

The Counterfactual Fallacy:
The Effect of Counterfactual Thinking on
Judgements of Responsibility

by

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The Counterfactual Fallacy: The Effect of Counterfactual

Thinking on Judgements of Responsibility

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Abstract

This thesis was an investigation of the counterfactual fallacy, the tendency to confuse the perception that an event easily might not have been with the perception that an event ought not to have been. In a series of experiments subjects read a scenario in which actions leading to an accident were either highly mutable or less mutable, and either foreseeably or unforeseeably related to the accident. Subject's ratings of the actor's responsibility for the accident were compared with predictions based on Heider's (1958) model of responsibility, Wells and Gavanski's (1989) model of the effect of mutability on responsibility, and the counterfactual fallacy. The results generally supported the predictions derived from the counterfactual fallacy. In an additional series of experiments, subjects' perceptions of the mutability of the scenarios were assessed. The results from these experiments proved inconclusive.

Dedication

To my wife

Fay

And to my grandmother

Josephine West

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The frame of reference adopted often affects the outcome of a judgement. For example, a 400 gm. weight will be judged as being heavier in the context of weights of 100 to 300 gm., than it will in the context of weights of 400 to 600 gm. (DiLollo, 1964). Social judgements may also be similarly determined. Downward comparison theory, for instance, is based on the proposal that comparisons with others who are worse off will bolster ones self-esteem, whereas comparisons with others who are better off will threaten ones self-esteem (Crocker, Thompson, McGraw & Ingerman, 1987; Friend & Gilbert, 1973; Hakmiller, 1966; Smith & Insko, 1987; Wills 1981, 1987; Wood, Taylor, & Lichtman, 1985)

One interesting type of comparison is between events that actually occurred and mental representations of alternative versions of those events. Perhaps the clearest example of this is comparisons between what actually happened and what was expected to happen; that is, comparisons of reality to mental representations of how reality was expected to unfold. Consider a runner who places second in a marathon. If the runner had expected to come first he

or she might be disappointed, whereas if the runner had expected to do worse than second, he or she would probably be pleased.

Recently, a considerable amount of attention has been devoted to mental representations that are constructed after events occur. For example, after losing a tennis match because of a double fault, a player might think about what the outcome would have been if he or she had not double faulted. These post hoc representations of what might have been have been termed counterfactual thoughts (Kahneman & Tversky, 1982).

Counterfactual thoughts are constructed by mentally modifying certain aspects of an event and then mentally simulating the event with these changes (Kahneman & Tversky, 1982; Kahneman & Miller, 1986). Potentially an event could be mentally modified in countless different ways. However, certain types of modifications may occur more often than others. For example, if a person switched flights at the last minute and was subsequently killed in a mid air explosion, the thought, "if only that person had not switched

flights," would seem more likely to come to mind than thoughts such as, "if only the flight had been cancelled," or, "if only oxygen were not flammable."

Research into counterfactuals has confirmed that certain modifications are more likely than others, and that events which are susceptible to these modifications are more prone to evoke counterfactuals than events which are not (Johnson, 1986; Kahneman & Miller, 1986; Kahneman & Tversky, 1982; Miller & McFarland, 1986; Miller & Turnbull, 1991; Miller, Turnbull & McFarland, 1989, 1990; Turnbull, 1981; Wells, Taylor & Turtle, 1987; Wells and Gavanski, 1989). The extent to which an event evokes counterfactuals is referred to as the perceived mutability of the event (Kahneman & Miller, 1986). Mutability, therefore, refers to a psychological sense of how easily reality could have been different from what it was (Kahneman & Tversky 1982; Kahneman & Miller, 1986).

Research has also focused on the impact of mutability on reactions to events (Johnson, 1986; Kahneman & Miller, 1986; Kahneman & Tversky, 1982;

Miller & McFarland, 1986; Miller & Turnbull, 1991; Miller, Turnbull & McFarland, 1989, 1990; Turnbull, 1981; Wells & Gavanski, 1989). In general, this research seems to demonstrate that mutability increases the intensity of the reaction. However, whether these reactions are more positive or more negative seems to depend on the particulars of the situation. For example, following a more mutable event, observers have been found to recommend higher compensation for the family of a victim (Miller & McFarland 1986), but also to rate victims more negatively (Johnson 1986).

Recently, Miller and Turnbull (1991) have proposed that counterfactuals may be implicated in moral judgements concerning negative life events. These authors argue that people are affected by the counterfactual fallacy, the tendency to confuse what easily might not have been with what ought not to have been. One important implication of this claim is that there will be a tendency to judge actions that are highly mutable as morally wrong.

In support of the counterfactual fallacy, Miller and Turnbull describe a study by Sanitioso and Miller

(1989) in which subjects were asked to indicate how they thought the perpetrator of a negative event would feel. The event was either foreseeable and the result of routine actions, unforeseeable and the result of exceptional actions, or unforeseeable and the result of routine actions. The use of routine versus exceptional actions was based on Kahneman and Tversky's (1982) findings that exceptional actions are more mutable than routine or default actions. Thus, the effects of mutability could be assessed by comparing the unforeseeable, routine condition (low mutability) and the unforeseeable, exception condition (high mutability). Also, as foreseeability is a generally accepted determinant of responsibility (Heider, 1958; Shaw & Sulzer, 1964), the effects of the morality of the action (ie. whether or not it ought to have been) could be assessed by comparing the foreseeable, routine condition and the unforeseeable, routine condition. Essentially, the unforeseeable, routine condition was a control against which a more mutable condition and a more immoral condition could be compared.

Analysis revealed that when the event was

foreseeable the perpetrator was expected to feel worse than when the event was unforeseeable. In addition, the mutability of the event influenced subject's reactions. Specifically, when the event was exceptional the perpetrator was expected to feel worse than when the event was routine. These results are consistent with the view that actions that easily might not have been cause effects similar to actions that ought not to have been. However, since subject's moral judgements were not assessed, the study did not directly address the claim that mutability can affect moral judgements.

The relationship between mutability and moral judgements, specifically judgements of responsibility, was examined in a study by Wells and Gavanski (1989). They presented subjects with a scenario in which a cab driver refused to give a paraplegic couple a ride. The couple decided to drive themselves but on their way they drove over a bridge which had been washed out only 15 minutes before. Their car plunged into the water where they drowned. The cab driver, who took the same route as the couple, was described as either crossing the bridge before it collapsed, or crossing it 5

minutes after it had washed out and also having plunged into the water.

After reading one of the two versions described above, subjects rated the extent to which the cab driver was responsible for the couple's death. Results indicated higher ratings of responsibility when the cab driver crossed the bridge before it was washed out than when he crossed the bridge after it was washed out.

The manipulation of mutability in this experiment was based on the proposal (Wells & Gavanski, 1989) that an exceptional action will create a perception of mutability only if the routine or default action to which it is altered allows the outcome to be avoided. In their scenarios the refusal of the cab driver to take the paraplegic couple was an exceptional action. Replacing it with a default or routine action (ie. he accepted the fare) would allow the negative outcome to be avoided only when the cab driver crossed the bridge before it was washed out. Therefore, as predicted by the counterfactual fallacy, the more mutable condition led to more severe judgements of responsibility.

Wells and Gavanski (1989), however, argue that

mutability alone cannot influence ratings of responsibility. Rather, they propose that mutability affects judgements of causation, and that causation is necessary but not sufficient for assigning responsibility (Fiske & Taylor, 1984). They suggest that judgements of responsibility will be influenced by mutability only when other prerequisites of responsibility such as intention, foreseeability, or inappropriate actions (eg. the inappropriate refusal of the cab driver) are present. According to the counterfactual fallacy, though, mutability alone should be sufficient to influence the assignment of responsibility.

Experiment 1

In order to begin an empirical examination of the counterfactual fallacy it was decided, following Sanitioso and Miller (1989), to manipulate mutability through descriptions of routine or exceptional actions that led to negative outcomes. According to the commonly accepted view of responsibility (Heider, 1958; Shaw & Sulzer, 1964), when an accident is perceived to have been unforeseeable, the differences between

routine and exceptional actions should not affect judgements of responsibility as they do not affect any of the factors associated with such judgements (eg. foreseeability, intentionality). However, this is not the case when an accident is perceived to have been foreseeable. Consider the difference between two drivers who cause identical accidents: one who routinely drives very fast (a repeat offender); and one who normally drives at reasonable speeds, but drives fast only on the day of the accident (a first time offender). Because speeding is an action that is more likely to cause an accident than driving at a reasonable speed, the accident would have been more foreseeable in the case of the driver who always speeds. Based on this, the repeat offender could be considered more responsible than the first time offender.

