ABSTRACT

THE EFFECT OF COUNTERFACTUAL POTENCY ON BEHAVIORAL INTENTIONS

by Woo J. Kim

Not all counterfactual thinking about "what might have been" equally affects behavioral intentions. This research examined the hypothesis that counterfactual potency (CP), the multiplicative effect of the likelihoods of the "if" and "then" clauses of counterfactuals, would influence the strength of counterfactuals' effect on behavioral intentions. Study 1 used vignettes varying in mutability levels and found that participants who read highly mutable vignettes formed stronger CP and relevant intentions. However, CP did not mediate the effect of mutability on intentions. In Study 2, I attempted to develop a manipulation to experimentally test the facilitating effects of CP on intentions, but the creation of a CP manipulation using modal verbs was not successful. Study 3 was designed to examine if two mutability determinants, closeness and norm violation, had distinct effects on CP and intention. The results indicated that violating the norm enhanced CP and both directly and indirectly (via CP) increased intentions. An additional study, described in the general discussion, was conducted and found that greater CP led to faster intention formation. Taken together, the current research provides initial evidence that more potent counterfactuals strengthen and facilitate behavioral intentions.

THE EFFECT OF COUNTERFACTUAL POTENCY ON BEHAVIORAL INTENTIONS

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The Effect of Counterfactual Potency on Behavioral Intentions

Imagining what might have been, known as counterfactual thinking, is a common and pervasive form of mental simulation (Summerville & Roese, 2008). When engaging in counterfactual thinking, people imagine conditional propositions which contain an "if" and "then" clause. An "if" clause describes an alternative behavior that did not occur, and a "then" clause depicts a consequent, imagined outcome (Roese & Epstude, 2017). People construct hypothetical situations and identify how they would have obtained a better (upward counterfactual) or worse (downward counterfactual) outcome if they had engaged in an alternative behavior (additive counterfactual) or had not engaged in an existing action (subtractive counterfactual). For example, after receiving an unsatisfactory grade, students may think that "if only I had studied more, the exam would have gone better."

Certain types of counterfactuals can help people prevent recurrences of similar negative outcomes or procure a better outcome in the future (for a review, see Roese & Epstude, 2017). Upward counterfactuals, which simulate a favorable alternative to reality, can facilitate intentions, regulate behaviors, and improve performance (e.g., Kray, Galinsky, & Markman, 2009; Page & Colby, 2003; Roese, 1994; Smallman & Roese, 2009).

However, not all counterfactual thoughts are equally functional. Some counterfactuals can result in fast and strong intention formation whereas some other counterfactuals can lead to relatively slower and weaker intention formation (e.g., Smallman, 2013; Walker, Smallman, Summerville, & Deska, 2016). Why does the strength of counterfactual effects on intention formation vary? Past research has focused on counterfactual content (Smallman, 2013), group membership (Walker et al., 2016), and temporal distance (Smallman & McCulloch, 2012) to answer this question. Nonetheless, there are many factors possibly changing levels of counterfactuals' effects that still need to be explored. One such factor, and the primary focus of this research, is likelihood perception.

Simulating a hypothetical situation affects judgments by altering likelihood perception. That is, when simulating a future event, people judge that the event will actually happen because the simulation increases likelihood perception (Sherman, Zehner, Johnson, & Hirt, 1983). Counterfactual thinking as type of mental simulation entails likelihood perception of the past (Petrocelli, Percy, Sherman, & Tormala, 2011). Thus, the present studies concern whether

likelihood perception of counterfactual thinking, known as counterfactual potency, influences future judgments.

Counterfactual Potency

In an attempt to identify a factor determining the strength of counterfactuals' effects, Petrocelli et al. (2011) developed a framework called counterfactual potency (CP). Specifically, counterfactual potency is the multiplicative effect of the subjective likelihood of the "if" clause of a counterfactual ("if likelihood" or IL) and the subjective likelihood of the "then" clause of a counterfactual considering the "if" clause ("then likelihood" or TL). Simply put, CP is the perceived likelihood of a counterfactual.

Suppose that one thinks that "If only I had taken a different route, then I would have avoided the accident." According to Petrocelli et al. (2011), the degree to which the antecedent (i.e., taking a different route) is perceived to be likely as well as the perceived likelihood of the outcome (i.e., avoiding the accident) given the antecedent had happened determine the strength of this counterfactual's effect (see also Spellman, 1997). For example, in one of their studies, participants were asked to read the story of Mr. Jones who was suffering severe injuries due to a terrible car accident and to rate the IL and TL for each counterfactual they generated. The findings revealed that when CP, the product of IL multiplied by TL, increased, negative emotions (e.g., regret and guilt) and responsibility that participants thought Mr. Jones would have experienced were stronger.

Although Petrocelli et al. (2011) identified how the influences of counterfactuals vary in affective outcomes and responsibility perception depending on likelihood perception, questions remain as to whether and how CP affects behavioral intentions and ultimately changes future behavior.

CP and Regulatory Functions of Counterfactual Thinking

Counterfactual thinking, which refers to thoughts about what might have been, often serves a functional role in regulating behavior by reflecting a desired goal (Roese & Epstude, 2017). For instance, one may think that "If I had studied, I would have passed the exam." Counterfactual thoughts embody a more desirable goal state (e.g., passing the exam) and an alternative action (e.g., studying) needed to achieve the goal.

Upward counterfactual thinking can regulate behavior by identifying better outcomes that could have been obtained. This regulatory function can occur via two distinct routes (Roese &

Epstude, 2017). The first route, the content-neutral pathway, refers to the process by which counterfactual thinking impacts behaviors that are not relevant to a specific counterfactual. That is, regardless of counterfactual content, in this pathway, behavior changes occur mainly via negative affect (Myers, McCrea, & Tyser, 2014), enhanced motivational levels (e.g., Markman, McMullen, & Elizaga, 2008), and different cognitive procedures caused by counterfactual mindsets (e.g., Kray et al., 2009). In line with this pathway, counterfactuals can have diffuse motivational benefits by increasing negative affect and control perception (Smallman & Summerville, 2018). In other words, increased negative affect and perceived control induced by counterfactual thinking can enhance and maintain motivation. Previous research shows that counterfactuals increase negative affect and control perception over future events, and in turn motivation and future performance (Markman et al., 2008; Nasco & Marsh, 1999).

Potency may activate the content-neutral pathway both through its effects on affect and perceived control. Given that stronger CP induces more intense negative emotions (Petrocelli et al., 2011), it is likely that CP enhances general motivation. In addition, the more likely a counterfactual is, the greater a sense of responsibility people perceive (Petrocelli et al., 2011). The high responsibility perception for a past event not just intensifies a feeling of regret (e.g., Zeelenberg, van der Pligt, & de Vries, 2000) but also leads to frequent counterfactual generation (Girotto, Legrenzi, & Rizzo, 1991). Frequent counterfactuals in turn result in a strong feeling of personal control over future events (Nasco & Marsh, 1999). Therefore, it is plausible that more likely counterfactuals lead to stronger motivation by means of increased negative affect and control perception via the content-neutral pathway.

The second route, the content-specific pathway, refers to the process by which counterfactuals affect behaviors specifically related to the contents of a counterfactual. Behavior changes through this pathway occur by stimulating intentions formed by causal inferences from counterfactual thinking (e.g., Smallman & Roese, 2009). In this pathway, a counterfactual provides a lesson that helps avoid a similar mistake in the future. That is, individuals can think back to what happened in the past, generate a counterfactual involving an alternative behavior that could have changed the past outcome, and imagine performing the alternative behavior to achieve the desired, unobtained goal. However, whether and how CP works in the contentspecific pathway is still unclear (see Figure 1). Does CP affect intention formation via the

content-specific pathway? If so, how does CP change intentions? The current research thus focuses on how CP influences behavioral intentions in this content-specific pathway.

How Does CP Influence Behavioral Intentions?

There are three rationales behind the influence of CP on intention formation. First, higher CP would increase memory encoding, availability, and accessibility. One fundamental function of memory is to establish references from past experiences and use them in the future (Anderson & Milson, 1989). Similarly, one process by which counterfactuals affect behavioral intentions is to learn from past mistakes (e.g., Smallman & Roese, 2009). When a simulated event is perceived to be likely or plausible, the memory of that event tends to be thoroughly encoded, readily available, and in turn more accessible (Kahneman & Tversky, 1982; Pezdek, Finger, & Hodge, 1997; Sherman et al., 1983). Likewise, if simulated counterfactual thoughts are regarded as likely or plausible, the likelihood of the activation of stored knowledge (e.g., a counterfactual *per se* and a lesson from it) would increase. That is, a similar situation in the future stimulates stored knowledge to activate, and counterfactuals likely to have happened would easily come to mind because they would become more accessible.

Second, higher CP would increase the use of specific knowledge. The increased likelihood of knowledge activation does not guarantee the use of that knowledge. That is, even if individuals can readily recall a memory, they would not use this knowledge if it is not appropriate or causally relevant for the future behavior (Ajzen, 1977; Higgins, 1996). However, the CP construct contains TL, which is the perceived likelihood of an alternative outcome (i.e., a "then" clause) given that an alternative action (i.e., a "if" clause) had taken place. CP thus captures the significance of the causal relationship between the alternative action and outcome. In this sense, TL implies how likely an alternative action would help achieve the desired goal. As the content-specific pathway posits that counterfactuals influence future behaviors which are specifically related to the contents of the counterfactuals, CP can convey the significant causal relationship between an alternative action and the desired goal in the future. Individuals then would try to engage in the alternative behaviors that can actually help obtain the goal. Put differently, among available and accessible counterfactuals in memory, individuals would use the ones that are likely to lead to fulfill the goal. Therefore, CP would identify functional behaviors for the future.

