Allophonic variation and word recognition in 1.5 year-old children

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When learning their native language, infants are exposed to a large amount of variation in the input. Some of this variation is regular and systematic, i.e. allophonic variation. Part of a child's task when learning their native language must entail the mapping of multiple allophonic variants onto the same lexical item. This study examines 1.5 year-olds' ability to recognize familiar words that are produced with an allophonic variant. Specifically we investigate the alternation between word-final coronal stops in English ([t] and [d]) and taps, [ɾ] (Kahn, 1980; Turk, 1992). We report the results of two word recognition experiments implemented using eye-tracking in a visual world paradigm, testing both adults and 1.5 year-old children. Target words were recorded in three conditions: (1) canonical stops (e.g. [bæt]), (2) taps (e.g. [bæɾ]), and (3) 1-feature place mispronunciations (e.g. [bæp]) in two carrier frames: *Look for the X Sam lost!* (for stops) and *Look for the X again* (for taps). Adults recovered the target word equally well in both the stop and tap condition, as exemplified by an increase in the proportion of looks to the target image in the test phase as compared to a silent baseline (see Figure 1). When presented with a target word produced with a 1-feature mispronunciation, adults also looked to the target image more in the test phase than in the baseline, but not to the same extent as in the stop and tap conditions confirming that word recognition is gradient, as has been shown in previous research (e.g. Swingley, 2009). Infant testing is currently underway. Preliminary results (n = 7) indicate that children accepted tapped /d/-final words as labels for familiar objects. When presented with a tapped form of a /t/-final word, children did not seem to accept it as viable label for a familiar object. This difference between /t/ and /d/-final words may arise given the closer phonetic similarity between [d] and [ɾ], than [t] and [ɾ] (Herd et. al. 2010), consistent with a principle of minimal modification (e.g. Steriade 2001/2008). Infants may misinterpret /t/-final words as being produced with a final [d] and thus treat it as a 1-feature mispronunciation. With /d/-final words, they may treat words with final [d] and [ɾ] equivalently due to the perceptual similarity.

Figure 1.

Difference scores by condition (n = 32), Experiment 1 (Adults). Condition is represented on the x-axis and the y-axis represents the difference in proportion looking at the target familiar object in the test phase and the baseline phase. Error bars indicate standard errors.
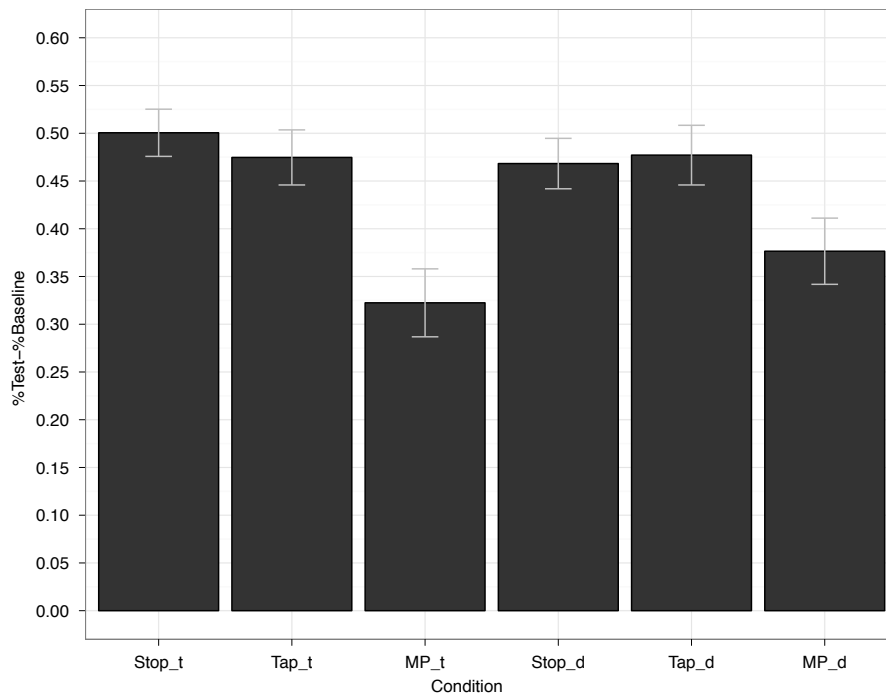
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