



# Perceptual Learning on Simultaneity and Temporal Order Judgments

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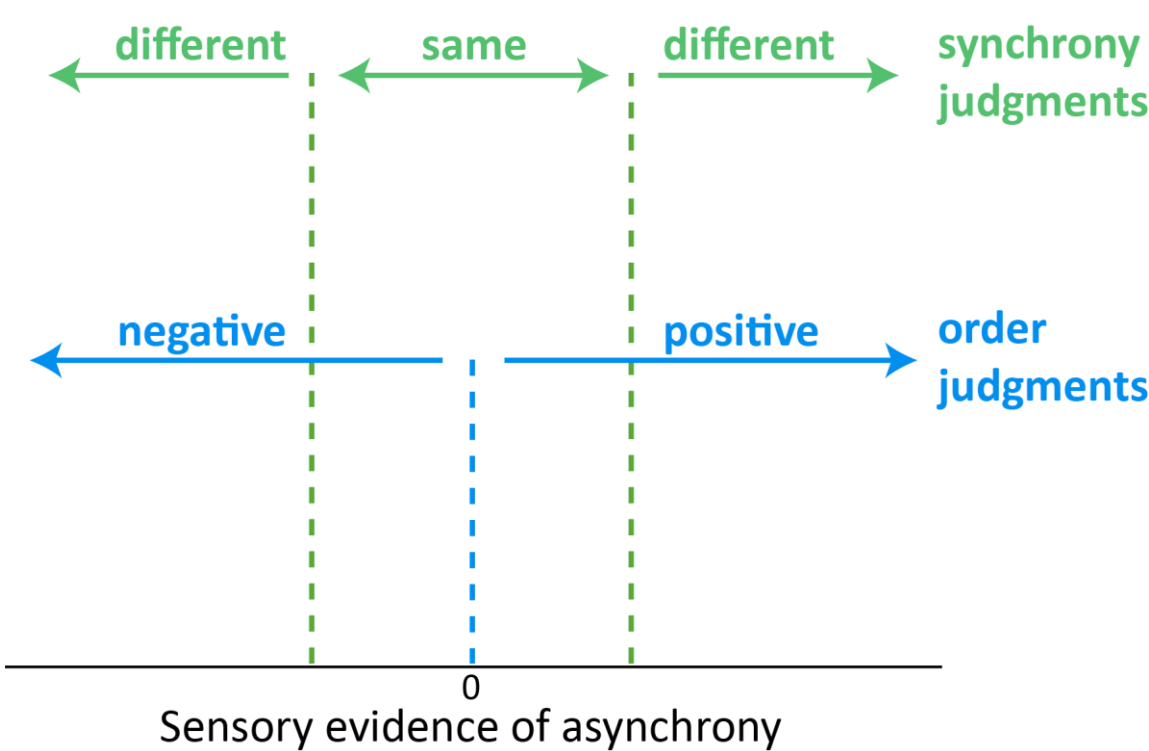
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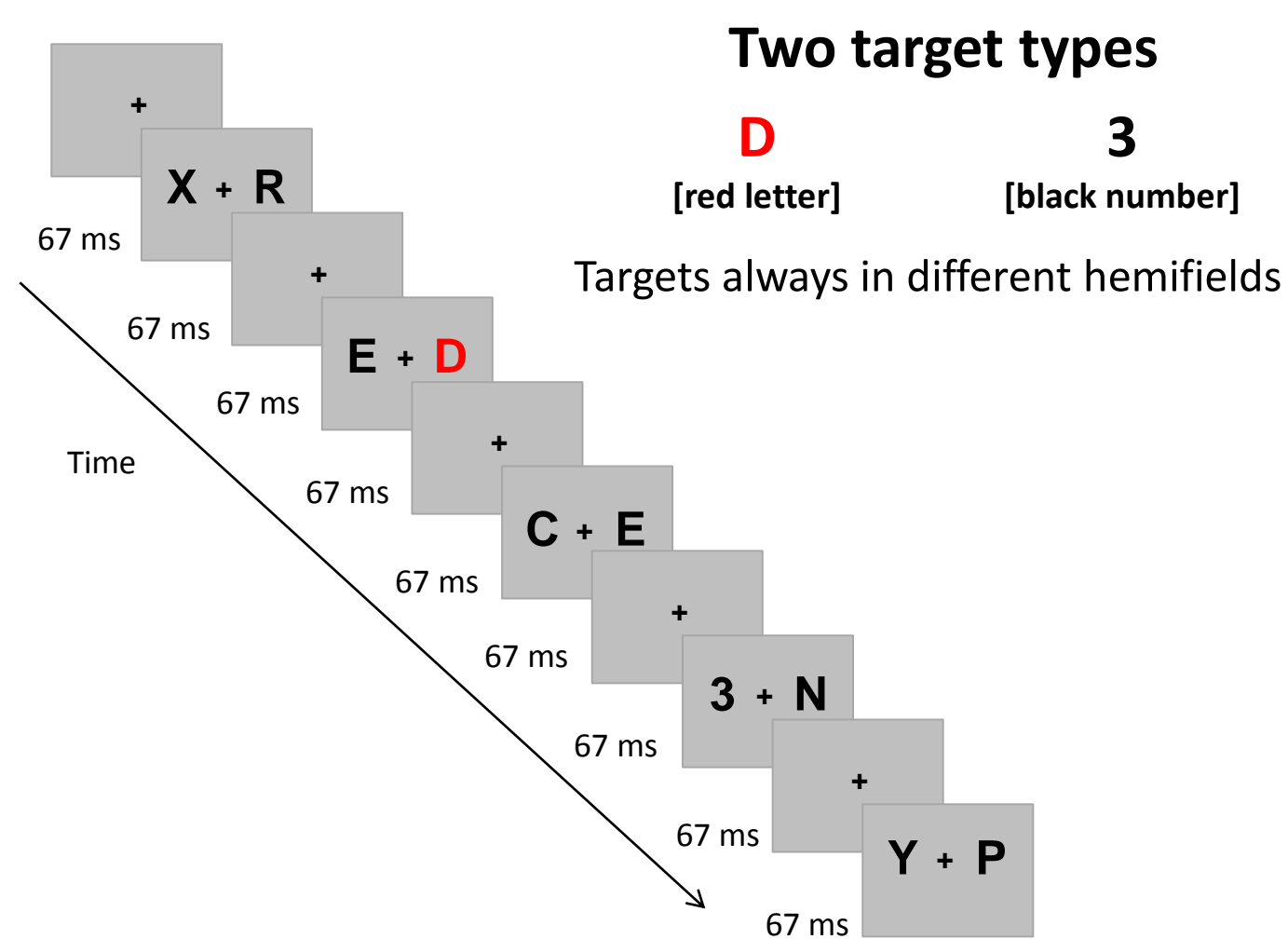
Poster # 56.3003

