Do rewards and punishments affect target selection and movement execution? (#14130)

Author(s)
Matthew Miller (Auburn University) - mwm0024@auburn.edu
Keith Lohse (University of Utah) - keith.lohse@health.utah.edu

1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
Do rewards and/or punishments enhance the ability to choose the appropriate target for one's movement and/or execution of that movement?

3) Describe the key dependent variable(s) specifying how they will be measured.
Target selection will be measured by whether participants choose the correct target on each trial. Movement execution will be measured by radial error (RE) and bivariate variable error (BVE).

4) How many and which conditions will participants be assigned to?
Participants will be assigned to a neutral, reward, or punishment group. Participants will have their target selection, RE, and BVE assessed during six practice blocks, an immediate posttest, a 1-day posttest, and a 7-day posttest. Participants will also have their RE and BVE assessed at a pretest.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
To measure learning, target selection will be submitted to a 3 (Condition) x 3 (Posttest: immediate/1-day/7-day) mixed-factor ANOVA. RE and BVE will be submitted to a 3 (Condition) x 3 (Posttest) ANCOVA, with pretest RE/BVE serving as the covariate.

To measure performance, target selection will be submitted to a 3 (Condition) x 6 (Practice Block: 1/2/3/4/5/6) mixed-factor ANOVA. RE and BVE will be submitted to a 3 (Condition) x 7 (Practice Block: Pretest/1/2/3/4/5/6) mixed-factor ANOVA.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
Participants exhibiting Cook's distances ≥ 1.00 will be excluded.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
N = 66 based on an a priori power calculation designed to detect a partial eta squared of .09 for a within-between interaction. (Alpha = .05, β = .2, number of groups = 3, number of measurements = 3, nonsphericity correction = 1.)

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
We will collect and analyze the following: Intrinsic Motivation Inventory, Motivation and Engagement Questionnaire, Strategy Questionnaire. Specifically, we will explore group differences in variables extracted from these measures and investigate whether any group differences moderate and/or mediate group effects observed in target selection and/or movement execution.