# Word frequency effects are unstable during picture naming

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## Introduction

- Theories of language production locate the frequency effect at the word form level (Levelt, Roelofs, & Meyer, 1999)
- Jescheniak & Levelt (1994): frequency effects were stable across three repetitions during picture naming (requiring lemma access + phonological encoding), but not gender decision (requiring lemma access only), suggesting frequency does not affect lemma access
- But other studies have found frequency effects at other stages of production (e.g., Navarrette et al., 2006)

## Research questions

- What aspects of production are affected by frequency?
- What is the relationship between frequency and repetition?
- How long lasting are any changes in frequency as a result of repetition?

We addressed these questions in a three session picture-naming experiment

## Session 1: Method

- **N=39**
- 32 HF pictures, 32 LF pictures
- Each picture presented 6 times
- Administered online

## Results

- Participants were faster with each presentation ($t=8.33$)
- No overall frequency effect ($t=-1.17$)
- But there was an interaction between frequency and presentation ($t=4.50$)
- Participants were faster to name high frequency pictures on their first presentation only ($t=-3.23$)

The frequency effect disappeared after a single repetition

## Sessions 2 & 3: Method

- **N=39**
- Old pictures, New pictures
- Each picture presented once
- Session 2: 3-5 nights after Session 1 (mean=4)
- Session 3: 10-14 nights after Session 2 (mean=12)

## Results

- Participants were faster to name high frequency pictures in both sessions ($t<2.44$)
- They were also faster for old than new pictures ($t<6.97$)
- Frequency*Picture Type ($t>2.24$): frequency effect for new pictures only ($t<2.90$)

The frequency effect was still absent 3-5 nights and 10-14 nights later

## Conclusions

- The frequency effect was reduced (and eliminated) by repetition, consistent with previous studies in the literature (e.g., Griffin & Bock, 1994)
- These findings are inconsistent with Jescheniak & Levelt (1994 – frequency is unlikely to be solely located at the phonological level
- Importantly, the frequency effect was still absent over two weeks after participants first named the pictures

Repetition altered the representations of low frequency words, making them easier to produce

In on-going work, we are testing whether frequency altered task-specific (episodic) or lexical representations