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*An Empirical Overview*

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# Second Thoughts About Decision Reversibility: An Empirical Overview

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## Abstract

People generally expect that having the opportunity to reverse a decision contributes to the quality of decision-making. However, previous research has unequivocally shown that reversible decisions actually yield lower levels of post-choice satisfaction and higher levels of regret than irreversible decisions. Only recently, research has begun to investigate the underlying processes explaining these counterintuitive and detrimental consequences of decision reversibility. In the present paper, we will review and integrate this research and distinguish a number of important cognitive and motivational consequences of decision (ir)reversibility. With this paper, we aim to inspire future research into the discrepancy between people's wish for reversibility on the one hand and their need for irreversibility on the other.

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A pervasive notion in modern Western society is that choice is freedom and freedom is good. Having choice options is essential to autonomy and control and is considered to be a core value (Dowding, 1992; Rotter, 1966; Taylor, 1989; Taylor & Brown, 1988). People's need for freedom of choice is not only reflected in the fact that many Western nations and states have a free market economy and are governed or ruled by a democracy but also in the ever increasing number of options consumers can choose from. Horovitz (2004) provided compelling illustrations of this proliferation of choice alternatives. For instance, Tropicana now sells more than 24 different types of juice instead of only two (which was the case two decades ago), and Starbucks now provides more than 19.000 ways to serve a cup of coffee. The number of options people can choose from has also grown excessively since the arrival of the Internet and the digital world. From our homes, we can compare all different possibilities online and order products from all over the world.

Similar to choosing from a large variety of choice alternatives, the opportunity to potentially reverse initial decisions can also offer a sense of freedom of choice. Reversible decision-making not only allows people more time to make a final decision and potentially switch back and forth between preferences, it also provides a safety net in case the initial decision turns out to be wrong. As such, people tend to prefer reversible to irreversible decision-making (Gilbert & Ebert, 2002). This is, for instance, illustrated by the fact that new employees are often provided temporary (rather than permanent) contracts and that people often buy products at full price that can be returned to the store rather than products that are on sale but cannot be returned. Although individuals generally expect the best outcome to arise from reversible decision-making, it appears to be associated with some counterintuitive consequences. Research, for instance, shows that people are less satisfied with decisions that once were reversible as compared to decisions that were irreversible to begin with (e.g., Gilbert & Ebert, 2002). This is especially interesting in light of the fact that people hardly ever choose to revise their initial choice (e.g., Bullens, van Harreveld, Förster, & van der Pligt, 2013; Gilbert & Ebert, 2002).

So far, researchers suggested that the endowment effect (the phenomenon whereby individuals value an object more because they possess it (cf. Kahneman, Knetsch, & Thaler, 1990; Thaler, 1980) might underlie this tendency of individuals to stick to the preliminary chosen object.

Despite its obvious practical as well as theoretical relevance, the topic of decision reversibility has been under-researched. Only recently, the basic and less deliberate cognitive processes associated with reversible decision-making have been investigated. In the present paper, we will review and integrate that research. Furthermore, we will reflect on the concept of decision reversibility in more general terms. Avenues for future research into the consequences of decision reversibility are also discussed.

## What We Know About Decision Reversibility

Research unequivocally demonstrated that while people have a preference for reversible decisions, these in fact yield lower levels of post-choice satisfaction and higher levels of regret than irreversible decisions (Bullens, van Harreveld, & Förster, 2011; Bullens et al., 2013; Frey, Kumpf, Irle, & Gniech, 1984; Gilbert & Ebert, 2002). In one of their studies, Gilbert and Ebert (2002), for instance, asked students who participated in a photography course to shoot 12 photographs and then to choose two of these to develop. After developing the two photographs, all students were asked which of the two they wanted to take home. For half of the participants, this decision was irreversible. They would not be able to revise their choice anymore. For the other half, the decision was reversible. They were allowed to exchange their chosen photograph for the rejected one within the next five days. Gilbert and Ebert found that students for whom the decision was irreversible liked the chosen photograph more than students for whom the decision was reversible. Importantly, these differences in liking were still present 11 days after the decision, even after students could no longer exchange their chosen photo. Apparently, the effects of decision reversibility last over time (see also Frey et al., 1984).

