Recap

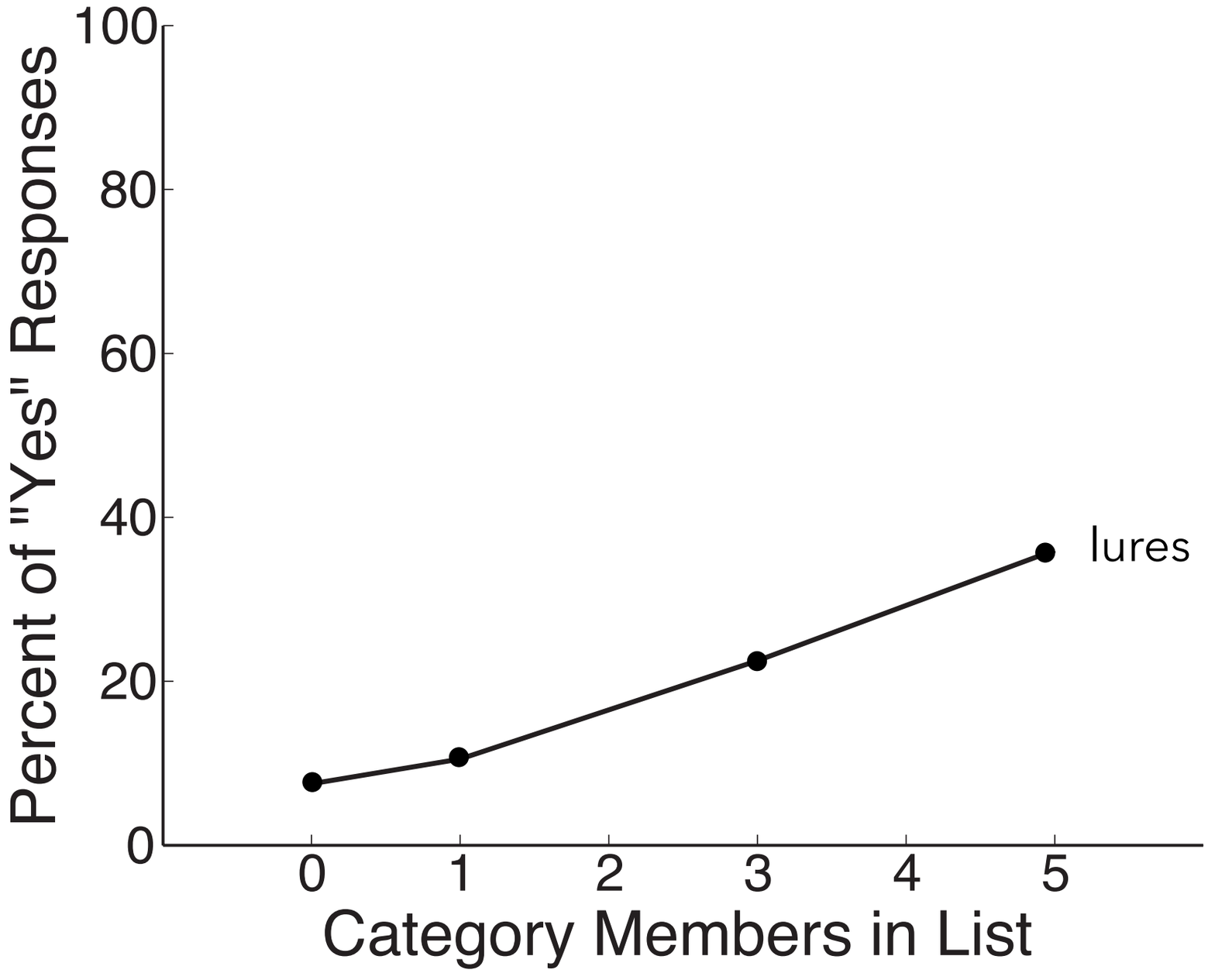
- Multiple trace hypothesis
- Summed similarity (link to recognition memory)

