How the Overdetermination of Missing-out on Experiences Shapes Consumer Reactions

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A thesis submitted

for the Degree of Doctor of Philosophy in Management (Marketing)

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November 2025

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ACKNOWLEDGEMENTS

First and foremost, I would like to express my heartfelt gratitude to my two supervisors, Professor Janina Steinmetz and Dr. Jingshi (Joyce) Liu. This thesis would not have been possible without their guidance and support. I encountered many setbacks along my PhD journey, but thanks to their unwavering encouragement and assistance, I was ultimately able to complete my dissertation successfully. Throughout my doctoral studies, they were always there to offer timely help, point out things I might have overlooked, and respond promptly to any of my emails. It was their mentorship that transformed me from a student who needed to be pushed forward into someone who is proactive and eager to think independently. I am deeply grateful to them.

In addition, I thank my dissertation committee, Prof Anirban Mukhopadhyay (examiner), Dr David Faro (examiner), and Dr. Daniela Cristian (chair). My sincere thanks also go to the faculty members of the marketing department for their insightful comments throughout my dissertation process. I am especially thankful to the PhD programme co-ordinator Miss Malla Pratt for her help beyond academia. I also appreciate the companionship and encouragement of my fellow PhD students. I will always remember how we supported and encouraged each other, and the hugs we shared during difficult times.

Finally, I want to thank my family and my partner. My parents have always supported my decisions and reassured me that it is okay to fail. My partner provided me with endless emotional support, listened patiently to my research ramblings, and celebrated every small achievement with me.

DECLARATION

I, Sinan He, confirm that the work presented in this thesis is my own. When information has been derived from other sources, I confirm that this has been indicated in the thesis.

ABSTRACT

Consumers frequently miss out on purchases and consumption experiences, for various reasons. Prior research suggests that missing out leads to negative consumer reactions such as disappointment. The present research identifies a condition under which these adverse responses are mitigated, namely, when missing out is overdetermined. Specifically, it aims to investigate how the overdetermination of missing-out affects consumers' responses. I propose that consumers who miss out on a desired purchase or consumption opportunity will be less disappointed when their missing-out is overdetermined (vs. not overdetermined), that is, when multiple independently sufficient reasons lead to the same outcome of missing-out. This effect occurs because overdetermination increases the likelihood that consumers attribute the outcome to fate, which in turn reduces their disappointment. To explore the practical implications of this overdetermination effect, I further examine downstream consequences including compensation satisfaction, choice of alternative, and reengagement intention. When brands are responsible for the missed-out event (e.g., by having cancelled it), they often provide compensation to the affected consumers. My findings show that consumers in overdetermined (vs. non-overdetermined) missing-out situations are more satisfied with the compensation offered. Moreover, there is some evidence that overdetermination reduces the likelihood that consumers will opt for alternative options. However, I find no significant effect of overdetermination on reengagement intention. Overall, this thesis bridges the literature on missing-out, overdetermination, and fate attribution, and provides theoretical contributions to these research streams. It offers theoretical advancements in understanding how consumers process and cope with missed purchase and consumption opportunities, as well as practical implications for brands in managing the inevitable cases where consumers miss out on purchases and consumption opportunities.

CHAPTER 1: INTRODUCTION

In the globally popular sitcom Friends, in the episode "The One Where No One's Ready", Ross invites his friends to attend a speech he is giving at a conference. However, multiple things go wrong: His girlfriend, Rachel, struggles to decide what to wear, leading to a heated argument that delays their departure for the conference. Meanwhile, his friends Chandler and Joey get into a ridiculous fight over a sofa that further delays the group's departure. To make things worse, it starts raining, which eliminates any chance to catch a much-needed cab to the conference. Because of the multiple negative events, Ross misses his speech. Lay psychology might predict that the more negative events happened that caused the missed-out speech, the more disappointed Ross would be. After all, each independent event (e.g., no cab) is negative and would have been sufficient in causing missing-out. I test whether this is the case, or whether the existence of multiple independent and sufficient factors that lead to a missed opportunity might actually alleviate disappointment.

Consumers frequently miss purchase and consumption opportunities for various reasons, such as forgetting the time of an event, dealing with unexpected personal issues, or being stuck in traffic. Indeed, news reports suggest that as many as 14.3% of consumers who purchase tickets miss visiting NFL games (LVSportsBiz.com 2022) and around 5% of consumers miss concerts (The Guardian 2021). Moreover, airlines often overbook flights in anticipation of no-shows, for example, EasyJet estimates that an average of 5% of passengers do not show up for their flights (Calder 2023). While the literature on fear of missing out (FOMO) suggests that consumers do not like to miss out (Good and Hyman 2021; Hayran and Gürhan-Canli 2022; Hodkinson 2019; Rifkin, Chan, and Kahn 2024), they still frequently miss out on desired opportunities. It is not surprising that consumers feel disappointed after missing out, as it stems from unmet expectations (Zeelenberg et al. 2000).

Even if one negative obstacle would have been enough to cause a consumer to miss out, sometimes multiple such obstacles co-occur, a phenomenon referred to as overdetermined missing-out. The question is, how would consumers respond to situations in which they face multiple obstacles leading to a missing-out? An additive perspective suggests that consumers feel more disappointed when multiple (vs. one) negative events contribute to missing-out (Hull 1943). Conversely, an averaging or focalism perspective suggests that consumers experience a level of disappointment that reflects the average negativity of the events or the negativity of the most salient focal event (Fredrickson and Kahneman 1993; Seta, Haire, and Seta 2008a, 2008b; Seta, Seta, and Wang 1991; Wilson et al. 2000). However, I raise a different prediction: consumers may feel less disappointed having encountered multiple (vs. one) obstacles leading to the same missing-out. For example, consumers who miss out on an event may be less disappointed when they find out they would not have been able to attend the missed event anyway.

Why would the co-occurrence of negative events potentially reduce disappointment? People often feel that the universe conspires against them when everything seems to go wrong in their lives. On popular online forums such as Reddit and Quora, numerous posts discuss the idea that life feels fated when misfortunes pile up (see appendix A for examples). I argue that consumers may attribute missing-out to fate when multiple obstacles are present, as these obstacles imply the inevitability of the negative outcome. This attribution to fate, in turn, reduces consumer disappointment.

In addressing the question of overdetermined missing-out, this thesis aims to achieve the following objectives. First, it aims to examine consumers' responses when they miss out on consumption opportunities that they intended to purchase or participate in. Specifically, I examine whether overdetermined (i.e., multiple-cause) missing-out, compared to single-cause missing-out, alleviates consumers' negative reactions. I propose a counterintuitive prediction that overdetermination reduces consumer disappointment to missing-out. I also examine the process through which this effect occurs. The findings contribute to literature on consumers' missing-out by identifying a specific scenario in which consumers feel less disappointed to the generally negative experience of missing-out on a desired purchase or consumption opportunity. They also contribute to the literature of fate attribution by establishing it as a distinct psychological mechanism that uniquely mediates the relationship between overdetermination and consumer disappointment.

Second, it aims to provide important practical implications for marketers: brands frequently encounter frustrated customers who miss out on purchases or consumption experiences. My research suggests that communicating potential overdetermining factors could be one way to alleviate negative consumer reactions and ultimately increase the satisfaction of consumers even in the face of failure. To provide more specific implications, the present research also investigates several potential downstream consequences of the proposed overdetermination effect on compensation satisfaction, choice of alternatives, and reengagement intention.

The remainder of this thesis is organized as follows: Chapter 2 provides a literature review summarizing relevant prior research on missing out, overdetermination, and fate attribution. Chapter 3 outlines the conceptual framework and hypotheses development. Chapter 4 presents four studies that test the core hypotheses, namely that the overdetermination of missing out reduces consumer disappointment through fate attribution. Chapter 5 investigates a key downstream consequence—compensation satisfaction—of the main effect of overdetermination on disappointment through two studies. Chapter 6 examines two potential downstream behavioural consequences including choice of alternative and reengagement intention. Finally, Chapter 7 concludes the thesis by summarizing the findings and discussing the contributions, implications, and directions for future research.

CHAPTER 2: LITERATURE REVIEW

In this chapter, I will review the extant literatures on consumers' missing-out, overdetermination, and fate attribution.

2.1 Missing Out and Consumer Responses

Missing out, which refers to situations where individuals fail to seize desired opportunities, is common in consumers' daily lives, and it has significant influence on their psychological well-being and behaviours. Existing research has explored this phenomenon from various perspectives which I classify into two categories: anticipatory missing-out and post missing-out, based on the timing of the experience.

2.1.1 Anticipatory missing-out

Consumers are reluctant to miss out on what they want, whether it be an event or a product, and thus they react intensively to the fear of missing out (FOMO). The anticipatory missing-out experience brings FOMO, which refers to the anxiety of anticipatory regret over future opportunities (Hayan and Gürhan-Canli 2022). FOMO sets a positive expectation of potential experience and is accompanied by anticipatory regret over unselected options (Milyavskaya et al. 2018).

FOMO can adversely affect the psychological and even physical well-being of consumers. For example, FOMO is highly associated with many negative emotions including stress, anxiety, depression, boredom, and rumination (Baker, Krieger, and LeRoy 2016; Beyens, Frison, and Eggermont 2016; Hunt et al. 2018; Milyavskaya et al. 2018; Oberst et al. 2017). Moreover, not only is FOMO highly correlated with addiction to social media and problematic smartphone usage (Beyens et al. 2016; Elhai et al. 2018; Oberst et al. 2017), but it also intensifies individuals' emotional responses while scrolling through social media. (Przybylski et al. 2013). In line with these findings, individuals with high levels of FOMO reported reduced subjective well-being facing overload on social media compared to those with lower levels of FOMO (Chai et al. 2019). Studies also point out that individuals with high FOMO find it harder to focus on work or study (Alt 2015; Przybylski et al. 2013; Turkle 2011). Furthermore, FOMO is negatively related to physical well-being such as decreased sleep (Baker et al., 2016).

Moreover, prior research indicates that FOMO also influences consumers' behaviours and decisions. They often act on the purchase and engagement opportunities, motivated by the mindset of not wanting to miss out (Hodkinson 2019). Thus, FOMO is used by brands as an effective marketing strategy. For example, Booking.com sends promotional emails to users who are on holiday, recommending activities related to the holiday destination: "Don't miss out on these activities!" Consistent with these practices, research has found consumers who experience FOMO have higher purchase or engagement intention (Argan et al. 2022; Good and Hyman 2020; Zhang, Jiménez, and Cicala 2020). Furthermore, consumers are more likely to pay more when their FOMO is elicited (Zhang et al. 2020). Similarly, consumers with heightened FOMO have higher future engagement intention with brands including store visits, event attendance, purchases, social media engagement, and recommendations (Rifkin, Chan, and Kahn 2023).

2.1.2 Post missing-out

More relevant to this thesis, literatures on post missing-out examines how consumers react after having missed on purchase and consumption opportunities. Consumers sometimes react negatively to missed opportunities, which can significantly harm brands. For example, consumers who encounter stockouts may switch to other products, switch to other brands, delay the purchase or even cancel the purchase, which result in sales losses for the brands and retailers (Campo, Gijsbrechts, and Nisol 2000; Emmelhainz, Stock, and Emmelhainz 1991). The specific consumer reactions depend on specific consumer, product, and usage characteristics such as brand loyalty, utilitarian versus hedonic product type, and urgency of need (Campo et al. 2000; Ezhil Kumar, Sharma, and Tapar 2021; Fitzsimons 2000; Sloot, Verhoef, and Franses 2005). In addition, stockouts of desired products lead to negative consumer emotions and lower decision satisfaction (Fitzsimons 2000; Kim and Lennon 2011). Another specific research stream studies the negative impact of consumers missing out on sales opportunities. It finds that consumers are less likely to purchase a subsequent inferior opportunity when they miss out on an attractive sale, relative to when they are unaware of the initial opportunity (Tykocinski and Pittman 1998; Tykocinski, Pittman, and Tuttle 1995). This tendency is referred to as "inaction inertia". Importantly, research on inaction inertia primarily focuses on the specific scenario where the second opportunity is less attractive in terms of monetary value. Much of research investigates why people refuse to purchase the inferior opportunity has found regret and devaluation to be the key reasons (Arkes, Kung, and Hutzel 2002; van Putten et al. 2013; Tykocinski and Pittman 1998).

