"Three questions regarding phonological short-term memory: What is it? Does it causally affect vocabulary growth? Do conflicting accounts need to conflict?"

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The relationship between nonword repetition ability and vocabulary size and learning has been a topic of intense research interest and investigation over the last two decades, following the demonstration that nonword repetition accuracy is predictive of vocabulary size (Gathercole & Baddeley, 1989). However, the nature of this relationship is not well understood. One prominent account posits that phonological short-term memory (PSTM) is a causal determinant both of nonword repetition ability and of phonological vocabulary learning, with the observed correlaton between the two reflecting the effect of this underlying third variable (e.g., Baddeley, Gathercole, & Papagno, 1998). An alternative account proposes the opposite causality: That it is phonological vocabulary size that causally determines nonword repetition ability (e.g., Snowling, Chiat, & Hulme, 1991). I will present a theory of phonological vocabulary learning, instantiated as a computational model. The model offers a precise account of the construct of PSTM, of performance in the nonword repetition task, of novel word form learning, and of the relationship between all of these. I will show through simulation not only that PSTM causally affects both nonword repetition accuracy and phonological vocabulary size, but also that phonological vocabulary size causally affects nonword repetition accuracy and phonological vocabulary size, but also that phonological vocabulary size causally affects nonword repetition ability. The plausibility of the model is supported by the fact that its nonword repetition accuracy displays effects of phonotactic probability and of nonword length, which have been taken as evidence for the causal effects, respectively, of phonological vocabulary knowledge and PSTM on nonword repetition accuracy. Thus the model makes explicit how the causal links posited by the two theoretical perspectives are both valid, in the process reconciling the two perspectives, and suggesting that the opposition between them is misplaced.