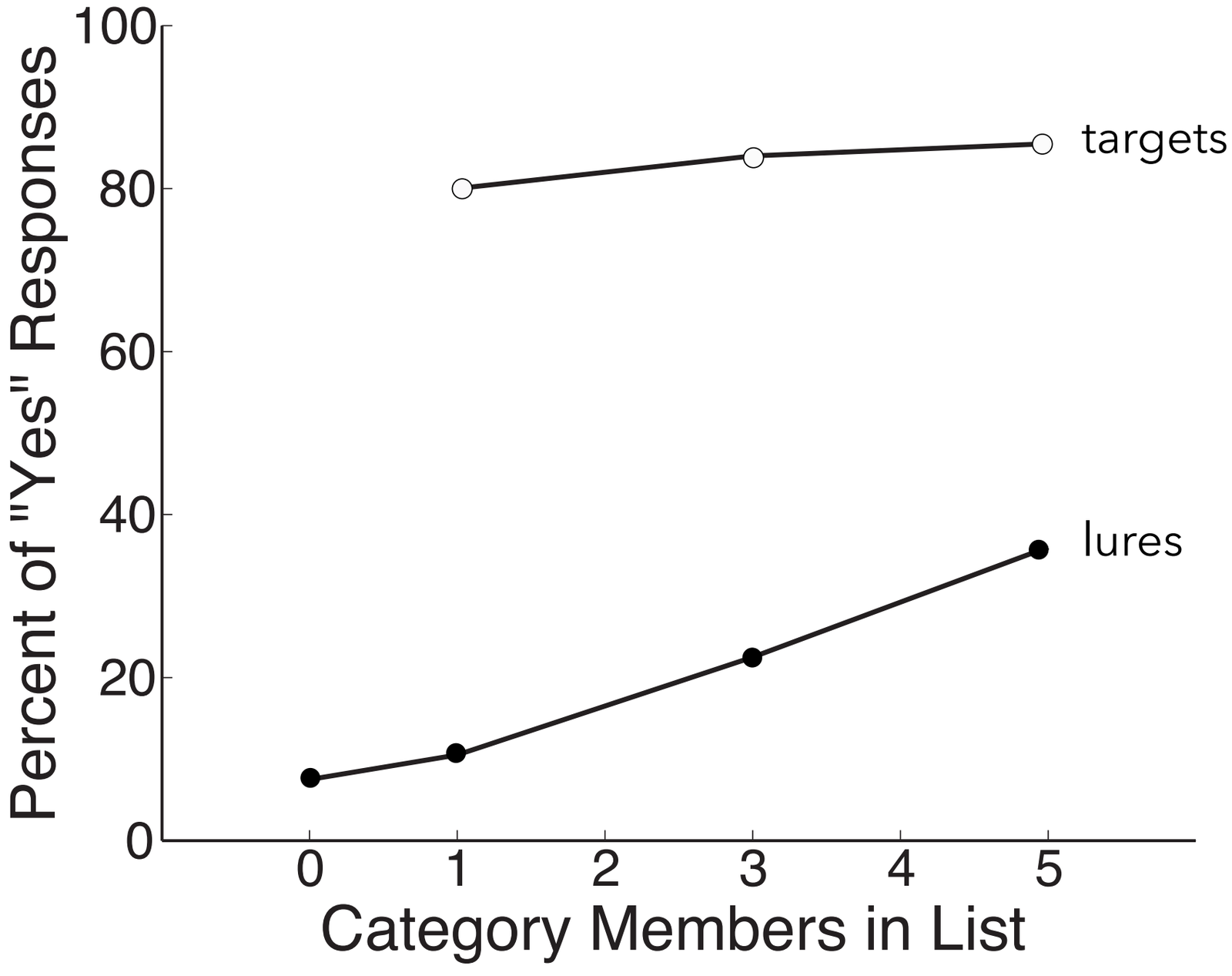
Empirical evidence for summed similarity

Experiment I: Recognition of items from categorized lists

Study: PREACHER, RUBY, SHIRT, COAT, MINISTER, PEARL, DRESS, BOOKLET, DIAMOND, SAPPHIRE, RABBI, MOUSE, EMERALD, . . .

Test: DIAMOND (target), BROCHURE (lure), BLOUSE (lure), BOOKLET (target), OPAL (lure), DRESS (target), . . .


Percent of "Yes" Responses
100
80
60
40
20
0
0
1
2
3
4
5
Category Members in List
lures