Third, if people perceive that their counterfactual thoughts are implausible or unlikely, these counterfactuals will not be impactful on intention formation. In the view of goal-directed cognition, a counterfactual thinking is simulated when people perceive a discrepancy between the desired goal and actual state. To reduce such discrepancy and obtain the goal, individuals search for possible alternatives (Roese & Epstude, 2017). If the possible alternatives are not likely to have happened or helped realize the goal, however, these alternatives would not be conceived as the means to reduce the discrepancy. Thus, counterfactuals would not render any learning lessons. For example, a student may think that "If only I had studied more, the exam would have gone better" after receiving a bad grade. If the student thinks that they could not have afforded more time to study for that exam, having multiple exams in a row a week (i.e., hardly likely to have studied more) or they come to believe that studying more would not have changed their grade (i.e., studying more is hardly likely to have increased the grade), this counterfactuals may not lead to behavior changes. Indeed, McCrea (2008) identifies that such counterfactuals can serve as an excuse for a bad grade and reduce motivation for a future exam.

Taken together, the current research hypothesizes that counterfactual potency (CP) would affect behavioral intentions. Higher CP would lead people to form intentions more easily and strongly.

Evidence from Past Research

Some previous research has found that counterfactual content affected intentions such that factors increasing the vividness or concreteness of counterfactuals enhanced the effect of counterfactuals on intentions. This is in line with the proposed CP effect that greater CP would increase the influence of counterfactuals on intention formation. For instance, Smallman and McCulloch (2012) examine the influence of temporal distance on functional counterfactual thinking. Describing negative events as having occurred in the near past more easily facilitated relevant behavioral intentions compared to simulating distant past events. Also, Smallman (2013) investigates the role of counterfactual content in forming behavioral intentions. In the first experiment, when considering concrete actions (e.g., wearing sunscreen), which were alternatives that could have changed the reality (e.g., getting a bad sunburn), participants formed the relevant intentions more quickly compared to the control (factual) condition. However, this was not the case when they considered abstract actions (e.g., taking precautions). Compared to

abstract terms, concrete terms led counterfactual alternatives to be more accessible and thus participants to form intentions more quickly.

These papers indirectly show that CP changes behavioral intentions. Prior research demonstrates that temporal distance is associated with mental representations. Specifically, simulating temporally closer events (e.g., cleaning the house tomorrow) induces concrete representation (e.g., vacuuming the floor) whereas imagining temporally distant events (e.g., cleaning the house next year) evokes abstract representation (e.g., showing one's cleanliness, see Liberman & Trope, 1998). Further, concrete (vs. abstract) representation and vivid (vs. pallid) events are judged to be more likely due to the ease of retrieval or imagining (e.g., Sherman, Cialdini, Schwartzman, & Reynolds, 1985; Wakslak & Trope, 2009). Kahneman and Tversky (1982) and Teigen (1998) also maintain that if a hypothetical event is easily generated, that event would be perceived to be more likely. In light of the evidence that concrete or vivid mental representation induces higher likelihood perception, near past events and concrete actions may have heightened CP and hence facilitated behavioral intentions in Smallman and McCulloch (2012) and Smallman (2013).

Overview of Current Work

In three studies, this research examined the relationship between CP and intention formation. Study 1 was designed to provide initial evidence for the effect of CP on behavioral intentions using vignettes varying in mutability. In Study 2, I attempted to create a CP manipulation that could implicitly induce different CP levels using different modal verbs (e.g., "must have" versus "might have"). Study 3 tested differences of two distinct determinants (norm violation and closeness) of mutability in CP estimates and intention formation, and these two factors differentially affected CP and intentions. Across these three studies, this research investigated the hypothesis that CP would influence behavioral intentions. I predicted that higher CP (versus lower CP) would lead people to form a relevant intention more strongly and easily.

Study 1

Study 1 was an initial investigation of the hypothesis that CP would affect intention formation. The prediction was that CP would be greater when individuals simulate highly mutable situations relative to low ones. Greater CP would in turn induce stronger intentions. This study postulates that the ease of imagining determines likelihood perception (Kahneman & Tversky, 1982; Petrocelli, Kammrath, Brinton, Uy, & Cowens, 2015; Sherman et al., 1985;

Stanley, Stewart, & De Brigard, 2017; Teigen, 1998). Negative events occurring under unusual (versus usual) circumstances make counterfactuals be more salient and easier to simulate (Kahneman & Miller, 1986; Teigen, 1998). For example, reading a story about an accident while driving an unusual versus usual route to home generated a counterfactual thought more readily (Walker et al., 2016). Also, if a negative outcome is close (versus distant) to the desired outcome, individuals easily imagine an alternative outcome. Missing a flight by 5 minutes more easily brings about a counterfactual thought than missing a flight by 30 minutes does (Kahneman & Tversky, 1982). The ease with which the counterfactual is imagined determines the subjective plausibility of the event (Kahneman & Tversky, 1982; Stanley et al., 2017). Based on this past work, the vignettes for the current study were designed to induce different levels of mutability which would affect CP ratings.

Method

Participants. Participants were recruited at Miami University and compensated with course credit. The pre-registered sample size was 175 at the minimum (Fritz & MacKinnon, 2007; see Appendix A for the pre-registered document), and I collected 192 responses ($M_{age} = 19.14$, *S.D.*_{age} = 1.14; 53.4% female; 71% White; 6.8% self-reported non-fluent international students). One response was eliminated because all intention scores were missing.

Material and procedure. After providing informed consent, participants were seated at a computer in an individual cubicle. They were randomly assigned to one of two between-subjects mutability conditions (high or low mutability) and instructed to imagine the situations several vignettes described. One half of participants read only high mutability vignettes and the other half read only low mutability vignettes. Each participant read 6 vignettes one at a time. Past research about counterfactuals has commonly employed a between-participants design (e.g., Walker et al., 2016) to avoid possible carry-over effects of counterfactual thinking. For instance, if a highly mutable vignette precedes a minimally mutable one, counterfactuals generated while reading the highly mutable vignette can lead participants to consider alternatives on the low mutability event (Galinsky, Moskowitz, & Skurnik, 2000).

The vignettes consisted of 6 descriptions of negative events that could have been avoided. Based on the 6 stories, 12 vignettes were developed (e.g., Walker et al., 2016, see Appendix B for specific wordings of the vignettes, counterfactual statements, and intention questions), 6 for the high and 6 for the low mutability condition. For the high mutability condition, participants

imagined situations where they could easily generate counterfactuals (e.g., having an accident while driving an *unusual*, indirect route). For the low mutability condition, they simulated events that are difficult to generate counterfactuals (e.g., having an accident while driving the *usual*, indirect route). After reading each vignette, all participants were shown the same counterfactual statement corresponding to the event description (e.g., "If only I had taken the most direct route, then I would have avoided the accident.").

After each counterfactual was presented, participants completed CP measures which consisted of IL and TL items anchored at very unlikely (1) and very likely (7). For IL, participants were asked to consider the "If only" part of the statement and rate their likelihood perception (e.g., "How likely is it that you would have taken the most direct route?"). For TL, they were instructed to focus on the "then" part of the counterfactual, assuming that the "If only" part had taken place (e.g., "Given that you had taken the direct route, how likely is it that you could have avoided the accident?"). Then they rated their intentions asking the likelihood that they would engage in the relevant behavior in the future (e.g., "In the future, how likely are you to take the most direct route?") on a slider set to the midpoint of very unlikely (0) to very likely (100).

Results

CP was calculated by multiplying IL and TL (Petrocelli et al., 2011). Zero-order correlations among all CP and intention scores can be found in Table 1. Calculated CP scores, ranged from 1 to 49, were submitted to a 2 (high and low mutability conditions) X 6 (event descriptions) mixed-model ANOVA with repeated measures on the second factor. Excluding one story (story 3 in Figure 2), which showed an inconsistent pattern with other stories, resulted in an insignificant interaction effect, F(3.79, 713.26) = .67, p = .61, $\eta_p^2 = .004$.¹ I assumed that high and low mutability would induce high and low CP respectively. Given that the main effect of condition remained significant after eliminating the story 3, F(1, 188) = 63.02, p < .001, $\eta_p^2 = .25$, and that all the high versus low mutability vignettes led to higher CP, the remaining vignettes successfully produced different levels of CP consistently as predicted.

¹ In separate analyses of IL and TL, IL did not interact with mutability condition, F(4, 725) = .671, p = .61, but differed by mutability condition, F(1, 188) = 87.55, p < .001, $\eta_p^2 = .32$, which was consistent with the outcomes of CP estimates. When TL ratings were considered, there was a significant interaction effect of vignette and mutability, F(3.68, 692.36) = 5.14, p = .001, $\eta_p^2 = .03$. As expected, the main effect of mutability was significant in the predicted pattern F(1, 188) = 8.99, p = .003, $\eta_p^2 = .05$.

Intention scores were submitted to a 2 (condition) X 5 (event descriptions) mixed-model ANOVA with repeated measures on the latter factor. Consistent with the prediction and previous research (Walker et al., 2016), there was a main effect of condition, F(1, 189) = 56.77, p < .001, $\eta_p^2 = .23$. Unexpectedly, the interaction of condition and events was significant, F(4, 756) = 2.46, p = .04, $\eta_p^2 = .01$. However, participants consistently formed stronger intentions in all the high mutability vignettes compared to the low mutability vignettes (see Figure 3). Therefore, the findings provided initial evidence for the hypothesis that CP would increase intentions.

