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## Semifactual “even if” thinking

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Semifactual thinking about what might have been the same, e.g., “even if Philip had not chosen the chocolate ice-cream sundae, he would have developed an allergic reaction” has been neglected compared to counterfactual thinking about what might have been different, e.g., “if only Philip had not chosen the chocolate ice-cream sundae, he would not have developed an allergic reaction”. We report the first systematic comparison of the two sorts of thinking in two experiments. The first experiment showed that counterfactual “if only” thoughts about an antecedent event lead people to judge the event to be more causally related to the outcome, whereas semifactual “even if” thoughts lead people to judge the antecedent event to be less causally related to the outcome. In addition, the experiment showed that generating counterfactual “if only” thoughts increases emotional reactions such as regret, whereas generating semifactual “even if” thoughts decreases such reactions. The second experiment, along with a replication experiment, showed that when people complete “if only” and “even if” sentence stems, they focus on different alternative antecedents to the outcome: “if only” thoughts focus on alternatives that would undo the outcome whereas “even if” thoughts focus on alternatives that would not undo it, from among a set of available alternative antecedents in which either all, some, or none would undo the outcome. The implications of the results for theories of thinking about what might have been are discussed.

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Counterfactual “if only” thinking about how things might have been different has been studied extensively by social and cognitive psychologists for the past 20 years, at least since Kahneman and Tversky’s (1982) seminal work on the topic. Suppose you experience an unpleasant situation, e.g., you forget your umbrella and you get wet in the rain. You might think about what might have been and you may generate a counterfactual “if only” thought about how things could have been different, for example, “if only you hadn’t forgotten your umbrella you wouldn’t have got wet”. This sort of imaginary counterfactual thinking is a pervasive feature of everyday life (e.g., Byrne, 1997; Kahneman & Miller, 1986; Roese & Olson, 1995; Spellman, 1997). The counterfactual thought undoes both the antecedent and the outcome, and so it contains both a false antecedent and a false outcome, temporarily supposed to be true (in fact, you did forget your umbrella and you did get wet).

The study of thinking about what might have been has implications for a wide range of social and cognitive processes, as we will see. But most research has focused on only one side of the story. Counterfactual “if only” thoughts about what might have been *different* have received considerable attention, but there has been a paucity of research on the equally important and related semifactual “even if” thoughts about what might have been the *same*. When you forget your umbrella and you get wet in the rain, you may generate a semifactual “even if” thought about how things could have been the same, for example, “even if you hadn’t forgotten your umbrella you would still have got wet”. The semifactual thought undoes the antecedent but not the outcome, and so it contains an antecedent that is false (you did forget your umbrella), and an outcome that is true (you did get wet).

Philosophers have long distinguished between counterfactual and semifactual thinking (e.g., Barker 1991; Goodman, 1973), but there has been little systematic study of the psychology of semifactual thinking. Our aim in this paper is to examine this other side of the story, semifactual thinking, and to compare it to counterfactual thinking. We will first sketch what is known about counterfactual thinking, then we will describe some recent ideas about the way people understand counterfactual and semifactual conditionals, and we will report the results of two experiments that compare the generation of semifactual and counterfactual thoughts.

## COUNTERFACTUAL THINKING

Many studies of counterfactual thinking have addressed *how* people think counterfactually, that is, what determines which factual event people change or mutate, and which imaginary alternative to the actual event they construct. For any factual situation, a potentially infinite set of counterfactual alternatives can be constructed. But people have neither the time nor the cognitive capacity to consider all of the counterfactual alternatives. The imaginary alternatives that

people consider must be constrained in some way. The results of studies on counterfactual mutability have shown that certain aspects of factual situations are more mutable than others, perhaps guided by core categories of mental life such as space, time, causality, and intentionality (e.g., Byrne, 1997; Miller & Johnson-Laird, 1976). For example, people undo actions within their voluntary control more often than those outside their control (Giroto, Legrenzi, & Rizzo, 1991; Markman, Gavanski, Sherman, & McMullen, 1995; McCloy & Byrne, 2000). They undo actions of a focal individual rather than actions of an individual in the background (Kahneman & Tversky, 1982), they undo actions that are unusual for an individual rather than routine actions (Gavanski & Wells, 1989; Kahneman & Tversky, 1982), and they undo actions rather than inactions (Byrne & McEleney, 2000; Gilovich & Medvec, 1994; Kahneman & Tversky, 1982). The causal and temporal relations between events also affect their mutability: people undo the first event in a dependent, causally related sequence (e.g., Wells, Taylor, & Turtle, 1987), and the last event in an independent, temporally related sequence (e.g., Byrne et al., 2000; Miller & Gunasegaram, 1990; Spellman, 1997). What is mutable may depend on the nature of the mental representations that people construct of the factual situation (Byrne, 1997; Legrenzi, Giroto, & Johnson-Laird, 1993) and their mental representation of the counterfactual alternatives (Walsh & Byrne, 2001).

The study of counterfactual thinking has also revealed the *antecedents* and *consequences* of counterfactual thinking, that is, the situations in which it is most likely to occur, and the effects it has on social and emotional judgements. The results of studies on the antecedents of counterfactual thinking have clarified when people are likely to think about what might have been—for example, counterfactual thinking is more common after negative outcomes, and after disconfirmed expectancies (e.g., Klauer & Migulla, 1995; Roese & Olson, 1997; Sanna & Turley, 1996). The results of studies on the consequences of counterfactual thinking have clarified that it influences the experience of certain emotions, such as regret, elation, guilt, and shame (e.g., Gilovich & Medvec, 1994; Landman, 1987; Niedenthal, Tangney, & Gavanski, 1994). It also influences judgements of causality, responsibility, and blame (e.g., Macrae, 1992; Miller & Turnbull, 1990; N'Gbala & Branscombe, 1995; Wells & Gavanski, 1989).

One of our primary aims in this paper is to study the consequences of semifactual thinking. Some of the studies that have examined the consequences of counterfactual thinking have relied indirectly on a baseline set by semifactual thinking. For example, Branscombe, Owen, Gartska, and Coleman (1996) asked people to rewrite an account of a crime so that the outcome was the same or different. They found that if people changed the actions of an individual involved in the crime and it resulted in a different outcome, people blamed that person more than if they changed an individual's actions and left the outcome unchanged. Likewise, Boninger, Gleicher, and Strathman (1994) gave

participants a scenario about an Olympic runner who lost her race after suffering debilitating side-effects from taking a legal painkiller. Participants told about an alternative drug that had no side-effects (a counterfactual alternative) judged the runner would feel more regret, more self-blame, and feel worse, than did those told about an alternative drug that had the same side-effects (a semifactual alternative).

These studies provide intriguing hints that counterfactual thoughts about how an outcome might have been different “if only” the events preceding it had been different may increase negative emotions and blame, compared to semifactual thinking about how an outcome might have been the same “even if” the events preceding it had been different. However, it is not possible to know from these studies whether semifactual thinking *decreases* judgements of emotions and blame compared to not thinking about what might have been at all, or whether it has the same effect as not thinking about what might have been. To draw such conclusions, what is needed is a comparison of the effects of semifactual thoughts to no thoughts about what might have been. In fact, it is not possible to know whether counterfactual thinking increases such judgements compared to not thinking about what might have been, or of it has the same effect as not thinking about what might have been: what is also needed is a comparison of the effects of counterfactual thoughts to no thoughts about what might have been. Our aim is to provide such comparisons. A second aim is to understand the cognitive processes that underlie the differences between semifactual and counterfactual thinking.