If, however, there is a tendency for highly mutable actions to be mistaken for immoral actions, then exceptional actions should lead to stronger judgements of responsibility when an accident is perceived as having been unforeseeable. In the case of

highly mutable actions that are foreseeably dangerous and therefore already perceived as immoral, an intriguing possibility is that the counterfactual fallacy can cause immoral actions to seem even more immoral. If this effect were strong enough it would contradict the notion of finding a repeat offender more responsible than a first time offender. Specifically, a person who routinely engaged in a foreseeably dangerous action thereby causing an accident would be held less responsible than a person who made an exception to his or her normally cautious behaviour and caused the same accident.

On the basis of the above considerations it was decided to examine the counterfactual fallacy employing a between subjects, 2x2, factorial design in which foreseeably and unforeseeably dangerous actions were described as routine (low mutability) or exceptional (high mutability). The dependent measure consisted of items assessing ratings of responsibility, as well as other moral judgements.

This design allowed several predictions to be assessed. As indicated above, rational moral reasoning

would predict that there should be no difference between routine and exceptional actions under unforeseeable conditions, while under foreseeable conditions, routine actions should lead to stronger judgements of responsibility than exceptional actions. Wells and Gavanski (1989) would also predict no effect under unforeseeable conditions (as long as no other prerequisites for assigning responsibility were present). However, under foreseeable conditions they would predict that exceptional actions should lead to stronger judgements of responsibility than routine actions. The prediction derived from the counterfactual fallacy is that even under unforeseeable conditions, exceptional actions should lead to stronger judgements of responsibility than routine actions. As it stands, the counterfactual fallacy does not explicitly offer a prediction for the foreseeable condition. However, as discussed above, one possibility is that it would have the same effect as under unforeseeable conditions.

Method

Subjects.

Subjects were 88 male and female volunteers from

the Simon Fraser University campus and the University of British Columbia campus.

Procedure.

Subjects were run in groups ranging from 1 to 4. They were asked to read a short scenario which described a fisherman who drove through an area where two boys were scuba diving and seriously injured one of the boys (the boy lost the use of his right arm). The scenario described the boys as having put up a diver's flag to indicate that there were divers below (foreseeable condition), or not having put one up (unforeseeable condition). The scenario also described the fisherman as driving through the area routinely (routine condition), or driving through only once, as an exception to his normal routine (exception condition). After reading one of the four versions of the scenario, subjects completed a brief questionnaire assessing their attitude towards the fisherman on a series of 7 point scales (with 7 representing the greatest magnitude of the specific attribute). These scales assessed perceptions of how responsible the fisherman was for the accident, how guilty he was, the

extent to which he should be fined, and how much he ought to donate to a charity concerned with injuries similar to the divers. Also, in an open ended question, subjects were asked to recommend a jail term for the fisherman (see Appendix A for copies of the experimental materials).

Results and Discussion

Analysis of variance revealed a main effect for the routine/exception manipulation in which mean ratings for responsibility were higher under the exception condition. Also, there was a main effect for foreseeability on all items with mean ratings higher under the foreseeable condition (Table 1).

Insert Table 1 about here

The main effect for responsibility, in which the perpetrator was held more responsible when his actions were exceptional than when they were routine, is consistent only with the predictions based on the counterfactual fallacy. This effect under the unforeseeable condition supports the contention that

mutability alone is sufficient to influence the assignment of responsibility as none of the conventional prerequisites for assigning responsibility (eg. foreseeability, intention, inappropriate actions) were present. This is inconsistent with both the traditional view of responsibility as well as Wells and Gavanski's (1989) model of responsibility and mutability.

Additionally, because routinely engaging in a dangerous activity is more likely to cause an accident than engaging in a dangerous activity only once, under the foreseeable condition the accident was more foreseeable under the routine condition than under the exception condition. Despite this, the perpetrator was held more responsible when his actions were exceptional than when they were routine. Thus it would appear that the counterfactual fallacy can lead people to violate the conventional wisdom of assigning greater responsibility when an accident was more foreseeable.

The foreseeability manipulation used in this study, however, needs to be viewed with caution as it was potentially confounded with the perceived

culpability of the victim. Specifically, under the unforeseeable condition the victim could have been perceived as culpable because he failed to put out a diver's flag, whereas this was not the case under the foreseeable condition. This confound was eliminated in Experiment 2.¹

Experiment 2

This experiment was performed to replicate the findings of Experiment 1 using a different set of scenarios and a design that did not confound foreseeability and culpability. It also included some additional questionnaire items to see if they would be sensitive to the routine/exception manipulation.

Method

Subjects.

Subjects were 60 male and female volunteers from the Simon Fraser University campus and the University of British Columbia campus.

Procedure.

As in Experiment 1, foreseeable and unforeseeable outcomes were crossed with routine and exceptional actions. In the scenarios used for this experiment, a

snowmobile driver drove across an unstable ridge and caused an avalanche which injured a boy skiing below (the skier also lost the use of his right arm). There was either a sign warning of the avalanche danger (foreseeable condition), or no sign and no way to tell that the ridge was dangerous (unforeseeable condition). Also, the snowmobile driver either drove through the area routinely (routine condition), or drove through only once, as an exception to his normal routine (exception condition). In all four versions the snowmobile driver was not caught in the avalanche.

In addition to the dependent measures used in Experiment 1, subjects were also asked to rate how much the protagonist should be blamed (1=not at all, 11=a great deal), feelings towards the protagonist (1=very negative, 11=very positive), and ratings of the protagonist as a human being (1=totally rotten person, 11=wonderful person).

Results and Discussion

Except for ratings of how much the protagonist ought to donate, which showed no significant effects, this experiment successfully replicated the results of

Experiment 1. On the additional items there was a significant main effect for the routine/exception manipulation on rating the protagonist as a human being (Table 2).

Insert Table 2 about here

Using a different set of scenarios and without confounding foreseeability and culpability, Experiment 2 revealed a main effect for responsibility in which the perpetrator was held more responsible when his actions were exceptional than when they were routine. In addition, ratings of guilt and blame produced trends toward a routine/exception main effect indicating that the perpetrator was perceived as more guilty and more blameworthy under the exception condition than under the routine condition (guilt, $p = .096$; blame $p = .091$, Table 2). Thus these findings add firm support to the findings of Experiment 1.

Rating the protagonist as a human being, however, produced puzzling results. Notably, in conjunction with the responsibility effect for routine/exception, it

appears that subjects thought more highly of the protagonist when he was more responsible for the accident. Also, feelings towards the protagonist produced a trend towards a routine/exception main effect ($p = .082$) in the same direction as that found for rating the protagonist as a human being (Table 2).

Experiment 3

Experiment 3 was an attempt to replicate the effects found in Experiment 2 under conditions in which the protagonist injures himself rather than a bystander. This was accomplished using the scenarios from Experiment 2 with the outcome altered accordingly. In agreement with the proposition that there is a tendency to judge actions that are highly mutable as morally wrong, it was predicted that changing the outcome would have no effect, and that Experiment 3 would replicate Experiment 2.

Method

Subjects.

Subjects were 60 male and female volunteers from the Vancouver International Airport.

Procedure.

The scenarios used in this experiment were identical to the ones used in Experiment 2 except that rather than describing the avalanche as injuring an innocent bystander, the avalanche was described as injuring the protagonist (he also lost the use of his right arm). Some of the items from the questionnaire used in Experiment 2, however, did not seem appropriate under these circumstances. Specifically, people are not usually found guilty, fined, or sent to jail for hurting themselves. Also, the item assessing how much the protagonist ought to donate would have been ambiguous under these circumstances. Therefore, the items assessing guilt and fines were replaced with items assessing how foolish the protagonist was (1=not foolish at all, 7=extremely foolish) and how careless the protagonist was (1=not at all careless, 7=extremely careless). Also, the jail and donation items were dropped from the questionnaire.

Results and Discussion

Analysis revealed a main effect for the routine/exception manipulation on ratings of

responsibility, foolishness, and carelessness. These effects indicate that the protagonist was perceived to be more responsible, more foolish, and more careless under the routine condition than under the exception condition (Table 3). These findings are in the opposite direction to what was found in Experiments 1 and 2.

Insert Table 3 about here

Consistent with Experiments 1 and 2 there were main effects for foreseeability on responsibility, foolishness, carelessness, and blame; with mean ratings higher under the foreseeable condition (Table 3).