## Introduction

SJs and TOJs both depend on arrival-time differences, yet may rely on distinct boundaries in temporal decision space.



## RSVP Stream



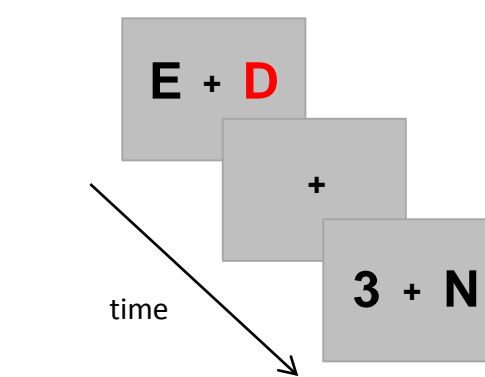
RSVP stimuli were identical for both tasks<sup>1</sup>

## Method

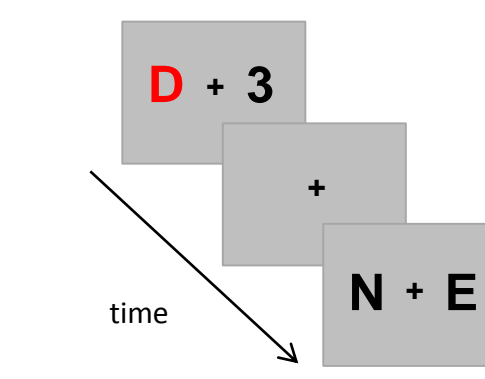
### Temporal Order Judgment (TOJ)