The literature discussed above suggests that consumers generally have a negative response to missing-out, which may lead to negative consequences for brands. What factors may attenuate these negative responses? While prior research has explored compensation in service failures (Choi and Choi 2014; Kau and Wan-Yiun Loh 2006; Pizzi and Scarpi 2013; Sinha and Lu 2019), it has not considered whether the number of failure causes affects consumer satisfaction. Building on the prior research, the present thesis investigates a different possibility to attenuate the negative responses of missing-out by studying how and why consumers react differently when there are multiple (vs. single) explanations for a missed opportunity.

2.2 Overdetermination

Scenarios in which multiple causes are independently sufficient to bring about the same outcome are referred to as overdetermination (Bernstein 2016). Overdetermined missing-out is when a missing-out outcome can be explained by more than one cause. The causes in my scenarios are independently sufficient to produce the missed outcome, making them diagnostic. This ensures that participants perceive the outcome as inevitable rather than simply difficult.

This complexity in causal attribution has important implications for how individuals assign blame in missed-out scenarios. Individuals make blame judgements, especially when outcomes do not meet their expectations, and the perceived blame attribution influences their subsequent attitudes and behaviours (Folkes 1984; Van Vaerenbergh et al. 2014; Weiner 1985, 2000; Wong and Weiner 1981). There is usually a clear party to be blamed when there is only one reason of an outcome, but it becomes unclear when there are multiple independent and sufficient reasons. The primacy effect is used to explain how people determine causal attribution in overdetermination situations (Henne et al. 2021). Specifically, people tend to attribute the outcome to events that happened earlier rather than those that occurred more recently in cases of overdetermination (Ahn and Kalish 2000; Henne et al., 2021). Consider this example: Just before John was heading out to a gig, he had to deal with an unexpected kitchen leak, which caused him to miss the gig. Later, he saw online that there was a public transit strike, meaning he would not have been able to make it to the gig anyway. According to the primacy effect, John would judge the kitchen leak as more causal than the transit strike. Causal attribution does not necessarily equate to blame attribution (Shaver and Drown 1986), which is what I am interested in, as consumers tend to act based on whom or what they blame. More specifically, I am interested in whether blame attribution differs between overdetermined and non-overdetermined conditions. That is, whether having one versus multiple explanations for a missing-out outcome has an influence on blame attribution.

Overdetermination helps alleviate negative emotions. For example, Lin, Zlatev, and Miller (2023) investigated overdetermination using scenarios in which people engage in self-standard violations. They found that when there are reasons other than one's own actions that are sufficient to cause the negative result, people would have lower negative self-evaluation. For example, if one decides to skip the workout, but later finds that the gym is closed anyway, they might feel less guilty and think that what they decided would not have mattered anyway. This paper focuses solely on scenarios where people engage in moral or self-control failures, while the present thesis examines whether similar effect of overdetermination on reducing disappointment exist when people miss out on desired opportunities. This is important because it might provide a new possibility for brands and consumers to deal with the disappointment of missing-out by addressing overdetermination. Moreover, their work focuses on motivated search for information that alleviates guilt (e.g., when people decide not to work out, they will tend to check if the gym is closed), however, I am interested in whether exogenous information has the same impact on negative responses alleviation. Existing research suggests that overdetermination reduces negative responses regardless of whether it is a self-standard violation and regardless of the sources of overdetermination information. This is because overdetermination suggests equifinality—multiple reasons leading to the same outcome—which reduces counterfactual thinking (Burres and Roese 2006; Norenzayan and Lee 2010), a key driver of regret and disappointment (Roese 1997; Zeelenberg et al. 1998). In the absence of counterfactual thinking, past events are perceived as unalterable, leading people to attribute the outcome to fate (Burres and Roese 2006). The fate attribution then serves as a buffer to reduce consumers' negative responses (Cohen 1960; Chan Wan, and Sin

2009). This thesis investigates these questions empirically and, more importantly, explains the underlying process: fate attribution.

2.3 Fate Attribution

Attribution Theory (Weiner 1985) identified three causal dimensions including stability, controllability, and locus of control. Stability refers to whether the cause of an outcome is perceived as consistent over time or subject to change. Controllability describes the extent to which a cause is considered to be under an individual's voluntary control. Locus of control indicates whether the cause is believed to originate within the person (internal) or from external factors beyond the individual. In this research, we focus on missing-out as a one-time event, making the dimension of stability, which refers to whether causes change over time, irrelevant. Our study specifically measures disappointment related to a single instance of missing-out, which is, by definition, a temporary constraint. Controllability is also not relevant because it is held constant experimentally. Therefore, we focus on the locus of control in this research. Specifically, we propose that consumers attribute to external factor, fate, in overdetermined missing-out situations.

Fate attribution, or the tendency to believe that events are predetermined and inevitable, is a psychological construct that shapes how individuals interpret life events (Chan, Wan, and Sin 2009; Pepitone and Saffiotti 1997). Those who attribute to fate believe in "meant to happen" instead of random chance or luck (Norenzayan and Lee 2010; Friedland 1998; Tang, King, and Kay 2018). This thesis only assesses fate attribution in an attributional framework and as a situational tool that people use to make sense of individual events. The purpose of this part of the literature review is twofold: first, to review the contextual triggers of fate belief adoption, i.e., when do people attribute to fate; and second, to summarize the role of fate attribution in regulating emotions and mitigating cognitive dissonance.

Beyond cultural backgrounds that could have an impact on fate attribution (Maitner and Summerville 2022; Maitner and Lee 2010), I am interested in situational factors that induce it. First, fate attribution is impacted by construal level. Burres and Roese (2006) explored the role of construal level—whether an event is interpreted in abstract or concrete terms (Trope and Liberman 2010)—in the plausibility of fate attribution. They found that people tend to attribute to fate when an event is framed at an abstract (vs. concrete) level. For example, when people are prompted to consider the "why" rather than the "how" of the event, or when they are directed to evaluate events in the distant rather than recent past, fate attribution becomes more likely.

Second, counterfactual thinking also plays a role. On one hand, a fixed outcome stemming from overdetermination eliminates the possibility of counterfactual thinking, which in turn induces attribution to fate (Burres and Roese 2006; Norenzayan and Lee 2010). On the other hand, Kray et al. (2010) argued that when counterfactuals are present, people may also attribute to fate but for a different reason: event improbability. They proposed that counterfactual thinking highlights the improbability of events, and that improbability induces fate attribution. For instance, one may feel more "meant to be" or fated for winning a lottery if they consider the endless numbers they could have chosen but did not. Moreover, the perceived importance of an event can encourage fate attribution as a means to cope with psychological strain (Tang et al. 2018). Similarly, decision difficulty is found to motivate belief in fate (Tang, Shepherd, and Kay 2014).

A related stream of research examines situations in which consumers "miss by a small margin," showing that narrowly missing an opportunity heightens regret and negative affect (Medvec, Madey, and Gilovich 1995). In these cases, outcomes are sufficiently close to success that it is easy for consumers to generate counterfactuals (e.g., "If I had left one minute earlier, I would have made it"), which intensifies regret. The present research differs conceptually and psychologically. Overdetermination reduces the ease of counterfactual reasoning because altering any one cause would not change the outcome. As a result, consumers are more likely to perceive the missed opportunity as inevitable and to attribute the outcome to fate. Thus, while small-margin missing-out increases negative responses by amplifying counterfactual thinking, overdetermined missing-out attenuates negative responses by eliminating counterfactuals and fostering fate attribution.

Finally, causal complexity is another premise that encourages fate attribution (Norenzayan and Lee 2010). Causal complexity refers to the perceptions that outcomes are caused by multiple factors and aligns with equifinality that multiple causes lead to a fixed outcome. Norenzayan and Lee (2010) showed that individuals from holistic thinking cultures are more likely to attribute events to fate because of their greater casual complexity tendency. They also manipulated the causal complexity in their study 4, showing that casual complexity reliably facilitates fate attribution. Causal complexity, along with the elimination of counterfactual thinking discussed in the previous point, together suggest a particularly relevant insight for my research: the overdetermination of missing-out may induce fate attribution.

Next, I discuss how fate attribution helps individuals regulate emotions and mitigate cognitive dissonance. Fate attribution serves as an emotional buffer in times of crisis, helping individuals to cope with distressing or uncontrollable events (Cohen 1960; Solomon, Greenberg, and Pyszczynski 2004; Specht, Egloff, and Schmukle 2011). For example, Specht et al. (2011) investigated the role of fate belief in managing grief after the death of a spouse. Their study revealed that individuals who attribute loss to fate experience lower levels of distress and adjust more successfully. Similarly, another paper examined how fate belief influences coping with bereavement among parents, finding that parents who hold this belief experience less emotional distress and better adjustment to their loss (Botti, Orfali, and

Iyengar 2009; Somer, Klein-Sela, and Or-Chen 2011). Moreover, Solomon et al. (2004) framed fate belief within Terror Management Theory, arguing that viewing life as predetermined reduces existential anxiety by providing a sense of order and purpose. Fate attribution can also help to create a sense of meaning by transforming life events into purposeful and interconnected elements of a larger coherent narrative, which is important for people's psychological well-being (Kray et al. 2010).

In terms of fate attribution and consumer reactions, Chan et al. (2009) investigated how fate attribution affects consumer tolerance in service failure scenarios in both individual and cultural levels. It was found that consumers with greater belief in fate are more tolerant of service failures, especially non-social failures (e.g., flight delay) than social failures (e.g., rude staff), and outcome failures than procedure failures (Chan and Wan 2009; Chan et al. 2009). They replicated this finding at the cultural level by showing that consumers in collectivist societies, such as Asian consumers who exhibit stronger fate beliefs, are more tolerant of non-social service failures (Chan et al. 2009), which aligns with Yau (1988)'s proposition of a positive relationship between fate belief and consumer tolerance. Similarly, consumers with stronger fate beliefs are less influenced by the fairness of recovery efforts by brands in service failures (Lee, Siu, and Zhang 2020). Building on these findings, it is likely that fate attribution reduces consumers' disappointment when they miss out on desired opportunities.

To summarize, the findings that eliminated counterfactual thinking and causal complexity induce fate attribution, and that fate attribution reduces consumers' negative reactions raise a possibility that consumers facing overdetermined missing-out are less disappointed due to fate attribution. The conceptual development and hypotheses are discussed in the next chapter.

CHAPTER 3: CONCEPTUAL DEVELOPMENT

Missing-out is common in consumers' daily lives. Prior research suggests that consumers often react negatively to missed opportunities, which might harm brands. This research explores whether certain circumstances might mitigate the negative responses to missing-out. This can be crucial for brands, as it enables them to better address the common situations in which consumers miss out. This research addresses this question, by examining whether consumers react differently to the negative experience of missing-out when multiple independent reasons contribute to the missed opportunity.

I define missing-out as situations where individuals fail to seize a desired opportunity. Three key characteristics define the scope of missing-out situations that I study. First, although Hayran, Anik, and Gürhan-Canli (2016) found that the fear of missing out is only triggered when the opportunities are perceived as self-relevant and pleasurable by consumers, we argue that it is not necessary for the missed opportunity to be seen as pleasurable to elicit the feeling of missing out. A "desired" opportunity does not have to be "pleasurable"; it can be unpleasurable as long as it aligns with one's goals. For example, a person who missed out a dental appointment, which is usually unpleasant, might still be disappointed because that dental appointment is important for their dental health. Thus, consumers will experience a sense of missing-out if they lose an opportunity that aligns with their goals. Second, Zhang et al. (2020) suggest that missing-out entails a feeling of permanent loss. If an experience is easily repeatable such as a weekly yoga class, then individuals who miss one session can simply attend the next. They are unlikely to have strong feelings of losing the possibility to experience that yoga class. Thus, we argue that the missed opportunities should be one-off. Third, the missing-out should be unexpected and unintentional. If consumers expect or intend to miss out, consumers may adjust their feelings beforehand and may not produce a strong sense of missing-out.