Percent of "Yes" Responses
100
80
60
40
20
0
0
1
2
3
4
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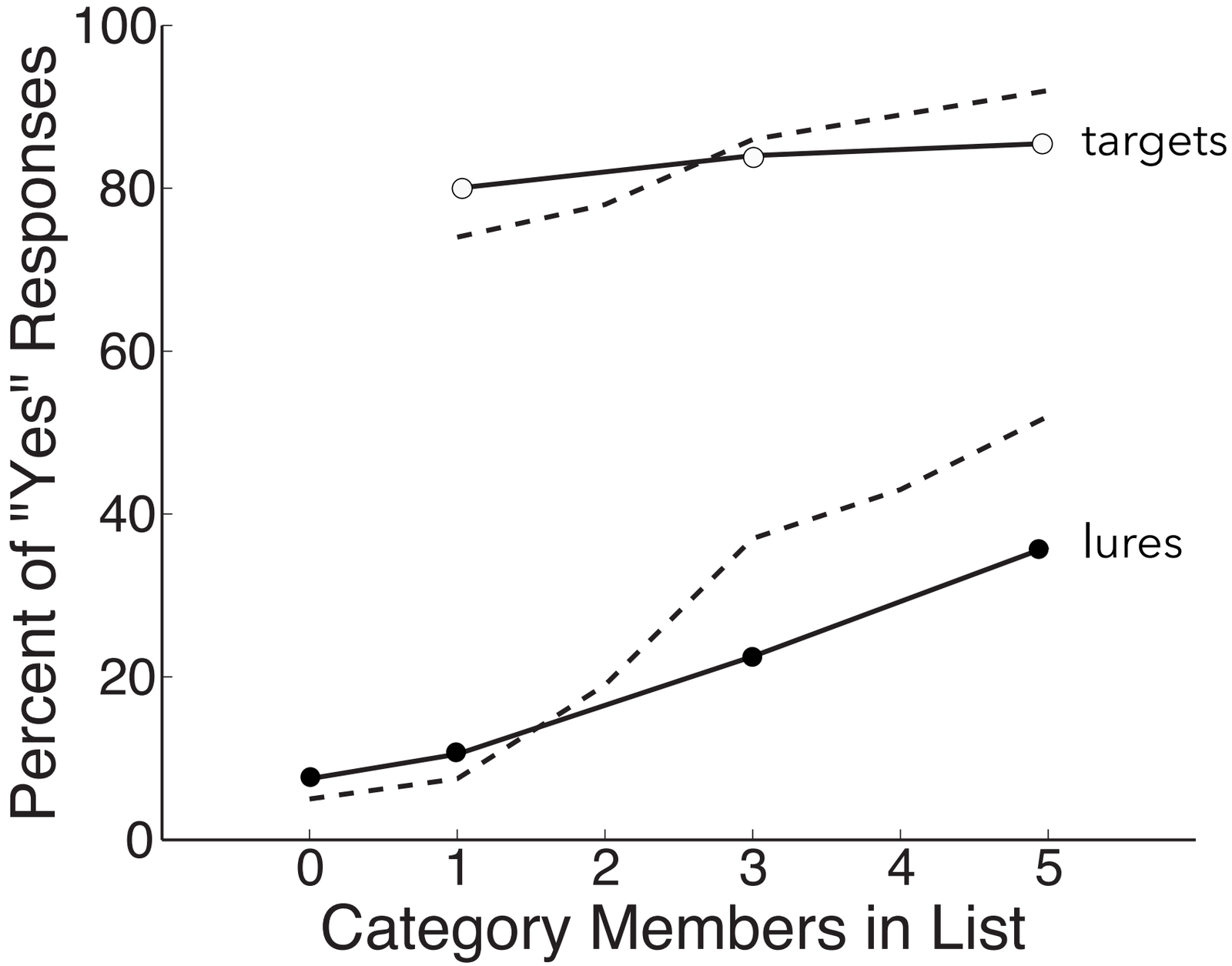
