

# Search efficiency scales with audiovisual semantic relatedness

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## Does semantics guide audiovisual search?

Semantic information is crucial to understanding real world environments<sup>1</sup>

Sounds speed search for “perfect match” images (e.g., meow, cat)<sup>2,3</sup>

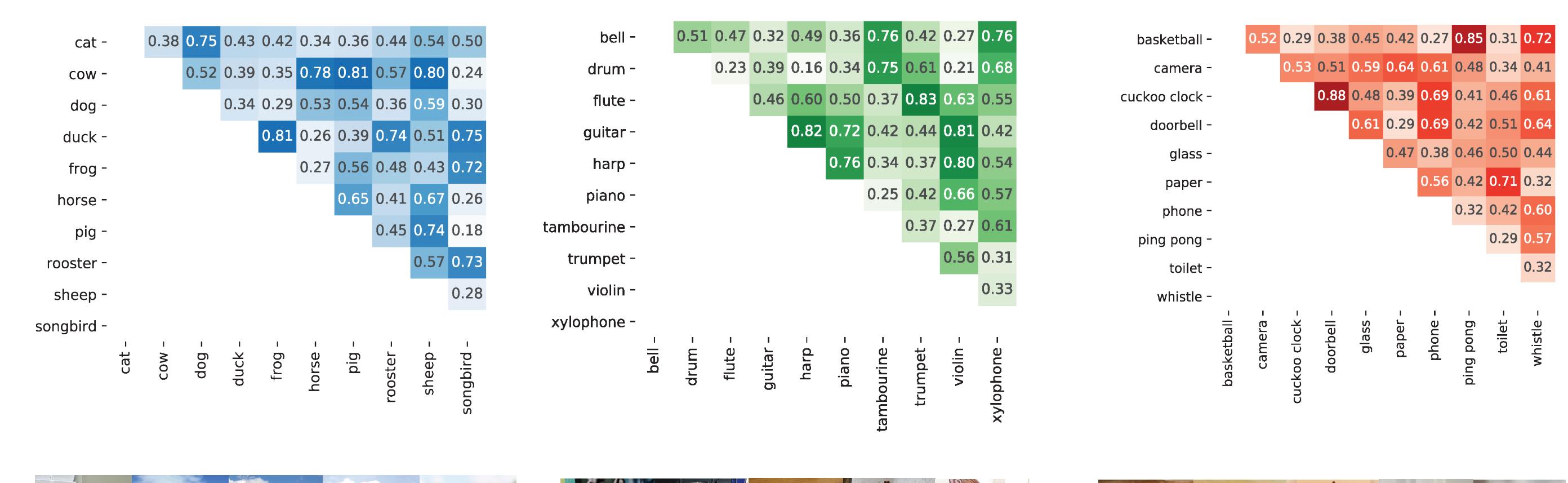
Is the audiovisual search benefit **specific** to perfect matches?

Is it **generalizable** to other semantic relationships?

Is it **sensitive to context**, such as set size?

