

Testing Analytic Bias by Using Concept Formation Paradigm in Nasal Harmony

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According to Steriade (2001), two general mechanisms are responsible for phonological typology: analytic bias, which refers to systematic cognitive predispositions like Universal Grammar (UG) helping people to learn some patterns than others, and channel bias (Ohalo 1993), which refers to the diachronic phonologization of phonetically systematic errors in speech transmission, without their being represented explicitly in grammar. To test for analytic bias, the present study examines nasal spreading by testing the learnability of artificial grammars.

In Johore Malay (Onn 1976), nasality spreads rightward from a nasal consonant to and past vowels, glides, and glottals (e.g., *mãĩãp*, ‘pardon’), while being blocked by all other consonants (e.g., [*pəŋãĩãsan*], ‘supervision’) (“blocking pattern”).

McCarthy (2009) argues that standard Optimality Theory (Prince & Smolensky 2004) has a surprising problem: it predicts that rather than spreading until a blocker is reached, nasality will not spread at all if there is a blocker anywhere within a word (e.g. [*pəŋawasan*]); [*mãĩãp*]) (the so-called “sour-grapes” pattern).

McCarthy (2009) develops Harmonic Serialism (HS), with word forms built step by step, partly to account for this problem. Thus nasality in Johore Malay can spread from one segment to another, step by step, until a blocker is reached. This correctly predicts that the blocking type of nasal spreading is attested, while the sour-grapes type of nasal spreading is not.

Since HS is claimed to be part of UG, the HS analysis implies that this cross-linguistic pattern is due to analytic bias. However, phonetic coarticulation also applies locally within words, and diachronic phonologization applies in a step-like fashion. Thus the sour-grapes pattern may be unattested merely because it cannot arise via channel bias. By contrast, if the non-existence of the sour-grapes pattern is due to analytic bias, as McCarthy assumes, a grammar with a blocking type pattern is predicted to be easier to learn than a grammar with a sour-grapes pattern.

The present experiment was a concept formation task to examine how participants learned both grammars over time. The overall accuracy of the sour-grapes grammar was always higher than that of the blocking grammar, and the burst of learning for the sour-grapes grammar was also earlier than that for the blocking grammar, suggesting that the learnability of the sour-grapes grammar was easier than that of the blocking grammar. The present study thus suggests that instead of analytic bias, this cross-linguistic favoring of blocking over sour-grapes grammars may be due to channel bias.