To account for repeated CP and intention ratings across multiple vignettes and test the hypothesis that CP would increase behavioral intentions, a multilevel regression approach was employed nesting trials within participants regressing intentions on CP. Consistent with the hypothesis, CP had a significant effect on intentions (uncentered CP, $\gamma = .88$, t = 12.02, p < .001, 95% C.I. = [.73, 1.02]). Namely, more likely counterfactuals led to stronger intentions. Further, I used multilevel regression to examine the causal role of mutability in likelihood judgements of counterfactuals and intention formation. Each of intentions and CP estimates was regressed on mutability. As shown in previous research (e.g., Walker et al., 2016), mutability condition (dummy coded, 0 = low and 1 = high mutability condition) predicted intentions, $\gamma = 16.10$, t = 7.68, p < .001, 95% C.I. = [11.96, 20.23]. There was also a significant influence of mutability condition on CP, $\gamma = 9.05$, t = 7.97, p < .001, 95% C.I. = [6.81, 11.29]. This suggests that events that easily bring about alternatives to reality lead relevant counterfactuals to be more likely and induce stronger intentions compared to events that are difficult to imagine alternatives.

Additionally, mediation analysis was conducted to identify if CP mediated the effect of mutability condition on intention. I used multilevel mediation approach because of the nature of hierarchical structure of the current data in which ratings were nested within vignettes. Specifically, I performed a multilevel structural equation modeling (MSEM) testing multilevel mediation following the procedures of Preacher, Zyphur, and Zhang (2010). A traditional multilevel modeling paradigm only considers one slope that combines within and between effects (e.g., Pituch & Stapleton, 2008). However, Preacher et al.'s (2010) approach using a MSEM paradigm allows to separate the between and within effects of a Level-1 variable. Thus, this method can account for the variation of a Level 1 variable in the between and within levels.

The mediation model (see Figure 4) that corresponds to a 2-1-1 design contained the Level-2 predictor (mutability condition), which had only between components, with the mediator

(CP) and outcome (intention) assessed at Level 1, which had both between and within variation. Because the predictor could exert its impact only at a between-person level, the mediation effect should be considered at the between level.

As shown in Figure 4, on the between level, the results indicated a positive effect of mutability condition on CP, $\gamma = .8.94$, *S.E.* = 1.14, 95% C.I. = [6.71, 11.18], which confirms the argument that the easier it was to generate alternatives, the more plausible counterfactuals were (e.g., Petrocelli et al., 2011; Stanley et al., 2017). Mutability condition also significantly altered intention, $\gamma = 15.48$, *S.E.* = 2.98, 95% C.I. = [9.63, 21.33] when CP was controlled for. Moreover, CP had a positive effect on intention when mutability was not taken into consideration, $\gamma = .87$, *S.E.* = .19, 95% C.I. = [.49, 1.25]. However, when mutability was controlled for, CP did not account for variance in intention formation, $\gamma = .07$, *S.E.* = .23, 95% C.I. = [-.39, .53]. The estimate for the indirect effect, which was calculated by multiplying estimates for *a* path (the effect of mutability on CP) and *b* path (the effect of CP on intention) on the between level, revealed a nonsignificant indirect impact of mutability on intention, $\gamma = .64$, *S.E.* = 2.09, 95% C.I. = [-3.46, 4.74]. That is, this outcome showed that CP did not mediate the relationship between mutability and intention.

Discussion

The primary purpose of this research is to identify whether CP would strengthen intentions. A multilevel modeling approach indicated that CP was a strong predictor of forming intentions. That is, participants who considered that counterfactuals were more likely to have occurred formed stronger intentions compared to those who perceived the counterfactuals as less likely. However, the multilevel mediation analysis revealed that CP did not mediate the impact of mutability on intention formation. Specifically, although mutability clearly had an effect on CP, these CP changes bore little relation to influences on intentions. This suggests that mutability is superior to CP in terms of intention formation.

Two important questions remain. The first issue is whether CP, independent of mutability, affects intentions. It is possible that CP has no effect on intention only when mutability is covaried out. That is, different levels of CP that are not induced by mutability may change intentions. Therefore, it is necessary to develop a method to manipulate CP directly.

Furthermore, a direct CP manipulation could eliminate possible demand effects and the consistency bias. In Study 1, participants were asked to rate their intentions after completing the

CP measures. Such a sequence of the current design could potentially bring about undesirable effects, such as the consistency bias and demand characteristics. That is, rating a counterfactual as "very likely" versus "very unlikely" may cause participants to choose a corresponding answer ("very likely") to the intention question. Also, asking the IL and TL questions right before the intention measure could increase a chance that participants recognize the purpose of the study. This may change the impact of CP on intention.² Therefore in Study 2, I attempted to develop a manipulation that could prime CP using different modal verbs in order to test direct CP effects on intentions and eliminate the possible consistency bias and demand effects.

The second issue is whether different mutability factors would play a distinct role in likelihood perception and its impact on intentions. The vignettes used in Study 1 involved norm violation, in which either an unusual or usual behavior caused a negative event, as well as closeness, in which a less desirable outcome was either nearly avoided or nowhere near avoided. According to past research, the detection of norm violation facilitates the mutation of unusual behaviors, and closeness promotes the mutation of negative outcomes which could have been nearly avoided. Put differently, unusual behaviors and close misses are those for which alternatives come to mind easily and thus facilitate counterfactual thinking (Kahneman & Miller, 1986; Roese, 1997). Considering that the ease of imagining determines likelihood perception (e.g., Petrocelli et al., 2015; Sherman et al., 1985), the assumption of Study 1 was that highly mutable events would induce more potent counterfactuals compared to slightly mutable events in light of the fact that mutability increases plausibility perception (Stanley et al., 2017; Teigen, 1998).

However, closeness and norm violation were not fully crossed in Study 1. One of the stories manipulated closeness and the others differed in terms of norm violation. Moreover, some stories that contained either usual or unusual behaviors also included closeness perception (e.g., "After finally parking and running to the salon, you got to the appointment 30 minutes late, and the stylist wouldn't see you."). For some, 30 minutes can be perceived as "close" but not for some others. Therefore, in Study 3, I separated mutability out into closeness and norm violation to examine whether different factors determining mutability change likelihood perception as well as its influence on intentions. I discuss this relationship further in Study 3.

 $^{^{2}}$ Apart from this thesis, I implemented an additional study that excluded these possibilities. The results are reported in the general discussion.

Study 2

In Study 2, I attempted to create a CP manipulation. I tested whether different modal verbs would change CP (e.g., "might have" for the low CP prime and "would have" for the high CP prime). I suspected that the modal verbs higher (e.g., must) and lower (e.g., might) in the perceived likelihood would induce higher and lower CP respectively.

Method

Study 2 was implemented to explore if distinct modal verbs induce different CP estimates. Miami University undergraduates voluntarily signed up for the study in exchange for course credit, and 91 participants completed the study. Given this sample size, the smallest effect detectable with 80% power was eta-squared = .005.

In this study, participants were instructed to imagine that negative events actually occurred to them. First, they completed 3 practice trials and then were randomly assigned to one of the 6 conditions. Each condition randomly presented descriptions of 42 negative events (e.g., "spilled food on favorite shirt") and corresponding counterfactuals (e.g., "SHOULD HAVE used napkins") one at a time.

Across conditions, everything was equal except the modal verbs in the counterfactual statements. For instance, for the event, "spilled food on favorite shirt," the corresponding action statement "used napkins" was paired with one of the 6 modal verbs (i.e., must, should, could, would, might, and may) in each condition. Participants were then asked to complete the IL (e.g., "How likely is it that you could have actually used napkins?") and the TL measure (e.g., "Given that you had actually used napkins, how likely is it that you would NOT have spilled food on your favorite shirt?") ranged from very unlikely (1) to very likely (7).

Results

CP was calculated by multiplying IL and TL (Petrocelli et al., 2011). In order to examine if CP levels would differ by modal verbs, the average CP was calculated for each modal verb. A six-factor (6 modal verbs) repeated measures ANOVA showed that there were no differences between modal verbs in CP ratings, F(4.06, 364.92) = .26, p = .90, $\eta_p^2 = .003$. Therefore, it was unsuccessful to develop a CP manipulation using different modal verbs.

I conducted an additional study, briefly summarized in the general discussion, to examine the prediction that greater CP would produce faster responses to intention judgments than the

lower CP would do. Although Study 2 failed to develop a CP manipulation, it provides important insight into the factors that do (and do not) affect CP.

Study 3

In Study 1, I examined CP effects on intention formation with the assumption that the ease of imagining counterfactuals would increase CP, and thus intentions. The results revealed no mediation of CP on the relationship between mutability and intention. However, different factors of mutability may have distinct effects. There are at least two factors that determine mutability: norm violation and closeness (Smallman & Summerville, 2018). Norm violation includes a case where either unusual or usual behaviors lead to a negative situation, and closeness involves whether a negative outcome could have nearly been avoided or nowhere near avoided. The farther away from the norm or the closer the event could have been avoided, the easier to imagine alternatives. For example, a car accident while driving an unusual (away from the norm) versus usual (the norm) route to home more easily generates alternatives to the reality. Missing a flight by 5 minutes (close to the desired outcome) more readily induces counterfactuals than missing a flight by 60 minutes does (distant to the desired outcome).