I expect that consumers who unintentionally miss out on opportunities that align with their goals will feel disappointed because they encounter disconfirmed expectations (Zeelenberg et al. 2000). Consumers form positive expectations about a product or experience they desire, but when they fail to obtain it, those expectations are unmet, leading to disappointment (Zeelenberg and Pieters 2004). Aligning with this, compared to other related negative emotions such as sadness and regret, disappointment is more associated with absence of positive outcomes (van Dijk 1999). Such disappointment can result from having missed out due to more than one reason, as consumers sometimes face multiple obstacles that prevent them from buying a desired product or attending a desired event. Does the number of reasons leading to the same outcome of missing-out influence the level of disappointment experienced by consumers? Different theories lead to different predictions. An additive account may predict that consumers experience greater disappointment when multiple negative events lead to missing-out, as the disappointment from each negative event accumulates (Hull 1943). In contrast, an averaging account, which averages the disappointment across multiple negative events (Fredrickson and Kahneman 1993; Seta et al. 1991; Seta et al. 2008a, 2008b), or a focalism account, which focuses on one salient negative event (Wilson et al. 2000), may predict that consumers experience a similar level of disappointment regardless of the number of (additional) causes leading to the missed opportunity. However, I propose that, paradoxically, consumers experience *less* disappointment when multiple reasons lead to missing-out—that is, when missing-out is overdetermined. This prediction is based on the following arguments.

Overdetermination refers to a situation where an outcome is the result of multiple "individually sufficient but not individually necessary" causes (Henne et al. 2021, p.2). In the context of missing-out, consumers sometimes face multiple obstacles preventing them from buying a desired product or attending a desired event. For example, they might feel too sick to attend an event, while at the same time facing a public transit strike that makes missing the event inevitable. Either being sick or the public transit strike independently and sufficiently results in the loss of the opportunity to experience the event. In addition, these causes are not individually necessary for the outcome to occur: even if they were not sick, they would have missed the event due to the transit strike; or, even if there was no transit strike, they would have missed the event because of their sickness. In such situations, the outcome of missing-out is overdetermined. Note that the order of the causes does not matter, and they may occur simultaneously or separately. I manipulate this in the empirical studies.

How does overdetermined missing-out reduce consumer disappointment? I contend that it is because overdetermination fosters fate attribution. It should be noted that my research examines fate attribution in terms of equifinality rather than in a religious sense. Fate attribution, a feeling of 'meant to be', suggests that there is no other way an outcome can be changed (Young and Morris 2004). Overdetermination implies an unchangeable nature of outcomes because multiple individually sufficient antecedents lead to the same outcome (Henne 2023). Prior research posits that people tend to explain things as fated when the outcome is overdetermined (Norenzayan and Lee 2010). Specifically, fate attribution reflects equifinality, where different antecedents result in the same outcome; in contrast, non-fate (mechanical) attribution allows counterfactual thinking and reflects multifinality, where different antecedents result in different outcomes (Norenzayan and Lee 2010). This also aligns with Burres and Roese (2006), stating that when past events are mentally perceived as unalterable, people tend to attribute the outcome to fate.

In addition, when a service or product fails, consumers often look for reasons, and the blame attributions impact consumers' reactions (Folkes 1984; Van Vaerenbergh et al. 2014).

To make a causal judgement, people often use counterfactual thinking (Byrne 2016; Gerstenberg et al. 2017; Henne et al. 2021), which involves considering whether a counterfactual alternative to that event would lead to the same outcome (Epstude and Roese 2008; Smallman and Roese 2009). For example, to determine whether a transit strike caused someone to miss an event, individuals consider whether they would have attended the event if there had been no transit strike. If they had attended the event, then they would have judged the transit strike as the cause. However, in an overdetermined missing-out context, where all the causes are independently sufficient for the outcome, changing any one of them alone would not prevent the loss of the experience. As a result, individuals may attribute the outcome to fate more in the overdetermined missing-out context than in other contexts (Pepitone and Saffiotti 1997; Petrocelli and Dowd 2009). Thus, in the case of non-overdetermined missing-out, consumers may blame themselves or others; in contrast, in the case of overdetermined missing-out, they may perceive the outcome as inevitable and fated.

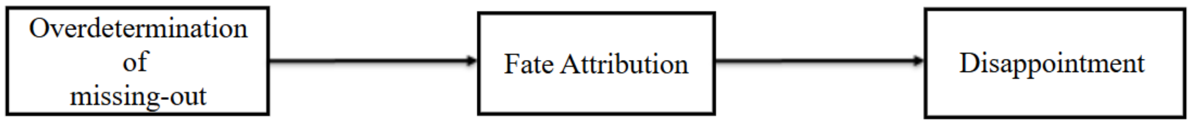
Research shows that attributing events to fate can reduce the emotional impact of negative experiences because beliefs such as "it is meant to be" can help reduce discontent (Cohen 1960; Solomon et al. 2004; Specht et al. 2011). More directly, Chan et al. (2009) demonstrated the effect of fate belief on alleviating consumers' dissatisfaction with service failure. They showed that, both at the individual and cultural levels, consumers with stronger beliefs in fate are more tolerant of service failures (Chan and Wan 2009; Chan et al. 2009). This could be because they are more accepting of adversity by attributing failures or challenges to uncontrollable factor (i.e., fate) and recognising the limits of personal control (Lee et al. 2020; Morling and Evered 2006; Wu, Chen, and Ng 2020). Therefore, I expect consumers to be more accepting of missing out on a desired opportunity and to adjust themselves to feel less disappointed when they have higher fate attribution. Figure 1 depicts the conceptual model. Formally, I hypothesize:

H1: Consumers who miss out on a desired opportunity are less disappointed when their missing-out is overdetermined (vs. not overdetermined).

H2: Fate attribution mediates the effect of overdetermined missing-out on consumer disappointment.

FIGURE 1

CONCEPTUAL MODEL



In the following chapters, I present the empirical studies testing the hypotheses. In chapter 4, I present four studies to test my core hypotheses. Specifically, study 1a and 1b investigate how overdetermination of missing-out influences fate attribution. Study 1b provides evidence that fate attribution is not simply a proxy for other types of blame attribution by including measurement of self-, third-party, and brand attribution. Study 2 tests how overdetermination of missing-out affects disappointment. Study 3 provides evidence for the underlying mechanism by testing the full model. Next, to explore practical implications, I discuss four potential downstream consequences of overdetermined missing-out. In chapter 5, I present two studies (study 4a and study 4b) to discuss the subsequent impact of overdetermined missing-out on compensation satisfaction in both hedonic and non-hedonic contexts. In chapter 6, I present five studies to examine two behavioural intention outcomes. Specifically, studies 5-8 examine how overdetermination might influence consumers' choice of alternative. Study 9 examines how overdetermination might affect consumers' reengagement intention with missed opportunities. Finally, I discuss two spinoff research studies that are related to the current research (appendix B), focusing on how consumers might engage with brands in the context of overdetermination. All the studies were preregistered, and the preregistration, experiment materials, and data are accessible here: https://researchbox.org/3935&PEER_REVIEW_passcode=UKVYJU.

CHAPTER 4: ALLEVIATING CONSUMER DISAPPOINTMENT FROM MISSED OPPORTUNITIES

I present four studies in this chapter. Study 1a and 1b examine the relationship between overdetermination and fate attribution and provide evidence for the independence of fate attribution controlling for other blame attributions. Study 2 tests the direct effect of overdetermination of missing-out on consumers' feeling of disappointment. Study 3 reveals the underlying process by examining the full model.

Study	IV	Key DV	others
1A	initial missing-out: yes (kitchen leak) vs. no x cancellation: yes (fire alarm) vs. no	Fate attribution	
1B	missing-out reason: internal (nap) vs. external (boss) x overdetermination (train): yes vs. no	Fate/internal/third-party/brand attributions	Engagement intention
2	initial missing-out: yes (misremember) vs. no x cancellation: yes vs. no	Disappointment	Dissatisfaction, Difficulty of imaging
3	initial missing-out: yes (misremember) vs. no x cancellation: yes vs. no	Fate attribution & Disappointment	Dissatisfaction, Negative emotions
4A	missing-out: control (cancellation) vs. overdetermined (cancellation+tire)	Disappointment & Compensation satisfaction	
4B	missing-out: control (cancellation) vs. overdetermined (cancellation+ID)	Disappointment & Compensation satisfaction	
5	missing-out reason: internal (misremember) vs. external (wrong info) x overdetermination: yes (out of town) vs. no	Disappointment & Choice of alternative	Interest in missed-opportunity communication
6	Control vs. missing-out (misremember) vs. overdetermined missing-out (misremember+train)	Disappointment & Choice of alternative	
7	missing-out reason: internal (misremember) vs. external (wrong info) x overdetermination: yes (out of town) vs. no	Disappointment & Expected enjoyment of alternative	Expected enjoyment of missed opportunity
8	Non-overdetermined (failed test) vs. Overdetermined (failed test +quota)	Choice of alternative	
9	Non-overdetermined (food poison) vs. Overdetermined (food poison+misremember)	Disappointment & Reengagement intention	

TABLE 1: SUMMARY OF STUDIES

4.1 Study 1A: Overdetermination and Fate Attribution

In this study, I test whether overdetermination of missing-out induces fate attribution. I employ a 2 (initial missing-out: yes vs. no) x 2 (cancellation: yes vs. no) between-subjects design, and thus have one baseline condition (no initial missing-out and no cancellation), two non-overdetermined missing-out conditions (initial missing-out only; cancellation only), and one overdetermined condition (initial missing-out and cancellation). I expect an interaction effect of initial missing-out and cancellation on fate attribution; specifically, I expect that fate attribution would be greater among consumers who encounter overdetermined (vs. non-overdetermined) missing-out. Cancellation by the brand is used as a missing-out reason because it is a common, brand-related cause for consumers to experience a loss of access or opportunity. The preregistration is available at https://aspredicted.org/WNS_V21.

Method

This study followed 2 (initial missing-out: yes vs. no) x 2 (cancellation: yes vs. no) between-subjects design. I set an a priori target sample size of N = 400 (N = 100 per condition). Four hundred and three participants from Prolific (58.6% female, M_{age} = 40.64, SD = 12.75) completed the experiment. Sensitivity analysis using G*Power software indicated that, given my experiment design and sample size, the smallest effect size I was adequately powered to detect was f = 0.14 (with 403 participants, a 0.05 alpha error rate, and 80% power).

Participants were randomly assigned to one of the four conditions. Participants were asked to read a short scenario and then answer some questions. Participants assigned to the no initial missing-out [initial missing-out] and no cancellation [cancellation] condition read:

You were eagerly looking forward to attending a special fitness class at a fitness studio. You got ready early to ensure you would not miss it [Unfortunately, you missed it because you needed to deal with an unexpected leak in your kitchen]. The class went on as *planned and many people attended [Later, you found out that the class had to be cancelled because the whole building was evacuated due to a false fire alarm].*

Fate attribution was measured by asking participants to rate to what extent they agree with the following statement: "Whether I attend the fitness class or not at the end was meant to be." (1 = Totally disagree, 7 = Totally agree) (Adapted from Norenzayan and Lee 2010). As an attention check, participants were asked if they had attended the fitness class or not in the scenario (1 = Yes, 2 = No, 3 = I don't know). Finally, participants reported their age and gender[1]. As preregistered, I coded participants in the no initial missing-out and no cancellation condition who chose "Yes", and all other participants who chose "No", as passing the attention check. Thus, there were 36 participants failed the attention check. The attention check failure was not balanced across conditions, as 20 participants in the no initial missing-out and no cancellation condition failed the check (13 of them chose "I don't know"). This may have been due to the vignette being unclear. For example, the phrase "got ready early to ensure you would not miss it" does not necessarily imply that they actually made it to the class. The pattern of the results did not change after excluding those who failed the attention check. I retained all participants in the subsequent analyses.

Results

Fate attribution. A two-way ANOVA was conducted on fate attribution using initial missing-out and cancellation as the factors. I found no significant main effect of initial missing-out ($F(1, 399) = 1.02$, $p = .313$, $\eta^2_p = .003$) or cancellation ($F(1, 399) = 1.87$, $p = .172$, $\eta^2_p = .005$) on fate attribution. There was a marginally significant interaction effect of initial missing-out and cancellation on fate attribution ($F(1, 399) = 3.27$, $p = .071$, $\eta^2_p = .008$).

