

To Believe, or Not to Believe

A Study about the Rejection of False Information

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This study investigates the Spinozan model on information processing. According to the established model, called the Cartesian model, we process linguistic information in two steps by first understanding its meaning and then determining whether or not to accept what has been said. However there is another model for this: the Spinozan model. This model states that understanding comes together with acceptance which can later be rejected in a separate act of judgment. This is examined through the use of assertions that are either accepted or rejected. The study also investigates if the same processes are found in the processing of exhortations. This study has tried to replicate the results achieved by Gilbert et al in their studies, and further tested if the same principles for ideas and assertions apply to a different part of language, namely exhortations. Acquired results goes against the initial assumptions and speaks against the conclusions made by Gilbert et al, while also indicating opposite effects on some occasions. They also indicate that exhortations that were to be ignored are forgotten, while false assertions are remembered without its measure of truth. This has lead to thoughts of an alternative Spinozan model.

Introduction

When presented with an assertion we choose to either believe what is said or we don't. But do we always have the resources necessary to make an active decision? Can we understand an assertion without believing in it? What steps are involved in taking in information and classifying it? These are some of the questions Gilbert et al claim to have answered.

Background

The Cartesian model, as named by Gilbert et al (1993), states that ideas are initially represented without any reference to their measure of truth. The model states that we take in a proposition, understand its meaning, and later make a rational analysis that decides if it is true or false. This model means that a) ideas are represented mentally without any measure of truth and b) the acceptance or rejection of ideas is a controllable process of judgment in two steps.

The alternative to the Cartesian model is the Spinozan (term also expressed by Gilbert et al), which means that a) we take in all propositions as true before a rational analysis is done and b) some ideas are reassessed as false. Our mental representations of propositions therefore always possess a

measure of truth of which the default value is true (Gilbert et al 1993).

It is in many ways difficult to decide which one of these models that best describe our way of processing information. Even with striking differences they both lead to the same conclusion in ideal circumstances. But if they were to be interrupted the processes' outcomes would differ greatly. If the information processing of an assertion would be interrupted the assertion would probably end up without having any measure of truth in the Cartesian model. According to the Spinozan model the information would still be classified as true, even in the case of falsehood (Gilbert et al 1993).

Gilbert et al made a study (1990) to investigate which model best describes the human processing of information. Their results pointed in favour of the Spinozan model. In the trial the subjects were given a learning task where assertions were presented to the subjects on a computer screen. After each assertion they were also shown a marking that indicated if the assertion was true, false or neutral. The subjects were supposed to try and memorize the different assertions as well as their markings. Concurrently as the subjects performed this learning task they were given a distractive

task which was to be performed while some of the assertions were shown.

Gilbert et al assumed that the distractive task would not interfere with the subject's ability to remember and recite the true assertions from the experiment correctly. They also predicted that false assertions presented with the distractive task would be remembered as true assertions. The results of the experiment further supported these predictions. The subjects recalled more false assertions as true than the opposite while also performing the distractive task.

In a later trial by Gilbert et al (1993) the subjects were instructed to read two crime reports which contained false assertions. The false statements of one of the reports exacerbated the crimes severity while the other false statements extenuated it. Some of the assertions on the reports also had a concurrent distractive task. The subjects were then asked to recommend the duration of the perpetrators punishment and also estimate different aspects of the perpetrators. Gilbert et al predicted that since the subjects had been distracted during the experiment they would think of the false information as true and that this would then influence their decision-making. The results acquired from the experiment this time also fortified the hypotheses of Gilbert et al. The subjects who read the exacerbating report along with the distractive task tended to judge the criminal harder than those without the concurrent distractive task.

Gilbert et als (1990) experiment thoroughly examined how the measure of truth in assertions are represented in memory and how they can be affected. Gilbert et al (1993) followed up the initial study by, instead of examining how the measure of truth is recalled, exploring how people act after their opinions formed by given assertions. This was motivated by a thought that both many philosophers and practically all psychologists share: that action is a required condition for creating beliefs. In her book *Varieties of Meaning* (2004), Ruth Millikan proposes that languages' primary function is to mediate theoretical judgments and thoughts (for

example assertions), as well as representations of goal states (for example exhortations). In both studies Gilbert et al has studied one of the primary functions of language proposed by Millikan, namely theoretical judgments. The second primary function of language, also as proposed by Millikan, consists of exhortations which along with assertions are examined in this study. At the time, studies on the second function are in scarce supply.