Based on previous research on the relationship between plausibility perception and mutability (e.g., Kahneman & Tversky, 1982; Stanley et al., 2017; Teigen, 1998), I assumed greater CP on highly mutable stories. The findings of Study 1 supported this assumption. However, CP was hardly impactful on intentions through mutability. In Study 3, I thus attempted to examine how two different determinants of mutability would change CP as well as the association between CP and intentions.

According to Roese (1997), norm violation and closeness play different roles in counterfactual generation. He emphasizes the distinction between counterfactual activation and content. Counterfactual activation refers to whether counterfactual processing is initially triggered, and counterfactual content refers to mutated (or altered) antecedents that undo the outcome. When individuals just think about a past event, counterfactual processing is "switched off." If they start wondering a different outcome than the actual one (e.g., "What might have been if I'd done something differently?"), counterfactual thinking is "switched on" or activated. Then people generate counterfactuals with specific content (e.g., "If only I had *gone to sleep early*") that could have resulted in the different outcome (e.g., "I would have been able to avoid the accident").

Because it is tied to counterfactual antecedents more than to counterfactual outcomes per se, CP is closely linked with counterfactual content rather than mere activation. Of CP components, IL (if likelihood) estimates antecedent plausibility whereas TL (then likelihood) represents the association between the antecedent and an alternative outcome. For instance, after receiving a bad grade, a student may process several alternatives, such as "I could have spent more time studying." Given that CP involves likelihood perception of a simulated *antecedent* and its association with the outcome, CP would differ by how much time the student would have been able to spend studying and the extent to which studying more would have resulted in a better grade. Therefore, different counterfactual content (e.g., "I could have reviewed my notes") would change its likelihood and thus CP.

Roese (1997) argues that closeness determines counterfactual activation whereas norm violation affects content of counterfactuals. Closeness triggers an alternative outcome. When missed opportunities are perceived as close, it would be required to make only slight effort to obtain the goal. Thus, perceived closeness motivates individuals to activate counterfactual thinking by simulating an alternative outcome. This process is a necessary condition for counterfactual content and takes limited forms because the number of alternative outcomes is restricted in a situation. However, once activated, counterfactuals take many forms according to norm violation. Violation of an a priori norm causes individuals to consider a scenario in which the norm had occurred. That way, they could return to the normal state in a counterfactual. Thus, normality determines what antecedent is mutated (Kahneman & Miller, 1986; Roese, 1997).

Taken together, I argue that closeness would minimally influence CP whereas norm violation would heavily affect CP estimates. Processing near misses (e.g., "I got 79 out of 100. I could have received B!") would hardly alter CP because closeness activates counterfactual thinking and this mere activation is just a necessary condition to estimate CP. However, norm violation would change CP as deviations from norms determine counterfactual content and counterfactual content is a key factor of likelihood perception of counterfactual thinking.

Although Teigen (1998) found that near misses increased probability perception of counterfactual thinking, he measured probabilities of counterfactual *outcomes*. Unlike his method, CP concerns perceived likelihood of an alternative action (IL) and the causal relationship between that action and the desired, unobtained goal (TL). Whereas Teigen (1998) focuses on probabilities of alternative outcomes *per se*, the TL measure in the current research

estimates the likelihood of the alternative outcome assuming that the alternative action had taken place. It was logical to examine probabilities of counterfactual outcomes in Teigen (1998) as closeness is closely related to outcomes. However, unlike Teigen's (1998) research, CP captures the likelihood of an alternative antecedent as well as the likelihood of the association between the antecedent and the alternative outcome. In short, the current research examines likelihood perception of a counterfactual antecedent and its relationship with a counterfactual outcome whereas Teigen (1998) looks at probabilities of counterfactual outcomes.

Therefore, in order to test whether different mutability factors serve a distinct role in CP and its influence on intentions, I manipulated norm violation and closeness in this study and explored their influences on CP and intentions. I predicted that unusual behaviors (i.e., violating the norm) would increase CP because unusual behaviors determine counterfactual content, and CP estimates the likelihood of this content. However, near misses (i.e., close outcome) would not strengthen CP because near misses merely switch on counterfactual processing, and CP would not differ by how easy to activate counterfactuals. Further, I suspected that norm violation would enhance behavioral intentions whereas closeness would have only few effects on intentions, if at all. This is because the intention measures for this study were coupled with specific alternative behaviors. In light of the fact that closeness has nothing to do with counterfactual content (alternative antecedents), closeness would not impact intentions.

More importantly, I examined whether these two mutability factors indirectly affected intentions via CP. In Study 1, norm violation and closeness were not cross-balanced. Thus, if norm violation and closeness have distinct effects on CP, the variance of the effects of mutability condition on CP and intentions may have been exacerbated, which could result in low t-values. I expected that the norm violation conditions would indirectly impact intentions through CP, but the closeness conditions would not.

Method

Participants. A power analysis indicated that 171-265 participants are necessary for a 2 (norm violation: unusual and usual behavior) X 2 (closeness: near and far miss) between-participants design with an effect size (.20 < f < .25) at 90% power. Therefore, I pre-registered a goal of a minimum of 171 participants (see Appendix A for the pre-registered document) and collected 249 responses for this study ($M_{age} = 30.86$, $S.D._{age} = 10.36$; 51% male; 71.5% White;

6.8%). Participants fluent in English were recruited on Prolific Academic, which is an online recruitment platform, and compensated with U.S. \$1.

Material and procedure. After providing informed consent, participants were asked to read vignettes and vividly imagine the described events as if they had actually experienced the events. Then they were randomly assigned to one of the 2 (norm violation) X 2 (closeness) fully between-subjects conditions. The norm violation manipulation involved usual (e.g., "You drove to campus like you normally do.") or unusual (e.g., "You decided to drive to campus instead of taking the bus like you normally do.") behaviors. The closeness manipulation consisted of near (e.g., "...you ended up getting 79 out of 100, which means you got a "C.") and far (e.g., "...you ended up getting 75 out of 100, ...") misses. The vignettes were derived from 3 story kernels (see Appendix C). After reading each vignette, participants read a corresponding counterfactual and completed the CP and intention measures same as those in Study 1. All participants in each condition read all 3 vignettes and rated the CP and intention scores for each vignette.

Results

IL and TL values were multiplied to create CP scores (Petrocelli et al., 2011). In Table 2, I reported zero-order correlations for all CP and intention estimates. The CP ratings were submitted to a 2 (norm violation: usual and unusual condition) X 2 (closeness: far and close condition) X 3 (vignette) mixed-model ANOVA with the third factor measured within-subjects (see Figure 5, upper panel).³ Crucially, the three-way interaction was not significant, F(1.92, 469.24) = 2.06, p = .13, $\eta_p^2 = .01$. Although there was a significant interaction of norm violation and vignette, F(1.92, 469.24) = 3.49, p = .03, $\eta_p^2 = .01$, as shown in Figure 5, CP ratings were consistently higher in all vignettes containing unusual versus usual behaviors. Thus, this interaction effect merely means that some of the vignettes more sensitively changed CP than the other(s). Vignette did not interact with closeness, F(1.92, 469.24) = .40, p = .66, $\eta_p^2 = .002$. Finally, there was a main effect for vignette, F(1.92, 469.24) = 8.50, p < .001, $\eta_p^2 = .03$, which implies that a counterfactual was more potent for some vignettes than others. Different potency levels between vignettes would not change the outcomes of this study, and I thus collapsed across vignette in analyses except as noted.

³ When IL or TL estimates were separately submitted instead of CP, the three-way interaction and all the two-way interactions were not significant, all *Fs* < 2.55, *ps* > .08. The main effects of norm violation, *Fs*(1, 245) > 11.92, *ps* < .001, $\eta_p^2 s > .05$, and vignette were significant, *Fs*(2, 490) > 9.04, *ps* < .001, $\eta_p^2 s > .04$, which shows the consistent pattern with the outcomes of CP.

The first prediction in Study 3 was that norm violation would result in greater CP. Consistent with this prediction, I found a main effect for norm violation, F(1, 245) = 34.34, p < .001, $\eta_p^2 = .12$, indicating that events involving unusual behaviors led to greater CP relative to usual behaviors. The second prediction was that closeness would not affect CP. As predicted, a null main effect for closeness, F(1, 245) = .02, p = .88, $\eta_p^2 < .001$, showed that participants perceived similar levels of CP regardless of near- or far-miss outcomes. The interaction of norm violation and closeness was nonsignificant, F(1, 245) = .003, p = .96, $\eta_p^2 < .001$.

The intention scores were also submitted to the same mixed-model ANOVA (see Figure 5, lower panel). This analysis revealed no significant three-way interaction, F(1.88, 459.68) = .69, p = .50, $\eta_p^2 = .003$. Vignette interacted with neither norm violation, F(1.88, 459.68) = 1.41, p = .25, $\eta_p^2 = .006$, nor closeness, F(1.88, 459.68) = .34, p = .70, $\eta_p^2 = .001$. There was a main effect for vignette, F(1.88, 459.68) = 40.27, p < .001, $\eta_p^2 = .14$. Thus, although the vignettes differed in the degree to which they elicited related intentions, this did not differ as a function of the independent variables.