Which Came First?  
**Letter** or **Number**

### Example Trials



Order Judgment: Letter 1st



Sync Judgment: Same time

### Synchrony Judgment (SJ)

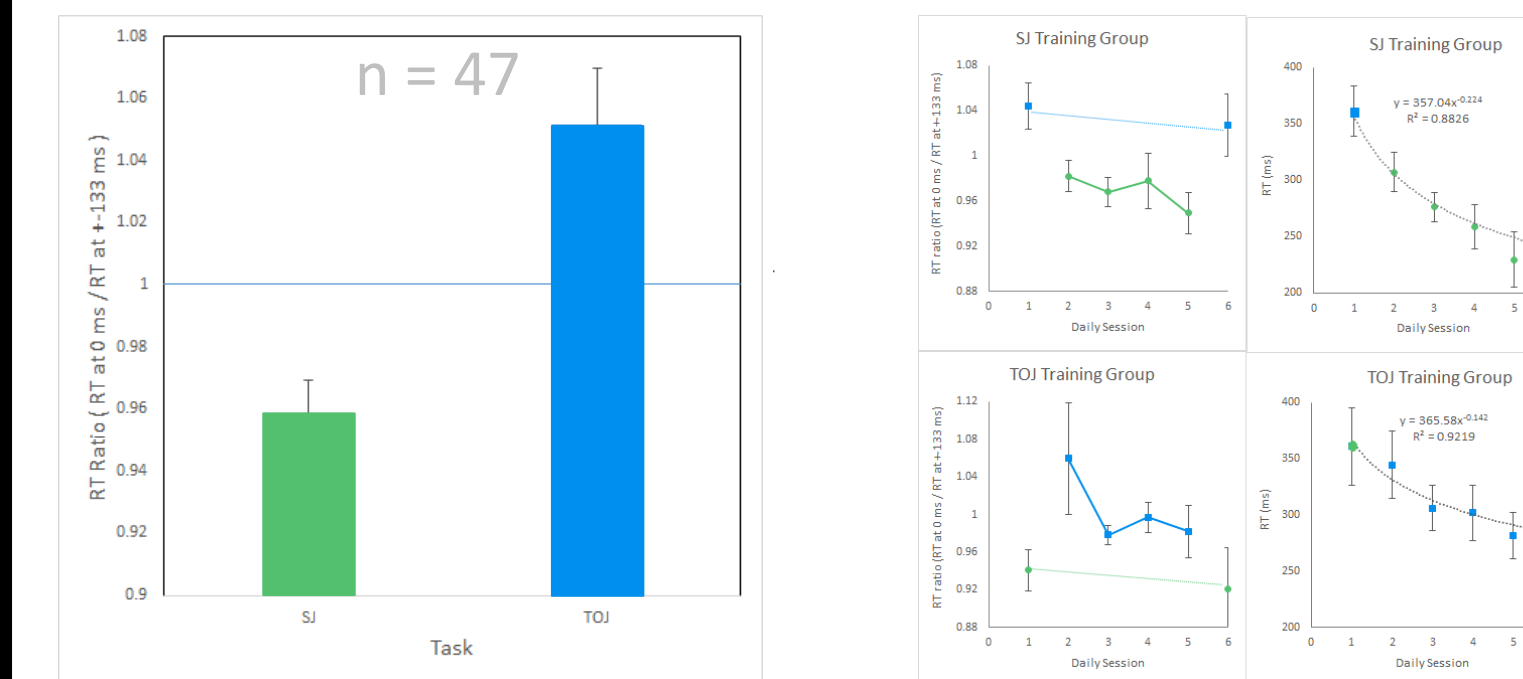
Did the **Letter** & Number appear at the Same time or Different times?

