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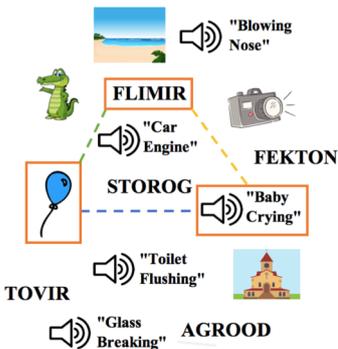
## 1 Background

New words become **integrated with existing words** in the mental dictionary but less is known about whether discrete **elements constituting a new word** become integrated with each other.

We trained participants to **associate written word forms with pictures and sounds**, and tested whether they formed fragmented or holistic word representations.

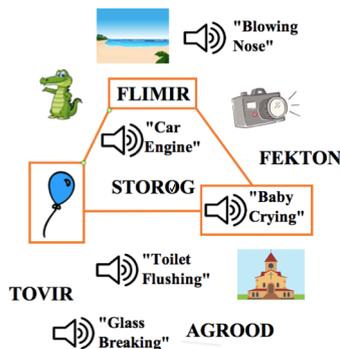
### Fragmented Representation

Association between any two elements is independent of other associations.



### Holistic Representation

Association between any two elements is dependent on the other associations.



**Retrieval dependency** = successful retrieval of BALLOON when cued with BABY CRYING predicts successful retrieval of FLIMIR when cued with BABY CRYING.

### Research Questions:

- Exp 1:** If elements of a new lexical representation are integrated into a holistic representation, we should observe retrieval dependency.
- Exp 2:** If holistic representations fragment during forgetting, retrieval dependency should disappear after a delay.

## 2 Methods

**Participants:** 30 monolingual English speakers in each Exp.

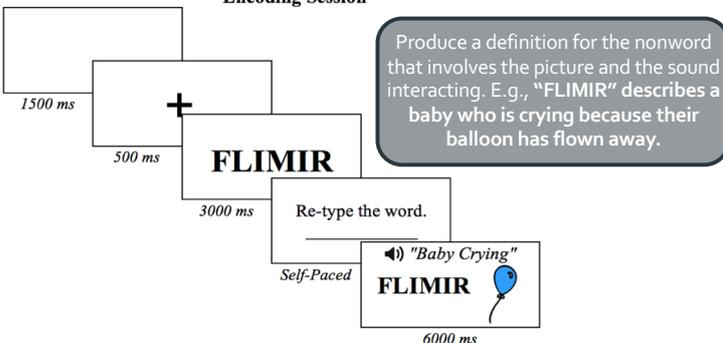
**Stimuli:** 24 word triplets consisting of orthographic, visual, and auditory elements.

**Procedure:** Immediate test in Exp 1; Immediate & delayed test in Exp 2.

Experiment	Training	Immediate Test	1 Week Retention Interval	Delayed Test
1	24 Word Triplets	24 Word Triplets		
2	24 Word Triplets	12 Word Triplets		24 Word Triplets

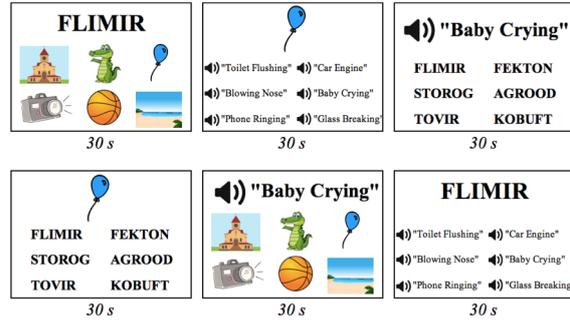
In Exp 2, 12 triplets were tested (tested at both test sessions) & 12 were non-tested (tested at delayed test only).

### Encoding Session



## 2 Methods

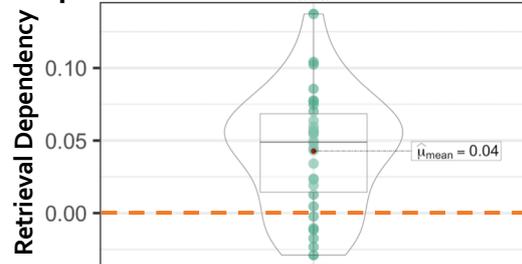
### Test Session: 6-AFC Recognition Memory



One pairwise association from each word triplet tested across 6 blocks.

## 3 Results

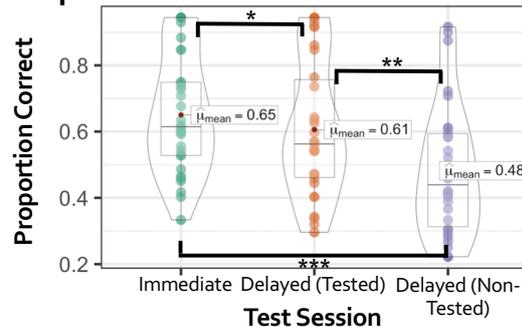
### Experiment 1:



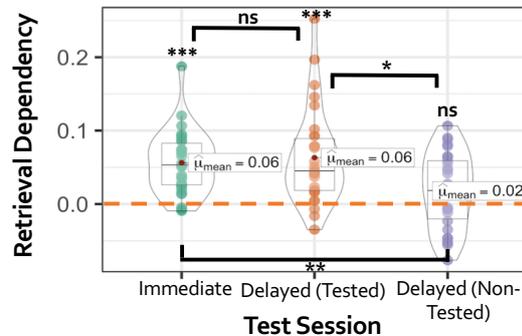
\*\*\*  $p < .001$   
 \*\*  $p < .01$   
 \*  $p < .05$

Retrieval dependency is significantly above 0.

### Experiment 2:



Significant forgetting for both tested and non-tested triplets.  
 Testing effect = accuracy greater for tested than non-tested triplets at delayed test session



Retrieval dependency at immediate but not delayed test session.  
 Testing effect = degree of retrieval dependency maintains after one week for tested triplets but not non-tested triplets.

## 4 Conclusions

Lexical memories form an **initial holistic representation** but **fragment over forgetting**. This differs from event memories which do not fragment (Joensen et al., 2020).

**Retrieval practice** protects against forgetting-induced fragmentation.

**Arbitrary form-meaning links** may be more difficult to maintain than event memories.