As predicted, there was a significant main effect for norm violation, F(1, 245) = 54.41, p < .001, $\eta_p^2 = .18$. That is, the more participants perceived exceptionality (deviation from the norm), the more strongly they formed intentions. This result conveys that violating an a priori norm leads to stronger intention formation to return to the normal state (hence, fulfill the goal). In contrast, their intentions hardly changed no matter how close the missed opportunities were, F(1, 245) = .04, p = .84, $\eta_p^2 < .001$. Norm violation and closeness did not interact with each other to predict intentions F(1, 245) = .81, p = .37, $\eta_p^2 = .003$.

I also used a multilevel regression nesting trials within participants to examine the predictions of the positive impacts of norm violation on CP and intention as well as the null relationships of closeness with CP and intention. First, CP estimates were regressed on norm violation (0 = usual, 1 = unusual behavior) and closeness (0 = far, 1 = near miss). As expected, there was a significant effect of norm violation on CP, $\gamma = 7.06$, t = 4.18, p < .001, 95% C.I. = [3.73, 10.38]. Moreover, in line with the prediction, closeness, $\gamma = .25$, t = .15, p = .89, 95% C.I. = [-3.09, 3.58] as well as the interaction of closeness and norm violation had no impact on CP, $\gamma = -.16$, t = -.07, p = .95, 95% C.I. = [-4.88, 4.55]. Second, intentions were regressed on norm violation and closeness. As predicted, norm violation increased intentions, $\gamma = 19.89$, t = 5.73, p < .001, 95% C.I. = [13.05, 26.73], whereas closeness did not, $\gamma = 1.31$, t = .38, p = .71, 95% C.I.

= [-5.56, 8.17]. The result also showed no interaction of the two factors, $\gamma = -3.92$, t = -.80, p = .43, 95% C.I. = [-13.61, 5.77].

Taken together with the outcomes of the ANOVAs, the findings support the main hypothesis of the positive influence of CP on intention formation. That is, more likely counterfactuals induced stronger intentions. Moreover, I divided mutability into norm violation and closeness with the predictions that norm violation would increase but closeness would have no effects on CP and behavioral intentions. The outcomes provide evidence for these predictions by showing distinct roles of norm violation and closeness in determining CP and intentions. When a negative event was caused by an unusual versus usual behavior, participants judged the corresponding counterfactual as more likely and thus showed higher intentions. Consistent with the predictions, it was not the case when closeness perception was described in vignettes. Namely, participants who read near-miss events did not differ from those who read far-miss events in terms of CP and intentions.

As in Study 1, I also conducted mediation analyses to test the mediation effect of CP on the relationships between two mutability factors and intentions. Given that there were no interaction effects of norm violation and closeness on neither CP nor intentions, it is reasonable to investigate two separate mediation models in which the initial predictor is either norm violation or closeness. Thus, I tested the indirect effect of each of the mutability factors separately on intentions via CP. I employed a MSEM paradigm to analyze multilevel mediation (Preacher et al., 2010). Similar to the data structure in Study 1, the design of Study 3 produced the Level-2 initial predictors (i.e., norm violation and closeness at the between level). Thus, the two mediation models corresponded to a 2-1-1 design with the Level-2 between predictors (either norm violation or closeness) and the Level-1 mediator (CP) and outcome (intention). Indirect effects were identified at the between level because in a 2-1-1 design the indirect effects exist only at the between level.

For norm violation (see Figure 6), the estimates for the *a* path (the impact of norm violation on CP) and *b* path (the impact of CP on intention) were found significant. The multiplicative product of these estimates showed a significant mediation effect of CP on the relationship between norm violation and intention, $\gamma = 4.70$, *S.E* = 2.15, *p* = .03, 95% C.I. = [.49, 8.91]. For closeness (see Figure 7), only the *b* path (the effect of CP on intention) was significant. There was no significant indirect effect for closeness, $\gamma = .29$, *S.E* = 1.34, *p* = .83,

95% C.I. = [-2.34, 2.91]. These results demonstrate that CP mediated the influence of norm violation (but not closeness) on participants' intentions in the predicted pattern.

Discussion

The purpose of Study 3 was to examine whether different determinants of counterfactual mutability serve as a different role in inducing CP and intentions. I predicted that violating a norm would lead individuals to perceive greater CP relative to following the norm. Further, I expected that outcome closeness (near or far misses) would not change CP because it is associated with counterfactual activation and outcomes rather than content and antecedents (Roese, 1997). In fact, people tend to generate counterfactuals more frequently when perceiving that an outcome (a missed opportunity) almost had happened (e.g., Medvec & Savitsky, 1997; Meyers-Levy & Maheswaran, 1992).

As predicted, the outcomes provided evidence supporting the main hypothesis that more potent counterfactuals would evoke stronger intentions to perform in the future. Only norm violation (but not closeness) resulted in differences in CP and intentions. Unusual versus routine behaviors caused participants to perceive their counterfactuals as highly likely and heightened counterfactual-related intentions. The mediating impact of CP confirmed that intentions changed due to not just mutability (or exceptionality) but also likelihood perception of counterfactuals (CP).

Past research has shown that mutability is an important determinant of counterfactual generation and functionality (Roese, 1997; Walker et al., 2016). Moreover, in Study 1, the mutability effect on intentions remained intact when CP was considered. When considering specific factors of mutability, however, I found that CP mediated the effect of norm violation but not closeness on intentions. This implicates that CP could be a proximal factor determining the strength of intentions especially when counterfactuals involve norm violation.

Closeness made minimal differences in CP and intentions. Closeness concerns physical or psychological distance between a desired but unfulfilled goal and the actual outcome. The closer the distance is, the easier individuals imagine an alternative outcome. In this sense, near misses would bring about a sense that an alternative outcome is likely to have happened. For example, a silver medalist who almost came in first would simulate a more likely counterfactual outcome than a silver medalist who was crushed by the gold medalist. Closeness would thus increase a sense that the unobtained goal could be obtained in the future. That is, individuals

would perceive high likelihood that they would be able to achieve the goal next time when the past outcome was close to the desired outcome. In line with this logic, close temporal distance increased motivation to achieve a future goal (Peetz, Wilson, & Strahan, 2009). Therefore, closeness may enhance motivation via the content-neutral pathway rather than the content-specific pathway.

In short, Study 3 identified that violating an a priori norm induced high perceived likelihood of simulated counterfactuals, and this heightened likelihood perception increased behavioral intentions. Also, perceived closeness exerted no effect on CP nor content-specific intentions. Thus, this study explains a possible reason for no mediation effect of CP on the link between mutability and intentions in Study 1, demonstrates CP's utility in a context of norm violation, and shows distinct roles of mutability factors.

General Discussion

This research explored the effect of CP on behavioral intentions. In Study 1, I assumed that participants who read mutable versus relatively less mutable vignettes would consider counterfactuals more likely (i.e., having greater CP) and thus form stronger intentions. Intentions were stronger when counterfactuals were easily simulated and likely to have happened. However, CP did not mediate the impact of mutability on intention. In Study 3, I closely examined mutability effects by separating two determinants of mutability, norm violation and closeness. That way, I could not only examine the hypothesis again but also identify the possibility that the two factors of mutability had distinct effects on the relationship between CP and intentions in Study 1. The findings of Study 3 indicated that CP mediated the influence of norm violation, but not closeness, on intention. That is, when violating a norm, individuals simulate a potent counterfactual and generate strong counterfactual-related intentions. The more potent a counterfactual is, the stronger intentions people generate. However, closeness perception failed to bring about differences in CP and intentions. This suggests that likelihood perception of counterfactuals and the following content-specific intentions are relatively insensitive to how close a desired outcome was to being obtained. Taken together, the current research provides initial and important evidence for CP's role in forming behavioral intentions via the contentspecific pathway.

In Study 2, I attempted to create a new CP manipulation that would allow me to examine the facilitating effect of CP on intention as well as to eliminate demand characteristics that may

have happened in Study 1. In order to create a new CP manipulation, different modal verbs that may alter likelihood perception were used. However, all modal verbs led to similar levels of likelihood perception. Therefore, Study 4, which is an additional study outside of the current thesis, was conducted. In this study, CP levels of prime statements used in Smallman (2013) were measured. The collected CP ratings were then compared with archival reaction time data for intention judgments from Smallman (2013). In the studies of Smallman (2013), participants were primed with counterfactual thoughts by reading an action phrase in which either a specific behavior, categorical behavior, or trait contained with a counterfactual cue (e.g., "could have"). Then they were asked to make a judgment about relevant future behaviors. For instance, after reading the prime statement, "could have used napkins," participants decided whether to use napkins or not in the future. The reaction times (RTs) for this intention judgment were measured and analyzed.

In Study 4, participants were assigned to one of 4 counter-balancing conditions, so that across all participants, each of the 4 mutations (two different specific behaviors, categorical behaviors, and traits) was rated for each of the 100 negative events. At the beginning of each trial, a negative event (e.g., spilled food on shirt) was presented. Participants then read the counterfactual cue (i.e., "could have") paired with one of three types of prime statements employed in Smallman (2013): specific behavior (e.g., "used napkins"), categorical behavior (e.g., "eaten neatly"), or trait (e.g., "been less sloppy"). Participants then rated CP and intentions using the same measures as in Studies 1 and 3. After 5 practice trials, the main trials were repeated 100 times. The event descriptions were randomly presented, and each participant read counterbalanced 50 specific behavior, 25 categorical behavior, and 25 trait prime statements.

