

The articulatory nature of the phonological code involved in visual masked priming: evidence from phonotactic repair and articulatory suppression

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Almost twenty years ago, a few researchers' attention was drawn toward several cases of perceptual repair of ill-formed consonant sequences presented auditorily. One well-documented case was [ebza] perceived as /e.bu.za/ by Japanese listeners, that is, repaired into an acceptable phonological form in Japanese (Dupoux et al., 1999). A similar case, also involving a vowel-epenthesis type of repair, is that of [speθjal] heard as /espeθjal/ 'special' by Spanish listeners (Cuetos et al., 2011; Hallé et al., 2013). Yet another case is that of [tl] perceived as /kl/ by native listeners of French or of English (Hallé et al., 1998; Hallé & Best, 2007), that is, a case of phonemic substitution. We call these cases of perceptual repair "phonotactic repairs." They are very similar in nature to the many cases of perceptual assimilations of nonnative simple speech sounds (Best, 1995). To put it simply, the notion of assimilation extends here to phonotactic combinations of sounds, which may be native or native-like.

This class of phenomena raises several interesting issues. For example, is there a stage of perception whereby the nonnative sequence is perceived faithfully? If yes, phonotactic repairs could be attributed to the listeners' production grammar. If not, speech perception would be automatically filtered by the listener's native phonological system (for pros and cons, see Breen et al., 2012, versus Dehaene-Lambertz et al., 2000). One argument in favor of the automaticity and immediacy of phonotactic repairs is that they are found in visual masked priming experiments, in which primes are so briefly presented then masked that they can only be processed non-consciously hence, as it were, "mechanically". For example, in Spanish, **"special"* primes *"especial,"* whereas **"stuto"* does not prime *"astuto"* 'astute' (Hallé et al., 2008), suggesting that *sC is automatically repaired into esC rather than into asC, well before lexical feedback may affect perception. Non-conscious phonotactic repairs of printed primes are also in agreement with the many findings of phonological priming from print and raise a second interesting issue: What is the nature of the phonological code mediated by print? We speculated, in Hallé et al. (2008), that this code could be articulatory, in line with Alvin Liberman's central and provocative claim that speech and print share the same gestural code (Liberman, 1996). Visual masked priming experiments offer the possibility to test for this hypothesis using the so-called "articulatory suppression" paradigm (concurrent task of repetitive speech production). Articulatory suppression should cancel out priming effects, were these effects indeed based on articulatory representations of the primes.

In this presentation, we first report recent data with French subjects on a visual masked priming experiment with printed target words beginning with "cl" or "gl," and primes beginning with **"tl"*, **"dl"* or unrelated to the targets. We replicate the basic findings with Spanish subjects of Hallé et al. (2008) and Kartushina et al. (2011). Finally, we report the recent findings by Yue and Peperkamp (2016), who found that the phonotactic repair priming effects disappear under a condition of articulatory suppression. Altogether, these data suggest that the phonological code mediated by subliminal print is articulatory in nature.