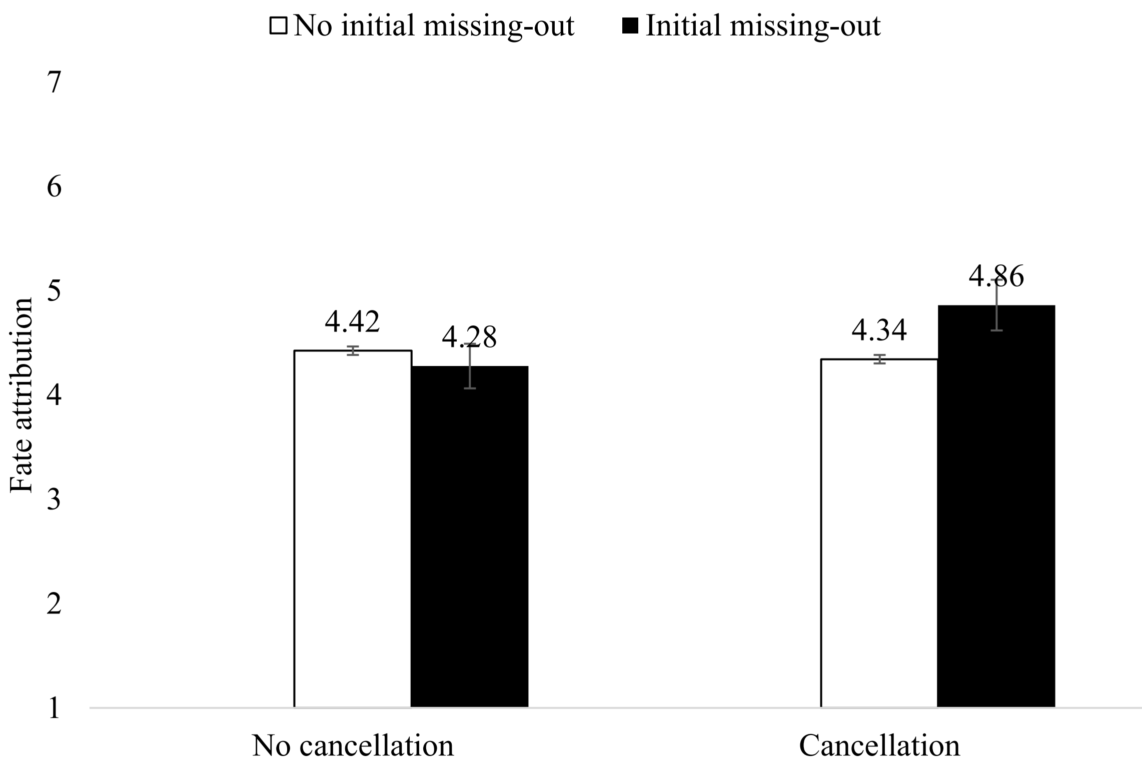
[1] In all studies, potential age and gender effects were tested (whether either variable moderated the effects of interest). Only results showing statistically significant moderation effects are reported in appendix D.

Planned contrasts revealed that, for participants in the condition that did not initially miss out the class, there was no significant difference in fate attribution whether the class was cancelled or not ($M_{\text{cancellation}}$ = 4.34, SD = 2.01 vs. $M_{\text{no\_cancellation}}$ = 4.42, SD = 1.73, $F(1, 399) = .10$, $p = .756$, $\eta^2_p = .000$). That is, the fate attribution in the baseline condition (no initial missing-out and no cancellation) was similar to that in the cancellation only condition. However, as predicted, for participants who initially missed out the fitness class, they reported greater fate attribution when the class was cancelled (i.e., missing-out was overdetermined) than when it went on as planned ($M_{\text{cancellation}}$= 4.86, SD = 1.80 vs. $M_{\text{no\_cancellation}}$ = 4.28, SD = 1.83, $F(1, 399) = 5.06$, $p = .025$, $\eta^2_p = .013$).

A second set of planned contrasts revealed that, within participants in the condition where the class was not cancelled, there was no significant difference in fate attribution between those who initially missed out and those who did not initially miss out ($M_{\text{initial\_missing-out}}$ = 4.28, SD = 1.83 vs. $M_{\text{no\_initial\_missing-out}}$ = 4.42, SD = 1.73, $F(1, 399) = .32$, $p = .574$, $\eta^2_p = .001$). That is, the fate attribution in the baseline condition (no initial missing-out and no cancellation) was similar to that in the initial missing-out only condition. However, as predicted, when the fitness class was cancelled, consumers who encounter initial missing-out (i.e., missing-out was overdetermined) reported greater fate attribution than those who did not encounter initial missing-out ($M_{\text{initial\_missing-out}}$ = 4.86, SD = 1.80 vs. $M_{\text{no\_initial\_missing-out}}$ = 4.34, SD = 2.01, $F(1, 399) = 4.00$, $p = .046$, $\eta^2_p = .010$).

FIGURE 2

INTERACTION EFFECT OF INITIAL MISSING-OUT AND CANCELLATION ON FATE ATTRIBUTION (STUDY 1A)



To simplify the analyses and test our hypotheses more directly, I additionally pooled the two non-overdetermined conditions. Thus, I have three conditions: baseline condition (no initial missing-out and no cancellation) vs. non-overdetermined condition vs. overdetermined condition. A one-way ANOVA (not preregistered) was conducted on fate attribution using condition as the factor. We found a significant effect of condition ($F(2, 404) = 3.19$, $p = .042$, $\eta^2 = .016$) on fate attribution. Post-hoc comparisons using Tukey HSD test revealed that participants in the overdetermined condition reported significantly higher fate attribution than those in the non-overdetermined condition ($M_{\text{overdetermined}} = 4.87$, SD = 1.79 vs. $M_{\text{non-overdetermined}} = 4.31$, SD = 1.92, $p = .035$), and (not significantly) higher than those in the baseline condition ($M_{\text{baseline}} = 4.42$, SD =1.76 vs. $M_{\text{overdetermined}} = 4.87$, SD = 1.79, $p = .184$).

Discussion

Study 1a showed that when consumers took part in the event as planned (baseline condition), their fate attribution did not differ significantly from that of consumers who missed out due to either a kitchen leak or a class cancellation. This indicated that consumers' perceptions of fate attribution were similar regardless of whether they participated in the event or missed it due to a single reason.

Importantly, this study provided evidence that missed-out consumers showed greater fate attribution when they encountered more than one reason for missing-out, relative to those who only encountered one reason. Specifically, I found that fate attribution was significantly greater among individuals who missed the fitness class due to both a kitchen leak and a class cancellation, compared to those who missed it due to either a kitchen leak or a class cancellation alone. This means that overdetermined missing-out does produce greater fate attribution. Moreover, I observed that when the fitness class was cancelled, those who initially missed it due to the kitchen leak also reported significantly greater fate attribution than those who did not initially miss it. This suggests that reasons for the initial missing-out do not matter, that is, they can be either internal or external. The effect of overdetermination on fate attribution should hold as long as there are two or more sufficient and independent reasons leading to the same missing-out outcome. I will explicitly examine this in the next study.

4.2 Study 1B: Independence of Fate Attribution

This study has three goals. First, it aims to replicate the effect of overdetermined missing-out on fate attribution as in study 1a but using conditions in which all participants miss out. Second, it tests whether it matters for overdetermination if the initial missing-out reason is internal or external. In study 1a, the kitchen leak may have led participants to feel angry at themselves, and they might have felt better when another reason (cancellation) was present, as it allowed them to shift the blame to external factors. However, I argue that the effect of overdetermination on fate attribution is not simply about shifting self-blame to others to feel better. This effect should hold even when the initial reason does not lie with the consumers themselves. To test this, I will vary the initial missing-out with either an internal or a third-party reason. Third, one might wonder whether fate attribution is simply a proxy for other types of blame attribution, or whether it is an artefact of measurement, given that I have only measured fate attribution. Thus, in this study, I measure other types of blame attributions in addition to fate attribution, including self-, third-party, and brand attribution, to better understand the relationship between overdetermination and blame attributions. The preregistration is available at https://aspredicted.org/zdgw-35wp.pdf.

Method

This study followed a 2 (missing-out reason: internal vs. third-party) × 2 (overdetermination: yes vs. no) between-subjects design. I set an a priori target sample size of N = 400 (N = 100 per condition). Four hundred and one participants from Prolific (65.5% female, M_{age} = 38.09, SD = 12.58) completed the experiment. Sensitivity analysis using G*Power software indicated that, given my experiment design and sample size, the smallest effect size I was adequately powered to detect was f = 0.14 (with 403 participants, a 0.05 alpha error rate, and 80% power).

Participants were randomly assigned to one of the four conditions. They read and imagined that they missed out on an art exhibition either because they took a nap and overslept (internal reason) or because their boss kept them working late (third-party reason). Then, participants in the overdetermined condition additionally read that the underground was severely delayed, and they would have missed the art exhibition anyway. Participants in the non-overdetermined condition did not receive any additional information.

All participants then answered a short survey. I measured fate attribution, self-attribution, third-party attribution, and brand attribution by asking “To what extent do you think it is fate/your fault/someone else’s fault/the gallery’s fault that you missed the art exhibition?” (1 = Not at all, 7 = Totally). The measuring order of these blame attributions was randomised. For exploratory purpose, I measured engagement intention by asking participants to rate how likely would they be to book another exhibition at this gallery (1 = Very unlikely, 7 = Very likely). The measuring order of blame attributions and engagement intention was randomised. There was no order effect on blame attributions or engagement intention, hence I collapsed across the order conditions in the analyses. As an attention check, participants were asked if they had seen the art exhibition or not (1 = Yes, 2 = No, 3 = I am not sure). Finally, participants reported their age and gender. As preregistered, I coded participants who chose “Yes” and “I don’t know” as failing the attention check. Seventeen participants failed the attention check. The pattern of the results did not change after excluding those who failed the attention check. I retained all participants in the subsequent analyses.

Results

Fate attribution. A two-way ANOVA was conducted on fate attribution using missing-out reason and overdetermination as the factors. I found a significant main effect of overdetermination on fate attribution as predicted ($F(1, 397) = 25.71$, $p < .001$, $\eta^2_p = .061$). Specifically, individuals were more likely to attribute to fate when their missing-out was overdetermined than when it was not overdetermined ($M_{\text{non-overdetermined}} = 3.08$, SD = 1.72 vs. $M_{\text{overdetermined}} = 4.03$, SD = 2.02). There was no significant main effect of missing-out reason

($F(1, 397) = 1.36$, $p = .245$, $\eta^2_p = .003$) or interaction effect of missing-out reason and overdetermination ($F(1, 397) = .11$, $p = .744$, $\eta^2_p = .000$) on fate attribution.

In addition, I re-ran the two-way ANOVA while controlling for the other attributions (self-, third-party, and brand attribution). Again, I found a significant main effect of overdetermination on fate attribution ($F(1, 393) = 20.89$, $p < .001$, $\eta^2_p = .050$). Specifically, individuals were more likely to attribute to fate when their missing-out was overdetermined than when it was not overdetermined ($M_{\text{non-overdetermined}} = 3.08$, SD = 1.72 vs. $M_{\text{overdetermined}} = 4.02$, SD = 2.01). There was no significant main effect of missing-out reason ($F(1, 393) = 2.37$, $p = .125$, $\eta^2_p = .006$) or interaction effect of missing-out reason and overdetermination ($F(1, 393) = .58$, $p = .447$, $\eta^2_p = 001$) on fate attribution.

Self-attribution. A two-way ANOVA was conducted on self-attribution using missing-out reason and overdetermination as the factors. The analysis yielded a significant main effect of missing-out reason on self-attribution ($M_{\text{internal}} = 5.96$, SD = 1.48 vs. $M_{\text{third-party}} = 2.42$, SD = 1.64, $F(1, 396) = 544.53$, $p < .001$, $\eta^2_p = .579$), as well as a significant main effect of overdetermination on self-attribution ($M_{\text{non-overdetermined}} = 4.45$, SD = 2.50 vs. $M_{\text{overdetermined}} = 3.98$, SD = 2.19, $F(1, 396) = 8.60$, $p = .004$, $\eta^2_p = .021$). Importantly, there was a significant interaction effect of missing-out reason and overdetermination on self-attribution ($F(1, 396) = 19.12$, $p < .001$, $\eta^2_p = .046$). The simple effect analyses showed that in the third-party condition, people reported similar levels of self-attribution regardless of whether the missing-out was overdetermined or not ($M_{\text{non-overdetermined}} = 2.32$, SD = 1.60 vs. $M_{\text{overdetermined}} = 2.54$, SD = 1.68, $F(1, 396) = 1.02$, $p = .31$, $\eta^2_p = .003$); in the internal condition, people reported lower levels of self-attribution when the missing-out was overdetermined compared to when it was not overdetermined ($M_{\text{non-overdetermined}} = 6.51$, SD = 1.07 vs. $M_{\text{overdetermined}} = 5.41$, SD = 1.63, $F(1, 396) = 27.09$, $p < .001$, $\eta^2_p = .064$).