## UNDERSTANDING COUNTERFACTUAL AND SEMIFACTUAL ASSERTIONS

People may understand a counterfactual assertion such as “if only he had jumped he would have caught the ball”, by keeping in mind not only the possibility that it describes, he jumped and he caught the ball, but also the factual situation it presupposes, he did not jump and he did not catch the ball (Byrne & Tasso, 1999; Fillenbaum, 1974; Johnson-Laird & Byrne, 1991). Evidence to corroborate this suggestion comes from experiments which show that people make more of the inferences that require access to the presupposed possibility (for example, they conclude “he did not jump” when they are told “he did not catch the ball”), from a counterfactual conditional such as “if he had jumped he would have caught the ball”, than from an indicative conditional, “if he jumped he caught the ball”. They make the same amount of inferences that require access to the asserted possibility (for example, they readily conclude “he caught the ball” when they are told “he jumped”) from both sorts of conditionals (Byrne & Tasso, 1999).

People may understand a semifactual assertion, such as, “even if he had jumped he would not have caught the ball”, by keeping in mind not only the

possibility it describes, he jumped and he did not catch the ball, but also the factual situation it presupposes, he did not jump and he did not catch the ball (Rios, Madruga, & Byrne, 2001). Evidence to corroborate this suggestion comes from experiments which show that people make fewer of certain inferences (for example, they rarely conclude "he jumped" when they are told "he did not catch the ball") from a semifactual conditional such as "even if he had jumped he would not have caught the ball", compared to an indicative conditional, "if he jumped he did not catch the ball".

Counterfactual and semifactual assertions differ not only in their logical structure, but also in the mental representations that people construct of them. A counterfactual "if only  $p$ ,  $q$ " is understood by keeping in mind the conjectured possibility of  $p$  and  $q$ , e.g., jumping and catching the ball, and the presupposed fact of not- $p$  and not- $q$ , e.g., not jumping and not catching the ball (Byrne & Tasso, 1999; Johnson-Laird & Byrne, 1991). A semifactual "even if  $p$ , not- $q$ " is understood by keeping in mind the conjectured possibility of  $p$  and not- $q$ , e.g., jumping and not catching the ball, and the presupposed fact of not- $p$  and not- $q$ , e.g., not jumping and not catching the ball (Rios et al., 2001). We suggest that it is this difference in mental representation that underlies the different consequences of counterfactual and semifactual thinking. In this paper we report the results of two experiments designed to compare counterfactual and semifactual thinking. The first experiment was designed to compare the consequences of counterfactual and semifactual thinking for people's causal judgements and their emotional reactions. The second experiment was designed to test whether or not people focus on different alternatives to reality in their "even if" thoughts from those that they focus on in their "if only" thoughts.

## EXPERIMENT 1 THE CONSEQUENCES OF SEMIFACTUAL THINKING

Our aim in the experiment was to provide the first systematic examination of the consequences of semifactual thinking. Our first aim was to compare the effects of semifactual and counterfactual thinking on judgements about causality. Counterfactual thinking has been hypothesised to play a key role in establishing causation but nothing is known about the effects of semifactual thinking on causal judgements. There have been no psychological studies to examine the consequences of semifactual thinking for perceptions of causality, and our aim was to redress this imbalance. Our second aim was to compare the effects of semifactual and counterfactual thinking on negative emotions. Very little is known about how semifactual thinking influences emotions (e.g., Boninger et al., 1994) and our aim was to provide the first comparison of the emotional consequences of semifactual and counterfactual thoughts, to no thoughts about what might have been.

## Semifactuals and causality

Counterfactual thinking can increase causal judgments. For example, Wells and Gavanski (1989) asked people to generate counterfactual thoughts about a scenario in which a taxi driver refused a lift to a disabled couple. The couple then took their own car and were involved in a fatal accident. They found that participants rated the taxi driver's behaviour as more causal when they generated counterfactual "if only" thoughts about his behaviour before making causal ratings, than when they rated his behaviour before generating counterfactual thoughts. Nothing is known about the effects of semifactual thinking on causal judgements. We conjecture that because of the different mental representations that underlie counterfactual and semifactual thinking, they should differ in their consequences for people's causal judgements.

Philosophers have considered that counterfactual and semifactual thinking may affect causal reasoning. For example, Mill's (1872) "method of difference" suggests it is necessary to think about whether undoing certain events in the past would undo an outcome, and such a method may be especially important in situations where experiments are not possible (Mackie, 1974; Tetlock & Belkin, 1996). Likewise, semifactual thinking has been hypothesised to play a role in judgements of causality. For example, Sherman and McConnell (1995, p. 210) suggest that:

... it is important for perceivers to consider not only how mutations could have changed the outcome but also how alternative antecedent events might have led to the same outcome. Only then will perceivers be able to judge correctly the inevitability or the avoidability of an event and to grasp the causal structure of the situation.

(See also Mandel & Lehman, 1996.)

We have suggested that when people understand a counterfactual, they keep in mind the conjectured possibility, *p* and *q*, e.g., jumping and catching a ball, and the presupposed fact, not-*p* and not-*q*, e.g., not jumping and not catching the ball. Accordingly, the outcome, *q*, (catching the ball) may appear to be dependent on the occurrence of the antecedent, *p* (jumping), because in the two possibilities that people keep in mind, *q* occurs only when *p* occurs (catching the ball occurs only when jumping occurs). These two possibilities represent a strong causal link between the antecedent and its outcome (Goldvarg & Johnson-Laird, 2000; Johnson-Laird & Byrne, 1991). A counterfactual, such as "if only he had jumped he would have caught the ball", may be interpreted as asserting that there is a causal link between its antecedent, e.g., jumping, and its consequent, e.g., catching the ball (e.g., Goodman, 1973; McEleney & Byrne, 2000).

In contrast, we have suggested that when people understand a semifactual, they keep in mind the conjectured possibility, *p* and not-*q*, e.g., jumping and not

catching the ball, and the presupposed fact, not-*p* and not-*q*, e.g., not jumping and not catching the ball. Accordingly, the outcome, not-*q* (not catching the ball), may appear independent of the occurrence of the antecedent, *p* (jumping), because *q* occurs whether or not *p* does (not catching the ball occurs whether or not he jumps). These two possibilities represent the denial of a causal link between the antecedent and its outcome. A semifactual, such as “even if he had jumped he would not have caught the ball”, may be interpreted to deny that a causal link exists between its antecedent (jumping) and its consequent (not catching the ball).

Accordingly we predict that when people generate counterfactual “if only” thoughts about an antecedent and its outcome, they will judge the antecedent to be highly causally important in producing the outcome (e.g., Wells & Gavanski, 1989). We also make the novel prediction that when people generate semifactual “even if” thoughts about an antecedent and its outcome, they will judge the antecedent to be less causally important in producing the outcome. We expect that compared to no thoughts about what might have been, counterfactual thinking will increase judgements of causality, and semifactual thinking will decrease judgements of causality.

## Semifactuals and emotions

Counterfactual thinking influences the emotions that people experience (e.g., Kahneman & Miller, 1986). One way it can affect emotions is through the contrast between a factual outcome and an imagined alternative outcome (e.g., Roese & Olson, 1995). For example, Roese (1994) showed that participants reported feeling worse following the outcome of a game of chance if they were asked to imagine how the outcome could have been better (an upward counterfactual), and reported feeling better if they were asked to imagine how the outcome could have been worse (a downward counterfactual). People’s emotional reactions may depend on the contrast between what actually happened and an available counterfactual alternative.