Each prime statement was considered a unit of analysis. I expected that specific behaviors would lead to higher CP relative to categorical behaviors and traits with the assumption that specific behaviors, which bring about rather concrete, vivid mental representation, would be easily induce counterfactual thoughts. As predicted, CP ratings on specific behaviors, M = 31.71, S.D. = 3.64, were higher than the others, M = 30.31, S.D. = 4.04, t(296) = 2.89, p = .004, d = .36. In particular, counterfactuals involving specific behaviors were perceived as more likely than those involving traits, M = 29.66, S.D. = 4.30, t(196) = 3.62, p < .001, d = .51. The comparison of counterfactuals containing specific, M = 31.71, S.D. = 3.64, versus categorical behaviors, M = 30.96, S.D. = 3.68, revealed the predicted trend, but not significant outcome, t(196) = 1.43, p =

.16, d = .20. In addition, archived RTs were correlated with CP scores, r = -.19, p = .001. Namely, the prime statements that were likely to have happened facilitated intentions. A mediation analysis was conducted to test if CP would mediate the effect of different counterfactual contents on RTs. The result indicated the significant indirect effect of counterfactual content (dummy coded, 1 = specific behavior, 0 = the others) on intentions, b = -.02, *S.E.* = .01, 95% *C.I.* = [-.04, -.004]. That is, specific behavior primes, which brought about greater CP, produced faster responses to intention judgments. Therefore, this additional study provided evidence for the hypothesis that CP would facilitate relevant intentions. This indicates that higher potency leads counterfactuals to be more accessible and thus results in faster intention judgment. Further, this study ruled out any demand or salience characteristics that may have affected the results of Study 1 and 3.

In the time since the term counterfactual potency (CP) has been introduced, only a handful of research has tested its effect (e.g., Petrocelli et al., 2015). In spite of the fact that likelihood perception carries a great deal of weight in later judgment (Reyes, Thompson, & Bower, 1980; Sherman et al., 1985), little research on the effects of likelihood or plausibility perception of counterfactual thinking has been conducted. The current research addresses that gap and assists in explaining how counterfactuals influence judgment in extant research.

To be specific, the current research broadens knowledge about the functional theory of counterfactual thinking (Roese & Epstude, 2017). Unlike the content-neutral pathway, extant literature paid little attention to the process of the content-specific pathway. Counterfactual thinking is functional when it elicits negative emotions and control perception, and thus increases motivation via the content-neutral pathway. However, it was unclear how counterfactual could be impactful within the content-specific pathway. This research provides a possible process that counterfactuals affect behavioral intentions via CP within this pathway.

Petrocelli et al. (2011) found that CP enhanced responsibility perception and worsened negative emotions. These findings imply a functional role of CP within the content-neutral pathway. Namely, regardless of counterfactual content, counterfactuals that appear to be likely (i.e., high CP) increase responsibility and negative affect and, in turn, motivation to improve. The current research is specifically focused on the content-specific pathway to examine how likelihood perception of the specific content of a counterfactual would exert its power on intention formation. The outcomes demonstrate that merely generating a counterfactual may not

lead the counterfactual to be functional. This research suggests that likelihood perception (i.e., CP) is one of the important determinants for counterfactuals to be impactful on future behaviors. Low CP may not provide ample confidence that the alternative behavior would help fulfill the desired goal that failed to achieve whereas high CP would provide the causal significance between the alternative action and goal and be more accessible, so that individuals easily remember what they did wrong and what they would have done differently when facing a similar situation (hence, easily and strongly form intentions).

Moreover, past research has identified various factors (e.g., counterfactual content, temporal distance, group membership) that affect the strength of counterfactual and intention formation within the content-specific pathway (Smallman, 2013; Smallman & McCulloch, 2012; Walker et al., 2016). I argue that a number of factors changing the counterfactuals' effect on behavioral intentions would stem from CP. That is, CP may serve as the most proximal determinant of whether counterfactuals evoke behavioral intentions. For example, counterfactual content (e.g., concrete or abstract, Smallman, 2013), temporal distance (e.g., simulating counterfactuals of distant or close past events, Smallman & McCulloch, 2012), and group membership (e.g., simulating ingroup or outgroup members' counterfactuals, Walker et al., 2016) are likely to alter likelihood perception of counterfactuals. In fact, in the additional study, it was the case that concrete counterfactual content (i.e., specific behavior) resulted in greater CP compared to abstract content (i.e., categorical behavior and trait). It is required for future research to identify the role of CP as a "master" mediator in the content-specific pathway.

In light of this argument, the current research provides insights into a reason why counterfactuals are sometimes not functional. For example, a counterfactual statement, such as "If I had studied more, I would have received a better grade," can be functional. According to the functionality of counterfactual thinking, this counterfactual is likely to evoke intentions to study more in the future (hence better grades). However, McCrea (2008) argues that a counterfactual can serve as an excuse to enhance self-esteem. In his paper, students who had failed an exam tended to have decreased motivation to improve. If the counterfactual is an excuse for a bad grade, that counterfactual statement would entail unlikely behaviors. That is, the counterfactual could be rephrased as "I should have studied more but I was too busy," which implies the low likelihood of the alternative behavior to have occurred. Such excuse-making counterfactuals would be dysfunctional due to low likelihood perception. In other words, a counterfactual that is

an excuse for the past outcome would reduce CP levels, and subsequently low CP would reduce both motivation and intention for future performance. Those possible associations between dysfunctional counterfactuals and CP should be examined in the future.

Additionally, Study 3 showed that factors that increased mutability played distinct roles. It was a prevalent assumption that mutability as a single construct determines counterfactual generation. As Roese (1997) argues, however, the current research also suggests caution in using mutability as a composite factor in research examining counterfactual function. Because closeness is irrelevant to counterfactuals' effect in the content-specific pathway, if a study explores mutability and functional counterfactual through this route it may incorrectly indicate that mutability had no effect. Further research should be done on the roles each of these factors play in the content-specific pathway. I suspect that closeness could increase one's motivation within the content-neutral route. Regarding normality, it is unclear though whether the effects of norm violation would differ from those of closeness differently in increases in general motivation. I believe that this is an important avenue for future research.

It should be noted, however, that CP may not always bring about *positive* consequences. Although the current research is based on the functional theory of counterfactual thinking, I do not claim that CP always induces positive outcomes. If a detrimental behavior (e.g., gambling behavior) is expected to result in fulfilling the desired outcome or achieving positive consequences (e.g., earning money), a highly likely counterfactual would mislead people and have them do that negative behavior. For instance, it seems plausible that an unusual gambling behavior (e.g., "When the house hand had 15 points, I hit on 17 on which I usually stand in Blackjack. The dealer got 2 points and stood, and I got 5 points and busted.") would increase CP (e.g., "If I had stood on 17, I would not have lost."), so that the player would expect to win by standing on 17 next time. Therefore, greater CP is likely to encourage gambling behavior. In fact, past research has demonstrated that near-miss gambling experiences were judged to be highly likely and led to more gambling behavior in the future (Dixon & Schreiber, 2004; Gilovich & Douglas, 1986). Although their findings concern the association between closeness, plausibility of counterfactuals, and following consequences probably via the content-neutral pathway, it is likely that CP increases gambling behavior in the content-specific route.

Also, high CP may hide the true cause of a past event and thus reduce a chance to improve or even lead to a negative result. When the true cause differs from a mutated cause,

counterfactuals cannot be functional (Smallman & Summerville, 2018). For instance, Sherman and McConnell (1996) argue that specific instances and recent events are more likely to be mutated compared to general instances and far events. Thus, when failing to identify the accurate cause by assigning causality to less causally relevant but more accessible causes (e.g., recent events or specific cases), counterfactuals could be less functional or even dysfunctional (Sherman & McConnell, 1996; Smallman & Summerville, 2018). Thus, CP may result in unintended dysfunctional outcomes.

Methodologically, the current research attempted to develop a CP manipulation. Participants judged if different modal verbs in counterfactual phrases made differences in CP. However, this was not effective as shown in Study 2. As a result, the present research could not directly manipulate CP. Although this research is meaningful in that it identifies initial evidence showing the role of CP in the content-specific pathway, a direct manipulation of CP would be able to demonstrate a more reliable outcome. Future research should create a direct CP manipulation that can apply to this context.

Simulating hypothetical worlds always involves likelihood perception. When an alternative action that in fact did not happen is likely to have occurred and be associated with a desired outcome, a similar circumstance in the future triggers this action. A counterfactual that contains an alternative action either unlikely to have happened or unlikely to have changed the outcome, is disregarded as this action would not be beneficial. This research demonstrates that counterfactual thinking exerts influences on behavioral intentions to varying degrees according to CP. Likelihood perception of counterfactual thinking is a critical determinant in forming behavioral intentions for the future. How likely we perceive alternative worlds to have happened may be a reason that we try to undo what had happened and fulfill the unobtained goal in the future.