A significant interaction was found for feelings towards the protagonist. Simple main effects indicated that subjects rated the protagonist who repeatedly engaged in a foreseeably dangerous behaviour less positively than in the other versions (Table 3). Since this is what would normally be expected these findings were uninteresting except in so far as they were different from what was found in Experiment 2. Rating the protagonist as a human being produced a trend

towards an interaction ($p = .099$) in which the simple main effects followed the same pattern as feelings toward the protagonist (Table 3).

These results failed to replicate the results of Experiment 2. The routine/exception effect on responsibility was reversed, indicating that the identity of the victim (ie. an innocent bystander versus the perpetrator of the misfortune) plays an important role.

One possible explanation for the reversal effect is that in all three experiments subjects' reactions were influenced by the mutability of the outcome, rather than the mutability of the protagonist's actions. It is important to note that when an action is altered it may or may not alter the outcome of the event. In cases in which it does alter the outcome, both the action and the outcome can be considered mutable. For example, the routine/exception manipulations in Experiments 1, 2, and 3 could be expected to influence both the mutability of the protagonist's actions and the mutability of the outcome (ie. if he stuck to his routine the accident would not have occurred). If the

counterfactual fallacy is applied to the outcome rather than the protagonist's actions, then in Experiments 1 and 2 the exceptional condition would have led subjects to feel that the innocent bystander ought not to have been hurt, whereas in Experiment 3 the exception condition would have led subjects to feel that the protagonist ought not to have been hurt. This could have led to feelings of revenge when the innocent bystander was hurt, and feelings of sympathy when the protagonist was hurt. Feelings of sympathy could have dampened allegations of responsibility, whereas the desire for revenge or retribution could have heightened them.

It is also possible that the changes in the dependent measure, rather than the changes in the scenarios, caused the different results. Specifically, in Experiment 2 the responsibility item was preceded by questions about guilt and fines, whereas in Experiment 3 the responsibility item was preceded by questions about foolishness and carelessness. This creates a sense in which the dependent measure used in Experiment 3 seems less punishment oriented than the dependent

measure used in Experiment 4. Such a difference could conceivably affect subjects' responses.

Experiment 4

Experiment 4 was done to rule out the possibility that the reversal of the routine/exception responsibility effect in Experiment 3 was due to the change in the questionnaire items that preceded the responsibility item. In order to do this, Experiment 2 was repeated using the dependent measure from Experiment 3. It was predicted that the results would match those from Experiment 2.

Method

Subjects.

Subjects were 100 male and female volunteers from the Vancouver International Airport.

Procedure.

The procedure was exactly the same as in Experiment 2, except that the dependent measure used was the one from Experiment 3.

Results and Discussion

Analysis revealed a significant interaction for the responsibility item. The simple main effects showed

that the routine/exception manipulation created a significant effect only under the unforeseeable condition (Table 4). The direction of this effect was the same as in Experiments 2 (i.e. the perpetrator was held more responsible when his actions were exceptional than when they were routine). The simple main effects for foreseeability were both significant with mean ratings higher under the foreseeable condition. Similarly, there was a main effect for foreseeability with mean ratings higher under the foreseeable condition on all the other items except ratings of the protagonist as a human being (Table 4).

Insert Table 4 about here

These results failed to replicate the findings from Experiment 2 thus indicating that the context created by the choice of questions is an important factor. However, under the unforeseeable condition, there was a routine/exception responsibility effect in the same direction as in Experiment 2. Therefore, at least under the unforeseeable condition, the

differences in the questionnaires does not seem to have been the cause of the reversal of the responsibility effect in Experiment 3.

Experiment 5

The purpose of this experiment was to replicate the reversal effect found for responsibility in Experiment 3, and to demonstrate that different methods of manipulating mutability cause similar effects. The scenarios used were the same as in Experiment 3 except that mutability was manipulated by varying the distance between the protagonist and the place he needed to get to in order to be safe (ie. out of the path of the avalanche). This manipulation was based on the proposal that the closer one comes to escaping a negative event, the greater the mutability of that event (Kahneman and Miller, 1986; Miller and McFarland, 1986).

Method

Subjects.

Subjects were 80 male and female volunteers from the University of British Columbia campus.

Procedure.

The procedure was the same as in Experiment 3

except that the scenarios were altered. The story was modified so that the snowmobile driver traversed his route only once. When the avalanche started the driver tried to get out of the way. He was portrayed as coming within a few feet of safety (close condition), or not coming close at all (far condition). As before, foreseeability was manipulated by having a warning sign present or not present.

Results and Discussion

Analysis of variance revealed significant interactions for responsibility and blame, and a trend towards an interaction for carelessness ($p = .067$). Examining the simple main effects revealed similar patterns for these items. The distance to safety manipulation produced significant effects only under the unforeseeable condition (Table 5). The effect was such that the perpetrator was rated as more responsible, more careless, and blamed more when he came closer to safety. These results were in the same direction as the responsibility effects in Experiments 1, 2, and 4 (ie. greater mutability caused stronger perceptions of responsibility). The foreseeability

simple main effects for responsibility, carelessness, and blame were significant under both the far from safety condition and the close to safety condition, with mean ratings higher under the foreseeable condition.

Insert Table 5 about here

The foolishness item also produced a trend towards an interaction ($p = .064$), but the simple main effects exhibited a somewhat different pattern than with responsibility, carelessness and blame. The foreseeability simple main effects were significant under both the far from safety condition and the close to safety condition, with mean ratings higher under the foreseeable condition. However, neither of the distance to safety simple main effects were significant (under foreseeable, $p = .187$; under unforeseeable, $p = .187$, Table 5).

Feelings towards the protagonist and rating the protagonist as a human being also demonstrated significant interactions. However, the simple main

effects revealed different patterns (Table 5). The pattern of results from these two items did not suggest any clear interpretations.

This experiment failed to replicate the reversal of the responsibility effect found in Experiment 3. However, it did produce a responsibility effect in the same direction as found in Experiments 1, 2, and 4. In addition, similar effects were also achieved on carelessness and blame. This failure to replicate Experiment 3 using scenarios in which the protagonist injures himself indicates that the reversal of the responsibility effect in Experiment 3 cannot be accounted for simply in terms of the identity of the victim (as postulated in the Discussion section of Experiment 3).

Experiment 6

Experiments 6 through 9 were an attempt to demonstrate more directly that the methods used to manipulate mutability in Experiments 1 through 5 did, in fact, affect subject's perceptions of how easily the event could have been altered. To date, the evidence that the routine/exception manipulation affects

mutability consists of the finding that subjects are more likely to change an exceptional item than a routine item when reconstructing a scenario (Kahneman and Tversky, 1982; Wells, Taylor, and Turtle, 1987), and that the magnitude of subjects' responses to an event are greater when the protagonist's actions are exceptional rather than routine (Kahneman and Miller, 1986; Miller and McFarland, 1986). The evidence for the distance to safety manipulation is that, like the routine/exception manipulation, the magnitude of subjects' responses to an event are greater when the protagonist comes closer to safety (Miller and McFarland, 1986). Experiments 6 through 9 addressed the question of mutability by asking subjects about their perceptions of how easily the scenarios could be altered so as to avoid a negative outcome. This experiment tested the scenarios used in Experiment 5.

Method

Subjects.

Subjects were 64 male and female volunteers from the University of British Columbia campus.

Procedure.

The procedure was exactly the same as in Experiment 5 except that the dependent measure was replaced with one assessing perceptions of mutability. It consisted of an item asking subjects to complete the sentence, "This accident would not have happened if only....", and four 7 point scales assessing mutability. The scales measured ratings of: how easy it was to picture the accident not having happened (1=not at all easy to picture it, 7=extremely easy to picture it), how avoidable the accident was (1=not at all avoidable, 7=extremely avoidable), how inevitable the accident was (1=not at all inevitable, 7=extremely inevitable), and subjects' estimates of how quickly the answer to the sentence completion question came to mind (1=almost immediately, 7=had to think about it for a while). This last item was based on the proposal that perceptions of mutability are a function of the availability of counterfactuals. Specifically, greater availability has been theorized to create stronger perceptions of mutability (Kahneman and Miller, 1986). If mutability is based on availability then it is

reasonable to postulate that response times should be shorter under more mutable conditions.

Results and Discussion

The item assessing picturing the event not having happened produced a significant interaction. The simple main effects revealed a significant effect for the distance to safety manipulation under the foreseeable condition, indicating that subjects perceived that it was easier to picture the accident not having happened under the close to safety condition. Also, under the far from safety condition there was a foreseeability simple main effect with mean ratings higher under the unforeseeable condition (Table 6).

Insert Table 6 about here

In addition, there was a main effect for foreseeability on the avoidability item and on the inevitability item, as well as a trend ($p = .061$) towards a foreseeability main effect on the estimates of response times (Table 6).

