

Nevertheless, we always begin from characteristics of the world with which we are familiar. What we do is imagine powers that we do not have, but that are conceivable. So much so that these powers usually belong to other nonhuman entities: speed (missiles), going backwards in time (history books), transforming objects (technologies), calculations and memory (computers), disappearing (complete mimicry of certain animals), and so forth.

When the purpose is to console ourselves or others, in order to encourage or deceive ourselves, or to make ourselves feel guilty, we resort to the notion of control. We construct counterfactuals to demonstrate that avoiding a certain situation was beyond our power, or that it was in our power, but we are to blame for not having avoided it. To exalt in ourselves, instill hope, or deceive ourselves, we imagine alternative worlds that are "worse off" without our intervention. To make ourselves feel guilty, we imagine that if we had not existed, "better" alternative worlds would have.

In childhood, we are unable to create counterfactuals with respect to the contents of our mind. Children believe that what is inside their minds and what is inside the minds of others is the same. For this reason a child cannot believe that others have false beliefs (they have the same beliefs as the child and these beliefs are true), until he or she reaches full development between the ages of one and five (Surian et al. 2007). Adults become so sophisticated that they are able to comprehend statements such as the one made by the former Federal Reserve chairman, Alan Greenspan: "I know you believe you understand what you think I said, but I am not sure you realize that what you heard is not what I meant" (Resche 2004, p. 731).

Ruth Byrne says that "people do not tend to imagine 'miracle-world' alternatives" (Byrne 2005, p. 191). However, if the goal is to construct a religion, it is better to do just that. "Religions are costly, hard-to-fake commitments to a counterintuitive world of super-natural causes and being" (Atran 2002, p. 264). The experiments of Scott Atran on the impact and memorizability of intuitive and minimally counterintuitive beliefs show that the delayed one-week recall presents the following sequence of remembering: intuitive and ordinary, intuitive but bizarre, minimally counterintuitive, and maximally counterintuitive. The best type of counterfactual to use for religious believers is the intuitive but bizarre domain of beliefs: for example, floating pencil, dangling cat, blinking newspaper. These are the couplings typical of miracles: walking on water, restoring sight to the blind, multiplying food, curing the ill. From the viewpoint of naïve physics, such things are impossible, but believable. In earthly matters, which are matters of explanations and calculation, one prefers a probable counterfactual to an improbable one for explaining things. In unearthly matters, an improbable belief is worse than an impossible belief for building faith in a religion. It is on such grounds that Oscar Wilde (1889/1989, p. 990), another great Dubliner like Ruth Byrne, criticized the Church of England and anticipated the experiments of Atran: "The growth of common sense in the English Church is a thing very much to be regretted. It is really a degrading concession to a low form of realism. It is silly, too. It springs from an entire ignorance of psychology. Man can believe the impossible, but man can never believe the improbable."

### Differential focus in causal and counterfactual thinking: Different possibilities or different functions?<sup>1</sup>

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**Abstract:** In *The Rational Imagination*, Byrne proposes a mental models account of why causal and counterfactual thinking often focus on different antecedents. This review critically examines the two central propositions of her account, finding both only weakly defensible. Byrne's account is contrasted with judgment dissociation theory, which offers a functional explanation for differences in the focus of causal and counterfactual thinking.

In *The Rational Imagination: How People Create Alternatives to Reality*, Byrne (2005) offers an account of why the contents of causal and counterfactual thoughts often diverge. Her account, based on the principles of mental models theory (MMT; Johnson-Laird & Byrne 2002) has two central propositions. First, counterfactual and causal thoughts sometimes differ in content because the former tend to focus on enablers, whereas the latter tend to focus on strong causes. Enablers are necessary conditions for the occurrence of an effect ( $C \Rightarrow A$ ), whereas strong causes are both necessary and sufficient for the effect ( $A \Leftrightarrow C$ ). Second, enablers are consistent with three possibilities and tend to be represented by two, whereas strong causes are consistent with two possibilities and tend to be represented by one. Specifically, if antecedent  $A$  is an enabler of consequent  $C$ , then the possibilities  $A \wedge C$ ,  $A \wedge \neg C$ , and  $\neg A \wedge \neg C$  are consistent and the first and last possibilities will tend to be mentally represented. For causes, the first and last of the same possibilities are consistent and only the first will tend to be represented. In Byrne's account, then, the basis for divergence in the content of causal and counterfactual thinking is that the former focuses on necessary and sufficient antecedents, whereas the latter focuses on necessary (but not necessarily sufficient) antecedents.