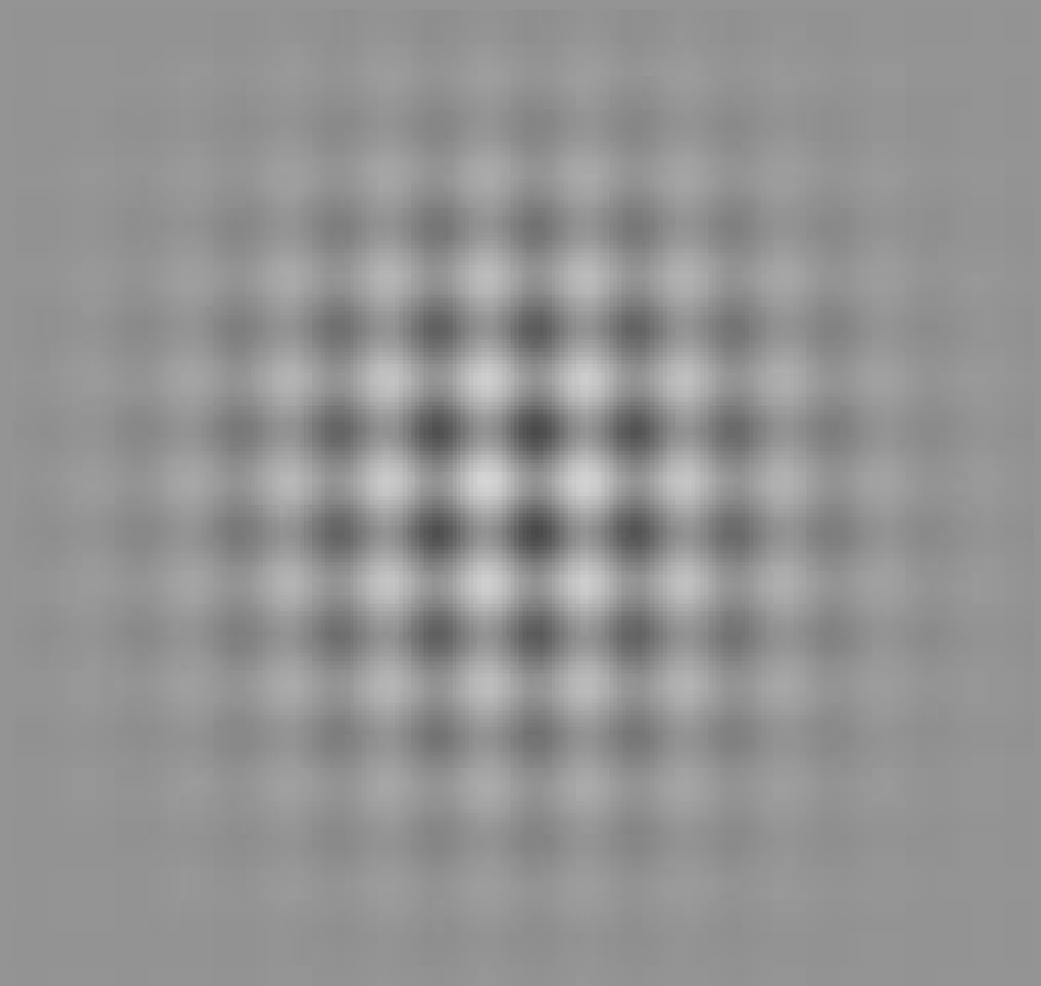
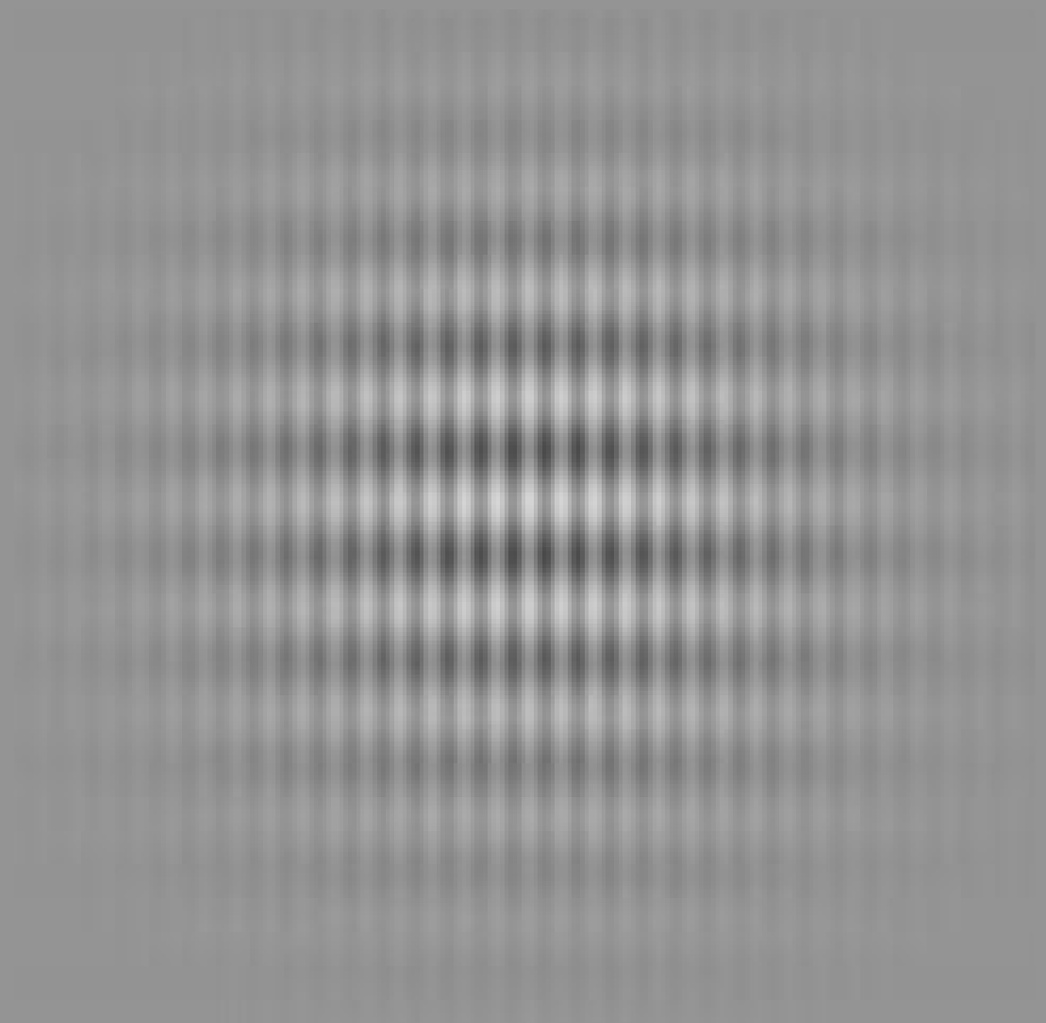
Category Members in List
targets
lures