## Quantifying semantic relatedness

**Sight-Sound Semantics Database<sup>4</sup>:** (Available on OSF!)



Animals



Instruments



Household items

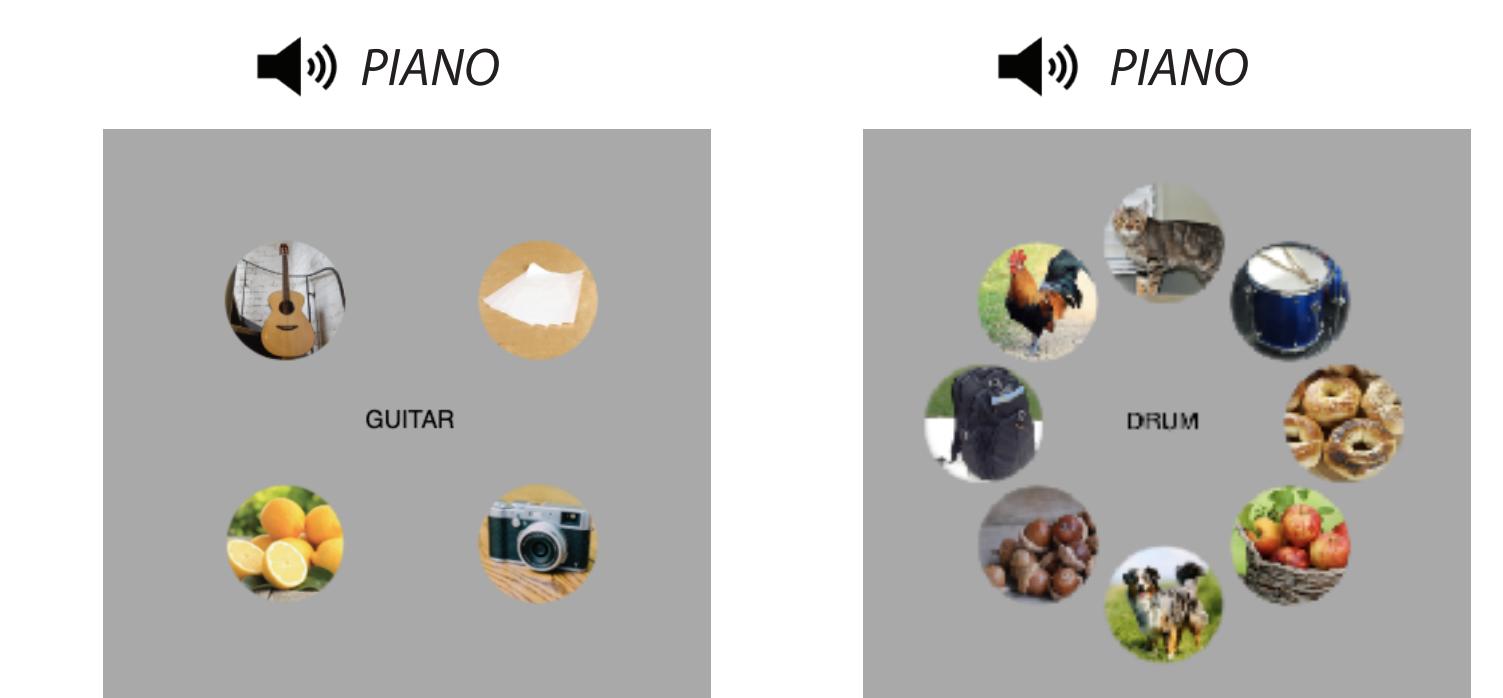
## Measuring semantic influence on attention

**Search:** Where is the image for the target word?



- 123 participants
- 90 sound/image pairs
- Sound irrelevant to task
- 500 ms delay before response

