

Preregistration Report

1. Study Information

1.1 Title

Replicating the study “Speaker Knowledge Influences the Comprehension of Pragmatic Inferences” by Bergen and Grodner (2012)

1.2 Authors

Georg Fasching, Jara Herwig, Juanjuan Jia, Lorenzo Pavan

1.3 Description

This study aims to replicate the study “Speaker Knowledge Influences the Comprehension of Pragmatic Inferences” by Bergen and Grodner (2012). Speakers often communicate more than only the literal message they utter. The study examines whether implicature generation caused by encountering the existential quantifier “some” is sensitive to speaker’s knowledge. When reading “Some of the investments lost money” there are two ways to interpret the word “some”. Either listeners/readers build a strong implicature that not all investments lost money or they build a weak implicature that the speaker doesn’t know whether all investments lost money. The main research questions in this paper were how and at which point in interpretation speakers’ knowledge affects perceivers’ comprehension of scalar implicatures. These are therefore also the research questions of this study.

1.4 Hypotheses

The hypothesis is directional: it is expected that speakers’ knowledge will affect the generation of scalar implicatures, in that full-knowledge (knowing whether the stronger statement was true) will lead to a generation of strong implicatures and partial- knowledge (considering it merely possible that the stronger statement was true) will facilitate the generation of weak implicatures. Generation of strong implicatures will lead to longer reading times of trigger sentences and shorter reading times of complement sentences (see 4.1). It is because the first integration of a strong implicature causes more effort. But once a strong implicature is created, it will be beneficial for processing the subsequent complement information. Differently from the original study where they examined every predefined language region in the sentences, we will only focus on language regions where significant effects of knowledge were found in the original paper. The language regions we are focusing on are called critical language regions. These are quantifier regions (e.g. consisting of “some of”) in trigger sentences and predicate regions (e.g. consisting of “were successful”) in complement sentences. Besides, we will leave out the analysis for the factor continuation (see 4.1), as there were no effects found as well.

Precisely, it is expected that:

- 1) Full-knowledge will lead to a longer reading time of the critical regions of trigger sentences and shorter reading time of the critical regions of complement sentences under scalar conditions (in which trigger sentences begin with “Some”), compared to partial-knowledge.
- 2) The level of knowledge should make no difference in the reading time of the critical regions in both trigger sentences and complement sentences under focused conditions (in which trigger sentences begin with “Only some”). It is because the focus particle “only” has the effect of asserting the not-all interpretation. As a result, contextual information about speakers’ knowledge should not alter interpretation for both trigger sentences and complement sentences.

2. Design Plan

2.1 Study type: Experiment

2.2 Blinding

This is a double-blind study. The experiment is conducted online, so there is no interaction between the participants and the experimenters. Experimenters do not know to which group participants are assigned since the assignment happens randomly for each participant. Participants also do not know to which they are assigned.

2.3 Study design

The study is a 2 X 2 X 2 within-subjects multifactorial design. The three factors with two levels each are knowledge-context (full vs. partial), trigger-type (scalar vs. focused), and continuation-type (complement vs. cancelation). Each language stimulus is constructed by crossing the first two factors. In addition to the four critical conditions, two additional conditions will be run. These are identical to the scalar–trigger conditions except that the complement sentence is replaced with the cancelation one. Altogether there are 6 conditions: full-scalar-complement (c1), full-focused-complement (c2), partial-scalar-complement (c3), partial-focused-complement (c4), full-scalar-cancelation (c5), partial-scalar-cancelation (c6). Six presentation lists will be counterbalanced using Latin square design. Stimuli will be pseudorandomly mixed with 65 fillers consisting of 2- to 4- sentences passages. Each list contains 24 language stimuli and 25 filler items.

Sentences will be presented using a noncumulative, self-paced word-by-word display on the computer. Each trial begins with dashes standing in for non-white-space characters. Participants press the spacebar to replace each series of dashes with the word it concealed. This causes the previous word to disappear. The time between button presses is recorded. Following each passage, participants will need to answer a yes-or-no comprehension question.