Third-party attribution. A two-way ANOVA was conducted on third-party attribution using missing-out reason and overdetermination as the factors. I found a significant main effect of missing-out reason on third-party attribution ($M_{internal}$ = 1.71, SD = 1.29 vs. $M_{third\text{-}party}$ = 5.12, SD = 1.89, $F(1, 396) = 464.53$, $p < .001$, $\eta^2_p = .540$), but no significant main effect of overdetermination on third-party attribution ($F(1, 396) = .60$, $p = .43$, $\eta^2_p = .002$). Importantly, I found a significant interaction effect of missing-out reason and overdetermination on third-party attribution ($F(1, 396) = 22.68$, $p < .001$, $\eta^2_p = .054$). The simple effect analyses revealed that in the third-party condition, people reported lower levels of third-party attribution when the missing-out was overdetermined relative to when it was not overdetermined ($M_{non\text{-}overdetermined}$ = 5.55, SD = 1.79 vs. $M_{overdetermined}$ = 4.67, SD = 1.90, $F(1, 396) = 15.11$, $p < .001$, $\eta^2_p = .037$); in the internal condition, people reported higher levels of third-party attribution when the missing-out was overdetermined compared to when it was not overdetermined ($M_{non\text{-}overdetermined}$ = 1.40, SD = .99, vs. $M_{overdetermined}$ = 2.03, SD = 1.48, $F(1, 396) = 8.07$, $p = .005$, $\eta^2_p = .020$).

Brand attribution. A two-way ANOVA was conducted on brand attribution using missing-out reason and overdetermination as the factors. The analyses yielded significant main effects of both missing-out reason ($M_{internal}$ = 1.39, SD = 1.09 vs. $M_{third\text{-}party}$ = 1.85, SD = 1.49, $F(1, 396) = 13.14$, $p < .001$, $\eta^2_p = .032$) and overdetermination ($M_{non\text{-}overdetermined}$ = 1.43, SD = 1.12 vs. $M_{overdetermined}$ = 1.80, SD = 1.48, $F(1, 396) = 8.57$, $p = .004$, $\eta^2_p = .021$) on brand attribution. I also observed a significant interaction effect of missing-out reason and overdetermination on brand attribution ($F(1, 396) = 5.57$, $p = .019$, $\eta^2_p = .014$). The simple effect analyses revealed that in the third-party condition, individuals reported higher levels of brand attribution when the missing-out was overdetermined relative to when it was not overdetermined ($M_{non\text{-}overdetermined}$ = 1.52, SD = 1.22 vs. $M_{overdetermined}$ = 2.19, SD = 1.66, $F(1, 396) = 13.78$, $p < .001$, $\eta^2_p = .034$); in the internal condition, individuals reported similar levels of brand attribution relative to when it was not overdetermined ($M_{\text{non-overdetermined}} = 1.35$, SD = 1.01 vs. $M_{\text{overdetermined}} = 1.43$, SD = 1.16, $F(1, 396) = .16$, $p = .686$, $\eta^2_p = .000$).

Engagement intention. A two-way ANOVA was conducted on engagement intention using missing-out reason and overdetermination as the factors. I did not find significant main effect of missing-out reason ($F(1, 396) = .11$, $p = .74$, $\eta^2_p = .000$) or overdetermination on engagement intention ($F(1, 396) = 1.42$, $p = .23$, $\eta^2_p = 004$). There was also no interaction effect of missing-out reason and overdetermination ($F(1, 396) = .43$, $p = .51$, $\eta^2_p = .001$) on engagement intention.

Discussion

This study replicated study 1a by showing that overdetermined missing-out leads to greater fate attribution. It also showed that this effect is generalisable to more than just internal missing-out reasons because there was no interaction effect of missing-out reason and overdetermination on fate attribution. That is, in overdetermined condition, there was no difference in fate attribution regardless of whether the missing-out reason was internal or third-party.

A key objective of this study was to examine whether fate attribution operates independently from other blame attributions. The results showed that overdetermination significantly increased fate attribution, even when controlling for self-, third-party, and brand attributions. Hence, the effect of overdetermination on fate attribution was independent of other blame attributions. This suggests that consumers who encounter overdetermined (vs. non-overdetermined) missing-out do attribute their missing-out to fate, and that fate attribution functions as a distinct psychological response mechanism, rather than merely reflecting a redistribution of other attributions. Therefore, fate attribution is not simply a proxy of the other blame attributions. This finding aligns with previous research claiming that attributions to fate and to responsible individuals are not necessarily mutually exclusive (Burres and Roese 2006; Norenzayan and Lee 2010).

Besides fate attribution, the results showed that overdetermination reduced self-attribution when the initial missing-out reason was internal. This finding aligns with prior research on self-serving biases in blame attribution which suggests that individuals feel less personally responsible when other uncontrollable reasons lead to a missed opportunity (Miller and Ross, 1975). Moreover, when the initial missing-out reason was internal, overdetermination led to increased third-party attribution, as participants shifted blame toward external forces. However, when the missing-out reason was already external, overdetermination reduced third-party attribution.

Although there were significant main effects and significant interaction effect of missing-out reason and overdetermination on brand attribution, the participants across the conditions reported very low mean scores (M_{internal} = 1.35, $M_{\text{third-party}}$ = 1.52, $M_{\text{overdetermined\_internal}}$ = 1.43, $M_{\text{overdetermined\_third-party}}$ = 2.19). This suggests that participants did not hold the brand (the gallery) responsible for their missing-out of the art exhibition. Study 5 in chapter 6 will also provide support for this.

4.3 Study 2: The Effect of Overdetermination on Disappointment

Study 2 tests whether overdetermination can reduce the negative effect of missing-out on disappointment. It follows similar design as study 1a (2 (initial missing-out) x 2 (cancellation)) to include a baseline condition (no initial missing out and no cancellation), which allows me to empirically test whether consumers feel more disappointed when they miss out compared to when they do not. I expect consumers to experience greater disappointment when they miss out (vs. do not miss out) on a desired opportunity; however, and more importantly, this effect should be mitigated if there is another independent reason to explain this missing-out. Additionally, since I use a scenario-based experiment, it is possible that participants find it more difficult to imagine having two reasons for a missing-out than having one. Thus, I measure the difficulty of imagining the scenarios to capture the potential confound. The preregistration is available at https://aspredicted.org/XW8_7MV.

Method

This study followed a 2 (initial missing-out: yes vs. no) x 2 (cancellation: yes vs. no) between-subjects design. I set an a priori target sample size of N = 400 (N = 100 per condition). Four hundred participants from Prolific (59% female, M_{age} = 39.95, SD = 12.93) completed the experiment. Sensitivity analysis using G*Power software indicated that, given my experiment design and sample size, the smallest effect size I was adequately powered to detect was f = 0.14 (with 400 participants, a 0.05 alpha error rate, and 80% power).

Participants were randomly assigned to one of the four conditions. Similar to study 1a, participants first read and imagined that they either got ready early for a fitness class or missed out on the class due to misremembering the date, and then read that the class either went on as planned or got cancelled.

Next, I measured participants' disappointment with the event with the following items: "How do you feel about this fitness class experience?" and "How would you rate your overall experience with this fitness class?" (1 = Very disappointed, 7 = Very happy; reverse coded, α = .959). In addition, I measured participants' dissatisfaction with the brand that was associated with the missing-out because disappointment is an important antecedent of dissatisfaction (Inman et al. 1997; Zeelenberg and Pieters 2004). I was interested in understanding consumers' brand (dis)satisfaction because it may impact consumers' future brand loyalty and engagement with the brands (Bloemer and Kasper 1995; Fernandes and Moreira 2019; Zeelenberg and Pieters 2004). It was measured with the following items: "In general, how do you feel about the fitness studio?” and “How would you rate your satisfaction with the fitness studio?” (1 = Very dissatisfied, 7 = Very satisfied; reverse coded, α = .959). I expect that consumers feel less dissatisfied with the brands when their missing-out is overdetermined (vs. not overdetermined). The measuring order of disappointment and brand dissatisfaction was randomised. There was no order effect on disappointment and brand dissatisfaction, hence I collapsed across the order conditions in the analyses. Difficulty of imagining was measured with “How difficult it is for you to imagine yourself in the above scenario?” (1 = Not difficult at all, 7 = Extremely difficult). As an attention check, participants were asked if they had seen the art exhibition or not (1 = Yes, 2 = No, 3 = I am not sure). Finally, participants reported their age and gender. As preregistered, I coded participants in the no initial missing-out and no cancellation condition who chose “Yes”, and all other participants who chose “No”, as passing the attention check. Thirty-two participants failed the attention check. The attention check failure was not balanced across conditions, as 18 participants in the no initial missing-out and no cancellation condition failed the check (13 of them chose “I don’t know”). This issue may be similar to that in study 1a, where the vignette (“got ready early to ensure you would not miss it”) was not sufficiently clear about participants successfully making it to the fitness class. The pattern of the results did not change after excluding those who failed the attention check. I retained all participants in the subsequent analyses.

Results

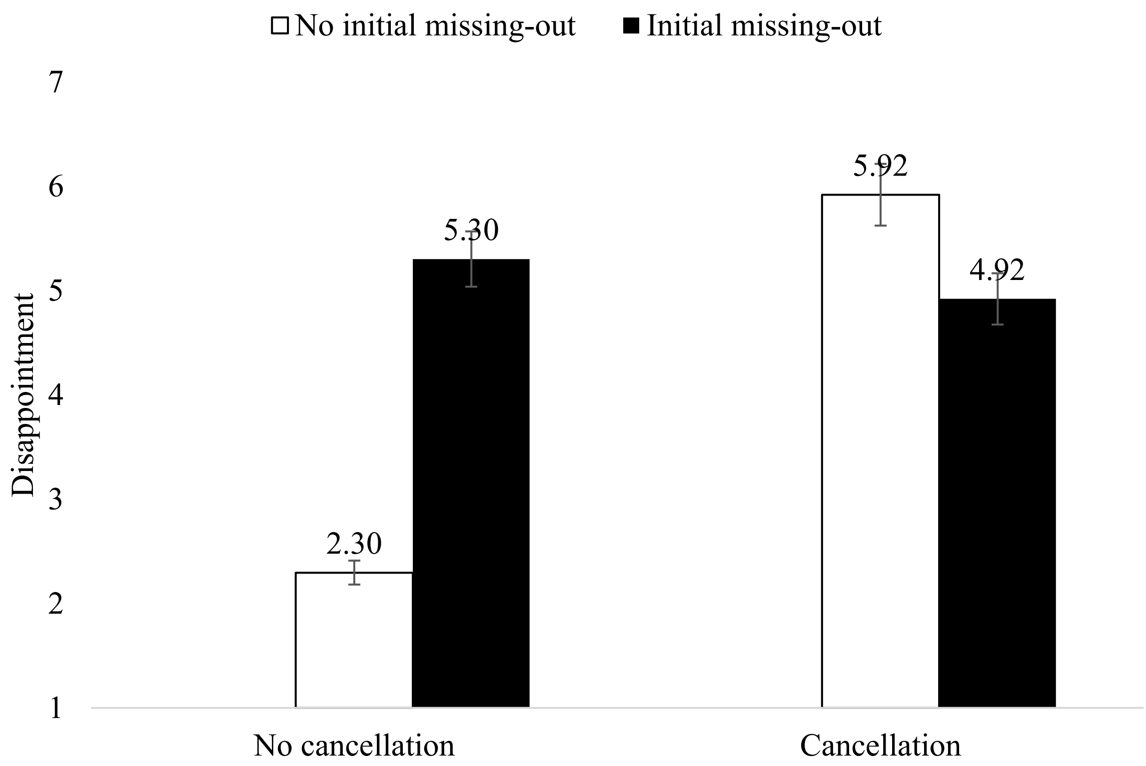
Disappointment. A two-way ANOVA was conducted on disappointment using initial missing-out and cancellation as the factors. The analyses revealed a significant main effect of initial missing-out on disappointment ($M_{\text{initial\_missing-out}}$ = 5.11, SD = 1.42 vs. $M_{\text{no\_initial\_missing-out}}$ = 4.09, SD = 2.19, $F(1, 396) = 57.47$, $p < .001$, $\eta^2_p = .127$), and a significant main effect of cancellation on disappointment ($M_{\text{no\_cancellation}}$ = 3.79, SD = 2.01 vs. $M_{\text{cancellation}}$ = 5.42, SD =

1.40, $F(1, 396) = 149.68$, $p < .001$, $\eta^2_p = .274$). The analyses also revealed a significant interaction effect of initial missing-out and cancellation on disappointment ($F(1, 396) = 228.65$, $p < .001$, $\eta^2_p = .366$). The simple effects supported my prediction: consumers who did not initially miss the class felt more disappointed when the class was cancelled than when it went on as planned ($M_{no\_cancellation} = 2.30$, SD = 1.17 vs. $M_{cancellation} = 5.92$, SD = 1.28, $F(1, 396) = 374.16$, $p < .001$, $\eta^2_p = .486$). More importantly, and as predicted, consumers who initially missed the fitness class felt less disappointed when the class was cancelled (i.e., missing-out was overdetermined) than when it went on as planned ($M_{no\_cancellation} = 5.30$, SD = 1.49 vs. $M_{cancellation} = 4.92$, SD = 1.34, $F(1, 396) = 4.17$, $p = .042$, $\eta^2_p = .010$).