Gilbert and Ebert explained this somewhat counterintuitive finding by arguing that the so-called ‘psychological immune system’ only operates after having made an irreversible choice, but not after having made a reversible choice. The notion of a ‘psychological immune system’ refers to the fundamental human motivation to feel happy with oneself and the decisions one makes. People want to avoid negative affect and strive towards recovery after negative emotional events (e.g., Festinger, 1957; Gilbert, Pinel, Wilson, Blumberg, & Wheatley, 1998). The ‘psychological immune system’ entails the variety of strategies people employ (mainly unconsciously) to protect themselves from potential threats to their emotional well-being (Gilbert & Ebert, 2002; Wilson & Gilbert, 2005). People use these strategies in all kinds of situations, for instance, when one has been rejected for a job, or when one suffers from chronic illness. Research has also convincingly shown that after people have made (important) irreversible decisions, the psychological immune system protects them from possible feelings of regret. People, for instance, tend to increase the attractiveness of the chosen alternative and decrease the attractiveness of the rejected alternative after irreversible decision-making, which, in turn, increases post-choice satisfaction (Festinger, 1957). In the literature, this mechanism is generally referred to as the spreading of alternatives. Individuals spread apart the attractiveness of alternatives in order to be happier with their choice. Other examples of satisfaction-enhancing strategies (see Brownstein, 2003 for a review) are selective exposure to information that supports the decision (Hart et al., 2009), post-decisional distortion of facts (Svenson, Salo, & Lindholm, 2009), and post-decision memory attribution (i.e., attributing, both correctly and incorrectly, more positive characteristics to the chosen alternative and more negative characteristics to the rejected alternative) (Mather, Shafir, & Johnson, 2000; Mather, Shafir, & Johnson, 2003).

Thus, individuals use all kinds of strategies to optimize choice satisfaction after irreversible decision-making. Gilbert and Ebert (2002) suggested that after reversible decision-making, however, people are unable to use such strategies because both decision alternatives are still relevant to the decision-maker. Instead, according to Gilbert and Ebert, reversible decision-makers critically evaluate the chosen option and particularly focus on its imperfections in order to decide whether or not to stick to the initial decision. This pondering, in turn, can have a negative impact upon their choice satisfaction.

Indirect evidence supports this latter notion. Frey (1981), for instance, revealed weaker preferences for information supporting one's decision after reversible compared to irreversible decision-making (see also Frey & Rosch, 1984). Until recently, however, direct evidence for the proposed underlying mechanism was lacking. That is, until recently, it was unclear what specifically happens after reversible decision-making, how this differs from what happens after irreversible decision-making, and how these differences impact on choice satisfaction and regret. Studies into decisional engagement and regulatory motivation under (ir)reversible decision-making have shed more light on these matters (Bullens et al., 2011; Bullens et al., 2013; Bullens, van Harreveld, Förster, & Higgins, 2014). Below, we discuss this research in more detail. Furthermore, we will also present very recent results pointing to an additional explanation for the lower levels of satisfaction after reversible versus irreversible decision-making (Bullens & van Harreveld, 2016).

### *Decisional engagement*

Insight into the cognitive consequences of decision (ir)reversibility can be drawn from research on goal fulfillment. In this research, it is often argued that as long as goals are active, goal-related constructs should remain accessible as this is functional for effective goal pursuit (Ach, 1935; Bargh, 1997; Gollwitzer, 1999; Kuhl, 1983). Imagine, for instance, a situation in which one is preparing a fancy dinner. As long as one is in the stage of making preparations, it is functional to have concepts related to preparing a dinner such as 'groceries' accessible. However, as goal fulfillment research shows, as soon as goals are fulfilled, the accessibility of goal-related constructs decreases because they lose their functionality (e.g., Liberman & Förster, 2000; Marsh, Hicks, & Bink, 1998; Zeigarnik, 1927). Thus, once the fancy dinner is ready, concepts such as 'groceries' are inhibited.

