Auditory and visual cues in speech production

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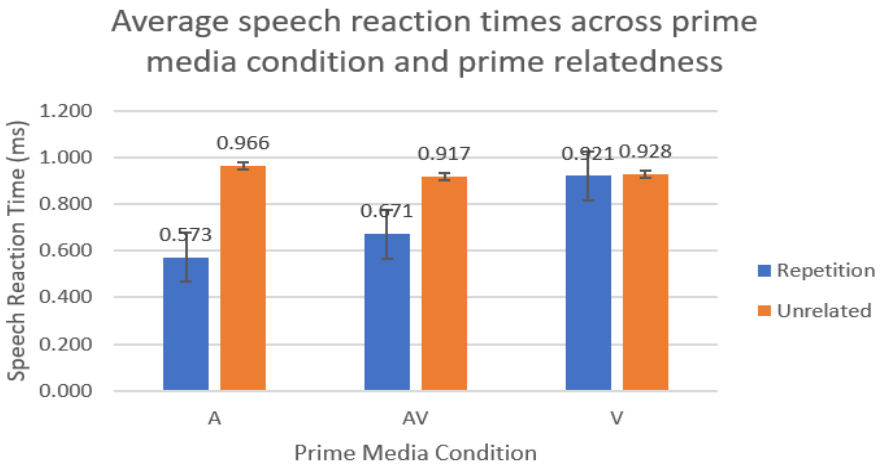
A considerable amount of research looks at infants' use of auditory linguistic information to acquire language (1). Studies are increasingly looking at the role of visual information in speech processing, and how both visual and auditory cues are integrated in language development (2, 3, 4, 5). It is still not well understood how a learner's use of visual cues develops over time; moreover, it is still unclear what linguistic information can be extracted from visual speech. The current study investigates whether four to six-year-old children are able to use visual speech cues (i.e. lip reading) to access words from their mental lexicon during spoken word production. To test this, we are examining how quickly children are able to correctly name a target image during a primed picture naming task. The target image (e.g. *ball*) is preceded by prime words that are either the same word as the target (e.g. *ball*), or an unrelated word (e.g. *coat*). These prime words are presented in either Visual-Only speech (video of someone mouthing '*ball*'), Audio-Only speech (hearing '*ball*'), or with Audio and Visual speech (hearing and seeing someone say '*ball*').

We expect that when the children are primed with a matching word in any of the AV, AO, or VO formats, they will perform optimally (shortest Speech Reaction Times) compared to when they are primed with a word that does not match the target. We expect to see the shorter SRTs in trials with primes that are the same word as the target based on the assumption that the prime will activate that word in the mental lexicon allowing for faster retrieval.

To date, we have data collected from 20 children between the ages of 4 and 6 years old. The preliminary results from the AV and AO conditions follow the predicted pattern of shorter SRTs in the repetition condition compared to unrelated condition (seen below in Figure 1). Results from the VO trials, however, show similar SRTs in both the repetition condition and unrelated condition. If children are able to use visual speech to access representations in the mental lexicon, we would expect to see the same trend in the VO condition as in the AV and AO conditions. Trends in the preliminary results may suggest that the processing of visual speech differs from auditory and auditory-visual speech in this production task.



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