The distance to safety simple main effect from

picturing the event not having happened indicates that this manipulation did affect perceptions of mutability. This finding, however, does not account for the distance to safety effects on responsibility, carelessness, and blame; found under the unforeseeable condition in Experiment 5.

The main effects for foreseeability on the items assessing avoidability, inevitability, and estimates of response times indicate that the foreseeable condition was more mutable than the unforeseeable condition. However, the picturing the event not having happened item presents a problem as under the far condition the foreseeability simple main effect indicates that it was more difficult to picture the event not having happened under the foreseeable condition than under the unforeseeable condition.

Another disturbing finding was that coding the sentence completions revealed that only 2 subjects mentioned anything to do with the distance manipulation. However, Kahneman and Tversky (1982) and Kahneman and Miller (1986) have both suggested that people create more than one mental simulation of an

event and that the perception of mutability is created by combining the mutability of each simulation. Therefore the most available counterfactual thought would not have to represent the factors that were manipulated.

Experiment 7

This experiment was performed to investigate the effect that the scenarios from Experiment 3 would have on the dependent measures used in Experiment 6.

Method

Subjects.

Subjects were 68 male and female volunteers from the Simon Fraser University campus and the University of British Columbia campus

Procedure.

The procedure was exactly the same as in Experiment 6 except that the scenarios from Experiment 3 were used instead.

Results and Discussion

The routine/exception manipulation produced a main effect for the inevitability item indicating that subjects perceived the exception condition to be less

inevitable than the routine condition. Also, there were main effects for foreseeability on the avoidability item and on subject's estimates of their response times. These effects indicated that subjects perceived the accident to be more avoidable under the foreseeable condition, and that subjects felt that counterfactuals came to mind faster under the foreseeable condition (Table 7).

Insert Table 7 about here

Unlike Experiment 6, this experiment did not produce an effect on the item assessing how easy it was to picture the event not having happened. However, there was a routine/exception effect on the inevitability item. This effect was in the expected direction (ie. subjects felt that the accident was more inevitable under the routine condition) and it was in accord with the main effects found for foolishness, carelessness, and responsibility in Experiment 3.

Coding the sentence completions did not reveal any systematic differences between the routine condition

and the exception condition, but it did reveal that the majority of subjects (90%) were focused on the protagonist's decision to take the dangerous route, which is where the routine/exception manipulation took place. This is very different from what was found in Experiment 6, in which only 2 subjects (3%) focused on the part of the scenario used to manipulate mutability.

Experiment 8

This experiment was done in an attempt to replicate the findings of Experiment 7 using the scenarios from Experiment 2, which also employed a routine/exception manipulation.

Method

Subjects.

Subjects were 64 male and female volunteers from the University of British Columbia campus.

Procedure.

The procedure was the same as in Experiment 7 except that the scenarios from Experiment 2 were used instead of the scenarios from Experiment 3.

Results and Discussion

Analysis revealed an interaction on the

inevitability item. Examining the simple main effects uncovered a significant routine/exception effect under the unforeseeable condition, indicating that subjects felt that the exception condition was less inevitable than the routine condition. There was also a trend in which under the routine condition, subjects rated the foreseeable condition as less inevitable than the unforeseeable condition ($p = .079$, Table 8). In addition there was a routine/exception main effect for subjects' estimates of their response times, indicating that subjects felt counterfactuals came to mind faster under the routine condition than under the exception condition.

Insert Table 8 about here

There was a main effect for foreseeability on avoidability and a trend towards a foreseeability main effect for picturing the event not having happened ($p = .070$). These effects indicated that the accident was perceived to be more avoidable and easier to imagine not having happened under the foreseeable condition

than under the unforeseeable condition. Also there was a main effect on subjects' estimates of their response times. This effect indicated that subjects felt that counterfactuals came to mind faster under the foreseeable condition than under the unforeseeable condition (Table 8).

As in Experiment 7, coding the sentence completions showed that there were no systematic differences between the routine and exception conditions, and that most subjects were focused on the decision to take the dangerous route (94%).

The results from the inevitability item were somewhat consistent with Experiment 7 in that under the unforeseeable condition there was a routine/exception effect in the expected direction. However, the main effect for subjects' estimates of their response times indicated that under the exception condition, subjects took longer to formulate a counterfactual. This would indicate that the counterfactuals created under the exception condition were less available than those created under the routine condition.

Experiment 9

Experiment 9 was done to see what effects the scenarios used in Experiment 1 would have on the dependent measure used in Experiments 6, 7, and 8. It was predicted that there would be a routine/exception effect on inevitability, under the unforeseeable condition. This would provide a somewhat consistent finding across all of the scenarios that used the routine/exception manipulation.

Method

Subjects.

Subjects were 110 male and female volunteers from the Simon Fraser University campus and the University of British Columbia campus.

Procedure.

The procedure was the same as in Experiments 6, 7, and 8, except that the scenarios from Experiment 1 were used.

Results and Discussion

This Experiment failed to produce any significant routine/exception effects. There was a foreseeability effect on the avoidability item, indicating that

subjects perceived the accident to be more avoidable under the foreseeable condition than under the unforeseeable condition. Also, there was a trend ($p = .065$) toward a foreseeability main effect on the inevitability item, indicating that subjects perceived the accident to be less inevitable under the foreseeable condition than under the unforeseeable condition (Table 9).

Insert Table 9 about here

Coding the sentence completions revealed one interesting result. Under the foreseeable condition only 2% of the subjects mentioned the victims behaviour, while under the unforeseeable condition 80% of the subjects based their counterfactual around the victim's behaviour (most notably his failure to post a warning sign). Under the foreseeable condition most subjects (91%) focused on the decision to perform the dangerous action (ie. the place where the routine/exception manipulation took place). This finding was interesting as it indicated that the

culpability confound in Experiment 1 did have an effect.

Discussion

The studies presented in this thesis were designed to examine the counterfactual fallacy, the tendency to confuse the perception of what easily might not have been with the perception of what ought not to have been; in other words, the tendency to judge highly mutable actions as morally wrong. The prediction derived from the counterfactual fallacy was that under unforeseeable conditions, actions that evoke strong perceptions of mutability would elicit greater perceptions of responsibility than actions that do not evoke strong perceptions of mutability. The results of Experiments 1, 2, 4, and 5 provide support for this prediction. The prediction was also supported by ratings of carelessness, blame and rating of the protagonist as a human being in Experiment 5. In all of these results, relative to the low mutability, unforeseeable condition, the protagonist was rated more negatively when the outcome of his actions was more foreseeable, and also when his actions were more

mutable. This pattern of results is consistent with the view that actions that easily might not have been cause effects similar to actions that ought not to have been.

In addition, the routine/exception manipulation in Experiments 1 and 2 caused a main effect for responsibility, and did not interact with foreseeability. This indicates that the counterfactual fallacy can also influence judgements when an accident was foreseeable to the protagonist. Because routinely engaging in a dangerous activity is more likely to cause an accident than engaging in a dangerous activity only once, the accidents under the foreseeable condition in Experiments 1 and 2 were more foreseeable under the routine condition than under the exception condition. Despite this, the protagonist was rated as more responsible under the exception condition.

An alternative explanation for these findings is that higher standards of responsibility were applied to the protagonist under the exception condition because his earlier, law abiding behaviour created the perception that he "knew better." However, this explanation is not parsimonious as it does not explain

why the routine/exception effect also occurred when the accident was unforeseeable.

Although it appears as though the counterfactual fallacy led subjects to violate the conventional wisdom of assigning greater responsibility when an accident is more foreseeable, this does not mean that people are insensitive to the rational relationship between foreseeability and responsibility. In fact, in a pilot study using a within subjects design and the two foreseeable scenarios from Experiment 2, 70% of subjects indicated that the repeat offender (the routine condition) should be held more responsible than the first time offender (the exception condition) ($n = 21$, $\chi^2 = 3.875$, $p < .05$). Thus an important point about the counterfactual fallacy is that it may be possible to avoid it by explicitly supplying appropriate comparisons.

Contrary to predictions, in Experiment 3 the protagonist was rated as more foolish, careless, and responsible when the negative outcome of his actions was more foreseeable, but less foolish, careless, and responsible when his actions were more mutable. A

possible explanation for this lies in the notion that when a person routinely engages in a dangerous act it is rational to expect that he or she will get hurt. Experiment 5 did not have a routine condition, and in Experiments 1, 2, and 4 the person engaging in a routine activity was not the person who was hurt. Only in Experiment 3 did a person engage in a routine activity and get injured as a consequence of it. Thus, from the subject's perspective, it is likely that only in the routine condition of Experiment 3 was the specific outcome expected, and therefore foreseeable. If a sense of foreseeability was created under the routine condition of Experiment 3, it could have led to an increase in perceptions of responsibility. Furthermore, if this effect were larger than the mutability effect under the exception condition, it could appear as though the mutability effect had reversed direction.