I agree with Byrne on the basics; namely, we share common definitions of enablers and strong causes, and we agree on the possibilities that are consistent with each. Our psychological accounts of causal and counterfactual thinking, however, diverge sharply. A fundamental difference is that Byrne traces differential focus in causal and counterfactual thinking to differences in the possibilities represented by enabler and strong-cause concepts, whereas judgment dissociation theory (JDT; Mandel 2003c; 2005) traces the differential focus to functional differences in these related but nevertheless distinct forms of goal-directed cognition. In JDT, the primary function of counterfactual thinking about negative past outcomes is to identify acts or events, particularly personally controllable ones (Mandel & Lehman 1996), that would have been sufficient to prevent the actual outcome or consequentially similar outcomes had they been taken or had they occurred. In contrast, the primary function of causal thinking is to identify acts or events that were sufficient to bring about the outcome as it actually occurred under the circumstances. Byrne does not deny these functional differences – indeed, at points in her book, she alludes to them – but they remain on the periphery of her account.

Consider Byrne's proposition that counterfactual statements focus on enablers, whereas causal statements focus on strong causes. This distinction alone cannot explain the phenomenon of differential focus, because strong causes are, by definition, also enablers. That is, strong causes constitute a subset of C-enablers that are also sufficient to yield C. Hence, all strong causes should be candidates for counterfactual thinking, although some enablers would not be candidates for causal ascription. Byrne's first proposition begs the question of why counterfactual thinkers would focus on enablers that are not strong causes if the latter already meet the enabler criterion. If not functionally motivated, such behavior might seem a waste of scarce cognitive resources, perhaps even irrational.

Contrary to Byrne's account, the fact that counterfactuals meet the logical criterion for enabling seems to me largely incidental. Consider the statement, "If only the CIA hadn't botched their analyses, 9/11 would have been averted." According to

Byrne, this counterfactual signifies that “botching” was necessary for 9/11, with emphasis placed on the necessary condition for the generation of the actual disaster. According to JDT, the counterfactual means something quite different; namely, that the absence of (or a reduction in) botching would have sufficed to have prevented the disaster. The emphasis here is on foregone sufficient disablers rather than actual necessary enablers. In this view, such counterfactual conditionals represent a form of *satisficing* (Simon 1956) in which one identifies events, especially controllable acts, which would have been enough to undo a past failure. The emphasis on control in this account, sharing much in common with Collingwood’s (1940) manipulation theory of causation, can also explain why counterfactuals often focus on factors other than strong causes even though the latter satisfy the enabling criterion – namely, because manipulability is, at best, a weak constraint on causal ascriptions. The theoretical focus on sufficient disablers rather than necessary enablers is also supported by literature indicating that people are biased toward sufficiency testing for adaptive reasons (Friedrich 1993; Klayman & Ha 1987) and tend to interpret causatives in terms of sufficiency (Mandel 2003c; Mandel & Lehman 1998; Wolff 2007).

Briefly, let me say a few words about Byrne’s second central proposition, which links the distinction between enablers and strong causes to mentally represented possibilities. Her prediction that enablers (and, by extension, counterfactuals) conjure up possibilities  $A \wedge C$  and  $\neg A \wedge \neg C$ , whereas strong causes conjure up only the former, fits the data. However, the reason for this prediction is unexplained. Indeed, the opposite prediction seems to me more plausible: If temporal order is preserved, as it tends to be in causal reasoning (Einhorn & Hogarth 1986), then only one of the two models is congruent with enabling ( $\neg A \wedge \neg C$  as  $\neg A \Rightarrow \neg C$ ), whereas both are congruent with strong causes ( $A \wedge C$  as  $A \Rightarrow C$  and  $\neg A \wedge \neg C$  as  $\neg A \Rightarrow \neg C$ ). As I have proposed elsewhere (Mandel 2003b), the reason why past-tense counterfactual conditionals appear to evoke two possibilities, whereas indicative conditionals do not point to facts; only possibilities. Given that possibilities, not facts, constitute the basic units of mental representation in MMT, Byrne’s account cannot accommodate this type of explanation.