On the basis of this literature, it could be argued that as long as the goal to make a decision has not been completely fulfilled (as is the case in reversible decision-making), people remain occupied with the choice. Furthermore, this decisional engagement should be reduced as soon as the decision changes from reversible to irreversible. Bullens et al. (2011) examined whether this is the case. In one of their studies, participants were told that two separate draws were going to be held for two different prizes (an iPod and a portable DVD player). Participants had to decide which draw they wanted to enter. This decision was either irreversible (i.e., the decision was immediately final) or reversible (i.e., participants were able to revise their decision right before the end of the experimental session, if they wished to do so). Thereafter, they performed a lexical decision task in which participants were several times presented with a letter string on the computer screen and asked to indicate as quickly as possible whether the letter string was a word or a non-word. The idea behind this task is that the faster a person indicates that a letter string is a word, the more accessible this word is. Participants were presented with words related to the decision (e.g., music), unrelated to the decision (e.g., plant), and non-words (e.g., pesfen). A second lexical decision task was performed after participants in the reversible decision condition were provided the opportunity to change their mind. At this point, their decision thus became irreversible. Results from the first lexical decision task revealed that, in line with goal fulfillment

theory, decision-related words remained relatively more accessible after having made a reversible instead of an irreversible decision. The results from the second lexical decision task furthermore revealed that as soon as the time during which the decision could be revised had passed, the relative accessibility of decision-related words immediately decreased. Apparently, people remain thinking about a decision only as long as they can change their minds.

A follow-up study by Bullens et al. (2011) corroborated these findings by showing that the reversibility of the decision influenced people's working memory capacity (indicating the extent to which people are cognitively occupied). In this study, participants were again asked to make an irreversible or reversible decision between two different prizes they could win in a lottery. They then proceeded with an ostensibly unrelated task (i.e., the operation span task) in which working memory capacity was assessed. After finishing this task, participants were asked to indicate to what extent they regretted (a concept closely related to choice satisfaction) their decision between the two prizes. Altogether, the results revealed that working memory capacity was lower after having made a reversible decision than after having made an irreversible decision. Moreover, it appeared that the lower working memory capacity of reversible decision-makers had an impact on levels of regret. Thus, reversible (compared to irreversible) decision-making yielded people to be more cognitively occupied, which, in turn, increased their levels of decisional regret. On the basis of these two studies, Bullens et al. (2011) suggested that the decision-related thoughts people have after having made a reversible decision are related to the decisional regret (or post-decisional dissatisfaction) they experience.

In a subsequent series of studies, Bullens et al. (2013) aimed to gain insight into the nature of these decision-related thoughts and thus into the process through which reversible decisions lead to regret. In one of their studies, participants were asked to decide which of two task combinations (both consisting of a pleasant and an unpleasant task) they would like to perform during the last part of the experimental session. For half of the participants, this decision was irreversible; for the other half, the decision was reversible. They were able to revise their choice right before the start of the tasks. After participants indicated their decision, they were asked to perform a lexical decision task with positive words related to the decision (these words were derived from the descriptions of the pleasant tasks of both task combinations), negative words related to the decision (these words were derived from the descriptions of the unpleasant tasks of both task combinations), unrelated words to the decision, and non-words. In line with the suggestions of Gilbert and Ebert (2002), Bullens and colleagues found that after having made an irreversible choice, the positive aspects of the chosen alternative and the negative aspects of the rejected alternative were more accessible. Thus, irreversible decision-makers attend to those aspects of the decision that help to *increase* their satisfaction. The results furthermore showed that after a reversible choice, the negative aspects of the chosen alternative and the positive aspects of the rejected alternative (i.e., aspects of the decision that actually *decrease* satisfaction) were more accessible.

Hence, in line with suggestions made by Gilbert and Ebert, it seems that the 'psychological immune system' only operates after an irreversible decision (i.e., people focus on the satisfaction *increasing* aspects) rather than a reversible decision. And, perhaps more importantly, it seems that reversible decision-makers even behave in a manner that decreases choice satisfaction (i.e., people focus on the satisfaction *decreasing* aspects). In a similar vein, research by Hafner, White, and Handley (2012) demonstrated more counterfactual thinking (i.e., thoughts of what might have been) after reversible rather than irreversible decision-making. Moreover, these differences in counterfactual thinking partially mediated the effects on choice satisfaction. That is, on a thought-listing task, participants who had made a reversible decision reported more thoughts about possible alternative outcomes than those who made an irreversible decision, and these thoughts, in turn, led to lower levels of satisfaction. To note, these findings were only revealed

under conditions of low cognitive load and not under conditions of high cognitive load. Thus, only when participants had enough cognitive space to ponder upon the reversible choice, they generated more counterfactuals. When cognitive resources were curtailed, reversibility was not associated with more counterfactual thinking.