Percent of "Yes" Responses
100
80
60
40
20
0
0
1
2
3
4
5
Category Members in List
targets
lures

Experiment 2: Recognition of visually-similar textures





+

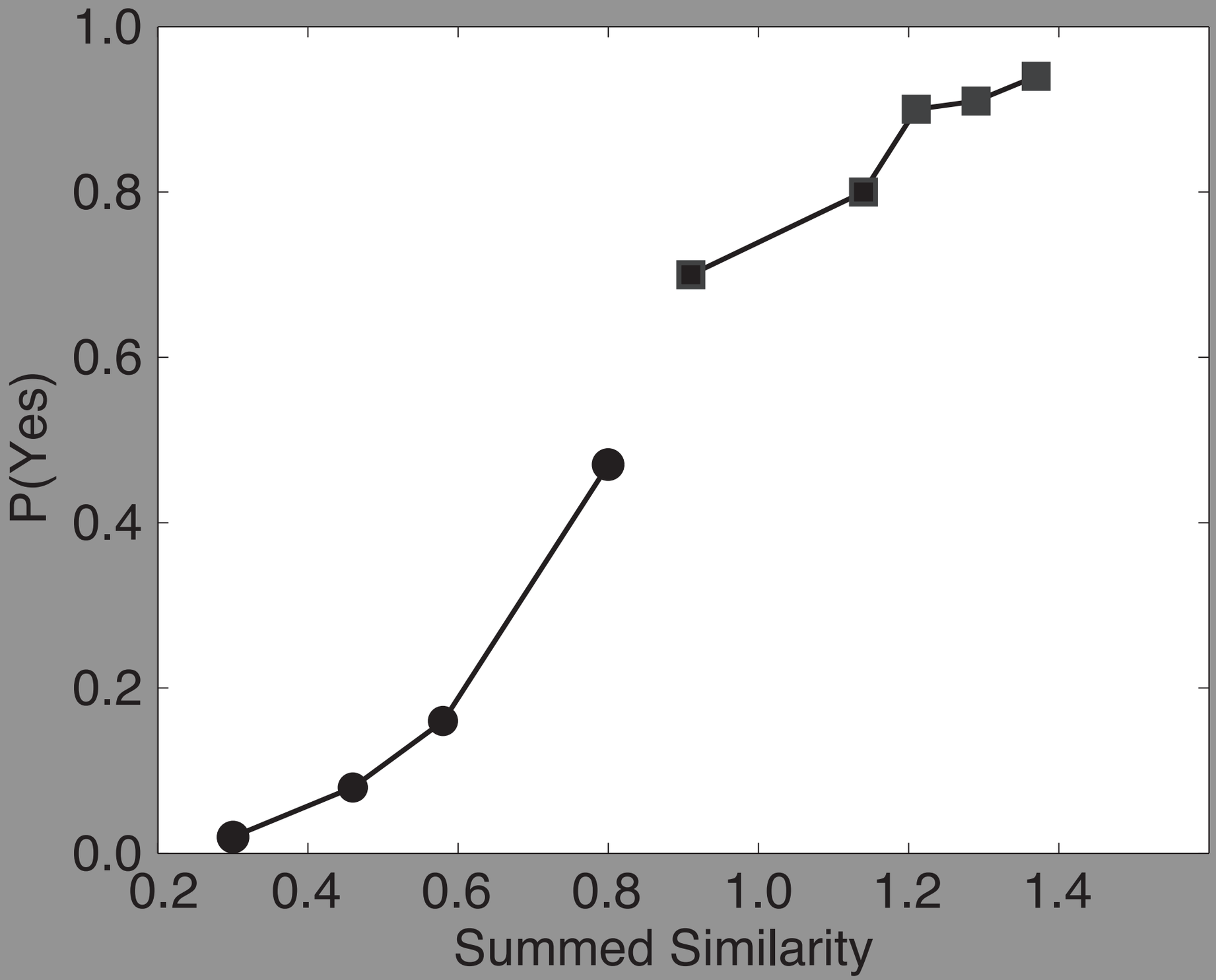

1.0
0.8
0.6
0.4
0.2
0.0
P(Yes)
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Summed Similarity