2.4 Randomization

The six counterbalanced lists will be assigned to participants randomly. To achieve equal sample sizes for each list, block randomization is used.

3. Sampling Plan

3.1 Existing data

Registration prior to the creation of data.

3.2 Data collection procedures

Participants in the study by Bergen and Grodner (2012) were native English-speaking College students. Because of time constraints, we will not recruit native English-speakers. We will simply require our participants to have good English language knowledge (at least B1 (self-declared) according to the English language level (CEFR)).

Participants are going to be recruited via social media, the forum of a university course, and email contact. Participation is voluntary and there is going to be no compensation. Every participant is allowed to take part only once. We make this constraint explicit on the landing page of our experiment.

3.3 Sample size

We will try to recruit as many participants as possible. Our aim is to have around 40 participants to come close to the original study.

3.4 Sample size rationale

The rationale for this sample size is to remain consistent with the original study. Since our pool of reachable participants is limited and we have no monetary or other incentives to offer, and since time is critical (project deadline) we cannot state a minimum number of participants to draft.

3.5 Stopping rule

We will stop data collection on 31st July 2020. In this way, we will have enough time to conduct the analysis and finish the report on time.

4. Variables

4.1 Manipulated variables

The manipulated variables are *knowledge-context*, *trigger-type*, and *continuation-type* with two levels each: *knowledge-context* (*full-knowledge* vs. *partial-knowledge*), *trigger-type* (*scalar* vs.

focused), and continuation-type (*complement* vs. *cancelation*). Full knowledge sentences depict the speaker as having expertise, or a clearer idea at least, in the topic of the block. Partial-knowledge sentences do not suggest any speaker's expertise in the topic of the given block. If a *trigger* is *scalar*, the relative sentences start with "some". If it is *focused*, they start with "only some". If the continuation sentence is *complement*, the sentence confirms a strong implicature. If continuation is *cancelation*, the sentence contradicts either a strong or a weak implicature triggered by context sentences.

4.2 Measured variables

As mentioned before, we will use self-paced reading as a method. The time between button presses will be recorded and taken as the reading time of the corresponding language chunks. Precisely, the dependent variable is the reading time (milliseconds per word) of language chunks of the trigger sentences and the continuation sentences.

5. Analysis Plan

5.1 Statistical models

The analysis plan will follow the plan of the original study. Linear mixed-effect regression analyses using lme4 (Bates, 2008) in the statistical language R (R Development Core Team, 2008) will be mainly applied to analyze the data. Participants and items will be modeled as crossed random factors. Speaker knowledge (full vs. partial), trigger-type (scalar vs. focused), continuations (complement vs. cancelation), and their interaction will be modeled as fixed effects using analysis of variance (ANOVA)-style sum coding.

5.2 Transformations

The RTs will be log-transformed and submitted to the previously mentioned linear mixed-effect regression model.

5.3 Inference criteria

As used in the original study (Bergen & Grodner, 2012), we will use the standard $p < .05$ criteria for determining if there are effects of speakers' knowledge (see 1.4, points 1 and 2). If the p-value of the effects of speakers' knowledge is lower than 0.05, then statistically significant effects of speakers' knowledge on implicature generation can be inferred. Otherwise, there is no effect of speakers' knowledge on implicature generations.

5.4 Data exclusion

The data exclusion criterion will mainly follow the original study as well. Participants, whose accuracy rates below 80% and language level below B1, will be eliminated from RT analyses.

5.5 Missing data

If a subject does not complete the tasks, that subject will not be included in the analysis.

6. Other

Here we aim to replicate the study “Speaker Knowledge Influences the Comprehension of Pragmatic Inferences” by Bergen and Grodner (2012), with some minor changes in the hypotheses. We will use the experimental language stimuli and the filler from the original study. Besides, we created 6 fillers by ourselves to make the practice trials.

Link to the experiment: <http://xp-lab-2020-bergen-grodner-replication.netlify.app>

References:

Bergen and Grodner. (2012), “Speaker Knowledge Influences the Comprehension of Pragmatic Inferences”, *Journal of Experimental Psychology: Learning, Memory, and Cognition*, pp. 1450 - 1460.