Question at issue

To examine if people under cognitive load have difficulties in separating exhortations that they have reasons to carry out from exhortations that they have reasons to ignore, as well as investigate if there is any difference in how we process exhortations and assertions. The assumption is that more false assertions and exhortations to be ignored will be recalled as true than the other way around.

Method

The subjects were to perform two different experiments successively: one for exhortations and one for assertions. Half of the subjects performed the exhortation-experiment first and the other half started with the assertion-experiment. They were informed that they were supposed to carry out some of the exhortations ignore others. In the assertion experiment the subjects were informed that the assertions presented were either to be considered true or false.

Both experiments utilized the colours red and black to tell the alternatives (true/false) for assertions and the alternatives (carry out/don't carry out) for exhortations apart. In both of the experiments the subjects also had to perform a distractive task which occurred in conjunction with some exhortations and assertions, which will hereby be called *stimuli*. As the subjects were presented stimuli both with and without the distractive task, they also acted as their own control group. Therefore an in-group design was used in this study.

Instructions

The subjects were invited to partake in a study about “how people learn new languages”. This was not the study’s real purpose, which was revealed to the subjects after they had performed the experiments.

The experiments were performed in a secluded room without interfering factors. The equipment used consisted of a webcam, a microphone, a CRT-computer screen and a keyboard. Before the experiments started the subjects were given a form to fill out that examined their language skills. The form was present to sift out subjects with difficulties and to give the subjects a more convincing impression of the study and its purpose.

Then, depending on which of the two experiments was to be performed first, the subjects were given specific instructions for the experiment. These instructions described the main task and the distractive task thoroughly.

Learning task

Assertions

The assertions were of the form “An X is an Y”, where X was a made-up word (noun) that the subjects were led to believe was from the Indian minority language Kashmiri and Y was its made-up counterpart in Swedish. Depending on the colour (red or black) of the assertion the subject were supposed to memorize it as being true or false.

In this experiment ten assertions that were to be memorized as true were shown with the concurrent distractive task and four without. An equal amount of assertions, both with and without the distractive task, were to be memorized as false.

Exhortations

The exhortations were in the form of “say Y”, where Y was the Swedish words (noun) that corresponded to the made-up word in the assertion-experiment. Depending on which colour the exhortation was written in the subjects were to follow the exhortations by

speaking the Y word aloud or ignore it while also memorizing it in both cases.

The exhortation-experiment consisted of 12 exhortations with the distractive task, described below, and four without that were supposed to be followed. The exhortations that were to be ignored consisted of eight with the distractive task and four without.

Distractive Task

The distractive task was in the form of numbers crawling across the screen just below 20 of the stimuli in each experiment. Remaining stimuli were presented without the distractive task since they were included for control reasons. The numbers crawled across the screen with the same velocity and were the same size as the stimuli used.

The task the subjects were to perform consisted of noticing whenever the number five crawled across the screen and pressing a key on the keyboard on each occurrence.

Recall Task

After every completed experiment the subjects were given a recall task that tested which word from the experiment they could identify. The test was designed as a form with questions in the form of “Is X a Y?” respectively “Say Y” where the options of answers were “true”, “false” and “did not occur” in the assertion-experiment, alternatively “supposed to carry out”, “supposed to ignore” and “did not occur” in the exhortation-experiment. The subject’s task in this was to mark one of the alternatives for the 28 stimuli, but the test also included 14 new stimuli which were not present in the experiments.

Procedure

The two experiments both presented 28 stimuli to the subjects through a computer program developed specifically for the study. In the middle of the screen there was a thick, white line over an otherwise black background. Within this white line the stimulus came crawling across the screen

from right to left, one at a time. When a crawling stimulus had disappeared off screen a new one came on the opposite side. The subjects were after this part of the experiment asked to fill out a form as described above.

When the form had been handed to the experimenter the procedure was repeated but with the other experiment. When the second form had been handed over a short interview about the experiments and the subject's participation was conducted. When the interview was reaching its end, the experimenter revealed the true purpose of the study to the subjects.

Results

All statistical test performed on the data were made with the two-way version of *Fisher's Exact Test*. The results were divided into those who recalled more than 50 % correctly (marked as +) and those whose correct recalling was lower than 50 % (marked as -). The *p*-value is given along with the values tested.

