AsPredicted Questions

EALS STUDY 2

1) Data collection - Have any data been collected for this study already?

No, no data have been collected yet.

2) Hypothesis - What's the main question being asked or hypothesis being tested in this study?

Q: Are children ages 4-6 more likely to ask for help during a challenging learning task following an interaction with an adult who did vs. did not reliably provide help?

H: Children who received help to complete an art project (*reliable help condition*) will be more likely to subsequently ask for help than children who did not receive help (*unreliable help condition*).

3) Dependent variable - Describe the key dependent variable(s) specifying how they will be measured.

Children are provided a bell that they can ring to make a bid for help as they try to figure out how a challenging toy functions. Our DVs include:

1. Presence/absence of bid for help (binary)
2. The duration (in seconds) until first bid for help (continuous)

These DVs will be analyzed jointly using survival analysis (specifically via a Cox regression).

4) Conditions - How many and which conditions will participants be assigned to?

There are 2 conditions: (i) *reliable help condition* wherein the researcher helps children complete an art project and (ii) *unreliable help condition* wherein the researcher does not help children complete an art project. Participants will be assigned to one of the conditions (i.e., between-subjects design) following an order sheet that counterbalances the condition.

5) Analyses - Specify exactly which analyses you will conduct to examine the main question/hypothesis.

To account for the potential of heavily right-censored data (i.e., participants may never make a bid for help and thus would not have a "duration until first bid" data point), we will conduct a survival analysis with Cox proportional-hazards regression models (Cox, 1972) of the form `survival(time_to_first_help, help_sought) ~ condition`. The analysis will be conducted using the survival package in R.

In addition to reporting p-values for the standard Cox regression, we will use the baymedr package (using the coxph_bf command as in https://doi.org/10.1101/2022.11.02.22281762) to compute a one-sided Bayes Factor assessing the data supporting the hypothesis that the reliable condition results in a greater probability of requests for help and an overall shorter time to help requests. We define the default (truncated gaussian) prior on effects with a mean of zero and standard deviation of 1. We will interpret a BF > 10 as strong evidence, BF > 5 as moderate evidence, and BF > 3 as weak evidence for a condition effect.

6) Outliers and Exclusions - Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

Participants will be excluded if they have parent-reported developmental delays or do not demonstrate sufficient proficiency in English (i.e., they don't understand and follow task directions), end the task before the toy exploration phase ends, or if parents interfere with the task or there is significant experimenter error (e.g., deviations from the protocol).

Analyses will be based on only one data point per participant (first bid for help), and so if a participant meets our inclusion criteria, there is no possibility of missing data. Therefore, our preregistration includes no protocol for handling missing data.

7) Sample Size - How many observations will be collected or what will determine sample size?

We are uncertain as to the size of the effect we will observe (if any), thus we plan a sequential Bayes Factor analysis. We will test an initial sample of 10 children in each condition, and then evaluate the Bayes Factor on the hypothesis of a positive condition effect (reliable experimenter -> greater probability of requests for help and an overall shorter time to help requests) after each day of testing. We will stop testing if either a BF > 10 in favor of the hypothesis of a condition effect, a BF > 3 against the hypothesis, or at an N=30/condition (N=60 total).

8) Other - Anything else you would like to pre-register?

We will also conduct follow-up, exploratory tests:

First, we will conduct follow-up regressions including age and gender as additional predictors.

Second, we will conduct analyses to examine exploration and help-seeking behaviors over the course of the toy phase by condition. Exploratory behaviors may include count of unique actions with the toy, or time of actively interacting with the toy. Help-seeking behaviors may include count of bids for help, or time of waiting for help without interacting with the toy.

Third, we will conduct analyses to examine differences in children's affect and mood during the toy phase, both within and between conditions. Affective measures may include apparent contentedness, smiling, fidgetiness, among others.

9) Name - Give a title for this AsPredicted pre-registration