A second set of planned contrasts revealed that, in the no cancellation condition, people who initially missed out (vs. did not initially miss out) on the fitness class felt more disappointed ($M_{initial\_missing\text{-}out} = 5.30$, SD = 1.49 vs. $M_{no\_initial\_missing\text{-}out} = 2.30$, SD = 1.17, $F(1, 396) = 257.69$, $p < .001$, $\eta^2_p = .394$); in contrast, in the cancellation condition, people who initially missed out on the fitness class (i.e., missing-out was overdetermined) felt less disappointed than those who did not initially miss out ($M_{initial\_missing\text{-}out} = 4.92$, SD = 1.34 vs. $M_{no\_initial\_missing\text{-}out} = 5.92$, SD = 1.28, $F(1, 396) = 28.84$, $p < .001$, $\eta^2_p = .067$).

FIGURE 3

INTERACTION EFFECT OF INITIAL MISSING-OUT AND CANCELLATION ON DISAPPOINTMENT (STUDY 2)



Similar to Study 1a, I pooled the two non-overdetermined conditions. Thus, we have three conditions: baseline condition (no initial missing-out and no cancellation) vs. non-overdetermined condition vs. overdetermined condition. A one-way ANOVA (not preregistered) was conducted on disappointment using condition as the factor. I found a significant effect of condition ($F(2, 404) = 209.11$, $p < .001$, $\eta^2 = .509$) on disappointment. Post-hoc comparisons using Tukey HSD test revealed that participants in the overdetermined condition reported significantly lower disappointment than those in the non-overdetermined condition ($M_{\text{overdetermined}} = 4.92$, SD = 1.34 vs. $M_{\text{non-overdetermined}} = 5.58$, SD = 1.42, $p < .001$), and significantly higher disappointment than those in the baseline condition ($M_{\text{baseline}} = 2.30$, SD =1.16 vs. $M_{\text{overdetermined}} = 4.92$, SD = 1.34, $p < .001$).

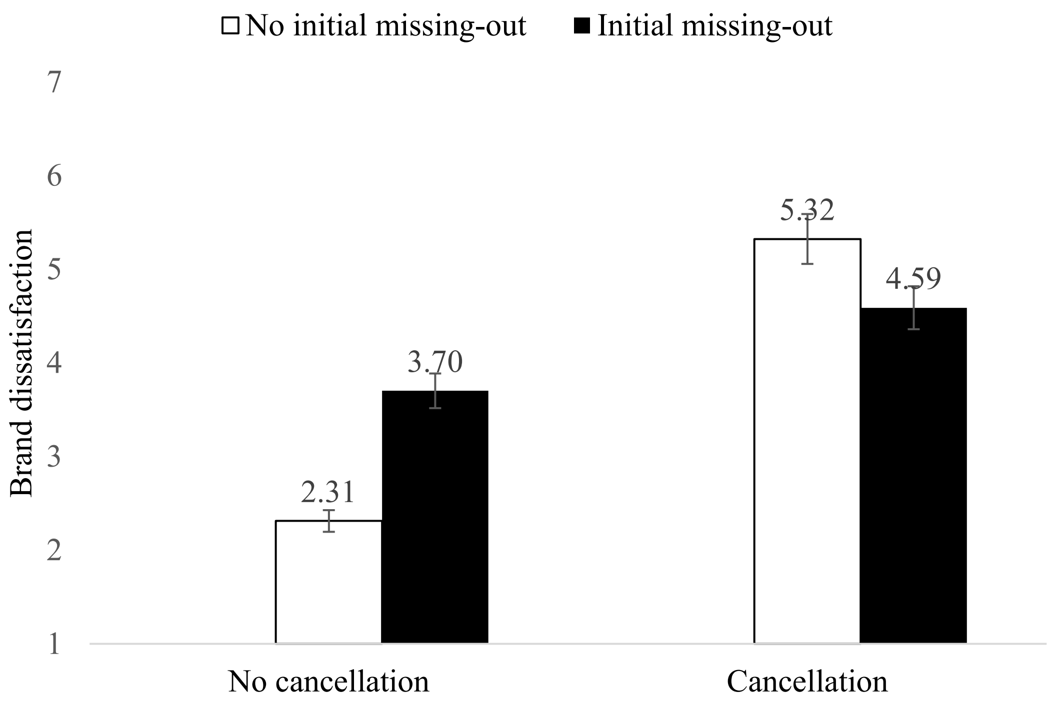
Brand dissatisfaction. A two-way ANOVA was conducted on brand dissatisfaction using initial missing-out and cancellation as the factors. I found a significant main effect of initial missing-out on brand dissatisfaction ($M_{\text{initial\_missing-out}}$ = 4.15, SD = 1.41 vs. $M_{\text{no\_initial\_missing-out}}$ = 3.80, SD = 1.95, $F(1, 396) = 6.46$, $p = .011$, $\eta^2_p = .016$), and a significant main effect of cancellation on brand dissatisfaction ($M_{\text{no\_cancellation}}$ = 3.00, SD = 1.37 vs. $M_{\text{cancellation}}$ = 4.95 SD = 1.43, $F(1, 396) = 228.21$, $p < .001$, $\eta^2_p = .366$). I also found a significant interaction effect of initial missing-out and cancellation on brand dissatisfaction ($F(1, 396) = 67.76$, $p < .001$, $\eta^2_p = .146$). The simple effects revealed that when consumers did not encounter initial missing-out, cancellation (vs. no cancellation) led to greater brand dissatisfaction ($M_{\text{no\_cancellation}}$ = 2.31, SD = 1.10 vs. $M_{\text{cancellation}}$ = 5.32, SD = 1.37, $F(1, 396) = 272.33$, $p < .001$, $\eta^2_p = .407$). This effect was weakened when consumers initially missed out on the fitness class ($M_{\text{no\_cancellation}}$ = 3.70, SD = 1.25 vs. $M_{\text{cancellation}}$ = 4.59, SD = 1.41, $F(1, 396) = 23.63$, $p < .001$, $\eta^2_p = .056$).

A second set of planned contrasts revealed that, when the class was not cancelled, consumers who initially missed out were more dissatisfied than those who did not initially missed it ($M_{\text{initial\_missing-out}}$ = 3.70, SD = 1.25 vs. $M_{\text{no\_initial\_missing-out}}$ = 2.31, SD = 1.10, $F(1, 396) = 58.04$, $p < .001$, $\eta^2_p = .128$); however, when the class was cancelled, consumers who initially missed out (i.e., missing-out was overdetermined) were less dissatisfied than those who did not initially miss out ($M_{\text{initial\_missing-out}}$ = 4.59, SD = 1.41 vs. $M_{\text{no\_initial\_missing-out}}$ = 5.32, SD = 1.37, $F(1, 396) = 16.19$, $p < .001$, $\eta^2_p = .039$).

FIGURE 4 (STUDY 2)

INTERACTION EFFECT OF INITIAL MISSING-OUT AND CANCELLATION ON

BRAND DISSATISFACTION



Difficulty of imagining. A two-way ANOVA was conducted on difficulty of imagining using initial missing-out and cancellation as the factors. The results indicated no significant main effect of initial missing-out (F(1, 396) = .85, p = .357, η^2_p = .002), but a marginally significant main effect of cancellation (F(1, 396) = 3.19, p = .075, η^2_p = .008). No cancellation condition was considered more difficult to imagine than cancellation condition ($M_{\text{no\_cancellation}}$ = 2.27, SD = 1.64 vs. $M_{\text{cancellation}}$ = 2.01, SD = 1.33) There was no interaction effect of initial missing-out and cancellation on difficulty of imagining (F(1, 396) = 1.33, p = .249, η^2_p = .003). As cancellation had a marginally significant main effect, I ran two additional ANCOVAs on disappointment as well as brand dissatisfaction, using initial missing-out and cancellation as the IVs and including difficulty of imagining as a covariate. The interaction effect of initial missing-out and cancellation on disappointment and brand dissatisfaction held using difficulty of imagining as the covariate. Thus, I will not measure difficulty of imagining in the future studies.

Discussion

In this study, I first showed that consumers did feel disappointed when they missed out on events they had intended to participate in, compared to when they did not miss out. I also had evidence supporting H1 that this negative effect of missing-out on disappointment is reversed when the missing-out is overdetermined. Similar to Study 1a, when the event was cancelled, those who initially missed out (i.e., when an overdetermining factor was present) were less disappointed than those who did not initially missed out. This indicates that consumers feel less disappointed when they miss out due to two independent reasons (i.e., misremembering the date and class cancellation), compared to when they miss out due to only one reason (i.e., misremembering the date or class cancellation), regardless of whether the initial missing-out reasons is internal or external. The effect of overdetermination on disappointment should hold as long as there are two or more sufficient and independent reasons leading to the same outcome.

Moreover, results confirmed that the interaction effect of initial missing-out and cancellation on disappointment remained robust even after including difficulty of imagination as covariate, which ruled out the difficulty of imagining the scenarios as a possible confounding factor.

In addition, I measured brand dissatisfaction. The results showed that consumers were less dissatisfied with the brands when the missing-out was overdetermined, even if the event is cancelled by brands. I measured brand dissatisfaction in study 2 and the following study 3 because I used brand cancellation as one of the reasons for consumers' missing-out in the vignettes. It is interesting and important to study beyond the specific emotion of disappointment and investigate how overdetermination might influence consumers' attitudes towards the associated brands. However, brand dissatisfaction is not the focus of this research, as brand cancellation is not necessary for overdetermination of missing-out. I do not always include brand cancellation in experiment vignettes (e.g., study 1b and study 5), so it does not make sense to focus on brand dissatisfaction.

4.4 Study 3: Testing the Full Model

Study 3 has two key objectives. First, it aims to test the mechanism underlying the reduced disappointment I observed for consumers' missing-out on an opportunity in the context of overdetermination. I propose that overdetermined missing-out induces consumers' fate attribution which then reduces disappointment (H2). Second, one may argue that a potential reduction in general negative emotions can also explain the effect of overdetermination on disappointment. It is possible that when missing out (vs. not missing out) on an opportunity, consumers will develop negative emotions because of not being able to obtain the opportunity. These general negative emotions may then lead to consumer disappointment. However, the general negative emotions may attenuate when the missing-out is overdetermined (Lin et al. 2023), and thus the disappointment will be reduced. Thus, the reduction in general negative emotions may serve as an alternative explanation for the observed effect of overdetermination on reduced disappointment. To test this, I additionally measured negative emotions. The preregistration is available at https://aspredicted.org/2BJ_RVG.

Method

This study followed a 2 (initial missing-out: yes vs. no) × 2 (cancellation: yes vs. no) between-subjects design. I set an a priori target sample size of N = 400 (N = 100 per condition). Four hundred and three participants from Prolific (59.5% female, M_{age} = 38.94, SD = 13.58) completed the experiment. Sensitivity analysis using G*Power software indicated that, given my experiment design and sample size, the smallest effect size I was adequately powered to detect was f = 0.14 (with 403 participants, a 0.05 alpha error rate, and 80% power).