The studies discussed above suggest that after reversible decision-making, people remain to think about the choice alternatives and engage in unfavorable comparison between the chosen and rejected alternatives. This unfavorable comparison, in turn, leads to lower levels of satisfaction. A set of studies conducted by Gu, Botti, and Faro (2013) further supported this line of reasoning and showed that physical acts that are metaphorically associated with the concept of closure (i.e., creating a sense that the decision is complete) can inhibit people's tendency to re-evaluate the chosen and rejected alternative(s). This reduced pondering, in turn, leads to greater choice satisfaction. In one of their studies, participants had to make a difficult choice between several chocolates that were displayed on a tray under a transparent lid. Before making their choice, participants had to lift the transparent lid off the tray. After making their choice, half of the participants were asked to put the lid back on the tray with the non-chosen chocolates (increasing perceptions of closure). The other half did not put the lid back on the tray (not increasing perceptions of closure). Results revealed that those who put the lid back on the tray afterwards engaged in less comparison between the chosen and rejected alternatives, and, as a consequence, were more satisfied with their decision than those who did not put the lid back on the tray. Thus, the mere perception of decision finality (without explicitly manipulating decision (ir)reversibility) leads one to ponder more about the choice alternatives, which, in turn, reduces levels of choice satisfaction.

### *Motivational consequences*

The findings discussed above suggest that reversible decision-making yields people to focus on a *negative* decisional outcome (i.e., focus on negative aspects of chosen alternative and positive aspects of rejected alternative), probably because this information specifically indicates whether revising is actually necessary. Irreversible decision-making, on the other hand, leads individuals to focus on a *positive* decisional outcome (focus on positive aspects chosen alternative and negative aspects rejected alternative), probably because this information enhances their perception of having made a proper choice. These findings relate decision (ir)reversibility to regulatory focus theory (Higgins, 1997). According to this theory, there are two self-regulatory systems that can help to achieve a goal; a promotion and a prevention system. Whereas individuals in a promotion focus are concerned with growth, accomplishment, and the presence or absence of *positive* outcomes, individuals in a prevention focus are concerned with safety, responsibility, and the presence or absence of *negative* outcomes. These different concerns lead to distinct motivational orientations to reach a desired end-state. While promotion-oriented individuals more likely use approach strategic means to reach a goal and show more eager behavior, prevention-oriented individuals more likely use avoidance strategic means to reach a goal and show more vigilant behavior (Crowe & Higgins, 1997; Higgins, Roney, Crowe, & Hymes, 1994). To illustrate, when one's goal is to win a tennis match, regulatory focus theory would predict that a promotion-oriented individual would take risks, whereas a prevention-oriented individual would be more careful in his play, trying to make as little mistakes as possible.

People's regulatory motivation can be emphasized chronically (i.e., an enduring personality characteristic), but also situationally (i.e., induced by the situation one finds himself/herself in). Research has, for instance, shown that priming people with a positive versus negative self-stereotype (a situational feature) activates a promotion motivation and a prevention motivation, respectively (Seibt & Förster, 2004). Apparently, real-life situations can also

strengthen different regulatory motivations. Because previous research (Bullens et al., 2013; Hafner et al., 2012) showed that reversibility leads to a focus on possible negative outcomes, Bullens et al. (2014) argued that a situation in which one has to make a reversible decision, compared to an irreversible decision, should activate a prevention focus more than a promotion focus. In five experiments, participants had to make an irreversible or reversible decision. Immediately after reading the instructions, but before making the choice, participants' regulatory motivation was determined with different measurements of regulatory motivation (e.g., the preference for approach versus avoidance strategies, and speed versus accuracy). Results revealed that reversible decision-makers become relatively more prevention than promotion oriented compared to irreversible decision-makers. They, for instance, performed slower on a task, but were at the same time also more accurate compared to irreversible decision-makers. Although not yet examined directly, these findings thus point towards regulatory motivation as the driving force between the differences in focus on decisional aspects after reversible versus irreversible decision-making, which in turn affects people's levels of satisfaction and regret.

