

Nature of the Reverse Production Effect: Is it Language Specific?

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The impact of speech production throughout language development begins at an early age; infant research has suggested that production carries perceptual and saliency influences (1, 8), which enables produced words in early toddlerhood to have more developed or integrated lexical representations (6, 7). The possible influence of production however, is not well-understood and very little research has addressed this issue empirically. Previous research with adults and older children has shown beneficial effects on recall and recognition tasks for known words that were produced as opposed to heard during training (3, 5). More recent studies (9, 10) have tested this production effect further in adults and children with newly trained words. In these studies, participants were taught words with visual referents that were either produced or heard during training, then tested on their recognition of the newly trained words. Adults showed better recognition of new words produced during training, while children showed an unexpected pattern - better recognition of new words that were only heard. This was labelled the *Reverse Production Effect (RPE)*. One hypothesis is that speech production during word learning increases the task demands, but that this also depends on the linguistic stimuli and the developmental stage of the learner. Therefore, it may be more efficient for learners to initially listen to language before engaging the production system because this will free up resources for the creation of sound and meaning representations. If the RPE stems specifically from speech production, one would predict that a non-verbal or non-speech task would not lead to a similar disruption in learning (2, 4). The current study further investigates the nature of the RPE in 5 and 6 year-old children. Specifically, it asks whether the RPE is a consequence of task difficulty, (i.e performing an action during learning) or if it is triggered by linguistic factors (i.e specific to speech-related tasks during learning).

In our study, participants are trained on novel words with visual referents. During training, half of the words are heard, while the other half belong to one of the following training conditions (between-subjects): Produce (produce the words aloud: speech task), Mouth (stick out tongue: non-verbal, “speech” task) or Nose (touch nose with finger: non-verbal, non-speech task). After training, a preferential looking paradigm is used to test recognition of the novel words.

We predict that if the RPE is caused primarily by linguistic factors, then an advantage for Heard items should only be found when compared to the Produce (speech task) and Mouth (non-verbal, “speech” task) conditions, but not when compared Heard items to Nose condition (non-verbal, non-speech task). Preliminary data from 22 participants indicate an advantage for Heard items when compared to all other conditions (Nose, Mouth and Produce conditions). In other words, the RPE appears to hold for all action-related tasks, not those specific to speech. While results do not discount the effect of linguistic factors, they do indicate that one source of the RPE stems from task-difficulty. This research helps build our knowledge on how children learn to speak and communicate throughout childhood, and to help us understand why production sometimes facilitates and sometimes disrupts learning.

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