Dissociating Temporal Order & Simultaneity: A Perceptual Learning Study

Nestor Matthews[1], Rebecca Achtman[1], Rachel Fenton[1], Brynn FitzGerald[1], Leslie Welch[2]

[1]Denison University - Department of Psychology; [2]Brown University - Cognitive, Linguistic & Psychological Sciences

Poster # 53.338

Introduction

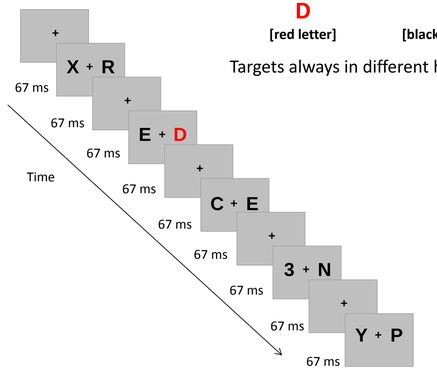
- Dynamic environments often contain stimuli that vary simultaneously and stimuli that vary sequentially.
- Synchrony Judgments and Temporal Order Judgments both depend on the difference between the arrival times of two stimuli.
- **QUESTION**: Does perceptual learning of one temporal task, Synchrony Judgment, **generalize** to another temporal task, Temporal Order Judgment?

RSVP Stream

Two target types

D [red letter] **3** [black number]

Targets always in different hemifields

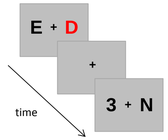


Method

Example Trials

Temporal Order Judgment (Order)
(Day 1 and 6)

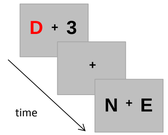
Which Came First?
Letter or **Number**



Order Judgment: Letter 1st

Synchrony Judgment (Sync)
(Days 2 - 5)

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



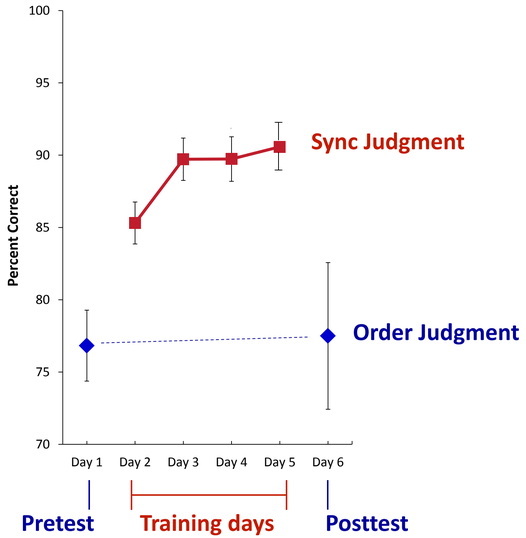
Sync Judgment: Same time

Training and testing schedule

Day 1	Days 2 - 5	Day 6
Pretest Order	Training Sync	Posttest Order

RSVP stimuli were identical for both tasks[1]

Results



- Percent correct for Synchrony Judgments increased significantly between 1st and 2nd training sessions.
- No further improvement for 3rd and 4th training sessions.
- Percent correct for Temporal Order Judgments were the same before and after training sessions.

Discussion

- Even though the stimuli were identical for both tasks, perceptual learning on Synchrony Judgments **did not generalize** to Temporal Order Judgments.
- This finding argues against the idea that Synchrony Judgments and Temporal Order Judgments share a neural computation.
- Our data confirm other perceptual learning studies that favor task-specific reweighting at a decision stage rather than modifications to stimulus-driven responses early in the visual pathway[2-5].

References

1. Matthews et al. (2013). **PMID:** 23818678
2. Shiu & Pashler (1992). **PMID:** 1437491
3. Saffel et al. (2003). **PMID:** 12742106
4. Petrov, et al. (2005). **PMID:** 16262466
5. Matthews et al. (2012). **PMID:** 22303023

Poster: http://denison.edu/~matthewsn/vss2014dissociatingtojsandsjs.html