Another way counterfactual thinking can affect emotions is through causal inferences based on the counterfactual scenario generated. Roese and Olson (1995) suggested that people may, for example, regret events to the extent that they believe those events to have caused a negative outcome. In addition, Niedenthal et al., (1994) asked their participants to imagine themselves as the actor in a scenario in which a good friend’s date flirted with them and they exchanged telephone numbers. They found that participants who were directed to generate “if only” thoughts that focused on their own behaviour, reported feeling more guilt than shame about the events of the scenario, whereas participants directed to generate “if only” thoughts that focused on the type of person that they were, reported feeling more shame than guilt. Causal inferences may influence not only the degree of emotion experienced, but also the specific emotion that people report.



Very little is known about how semifactual thinking influences emotions (Boninger et al., 1994; Branscombe et al., 1996). Semifactual thoughts are unlikely to influence emotions through a contrast between a factual outcome and an imagined outcome because, of course, semifactual outcomes are, by definition, identical to the factual outcome. If thinking about what might have been influences emotions solely through a contrast mechanism, semifactual thinking should have no effects on emotions. However, semifactual thoughts may influence emotions through causal inferences based on the scenario generated. For example, people may regret an antecedent because they believe it caused a negative outcome, but semifactual thoughts may reduce how causal the antecedent is perceived to be in producing the outcome. If semifactual thoughts reduce perceived causality, then they should also reduce negative emotions.

In our first experiment we relied on a scenario about an Olympic runner who injured herself the day before a race (adapted from Boninger et al., 1994). The runner chose between two legal painkillers, an older drug with known side-effects including drowsiness and nausea, and a newer drug, whose side-effects were unknown. The runner chose the older drug, experienced the side-effects, and narrowly missed winning a medal. Boninger et al. (1994) gave participants in one condition the information that the newer drug had no side-effects, and those in a second condition the information that the newer drug had the same-side effects as the older one. Participants in the first condition judged that the runner would feel more regret about the drug decision, feel more self-blame, and feel worse, compared to participants in the second condition. One interpretation of these results is that thinking counterfactually about how things could have been different increases judgements of negative emotions (Boninger et al., 1994). It is likely that participants in the first condition engaged in counterfactual thinking, and participants in the second condition engaged in semifactual thinking. However, our concern is that it is not possible to know whether the results show that counterfactual thinking increases judgements of negative emotions, or semifactual thinking decreases judgements of negative emotions, or both. Our aim was to compare counterfactual and semifactual thinking to a neutral baseline, in which we gave participants in a third condition no information about the newer drug, to examine the effects of each type of thinking on negative emotions.

The presentation of alternatives that lead to a different outcome or the same outcome may indirectly induce counterfactual and semifactual thinking, but it is also possible to do so more directly, by asking participants to generate either "if only" thoughts or "even if" thoughts on behalf of the protagonist of the scenario. The more direct instruction has the advantage of providing an objective measure that participants are generating the same sorts of thoughts. In the experiment we included this more direct manipulation as well, and again, we included a third condition as a baseline, in which participants were not asked to generate mutations. The combination of three sorts of alternatives (same outcome, dif-

ferent outcome, no information about the outcome) and three sorts of thought-generation tasks (even if, if only, no thoughts) resulted in nine conditions, which allowed us to examine systematically the consequences of semifactual and counterfactual thinking on judgements.

We asked our participants to make judgements about negative emotions (regret, self-blame, and feeling bad), and we also asked them to make judgements about causality (for an earlier preliminary report of the experiment, see also McCloy & Byrne, 1999). The experiment provides the first systematic comparison of the effects of semifactual and counterfactual thinking on causal judgements, and on negative emotions.

## Method

*Participants.* The participants were 367 undergraduates (264 women, 101 men—2 participants did not record their gender) from the University of Dublin, Trinity College. They had an average age of 19 years (range 17–46 years). They were assigned at random to one of nine groups, each of approximately 40 participants.

*Procedure.* The experimental materials were presented in a three-page booklet consisting of a cover page with instructions and space for recording age and gender, a second page with one of the versions of the scenario, and a third page with a mutation task (if only, even if, or no mutation task), the three emotion rating tasks (regret, feeling bad, self-blame) and the causal rating task. Participants were instructed to read the scenario carefully and to answer the questions that followed. They were asked to answer the questions in the order in which they were presented and not to change their answers once they had written them. On completion of the experiment participants were verbally debriefed.

*Materials and design.* We gave all of the participants the following scenario, based on that used by Boninger et al. (1994):

You are a runner and since the age of eight you have competed in the sprint races in local track and field events. Up through school you had won every race in which you had competed. It was at the age of 13 that you began to dream about the Olympics. At the age of 18, before starting college, you decide to give the Olympics one all out shot. You make the Irish Olympic team for the 400 metre race.

On the day before the 400 metre race, in a freak accident during training, you sprain your left ankle. Although there is no break or fracture, when you try to run, the pain is excruciating. Your trainer tells you about many advances in pain killing medications and assures you that you will still be able to participate. He recommends that you choose between two drugs, both legal according to Olympic guidelines. One is a well-known pain killer that has been proved effective but also

has some serious side effects including temporary nausea and drowsiness. The other pain killer is a newer and less well-known drug. Although the research suggests that the newer drug might be a more effective pain killer, its side effects are not yet known because it has not been widely used.

After considerable thought, you elect to go with the more well-known drug. On the day of the race, although there is no pain in your ankle, you already begin to feel the nausea and find yourself fighting off fatigue. You finish in fourth place, only 1 tenth of a second from a bronze medal, 4 tenths from a silver, and 5 tenths from a gold medal.

We manipulated the nature of the alternative outcome that participants read about by ensuring that the scenario had three different endings. For the different outcome condition the final paragraph read:

After the event, you learn that some athletes in other events who were suffering from similar injuries used the other, newer drug. They felt *no* pain and experienced *no* side effects.

For the same outcome condition, the paragraph instead read that the other athletes had felt *no* pain but experienced *the same* side-effects. For the no alternative condition this paragraph was omitted, so participants received no information concerning other athletes' experiences with the newer drug.

We also manipulated the nature of the mutation task so that one of three mutation tasks followed the scenario: a counterfactual mutation task in which participants were asked to imagine that in the days and weeks following the race they thought "if only ..." and they were asked how they completed this thought; a semifactual mutation task, in which participants were instead asked to imagine that they thought "even if ..." and were asked how they completed this thought; or a no mutation task, for which participants proceeded directly from reading the story to carrying out the emotion and cause rating tasks.

These two independent variables, each with three levels, resulted in nine different conditions. The main dependent variables were participants' causal ratings of the decision to take the older drug, and their ratings of emotional reactions to the outcome of the scenario. We examined their causal judgements by asking them to put themselves in the place of the protagonist of the story and to answer the question: "To what extent do you think your decision to take the well-known drug led to your failure to obtain an Olympic medal in the 400 metre race?" They gave their answer on a 9-point scale where 1 indicated that they believed their decision was not at all causal, and 9 indicated that they believed it was the most important cause of their failure. We examined their judgements of negative emotions in a similar way, by asking them the questions, "How much do you regret taking the more well-known drug?" "To what extent do you feel bad about how things turned out?" and, "How much do you blame yourself for not

getting an Olympic medal in the 400 metre race?” They provided their answers on a 9-point scale, where 1 indicated that they did not feel the emotion at all and 9 indicated that they felt it a great deal. All participants received the emotion rating tasks in the order described, followed by the causal rating task.