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Table 1.

| | | | - | | | | | ~ | | | | |
|------------------|-------|-------|-------|-----------|-----------|-----------|-----------|-------|-------|-------|------|----|
| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1. S1-CP | — | | | | | | | | | | | |
| 2. S2-CP | .43** | — | | | | | | | | | | |
| 3. S3-CP | .26** | .21** | — | | | | | | | | | |
| 4. S4-CP | .47** | .49** | .12 | — | | | | | | | | |
| 5. S5-CP | .37** | .32** | .05 | .35** | — | | | | | | | |
| 6. S6-CP | .24** | .34** | .03 | .37** | .37** | _ | | | | | | |
| 7. S1-Intention | .49** | .20** | .16* | .23** | $.18^{*}$ | .08 | — | | | | | |
| 8. S2-Intention | .15* | .45** | 001 | .24** | .14 | $.17^{*}$ | .06 | _ | | | | |
| 9. S3-Intention | .01 | 02 | .46** | 07 | 02 | 07 | $.17^{*}$ | .03 | — | | | |
| 10. S4-Intention | .07 | .06 | 04 | $.17^{*}$ | .05 | .01 | .14 | .16* | 02 | — | | |
| 11. S5-Intention | .004 | .15* | .19** | .06 | .10 | 003 | 06 | .26** | .22** | .29** | — | |
| 12. S6-Intention | .10 | .24** | 14* | .12 | .24** | .37** | .07 | .34** | 13 | .27** | .16* | — |

Study 1 Zero-Order Correlations

Note. S: story, CP: counterfactual potency. *p < .05. **p < .01.

Table 2.

| Variable | 1 | 2 | 3 | 4 | 5 | 6 |
|-----------------|------------|-------|-------|-------|-------|---|
| 1. S1-CP | _ | | | | | |
| 2. S2-CP | .24** | — | | | | |
| 3. S3-CP | .51** | .21** | — | | | |
| 4. S1-Intention | $.40^{**}$ | .09 | .33** | — | | |
| 5. S2-Intention | .12 | .43** | .01 | .25** | _ | |
| 6. S3-Intention | .35** | .07 | .54** | .55** | .20** | _ |
| | | | * | 44 | | |

Study 2 Zero-Order Correlations

Note. S: story, CP: counterfactual potency. *p < .05. **p < .01.



Figure 1. Two distinct pathways from counterfactual thinking to behavior and the (potential) roles of counterfactual potency.



Figure 2. Differences of CP according to mutability conditions X event descriptions. Error bars represent 95% confidence intervals.



Figure 3. Differences of intentions according to mutability conditions X event descriptions. Error bars represent 95% confidence intervals.



Figure 4. A 2-1-1 multilevel mediation model of the effect of mutability on intention via CP in Study 1. Standard errors are presented in parentheses. Mutability condition was dummy-coded, 0 = 100 mutability, 1 = 100 mutability. ***p < .001.



Figure 5. Differences of CP estimates and intentions according to norm violation X closeness X vignette. Error bars represent 95% confidence intervals.



Figure 6. A 2-1-1 multilevel mediation model of the effect of norm violation on intention via CP in Study 3. Standard errors are presented in parentheses. Norm violation was dummy-coded, 0 = usual behavior, 1 = unusual behavior. p < .05, p < .001.



Figure 7. A 2-1-1 multilevel mediation model of the effect of closeness on intention via CP in Study 3. Standard errors are presented in parentheses. Closeness was dummy-coded, 0 = far miss, $1 = \text{close miss.}^{***} p < .001$.

Appendix A

Study 1 Pre-registration

ASPREDICTEDCONFIDENTIAL - FOR PEER-REVIEW ONLY

Woo's Master Study 1 (CP and intention) (#19236)

Created: 02/03/2019 03:41 PM (PT) Shared: 06/23/2019 07:10 PM (PT)

This pre-registration is not yet public. This anonymized copy (without author names) was created by the author(s) to use during peer-review. A non-anonymized version (containing author names) will become publicly available only if an author makes it public. Until that happens the contents of this pre-registration are confidential.

1) Have any data been collected for this study already?

No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?

We are interested in the relationship between the perceived likelihood of counterfactual thoughts, called counterfactual potency, and intention formation. We predict that intentions will be stronger when people simulate high counterfactual potency situations (i.e., highly likely counterfactuals) relative to low counterfactual potency situations.

3) Describe the key dependent variable(s) specifying how they will be measured.

Counterfactual potency [likelihood perception of counterfactuals] and intentions will be measured. Specifically, counterfactual potency measures consist of the "if likelihood" (IL) and "then likelihood" (TL, Petrocelli, Percy, Sherman, & Tormala, 2011). The IL items include "How likely is it that you would have taken the most direct route?" and the TL items include "Given that you had actually taken the direct route, how likely is it that you could have avoided the accident?" anchored with 1 equal to "very unlikely" and 7 equal to "very likely." Counterfactual potency will be calculated by multiplying IL and TL. Intention items include "In the future, how likely are you to take the most direct route?" anchored at very unlikely [1] and very likely (7).

4) How many and which conditions will participants be assigned to?

Participants will be assigned to one of two conditions, high and low counterfactual potency condition (i.e., 2 between-subjects design). Each participant will read 6 vignettes in either high or low potency condition.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

We will conduct a mediation analysis using the mean value of each measure. This mediation analysis will test the mediating role of the average CP across all 6 vignettes on the relationship between condition and intention. Also, we will conduct a multilevel regression nesting each vignette within participant. This analysis will test the effects of condition on intention, counterfactual potency on intention, and condition on counterfactual potency separately. Multilevel mediation of counterfactual potency between condition and intention will also be employed.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

In case that non-native English speakers misunderstand the questions due to the fact that expressions involving unreal past and future are something that most of them struggle with, we will exclude ESL students in the primary analysis. However, results including them will also be reported.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

We will collect data via lab sessions. Sessions will be scheduled until at least 175 participants have signed up.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

Nothing else to pre-register.

Version of AstVedkited Questions: 2.00

Verify authenticity:http://aspredicted.org/blind.php?x=h97nt5

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Woo's Master's Study 2 (closeness, norm violation, and CP) (#22503)

Created: 04/22/2019 11:39 AM (PT) Shared: 07/09/2019 03:50 PM (PT)

This pre-registration is not yet public. This anonymized copy (without author names) was created by the author(s) to use during peer-review. A non-anonymized version (containing author names) will become publicly available only if an author makes it public. Until that happens the contents of this pre-registration are confidential.

1) Have any data been collected for this study already?

No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?

We are interested in the relationship between the perceived likelihood of counterfactual thoughts, called counterfactual potency, and intention formation. In this study, we are looking at whether closeness and norm violation influence counterfactual potency and intention. The prediction is that unusual behaviors (i.e., violating the norm) will increase CP; however, near misses (i.e., close outcome) will not increase CP. Also, I predict that CP will not mediate the effect of the closeness conditions (i.e., near and far misses) but will mediate the effect of the norm violation conditions (i.e., usual and unusual behaviors) on intention.

3) Describe the key dependent variable(s) specifying how they will be measured.

Counterfactual potency (likelihood perception of counterfactuals) and intentions will be measured. Specifically, counterfactual potency measures consist of the "if likelihood" (IL) and "then likelihood" (TL, Petrocelli, Percy, Sherman, & Tormala, 2011). The IL items include "How likely is it that you would not have driven to get to campus?" and the TL items include "Given that you had actually not driven to get to campus, how likely is it that you could have gotten a better grade?" anchored with 1 equal to "very unlikely" and 7 equal to "very likely." Counterfactual potency will be calculated by multiplying IL and TL. Intention Items include "In the future, how likely are you to drive to get to campus on the day of an exam?" using a slider anchored at very unlikely (0) and very likely (100).

4) How many and which conditions will participants be assigned to?

We will use a 2 (norm violation: unusual and usual behavior) X 2 (closeness: near and far miss) between-participants design. Thus, participants will be randomly assigned to one of 4 conditions and each participant will read 3 vignettes.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

We will conduct a 2 (norm violation: unusual and usual behavior) X 2 (closeness: near and far miss) two-way ANOVA on CP in order to examine the hypothesis that only unusual behaviors will increase CP. A mediation analysis using the mean value of each measure across all vignettes will also be implemented. This mediation analysis will test the mediating role of the average CP across all 3 vignettes on the relationship between condition and intention. Also, we will conduct a multilevel regression nesting each vignette within participant in each condition. This analysis includes testing the effects of condition on intention, counterfactual potency on intention, and condition on counterfactual potency separately. Multilevel mediation of counterfactual potency between condition and intention will also be employed.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

We will exclude incomplete responses as statistically necessary.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

We will collect data from a minimum of 171 participants via an online recruitment platform (Prolific Academic).

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

Nothing else to pre-register.

Verify authenticity:http://aspredicted.org/blind.php?x=my97sa

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Appendix B

Study 1 Vignettes, Counterfactual Statements, and Intention Questionnaires

Accident (Story 1)

High mutability. Every day, Monday through Friday, you leave your apartment for class right around 8:00, arriving at the building by 8:30. You typically take the highway, which is the most direct route. One morning, you decided to take scenic indirect route, allowing you to enjoy the nice weather. While you are driving, another driver entered the road, and quickly moved into your lane. You could not avoid the car, and you collided with them.

Low mutability. Every day, Monday through Friday, you leave your apartment for class right around 8:00, arriving at the building by 8:30. You typically take the scenic indirect route, rather than the most direct route, allowing you to enjoy the nice weather. One morning, while you were following your typical routine, another driver entered the road, and quickly moved into your lane. You could not avoid the car, and you collided with them.

Counterfactual statement. "If only I had taken the most direct route, then I would have avoided the accident."

Intention. "In the future, how likely are you to take the most direct route?"

Exam (Story 2)

High mutability. One day when you had to take an exam, you decided to drive to campus instead of taking the bus like you normally do. It took you 10 minutes to find a parking spot. You had to park very far from the classroom. You got to class late. Your professor allowed you to take the exam but would not give you additional time to complete it. You ended up getting a "D", because of the questions that you did not answer in time.