Photo lineups

Clark and Tunnicliff, 2001

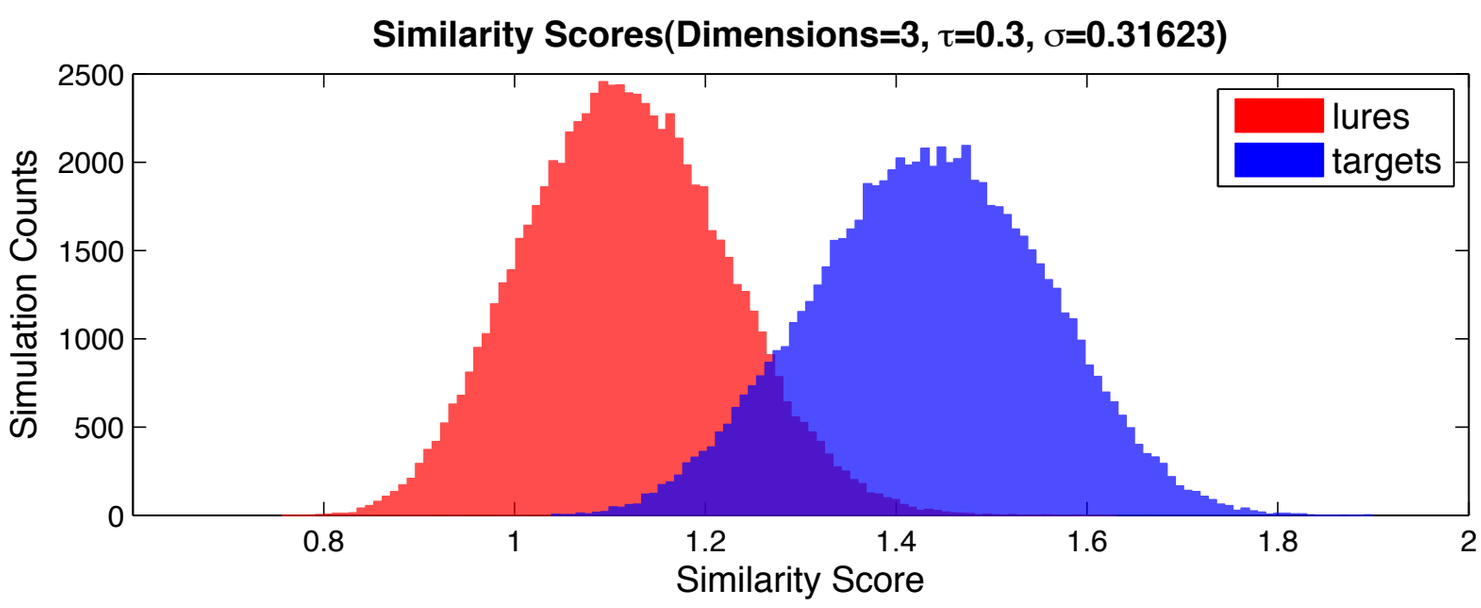
Connection to strength theory

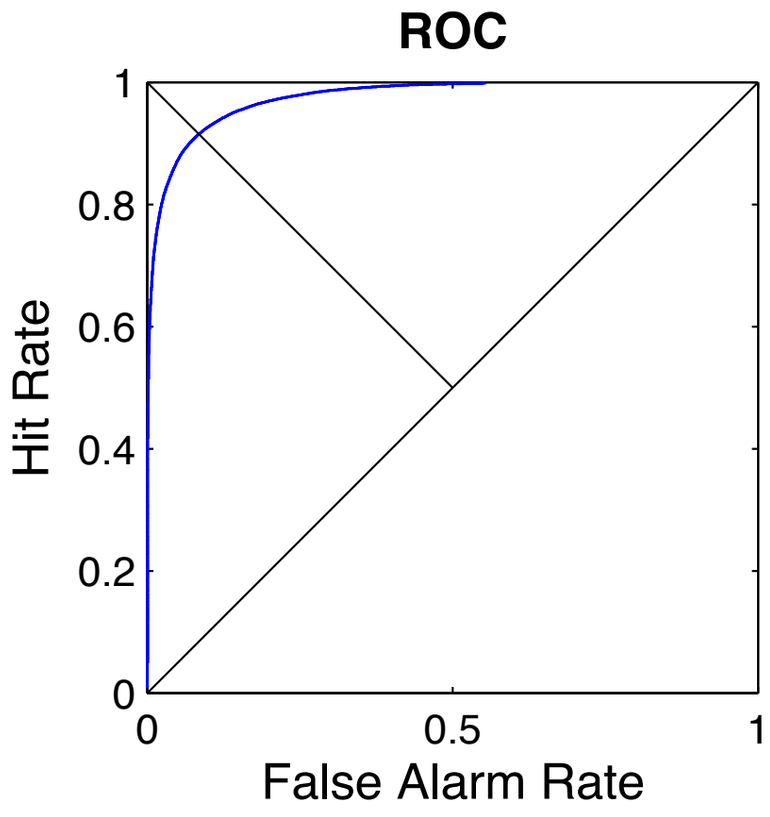
- Given a baseline item, we can ask how similar each target and lure is to that baseline item

- We get a distribution of lure similarity values and target similarity values (analogous to lure and target strength values)

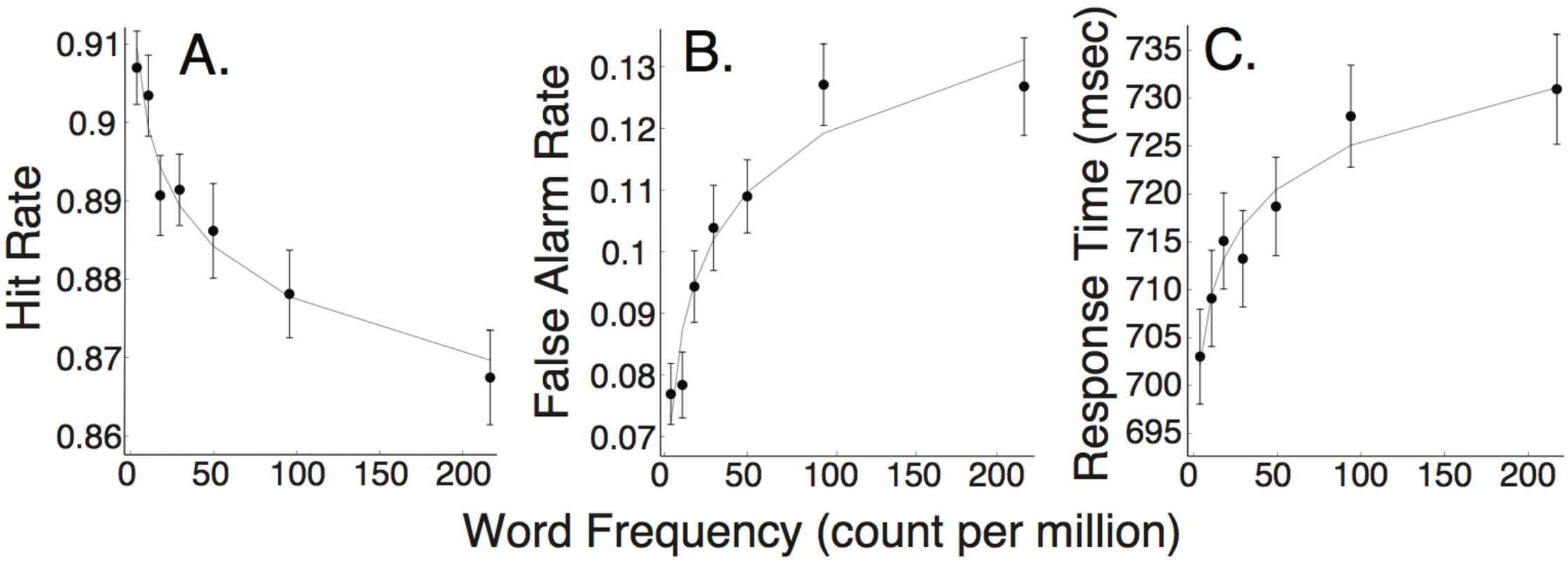
- We can make ROC curves using these similarity values