## Results and discussion

We carried out a 3 (thought generated: if only, even if, no thought) by 3 (alternative outcome: different, same, none) multivariate analysis of variance on the four dependent rating measures: causal ascription, regret, feeling bad, self-blame. The MANOVA showed a main effect of each of the independent variables, the thought generated, Wilks lambda = 0.95,  $F(2, 356) = 2.07$ ,  $p < .05$ , and the alternative outcome, Wilks lambda = 0.77,  $F(2, 356) = 12.13$ ,  $p < .0001$ . There was no interaction between the two variables, Wilks lambda = 0.93,  $F(2, 356) = 1.51$ ,  $p < .87$ . We report the results from each univariate analysis of variance in turn.

*“If only” and “even if” thoughts have different effects.* The kind of thought that participants generated (if only, even if, no thought) affected their judgements of causal and emotional strength. Univariate ANOVAs showed that the sort of thought generated affected participants’ judgements of causal strength, and of one of the emotions, feeling bad. The thought generated affected the ratings of causality,  $F(2, 356) = 4.77$ ,  $p < .01$ : As we predicted, “even if” thoughts *decreased* participants’ ratings of the causal role of the decision to take the more well known drug compared to no thoughts ( $M = 4.82$  vs  $5.67$ , Student-Neuman-Keuls tests,  $p < .05$ ). Interestingly, “if only” thoughts did not increase or decrease ratings of the causal role of the decision compared to no thoughts ( $M = 5.23$  vs  $5.67$ ,  $p > .05$ ). The difference between “even if” and “if only” thoughts also was not reliable ( $M = 4.82$  vs  $5.23$ ,  $p > .05$ ), as Table 1 shows.

The kind of thought generated affected how bad participants reported feeling:

TABLE 1  
The effects of the generation of “even if”, “if only”, and no thoughts (collapsed over different alternative outcomes) on ratings of causal strength and negative emotions in Experiment 1

<i>Thoughts generated</i>	<i>Judgements</i>			
	<i>Cause</i>	<i>Regret</i>	<i>Feeling bad</i>	<i>Self-blame</i>
“Even if” thoughts	4.82	5.29	6.68	4.85
“If only” thoughts	5.23	5.36	7.29	5.35
No thoughts	5.67	5.88	7.30	5.25

As we predicted, “even if” thoughts *decreased* participants’ ratings of feeling bad compared to no thoughts ( $M = 6.68$  vs  $7.30$ ), and compared to “if only” thoughts ( $M = 6.68$  vs  $7.29$ ), as shown by post-hoc Student-Neuman-Keuls tests,  $p < .05$ . Once again, interestingly there were no differences between “if only” thoughts and no thoughts ( $M = 7.29$  vs  $7.30$ ,  $p > .05$ ).

The kind of thought generated had no reliable effect on how much participants blamed themselves for the outcome,  $F(2, 356) = 1.55$ ,  $p < .21$ : similar ratings were made for “even if” thoughts ( $M = 4.85$ ); “if only” thoughts ( $M = 5.35$ ); and no thoughts ( $M = 5.25$ ). It also had no reliable effect on how much participants regretted the decision,  $F(2, 356) = 2.50$ ,  $p < .08$ : similar ratings were made for “even if” thoughts ( $M = 5.29$ ); “if only” thoughts ( $M = 5.36$ ), and no thoughts ( $M = 5.88$ ).

*Different outcomes have different effects.* The nature of the alternative outcome that participants read about also affected their ratings of emotions and causes. Univariate ANOVAs showed that the alternative outcome affected participants’ ratings of causality, and one of the negative emotions—this time, regret.

The nature of the alternative outcome affected participants’ ratings of the causal role of the decision to take the well known drug,  $F(2, 356) = 27.91$ ,  $p < .001$ : As we expected, their ratings of causality *decreased* when the same outcome occurred for the other drug compared to when they were given no information about the outcome from the other drug ( $M = 4.26$  vs  $5.25$ ); and their ratings of causality *increased* when a different outcome occurred for the other drug compared to when they were given no information about the outcome from the other drug ( $M = 6.23$  vs  $5.25$ ), as shown by post-hoc Student-Neuman-Keuls tests ( $p < .05$ ), as Table 2 shows.

The nature of the alternative outcome affected how much participants regretted their decision to take the well known drug,  $F(2, 356) = 43.21$ ,  $p < .001$ : As we expected, participants’ ratings of regret *decreased* when the

TABLE 2  
The effects of the provision of an alternative that would lead to a different outcome, the same outcome, or no alternative (collapsed over different thoughts generated) on ratings of ratings of causal strength and negative emotions in Experiment 1

Alternative provided	Judgements			
	Cause	Regret	Feeling bad	Self-blame
Same outcome	4.26	4.08	7.07	4.99
Different outcome	6.23	6.78	7.06	5.25
No alternative	5.25	5.73	7.16	5.24

same outcome occurred for the other drug compared to when they were given no information about the outcome from the other drug ( $M = 4.08$  vs  $5.73$ ); and their ratings of regret *increased* when a different outcome occurred for the other drug compared to when they were given no information about the outcome from the other drug ( $M = 6.78$  vs  $5.73$ ), as shown by post-hoc Student-Neuman-Keuls tests ( $p < .05$ ).

There was no effect of the nature of the alternative outcome on how bad participants reported feeling about the outcome of the scenario,  $F(2, 356) = 0.13$ ,  $p < .88$ : similar ratings were made for same outcome ( $M = 7.07$ ), different outcome ( $M = 7.06$ ), and no information ( $M = 7.16$ ). There was also no effect of the nature of the alternative outcome on how much participants blamed themselves for the outcome of the scenario,  $F(2, 356) = 0.46$ ,  $p < .63$ : similar ratings were made for same outcome ( $M = 4.99$ ), different outcome ( $M = 5.25$ ), and no information ( $M = 5.24$ ).

The results of the experiment provide three new and important clues about the consequences of “even if” and “if only” thinking. The first important finding is that generating “even if” thoughts *reduces* people’s causal judgements and their judgements of how bad a protagonist will feel, compared to not thinking about what might have been. The reduction is apparent when the effects of “even if” thoughts are compared to a baseline of no thoughts about what might have been (rather than compared to “if only” thoughts). The second important finding is that generating “if only” thoughts *does not increase* people’s causal judgements and their judgements of how bad a protagonist will feel, compared to not thinking about what might have been. No previous studies have directly compared the generation of “if only” thoughts, “even if” thoughts, and no thoughts, and our results indicate that it is “even if” thoughts that *reduce* these causal and emotional judgements, rather than “if only” thoughts which increase them.<sup>1</sup>

The third important finding is that an alternative that leads to the same outcome reduces people’s causal judgements and their judgements of regret compared to when no information about an alternative outcome is provided. The reduction is apparent when the effects of an alternative with the same outcome are compared to a baseline of no alternative (rather than compared to an alternative with a different outcome). An alternative that leads to a different outcome increases people’s causal judgements and their judgements of regret, compared to when no alternative outcome information is presented.

