Does implicit learning of ordered stimuli influence perceptual recognition speeds in temporal order judgement?

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Background

- Testing if Visual Statistical Learning (VSL) paradigm can influence responses on a Visual Temporal Order Judgement (TOJ) Task
- TOJ task run pre- and post-VSL training.
  - Experimental Group received VSL training.
  - Control group saw same VSL training, except in complete random order.

Methods

VSL Training

Participants were trained on a typical statistical learning paradigm. This task covertly trains participants to learn the specific order of stimuli. Groupings were in triplets of abstract fractal stimuli.

- 792 trials total
- Two Fractal stimuli triplets
- Interspersed between triplets were random selections of other fractal stimuli from pool of 93
- Cover task – press button when image “jiggles”

TOJ

Participants indicated which side of the screen a stimuli appeared on first.

- Stimulus Onset Asynchronies:
  - 0ms, 16.6ms, 33.3ms, 50ms, 100ms
- 792 trials total
- Stimuli only included the two fractal stimuli triplets pre-selected for VSL training

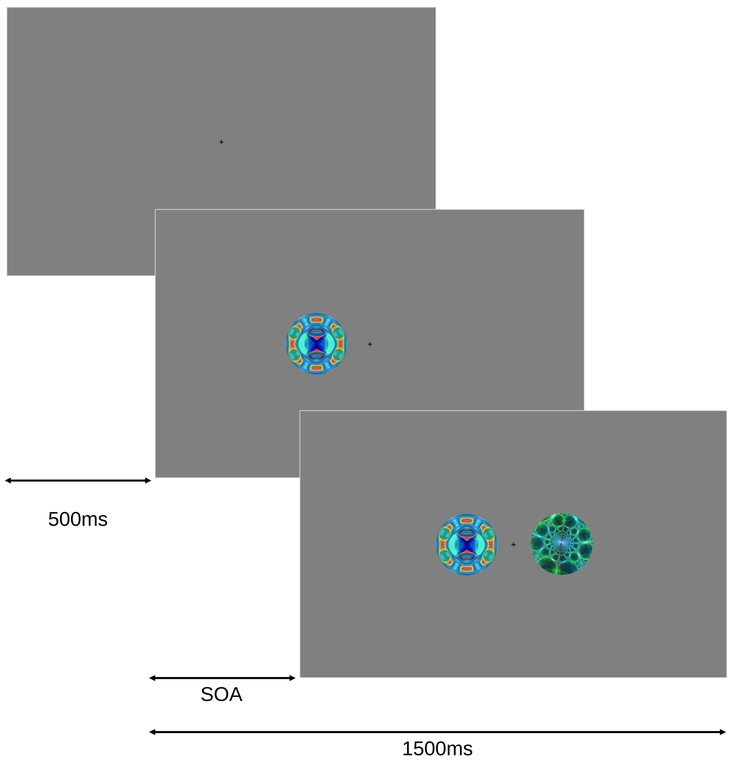

Figure 1. Sequence of events during TOJ. In this example, the left image appears first, and then the right side stimuli appears after a random stimulus onset asynchrony (0, 16, 33, 50, or 100ms).

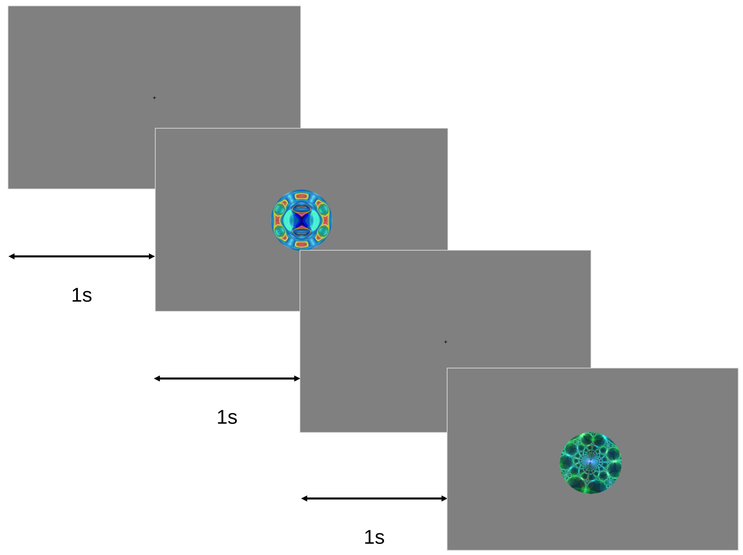

Figure 2. Sequence of events during VSL Training.

