Response Selection
- A central component to flexible, goal-based behavior is the ability to translate incoming sensory information into the appropriate action, a processes known as response selection (RS).
- The underlying operations have proven difficult to examine.

Mouse Tracking
- Mouse movements offer continuous output that reveals underlying cognitive dynamics.\(^1\)\(^2\)\(^3\)
- Trajectories provide an online measure of the co-activation of cognitive representations (as indexed by the amount of curvature).
- Therefore, can be used to probe competition during RS processes.

Present Study
- Use mouse tracking to probe RS in a choice-RT task.
- Examine the influence of stimulus and response similarity simultaneously because:
  1. Most mouse tracking studies only manipulate stimulus similarity and hold response similarity constant. Previous work has shown that stimulus and response features interact (e.g., Simon effect) and determine the duration of the RS process so it is important to manipulate both.
  2. Further, many traditional RS theories\(^4\)\(^5\) hold that RS operates over abstract symbols and is not sensitive to the metrical properties of the task. Is RS sensitive to the metrical properties of the input/output?

Procedure
- Conducted a 2 (stimulus) x 2 (response) between-subjects experiment, manipulating stimulus and response similarity.
- Each condition had four stimuli mapped to four response locations.
- Participants made mouse movements from bottom of screen to corresponding locations near top of screen based on the presented stimulus.

Far Response Locations
- Shared response locations
- Start Box
- Far colors:

Close Response Locations
- Shared response locations
- Close colors:

Results

Movement Trajectories: Time Pressure:
- **Stimulus x Response interaction; \(p < .05\)**

Conclusions
- Provide evidence that stimulus and response similarity affect RS and in a particular way: When both dimensions were close, there was more curvature and error in the trajectories. Replicated effect with different task demands (Time Pressure and Accuracy).
- Interaction appears to be driven by competition among the S-R alternatives at a level of processing that was sensitive to both stimulus and response features.
- Interaction apparent in the trajectories of the movement but not in the temporal measures.
- Suggests RS active binding of stimuli and responses.

References

Three Versions of the Experiment
- **Time Pressure**: had less than 1 second to make their response.
- **Accuracy**: had to be very precise in their movement (no time pressure)
- **Visual Discrimination**: use time pressure again but had to discriminate between visual stimuli (large/small).

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