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<sup>1</sup>In common with Wells and Gavanski (1989), we found a difference between causal ratings following counterfactual and semifactual thoughts, although that difference is not statistically reliable. As Wells and Gavanski did not include a baseline condition, it was not possible in their experiment to establish whether counterfactual “if only” thoughts increased causality or whether semifactual “even if” thoughts decreased causality. Our experiment provides such a comparison.

These three clues suggest that the impact of semifactual thinking on people's judgements and emotions may be just as important as that of counterfactual thinking. Thinking counterfactually about how things could have been different can increase causal judgements and emotional reactions, whereas thinking semifactually about how things could have turned out the same can reduce such causal judgements and emotional reactions.

Judgements of causality and emotion were reduced when reasoners thought semifactually, either implicitly when they were given a scenario in which another antecedent led to the same outcome compared to no information about other antecedents, or explicitly by generating "even if" thoughts compared to no thoughts. Judgements of causality and emotion were increased when reasoners thought counterfactually, although only when they were given a scenario in which another antecedent led to a different outcome, compared to no information about other antecedents. There was no increase for the more explicit task of generating "if only" thoughts compared to no thoughts, and the reason for this disparity remains unclear. It may be that the presentation of alternatives is a stronger or more reliable manipulation of counterfactual thinking than the generation of "if only" thoughts, at least in this situation. Another possibility is that the more open-ended "if only" generation task allows people to focus on a wide range of different possibilities, not limited to the drug choice of the protagonist. As the causal question only focused on this event, it may not have reflected the full range of participants' causal attributions about the scenario.

Regret ratings were reliably influenced by another antecedent being provided, a newer drug that led to the same bad effects or a newer drug that led to no bad effects. Regret ratings were not affected by generating thoughts about how the outcome could have been the same or different. The reason for this discrepancy seems clear: The provision of another antecedent (the newer drug) that led to the same or a different outcome focuses participants' thoughts on a very specific alternative antecedent, the newer drug. The regret question had a very specific focus, as it required participants to assess how much regret they would feel *for the choice of drug* that they made. It is perhaps unsurprising that the specific measure of regret about the new drug was most affected by information about the outcome of the new drug.

Feeling bad ratings were reliably influenced by the generation task, thinking "if only something else had happened the outcome would have been different", or "even if something else had happened the outcome would have been the same". Feeling bad ratings were not reliably influenced by another antecedent being provided, a newer drug that led to the same bad effects or a newer drug that led to no bad effects. Again the reason for this discrepancy seems clear: The direction to generate thoughts that led to the same or a different outcome provided a general focus, and participants' mutations mentioned not only the choice of drug but also the accident and other events. The feeling bad question

required participants to assess the impact of the outcome of the scenario. It is perhaps unsurprising that the general measure of feeling bad about the outcome was most affected by generating thoughts about how the outcome might have been the same or different.

Self-blame was unaffected by another antecedent being provided that led to the same or a different outcome, or by generating thoughts about how the outcome could have been the same or different. Boninger et al. (1994) found that another antecedent that led to the same or a different outcome reliably influenced self-blame. This failure to replicate their results, using the same scenario, rating scale, and a comparable sample, suggests a greater lability to judgements of self-blame than perhaps hitherto suspected.

Experiment 1 shows that both counterfactual and semifactual thinking can have consequences for people's judgements and emotions. We have shown that semifactual thinking influences people's emotional reactions, and it does so in a pattern that mirrors the effects of semifactual thinking on people's causal judgements. Therefore, we suggest that the effects of semifactual thinking on people's emotional reactions are the result of a causal inference mechanism, based on the mental representations that people construct when they think about what might have been. Our next experiment examines the nature of the alternatives that people keep in mind when they generate semifactual and counterfactual thoughts.

## EXPERIMENT 2 SEMIFACTUAL THINKING ABOUT MULTIPLE OUTCOMES

Our primary aim in the experiment was to examine how people generate semifactual “even if” thoughts in different situations. The effects of considering different alternatives to a decision are known only for situations in which just one alternative is considered (e.g., Wells & Gavanski, 1989). But in daily decision making, people often consider more than one alternative, and in this experiment we examined the effects of considering at least two explicitly provided alternatives. Consider an individual who has an allergic reaction to the vanilla ice-cream in a knickerbocker glory sundae that they choose from an ice-cream parlour menu. Suppose the other items on the menu, the banana split and the chocolate sundae, both have vanilla ice-cream in them, and so each one of the multiple available alternatives would have led to the same outcome. When the presented multiple alternatives lead to the *same* outcome, generating a semifactual “even if” thought is an easy matter, of simply selecting any one of the available alternatives. An individual can readily avail themselves of one of the presented alternatives to generate their semifactual thought, e.g., “even if he had chosen the chocolate sundae this would have happened”, or the individual



may even encompass all of the alternatives in a general framework, e.g., “even if he had chosen something else this would have happened”.

This task can be contrasted with the individual’s task when the protagonist has instead an allergic reaction to the jelly in the knickerbocker glory sundae. Suppose the other items on the menu, the banana split and the chocolate sundae, do not have jelly in them, and so any one of the multiple available alternatives would have led to a different outcome. When the presented multiple alternatives lead to a *different* outcome, an individual cannot use one of the presented alternatives in their semifactual “even if” thought about an alternative antecedent (a different sundae for example) that would lead to the *same* outcome (an allergic reaction). Given this difficulty, they may opt instead to focus not on the alternative possibilities, but on the facts of the situation, e.g., “even if he wasn’t allergic to jelly, this would have happened”.

Conversely, when the individual’s task is to generate an “if only” thought, their task is easy in the second situation just described, where multiple available alternatives lead to a *different* outcome (the banana split and the chocolate sundae do not have the jelly to which the protagonist is allergic). An individual can readily avail themselves of one of the presented alternatives in their counterfactual thought, e.g., “if only he had chosen the chocolate sundae this wouldn’t have happened”, or they can encompass both alternatives in a general assertion, e.g., “if only he had chosen something else this wouldn’t have happened”. Their task is harder in the first situation, where the multiple available alternatives lead to the *same* outcome (the banana split and the chocolate sundae both have the vanilla ice-cream to which the protagonist is allergic). An individual cannot use one of the presented alternatives in their counterfactual thought, and they may focus on the facts instead, e.g., “if only the knickerbocker glory didn’t contain vanilla ice-cream, this wouldn’t have happened”.

In short, the provision of multiple alternatives that lead to a *different* outcome makes generating an “even if” thought hard, and generating an “if only” thought easy; conversely, the provision of multiple alternatives that lead to the *same* outcome makes generating an “even if” thought easy, and generating an “if only” thought hard. We suggest that in the easy case participants’ thoughts will focus on the available alternatives either singly or collectively, whereas in the difficult case their thoughts will not focus on the alternatives but instead on the facts. Accordingly, our aim in the second experiment was to give participants two alternatives which both led to a different outcome, or both led to the same outcome. One group was given the task to generate an “even if” thought, and the other group had to generate an “if only” thought.