Low mutability. One day when you had to take an exam, you drove to campus like you normally do. It took you 10 minutes to find a parking spot. You had to park very far from the classroom. You got to class late. Your professor allowed you to take the exam but would not

give you additional time to complete it. You ended up getting a "D", because of the questions that you did not answer in time.

Counterfactual statement. "If only I had not driven to get to campus, then I would have gotten a better grade."

Intention. "In the future, how likely are you to drive to get to campus on the day of an exam?" (reverse-coded)

Airport (Story 3)

High mutability. Last year you were taking a big trip for spring break. You had to drive to the airport during rush hour. There was a lot of traffic. When you got to the airport, the lines for security were long. Your gate was the farthest one. You ran to your gate, but when you got there the plane had left 10 minutes ago.

Low mutability. Last year you were taking a big trip for spring break. You had to drive to the airport during rush hour. There was a lot of traffic. When you got to the airport, the lines for security were long. Your gate was the farthest one. You ran to your gate, but when you got there the plane had left 45 minutes ago.

Counterfactual statement. "If only I had left home earlier, then I would have caught the plane."

Intention. "In the future, how likely are you to leave home early when you take a trip?" Poisoning (Story 4)

High mutability. Last summer you had an internship with a company in town. You ate lunch at the same restaurant, Daydream, nearly every day. One day you decided to try a new restaurant, The Smile, with your coworkers. Even though you ordered something simple, you wound up getting food poisoning.

Low mutability. Last summer you had an internship with a company in town. You ate lunch at the same restaurant, The Smile, nearly every day. One day you went to your usual restaurant with your coworkers. Even though you ordered something simple you usually do, you wound up getting food poisoning.

Counterfactual statement. "If only I had not gone to The Smile, then I would have avoided getting food poisoning."

Intention. "In the future, how likely are you to go to The Smile?" (reverse-coded) Sunscreen (Story 5)

High mutability. You have pretty sensitive skin, so you're usually careful about what kinds of sunscreen you use to avoid irritating your skin. One morning, you realized you were out of your usual sunscreen, Prevasol. It was going to be really sunny that day, so you used a sample of another brand, Solera that had come in the mail. When you got home from class and was getting ready to go meet up with your friends, you realized that you had developed a really bad rash.

Low mutability. You have pretty sensitive skin, so you're usually careful about what kinds of sunscreen you use to avoid irritating your skin. It was going to be really sunny that day, so you used your typical sunscreen, Solera, without realizing the formula had been changed ("new and improved"). When you got home from class and was getting ready to go meet up with your friends, you realized that you had developed a really bad rash.

Counterfactual statement. "If only I had not used Solera, then I would have avoided getting a bad rash."

Intention. "In the future, how likely are you to use the Solera brand of sunscreen?" (reverse-coded)

Haircut (Story 6)

High mutability. You go to a really trendy salon where it's hard to get an appointment -the last one you made took 6 weeks to get. They do a really great job with your hair though, so it's worth it. On the day of your appointment, you decided to drive to the appointment instead of taking the bus like you normally do. On your way to the salon you got stuck in traffic due to construction and a malfunctioning traffic light. Additionally, it took you 15 minutes to find a parking spot due to all the construction. After finally parking and running to the salon, you got to the appointment 30 minutes late, and the stylist wouldn't see you.

Low mutability. You go to a really trendy salon where it's hard to get an appointment -the last one you made took 6 weeks to get. They do a really great job with your hair though, so it's worth it. On the day of your appointment, you drove to the appointment as you normally do. On your way to the salon you got stuck in traffic due to construction and a malfunctioning traffic light. Additionally, it took you 15 minutes to find a parking spot due to all the construction. After finally parking and running to the salon, you got to the appointment 30 minutes late, and the stylist wouldn't see you.

Counterfactual statement. "If only I had not driven to the appointment, then I would have gotten my haircut."

Intention. "In the future, how likely are you to drive to the salon?" (reverse-coded)

Appendix C

Study 3 vignettes, Counterfactual Statements, and Intention Questionnaires **Exam (Story 1)**

Unusual and far condition. One day when you had to take an exam, you decided to drive to campus instead of taking the bus like you normally do. It took you 10 minutes to find a parking spot. You had to park very far from the classroom. You got to class late. Your professor allowed you to take the exam but would not give you additional time to complete it. You had expected that you would get at least a B (80%). However, you ended up getting 75 out of 100, which means you got a "C," because of the questions that you did not answer in time.

Usual and close condition. One day when you had to take an exam, you drove to campus like you normally do. It took you 10 minutes to find a parking spot. You had to park very far from the classroom. You got to class late. Your professor allowed you to take the exam but would not give you additional time to complete it. You had expected that you would get at least a B (80%). However, you ended up getting 79 out of 100, which means you got a "C," because of the questions that you did not answer in time.

Unusual and close condition. One day when you had to take an exam, you decided to drive to campus instead of taking the bus like you normally do. It took you 10 minutes to find a parking spot. You had to park very far from the classroom. You got to class late. Your professor allowed you to take the exam but would not give you additional time to complete it. You had expected that you would get at least a B (80%). However, you ended up getting 79 out of 100, which means you got a "C," because of the questions that you did not answer in time.

Usual and far condition. One day when you had to take an exam, you drove to campus like you normally do. It took you 10 minutes to find a parking spot. You had to park very far from the classroom. You got to class late. Your professor allowed you to take the exam but would not give you additional time to complete it. You had expected that you would get at least a B (80%). However, you ended up getting 75 out of 100, which means you got a "C," because of the questions that you did not answer in time.

Counterfactual statement. "If only I had not driven to get to campus, then I would have gotten a better grade."

Intention. "In the future, how likely are you to drive on an important day?" (reverse-coded)

Airport (Story 2)

Unusual and far condition. Last year you were taking a big trip for spring break. There are two airports near where you live. You normally book a flight departing from the major airport a bit farther away from your place than the small airport. For this trip, you booked a flight departing from this small airport because you expected there would be a lot of traffic on the way to get to the major airport. When you got to the small airport, the lines for security were long. Your gate was the farthest one. You ran to your gate, but when you got there the plane had left 60 minutes ago.

Usual and close condition. Last year you were taking a big trip for spring break. There are two airports near where you live. You normally book a flight departing from the small airport which is closer to your place than the major airport. For this trip, you booked a flight departing from this small airport as you normally do. When you got to the airport, the lines for security were long. Your gate was the farthest one. You ran to your gate, but when you got there the plane had left 5 minutes ago.

Unusual and close condition. Last year you were taking a big trip for spring break. There are two airports near where you live. You normally book a flight departing from the major airport a bit farther away from your place than the small airport. For this trip, you booked a flight departing from this small airport because you expected there would be a lot of traffic on the way to get to the major airport. When you got to the small airport, the lines for security were long. Your gate was the farthest one. You ran to your gate, but when you got there the plane had left 5 minutes ago.

Usual and far condition. Last year you were taking a big trip for spring break. There are two airports near where you live. You normally book a flight departing from the small airport which is closer to your place than the major airport. For this trip, you booked a flight departing from this small airport as you normally do. When you got to the airport, the lines for security were long. Your gate was the farthest one. You ran to your gate, but when you got there the plane had left 60 minutes ago.

Counterfactual statement. "If only I had not booked a flight departing from the small airport, then I would have caught the plane."

Intention. "In the future, how likely are you to book a flight departing from the small airport?" (reverse-coded)

Haircut (Story 3)

Unusual and far condition. You go to a really trendy salon where it's hard to get an appointment--the last one you made took 6 weeks to get. They do a really great job with your hair though, so it's worth it. On the day of your appointment, you decided to drive to the appointment instead of taking the bus like you normally do. On your way to the salon you got stuck in traffic due to construction and a malfunctioning traffic light. Additionally, it took you 15 minutes to find a parking spot due to all the construction. After finally parking and running to the salon, you got to the appointment 45 minutes late, and the stylist wouldn't see you.

Usual and close condition. You go to a really trendy salon where it's hard to get an appointment--the last one you made took 6 weeks to get. They do a really great job with your hair though, so it's worth it. On the day of your appointment, you drove to the appointment as you normally do. On your way to the salon you got stuck in traffic due to construction and a malfunctioning traffic light. Additionally, it took you 15 minutes to find a parking spot due to all the construction. After finally parking and running to the salon, you got to the appointment 10 minutes late, and the stylist wouldn't see you.

Unusual and close condition. You go to a really trendy salon where it's hard to get an appointment--the last one you made took 6 weeks to get. They do a really great job with your hair though, so it's worth it. On the day of your appointment, you decided to drive to the appointment instead of taking the bus like you normally do. On your way to the salon you got stuck in traffic due to construction and a malfunctioning traffic light. Additionally, it took you 15 minutes to find a parking spot due to all the construction. After finally parking and running to the salon, you got to the appointment 10 minutes late, and the stylist wouldn't see you.

Usual and far condition. You go to a really trendy salon where it's hard to get an appointment--the last one you made took 6 weeks to get. They do a really great job with your hair though, so it's worth it. On the day of your appointment, you drove to the appointment as you normally do. On your way to the salon you got stuck in traffic due to construction and a malfunctioning traffic light. Additionally, it took you 15 minutes to find a parking spot due to all the construction. After finally parking and running to the salon, you got to the appointment 45 minutes late, and the stylist wouldn't see you.

Counterfactual statement. "If only I had not driven to the appointment, then I would have gotten my haircut."

Intention. "In the future, how likely are you to drive to the salon?" (reverse-coded)