## Training schedule

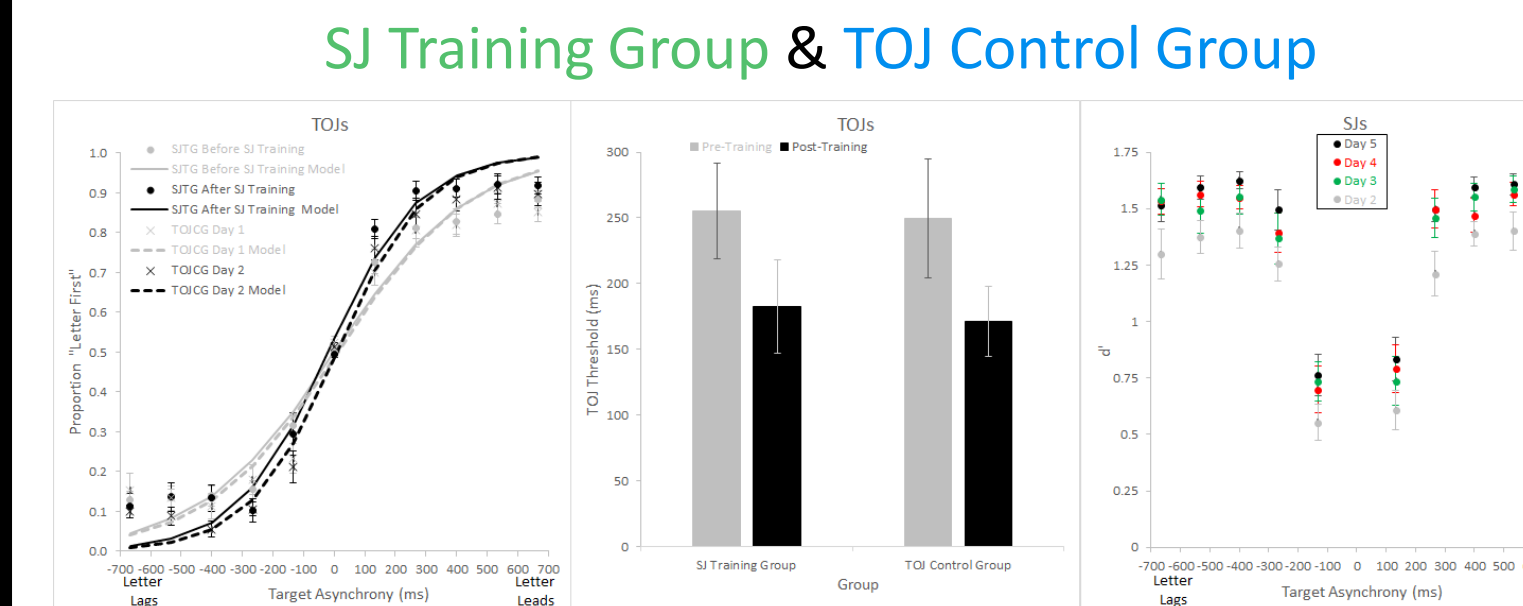
	Day 1	Days 2 - 5	Day 6
<b>SJ Training Group</b> n = 9	Pre-train TOJ	SJ Training	Post-train TOJ
<b>TOJ Control Group</b> n = 9	TOJ		TOJ
<b>TOJ Training Group</b> n = 11	Pre-train SJ	TOJ Training	Post-train SJ
<b>SJ Control Group</b> n = 10	SJ		SJ