Results

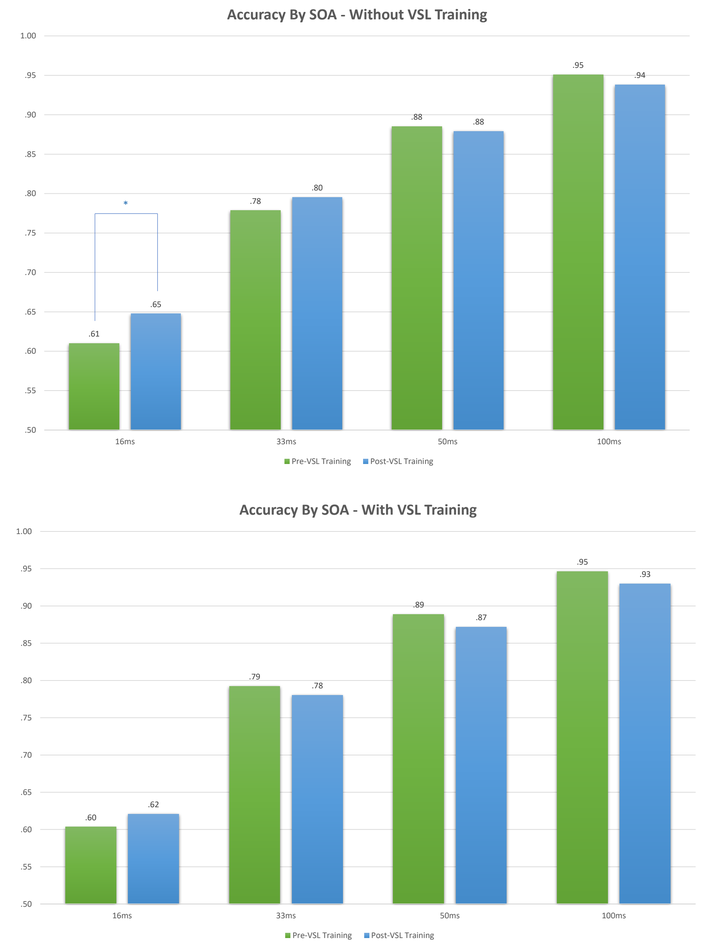

Figure 3. Charts show change in accuracy from the first TOJ session (green) to the second TOJ session (blue) for 16, 33, 50, and 100ms stimulus onset asynchronies.
* $p < 0.01$

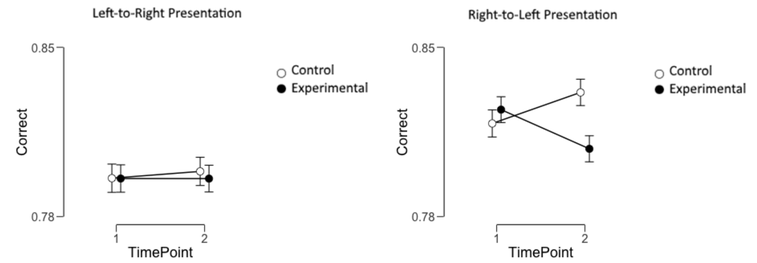

Figure 4. Charts of presentation orders (left-to-right or right-to-left) and response accuracy from pre-VSL training to post-VSL training in control and experimental groups. In presentations from left-to-right there is no difference between control and experimental groups. There is a significant difference in accuracy for right-to-left presentations, such that it only occurs after the experimental group’s post-VSL training.

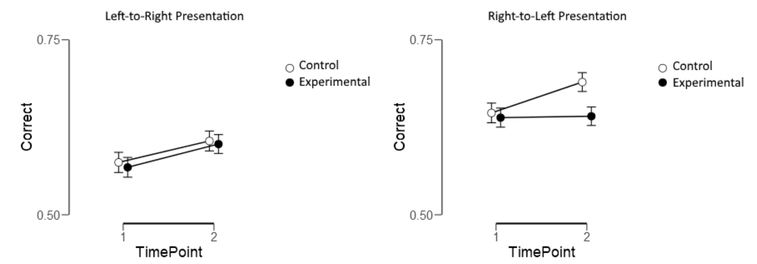

Figure 5. Charts of the same style as Figure 4 above except specific to the 16ms SOA trials. Here it is apparent that VSL training has no influence on left-to-right presentations, but there is a significant difference between the right-to-left presentations post-VSL training for the experimental group compared to the control group.

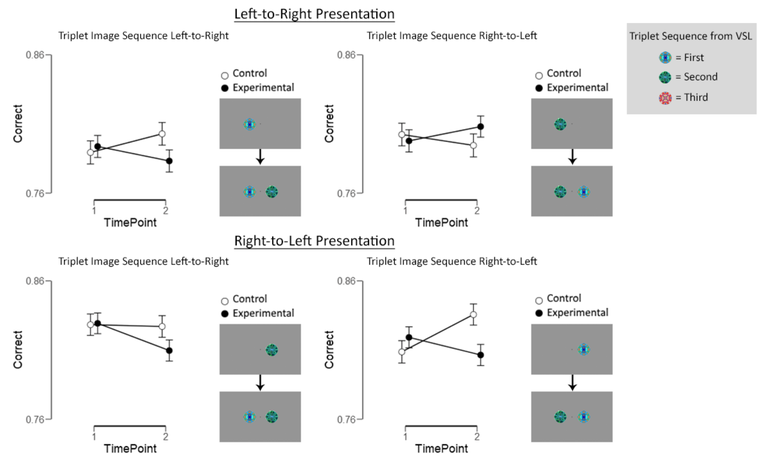

Figure 6. Charts of the same style as Figure 4 above except specific to the presentation order of stimuli trained to a sequence in VSL task. An example stimuli triplet is listed, along with each sample test screen during the TOJ task.

Conclusions

These preliminary findings suggest that the brief (approximately 10 minute) VSL training session interferes with perceptual judgements. The underlying cause is uncertain, but is interesting in light of the short time necessary to train.

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