can be derivational or inflectional, both can encode similar syntactic and semantic representations, and both come from closed classes that typically contain only a subset of a language's phonological inventory. Nevertheless, the literature has noted many differences between these two types of morphemes. One difference lies in frequency: overall, prefixing morphology is far less frequent than suffixing morphology, and is overwhelmingly restricted to languages with verb-object ordering (Dryer, 2013; Hawkins and Cutler, 1988; Hawkins and Gilligan, 1988). Another difference lies in phonological behavior: cross-linguistically, prefixes tend to participate in fewer alternations than suffixes do (Hyman, 2008), even though morphological boundaries are generally active sites for such alternations.

Given the similarities between prefixes and suffixes, their differences seem rather puzzling, but previous research has offered some provocative explanations from both functional and formal perspectives. For example, Hawkins and Cutler (1988) examine the typological distribution of prefixing and suffixing morphology, and offer an explanation grounded in speech processing (see also Colé et al., 1989; Cutler et al., 1985, and more recently Himmelmann, 2014). They cite evidence that the initial portions of a word drive the process of recognition (Grosjean, 1980; Marslen-Wilson, 1984, 1987; Marslen-Wilson and Welsh, 1978; Marslen-Wilson and Zwitserlood, 1989; Nooteboom, 1981, and many others), and also observe that listeners prefer to interpret the semantic information encoded in roots before they interpret the syntactic

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information typically encoded in affixes (as the authors point out, this observation holds mostly for inflectional affixes, but they argue that a similar observation should apply to derivational affixes). According to their logic, then, suffixing morphology should provide a perceptual advantage because it temporally aligns the important information of the root with the perceptually-prominent position of the word onset. Prefixing morphology, on the other hand, should suffer from a disadvantage because the root and the word onset are temporally mis-aligned. Hawkins and Cutler (1988) put forth these proposed perceptual differences to account for the different frequencies of prefixing versus suffixing languages.

Previous research has also tackled differences in phonological behavior. Whereas suffixes generally participate in both regressive and progressive alternations, prefixes do not. Specifically, although prefixes often undergo regressive alternations triggered by roots, they rarely trigger progressive alternations on the following root (Hyman, 2008). To illustrate by way of simple voicing examples from English, we see cases where suffixes trigger regressive assimilation (*lea*[f], *lea*[v]-*es*), where suffixes undergo progressive assimilation (*cat*-[s], *dog*-[z]), and where prefixes undergo regressive assimilation (*tran*[s]-*sexual*, *tran*[z]-*national*), but we do not see cases where prefixes trigger progressive assimilation (**off*-[p]*eat* for *off-beat,* **sub*-[b]*ar* for *sub-par*). The nasal assimilation process in Luganda is an example of this otherwise rare occurrence: *m-báànj-a* → *m-m̲áànj-a* 'I demand payment', Hyman and Katamba (1999:397). The ''Alternation Asymmetry'', as we refer to it, holds for a heterogeneous set of processes, including local assimilations, long-distance assimilations such as consonant harmony (Hansson, 2001) and vowel harmony (Walker, 2011), and vowel elision (Casali, 1997), suggesting the need for a very general explanation.

Research in theoretical phonology, particularly in Optimality Theory, has used the concept of positional faithfulness to approach this problem. The idea is that certain positions within a word possess a privileged status, and faithfulness constraints preserve the underlying identity of segments in those positions. When ranked above the relevant markedness constraints, then, positional faithfulness constraints prevent alternations from occurring in certain positions, even if the alternation remains active elsewhere. McCarthy and Prince (1995) initially proposed a positional faithfulness constraint that preferentially preserves segments in roots but not affixes. Beckman (1997) and Casali (1997) took a step further and proposed constraints that preserve segments specifically in the *initial* portions of roots. These analyses can competently model the Alternation Asymmetry because they preferentially protect just those root segments which are closest to the prefix (namely, the initial segments most likely to undergo any putative progressive alternations triggered by the prefix). For example, the constraint IDENT-σ_1(VOICE) would state that segments in root-initial syllables should have identical voicing values in the input and the output, thereby mitigating specifically against changes such as *off-beat* → *off*-[p]*eat.* Furthermore, because faithfulness constraints can prevent any type of surface alternation, including local and long distance assimilations as well as other changes, this theoretical solution seems to be a satisfyingly general one.

1.1. Conflicting evidence from word recognition studies

In many ways, these previous proposals – one functional, one formal – represent significant progress in our understanding of the differences between prefixes and suffixes. In other ways, however, these proposals simply do not fit with the existing evidence about how listeners perceive spoken words. For example, Hawkins and Cutler (1988) conclude that suffixing morphology should offer a perceptual advantage over prefixing morphology, but they do not test this idea explicitly. In fact, the few studies that do examine this issue suggest the opposite pattern. In priming experiments, prefixed forms prime their stems (*insincere* primes *sincere*) as well as related prefixed forms (*unfasten* primes *refasten*). Suffixed forms also prime their stems (*punishment* primes *punish*), but they do not prime related suffixed forms (*confession* does not prime *confessor*) (Marslen-Wilson et al., 1994). Feldman and Larabee (2001) demonstrated a similar prefixation advantage across several modalities and inter-stimulus intervals. Not only does prefixing morphology appear to offer a processing advantage over suffixing morphology, it also appears to offer an advantage over bare roots. Schriefers et al. (1991) asked listeners to perform gating and phoneme monitoring tasks while listening to spoken Dutch words containing early versus late uniqueness points. To their surprise, however, results showed no effect of uniqueness point. Instead, in gating tasks, listeners needed significantly more sensory information to identify bare roots versus prefixed words, regardless of early versus late uniqueness points. Similarly, in phoneme monitoring tasks, listeners responded more slowly in the bare root condition compared to the prefixed condition, again regardless of uniqueness point. Interestingly, even though their study did not explicitly test the question of affixed words versus bare roots, Marslen-Wilson et al. (1994) report a compatible result: ''[p]refixed pairs prime each other as well as, if not better than, pairs made up of a free stem and a prefixed form'' (1994:27, with specific reference to their Experiment 4). Taken together, these experimental findings suggest a prefixation advantage that is at odds with Hawkins and Cutler's (1988) processing proposal.

The OT concept of positional faithfulness also raises problems when we attempt to translate it into perceptual terms. Essentially, the theory claims that if segments occupy root-initial positions, those segments should not alternate. The implication – sometimes made explicit, as in Beckman (1997) – is that alternations somehow interfere with accurate segmental perception, and such interference cannot be tolerated in a position that is so important for word recognition. But it is not clear whether this implication really holds. The initial portions of a word drive the process of recognition (works cited