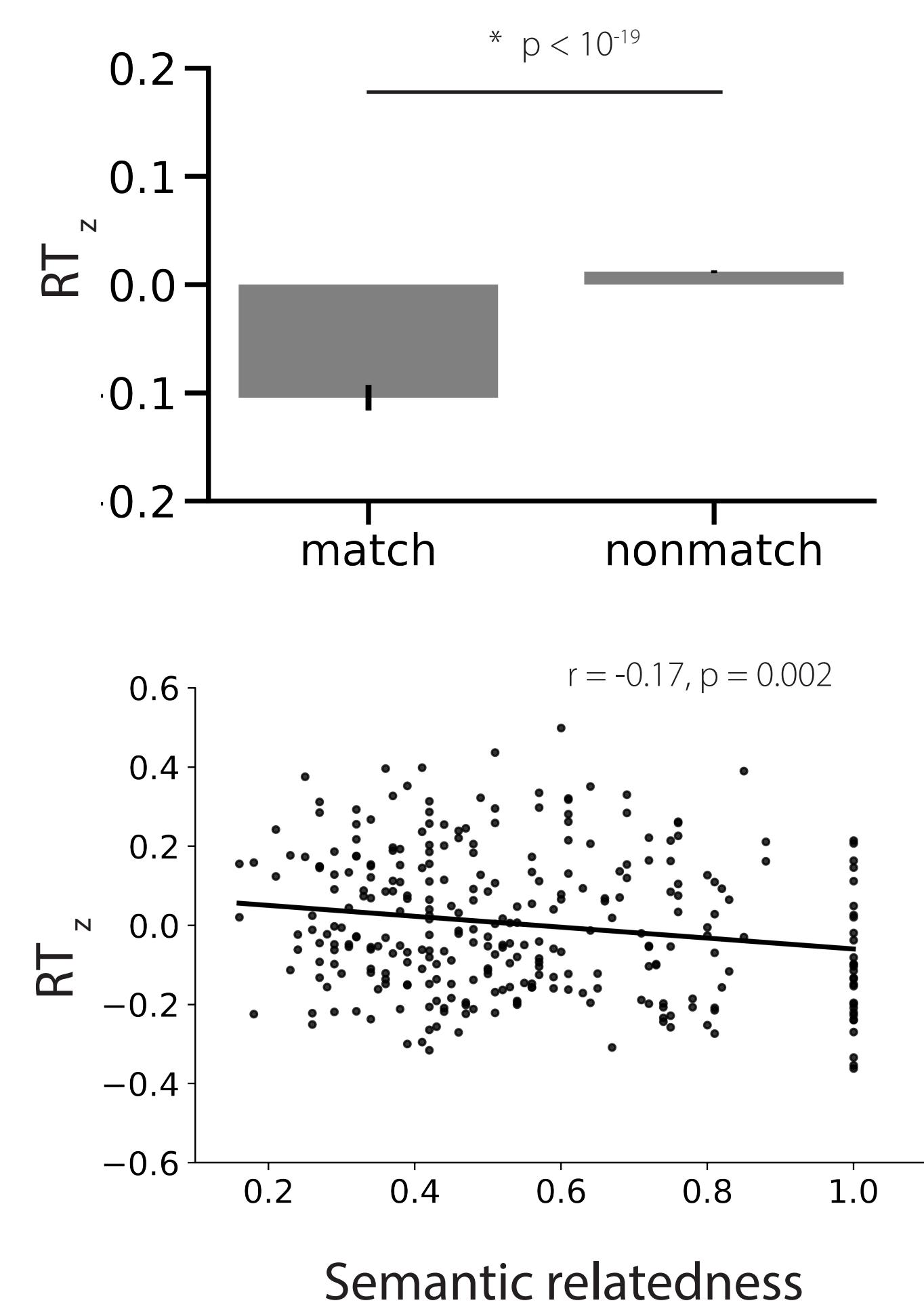
## Search set manipulation



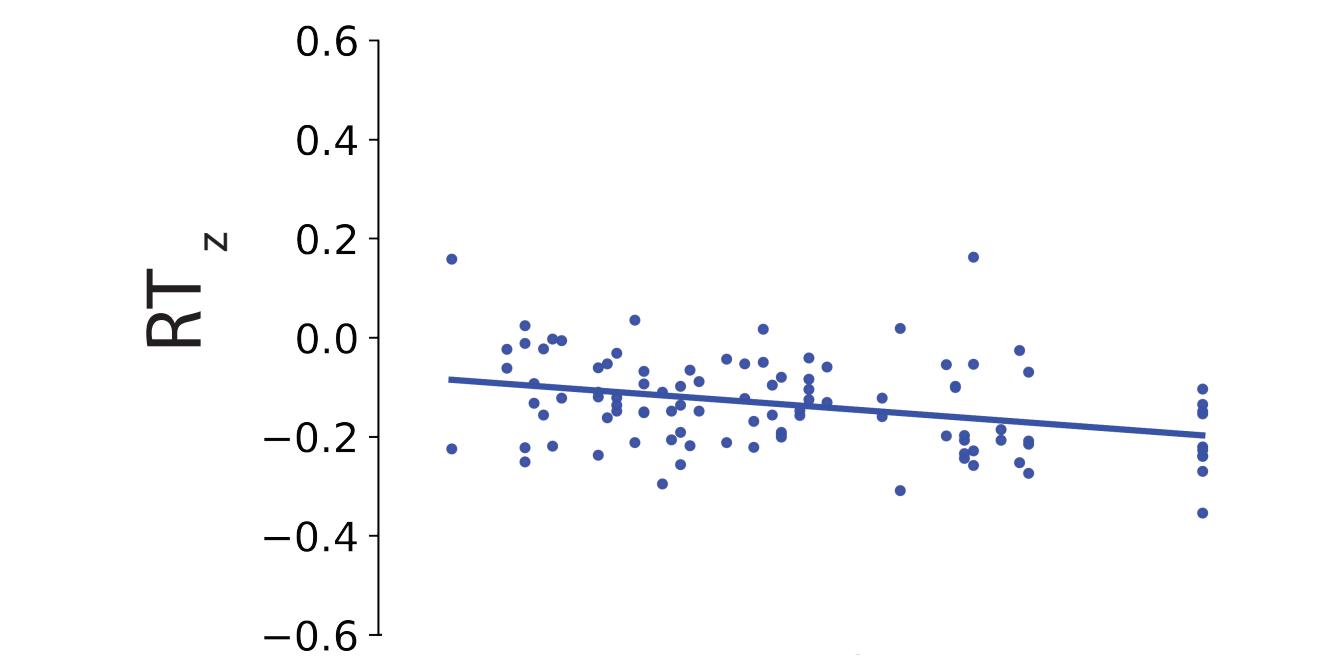
- 198 participant
- 2 set sizes: 4 images & 8 images
- Immediate response

