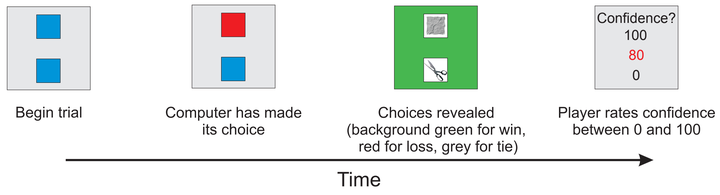
Updating is more than a set-shift

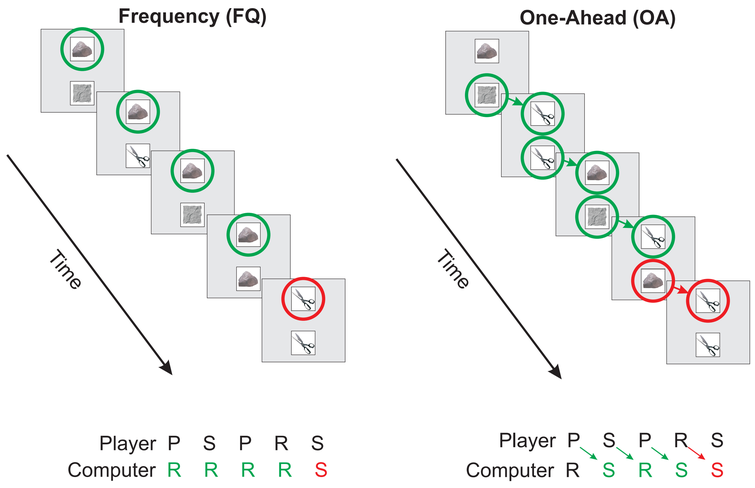
Alex Filipowicz[1], Elisabeth Stöttinger[1], Britt Anderson[12], James Danckert[1]
[1]Department of Psychology, University of Waterloo, [2]Centre for Theoretical Neuroscience

Is set shifting enough to explain updating?

- **We create mental models based on information from our environment**
  - When information we receive no longer fits model, model needs to be ***updated***
- **Updating includes more than just set-shifting:**
  - Set-shifting: only model ***content*** changes
  - Updating: model ***type*** can also change
- **Is there a difference in how quickly we update the content of our model vs the type of model we have?**
  - Updating model type should be more challenging since mental model itself requires change

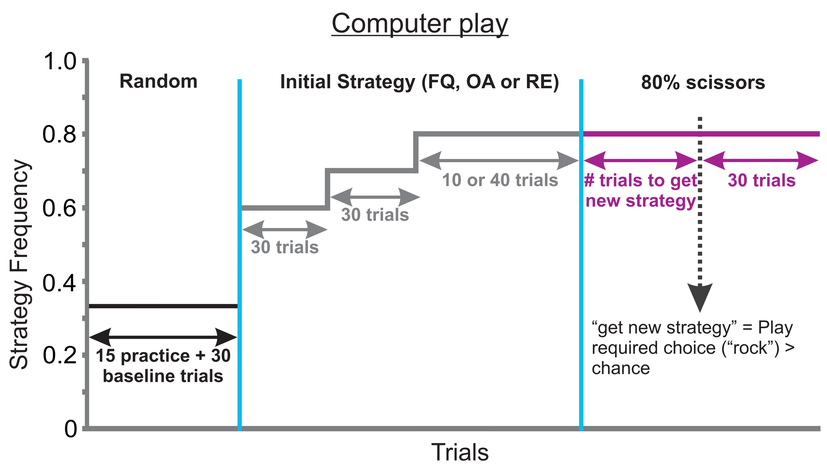
Measuring strategy shifts using Rock-Paper-Scissors