Participants were randomly assigned to one of the four conditions. Similar to previous study 1a and study 2, participants read that they either got ready early to see a comedy show or missed out on it due to misremembering the show time. Half of the participants then read that the show went on as planned, while the other half read that the show was cancelled.

Next, participants answered a short survey. Disappointment (α = .956) and brand dissatisfaction (α = .949) were measured with the same questions used in study 2. Participants reported their fate attribution with question similar to study 1a and study 1b. In addition, negative emotions were measured by asking participants to rate to what extent they experienced pain/was upset/was unhappy (1 = Not at all, 7 = Very much; α = .854). The measuring order of the DV (disappointment and brand dissatisfaction) and proposed mediator (fate attribution and negative emotions) was counterbalanced. No order effects were observed on any of the measures, hence I collapsed across the order conditions in the analyses. As an attention check, participants were asked if they had seen the comedy show or not (1 = Yes, 2 = No, 3 = I am not sure). Finally, participants reported their age and gender. As preregistered, I coded participants in the no initial missing-out and no cancellation condition who chose "Yes", and all other participants who chose "No", as passing the attention check. Thirty-three participants failed the attention check. The attention check failure was not balanced across conditions, as 23 participants in the no initial missing-out and no cancellation condition failed the check (15 of them chose "I don't know"). This issue may be similar to those in study 1a and study 2, where the vignette ("got ready early to ensure you would not miss it") was not sufficiently clear about participants successfully making it to the comedy show. The pattern of the results did not change after excluding those who failed the attention check. I retained all participants in the subsequent analyses.

Results

Fate attribution. A two-way ANOVA was conducted on fate attribution using initial missing-out and cancellation as the factors. I found no significant main effect of initial missing-out ($F(1, 399) = 1.24$, $p = .266$, $\eta^2_p = .003$) or cancellation ($F(1, 399) = .30$, $p = .585$, $\eta^2_p = .001$) on fate attribution. Importantly, there was a significant interaction effect of initial missing-out and cancellation on fate attribution ($F(1, 399) = 4.79$, $p = .029$, $\eta^2_p = .012$). Planned contrasts revealed that, for participants that did not initially miss out the show, there was no significant difference in fate attribution whether the show was cancelled or not ($M_{\text{cancellation}} = 3.81$, SD = 1.59 vs. $M_{\text{no\_cancellation}} = 4.09$, SD = 1.64, $F(1, 399) = 1.30$, $p = .255$, $\eta^2_p = .003$). However, as predicted, for participants who initially missed out on the show, they reported greater fate attribution when the show was cancelled (i.e., missing-out was overdetermined) than when it went on as planned ($M_{\text{cancellation}} = 4.37$, SD = 1.91 vs. $M_{\text{no\_cancellation}} = 3.90$, SD = 1.71, $F(1, 399) = 3.87$, $p = .050$, $\eta^2_p = .010$).

A second set of planned contrasts revealed that, in the no cancellation condition, fate attribution did not vary significantly across the initial missing-out and no initial missing-out conditions ($M_{\text{initial\_missing-out}} = 3.90$, SD = 1.71 vs. $M_{\text{no\_initial\_missing-out}} = 4.09$, SD = 1.64, $F(1, 399) = .56$, $p = .456$, $\eta^2_p = .001$); in the cancellation condition, participants who initially missed out on the comedy show (i.e., missing-out was overdetermined) had greater fate attribution than those who did not initially miss out ($M_{\text{initial\_missing-out}} = 4.37$, SD = 1.91 vs. $M_{\text{no\_initial\_missing-out}} = 3.81$, SD = 1.59, $F(1, 399) = 5.64$, $p = .018$, $\eta^2_p = .014$).

Similar to Study 1a and 2, I pooled the two non-overdetermined conditions. Thus, we have three conditions: baseline condition (no initial missing-out and no cancellation) vs. non-overdetermined condition vs. overdetermined condition. A one-way ANOVA (not preregistered) was conducted on fate attribution using condition as the factor. I found a significant effect of condition ($F(2, 410) = 209.11$, $p = .032$, $\eta^2 = .017$) on fate attribution. Post-hoc comparisons using Tukey HSD test revealed that participants in the overdetermined condition reported significantly greater fate attribution than those in the non-overdetermined condition ($M_{\text{overdetermined}} = 4.37$, SD = 1.90 vs. $M_{\text{non-overdetermined}} = 3.85$, SD = 1.65, $p = .029$).

Negative emotions. A two-way ANOVA was conducted on negative emotions using initial missing-out and cancellation as the factors. I found significant main effects of initial missing-out ($M_{\text{no\_initial\_missing-out}} = 3.10$, SD = 1.86 vs. $M_{\text{initial\_missing-out}} = 3.84$, SD = 1.54, $F(1, 399) = 42.18$, $p < .001$, $\eta^2_p = .096$) and cancellation ($M_{\text{cancellation}} = 3.81$, SD = 1.55 vs. $M_{\text{no\_cancellation}} = 3.13$, SD = 1.86, $F(1, 399) = 37.35$, $p < .001$, $\eta^2_p = .086$) on negative emotions. Importantly, there was a significant interaction effect of initial missing-out and cancellation on negative emotions ($F(1, 399) = 288.61$, $p < .001$, $\eta^2_p = .420$). Specifically, individuals who did not initially miss out on the comedy show reported more negative emotions when the show was cancelled than when it went on as planned ($M_{\text{cancellation}} = 4.49$, SD = 1.26 vs. $M_{\text{no\_cancellation}} = 1.56$, SD = 1.01, $F(1, 399) = 258.09$, $p < .001$, $\eta^2_p = .393$). However, individuals who initially missed out on the comedy show had less negative emotions when the show was cancelled (i.e., missing-out was overdetermined) than when it went on as planned ($M_{\text{cancellation}} = 3.16$, SD = 1.53 vs. $M_{\text{no\_cancellation}} = 4.53$, SD = 1.19, $F(1, 399) = 61.22$, $p < .001$, $\eta^2_p = .133$).

Another set of planned contrasts reveal that, in the no cancellation condition, people who initially missed out (vs. did not initially miss out) on the comedy show reported more negative emotions ($M_{\text{initial\_missing-out}} = 4.53$, SD = 1.19 vs. $M_{\text{no\_initial\_missing-out}} = 1.56$, SD = 1.01,

$F(1, 399) = 266.72$, $p < .001$, $\eta^2_p = .401$); in the cancellation condition, people who initially missed out (vs. did not initially miss out) on the comedy show had less negative emotions ($M_{\text{initial\_missing-out}} = 3.16$, SD = 1.53 vs. $M_{\text{no\_initial\_missing-out}} = 4.49$, SD = 1.26, $F(1, 399) = 56.99$, $p < .001$, $\eta^2_p = .125$).

Disappointment. A two-way ANOVA was conducted on disappointment using initial missing-out and cancellation as the factors. The analyses yielded significant main effects of initial missing-out ($M_{\text{no\_initial\_missing-out}} = 4.38$, SD = 2.18 vs. $M_{\text{initial\_missing-out}} = 5.08$, SD = 1.36, $F(1, 399) = 42.32$, $p < .001$, $\eta^2_p = .096$) and cancellation on disappointment ($M_{\text{cancellation}} = 5.49$, SD = 1.34 vs. $M_{\text{no\_cancellation}} = 3.94$, SD = 1.96, $F(1, 399) = 172.99$, $p < .001$, $\eta^2_p = .302$). This study also replicated the significant interaction effect of initial missing-out and cancellation on disappointment ($F(1, 399) = 287.62$, $p < .001$, $\eta^2_p = .419$). The simple effects supported my prediction: consumers who did not initially miss out on the comedy show felt more disappointed when the comedy show was cancelled than when it went on as planned ($M_{\text{cancellation}} = 6.14$, SD = 1.03 vs. $M_{\text{no\_cancellation}} = 2.40$, SD = 1.22, $F(1, 399) = 438.54$, $p < .001$, $\eta^2_p = .524$); however, and more importantly, consumers who initially missed out on the comedy show felt less disappointed when the comedy show was cancelled (i.e., missing-out was overdetermined) than when it went on as planned ($M_{\text{cancellation}} = 4.84$, SD = 1.29 vs. $M_{\text{no\_cancellation}} = 5.32$, SD = 1.40, $F(1, 399) = 7.50$, $p = .006$, $\eta^2_p = .018$).

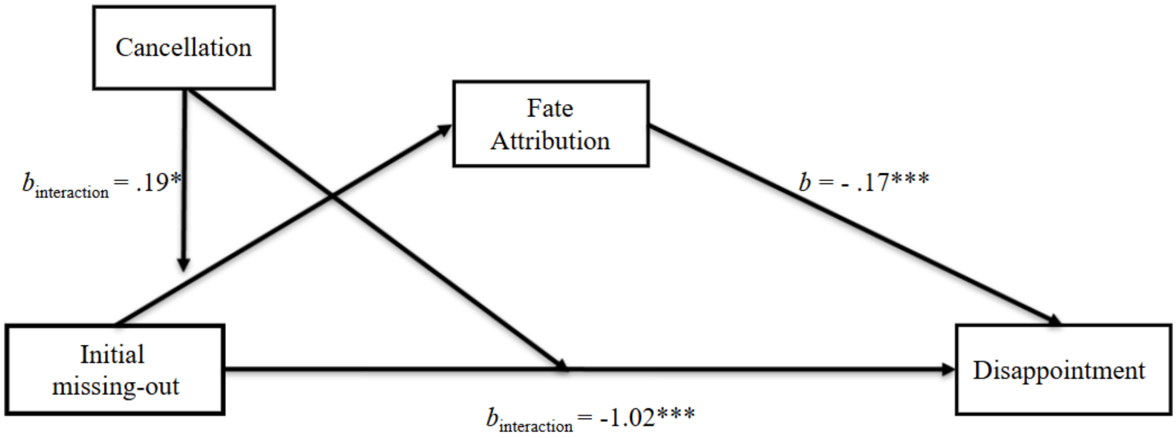
A second set of planned contrasts showed that, in the no cancellation condition, people who initially missed out (vs. did not initially miss out) on the comedy show felt more disappointed ($M_{initial\_missing\text{-}out} = 5.32$, SD = 1.40 vs. $M_{\text{no\_initial\_missing-out}} = 2.40$, SD = 1.22. $F(1, 399) = 266.30$, $p < .001$, $\eta^2_p = .400$); in contrast, in the cancellation condition, people who initially missed out (vs. did not initially miss out) on the comedy show felt less disappointed ($M_{\text{initial\_missing-out}} = 4.84$, SD = 1.29 vs. $M_{\text{no\_initial\_missing-out}} = 6.14$, SD = 1.03 $F(1, 399) = 56.55$, $p < .001$, $\eta^2_p = .124$).

Similar to Studies 1a and 2, we pooled the two non-overdetermined conditions. A one-way ANOVA (not preregistered) was conducted on disappointment using condition as the factor. I found a significant effect of condition ($F(2, 411) = 223.97$, $p < .001$, $\eta^2 = .522$) on disappointment. Post-hoc comparisons using Tukey HSD test revealed that participants in the overdetermined condition reported significantly lower disappointment than those in the non-overdetermined condition ($M_{\text{overdetermined}} = 4.84$, SD = 1.28 vs. $M_{\text{non-overdetermined}} = 5.72$, SD = 1.30, $p < .001$), and significantly higher disappointment than those in the baseline condition ($M_{\text{baseline}} = 2.46$, SD =1.21 vs. $M_{\text{overdetermined}} = 4.84$, SD = 1.28, $p < .001$).

Underlying process of disappointment (fate attribution). To focus on my main hypotheses, I first ran a moderated mediation analysis on disappointment in SPSS (PROCESS Model 8), with initial missing-out as the independent variable (IV), cancellation as the moderator, and fate attribution as the mediator. Consistent with H2, the interactive effect of initial missing-out and cancellation on disappointment was mediated by fate attribution (b = - .06, SE = .03, 95% CI [- .134, - .007]; figure 5). Cancellation moderated the effect of initial missing-out on fate attribution ($b = .19$, SE = .09, $t(399) = 2.19$, $p = .029$); that is, initial missing-out increased fate attribution only the event was cancelled ($b = .28$, SE = .12, $t(399) = 2.37$, $p = .018$), but not when the event was not cancelled ($b = -.09$, SE = .12, $t(399) = -.75$, $p = .456$). Fate attribution then reduced disappointment ($b = -.17$, SE = .04, $t(398) = -4.69$, $p < .001$). As such, consistent with my hypothesis, fate attribution significantly mediated the effect of initial missing-out on disappointment in the presence of cancellation (b = - .05, SE = .02, 95% CI [- .097, - .007]), but not in the absence of cancellation ($b = .02$, SE = .02, 95% CI [- .022, .062]). Therefore, overdetermination of missing-out reduced disappointment through increased fate attribution.