Our second aim in the experiment was to examine whether “if only” and “even if” sentence completion tasks reliably evoke counterfactual and semifactual thoughts respectively. To this end we also provided people with two alternatives, one that would lead to a different outcome and one that would lead

to the same outcome. For example, when the protagonist has instead an allergic reaction to the chocolate ice-cream in the knickerbocker glory sundae, one of the alternatives, the banana split, would have led to a different outcome, whereas the other alternative, the chocolate sundae, would not. We suggest that people use "if only" in situations where they presuppose the falsity of the antecedent and consequent, and they use "even if" in situations where they presuppose the falsity of the antecedent and the truth of the consequent. Hence the focus of "if only" thoughts will be on the alternative that would undo the outcome and the focus of "even if" thoughts will be on the alternative that would not undo the outcome.

Our second aim was thus the simple and modest goal of establishing that thoughts with a counterfactual structure are evoked by "if only" assertions and that thoughts with a semifactual structure are evoked by "even if" assertions. It seems clear from previous research that counterfactual thoughts can be readily expressed using phrases such as "if only", or by using conditionals in the subjunctive mood, e.g., "if I had remembered my umbrella I would not be wet". The situation is less clear-cut for semifactual thoughts, and it is a matter of some philosophical debate whether semifactuality can best be captured by a phrase such as "even if", e.g., "even if I had remembered my umbrella I would be wet" (e.g., Bennett, 1982; Goodman, 1973), or by a phrase such as "if ... still", e.g., "if I had remembered my umbrella I still would be wet" (e.g., Barker, 1991).

## Method

*Participants and procedure.* The participants were 117 undergraduates from the University of Dublin, Trinity College (79 women, 38 men) who took part in the experiment voluntarily. Their average age was 21 years, with a range from 17 to 55 years. The participants were tested in large groups and were instructed to read the scenarios carefully and to provide answers to the questions that followed as the answers occurred to them. They were also instructed not to change their answers once they had written them.

*Materials and design.* We constructed scenarios based on an ice-cream parlour sundae menu and a restaurant dinner menu. Each participant received two scenarios, based on each content. They were asked to provide "if only" thoughts for one content and "even if" thoughts for the other. The order in which participants received the two scenarios was determined at random. Hence the first independent variable was the mutation task: "if only" or "even if".

Both scenarios contained a menu with three possible choices. The menu was followed by an ordering decision by the protagonist that led to a negative outcome. An example of the ice-cream parlour scenario is as follows (the restaurant scenario is provided in Appendix 1):

Philip goes into an ice-cream parlour. He looks at the menu for ice-cream sundaes:

Sundaes

*Banana Split*

Ice-cream (Strawberry and Vanilla), Banana, Cream and Butterscotch Sauce

*Knickerbocker Glory*

Ice-cream (Strawberry, Chocolate and Vanilla), Fruit, Jelly and Cream

*Chocolate Sundae*

Ice-cream (Chocolate and Vanilla), Chocolate Flake, Cream and Chocolate Sauce

He's not sure which to choose, but eventually decides on the Knickerbocker Glory. While he is eating it he starts to come out in a rash. When he asks he finds out that the jelly used contains an ingredient to which he is allergic. He looks at the menu and his choice of sundae.

The first independent variable was whether the participants' task was to generate a semifactual thought or a counterfactual thought. For the semifactual task participants were asked:

Philip thinks about whether or not things could have been different. He says "even if ..." How does he complete this sentence?

And for the counterfactual task "if only" was used in place of "even if" in the sentences just given. The second independent variable was the nature of the available alternatives. There were four versions of the scenario. In each one, the facts remained the same: the option chosen was the knickerbocker glory and the outcome was that Philip ate something to which he was allergic. The four scenarios differed in the alternative possibilities, specifically whether the two rejected alternatives, the banana split and the chocolate sundae, would have led to the same or a different outcome. In one version, the outcome was attributed to the jelly and so both alternatives would have undone the outcome, and in another version, the outcome was attributed to the vanilla ice-cream and so neither alternative would have resulted in a different outcome. In a third version the outcome was attributed to the chocolate ice-cream and so the first alternative but not the second would have led to a different outcome, and in the fourth version the outcome was attributed to the strawberry ice-cream and so the second alternative but not the first would have led to a different outcome. We varied the order of presentation of the alternatives on each of the two menus to control for any potential order effects. Each menu item appeared equally as often in each of the three positions in the scenario. Each participant received two scenarios, one based on each content (ice-cream parlour; restaurant) and were asked to provide "if only" thoughts for one content and "even if" thoughts for the other. The order in which participants received the two scenarios was determined at random. The independent variables were the mutation task carried out by participants, "if only" or "even if", and the nature of the alternatives that they read about, same

outcome, different outcome, one same and one different outcome (two versions). The dependent variable was the content of participants' first “if only” and “even if” thoughts.

## Results and discussion

We categorised the focus of participants' first “if only” and “even if” thoughts into four main categories: Thoughts that focused on one of the alternatives (e.g., “even if I had chosen the banana split ...”), or the other (e.g., “even if I had chosen the chocolate sundae ...”), thoughts that focused on the factual choice, including mentions of the reaction to it (e.g. “if only the knickerbocker glory had not contained jelly ...”, “if only I wasn't allergic to jelly ...”), and thoughts that focused on unspecified alternatives (e.g., “if only I had chosen something else ...”). The results for each of the two scenarios received by participants are reported separately in Appendix 2. As the results for the individual scenarios are very similar, we report the overall pattern of responding collapsed across the two scenarios.

Overall, the most common first thought focused on some aspect of the factual situation (35% overall, see Table 3). Participants focused as often on one of the alternatives (e.g., the banana split, 19%) as the other (e.g., the chocolate sundae, 20%). Overall 16% of participants' thoughts focused on an unspecified alternative, and 11% fell into a miscellaneous category.

*Multiple alternatives with similar outcomes.* Consider first the scenario in which neither of the alternatives presented would have resulted in a different outcome, e.g., the vanilla ice-cream caused the allergic reaction and it is present in all three sundaes, so choosing a different sundae would produce the same outcome. The focus of people's counterfactual “if only” and semifactual “even if” thoughts is very different.<sup>2</sup> Participants “even if” thoughts focused most often on an unspecified alternative (51%), e.g., “even if I'd chosen something else this would have happened”. As we predicted they can refer in this easy semifactual task in a general way to the multiple available alternatives to generate their semifactual thought.<sup>3</sup> In contrast, their “if only” thoughts focused on aspects of the factual situation (64%), e.g., “if only I wasn't allergic to vanilla

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<sup>2</sup>In an earlier experiment we did not vary the order (see McCloy, 2000). The results were essentially the same as this experiment, with some confounding effects of order which were removed in this experiment. The two experiments replicate each other well and so we report only one here.

<sup>3</sup>In the ice-cream parlour scenario participants' “even if” thoughts focus significantly more often on an unspecified alternative (61%) than on any of the other events (all 11%; binomial,  $n = 13$ ,  $z = 2.5$ ,  $p < .01$ ). In the restaurant scenario participants' “even if” thoughts focus on an unspecified alternative as often as on the factual event (both 37%), but more often than on either alternative (binomials: option 1, 16%,  $n = 10$ ,  $z = 1.26$ ,  $p < .1$ ns; option 2, 5%,  $n = 8$ ,  $z = 2.12$ ,  $p < .05$ ).

