How good are we at pretending we don’t see something?

Pretense requires understanding how we would behave with different knowledge — providing a window on counterfactual self-simulation.

Our Approach: ‘Pretend Battleship’

N=500, pre-registered: osf.io/v0zsb

Try pretending yourself: tinyurl.com/BattleshipVSS

Non-pretend: sink two 2-square patrol boats and one 3-square submarine with as few clicks as possible (5 games).

Pretend: you see, but pretend not to know, where the ships are (5 games).

Half-games: one pretend and one non-pretend game start with a partly finished board.

Judge: observed the games of previous players and try to determine who pretended (5 trials).

Results

SIMILAR NUMBER OF CLICKS

Median number of clicks = 16

GAME OPTIMALITY

• Thompson sampling approximates optimal behavior.
  * Clicking where the posterior probability is high is not strictly optimal, but approximates optimal behavior in most cases. Audinot, Bonnet, & Viennot (2014), Section 3.3.

• Non-pretend games are more optimal than random.

• Pretend games are less optimal than non-pretend games, but still more optimal than random.

RESPONSE TIME ANALYSIS

Pretenders were instructed to pretend in both where and when they clicked. We compared patterns in click-latency across pretend and non-pretend games:

HITTING VERSUS MISSING A SHIP

• Non-pretenders were 109 ms (12%) faster when hitting a ship, and 182 ms (15%) slower on the next click.

• Pretenders showed exaggerated effects: 293 ms (31%) faster and 182 ms (15%) slower.

EFFECT OF UNCERTAINTY

• Uncertainty = the entropy of the posterior distribution over cell selections H(P).

• Both pretenders and non-pretenders showed a quadratic effect of H(P) on RT, but this was exaggerated in pretenders.

DETECTING PRETENSE

• Pretense detection not significantly above chance (51%).

• No correlation between pretense detection ability and the ability to trick others (r=−0.03), or the optimality of pretend, relative to non-pretend games (r=−0.02).

CONCLUSIONS

• Our findings suggest a striking capacity for self-simulation: pretenders reproduce subtle patterns of cell selection and decision latency, but often in exaggerated form.

• Ask me about ongoing work to exclude alternative explanations (e.g., suppression of knowledge), and generalizability to other games.