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Reports

Psychological distance and judgments of causal impact☆

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HIGHLIGHTS

- People judge causal impact by considering the magnitude of effects, and—to a weaker extent—the magnitude of causes.
- Psychological distance influences which piece of information is weighted more strongly.
- Effect magnitude dominates judgments of proximal events.
- Cause magnitude is weighted relatively more for distal events.

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ABSTRACT

When assessing causal impact, individuals have to consider two pieces of information: the magnitude of the cause that resulted in an effect, and the magnitude of the resulting effect. In the present research, participants judged the causal impact of cause–effect relationships in which the magnitude of causes and effects varied independently. Participants mainly relied on effect magnitude, rating causal impact to be much higher when strong (vs. weak) effects emerged. When participants took cause magnitude into account (which they did, but to a lesser extent), their judgments reflected a covariation rule (i.e., causal impact being maximal for strong causes generating strong effects) rather than a ratio rule (i.e., causal impact being maximal for weak causes generating strong effects). These distinct views on causal impact were moderated by psychological distance: Effect magnitude dominated judgments of proximal events, whereas cause magnitude had relatively more impact on causal judgments of distal events.

Introduction

Judgments of causal impact are important for regulating behavior in professional and private realms, alike. Cause–effect relationships are omnipresent in our lives, calling for the assessment of causal impact on multiple occasions. Doctors, for instance, judge the impact that a treatment has on health improvement to make optimal medical decisions. Citizens judge the impact of political activities on society and the economy. And researchers, when evaluating studies concerning health, education, or behavioral science, may assess the strength of a manipulation to determine the size of an effect. In everyday life, people monitor the influence of food and drinks on well-being, try to find out how effective or dangerous their sports activities are, or assess the impact of their actions on relationship quality and life satisfaction.

In all these judgments, people can, in principle, use two pieces of information about causal impact: the magnitude of a cause (e.g., the amount of alcohol drunk; the amount of money spent on a car) and the magnitude of an effect (e.g., the strength of the headache the next day; the fun of driving) to assess the causal impact (e.g., of a drink; of a transportation investment). What information is used when people make causal-impact judgments? And what factors influence what information people focus on while making the judgments? In the present research, we examined how people judge the impact of causes on effects (Experiment 1) and demonstrate that psychological distance from the judged event moderates these judgments (Experiment 2).

How to measure causal impact

One normative rule to measure social impact, analogous to the decibel rule in engineering, is an effect/cause ratio rule, according to which causal impact increases to the extent that maximal effects (in the numerator) grow out of minimal causes (in the denominator). A poison, for instance, of which just a small amount is enough to kill many rats, has a stronger impact than a poison of which a larger amount is needed,

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or a poison that kills only a few rats. More precisely, this ratio rule can be expressed as follows:

> If Δc denotes a causal treatment (e.g., an increment in food) and Δe denotes an effect (i.e., an increment of health problems), then causal impact is reflected in the ratio $\Delta e/\Delta c$, which measures the number of units changing in an effect variable given one unit of change in a causal variable (Fiedler, Freytag, & Unkelbach, 2011, p. 163).

However, subjective judgments of causal impact have been shown to violate the logic of this ratio rule. Most short-sighted causal-impact judgments focus almost exclusively on the effect magnitude, whereas the magnitude of the cause that was required to induce the effect is fully ignored. Thus, the impact of a cause appears to be stronger when the resulting effect is strong rather than weak, with little attention given to the magnitude of the cause (Fiedler et al., 2011). This bias was expected by Nisbett and Wilson (1977) and is also mirrored, for instance, in common research practice where researchers often over-emphasize effect-variance and effect-sizes while ignoring operationalizations of independent variables (i.e., magnitude of causes; see for instance, Mayo, 1978; Prentice & Miller, 1992).

The simplifying rule has been found in several studies by Fiedler et al. (2011), in which participants were presented with fictitious health studies that provided them with data of a control and an experimental group. Participants judged the causal impact of strong dietary treatments (i.e., the experimental group of the fictitious study comprised only the top 15% of dieters—those who had adhered most rigorously to the dieting instructions) or weak dietary treatments (i.e., the experimental group of the fictitious study comprised all dieters with diets that were not always applied with perfect consistency) leading to strong or weak health effects (i.e., the distribution of health scores obtained from the experimental and the control groups reflected a strong or a weak overlap).

