

ORAL EXAMINATION

BEHAVIORS MAINTAINING PERCEPTUAL CONTINUITY

LAU WEE KIAT, PSYCHOLOGY

Abstract

Our perception of the world is continuous although the input to various senses is fraught with perturbations and ambiguities. Perceptual continuity is defined as the continuous experience of external, discriminable things which involves some implicit reasoning to complete missing information. In this thesis, we conducted psychophysical experiments to investigate behaviors that maintain perceptual continuity over three parts.

In Part 1, we investigated response behaviors. We proposed that responses to a stimulus do not deviate from each other if the stimulus appeared stable and non-changing. We examined response behaviors through serial dependence. Serial dependence is an effect in which the current response error is biased by the preceding stimulus. We showed that our responses can be biased (i.e. assimilate) to similar or stable objects. In the case of serial dependence, our responses to the physical world appear to be embedded in perception, and we become biased by what we previously perceived.

In Part 2, we investigated how observers behaved if they were unaware to consistent changes. We do not notice changes which occur during eye blinks because of missing visual information. We introduced a dot stimulus which steps repeatedly during the blink and showed that the oculomotor system adapted to positional changes across blinks even though the observers were unaware of the changes. From this, we deduced that the oculomotor system could maintain perceptual continuity by blink adaptation behaviors: positional changes were minimized during the blink. Therefore, objects appear to be in the same position after the blink. Since the object appears to not have changed, the perception of the object's position remains continuous.

Thursday
03 Sep 2020

3.30 pm

Venue:
TEAMS Meeting

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In Part 3, we studied how saccade planning is influenced by blinks and fixation errors. The oculomotor system plans the saccade before shifting our eyes to where we want them to. The saccade plan is updated when additional movements occur. This updating allows the oculomotor system to ensure our eyes land accurately at the destination. We asked if the saccade plan was also updated simply by blinking, since the eyes move during the blink. We found that saccades to visible objects were more accurate if observers blinked after saccade planning. This indicated that saccade plans were updated to enable a continuous experience of visual exploration because our eyes land where we want them to.

In summary, this thesis addressed the following behaviors that could maintain perceptual continuity: 1) through serial dependence, we continue to respond in a similar way based on what we saw previously, 2) positional changes of a target are minimized across a blink, and 3) saccade plans are updated when we blink during visual exploration to visible targets.

Proceedings

Duration	Session
5 mins	Chairperson Welcome & Introduction of Panel
30-45mins	Presentation by Student
15 mins	Q&A (by audience – faculty / students)
Break	Audience to leave the meeting
30 mins	Q&A by Panel
15 mins	Chairperson to ask candidate to leave the meeting Private Panel Discussion and Decision on the Oral Examination
15 mins	Candidate invited back by Chairperson Feedback and Outcome of Oral Examination

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