IDEA I

Just to summarize the flanker idea that we spoke about today.

The first one would see us go back to the old school and use the flanker task, in order to investigate the extent to which commitment (or even having a social goal in general) can increase executive control. The first step would be to manipulate the original flanker task in such a way that we make the flankers more tempting, thereby making the interference effect stronger. That is, making flankers more tempting should mean an increased amount of executive control needed to avoid looking at them, which should lead to the flankers interfering more with responses. On incongruent trials (a black arrow congruent with the response dimension nested in black arrows incongruent with the response dimension) participants would be informed that they would get extra points at the end of the experiment, depending on how many silver arrows there are amongst the distractors (e.g. 80% black arrows and 20% silver arrows). Here we are essentially tempting participants to look at the distractors, meaning that they need more executive control in order to stay focused on the target arrow. This should result in a stronger interference effect (RTincongruent-RTcongruent) in trials where there is a reward for the silver distractors, compared to trials in which there is no reward for the silver distractors (this would be manipulated within groups, so distractor reward vs no distractor reward).

The next step would be to manipulate whether participants are doing the flanker task, simply to earn points for themselves, or to earn points for both themselves and their partner (individual vs joint). If being in the joint context is already enough to make the participant engage more executive control to avoid looking at the distractors, then we should see less interference for the reward trials in the joint context, compared to in the individual context. This would tell us that doing a task with another is already enough to make people engage more executive control to focus on the task.

Once we have done this, we could do more things, to try and bring the effect of increased interference back, or kill it again. One idea was a manipulation in which participants do the task together with a partner who either chooses to solve a short captcha, or chooses to solve a long captcha. When their partner chooses a short captcha, then we should see more interference as participants put less effort into avoiding temptation. However, when their partner chooses a long captcha, we should see less interference as participants are willing to exert more executive control to avoid the distractors and focus on the target.

Hope this makes sense to everyone. We should discuss this more soon!

IDEA II

The other idea that we had was to use mouse tracking in order to measure how conflicted participants are when committing to a task. The papers that I've attached nicely explain how by using mouse tracking one can quantify how certain or uncertain someone is when making a decision. Essentially, when participants have to use the mouse to choose one of two options (usually presented in the top corners of the screen) dynamics of their mouse trajectory when they make a decision, e.g. how much the trajectory curves towards the other option, or how much they jitter between the two options, can tell us how certain or uncertain they are when making a decision. To some extent, it can also quantify to what extent there are top down influences which modulate their decisions. Considering this, the general idea would be to make them persist on some boring task, and at intervals, give them the option to continue or quit (which would be presented in the top corners of the screen). If they are certain that they want to continue, i.e. engaged, then their trajectories should be pretty smooth and direct when moving towards the continue option. However, if they are uncertain about whether or not to continue, i.e. gritting their teeth, then we should see more jitter, curvature, etc. when they are moving towards the continue option.

The basic idea for the experiment would be to combine this with the infamous battery charging task, with participants charging batteries for each other. Essentially, for one trial, participants would charge a battery for their partner, and would be presented with the option to continue or quit at regular intervals (e.g. at intervals of 10% of the batteries full power). Before every trial, they would see how much their partner charged their battery (which would be either a small amount: low power trials, or a lot: high power trials). When their partner has charged their battery a lot, we can quantify their certainty about whether or not to continue, and see something like engagement in the first half of the trial (they move to the continue option with certainty), and then gritted teeth at the second half of the trial (they are uncertain/jittery when moving towards the continue option).

Across two experiments, the participant will always see how much their partner is charging the battery for them. In experiment 1, participants will also believe that their partner will see how much they have charged, meaning that they are incentivised to reciprocate, as they need to keep up their reputation so their partner keeps on cooperating. In experiment 2 however, participants will believe that their partner will not be shown how much they have charged, meaning they have no incentive to reciprocate, with their partners level of cooperation not depending on their performance.

Firstly, for both experiments we should see more persistence for high power trials than low power trials. However, we should see an interaction, with participants persisting relatively more for high power trials when their partner gets feedback (exp 1), compared to when they don't get feedback (exp 2). If this all works out, we should be able to somehow tease engagement and gritted teeth apart using the mouse dynamics. In exp 2 (no feedback), although they are more persistent for high power trials than lower power trials, we should see less gritted teeth like movements, as they would simply end the trial once they had enough. However in experiment 1 (feedback), compared to exp 2, they would be relatively more persistent in high power trials than low power trials, but we would see more jittery movements towards the end of the trial, meaning they are grinding out the last few trials out to keep their partner happy. In short, a switch from certain/engaged mouse movements to uncertain/gritted mouse movements would be predictive of them ending the trial in experiment 2, but not in experiment 1.

We can speak about this again soon. I know it's a lot to digest (it's also difficult to spell out), so please let me know if you have questions, or if anything is unclear!

Best,

Luke

**2 Attachments**