In summary, Byrne provides a good overview of the mental models perspective on counterfactual thinking. In my own estimation, her book succeeds in presenting that account, even if the account itself reveals its own limitations.

NOTE

1. The author of this commentary carried out this research on behalf of the Government of Canada, and as such the copyright of the commentary belongs to the Canadian Crown and is not subject to copyright within the United States.

**Counterfactuals need not be comparative: The case of “As if”**

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**Abstract:** Byrne (2005) assumes that counterfactual thinking requires a comparison of facts with an imagined alternative. In our view, however, this assumption is unnecessarily restrictive. We argue that individuals do not necessarily engage in counterfactual simulations exclusively to evaluate factual reality. Instead, comparative evaluation is often suspended in favor of experiencing the counterfactual simulation as if it were real.

Ruth Byrne’s *The Rational Imagination* (2005) is an outstanding work that provides the clearest answers thus far to long-standing questions about counterfactuals such as “What is most mutable?” and “Why is this so?” Thus, in the spirit of broadening the perspective offered by Byrne, we will merely choose to quibble with a single phrase that appears in the book, specifically, “counterfactual thinking requires a comparison of the facts with the imagined alternative” (p. 122). In our view, this assumption, shared by most if not all scholars who study counterfactual thinking and conditional reasoning, is unnecessarily restrictive. Rather, we have suggested (e.g., see Markman & McMullen 2003; 2005; McMullen 1997; McMullen & Markman 2000), and continue to maintain, that individuals do not necessarily engage in counterfactual simulations exclusively to evaluate factual reality. Instead, comparative evaluation may be, and often is, suspended in favor of experiencing the counterfactual simulation as if it were real.

Markman and McMullen (2003) proposed a Reflection and Evaluation Model (REM) to account for how counterfactuals can have either contrastive (i.e., displaced away from a counterfactual standard) or assimilative (i.e., displaced toward a counterfactual standard) effects on affect and judgments. The model asserts that two psychologically distinct modes of mental simulation operate during counterfactual thinking: *reflection*, an experiential, “as if” mode in which counterfactual possibilities are vividly simulated, and *evaluation*, a comparative mode in which counterfactual standards are used as a reference point against which to evaluate factual reality. Reflection renders standard-consistent cognitions accessible, thereby yielding assimilation, whereas evaluation yields contrast because counterfactuals are used as a standard against which to compare factual reality.

To illustrate, consider how an individual who just missed being killed in a plane crash may experience a great deal of anguish by dwelling on what might have happened (assimilation) (see also Oettingen 1996), but at another time feel quite lucky by focusing on the fact that they are, by good fortune, alive today (contrast). Similarly, imagining having won the lottery might elicit positive affect by one’s fantasizing about having a great deal of money (assimilation) so long as one suspends their evaluation of the fact that they do not have a great deal of money. On the other hand, evaluation of this fact in light of the counterfactual should lead one’s perception of their present state to seem even more impoverished (contrast).

Byrne (2005) describes an interesting study conducted by Thompson and Byrne (2002) that examined whether there are differences among individuals in their willingness or ability to consider more than one possibility when confronted with a counterfactual conditional. Although the majority of participants kept in mind two possibilities – the presupposed facts and the counterfactual conjecture – about a quarter of the participants kept in mind only a single possibility – the presupposed facts – when they contemplated the conditional. In our view, however, this work neglects to mention a third way that individuals may entertain counterfactual assertions: keeping only the *false* possibility in mind. Moreover, engaging in such an “as if” type of simulation should have assimilative effects on subsequent responses and judgments. Is there empirical evidence to support such a claim?

An early and clear demonstration was provided by McMullen (1997), who asked participants to recall a somewhat negative event in their own lives and imagine how things could have turned out better (upward counterfactual) or worse (downward counterfactual) than they actually did. Participants in the reflection condition were then instructed to “vividly imagine what might have happened instead,” whereas those in the evaluation