CONFIDENTIAL - FOR PEER-REVIEW ONLY

Lossy Compression - Study 2 (#84039)

Created: 12/27/2021 10:12 AM (PT)

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 changes in the amount of information lost when replacing a fine-grained causal variable with a more coarse-grained causal variable predict participants' separate evaluations of coarse-grained and fine-grained causal claims? This question is addressed in the proportionality conditions.

Do changes in the amount of information lost when replacing a fine-grained causal variable with a more coarse-grained causal variable predict participants' relative preference for coarse-grained versus fine-grained causal claims? This question is addressed in the proportionality conditions.

Do changes in the amount of information lost when replacing a set of variables describing both a principle causal variable and a background condition predict participants' separate evaluations of causal claims that do and do not mention the background condition? This question is addressed in the stability conditions.

Do changes in the amount of information lost when replacing a set of variables describing both a principle causal variable and a background condition predict participants' relative preference for causal claims that do or do not mention the background condition? This question is addressed in the stability conditions.

Does changing the amount of information that is lost when replacing a more fine-grained causal description with a more compressed causal description have differential effects depending on whether the more compressed description is achieved through coarse-graining (proportionality) or through the omission of a background condition (stability)?

3) Describe the key dependent variable(s) specifying how they will be measured.
Each participant will be asked to evaluate three causal claims:

C1. The claim that a coarse-grained type of phenomenon C causes a given effect E.
C2a. The claim that a more fine-grained description of C causes E.
C2b. The claim that both C and a background condition B causes E.
C3a. The claim that a more fine-grained description of C, which is different from that given in C2a, causes E.
C3b. The claim that both C and a background condition B', where B' is not identical to B, causes E.

Participants assigned to the "Proportionality" condition will be asked to evaluate C1, C2a, and C3a, while participants assigned to the "Stability" condition will be asked to evaluate C1, C2b, and C3b. Claim C1 will be shown to participants first, and then C2a/b and C3a/b will be shown on a second page. Evaluation consists in stating how good it would be to include that claim in a report describing the findings of a study presented to the participant, on a scale from -3 (very bad) to 3 (very good), with 0 denoting neutrality.

The six dependent variables measured will be the following:

DV1. Evaluation of C1
DV2. Evaluation of C2a/b
DV3. Evaluation of C3a/b
DV4. Evaluation of C1 – Evaluation of C2a/b
DV5. Evaluation of C2a/b – Evaluation of C3a/b
DV6. Evaluation of C1 – .5(Evaluation of C2a/b - Evaluation of C3a/b)

4) How many and which conditions will participants be assigned to?
Participants will be randomly assigned to one of three vignettes, and then to one of either the "Proportionality" or "Stability" conditions. Finally, participants will be assigned to one of three possible values for the conditional probability of the effect given the fine-grained phenomenon described in C2a/b. Each of these conditional probabilities corresponds to an amount of information loss that is realized by moving either from a model containing a fine-grained variable to a model containing a coarsening of that variable, or from a model containing a primary causal variable and a background condition

to a model containing only the causal variable. This amounts to a total of 18 possible conditions that participants will be assigned to prior to the experiment.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
We will conduct six multiple linear regressions, in which we regress one of each of the six dependent variables listed above on: i) the vignette that a participant is assigned to, ii) whether the participant is assigned to the "Proportionality" or "Stability" condition, iii) the amount of information loss that the participant is assigned to (treated as a continuous variable capturing "loss"), and iv) the interactions between the three independent variables just listed.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
In addition to the causal claims C1-C3 listed above, participants will also be asked to evaluate three causal claims that are false, given the data that they are presented. Any participants who assign a score of 0 or higher to any of these false causal claims will be excluded. Participants will also be asked a comprehension check question about the vignette that they are presented; participants who answer incorrectly will be excluded. We expect to exclude 25% of participants.

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.
We aim to recruit 25 participants on Prolific for each of the 18 conditions in the study, for a total of 450 participants. Assuming 25% exclusion, we will initially collect data from 600 participants. If, after exclusions, we are left with fewer than 450 participants, we will collect additional data in batches of 20 until we have at least 450 participants, post-exclusion.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
N/A.