This alternative explanation was examined in a post hoc analysis of the responsibility item in Experiments 1 to 5. The data from these experiments was combined into a 2 x 2 x 5 factorial design, crossing

mutability, foreseeability, and the sets of scenarios used in each experiment. An omnibus F test revealed a 2 way, mutability by experiment interaction, ($p < .01$). Following this, the high mutability condition of Experiment 3 was contrasted with the high mutability conditions of Experiments 1, 2, 4, and 5. These contrasts indicated no significant differences. Similarly, the low mutability condition of Experiment 3 was contrasted with the low mutability conditions of Experiments 1, 2, 4, and 5. In each case, these contrasts revealed that the mean rating for responsibility was significantly higher in Experiment 3 (Table 10).

Insert Table 10 about here

This pattern of results, as illustrated in figure 1, indicates that the effect of high mutability on ratings of responsibility was not altered in Experiment 3. Instead, as hypothesised above, it seems that the reversal was due to an effect under the low mutability condition of experiment 3.

Insert Figure 1 about here

Another result that seems contrary to predictions is the effect for rating the protagonist as a human being in Experiment 2. On this item the protagonist was rated more positively under the high mutability condition than under the low mutability condition. However, the relation of this item to moral judgements is unclear. Recall that in Experiment 2 subjects rated the protagonist as more responsible under the high mutability condition than under the low mutability condition. In conjunction with the effect for rating the protagonist as a human being this results in the protagonist being rated more positively when he was perceived as more responsible for the accident. In addition to this, rating the protagonist as a human being was unaffected by the foreseeability manipulation in Experiment 2.

These findings are very interesting as they suggest that attributions about the protagonist's general character can be affected differently by

mutability than moral judgements about the protagonist's actions. However, what this difference might entail is unclear as the effects produced by rating the protagonist as a human being and feelings toward the protagonist do not form a coherent picture when viewed across experiments.

The purpose of Experiments 6 through 9 was to find additional evidence of the differences in mutability as a function of the experimental manipulations. Results consistent with this goal were found under the foreseeable condition in Experiment 6 (which used the scenarios from Experiment 5), in which the accident was perceived to be easier to picture not having happened under the high mutability condition. This finding was encouraging, but in Experiment 5 the same scenarios also caused effects under the unforeseeable condition. Thus one would expect a reliable measure of mutability to have reflected this.

Experiment 7 (which used the scenarios from Experiment 3) produced a main effect for the inevitability item such that the high mutability condition was considered less inevitable than the low

mutability condition. Also, a similar effect for inevitability was found in Experiment 8 (which used the scenarios from Experiments 2 and 4), but only under the unforeseeable condition. Again, these effects were somewhat supportive, but the mutability effect that occurred under the foreseeable condition of Experiment 2 was not reflected in the results of Experiment 8.

Another item from Experiment 8 that produced a mutability effect was subjects' estimates of their response times for creating a counterfactual version of the scenario which they had read. The main effect for this item, however, was in the opposite direction to what was predicted, that is subjects rated the time it took to create a counterfactual to be greater under the high mutability condition than the low mutability condition. This finding seems contrary to the view that highly mutable events are highly available (Kahneman and Tversky, 1982; Kahneman and Miller, 1986). Possibly using the actual response times, rather than subjective estimates, would be a better measure.

In general the results from Experiments 6 through 9 are inconclusive. It is important to note, however,

that these experiments were exploratory in nature, and that there is, in fact, no claim in the literature that people necessarily have direct access to their perceptions of mutability.

According to the counterfactual fallacy, higher mutability will strengthen the perception that an event ought not to have occurred. In general the findings of this study support this prediction. Increasing the level of mutability was shown to elevate ratings of responsibility under conditions in which the commonly accepted prerequisites for responsibility, such as foreseeability, intentionality, or inappropriate actions, did not exist. As well, it was shown to cause the perpetrator of a less foreseeable accident to be held more responsible than the perpetrator of a more foreseeable accident.

The implications of these findings are potentially quite serious. One area in which the counterfactual fallacy could clearly have an effect is in the justice system, most notably in jury trials. Another area is in coping with traumatic life events (Davis, Lehman, Thompson, Silver & Wortman, 1991). In relation to

coping, future research on the counterfactual fallacy should address the question of how the counterfactual fallacy influences victims' perceptions of their own responsibility.

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Appendix A

Experimental ScenariosExperiments 1 and 9Foreseeable/Routine.

Fred was a sport fisherman and every weekend during the salmon season he would go out and troll for salmon. This year, however, one part of the bay was being used regularly by two boys who were learning to scuba dive. The area was clearly marked with divers' flags to warn boats to stay away and Fred knew what these signs meant. On many occasions Fred saw other power boats drive through this area and there were no problems. Also, this area stood between the place where Fred launched his boat and his favourite fishing area. Every weekend Fred drove his boat through the diving area. This went on for weeks until around the middle of the season when a tragic incident occurred. As usual, Fred decided to ignore the signs and drive straight to his fishing spot. However, as he was driving through the diving area one of the boys surfaced into the churning blades of his propeller. The boy lost the use of his right arm.

Foreseeable/Exception.

Fred was a sport fisherman and every weekend during the salmon season he would go out and troll for salmon. This year, however, one part of the bay was being used regularly by two boys who were learning to scuba dive. The area was clearly marked with divers' flags to warn boats to stay away and Fred knew what these signs meant. On many occasions Fred saw other power boats drive through this area and there were no problems. Also, this area stood between the place where Fred launched his boat and his favourite fishing area. Every weekend Fred avoided driving through the diving area. This went on for weeks until around the middle of the season when a tragic incident occurred. Just this one time Fred decided it would be alright to ignore the signs and drive straight to his fishing spot. However, as he was driving through the diving area one of the boys surfaced into the churning blades of his propeller. The boy lost the use of his right arm.

Unforeseeable/Routine.

Fred was a sport fisherman and every weekend during the salmon season he would go out and troll for

salmon. This year, however, one part of the bay was being used regularly by two boys who were learning to scuba dive. The area was not marked with divers' flags or anything else that might indicate that there were divers below. Also, because the divers always got an earlier start than Fred he never got a chance to see them. Consequently it was impossible for Fred to know that they were down there. On many occasions Fred saw other power boats drive through this area and there were no problems. Also, this area stood between the place where Fred launched his boat and his favourite fishing area. Every weekend Fred would drive through the diving area having no way of knowing that the divers were underneath him. This went on for weeks until around the middle of the season when a tragic incident occurred. As usual, Fred decided to drive straight to his fishing spot. However, as he was driving through the diving area one of the boys surfaced into the churning blades of his propeller. The boy lost the use of his right arm.

Unforeseeable/Exception.

Fred was a sport fisherman and every weekend

during the salmon season he would go out and troll for salmon. This year, however, one part of the bay was being used regularly by two boys who were learning to scuba dive. The area was not marked with divers' flags or anything else that might indicate that there were divers below. Also, because the divers always got an earlier start than Fred he never got a chance to see them. Consequently it was impossible for Fred to know that they were down there. On many occasions Fred saw other power boats drive through this area and there were no problems. Also, this area stood between the place where Fred launched his boat and his favourite fishing area. However, Fred always preferred to drive along the shore so he just never happened to go through the diving area. This went on for weeks until around the middle of the season when a tragic incident occurred. Fred decided that just this one time he would drive straight to his fishing spot. However, as he was driving through the diving area one of the boys surfaced into the churning blades of his propeller. The boy lost the use of his right arm.

Experiments 2, 4, and 8

Foreseeable/Routine.

Fred was an ice fisher and every weekend during the winter he would go out ice fishing on his favourite lake. To get to the lake Fred used a snowmobile. The shortest route to the lake passed over a ridge that was above a popular skiing area. Although the snow on this ridge looked safe it was unstable and could cause an avalanche. It was clearly marked with signs that read, "KEEP OUT. ACTIVITY IN THIS AREA COULD CAUSE AN AVALANCHE ON THE SKI SLOPES BELOW." Fred had seen these signs. On many occasions Fred saw other snowmobile drivers cross the ridge and there were no problems. Every weekend Fred would drive across the ridge. This went on for weeks until a tragic incident occurred. As usual, Fred decided to drive across the ridge. His snowmobile triggered an avalanche and, although Fred escaped unharmed, a young boy on the ski slopes below was caught in it. The boy was dug out and taken to hospital. The boy lost the use of his right arm.