## Results

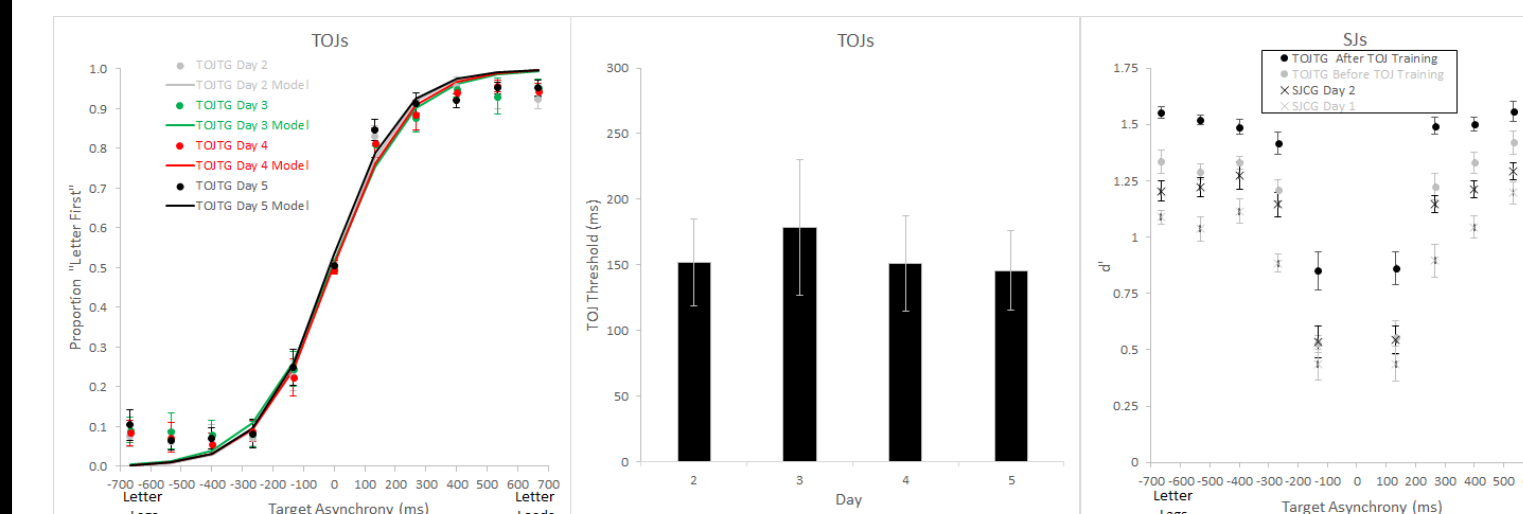
### Reaction Time



### Temporal Precision



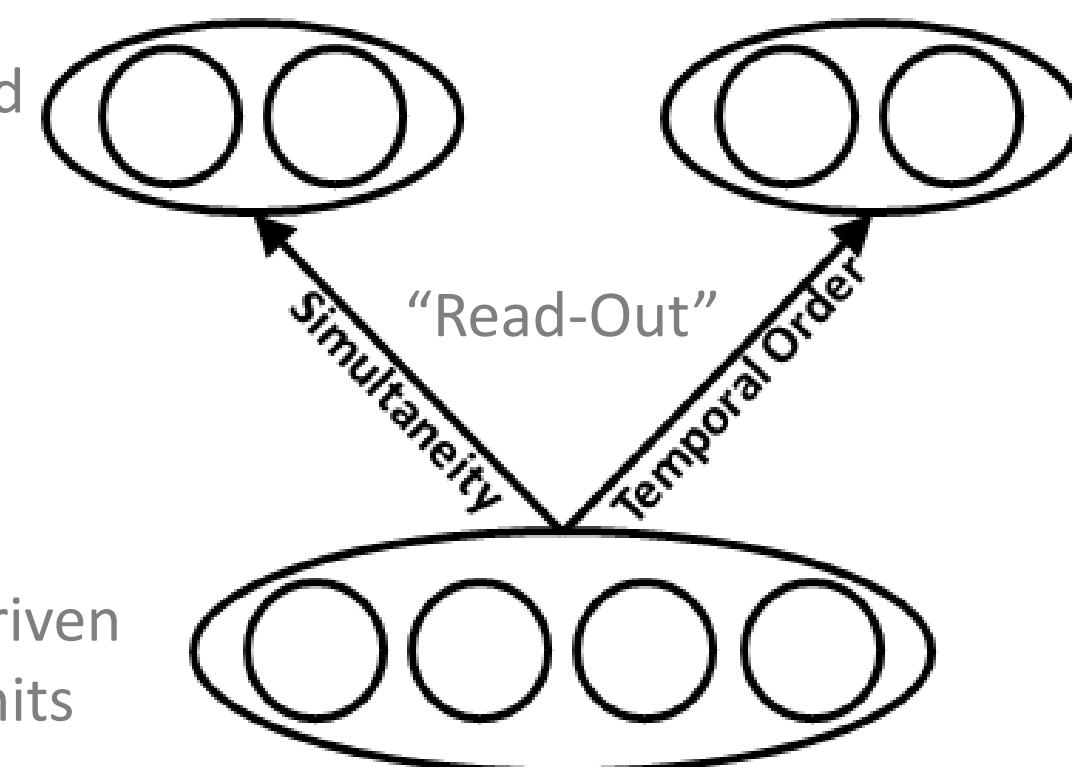
### TOJ Training Group & SJ Control Group



## Discussion

- Under identical retinal stimulation, SJs and TOJs exhibited distinct reaction time patterns, and temporal precision failed to exhibit transfer-of-training effects.
- The results demonstrate distinct decision-related and/or "read-out" factors<sup>2</sup> – rather than stimulus-driven neural factors – set the limit on SJ and TOJ performance.

Decision-Related Neural Units



Stimulus-Driven Neural Units

## References

- Matthews et al. (2013). PMID: [23818678](https://pubmed.ncbi.nlm.nih.gov/23818678/)
- Petrov, et al. (2005). PMID: [16262466](https://pubmed.ncbi.nlm.nih.gov/16262466/)

Poster: <http://denison.edu/~matthewsn/vss2015matthewswelchachtman.html>