### *Responsibility*

Although previous research provides insight into why people are less satisfied and/or experience more regret after having made a reversible decision, levels of choice satisfaction and regret may also depend on the extent to which a person feels responsible for reaching a positive decision outcome. Research, for instance, shows that individuals who feel more responsible for the decision outcome will more likely regret a decision than individuals who feel less responsible for the decision outcome (e.g., Frijda, Kuipers, & ter Schure, 1989; Gilovich & Medvec, 1994; Zeelenberg, van Dijk, & Manstead, 1998).

Thus far, research has not yet examined possible differences in feelings of responsibility after reversible and irreversible decision-making as an additional explanation for the post-decisional effects on regret and satisfaction. Nevertheless, it seems quite likely that such differences do exist. Research by Iyengar and Lepper (2000), for example, suggests that individuals who choose from a larger choice set feel more responsible to reach a positive decision outcome than people who choose from a smaller choice set. Iyengar and Lepper argued that these differences in responsibility are due to the fact that people believe to have a higher chance of finding the optimal alternative when choosing from a larger choice set rather than a smaller choice set.

To a certain degree, reversible decision-makers (compared to irreversible decision-makers) also have a relatively higher likelihood to end-up with the best alternative as they have the opportunity to reverse a potentially negative initial decision outcome. On the basis of this assumption, it could be argued that reversible decision-makers will feel more responsible for the decision outcome than irreversible decision-makers. Unpublished data of Bullens and van Harreveld (2016) indeed suggest that differences in responsibility for the decision outcome may also contribute to the relatively higher levels of regret after a reversible decision. In their research, Bullens and van Harreveld provided participants with a scenario in which two protagonists make a decision between two products. For one of the characters in the scenario, this decision is irreversible; for the other, this decision is reversible. This latter character can still exchange the chosen product within the next week. After one week (at this time the decision has become final for both characters), both receive the product at home. Unfortunately, for both of them, the decision turns out to be wrong. After reading the scenario, participants were asked to what extent they believed that the characters in the scenario felt responsible for obtaining a good decision outcome prior to receiving the product and how much they will likely blame themselves for ending up with the wrong product and regret their decision. The results showed that participants expected stronger feelings of responsibility, self-blame, and

regret for the character for whom the decision was reversible than for the character for whom the decision was irreversible. These results suggest that the responsibility people feel for the decision outcome could be an additional underlying factor in the relation between decision (ir)reversibility and choice satisfaction and regret. As this was only a first (scenario) study, more research into the role of responsibility in actual (ir)reversible decision-making behavior is needed though to substantiate this notion.

In sum, people prefer reversible to irreversible decisions as the former offer a sense of freedom of choice. Previous research on the topic of decision (ir)reversibility, however, showed that people's preference for reversible decisions can also backfire in the sense that reversible decisions yield lower levels of choice satisfaction and higher levels of regret than irreversible decisions. We discussed different underlying processes accounting for these effects on choice satisfaction, such as a difference in focus on decisional aspects and differences in regulatory motivation. Moreover, we suggested that the extent to which a person feels responsible for obtaining a positive outcome may also be an underlying factor in the relation between decision (ir)reversibility and regret.