TABLE 3  
Percentages of participants who focused on each alternative and the nature of their “if only” and “even if” thoughts in each condition in Experiment 2

<i>Alternatives provided</i>	<i>Focus of Mutation</i>			
	<i>One alternative</i>	<i>Other alternative</i>	<i>Factual choice</i>	<i>Unspecified alternatives</i>
<i>Same outcomes</i>				
if only ( <i>n</i> = 42)	5	2	64	2
even if ( <i>n</i> = 37)	14	5	24	51
<i>Different outcomes</i>				
if only ( <i>n</i> = 35)	23	17	37	11
even if ( <i>n</i> = 41)	24	10	41	22
<i>One same, one different (version 1)</i>				
if only ( <i>n</i> = 19)	53	16	21	0
even if ( <i>n</i> = 22)	18	68	5	9
<i>One same, one different (version 2)</i>				
if only ( <i>n</i> = 21)	0	62	19	0
even if ( <i>n</i> = 17)	35	12	35	12

ice-cream, this wouldn’t have happened”. When neither alternative would lead to a different outcome the counterfactual task is hard and people construct a counterfactual by deleting the factual antecedent, rather than by substituting it with a counterfactual alternative.<sup>4</sup>

Consider now the scenario in which both of the alternatives presented would have resulted in a different outcome, e.g., the jelly caused the allergic reaction and it is not present in either of the other two sundaes, so choosing a different sundae would produce a different outcome. As we predicted, participants’ “even if” thoughts in this hard semifactual task focused most often on the factual situation (41%).<sup>5</sup> However, contrary to our expectations, their “if only” thoughts in this easy counterfactual task also focused most often on the factual situation

<sup>4</sup>In the ice-cream parlour scenario participants’ “if only” thoughts focus significantly more often on the factual events (78%) than on any of the other events (binomials: unspecified alternative, *n* = 20, *z* = 3.58, *p* < .001; option 1, *n* = 21, *z* = 3.27, *p* < .001; option 2, *n* = 18, *z* = 4.24, *p* < .001). In the restaurant scenario participants’ “if only” thoughts focus on the factual event (58%), more often than on any of the other events (binomials: unspecified alternative and option 1, both %5, *n* = 12, *z* = 3.64, *p* < .001; option 2, 0%, *n* = 11, *z* = 3.32, *p* < .001).

<sup>5</sup>In the ice-cream parlour scenario, participants’ “even if” thoughts focus more often on the factual situation (38%) than on any of the other events (binomials: unspecified alternative, 33%, *n* = 12, *z* = 1.15, *p* < .13ns; option 1, 289%, *n* = 11, *z* = 1.51, *p* < .07 marginal; option 2, 6%, *n* = 9,

(37%) although less so than in the hard counterfactual task (64%).<sup>6</sup> As in the previous experiment, these results may be due to the open-ended nature of the mutation task questions. Our participants appear to have been able to imagine other alternatives to the events described that were not specifically related to the ice-cream choice: across all conditions participants often changed the factual events, which is perhaps not surprising given that the scenario describes a very limited set of events.

*Multiple alternatives with different outcomes.* The results show that participants’ “if only” thoughts focused on the alternative that would lead to a different outcome, whereas their “even if” thoughts focused on the alternative that would lead to the same outcome, as Table 3 shows. For the versions in which the banana split (or roast chicken—option 1) would lead to a different outcome, most of the participants’ “if only” thoughts focused on this different-outcome alternative (53%, e.g., “if only I had chosen the banana split ...”), whereas most of their “even if” thoughts focused on the same-outcome alternative (option 2, 68%, e.g., “even if I had chosen the chocolate sundae ...”).<sup>7</sup> Again, people focus on very different things in “if only” and “even if” thoughts. Likewise, for the versions in which the chocolate sundae (or steak and mushroom pie—option 2) would lead to a different outcome, participants constructed “if only” thoughts that focused on it (62%), whereas they constructed “even if” thoughts that focused on the other alternative (option 1, 35%).<sup>8</sup> Finally, the pattern is

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$z = 2.33, p < .01$ ). In the restaurant scenario, participants’ “even if” thoughts focus on the factual situation (40%) more often than on the other events (binomials: option 2, 25%,  $n = 13, z = 0.83, p < .2\text{ns}$ ; option 1, 15%,  $n = 11, z = 1.51, p < .07$  marginal; unspecified alternative, 10%,  $n = 10, z = 1.90, p < .05$ ).

<sup>6</sup>In the ice-cream parlour scenario, participants’ “if only” thoughts focus most often on the factual situation (53%) than on any of the other events (binomials: unspecified alternative, 18%,  $n = 12, z = 1.73, p < .05$ ; options 1 and 2, 12%,  $n = 11, z = 2.11, p < .05$ ). In the restaurant scenario, participants’ “if only” thoughts focus on option 2 most often (33%—binomials: factual situation, 25%,  $n = 11, z = 0.30, p < .4\text{ns}$ ; option 1, 22%,  $n = 10, z = 0.63, p < .3\text{ns}$ ; unspecified alternative, 6%,  $n = 7, z = 1.89, p < .05$ ).

<sup>7</sup>In the ice-cream parlour scenario participants’ “if only” thoughts focus more often on option 1 (70%) than on any of the other events (binomials: factual situation, 20%,  $n = 9, z = 1.67, p < .05$ ; unspecified alternative and option 2, 0%,  $n = 7, z = 2.65, p < .01$ ). Their “even if” thoughts focus more often on option 2 (73%) than on any other event (binomials: option 1, 18%,  $n = 10, z = 1.90, p < .05$ ; unspecified alternative, 9%,  $n = 9, z = 2.33, p < .01$ ; factual situation, 0%,  $n = 8, z = 2.83, p < .01$ ). In the restaurant scenario participants’ “if only” thoughts focus more often on option 1 (73%) than on any of the other events (binomials: factual situation, 18%,  $n = 10, z = 1.90, p < .05$ ; unspecified alternative and option 2, 0%,  $n = 8, z = 2.83, p < .01$ ). Their “even if” thoughts focus most often on the factual situation (40%—binomials: option 2, 30%,  $n = 7, z = 0.38, p < .4\text{ns}$ ; unspecified alternative and option 1, 10%,  $n = 5, z = 1.34, p < .09\text{ns}$ ).

particularly clear when we collapse the two versions together. Participants focus on the alternative that would lead to a different outcome rather than the alternative that would lead to the same outcome, regardless of what that event is, in their “if only” thoughts (58% versus 8%). In contrast, their “even if” thoughts focus on the alternative that would lead to the same outcome rather than on the one that would lead to a different outcome (54% versus 15%).

Overall, the results of this experiment show that when people generate semifactual thoughts, they focus on the alternatives to the situation when there are multiple alternative antecedents that would nonetheless have led to the same outcome, and they focus on the facts of the situation when there are no available alternatives that would lead to the same outcome. When people generate counterfactual thoughts, they focus on the facts of the situation when there are no available alternatives that would lead to a different outcome; surprisingly, they also exhibit a tendency to focus on the facts even when there are multiple alternative antecedents that would have led to a different outcome.

People focus on different imaginary alternatives when they generate “if only” thoughts than when they generate “even if” thoughts. When people generate “if only” thoughts they focus on an imaginary alternative that would lead to a different outcome and when they generate “even if” thoughts they focus on an imaginary alternative that would lead to the same outcome. We can conclude that “if only” and “even if” provide a good characterisation of counterfactuals and semifactuals respectively (e.g., Barker, 1991; Bennett, 1982). Overall, the results show that the focus of “if only” and “even if” thoughts is affected by the nature of the alternative antecedents available.