The distractive tasks effect on the subjects' ability to correctly recall assertions (both true and false) was tested, which gave $p = 0.0125$ (w. dist. task +/-: 18/18 and w/out dist. task +/-: 29/7) which is statistically significant. The same effect and test on the exhortations gave $p = 0.5798$ (w. dist. task +/-: 26/10 and w/out dist. task +/-: 29/7) which is not statistically significant.

Assertions

According to the model proposed by Gilbert et al (1993), the distractive task should make the subjects recall false assertions as true in a higher extent. The results acquired trough this study does not show this effect. The incorrectly recalled assertions are almost equally divided between those with (40.88 %) and without (40.93 %) the distractive task. However more true assertions with the distractive task (28.24 %) were recalled as false, than those without (16.73%). The subjects generally had more difficulties

recalling false assertions as false (44.57 %) than true assertions as true (78.78 %).

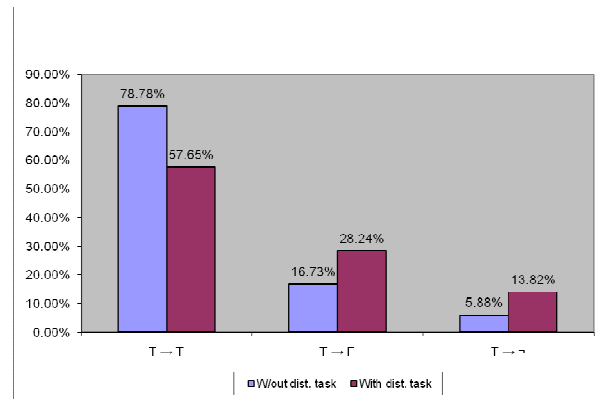


Figure 1: Recall of true assertions.

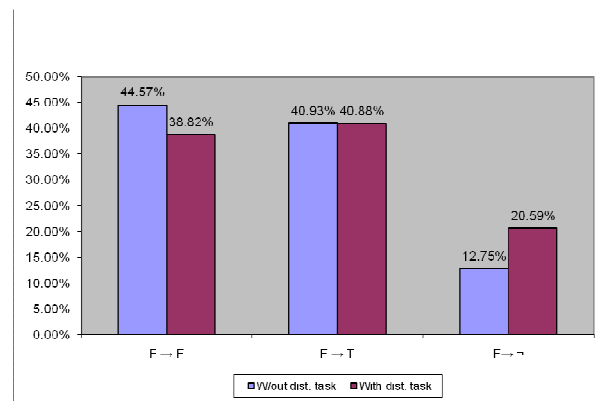


Figure 2: Recall of false assertions.

Explanation: $T = true$, $F = false$ and $\neg = not$ occurring.

The distractive tasks effect on the subjects ability to correctly recall true assertions was tested which gave $p = 0.2603$ (w. dist. task +/-: 30/6 and w/out dist. task +/-: 34/2), which is not statistically significant. The same effect and test on false assertions gave $p = 0.3412$ (w. dist. task +/-: 13/23 and w/out dist. task +/-: 18/18), which is not statistically significant either.

Exhortations

Of the exhortations without the distractive task, 98.48 % were carried out correctly. The exhortations with the distractive task were carried out correctly in 98.94 % of the cases.

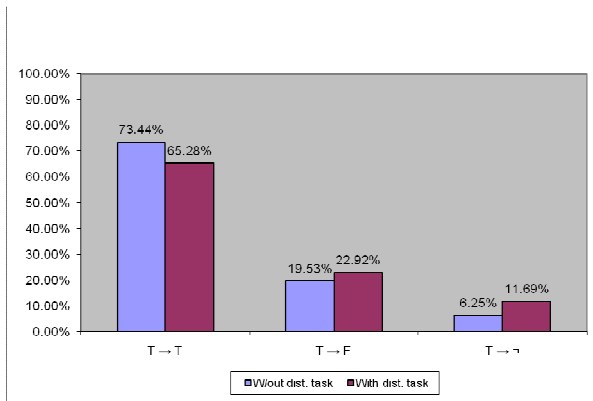


Figure 3: Recall of exhortations to be carried out.

