Dissociating Temporal Order & Simultaneity: A Perceptual Learning Study
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Example Trials
1. Matthews et al. (2013). PMID: 23818678
5. Matthews et al. (2012). PMID: 22303023

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

Temporal Order Judgments (Order) (Day 1 and 6)
Which Came First?
Letter or Number

Synchrony Judgments (Sync) (Days 2 - 5)
Did the Letter & Number appear at the Same time or Different times?

RSVP Stream

Two target types

D [red letter]
E [black number]

Targets always in different hemifields:

67 ms
67 ms
67 ms
67 ms
67 ms
67 ms
67 ms

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.

References
1. Matthews et al. (2013).

Pretest Training days Posttest

Pretest Order Training Sync Posttest Order

Percent correct for 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 pathway²⁻⁵.

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?

Method

Example Trials

Order Judgment: Letter 1st

Sync Judgment: Same time

Results

Discussion

RSVP stimuli were identical for both tasks¹