Summed similarity ROC





Revisiting the mirror effect



More frequently used English words have (A) lower hit rates and (B) higher false alarm rates. They also have (C) longer response times.

Revisiting the mirror effect

- Words' attribute vectors are related to the contexts in which the words occur
- Common words are associated with many contexts
- Therefore any two common words are more likely to share contextual features
- Therefore common words are (on average) more similar to each other than rare words

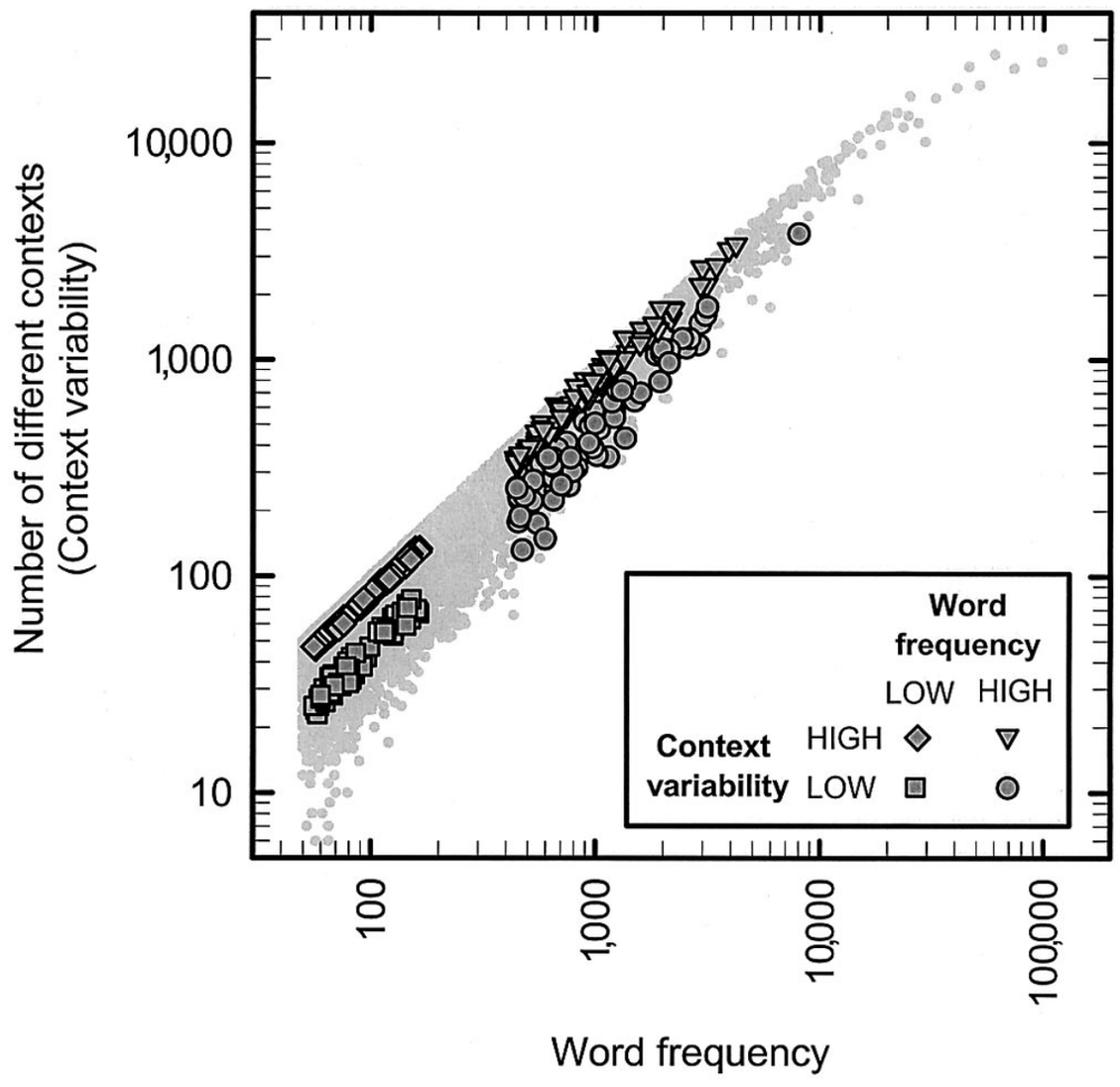
Revisiting the mirror effect

- How much “boost” in similarity “strength” does a common word get after a new presentation?
- That’s determined by how different the presentation context is from one of the contexts already associated with the word
- Since common words are associated with many contexts, the chances of the current context being different is smaller for common vs. rare words