According to the ratio rule, a diet is most effective if a weak treatment brings about a strong health effect. Yet this rule was not reflected in participants' judgments. Either they judged the impact of the diet solely according to the magnitude of the health effect and disregarded the magnitude of the treatments or—when primed to pay attention to the cause magnitude, as well—they apparently applied another rule that can be contrasted with the ratio rule. That is, they judged causal impact to be stronger when the magnitude of the cause leading to a given effect was *large* rather than small (Fiedler et al., 2011). The underlying alternative rule is easily identified as the covariation rule (Hilton, 1990, 1996; Kelley, 1972, 1973). The covariation between cause and effect is maximized when large causal inputs co-occur with large outputs on the effect side. It is small, in contrast, when causal input is weak because this means less detectable variation on the causal dimension.

At the normative level, it is important to note that there is nothing logically wrong with the covariation rule. Although covariation does not afford a quantitative measure of the standard increment in an effect given a standard increment in the cause, it does provide a sensible measure of the overall visibility or detectability of a cause–effect relationship. To the extent that judgments of causal impact are sensitive to the metacognitive ease or apparent salience of a causal relationship, they can actually be expected to follow the covariation rule (Fiedler et al., 2011).

In summary, two principles contribute to judgments of causal impact: (a) judgments are incommensurately based on the magnitude of the effect, with disregard for the influence of the magnitude of the cause, and (b) if attention is paid to the magnitude of the cause, large causes are considered as having a stronger impact than small causes. In the present research, we sought to test whether these two views bias judgments when participants are asked to judge the causal impact in cause–effect relationships, replicating Fiedler et al.'s (2011) findings in a more natural task context with cardinal numbers rather than percentile values used to quantify causal input. Additionally, we investigated whether the distinct views on causal impact are moderated by psychological distance.

Experiment 1: causal-impact bias

In Experiment 1, we tested the hypothesis that people judge causal impact to be stronger when the effect is strong (in line with both the ratio and the covariation rule) and when the cause is strong (in line with the covariation rule). In general, the influence of the effect information on judgments of causal impact should be greater than the influence of the cause information. Participants were presented with statements that involved a cause–effect relationship (e.g., eating 15 cookies of brand D causes an increase in body weight of 1 scale point). Both the strength of the cause (e.g., 15 vs. 50 cookies) and the strength of the effect (e.g., increase in body weight of 1 vs. 10 scale points) were varied within participants.

With this new paradigm we sought to replicate and extend the findings of Fiedler et al. (2011) as follows. Firstly, in the previous research by Fiedler et al., participants were asked to judge causal impact of dietary treatments on physical health in fictitious studies. In the present experiments, we used multiple judgments domains, such as weight increase, athletic performance, and emotions, showing that the effect can be generalized across domains. Secondly, participants in Fiedler et al.'s studies were required to sample the relevant information regarding cause and effect magnitudes. In the present experiments, we simplified the task by telling participants explicitly which cause magnitude affected which effect magnitude in one sentence. This was done in order to test whether the effect could be replicated when information is provided directly without sampling and inferences about cause and effect magnitudes being necessary. Thirdly, Fiedler et al.'s scenario referred to a fictitious study conducted in the past. The causal-impact judgments in the present experiment referred to present scenarios (Experiment 1) and future scenarios (Experiment 2).

Method

Participants and design

Thirty-eight participants were recruited from the Internet platform MTurk to take part in a study on causal judgments in exchange for $0.40. Cause strength and effect strength were manipulated within participants, resulting in a 2 (Cause Strength: low vs. high) × 2 (Effect Strength: low vs. high) within-participants design. We excluded six participants because they discontinued the study after reading the instructions. The remaining sample consisted of 32 participants (22 females, 10 males). Age ranged from 18 to 62 years ($M = 37.0$, $SD = 12.97$, $Mdn = 34$).

Materials

In this experiment, we presented participants with 16 events that involved a cause–effect relationship. These events referred to four different areas: (a) number of cookies eaten causing increase in body weight, (b) amount of doping drugs taken causing increase in athletic performance, (c) amount of tip left on the table causing increase in a waiter's happiness, and (d) minutes of waiting time causing anger in a customer. For each topic, we varied the size of the cause (e.g., 15 vs. 50 cookies) and the size of the effect (e.g., 1 vs. 10 scale points), resulting in 16 combinations (see Table 1). We used physical scale units to vary the size of the causes. To vary the size of the effects, we used "scale points" because some of the effects were psychological effects that cannot be expressed in physical units. For each statement, participants were asked to indicate the causal impact by answering the question "How strong is the influence of the cause on the effect?" on a scale from 1 (*very weak*) to 10 (*very strong*).