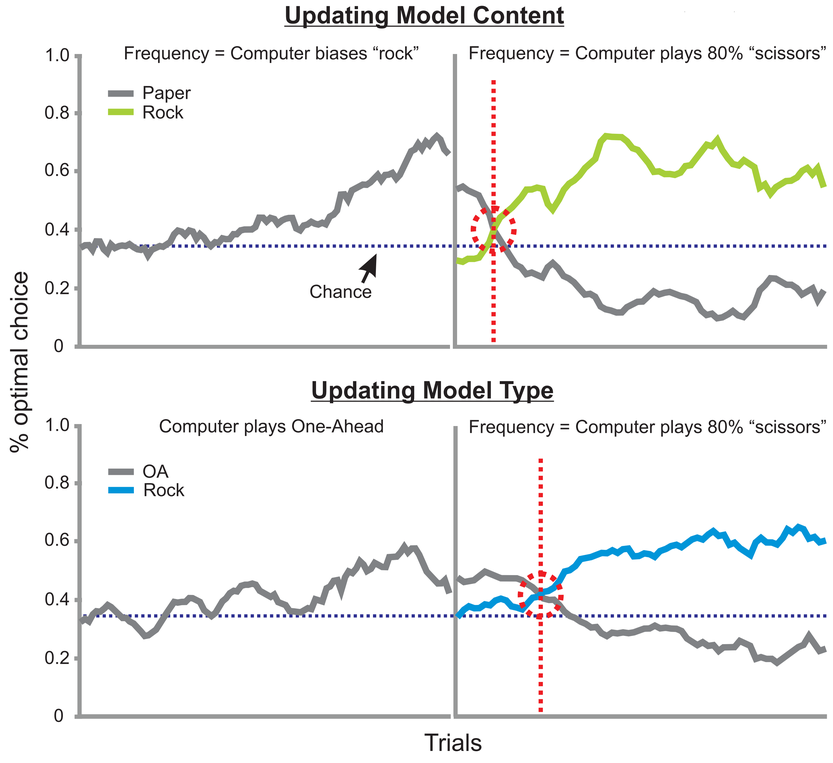
92 undergraduates played RPS against a computer opponent and were exposed to one of two initial strategies: 1) Frequency (FQ): changing bias for "rock" or 2) One-ahead (OA): computer plays the item that would beat participant's last play. A third group was artificially reinforced (RE), with wins 'rigged' up to 80% regardless of their play.

Computer switches strategies during task



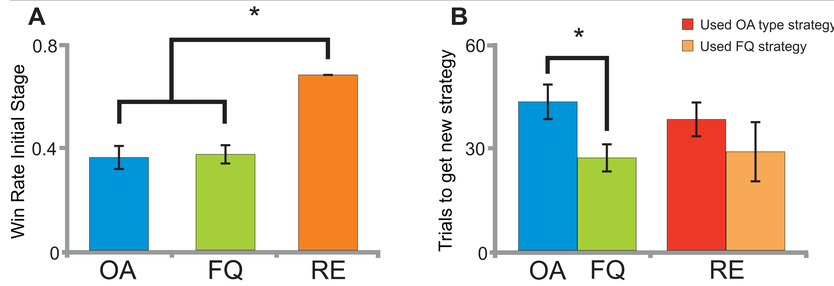
Participants were not made explicitly aware of any strategy switches. Participants were exposed to an 80% frequency of the initial strategy for either 10 or 40 trials to assess initial strategy reinforcement.

Strategy shift is quicker when model content is changed rather than model type



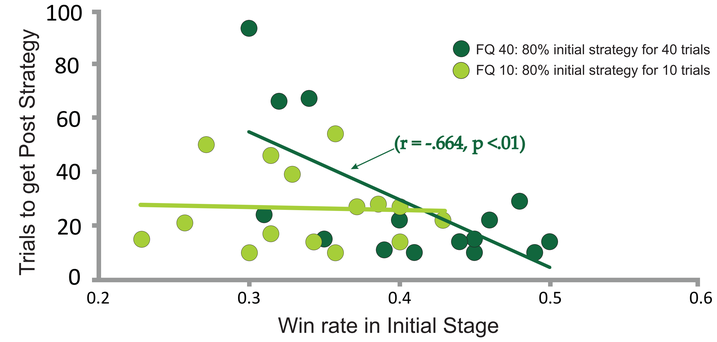
Moving average of frequency that participants played optimal choice against each strategy over 10 trials.

Reinforcement alone does not predict switch

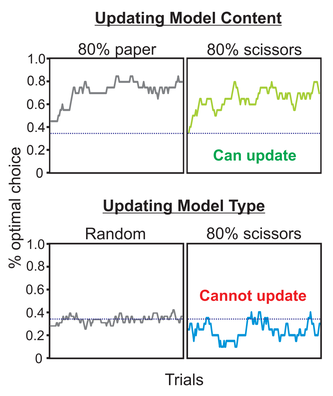


RE participants won most (**A**) but were not the quickest to get the new strategy (**B**). RE participants who used a frequency strategy tended to get new strategy quicker than RE participants using a one-ahead type strategy.

With enough exposure, wins predict switch in model content



General conclusions



- **Set-shifting doesn't fully explain updating**
  - Participants quicker at updating model content than updating model type
- **Reinforcement can influence update of model content, but not model type**
- **RBD updating patterns (left) suggest distinct neural activation for these two types of updating (see B66)**
- **For research on working memory and updating see G109**

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alsfilip@uwaterloo.ca
http://thedaag.uwaterloo.ca/