## GENERAL DISCUSSION

Our aim has been to provide a systematic comparison of semifactual and counterfactual thinking. In the first experiment, we showed that semifactual “even if” thinking and counterfactual “if only” thinking have different judgemental and affective consequences. Generating semifactual thoughts about an event, whether explicitly through completing “even if” sentence stems, or implicitly through reading about an alternative that led to the same outcome, can

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<sup>8</sup>In the ice-cream parlour scenario participants’ “if only” thoughts focus more often on option 2 (50%) than on any of the other events (binomials: factual situation, 30%,  $n = 8$ ,  $z = 0.71$ ,  $p < .24$ ns; unspecified alternative and option 1, 0%,  $n = 5$ ,  $z = 2.24$ ,  $p < .01$ ). Their “even if” thoughts focus more often on option 1 and the factual situation (both 43%) than on any other event (binomials: option 2, 14%,  $n = 4$ ,  $z = 1.00$ ,  $p < .16$ ns; unspecified alternative, 0%,  $n = 3$ ,  $z = 1.73$ ,  $p < .05$ ). In the restaurant scenario participants’ “if only” thoughts focus equally as often on options 1 and 2 and on the factual situation (all 33%) but more so than on an unspecified alternative (0%—binomial:  $n = 3$ ,  $z = 1.73$ ,  $p < .05$ ). Their “even if” thoughts focus more often on option 1 (73%) than on any of the other events (binomials: option 2, 18%,  $n = 10$ ,  $z = 1.90$ ,  $p < .05$ ; unspecified alternative and factual situation, 0%,  $n = 8$ ,  $z = 2.83$ ,  $p < .01$ ).

reduce the event's perceived causal importance compared to generating no thoughts about what might have been. Generating counterfactual thoughts about the same event can increase its perceived causal importance compared to no thoughts about what might have been (at least implicitly through reading about an alternative that led to a different outcome, if not explicitly through generating "if only" thoughts). The affective consequences of semifactual and counterfactual thinking mirror their judgemental consequences. Semifactual thinking reduces emotional reactions to negative outcomes (such as regret or feeling bad), whereas counterfactual "if only" thinking increases these emotional reactions.

The semifactual and counterfactual thoughts that people generate depend on the nature of the available alternatives. The second experiment shows that people generate semifactual thoughts that focus on the available alternatives, in a specific or general way, when they would have led to the same outcome; otherwise, they focus on the facts of the situation. Likewise, people generate counterfactual thoughts that focus on the facts of the situation when the available alternatives would have led to the same outcome, although they also focus on the facts even when the alternatives would have led to a different outcome. When one of the available alternatives would have led to a different outcome and the other wouldn't, people's semifactual thoughts focus on the alternative that would have led to the same outcome, whereas their counterfactual thoughts focus on the alternative that would have led to a different outcome.

People may construct different mental representations when they understand and generate semifactual and counterfactual thoughts. When people generate counterfactual "if only" thoughts they keep in mind at least two alternative possibilities, one that corresponds to the facts in which both the antecedent event and the outcome occurred, e.g., the runner took the older drug and she lost her race, and one that corresponds to an alternative possibility in which neither the antecedent event nor the outcome occurred; the runner did not take the older drug and she won her race (Byrne & Tasso, 1999; Johnson-Laird & Byrne, 1991). In these two alternatives the outcome does not occur without the antecedent, and so the antecedent is interpreted as a cause of the outcome. When people generate semifactual "even if" thoughts they also keep in mind at least two alternative possibilities, one that corresponds to the facts in which both the antecedent event and the outcome occurred, e.g., the runner took the older drug and lost her race, and one that corresponds to an alternative possibility this time in which the antecedent event did not occur but nonetheless the outcome occurred, e.g., the runner did not take the older drug and she lost her race anyway (Rios et al., 2001). In these two alternatives the outcome occurs with and without the antecedent, and so the antecedent is interpreted as only weakly causally related to the outcome. We suggest that causal inferences about the relation between the antecedent and the consequent may underlie the emotional calibration that occurs, with counterfactual thinking amplifying emotional



reactions, and semifactual thinking reducing them. We have considered negative emotions in this paper: the consequences of generating semifactual thoughts following positive outcomes for positive emotions (e.g., relief and feeling good) remain to be explored.

The experiments reported in this paper represent the first systematic attempt to understand people's semifactual "even if" thinking. Semifactual thinking reduces people's judgements of causality compared to no thoughts about what might have been and compared to counterfactual thinking. It reduces people's judgements of negative emotions such as regret and feeling bad. Semifactual thoughts focus on alternatives that would lead to the same outcome, and when no such alternatives are available, they focus on the facts of the situation. The systematic similarities and differences between semifactual and counterfactual thinking indicate that it plays an equally important role in thoughts about what might have been. We suggest that semifactual thinking deserves the same amount of research attention as counterfactual thinking, if we are to develop a balanced and complete understanding of human thinking about what might have been.

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## APPENDIX 1

The second scenario used in Experiment 2

Mary goes to a restaurant to have lunch. She looks at the specials board for the day:

### Specials

*Roast chicken*

(Chicken with traditional gravy, carrots and peas)

*Steak and mushroom pie*

(Puff pastry with round steak, mushrooms and gravy)

*Chicken in a wine and mushroom sauce*

(Chicken, mushrooms and onions in a rich wine sauce)

*All the above served with potatoes*

Mary thinks that all three sound good. She eventually decides to have the chicken in a wine and mushroom sauce. She does not enjoy her meal as all the mushrooms used that day had gone off. She looks at the menu and her choice of meal. Mary thinks about whether or not things could have been different. She says if only ... How does she complete this sentence?

## APPENDIX 2

## Individual scenario results for Experiment 2

Percentages of participants who focused on each alternative and the nature of their “if only” and “even if” thoughts in each condition in Experiment 2 for the “Ice-cream Parlour” scenario

<i>Alternatives provided</i>	<i>One alternative</i>	<i>Other alternative</i>	<i>Factual choice</i>	<i>Unspecified alternatives</i>
<i>Same outcomes</i>				
if only ( $n = 19$ )	13	0	78	9
even if ( $n = 19$ )	11	11	11	61
<i>Different outcomes</i>				
if only ( $n = 18$ )	12	12	53	18
even if ( $n = 20$ )	28	6	38	33
<i>One same, one different (version 1)</i>				
if only ( $n = 11$ )	70	0	20	0
even if ( $n = 10$ )	18	73	0	9
<i>One same, one different (version 2)</i>				
if only ( $n = 9$ )	0	50	30	0
even if ( $n = 11$ )	43	14	43	0

Percentages of participants who focused on each alternative and the nature of their “if only” and “even if” thoughts in each condition in Experiment 2 for the “Restaurant” scenario

<i>Alternatives provided</i>	<i>One alternative</i>	<i>Other alternative</i>	<i>Factual choice</i>	<i>Unspecified alternatives</i>
<i>Same outcomes</i>				
if only ( $n = 19$ )	5	0	58	5
even if ( $n = 19$ )	5	16	37	37
<i>Different outcomes</i>				
if only ( $n = 18$ )	22	33	28	6
even if ( $n = 20$ )	15	25	40	10
<i>One same, one different (version 1)</i>				
if only ( $n = 11$ )	73	0	18	0
even if ( $n = 10$ )	10	30	40	10
<i>One same, one different (version 2)</i>				
if only ( $n = 9$ )	33	33	33	0
even if ( $n = 11$ )	73	18	0	0