### Is Decision Reversibility Always a Bad Thing?

The research reviewed thus far mainly showed reversible decision-making to have detrimental consequences (e.g., Bullens et al., 2011; Bullens, Förster, van Harreveld, & Liberman, 2011; Bullens et al., 2013; Frey et al., 1984; Gilbert & Ebert, 2002; Hafner et al., 2012). Recent research by Shiner (2015), however, suggests that for some people, reversible decision-making is not necessarily detrimental. More specifically, Shiner distinguished between *satisficers* and *maximizers*. Satisficers are known to choose the first 'good enough' option and do not want to spend a lot of time contemplating their decisions. Maximizers, on the other hand, tend to extensively search for the best option and generally prefer to evaluate all possible alternatives before coming to a decision (Schwartz, 2004). Generally, they are highly motivated to avoid negative outcomes (i.e., regret). Shiner found that whereas satisficers are more satisfied with *irreversible* decisions, maximizers are actually more satisfied with *reversible* decisions. Shiner argued that this is due to a fit between their respective decision goals (i.e., avoiding regret versus avoiding second-guessing) and the processes associated with reversible (i.e., providing a safety net) and irreversible decisions (i.e., faster decision process). This fit-explanation is in line with research showing that a fit between one's personality characteristic and the decisional process increases people's evaluation of the choice outcome (Higgins, 2000). Although it seems a plausible explanation, future research should indicate whether it can indeed explain the effects found by Shiner. In any event, the data show that reversible decision-making can in fact be beneficial for some.

Research of Bullens and van Harreveld (2013) also suggests that having the opportunity to revise a choice is not always detrimental. They based their research on previous studies showing that the risky, explorative style produced by a promotion motivation facilitates creativity (Friedman & Förster, 2001), whereas the vigilant, safety-oriented processing style produced by a prevention motivation facilitated analytical performance (Seibt & Förster, 2004). On the basis of these studies and the earlier discussed research showing a link between decision (ir)reversibility and regulatory motivation (Bullens et al., 2014), Bullens and van Harreveld expected and found that those having made an irreversible decision (triggering a promotion motivation), perform better on a creativity task, whereas those having made a reversible choice (triggering a prevention motivation) perform better on a task that assesses analytical ability. Thus, whether it is good or bad to engage in a task while still contemplating a reversible decision very much depends on the nature of this task. Reversible (compared to irreversible)

decisions impair creative thought but foster analytical performance. Future research should investigate whether there are more circumstances in which, or other tasks for which, reversible decision-making is actually a good thing.

### When Revising Is Still an Option

The period during which individuals are able to change their minds about the preliminary choice is often quite considerable. Many consumer products, for instance, can be returned even for weeks after purchase, and in hiring personnel, probationary periods are often as long as a year. In most of the research described in this paper, however, the period during which participants could revise their choice never exceeded the time of the experimental session. This situation differs significantly from many choice situations in real life, and, as such, certain effects might have been different when being measured a few days (or even weeks) after the (ir)reversible choice.

The degree to which decision (ir)reversibility will yield similar effects after an extended period of time may well depend on whether the dependent measure is related or unrelated to the decisional task. More specifically, one could argue that similar effects will be obtained when the dependent measure is inherently *related* to the choice, because a related task will likely remind the individual about the reversibility of the past decision. A task measuring choice satisfaction is a good example of such a decision-related task. Asking how satisfied one is with the chosen alternative even a few weeks after the decision has been made might remind the individual about the reversibility of the respective choice. Accordingly, the reversibility will likely still have an impact on the decision-maker's choice satisfaction. Research by Gilbert and Ebert (2002) indeed demonstrated effects of decision (ir)reversibility on choice satisfaction as long as 11 days after the (ir)reversible decision was made (see also Frey et al. [1984] who showed similar results three days after the (ir)reversible decision).

Contrary to choice-related tasks, choice *unrelated* tasks (e.g., creativity tasks) are less likely to remind us of the past decision, let alone about its reversibility. For these tasks to be affected by reversibility, it may be necessary that they are carried out not too long after the reversible choice has been made, or that other (situational) factors are present to remind the individual about the reversibility of the decision. Imagine, for example, a situation in which an employer provides a one-year temporary contract to a new employee (a reversible choice). It is possible that every time the two work together during that year, the employer is reminded about the reversibility of the past decision and the need to make a final decision at some point in the future. Accordingly, as long as the chosen alternative (in this case the chosen employee) reminds the decision-maker about the reversibility of the past decision, it could be the case that also an unrelated task is affected even some time after the preliminary decision has been made.

