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Reply to Fairley and Manktelow's comment on "Naive theories and causal deduction"

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Fairley and Manktelow (1997) have mistaken an error of presentation for an error of substance. My causal theory remains the same: Causal reasoning scenarios that require the reasoner to decide whether or not an effect will occur in the presence of a viable cause trigger consideration of disabling conditions—that is, factors that could prevent the effect from occurring in the presence of a viable cause. Scenarios that require the reasoner to decide whether or not a particular cause has produced an observed effect trigger consideration of possible alternative causes. The data reported by Cummins (1995) and Cummins, Lubart, Alksnis, and Rist (1991) are consistent with this theoretical analysis.

I thank Drs. Fairley and Manktelow for pointing out a problem in Cummins (1995). The problem stems from a regrettable typographical error that appears in the second to last paragraph in column 1 on page 649 in which "disabling conditions" and "alternative causes" were switched when referring to the example arguments. The relevant text should read "Accordingly, (g) should be influenced by consideration of disabling conditions. . . . On the other hand, (h) should be influenced by consideration of alternative causes."

That this was no more than an error of presentation rather than an error of content is apparent from two facts. First, the predictions of my theory are clearly and unambiguously spelled out in Figure 2 on page 650, where MP *and* MT are predicted to be influenced by the same factors, while AC *and* DA are predicted to be influenced by the same factors. Second, the theory, as originally and painstakingly laid out in Cummins, Lubart, Alksnis, and Rist (1991), made this point clear by systematically working through examples of each type of argument. In that paper, all conditionals were of the form "cause–effect," and MP *and* MT judgments were predicted and found to be affected by consideration of disabling conditions, while AC *and* DA were predicted and found to be affected by consideration of alternative causes. In Cummins (1995), I argued that reversing the order of the constituents to "effect–cause" would cause MP and MT to be affected by alternative causes, and AC and DA to be affected by disabling conditions. For example:

(a) *Modus Tollens* [cause → effect]
If the brake is depressed, then the car slows down
The car did NOT slow down.
Therefore, the brake was NOT depressed.

According to the theory, people reason about causal arguments by considering potential disabling conditions or alternative causes. In this particular case, the reasoner considers whether the car might not slow down even though the brake was depressed—that is, whether the EFFECT might not occur even though a viable cause is present. This situation is predicted to trigger consideration of disabling conditions—that is, conditions that could prevent an effect from occurring in the presence of a viable cause. It does not matter whether the effect appears in the conclusion or the second premise. This argument requires reasoning about whether the car must slow down given that the brake was depressed, and it is that concern that triggers consideration of disabling conditions. The reasoner considers whether the car might not slow down EVEN THOUGH the brake was depressed.

A different situation presents itself when the causal rule constituents are reversed in this type of argument:

(b) *Modus Tollens* [effect → cause]
If the car slowed down, then the brake was depressed.
The brake was NOT depressed.
Therefore, the car did NOT slow down.

Here, the reasoner is predicted to consider whether something else might cause the car to slow down even though the brake was not depressed—that is, whether ANOTHER CAUSE might produce the effect. This concern triggers consideration of alternative causes.

Similar analyses apply to Denying the Antecedent:

(c) *Denying the Antecedent* [cause → effect]
If the brake is depressed, then the car slows down.
The brake was NOT depressed.
Therefore, the car did NOT slow down.

The analysis here is the same as for (b). When evaluating this argument, reasoners are predicted to consider alternative causes—that is, they are predicted to consider whether some other cause might have made the car slow down.

(d) *Denying the Antecedent* [effect → cause]
If the car slowed down, then the brake was depressed.
The car did NOT slow down.
Therefore, the brake was NOT depressed.

The analysis here is the same as for (a). This argument is predicted to trigger consideration of disabling conditions. (Could something prevent the car from slowing down even though the brake was depressed?)

The theory can be summarized in the following way: *Whenever a reasoner must determine whether an effect*

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must occur in the presence of a viable cause, consideration of possible disabling conditions is triggered. Whenever a reasoner must determine whether a cause in fact produced a particular effect, consideration of possible alternative causes is triggered. These two simple strategies produce the predictions shown in Table 1 when mapped onto Modus Ponens, Modus Tollens, Denying the Antecedent, and Affirming the Consequent.

Table 1

Rule Order	Argument	Reason About	Judgment Influenced by
Cause–Effect	MP	Must effect occur?	Disabling Conditions
Cause–Effect	MT	Must effect occur?	Disabling Conditions
Cause–Effect	DA	Must this cause have produced effect?	Alternative Causes
Cause–Effect	AC	Must this cause have produced effect?	Alternative Causes
Effect–Cause	MP	Must this cause have produced effect?	Alternative Causes
Effect–Cause	MT	Must this cause have produced effect?	Alternative Causes
Effect–Cause	DA	Must effect occur?	Disabling Conditions
Effect–Cause	AC	Must effect occur?	Disabling Conditions

Again, I thank Drs. Fairley and Manktelow for providing me the opportunity to address a potential confusion caused by an unfortunate oversight in the theory's presentation.

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