Causality and responsibility judgments in temporal chains

as a function of outcome severity and order of presentation

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Introduction

This paper examines the influence of outcome importance and presentation order on judgments of causality and responsibility. We selected a very simple causal structure where two events (A and B) have to occur at any point in time for an outcome (R) to take place. Such a kind of time-independent causal chain has been termed a temporal chain, where the occurrence of the second event is not dependent on the first, but if either does not occur, then the final outcome will not occur. As an example, let consider the following story.

> Jones and Cooper were asked to toss a coin. If the coins came up the same then Jones and Cooper were to lose 100€. Jones tossed the coin: tails came up. Then, Jack tossed the coin ands tails came up as well. Jones and Cooper lost 100€.

The advantage of such a scenario is that it can be formalised as follows:

Fact A (John's toss) *and* Fact B (Cooper's toss) *then* Outcome R (loss 100€)

Formally, both facts A and B are causes of the outcome. Experiments have shown that, when events are presented in chronological order, people tend to attribute cause to and blame the last actor (e.g., Cooper). It has also been pointed out that the kind of question influences the

mechanism of blame attribution. Our first hypothesis was that these recency effects are eliminated when the event occurring last is presented first. The second hypothesis was that people reason differently when an outcome has a deep human impact. Finally, we wanted to test whether causality and responsibility attributions can be considered as equivalent in this kind of scenario.

Experiment

Material

We constructed three scenarios where two events (A and B) occur before the outcome (R) takes place. In each of the three scenarios, event A precedes event B which in turn precedes outcome R. We examined three types of scenario which varied the kind of outcome: a relatively low-impact loss of money ("Coin toss"), a higher impact story involving a non-human cause (an already ill person falling into a coma as a result of virus' attacks), and high impact scenario in which a person dies (the "medical" scenario). Two versions of each scenario were designed. In the *chronological* version event A was presented first while in the *reverse* version, event B was presented first. In both versions the outcome was presented last. To ensure that the participants would not recognize the similarities in the causal structures in the scenarios we designed two mock scenarios that were interspersed between the three scenarios of interest. Causal and responsibility judgments were assessed through four questions

"To which extent do you think A is the cause of event R?"

"To which extent do you think A is responsible for event R to occur?"

"To which extent do you think B is the cause of event R?"

"To which extent do you think B is responsible for event R to occur?"

Each question was followed by a seven-point Likert scale ranging from not a cause/not responsible (0) to cause/responsible (7). That is, we asked for four judgements per scenario. We had three hypotheses. First, we expected outcome to influence causal and responsibility judgments. Regarding the elimination of the recency effect, we expected lower causality scores for event B when presented in the reverse order. Finally, we expected differences between judgements of causality and responsibility.

Participants

The participants were 33 undergraduate students of Toulouse II University, who took part in the experiment voluntarily. They were instructed to fill the questionnaires as quickly as possible. After the session the participants were debriefed about the real purpose of the experiment.

Results

Mean values are reported in Table 1.

		Cause		Responsibility	
	Presentation order	Event A	Event B	Event A	Event B
Coin Toss	Chronological	1.29	1.36	2.07	2.14
	Reverse	2.26	2.58	1.53	1.63
Virus Coma	Chronological	2.36	4.57	3.00	5.50
	Reverse	2.47	3.00	4.21	5.16
Medical Death	Chronological	3.11	5.95	3.53	5.11
	Reverse	3.36	4.57	3.57	4.64

Table 1. Mean scores of cause and responsibility for each scenario and presentation order.

An ANOVA with judgements (A as cause , B as cause, A responsible, B responsible) and outcome (Tossing, Medical, Virus) as within subject factors and presentation order (*chronological, inversed*) as a between subject factor yielded significant differences. Judgement scores differ according to outcome [$F(2,62) = 24.44$, MSE = 8.38, $p < .01$][1]. The ANOVA confirms our main hypothesis stating that outcome type impinges on causal attribution. Judgements also differed from each other as a function of outcome type, [$F(3,93) = 10.91$, MSE = 4.28, $p < .01$]. This result reveals that judgements on causality were different from each other but also that causal attribution and responsibility are distinct[2].

Our hypothesis concerning the recency effect in high-impact scenarios was supported. Scores for factor B did differ and B was judged as less causal in the *reverse* condition compared to the *chronological* condition. This effect is clear in scenarios concerned with high impact outcome [one tailed analyses: $t(31) = 1.74$, $p < .05$; $t(31) = 2.75$, $p < .01$]

Discussion

The first objective of the present research was to examine whether judgements of causality and responsibility would differ depending on the nature of the outcome. The data collected so far support our view: For that the formal structure was explained in each scenario, a person correctly applying counterfactual reasoning should have arrived at the conclusion that both event A and event B were causes. The fact that causality judgements differed from one scenario to another

[1] Statistics are still significant when we consider each judgement separately. Cause A [F(2,62)=3.61 , MSE=4.76 , p<.05]; Cause B [F(2,62)= 21.09, MSE= 4.15, p<.01] ; Responsibility A [F(2,62)= 5.72, MSE=5.95 , p<.01]; Responsibility B [F(2,62)= 30.7, MSE= 3.67, p<.01].

[2] The pattern of results is similar if judgements of causes and responsibility are considered separately.

shows that the participants did not apply the same algorithm to determine causality in every *outcome* condition.

Also, the present experiment showed that the way a causal structure is presented may change what people focus on as the cause of an event. Finally, the results reported in the above support the view that causality and responsibility are not similar measures. People may consider that an individual is a cause of an event but is not responsible for it.