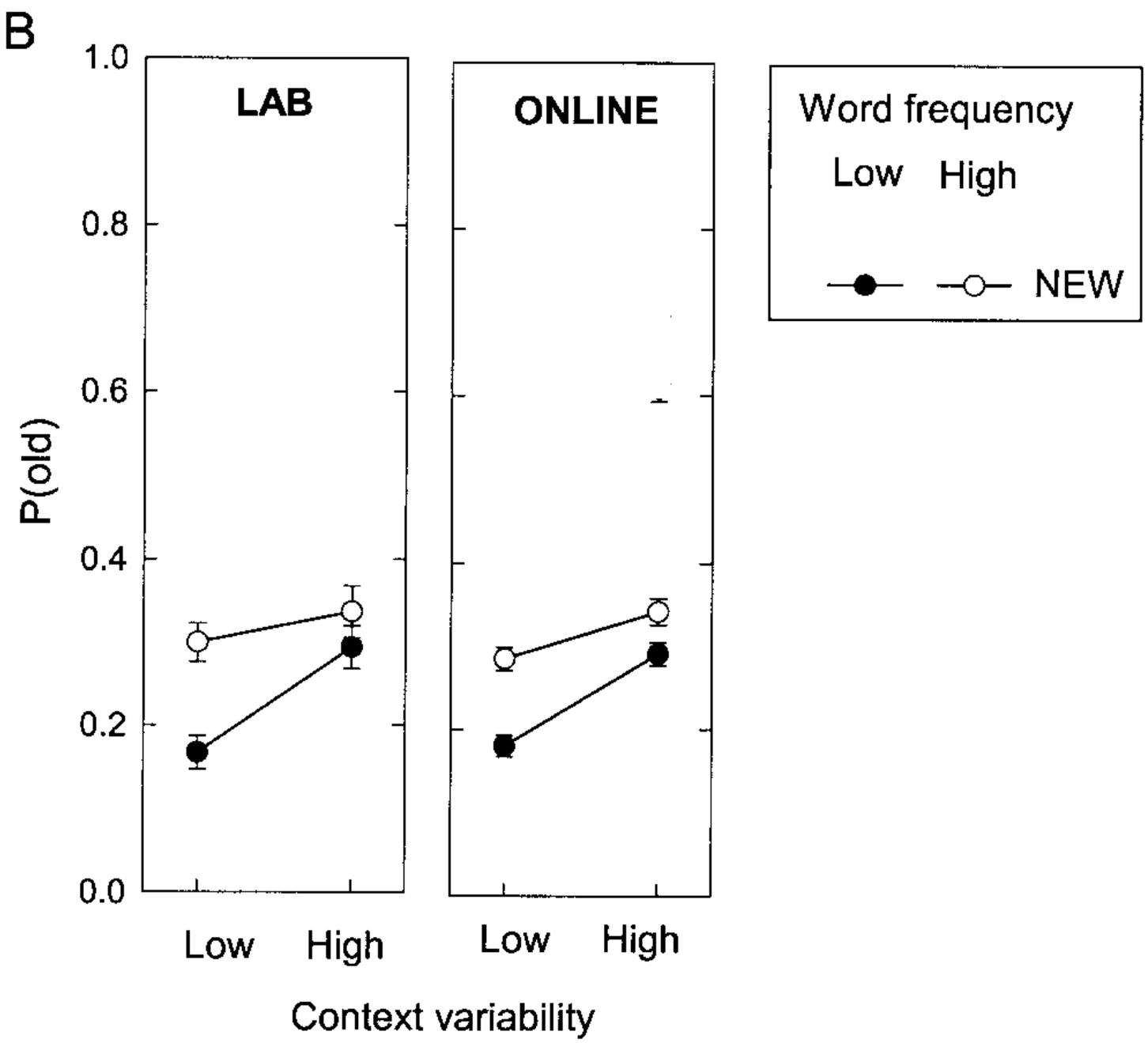
Revisiting the mirror effect

- Common words get a smaller boost in strength after a presentation, because the presentation context will tend to overlap more with the common word's associated context
  - This explains why common targets have a lower hit rate
- Common words are more similar to anything (on average), so they start out with a higher similarity to the probe
  - This explains why common targets have a higher false alarm rate

Word frequency or contextual similarity?



Common words have higher false alarm rates (made worse by increased contextual variability)



Common words have lower hit rates (made worse by increased contextual variability)