## As semantic relatedness increases, search speeds decrease

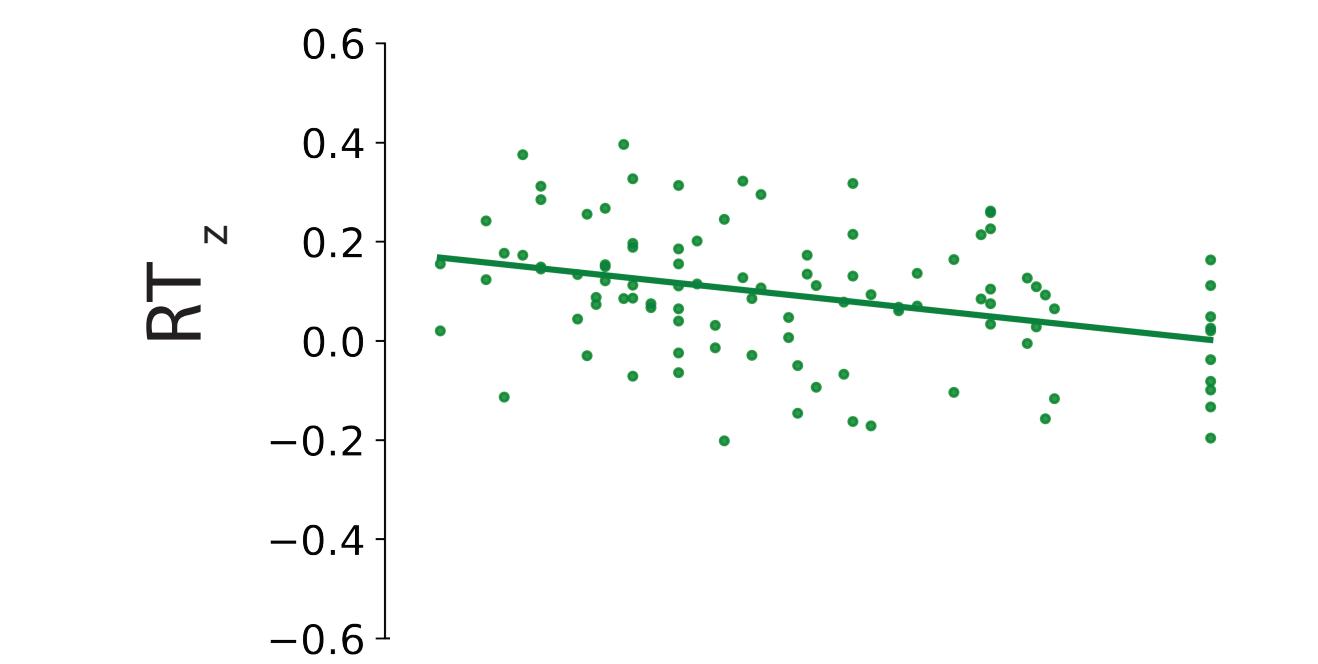
### All categories



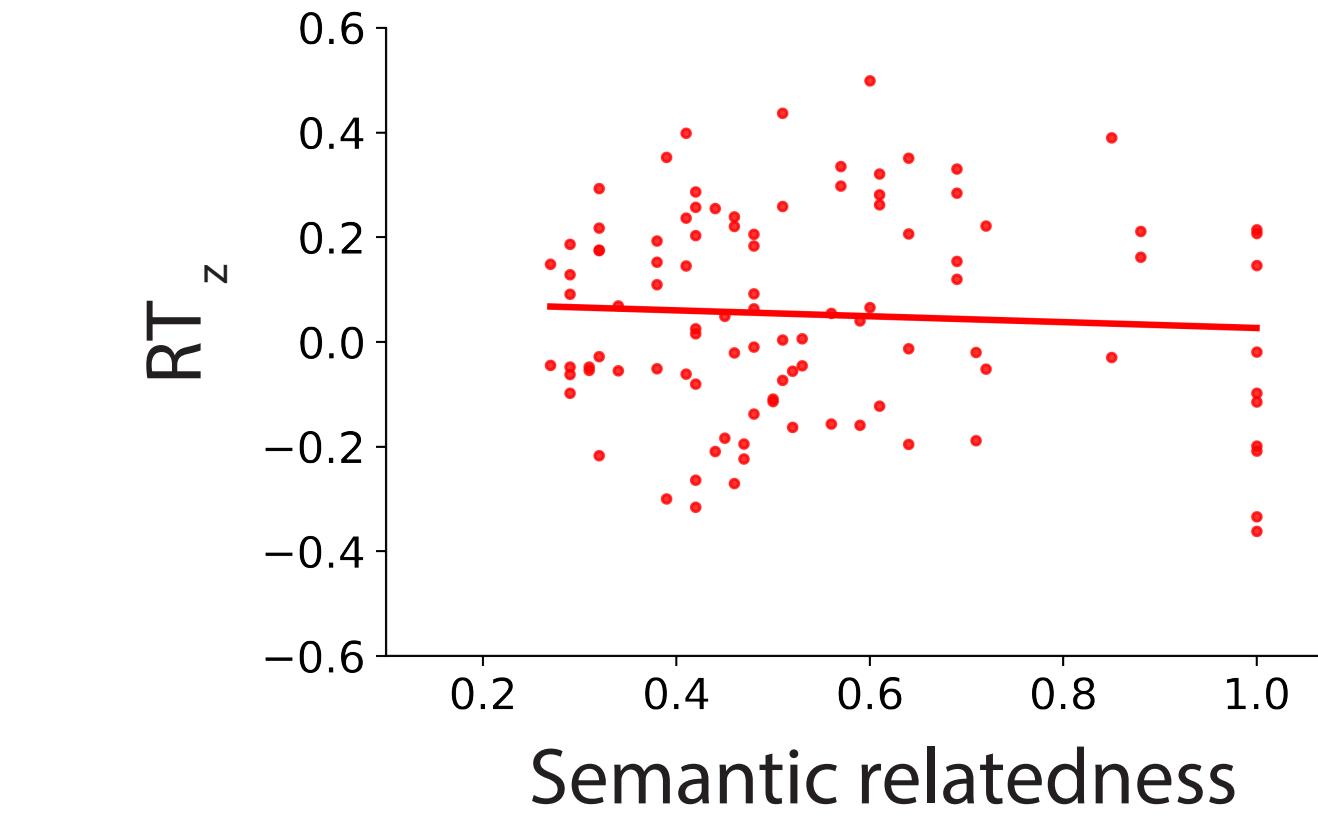
### Animals



### Instruments



### Household items



## Conclusions

Search efficiency is modulated by audiovisual semantic relatedness

The audiovisual semantic benefit is:

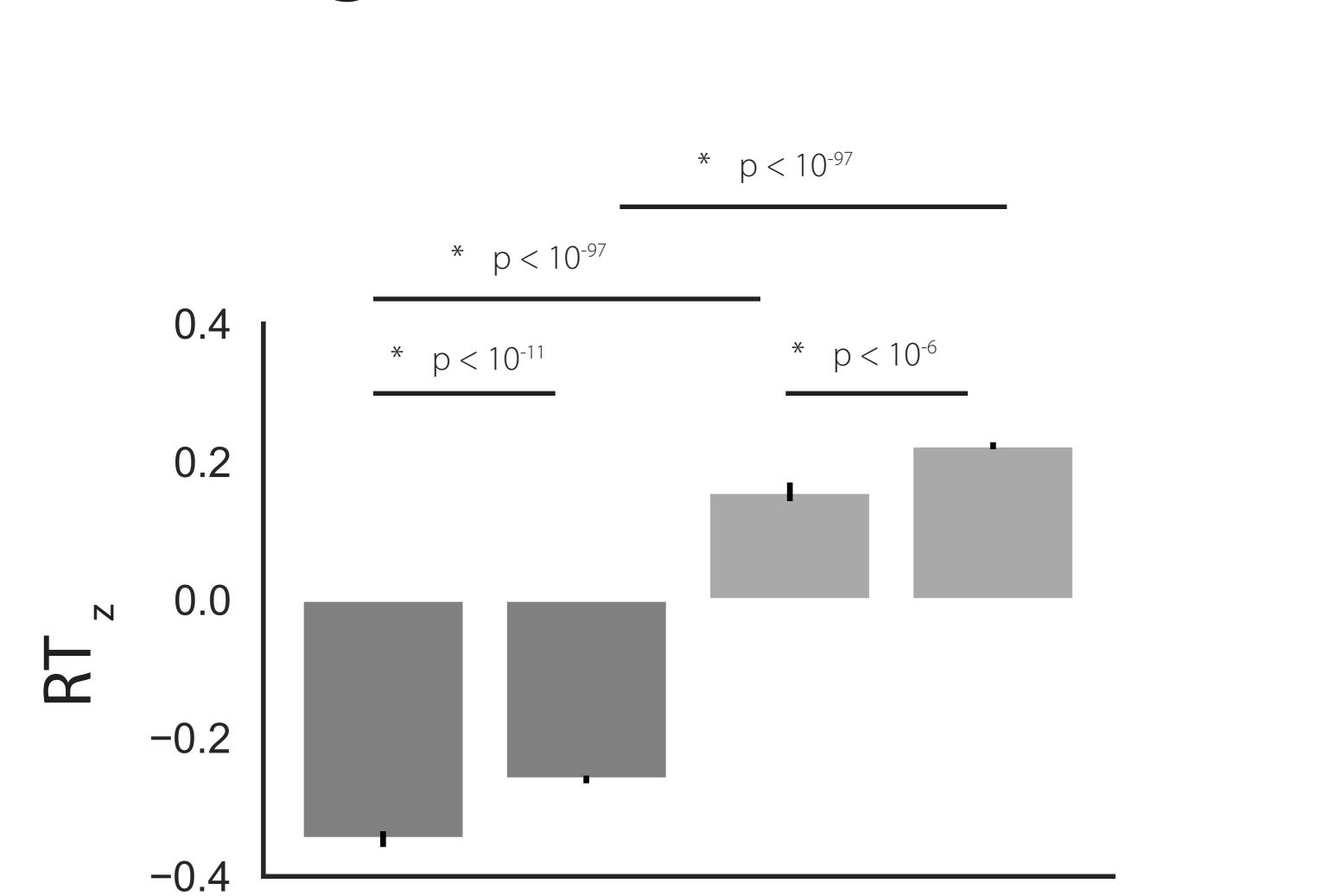
1. not specific to “perfect matches”
2. sensitive to category factors
3. sensitive to overall context & information available

Leading to larger theoretical implications, such as:

