Pre-Analysis Plan

Title of the Project:

The slider task: An oTree implementation for studying incentive effects in online experiments

Submitted by:

Lorenzo Pinna

Università Degli Studi di Pisa

lorenzo.pinna@unipi.it

Riccardo Vannozzi

University of Hamburg

riccardo.vannozzi@uni-hamburg.de

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Summary

The slider task is a computerized real-effort task in which subjects are asked to adjust a number of sliders to a predefined target position. Introduced by Gill and Prowse (2012), the task was shown to exhibit many desirable properties, including a high output elasticity with respect to monetary incentives. However, in a prominent laboratory replication, Araujo et al. (2016) found substantially weaker incentive effects, suggesting that the slider task might result in persistent boundary solutions when used to detect treatment effects on effort provision.

Despite these mixed findings, the slider task remains one of the most widely used real-effort tasks in experimental research. However, evidence on its output response to monetary incentives remains confined to the laboratory. Previous work suggests that the slider task might exhibit different properties in online environments. In particular, a large body of evidence (see e.g., Erkal et al., 2018) shows that incentive effects in real-effort experiments can be strengthened by the inclusion of alternative leisure activities. Crucially, remote participants in online experiments are naturally exposed to a wide range of alternative activities and distractions that are largely absent in controlled laboratory environments.

The natural presence of outside options, combined with the growing popularity of online studies, motivates an assessment of the output elasticity of the slider task in online environments, for which evidence is currently lacking. Against this background, we provide a significant addition to an earlier replication by conducting an online experiment that replicates the laboratory design of Araujo et al. (2016). In a between-subject design, participants complete 10 rounds of the slider task with monetary incentives that vary across treatments. Given the presence of naturally occurring outside options in online settings, we expect to find a larger output elasticity compared to Araujo et al. (2016), thereby indicating that the slider task is well-suited to detecting treatment-induced changes in output in online experiments.

Existing online studies using the slider task rely on different custom-coded variants, lacking a standardized implementation. Therefore, as a second contribution, we present an oTree-based implementation of the slider task that is compatible with online deployment. Unlike existing adaptations, it is an exact replica of the original z-Tree version developed by Gill and Prowse (2012), both in terms of functionality and user interface. This makes our results directly comparable to those reported in previous laboratory studies, including Araujo et al. (2016). We provide a replication package to facilitate standardization and comparability across studies.

Design and Hypothesis

We designed the oTree slider task in the vein of Gill and Prowse (2012), presenting the online replication of the laboratory version of the slider real-effort task. Our experimental design follows closely Araujo et al. (2016), which follows a between-subject design. We replicate their monetary incentive structure (half a cent $w_{0.5¢}$, two cents $w_{2¢}$, and eight cents $w_{8¢}$) for each correctly placed slider, which makes up our three treatment arms. At the start of the study, all participants are informed about the nature of the task, and they are required to provide demographic information. Subsequently, participants complete a two-minute practice round. After the practice round, participants are informed about the experimental rewards. At this stage the experimental procedure starts with our participants completing ten paid rounds of two minutes each.

We aim to recruit 60 participants for each treatment ($N_{0.5¢} = 60$,$N_{2¢} = 60$,$N_{8¢} = 60$) with an overall sample size of $N = 180$ participants. Participants are recruited through the platform Prolific and are located in the US. We stratify the treatment assignment to achieve gender quotas.

We define the number of sliders correctly placed by subject i in round t as $Y_{i,t}$, and the final payoff, for each treatment j over $T = 10$ rounds as $\Pi_i = w_{ij¢} \times \sum_{t=1}^{10} Y_{i,t}$.

We test the effect of monetary incentives in the online slider task through a linear regression model, replicating the Araujo et al. (2016) between-subject setting. We advance that, in the remote setting of the slider task, participants have a higher incentive to engage in outside tasks besides to the slider task. Hence, our main hypothesis is that, in our setting, the monetary incentives should naturally play a higher role than in the lab setting. We test the following hypothesis as in Araujo et al. (2016) through a linear regression model:

$$Y_{it} = \beta \frac{w_{ij¢} - 0.5}{8 - 0.5} + \sum_{s=2}^{10} \delta_s \cdot \mathbf{1}_{s=t} + \eta + u_i + \epsilon_{it}$$

where:

- $w_{ij¢} \in \{0.5, 2, 8\}$ are the treatment assignments. β quantifies the monetary incentive effect between subjects across treatments.
- δ_s are time fixed effects for each round in reference to the first period.
- η is a constant.
- u_i are participant random effects, which control for within-subject variation.
- ϵ_{it} are idiosyncratic error terms, which control for between-subject variation.

We advance that, compared to lab participants, remote participants face higher implicit costs of effort because of naturally available outside options. Hence, we hypothesize that the measure of output elasticity (β) to monetary incentives is larger than in lab counterparts.

We test this by comparing our β estimates with the Araujo et al. (2016) estimates. We also plan to do a comparison with other laboratory experiment real effort tasks conditional on data availability.

During the ten rounds, we collect information about whether the subject was actually performing the slider task, which constitutes a proxy for the usage of in-device outside options. We also collect information, after the ten rounds, on whether participants switched to out-of-device leisure activities during the completion of the task.

Accordingly, as a secondary exercise, we want to explore the role of outside options in the remote slider task. To achieve this end, we collect a quantitative measure of time spent in the device while not doing the slider task. We will make use of this measure to outline a mediation analysis, where we distinguish between the direct and indirect effects of monetary incentives on the slider task performance.

Finally, we will check for heterogeneous effects arising from demographic covariates, such as gender, place of residence (US states), and age.

References

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