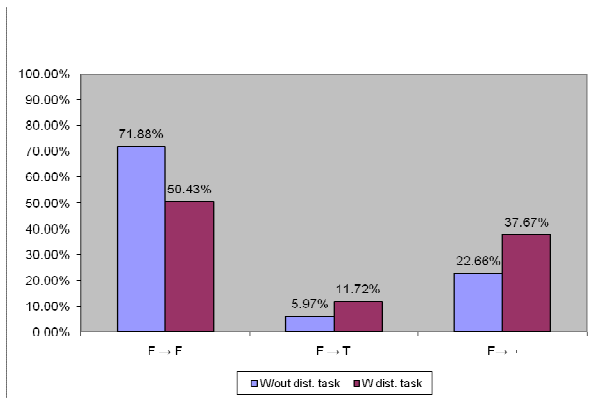


Figure 4: Recall of exhortations to be ignored.

Explanation: T = to carry out, F = to be ignored and ¬ = not occurring.

The distractive task could have had a small effect on exhortations that were to be carried out (73.44 % without the distractive task, 65.28 % with) than for exhortations to be ignored (71.88 % without the distractive task, 50.43 % with). It seems as if there is a difference between wrongly recalled exhortations to be carried out and those to be ignored. Subjects tended to recall ignored exhortations as not occurring at all more often than with carried out exhortations. The distractive task might have amplified this effect.

Significance for the distractive tasks influence on the subjects' ability to correctly recall for both exhortations that were to be carried out ($p = 0.3222$, w. dist. task +/-: 25/11 and w/out dist. task +/-: 26/10) and to be ignored ($p = 0.1552$, w. dist. task +/-: 31/5 and w/out dist. task +/-: 31/5) were tested, neither of which gave significant results.

Discussion

The distractive task made no difference in the recalling of false assertions as true (T → F Fig. 2). However a reverse effect as stated earlier can be observed but for which no statistical significance was found.

The assumption was that subjects would be more accurate in recalling more false assertions correctly without the distractive task, but it can be questioned whether this task gave enough cognitive load to disrupt any active process'.

Does the memory work in such a way that overloading it with an assertion, colour coding and such makes you remember things as true regardless of distraction? This is something for future research to investigate.

This study's results differentiate from those acquired by Gilbert et als experiments regarding assertions (Gilbert et al 1990 & 1993, Gilbert 1991). The modifications made in this study were so small from Gilbert et als design that they should not have affected the results in such a remarkable way. It should rather be that the original design isn't as generally applicable to fit the modifications made. The question then is if the Spinozan model is faulty, or if Gilbert et als way of testing the model isn't as generally applicable as required.

It seems as if there are different thought processes for assertions and exhortations. If a person claims something you yourself don't know anything about, you can put it in your collection of beliefs since it doesn't conflict with any other information. It's only when the new information conflicts with something already learned that the new information must be evaluated against the old (Gilbert 1992). In the case of this study, new information is categorised without conflicts to the right location. But exhortations practically always conflicts with prior items. Even "doing nothing" is conflicted by the exhortation and an active choice must be made in the same manner as when new information conflicts with old.

Especially when given exhortations to be ignored along with the distractive task, subjects tended to recall them as not occurring ($F \rightarrow \neg$ Fig 4). This might be because an action you're not supposed to carry out has no meaning and therefore no effort is made to remember it. Exhortations carried out seem to have a deeper meaning, and are thus remembered differently. The thought that the subjects just didn't read the exhortations to be ignored can't be totally ruled out.

Conclusions

The results speak against the conclusions drawn by Gilbert et al.

Gilbert et al means that there is no difference between understanding an assertion and believing it and by that they give support to the Spinozan model.

The results indicate that exhortations to be ignored are forgotten. False assertions are remembered without its measure of truth, but are alas remembered.

This study tested if Gilbert et als conclusions and justification of the Spinozan model could be applied to exhortations. The results show that assertions and exhortations are not processed in the same way.

Exhortations to be ignored tend to be forgotten in a wider extent than exhortations to be carried out. They have been recalled by subjects as not occurring, and therefore seem to have been forgotten completely.

False assertions on the other hand doesn't seem to be forgotten in the same manner since subjects generally remembered their occurrence in the experiment, but mixing up the assertions measures of truth.

It cannot be said that the model used in processing assertions works in the same way for exhortations. Alas little can be said of the processing of exhortations but this.

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