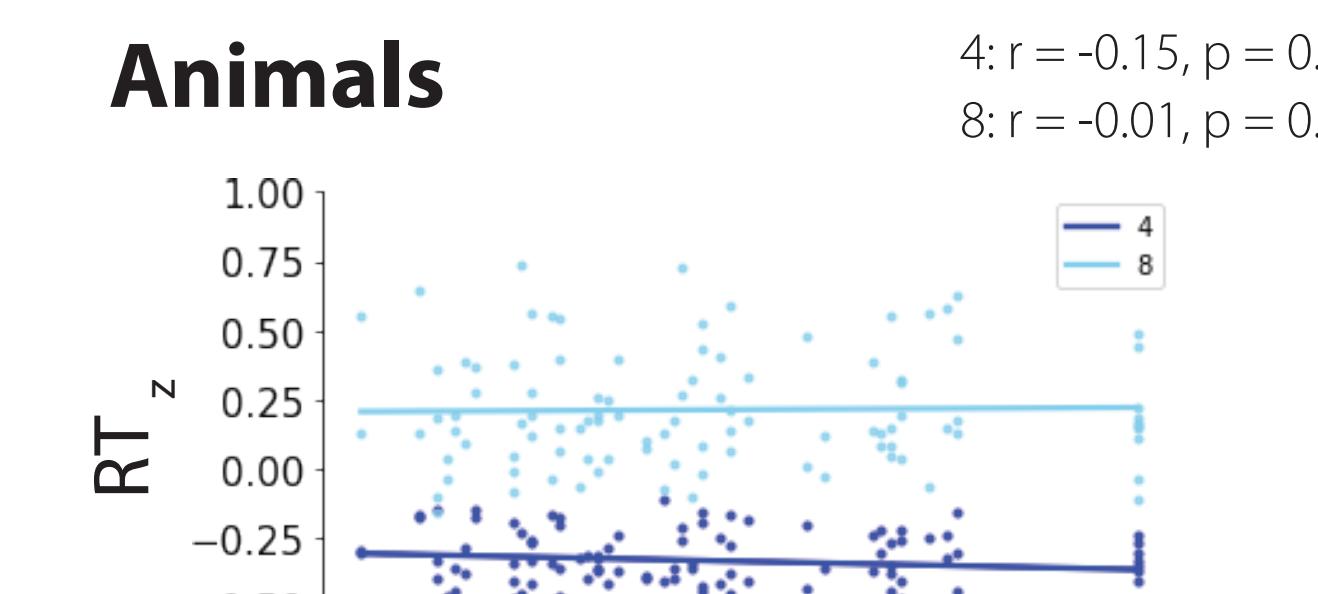
1. More types of semantic relationships may influence attention than thought
2. Attentional prioritization is dynamic and highly contextual