Possibly, decision reversibility will also affect unrelated tasks later in time as soon as the decision-maker moves closer to the final decision deadline. Imagine the same employer as described in the example above. After almost a year, he/she has to decide whether or not to extend the temporary contract. Likely, the closer the employer gets to the decision deadline, the more the reversibility of the past decision becomes salient, and, hence, the stronger the effects of decision reversibility will be. It would be interesting to explore under what conditions the effects reported in the current paper will be stronger or weaker after an extended period of time.

### When Revising Is No Longer an Option

We have discussed different explanations for why reversible decision-making leads to lower levels of satisfaction. One of them is the idea that after irreversible decision-making, people use all kinds of strategies to bolster their satisfaction with the choice (i.e., increase attractiveness

of chosen alternative and decrease attractiveness of rejected alternative), which they do not do after reversible decision-making. Accordingly, it could logically be assumed that as soon as the reversible decision becomes irreversible (e.g., when the period in which they can change their mind has passed), people start to bolster their satisfaction in the same way as they do when a decision is immediately irreversible. However, the results of Gilbert and Ebert (2002) suggest that this is not the case. As discussed earlier, they showed that the levels of satisfaction of reversible decision-makers remained significantly lower, even six days after the opportunity to revise had expired (see also Bullens et al., 2013).

The fact that reversibility may impact levels of satisfaction even after the decision has become irreversible is also central to what in the literature has been referred to as the lost opportunity principle (Beike, Markman, & Karadogan, 2009). According to this principle,

the most intensely experienced regrets are characterized by the perception that there were abundant opportunities in the past to prevent or change the outcome but that the outcome is no longer amenable to change in the future (Beike et al., 2009, p. 9).

The lost opportunity principle, thus, suggests that especially the idea that one could have changed the decision outcome (but did not), i.e., the idea that one had control and influence over the outcome, leads to the highest level of regret. Moreover, it is assumed that these effects extend further in time, in this case beyond the time window during which revision of the decision is possible. This suggestion also very well fits with our ideas on feelings of responsibility as being one of the underlying factors in the relationship between decision (ir)reversibility and satisfaction and/or regret. Future research should examine the specific roles of the lost opportunity principle and responsibility, as well as the extent to which these two concepts interact with one another in causing the dissatisfaction that tends to result from reversible decision-making.

### **Reversibility Defined More Broadly**

In this paper, we discussed the consequences of *decision* reversibility. However, in some cases, reversibility can also exist outside a decision-making context. For example, a text written with a pencil is more reversible than a text written with a pen. A text written on a computer is more reversible than a text written on an old-fashioned typewriter. Watching a movie from one's DVD collection is more reversible than watching a movie in the movie theater, and renting a house is more reversible than buying one. In the future, it would be interesting to see whether these types of (ir)reversibility have similar consequences as decision (ir)reversibility, because this would imply that the effects described in the current paper are also generalizable outside the decision-making domain. One could, for instance, ask participants to write a poem in pen or in pencil (those writing the poem with a pencil also receive an eraser) and then ask them about their satisfaction with the poem. On the basis of previous research on the relation between decision (ir)reversibility and choice satisfaction, it could be expected that those who have written the poem with a pen are more satisfied with their poem than those who have written it with a pencil. Altogether, the results reported in this paper might not only be relevant to the decision-making domain but may have implications beyond the topic currently reviewed, and may predict effects about (ir)reversibility in more general terms.

### **Concluding Thoughts**

We live in a society in which freedom has fundamental value and the favorable attitudes people hold towards reversible decisions might therefore be deeply rooted and difficult to change. However, the research discussed in the present paper mostly points towards detrimental

consequences of decision reversibility. We hope the current paper inspires future research into this discrepancy between what decision-makers want and what is actually good for them.

## Short Biographies

Dr. Lottie Bullens is an Assistant Professor in Social and Organizational Psychology at Leiden University. Her research focuses on the antecedents and consequences of different forms of choice-related stress and uncertainty. She recently finished her dissertation on the consequences of decision reversibility.

Dr. Frenk van Harreveld is an associate professor in Social Psychology at the University of Amsterdam. His research concerns various aspects of uncertainty. Frenk's research on attitudes and decision making examines various forms of evaluative conflict such as attitudinal ambivalence, decision reversibility, and regret. Other forms of uncertainty that he investigates are risk perception, lack of control, and mortality salience.

## Note

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