Foreseeable/Exception.

Fred was an ice fisher and every weekend during

the winter he would go out ice fishing on his favourite lake. To get to the lake Fred used a snowmobile. The shortest route to the lake passed over a ridge that was above a popular skiing area. Although the snow on this ridge looked safe it was unstable and could cause an avalanche. It was clearly marked with signs that read, "KEEP OUT. ACTIVITY IN THIS AREA COULD CAUSE AN AVALANCHE ON THE SKI SLOPES BELOW." Fred had seen these signs. On many occasions Fred saw other snowmobile drivers cross the ridge and there were no problems. Every weekend Fred would avoid driving across the ridge and take a longer route. This went on for weeks until a tragic incident occurred. Fred decided that, just this one time, he would drive across the ridge. His snowmobile triggered an avalanche and, although Fred escaped unharmed, a young boy on the ski slopes below was caught in it. The boy was dug out and taken to hospital. The boy lost the use of his right arm.

Unforeseeable/Routine.

Fred was an ice fisher and every weekend during the winter he would go out ice fishing on his favourite lake. To get to the lake Fred used a snowmobile. The

shortest route to the lake passed over a ridge that was above a popular skiing area. Although the snow on this ridge looked safe it was unstable and could cause an avalanche. However, as this instability was hidden no one knew it was there and no warning signs were posted. On many occasions Fred saw other snowmobile drivers cross the ridge and there were no problems. Every weekend Fred would drive across the ridge. This went on for weeks until a tragic incident occurred. As usual, Fred decided to drive across the ridge. His snowmobile triggered an avalanche and, although Fred escaped unharmed, a young boy on the ski slopes below was caught in it. The boy was dug out and taken to hospital. The boy lost the use of his right arm.

Unforeseeable/Exception.

Fred was an ice fisher and every weekend during the winter he would go out ice fishing on his favourite lake. To get to the lake Fred used a snowmobile. The shortest route to the lake passed over a ridge that was above a popular skiing area. Although the snow on this ridge looked safe it was unstable and could cause an avalanche. However, as this instability was hidden no

one knew it was there and no warning signs were posted. On many occasions Fred saw other snowmobile drivers cross the ridge and there were no problems. Fred preferred a different route so consequently he did not drive over the ridge. This went on for weeks until a tragic incident occurred. Fred decided that, just this one time, he would drive across the ridge. His snowmobile triggered an avalanche and, although Fred escaped unharmed, a young boy on the ski slopes below was caught in it. The boy was dug out and taken to hospital. The boy lost the use of his right arm.

Experiments 3 and 7

Foreseeable/Routine.

Fred was an ice fisher and every weekend during the winter he would go out ice fishing on his favourite lake. To get to the lake Fred used a snowmobile. The shortest route to the lake passed over a ridge that was above a popular skiing area. Although the snow on this ridge looked safe it was unstable and could cause an avalanche. It was clearly marked with signs that read, "KEEP OUT. ACTIVITY IN THIS AREA COULD CAUSE AN AVALANCHE ON THE SKI SLOPES BELOW." Fred had seen these

signs. On many occasions Fred saw other snowmobile drivers cross the ridge and there were no problems. Every weekend Fred would drive across the ridge. This went on for weeks until a tragic incident occurred. As usual, Fred decided to drive across the ridge. His snowmobile triggered an avalanche and Fred was caught in it. Fred was dug out and taken to hospital. He lost the use of his right arm.

Foreseeable/Exception.

Fred was an ice fisher and every weekend during the winter he would go out ice fishing on his favourite lake. To get to the lake Fred used a snowmobile. The shortest route to the lake passed over a ridge that was above a popular skiing area. Although the snow on this ridge looked safe it was unstable and could cause an avalanche. It was clearly marked with signs that read, "KEEP OUT. ACTIVITY IN THIS AREA COULD CAUSE AN AVALANCHE ON THE SKI SLOPES BELOW." Fred had seen these signs. On many occasions Fred saw other snowmobile drivers cross the ridge and there were no problems. Every weekend Fred would avoid driving across the ridge and take a longer route. This went on for weeks until a

tragic incident occurred. Fred decided that, just this one time, he would drive across the ridge. His snowmobile triggered an avalanche and Fred was caught in it. Fred was dug out and taken to hospital. He lost the use of his right arm.

Unforeseeable/Routine.

Fred was an ice fisher and every weekend during the winter he would go out ice fishing on his favourite lake. To get to the lake Fred used a snowmobile. The shortest route to the lake passed over a ridge that was above a popular skiing area. Although the snow on this ridge looked safe it was unstable and could cause an avalanche. However, as this instability was hidden no one knew it was there and no warning signs were posted. On many occasions Fred saw other snowmobile drivers cross the ridge and there were no problems. Every weekend Fred would drive across the ridge. This went on for weeks until a tragic incident occurred. As usual, Fred decided to drive across the ridge. His snowmobile triggered an avalanche and Fred was caught in it. Fred was dug out and taken to hospital. He lost the use of his right arm.

Unforeseeable/Exception.

Fred was an ice fisher and every weekend during the winter he would go out ice fishing on his favourite lake. To get to the lake Fred used a snowmobile. The shortest route to the lake passed over a ridge that was above a popular skiing area. Although the snow on this ridge looked safe it was unstable and could cause an avalanche. However, as this instability was hidden no one knew it was there and no warning signs were posted. On many occasions Fred saw other snowmobile drivers cross the ridge and there were no problems. Fred preferred a different route so consequently he did not drive over the ridge. This went on for weeks until a tragic incident occurred. Fred decided that, just this one time, he would drive across the ridge. His snowmobile triggered an avalanche and Fred was caught in it. Fred was dug out and taken to hospital. He lost the use of his right arm.

Experiments 5 and 6

Foreseeable/Not close to safety.

Fred was an ice fisher and one weekend during the winter he decided to go out ice fishing on his

favourite lake. To get to the lake Fred used a snowmobile. The shortest route to the lake passed over a ridge that was above a popular skiing area. Although the snow on this ridge looked safe it was unstable and could cause an avalanche. It was clearly marked with signs that read, "KEEP OUT. ACTIVITY IN THIS AREA COULD CAUSE AN AVALANCHE ON THE SKI SLOPES BELOW." Fred had seen these signs. Fred saw other snowmobile drivers cross the ridge and there were no problems. Fred set out across the ridge. He had made it half way across when the noise and vibrations from his snowmobile triggered an avalanche. Fred made a dash to get out of the way but it was hopeless as he was very far from safety. Fred was caught in the middle of the avalanche and swept down with it. Fred was dug out and taken to hospital. He lost the use of his right arm.

Foreseeable/Close to safety.

Fred was an ice fisher and one weekend during the winter he decided to go out ice fishing on his favourite lake. To get to the lake Fred used a snowmobile. The shortest route to the lake passed over a ridge that was above a popular skiing area. Although

the snow on this ridge looked safe it was unstable and could cause an avalanche. It was clearly marked with signs that read, "KEEP OUT. ACTIVITY IN THIS AREA COULD CAUSE AN AVALANCHE ON THE SKI SLOPES BELOW." Fred had seen these signs. Fred saw other snowmobile drivers cross the ridge and there were no problems. Fred set out across the ridge. He had almost made it to the other side when the noise and vibrations from his snowmobile triggered an avalanche. Fred made a dash to get out of the way and was within a few feet of being safe when his snowmobile stalled. Fred jumped off the snowmobile and tried to run but the snow was deep and made running difficult. Fred had almost made it out of the way when he was caught by the avalanche and swept down with it. Fred was dug out and taken to hospital. He lost the use of his right arm.

Unforeseeable/not close to safety.

Fred was an ice fisher and one weekend during the winter he decided to go out ice fishing on his favourite lake. To get to the lake Fred used a snowmobile. The shortest route to the lake passed over a ridge that was above a popular skiing area. Although

the snow on this ridge looked safe it was unstable and could cause an avalanche. However, as this instability was hidden no one knew it was there and no warning signs were posted. Fred saw other snowmobile drivers cross the ridge and there were no problems. Fred set out across the ridge. He had made it half way across when the noise and vibrations from his snowmobile triggered an avalanche. Fred made a dash to get out of the way but it was hopeless as he was very far from safety. Fred was caught in the middle of the avalanche and swept down with it. Fred was dug out and taken to hospital. He lost the use of his right arm.

Unforeseeable/Close to safety.