## Semantic benefit is sensitive to the overall context

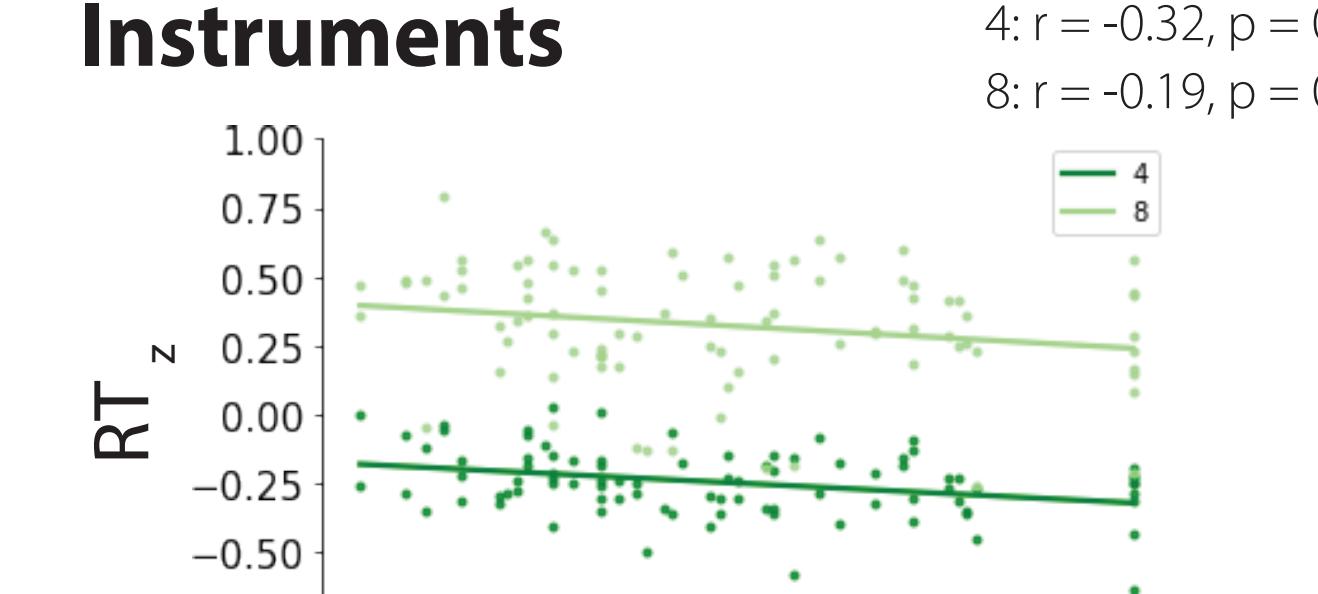
### All categories



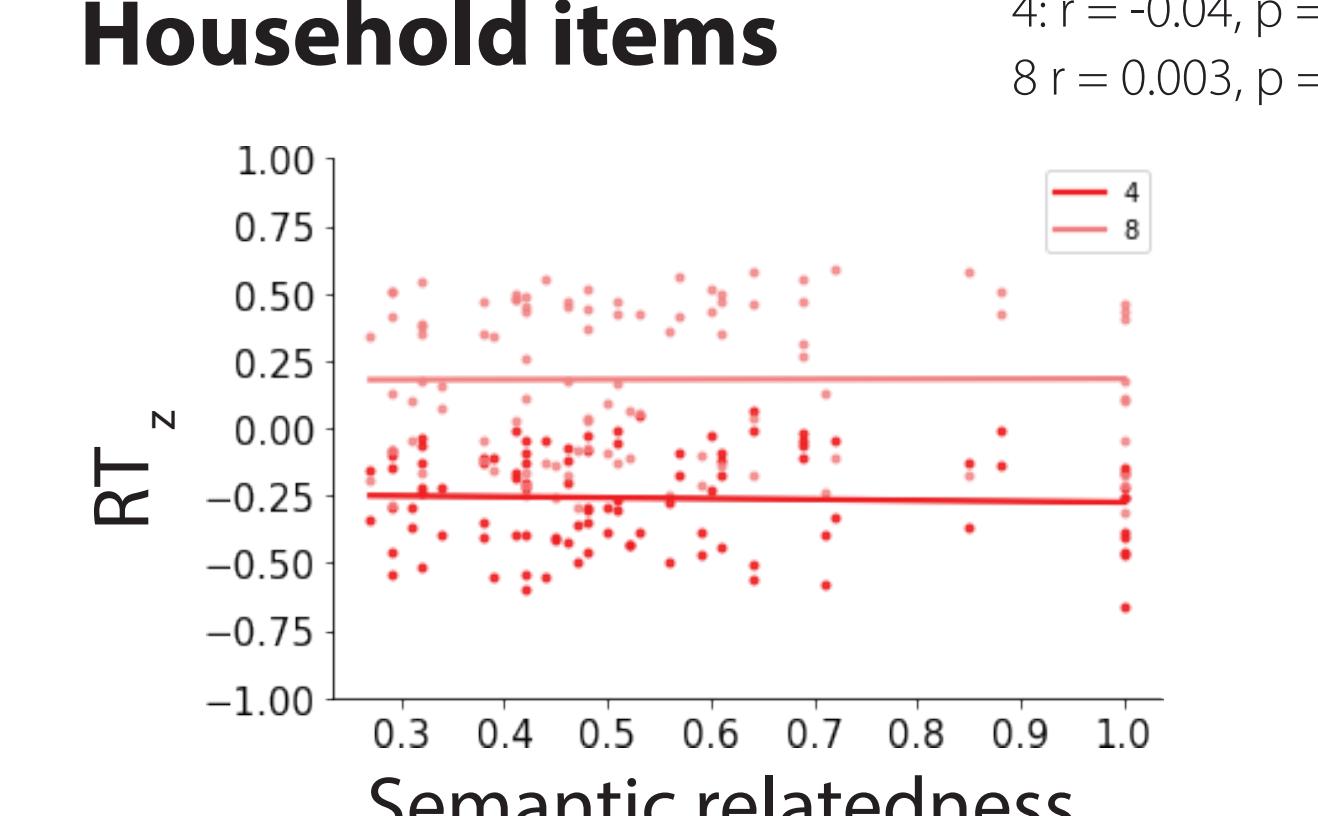
### Animals



### Instruments



### Household items



## Future questions

What neural mechanisms underpin attentional prioritization for semantically related sounds & images?

Are attentional prioritization maps multisensory in nature?

Can visual information modulate attentional priority for auditory signals?

**References** (1) Malcolm, et al 2016 (2) Iordanescu, et al 2008  
(3) Kvasova, et al 2019 (4) Wegner-Clemens, et al, 2022

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