

Study Information

Title

A replication of experiment one of the study: "Where the truth lies: how sampling implications drive deception without lying" by Ransom et al., 2019

Authors

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Description

Reasoning is an important factor in our everyday communication, as it allows us to efficiently decode and send messages. Part of this is reasoning about how another person has reasoned, this phenomenon is called meta-inference. The conclusions that are drawn from this meta-inference depend on the individual's knowledge and experiences. This becomes particularly interesting when looking at deception within communication. The conductors of the original study of our experiment, Ransom et al., 2019, have investigated the effects of varying perceived intentions on meta-inference. In their analysis of the meta-inferential challenge that deception without lying presents, they have both a sender-based and receiver-based approach. In their sender-based approach, they investigate the sending of deceptive information and in the receiver-based approach reasoning from deceptive communications.

This is a replication of the receiver-based study. In this experiment, the participants were presented with four alternative "treasure maps" and had to judge which one is genuine based on the evidence provided by "the pirate", a pretended past player. The participants are told that this past player is either a teammate (fellow pirate) or an opponent (opposing pirate). We examine the effects of (meta-)inference based on the perceived intent of the sender.

Hypotheses

There are different strategies for deception without lying. Two of those are being uninformative and being misleading. We are interested in the hypotheses obtained from the original paper. Specifically, we want to know if people take the intention of the sender into account when interpreting the offered evidence. This can be reformulated into the precise hypotheses:

1. Participants in the teammate condition are significantly more likely to choose the Lure when presented with misleading evidence than participants in the opponent condition.
2. Participants in the teammate condition are significantly more likely to choose the Lure when presented with uninformative evidence than participants in the opponent condition.

Design Plan

Study type

Experiment - A researcher randomly assigns treatments to study subjects, this includes field or lab experiments. This is also known as an intervention experiment and includes randomized controlled trials.

This experiment is conducted within the framework of an online experiment implemented using JavaScript, CSS and HTML and hosted on Netlify¹ via GitHub².

Blinding

Participants are blinded in the sense that they are not aware of what we are actually observing. There is no direct contact between the participants and the experimenters, as the experiment takes place online. Because of that any influence the experimenter could have on the participants is impossible.

Is there any additional blinding in this study?

There is no additional blinding.

Study design

The study is a within-subjects repeated-measures design with two factors. These factors are 'condition' and the 'provided evidence'. The factor 'condition' contains two levels: teammate and opponent. The factor 'provided evidence' contains three levels: uninformative, misleading and helpful. The participants go through six practice trials (three for each condition) and are then asked to go through 30 main trials in total.

Randomization

Everything in the experiment is randomized. In the main phase the on-screen order of the maps displayed in each trial, the trial order within each block and additionally the block order itself is randomized.

¹ A company that offers hosting and serverless backend services for web applications and static websites. (<https://www.netlify.com>)

² An online platform that provides hosting for software development using the distributed version-control system Git. (<https://github.com>)

Sampling Plan

Existing data

Data from a pilot study (N=5) was applied in order to guide our analysis and improve the implementation of our experimental design if ambiguities in the description of the task or other obstacles are encountered. The preregistration takes place prior to the creation of the data used in the final analysis.

Explanation of existing data

None of the existing data from the pilot study will be used in the final analysis of the replication experiment.

Data collection procedures

Participants will be recruited through social media and via direct message. Consequently, most participants will stem from our circle of friends, classmates and family members. We acknowledge that this may present downsides to our population sample, but deem it unavoidable in the prospect of time restrictions on our experiment and the lack of financial resources.

Sample size

In the original paper, 100 participants were recruited. We aim for 80 participants. That way even if a lot of trials or participants are excluded, we still have enough data to obtain the statistical power of our analysis. We only aim for 80 and not more due to time issues and possible language barriers of our majorly german speaking participants.

Sample size rationale

The sample size was decided by the sample size used in the original paper. Factors constraining a bigger sample size are an approaching project deadline and the lack of financial incentives for participants. Moreover, the circle of people we are able to contact via social media and email also provides an upper bound on our sample size.

Stopping rule

The collection of data will end either after having reached our target sample size of 80 or two days before the project deadline (31st of August 2021).

Variables

Manipulated variables

The manipulated variable is the evidence that is presented and the condition. The variable evidence exhibits three levels (helpful, misleading, uninformative) and the variable condition exhibits two levels (teammate, opponent). Participants believe that the provided evidence is from a past player and dependent on the fact whether she is a teammate or an opponent.

Measured variables

We record which map the participants believe to be the genuine one in the main trials. Additionally, reaction time and answers are recorded, in order to exclude data that seems falsified.

Analysis plan

Statistical models

Like the authors of the original study, we decided to apply Bayesian statistical inference for our analysis. The analysis will be written in the statistical programming language R (R Core Team, 2016), where we will rely on the 'tidyverse' package for preprocessing, analysing and visualising the data and the 'brms' package for analysing Bayesian regression models. For our main analysis, we will use a linear regression model with multiple predictors. The manipulated independent variables were 'clue' and 'condition' whereas the dependent variable was 'response'.

Transformations

We did not rely on any additional transformations, however, any categorical variable such as 'clue' or 'condition' will be dummy-coded to 1 and 0, if needed in the analysis. The reference category will therefore always be the variable that comes first in the alphabet, i.e. the reference level for 'condition' will be 'opponent' and for 'clue' it will be 'misleading'.

Inference criteria

For the statistical inference, we will create 'brm' models in order to test each hypothesis. The model we are going to use is a multinomial logistic regression model with response as categorical predictor variable. The model will provide us with useful posterior estimated coefficients from which we can report the expected values and their 95% credible intervals (CIs). In order to investigate if the hypothesis holds true or not, we will also report the posterior probability that a difference value δ , i.e. the mean of the estimated posterior for the respective coefficient, is bigger than 0. If a hypothesis states that $\delta > 0$, we can conclude that there is compelling evidence for this hypothesis if zero is not included in the 95% CI of δ and the posterior ($\delta > 0$) is close to one.

Data exclusion

In the final analysis, we will only concern the main trials. We decided to exclude participants who showed a lack of understanding of our instructions by introducing an error rate. The error rate determined the rate in which trials the participant selected the only viable option out of the four, namely when the cue was helpful. Participants who had an error rate of under 1.0 were not taken into account for our analysis. Furthermore, to prevent participants from clicking through the experiment and accidental double clicking we excluded participants who had a mean reaction time of under three seconds and individual trials which had a trial reaction time of under two seconds. We did not decide to have an upper bound on reaction times at any level as we refrained from punishing long thinking times because the experiment was not about reaction times. After conducting the pilot study, we excluded one participant for an error rate of below 1.0 and too fast mean reaction times.

Missing data

Additionally, in the unlikely case that some data points will not be recorded, all available data points from the participant will still be used in the analysis.

References

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- Grice, H. P. (1989). *Studies in the Way of Words*. Cambridge, MA: Harvard University Press.
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