Paraphrases of Counterfactual and Causal Conditionals

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Introduction

Counterfactual conditionals seem to be understood differently from factual conditionals. People may understand a factual conditional, e.g., 'if Joe cut his finger it bled' by initially envisaging just one true possibility, 'Joe cut his finger and it bled' (Johnson-Laird & Byrne, 1991; 2002). Counterfactual conditionals are different. People understand a counterfactual, e.g., 'if Joe had cut his finger it would have bled' by keeping in mind several possibilities. They think about the conjecture 'Joe cut his finger and it bled' and about the presupposed facts, 'Joe did not cut his finger and it did not bleed' (Byrne & Tasso, 1999).

Causal relations are often expressed in conditional 'if' assertions. There are different sorts of causal relations, such as strong ones, e.g., 'if Joe cut his finger it bled', weak ones, e.g., 'if the apples were ripe they fell off the tree', and enabling ones, e.g., 'if the ignition key was turned the car started'. People think about different sorts of possibilities when they understand them (Goldvarg & Johnson-Laird, 2001). Our aim was to examine whether people form different mental representations of factual and counterfactual conditionals, and different representations of strong, weak, and enabling causal relations.

Experiments

In two experiments we compared factual and counterfactual conditionals that expressed strong, weak, and enabling causal relations. In both experiments we relied on the sorts of paraphrases people produced as an indicator of the sorts of mental representations they formed (Fillenbaum, 1974). In the second experiment we provided a context to emphasise the different types of causal relations.

Method

Participants were asked to paraphrase conditional assertions without using 'if' (24 conditionals in experiment 1 and 12 in experiment 2). A conditional, e.g., 'if Joe cut his finger then it bled', can be paraphrased in several ways, e.g., 'Joe's finger bled when he cut it', 'Joe cut his finger and then it bled', or 'cutting Joe's finger caused it to bleed'.

Results

The results of both experiments showed that factual conditionals tended to be paraphrased most often by temporal connectives and counterfactuals by subjunctive constructions (see Table 1). There were few systematic differences between the different types of causal relations.

Table 1: Percentages of each type of paraphrase as a function of type of conditional, factual or counterfactual

Connective	Experiment 1		Experiment 2	
	Factual	Counterfactual	Factual	Counterfactual
Temporal	47	21	53	30
Causal	28	28	19	17
Conjunctive	9	5	0.5	0.5
Conditional	7	7	15	15
Subjunctive	4	35	10	35

Discussion

The two experiments show that people paraphrase factual and counterfactual conditionals by using different sorts of connectives. The data provide some support for the idea that people mentally represent factual conditionals by keeping in mind a single possibility (and so they use temporal connectives that refer to a single possibility); people mentally represent counterfactual conditionals by keeping in mind several possibilities (and so they use subjunctive constructions that capture several possibilities). Their mental representation of causal relations appears to be influenced primarily by the conditional that expresses the causal relation, i.e., whether it is factual or counterfactual.

Acknowledgments

References

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