As Predicted Template, Version 1.10

Participating Authors (Up to 5)

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AsPredicted Questions

1. **Data collection.** Have any data been collected for this study already?

* Yes, we already collected the data. (Not an accepted answer.)
* No, no data have been collected for this study yet.
* It’s complicated. We have already collected some data but explain in Question 8 why readers may consider this a valid pre-registration nevertheless.

1. **Hypothesis.** What’s the main question being asked or hypothesis being tested in this study?

When trying to remember sequences of words, does word similarity interfere with memory because of the similar *acoustic* *properties* or *mental representations* of the items?

1. **Dependent variable.** Describe the key dependent variable(s) specifying how they will be measured.

Word lists will be presented at a fixed rate through a loudspeaker under conditions that manipulate the acoustic properties and mental representations of words, and we will measure strict serial recall accuracy (i.e. the number of items recalled in the correct serial recall position) and serial position accuracy (i.e. the number of items correctly recalled at each position) across all conditions.

1. **Conditions.** How many and which conditions will participants be assigned to?

In a within-subject manipulation, each participant will hear a list of acoustically similar words and a list of acoustically dissimilar words. All of the words will have been degraded using a sinewave vocoding processor. In a between-subject manipulation, participants will be assigned to one of two training conditions for the acoustically similar word set. In the Phonologically Overlapping Mental Representations condition, participants will be trained to map vocoded acoustic signals to phonologically similar words. In the Phonologically Distinct Mental Representations condition, participants will be trained to map vocoded acoustic signal to phonologically distinct words.

1. **Analyses.** Specify exactly which analyses you will conduct to examine the main question/hypothesis.

A mixed measures Phonological (2) x Acoustic (2) ANOVA, in which the Phonological factor is between-subjects (Phonologically Distinct Mental Representation vs. Phonologically Overlapping Mental Representation) and the Acoustic factor is within-subjects (acoustically similar word set vs. acoustically dissimilar word set). [[The difference in strict serial recall accuracy between the Phonologically Similar word set and the Phonologically Dissimilar word set will be measured for each participant. A between groups T-test will compare the differences between conditions. ]] If the data obviously violate normality, we will conduct non-parametric alternatives to the ANOVA.

1. **More analyses.** Any secondary analyses?

Two alternate scoring methods will be used explore the effects of phonological similarity on item versus serial order memory. In the item-only scoring procedure, participants will be given credit for any correctly recalled item regardless of serial position. As item accuracy should be statistically equivalent across all conditions, this analysis will act as a check of item identification. To assess serial order memory independent of item-position binding, participants will be given credit for any correctly chained items. In this scoring procedure, an item will be counted as accurate if it is recalled following its preceding item from presentation. For example, if the presented list was *A, B, C, D, E, F* and the participant recalls *A, B, D, E, F, G,* the conventional scoring method would award 2 points as only *A* and *B* are recalled in their presented positions. Item scoring would result in 5 points for *A, B, D, E,* and *F.* The chained scoring procedure would award 4 points for *A, B, E,* and *F*.

One expected outcome is that the mental representation of the words will supersede the phonological similarity effect created by acoustic similarity. In this outcome, participants in the Phonologically Distinct Mental Representation training condition will perform equally well on both the acoustically similar wordlist and the acoustically dissimilar wordlist. Another potential outcome is that the acoustic properties of the acoustically similar wordlist will create a phonological similarity effect, regardless of the phonological distinctness of the mental representation. In this outcome, participants in both training conditions will perform equally well on the acoustically similar wordlist. Therefore, Bayesian models will be used to assess which possibility is best supported by our data. To account for alternate possibilities, we will also test models in which performance is the same across all conditions, in which performance across all conditions is unrelated, and in which performance is driven by a mixture of acoustic and mental representation phonological similarity.

Additionally, differences in item identification will be explored by examining the amount of time spent learning to map the trained phonological representation to each acoustic signal.

1. **Sample size.** How many observations will be collected or what will determine sample size? (No need to justify decision, but be precise about exactly how the number will be determined.

80 participants will take part in this study (40 in each between-subject Phonological condition), or until January 5, 2018 (whichever comes first).

1. **Other.** Anything else you would like to pre-register? (e.g., data exclusions, variables collected for exploratory purposes, unusual analyses planned?)

We will collect musical experience data in anticipation of a follow-up study involving musical stimuli.

1. **Name.** Give a title for this AsPredicted pre-registration. (Suggestion: use the name of the project, followed by study description.)

Acoustic vs. Mental Phonological Similarity

Finally. For record keeping purposes, please tell us the type of study you are pre-registering.

* Class project or assignment
* Experiment
* Observational/archival study
* Other: \_\_\_\_\_\_\_\_\_