Fred was an ice fisher and one weekend during the winter he decided to go out ice fishing on his favourite lake. To get to the lake Fred used a snowmobile. The shortest route to the lake passed over a ridge that was above a popular skiing area. Although the snow on this ridge looked safe it was unstable and could cause an avalanche. However, as this instability was hidden no one knew it was there and no warning signs were posted. Fred saw other snowmobile drivers

cross the ridge and there were no problems. Fred set out across the ridge. He had almost made it to the other side when the noise and vibrations from his snowmobile triggered an avalanche. Fred made a dash to get out of the way and was within a few feet of being safe when his snowmobile stalled. Fred jumped off the snowmobile and tried to run but the snow was deep and made running difficult. Fred had almost made it out of the way when he was caught by the avalanche and swept down with it. Fred was dug out and taken to hospital. He lost the use of his right arm.

Appendix B

The Dependent Variables

Experiments 1 and 2

(note, Experiment 1 contained only the first five questions)

How guilty do you think Fred is for the accident?

1	2	3	4	5	6	7
not guilty					extremely	
at all					guilty	

Fred should be fined for his actions.

1	2	3	4	5	6	7
disagree					agree	
completely					completely	

How responsible do you think Fred is for the accident?

1	2	3	4	5	6	7
not responsible					completely	
at all					responsible	

If Fred were to receive a jail sentence how long do you think it should be? (note- it is acceptable to put 0 if you do not think he should go to jail, the maximum sentence allowed is 20 years)

Experiments 3, 4, and 5

How foolish were Fred's actions?

1	2	3	4	5	6	7
not foolish					extremely	
at all					foolish	

How careless was Fred?

1	2	3	4	5	6	7
not careless					extremely	
at all					careless	

How responsible do you think Fred is for the accident?

1	2	3	4	5	6	7
not responsible					completely	
at all					responsible	

How much is Fred to blame for what happened?

1	2	3	4	5	6	7	8	9	10	11
not at									a great	
all									deal	

How do you personally feel about Fred?

1	2	3	4	5	6	7	8	9	10	11
very									very	
negative									positive	

How would you rate Fred as a human being?

1	2	3	4	5	6	7	8	9	10	11
totally					wonderful					
rotten person					person					

Experiments 6, 7, 8, and 9

How easy is it to picture this accident not having happened?

1	2	3	4	5	6	7
not at all			extremely			
easy to			easy to			
picture it			picture it			

How avoidable was the accident?

1	2	3	4	5	6	7
not at all			extremely			
avoidable			avoidable			

Please complete the following sentence:

This accident would not have happened if only...

How quickly did your answer to the last question come to mind?

1	2	3	4	5	6	7
almost						had to
immediately						think about
						it for a while

Given the circumstances, how inevitable was the accident?

1	2	3	4	5	6	7
not at all						extremely
inevitable						inevitable

Table 1. Individual cell means and marginal means from Experiment 1

	Foreseeable	Unforeseeable	Routine/ Exception <u>Main Effects</u>
Routine	responsible 6.14	responsible 2.27	4.02 #
	guilt 6.27	guilt 2.82	4.55
	fine 6.45	fine 1.91	4.18
	jail 2.55	jail 0.18	1.36
	donate 5.57	donate 3.82	4.67
Exception	responsible 6.73	responsible 3.27	5.00
	guilt 6.50	guilt 2.91	4.70
	fine 6.41	fine 2.18	4.30
	jail 3.10	jail 0.14	1.55
	donate 5.91	donate 3.73	4.82
<u>Foreseeable Main Effects</u>	responsible 6.43	2.77 !	
	guilt 6.39	2.86 !	
	fine 6.43	2.05 !	
	jail 2.81	0.16 !	
	donate 5.74	3.77 !	

Legend

- i = mutability/foreseeability interaction
- m = mutability simple main effect
- f = foreseeability simple main effect
- # = significant at the .05 level
- * = significant at the .01 level
- ! = significant at the .001 level
- ? = a trend, significant at the .10 level

Table 2. Individual cell means and marginal means from Experiment 2

	Foreseeable	Unforeseeable	Routine/ Exception <u>Main Effects</u>
Routine	responsible 5.40	responsible 3.40	4.40 *
	guilt 5.80	guilt 3.47	4.63 ?
	fine 5.33	fine 2.27	3.80
	jail 1.80	jail 0.07	0.93
	donate 4.87	donate 4.36	4.62
	blame 8.00	blame 4.33	6.17 ?
	feel 4.47	feel 5.53	5.00 ?
	rate 5.60	rate 5.93	5.77 *
Exception	responsible 6.13	responsible 5.13	5.63
	guilt 6.13	guilt 4.33	5.23
	fine 5.87	fine 2.40	4.13
	jail 2.29	jail 0.13	1.17
	donate 5.07	donate 4.47	4.77
	blame 8.53	blame 6.00	7.27
	feel 5.79	feel 6.07	5.93
	rate 6.57	rate 7.27	6.93
<u>Foreseeable Main Effect</u>	responsible 5.77	4.27 !	
	guilt 5.97	3.90 !	
	fine 5.60	2.33 !	
	jail 2.03	0.10 *	
	donate 4.97	4.41	
	blame 8.27	5.17 !	
	feel 5.10	5.80	
	rate 6.07	6.60	

Legend

- i = mutability/foreseeability interaction
- m = mutability simple main effect
- f = foreseeability simple main effect
- # = significant at the .05 level
- * = significant at the .01 level
- ! = significant at the .001 level
- ? = a trend, significant at the .10 level

Table 3. Individual cell means and marginal means from
Experiment 3

	Foreseeable	Unforeseeable	Routine/ Exception <u>Main Effects</u>
Routine	responsible 6.60	responsible 5.33	5.97 #
	foolish 6.27	foolish 4.47	5.37 #
	care 6.13	care 4.80	5.47 *
	blame 9.40	blame 6.40	7.90
	feel 3.67 m*f#	feel 5.80 f#	4.73 i#
	rate 5.33 m#f?	rate 6.47 f?	5.90 i?
Exception	responsible 5.60	responsible 4.90	5.03
	foolish 4.60	foolish 3.80	4.20
	care 4.47	care 3.73	4.10
	blame 8.20	blame 6.80	7.50
	feel 6.40 m*	feel 5.47	5.93
	rate 6.80 m#	rate 6.40	6.60
<u>Foreseeable Main Effects</u>	responsible 6.10	4.90 #	
	foolish 5.43	4.13 *	
	care 5.30	4.27 #	
	blame 8.80	6.60 *	
	feel 5.03	5.63 i#	
	rate 6.07	6.43 i?	

Legend

- i = mutability/foreseeability interaction
- m = mutability simple main effect
- f = foreseeability simple main effect
- # = significant at the .05 level
- * = significant at the .01 level
- ! = significant at the .001 level
- ? = a trend, significant at the .10 level

Table 4. Individual cell means and marginal means from
Experiment 4

	Foreseeable	Unforeseeable	Routine/ Exception Main Effects
Routine	responsible 6.00 f!	responsible 3.20 m*f!	4.60 i#
	foolish 5.84	foolish 3.52	4.68
	care 5.60	care 3.28	4.44
	blame 8.88	blame 5.12	7.00
	feel 4.12	feel 6.12	5.12
	rate 5.72	rate 6.16	5.94
Exception	responsible 5.80 f!	responsible 4.44 m*f*	5.12
	foolish 5.24	foolish 3.80	4.52
	care 5.16	care 3.80	4.48
	blame 8.56	blame 6.16	7.36
	feel 5.36	feel 6.04	5.70
	rate 5.95	rate 6.12	6.02
<u>Foreseeable Main Effect</u>	responsible 5.90	responsible 3.82 i#	
	foolish 5.54	foolish 3.66 !	
	care 5.38	care 3.54 !	
	blame 8.72	blame 5.64 !	
	feel 4.74	feel 6.08 *	
	rate 5.82	rate 6.14	

Legend

- i = mutability/foreseeability interaction
- m = mutability simple main effect
- f = foreseeability simple main effect
- # = significant at the .05 level
- * = significant at the .01 level
- ! = significant at the .001 level
- ? = a trend, significant at the .10 level

