

## **Knobe Effect: the influence of rational cognitive style**

### **Theoretical background**

A side effect is as an unintended, secondary effect of the main intended effect of an action. However, during his studies, Knobe (2003) discovered that people tend to consider some side effects as intentionally caused, while others are seen as unintentional. In his classic experiment Knobe (2003) administered the participants a twofold scenario in which a Chairman wants to increase profits of his company by starting a new program; this program involves two possible side-effects: in the first scenario, the profit growth will also bring about harmful effects to the environment, while in the second case the profits will also produce beneficial effects. In both conditions the Chairman asserts that he doesn't care about the side effects since he just wants to make a profit. Surprisingly, participants considered that the Chairman caused the environmental damage intentionally, while the beneficial effects were not considered intentionally performed. Therefore, people tend to consider positive side effects as intentionally caused to a lesser extent than negative ones (*Knobe Effect*). The causes of Knobe Effect have been long discussed (Cova et al., 2016), and one of the most accredited interpretations suggested that the negative consequences of the outcome might provoke an emotional reaction in the reader, which leads to an increase in intentionality judgments (Ngo et al., 2015). On the other hand, the role of the tendency to be rational, which refers to a logical, analytical and actively open-minded style of information processing (Evans & Stanovich, 2013) in decreasing this asymmetry of judgments is debated. Some authors (Pinillos et al., 2011) found that individuals with a rational cognitive style exhibit a lower asymmetry of intentionality judgments, whereas other authors failed to find such a relationship (Cokely & Feltz, 2009). Furthermore, the tendency to be rational was measured as an individual difference within the population, but there are no previous studies that manipulated this trait in order to evaluate the effects on the Knobe Effect, by administering concurrent tasks in order to overload the participants' cognitive capabilities.

### **Aims and Hypotheses**

The goal of this research project is to investigate, through two different studies, the relationship between the rational cognitive style and the attribution of intentionality to a side effect.

The first study will investigate the influence of the individual disposition to be rational on the attribution of intentionality. The hypothesis predicts that individuals who possess a rational cognitive style will provide lower judgments of intentionality to the scenario with the negative side effect, because of their ability to analyse situations more thoroughly.

In the second study, participants will be required to perform two concurrent tasks, in order to overload their cognitive abilities necessary to reason out the scenario. It is expected that, due to the cognitive load imposed, participants will further increase their intentionality judgments towards the negative side effect, compared to the positive one.

### **Methods –Participants and sample, Tools, Procedure, Statistical analyzes**

In the first study 73 participants (36 M, 37 F to reach a statistical power of 0.90 -G\*Power software analysis, Faul et al. 2007), aged between 20 and 50 years, will be recruited through university notice boards and social networks. The experiment will be administered through the Qualtrics software (2005, USA). After giving informed consent and some demographic information (gender, age, level of education), participants will provide intentionality judgments on a scale from 0 (not at all) to 10 (completely) to 8 scenarios, taken from the database of Ngo et al. (2015). Half of them will be carry a negative side effect and half of them a positive one. Unlike previous studies (eg. Pinillos et al., 2011), which employed only one short task to investigate the tendency to be rational (e.g. *Cognitive Reflection Task* - Frederick, 2005), in our study the rational cognitive style of participants will be measured by using two questionnaires (*Actively open-minded thinking*-Baron et al., 2015; *Rational and Experiential Inventory*-Pacini & Epstein, 1999) and two tasks (*Analogies* of the WAIS IV-Orsini

& Pezzuti scale, 2013; *reasoning subtest* of 16PF5-Sirigatti & Stefanile, 2001). The order of administration of the questionnaires/tasks and scenarios will be counterbalanced. In the second study, 160 participants (80 M, 80 F to reach a statistical power of 0.80 - G\*Power software analysis) will be recruited through university notice boards and social networks and the experiment will take place in a university laboratory (or if necessary using Qualtrics software). While providing intentionality judgments to the same scenarios as Study 1, participants will have to perform a concurrent task (backward counting - Pazzaglia & Cornoldi, 1999) to assess whether an overload of their cognitive abilities would lead to an increase of the Knobe Effect. This task will be compared with two control conditions: in the first, participants will perform a concurrent task requiring a low cognitive load (forward counting- Robertson & Frasca, 1992), while in the other they will provide judgments to the scenarios without performing any concurrent tasks. Each study will last about 15 minutes. The results will be analyzed, in both studies, using the SPSS 23.0 package. In the first study, regression analyses will be carried out to explore whether an individual tendency to be rational predicts the asymmetry of judgments, while in the second study the intentionality judgments provided by the three groups, engaged in tasks with different cognitive load (i.e., high, low and none), will be compared. The tutor agrees to request approval of the research project to the ethics committee of the University of Bologna.

### **Expected results and Implication**

In the first study, we expect that participants who possess a rational cognitive style will exhibit a lower asymmetry of judgments, compared to the control group.

In the second study, we expect the participants who undergo a greater cognitive load will show a greater asymmetry of intentionality judgments, compared to the two control groups.

These studies can provide useful elements to better understand the mechanisms underlying the attribution of intentionality, which represents a key capability in the everyday life of individuals who constantly need to ascribe meaning to other people's actions. Moreover, possessing an intention has strong implications because it involves a responsibility for the action of the agent who performs it. People generally distinguish between actions that are performed intentionally and those that are performed unintentionally. This distinction is decisive in the legal system where intentionality plays a crucial role, establishing the difference between deliberate murder and manslaughter (Malle & Nelson, 2003).

## References

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## Plan of activities

In the first 2 months of the research project, the fellow will complete a thorough literature review on the following topics:

- studies about the Knobe Effect;
- questionnaires and tasks aimed at measuring and manipulating the tendency to adopt a rational cognitive style of information processing;

In the next months, the research fellow will carry out the following tasks:

- selection and training in the use of questionnaires and tasks aimed at measuring and manipulating the tendency to use rationality (3rd month);
- enrolment of participants and data analysis of Study 1 (4 th/5th month);
- enrolment of participants and data analysis of Study 2 (6th/7th/8th month);
- discussion of the data obtained; preparation of a paper including both studies (9th-12th month).

As both studies can be performed on laboratory or on-line, using the Qualtrics platform if necessary for the containment measures of Covid19, the feasibility of project is considered “high”.