Table 5. Individual cell means and marginal means from
Experiment 5

	Foreseeable	Unforeseeable	Far/ Close Main Effects
Far	responsible 5.95 f!	responsible 2.95 m*f!	4.45 i#
	foolish 5.60 f!	foolish 2.85 f!	4.22 i?
	care 5.50 f!	care 2.85 m#f!	4.17 i?
	blame 8.80 f!	blame 3.95 m#f!	6.38 i#
	feel 5.15 m#f!	feel 7.35 f!	6.25 i#
	rate 6.30 f*	rate 7.60 m*f*	6.95 i#
Close	responsible 5.70 f#	responsible 4.45 m*f#	5.07
	foolish 5.00 f*	foolish 3.45 f*	4.22
	care 5.30 f!	care 3.75 m#f!	4.52
	blame 8.05 f*	blame 5.95 m#f*	7.00
	feel 6.45 m#	feel 6.35	6.40
	rate 6.50	rate 6.40 m*	6.45
<u>Foreseeable Main Effects</u>	responsible 5.82	3.70 i#	
	foolish 5.30	3.15 i?	
	care 5.40	3.30 i?	
	blame 8.42	4.95 i#	
	feel 5.80	6.85 i#	
	rate 6.40	7.00 i#	

Legend

i = mutability/foreseeability interaction
m = mutability simple main effect
f = foreseeability simple main effect
= significant at the .05 level
* = significant at the .01 level
! = significant at the .001 level
? = a trend, significant at the .10 level

Table 6. Individual cell means and marginal means from
Experiment 6

		Foreseeable	Unforeseeable	Far/ Close <u>Main Effects</u>
Far	picture	3.60 m*f#	picture 4.90 f#	4.25 i#
	avoid	5.55	avoid 4.05	4.80
	inevitable	4.47	inevitable 4.60	4.54
	response	1.70	response 2.70	2.20
	time estimate		time estimate	
Close	picture	5.00 m*	picture 4.60	4.80
	avoid	5.70	avoid 3.80	4.75
	inevitable	3.90	inevitable 5.15	4.52
	response	2.25	response 2.55	2.40
	time estimate		time estimate	
<u>Foreseeable Main Effects</u>	picture	4.30	4.75 i#	
	avoid	5.63	3.92 !	
	inevitable	4.18	4.88 #	
	response	1.97	2.63 ?	
	time estimate			

Legend

- i = mutability/foreseeability interaction
- m = mutability simple main effect
- f = foreseeability simple main effect
- # = significant at the .05 level
- * = significant at the .01 level
- ! = significant at the .001 level
- ? = a trend, significant at the .10 level

Table 7. Individual cell means and marginal means from
Experiment 7

	Foreseeable	Unforeseeable	Routine/ Exception <u>Main Effects</u>
Routine	picture 4.06	picture 3.94	4.00
	avoid 5.76	avoid 4.71	5.24
	inevitable 4.24	inevitable 5.24	4.74 #
	response 1.82	response 2.41	2.12
	time	time	
	estimate	estimate	
Exception	picture 5.06	picture 4.06	4.56
	avoid 6.29	avoid 4.35	5.32
	inevitable 3.71	inevitable 3.88	3.79
	response 1.76	response 2.71	2.24
	time	time	
	estimate	estimate	
<u>Foreseeable Main Effects</u>	picture 4.56	4.00	
	avoid 6.03	4.53 *	
	inevitable 3.97	4.56	
	response 1.79	2.56 *	
	time		
	estimate		

Legend

- i = mutability/foreseeability interaction
- m = mutability simple main effect
- f = foreseeability simple main effect
- # = significant at the .05 level
- * = significant at the .01 level
- ! = significant at the .001 level
- ? = a trend, significant at the .10 level

Table 8. Individual cell means and marginal means from
Experiment 8

	Foreseeable	Unforeseeable	Routine/ Exception Main Effects
Routine	picture 5.31	picture 4.94	5.13
	avoid 6.69	avoid 4.63	5.66
	inevitable 4.38 f?	inevitable 5.50 m*f?	4.94 i#
	response 1.50	response 2.31	1.91
	time estimate	time estimate	
Exception	picture 5.06	picture 3.94	4.50
	avoid 6.13	avoid 4.75	5.44
	inevitable 4.56	inevitable 3.81 m*	4.19
	response 2.06	response 3.50	2.78
	time estimate	time estimate	
<u>Foreseeable</u> <u>Main</u> <u>Effects</u>	picture 5.19	4.44 ?	
	avoid 6.41	4.69 !	
	inevitable 4.47	4.66 i#	
	response 1.78	2.91 *	
	time estimate		

Legend

- i = mutability/foreseeability interaction
- m = mutability simple main effect
- f = foreseeability simple main effect
- # = significant at the .05 level
- * = significant at the .01 level
- ! = significant at the .001 level
- ? = a trend, significant at the .10 level

Table 9. Individual cell means and marginal means from Experiment 9

	Foreseeable	Unforeseeable	Routine/ Exception Main Effects
Routine	picture 4.30	picture 4.04	4.17
	avoid 6.07	avoid 4.67	5.37
	inevitable 4.48	inevitable 4.85	4.67
	response 2.15	response 2.22	2.19
	time estimate	time estimate	
Exception	picture 4.68	picture 3.96	4.32
	avoid 6.04	avoid 4.75	5.40
	inevitable 3.68	inevitable 4.70	4.19
	response 1.89	response 1.89	1.89
	time estimate	time estimate	
<u>Foreseeable Main Effects</u>	picture 4.49	4.00	
	avoid 6.06	4.71 !	
	inevitable 4.08	4.76 ?	
	response 2.02	2.06	
	time estimate		

Legend

- i = mutability/foreseeability interaction
- m = mutability simple main effect
- f = foreseeability simple main effect
- # = significant at the .05 level
- * = significant at the .01 level
- ! = significant at the .001 level
- ? = a trend, significant at the .10 level

Table 10. Contrasts between Experiments

Contrast	High mutability	Low mutability
Experiment 3 Experiment 1	5.03 5.00	5.97 4.02 !
Experiment 3 Experiment 2	5.03 5.63	5.97 4.40 !
Experiment 3 Experiment 4	5.03 5.12	5.97 4.60 *
Experiment 3 Experiment 5	5.03 5.07	5.97 4.45 !

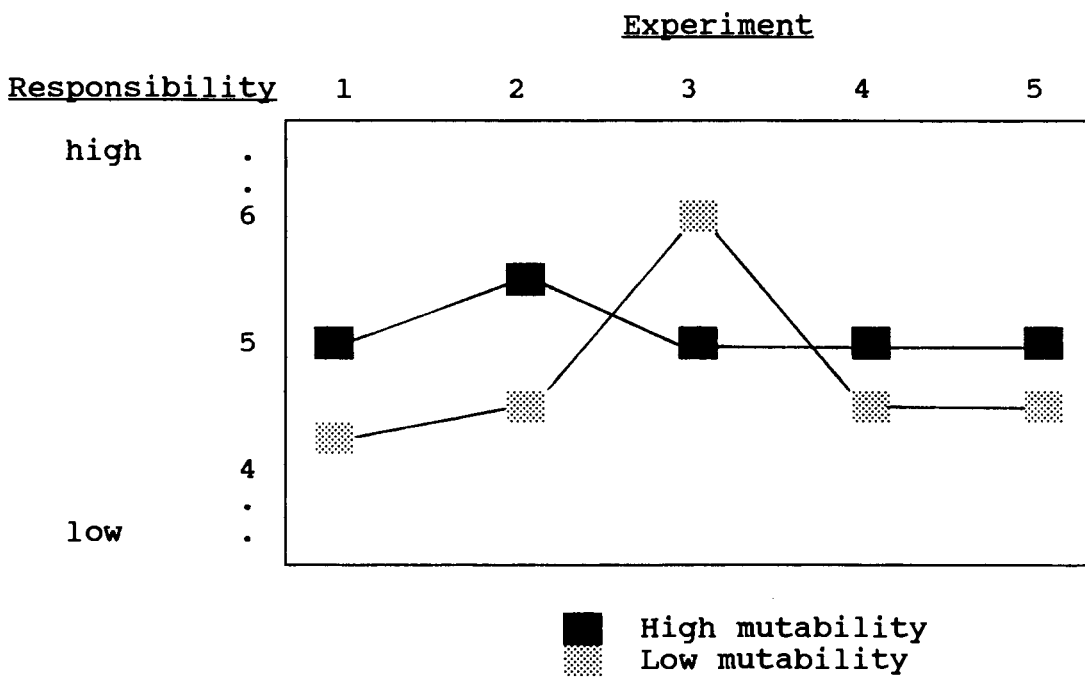
= significant at the .05 level

* = significant at the .01 level

! = significant at the .001 level

? = a trend, significant at the .10 level

Figure 1. Mean ratings of responsibility across experiments



Footnotes

1. A possible confound of the mutability manipulation is that subjects may have perceived the actions which caused an accident after being repeated several times (routine condition) to be less dangerous than the actions which caused an accident after the first time (exception condition). This potential confound is dealt with in Experiment 5 which replicated the mutability effect using a different method of manipulating mutability.