FIGURE 5

PATH ANALYSIS (STUDY 3)



Note: *p < .05, **p < .01, ***p < .001

Underlying process of disappointment (negative emotions). I ran a moderated mediation analysis on disappointment in SPSS (PROCESS Model 8), with initial missing-out as the IV, cancellation as the moderator, and negative emotions as the mediator. The results showed that negative emotions mediated the interactive effect of initial missing-out and cancellation on disappointment (b = - .81, SE = .11, 95% CI = [-1.028, -0.614]). Specifically, negative emotions significantly mediated the effect of initial missing-out on disappointment differently depending on whether cancellation was present or absent. In the presence of cancellation, negative emotions negatively mediated the relationship between initial missing-out and disappointment (b = - .25, SE = .05, 95% CI [- .345, - .163]). Conversely, in the absence of cancellation, negative emotions positively mediated the relationship between initial missing-out and disappointment (b = .56, SE = .07, 95% CI [.423, .697]).

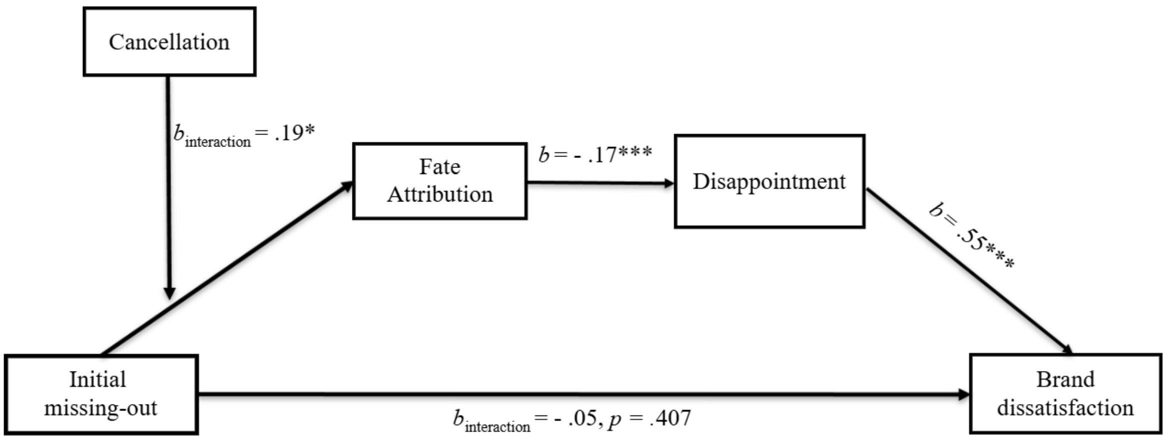
Parallel mediation. In addition, I ran a parallel moderated mediation analysis on disappointment in SPSS (PROCESS Model 8; not preregistered), with initial missing-out as the IV, cancellation as the moderator, fate attribution and negative emotions as the parallel mediators. The results showed that the interactive effect of initial missing-out and cancellation on disappointment was parallelly mediated by fate attribution (b = - .06, SE = .03, 95% CI [- .130, - .006]) and negative emotions (b = - .81, SE = .10, 95% CI = [-1.008, -0.608]). Thus, fate attribution remained a mediator of the relationship between overdetermination and disappointment even when the negative emotions were included.

Brand dissatisfaction. A two-way ANOVA was conducted on brand dissatisfaction using initial missing-out and cancellation as the factors. I found no significant main effect of initial missing-out on brand dissatisfaction ($F(1, 399) = .12$, $p = .73$, $\eta^2_p = .000$), but a significant main effect of cancellation on brand dissatisfaction ($M_{cancellation} = 5.06$, SD = 1.39 vs. $M_{no\_cancellation} = 3.10$, SD = 1.36, $F(1, 399) = 272.00$, $p < .001$, $\eta^2_p = .405$). More importantly, I replicated the significant interaction effect of initial missing-out and cancellation on brand dissatisfaction ($F(1, 399) = 113.15$, $p < .001$, $\eta^2_p = .221$). The simple effects supported my prediction: when consumers did not encounter initial missing-out, cancellation (vs. no cancellation) resulted in greater brand dissatisfaction ($M_{cancellation} = 5.73$, SD = 1.15 vs. $M_{no\_cancellation} = 2.44$, SD = 1.07, $F(1, 399) = 355.97$, $p < .001$, $\eta^2_p = .471$). This effect was weakened when consumers initially missed out on the fitness class ($M_{cancellation} = 4.40$, SD = 1.29 vs. $M_{no\_cancellation} = 3.69$, SD = 1.33, $F(1, 399) = 17.74$, $p < .001$, $\eta^2_p = .043$). A second set of planned contrast showed that, when the event went on as planned, consumers who initially missed out were more dissatisfied than those who did not initially missed out ($M_{initial\_missing\text{-}out} = 3.69$, SD = 1.29 vs. $M_{no\_initial\_missing\text{-}out} = 2.40$, SD = 1.15, $F(1, 399) = 51.22$, $p < .001$, $\eta^2_p = .114$). When the event was cancelled, consumers who initially missed out were less dissatisfied than those who did not initially missed out ($M_{initial\_missing\text{-}out} = 4.40$, SD = 1.29 vs. $M_{no\_initial\_missing\text{-}out} = 5.73$, SD = 1.15, $F(1, 399) = 62.42$, $p < .001$, $\eta^2_p = .135$).

Underlying process of brand dissatisfaction. I ran additional moderated mediation analysis in SPSS (PROCESS Model 85; not preregistered), with initial missing-out as the IV, cancellation as the moderator, fate attribution and disappointment as the serial mediators, and brand dissatisfaction as the DV. The moderated mediation was significant (*b* = - .03, SE = .02, 95% CI [- .075, - .004]; figure 6). Cancellation moderated the effect of initial missing-out on fate attribution (*b* = .19, SE = .09, *t*(399) = 2.19, *p* = .029); that is, initial missing-out increased fate attribution only in cancellation condition (i.e., missing-out was overdetermined) (*b* = .28, SE = .12, *t*(399) = 2.37, *p* =.018) but not in no cancellation condition (*b* = - .09, SE = .12, *t*(399) = - .75, *p* = .456). Fate attribution then reduced disappointment (*b* = - .17, SE = .04, *t*(398) = -4.69, *p* < .001), which in turn reduced brand dissatisfaction (*b* = .55, SE = .04, *t*(397) = 13.55, *p* < .001). As such, initial missing-out indirectly reduced brand dissatisfaction through fate attribution and disappointment in the cancellation condition (*b* = - .03, SE = .01, 95% CI [- .053, - .005]), but not in the no cancellation condition (*b* = .008, SE = .01, 95% CI [- .013, .034]).

FIGURE 6

PATH ANALYSIS (STUDY 3)



Note: *p < .05, **p < .01, ***p < .001

Discussion

Study 3 replicated the effect of overdetermined missing-out on reducing consumer disappointment. Supporting H2, fate attribution mediated the effect of overdetermination of missing-out on disappointment. Consumers who initially missed out on the desired event had greater fate attribution when the event was cancelled (vs. not cancelled), and the greater fate attribution, in turn, reduced their disappointment. I additionally showed that negative emotions also played a role in the effect of overdetermination on disappointment. Consumers who initially missed out on the desired event had less negative emotions when the event was cancelled (vs. not cancelled), and the reduced negative emotions, in turn, reduced their disappointment towards the event. This aligns with Lin er al. (2023)'s work on emotional attenuation in overdetermined situations. Importantly, the results suggested that fate attribution and negative emotions mediated the overestimation effect differently. Negative emotions positively mediated the relationship between initial missing-out and disappointment (when the overdetermining factor, cancellation, was absent), whereas fate attribution did not mediate this relationship in the absence of overdetermining factor (only mediated in the presence of overdetermining factor). Additional parallel moderated mediation analyses supported that fate attribution independently mediated the overdetermination effect.

In addition, study 3 replicated the effect of overdetermination on reducing brand dissatisfaction and further investigated the underlying process. It provided evidence that the interactive effect of initial missing-out and cancellation on brand dissatisfaction was serially mediated by fate attribution and disappointment. In other words, overdetermination of missing-out reduced consumer brand dissatisfaction with brands through increased fate attribution and reduced consumer disappointment.

To establish discriminant validity among the key constructs in study 3, I examined whether disappointment, general negative emotions, and fate attribution represent empirically distinct psychological responses. Although disappointment and negative affect are conceptually related, they are not interchangeable: disappointment reflects unmet positive expectations of a specific outcome, whereas negative affect captures a broader emotional reaction (Zeelenberg and Pieters 2004). Consistent with this distinction, the correlation between disappointment and negative emotions was positive but moderate, indicating that they do not measure the same underlying construct. Moreover, fate attribution was only weakly correlated with both disappointment and negative emotions, supporting the claim that fate attribution captures a distinct cognitive appraisal rather than an affective response. The parallel mediation analysis further confirms discriminant validity: fate attribution predicts disappointment even when controlling for general negative affect, demonstrating that the psychological mechanism is not reducible to simply "feeling bad" but reflects a unique attributional process.

4.5 Summary

Chapter 4 tested the proposed conceptual model. Study 1a first showed that overdetermination of missing-out induced greater fate attribution. It also showed that participants who did not miss out due to any reason reported similar levels of fate attribution as those who missed out due to one reason. Building on these findings, study 1b furthered by manipulating the initial missing-out reason (internal vs. third-party). It demonstrated that overdetermination of missing-out had a positive effect on fate attribution regardless of whether the initial missing-out reason was internal or not. More importantly, this study measured other types of blame attributions including self-, third-party, and brand attributions. Although overdetermination of missing-out changed these blame attributions, controlling for them, I still found that overdetermination had a significant influence on fate attribution. That is, the effect of overdetermination on fate attribution is independent of other blame attributions. Conceptually, this suggests that fate attribution is an independent construct, instead of simply a proxy of the other blame attributions.

Study 2 examined the main effect of overdetermination on disappointment. A 2 (initial missing-out) x 2 (cancellation) design was employed to include a baseline condition (no initial missing-out and no cancellation) where participants did not miss out. The results showed that consumers felt more disappointed when they missed out compared to when they did not, which was different with the fate attribution finding in study 1a, where the baseline condition showed similar levels of fate attribution as the non-overdetermined missing-out conditions. Importantly, as predicted, overdetermination attenuated the effect of missing out on disappointment. Additionally, to exclude the potential influence of confound, difficulty of imagining the scenarios was measured. The results revealed that participants did not find it more difficult to imagine missing out due to two reasons compared to just one reason.

Study 3 provided evidence of fate attribution as the underlying mechanism for the effect of overdetermination on disappointment. Another potential alternative account, negative emotions, was also measured. The analyses illustrated that fate attribution independently mediated the overdetermination effect, and that fate attribution and negative emotions mediated the effect differently. Moreover, this study revealed the underlying process of overdetermination on brand dissatisfaction: overdetermination of missing-out was found to reduce brand dissatisfaction sequentially through increased fate attribution and reduced disappointment.

In this chapter, I discussed important emotional responses of consumers when they encounter overdetermined missing-out and explained the underlying process. In the following two chapters, I focus on the subsequent outcomes that might have practical implications for brands.

CHAPTER 5: COMPENSATION SATISFACTION

In this chapter, I examine how overdetermination of missing-out affects consumers' satisfaction with compensation. This has practical relevance when consumers miss out due to brand-related reasons, such as when brands cancel an event and offer compensation for the cancellation. Compensation satisfaction is a key downstream consequence examined in this thesis because it is a strong predictor of various outcomes such as consumers' loyalty, re-patronage intentions, and word-of-mouth behaviours (Choi and Choi 2014; Kau and Wan-Yiun Loh 2006; Mattila 2001; Swanson and Kelley 2001; Wirtz and Mattila 2004). The question of how to compensate consumers following a service failure has been extensively studied (Grewal, Roggeveen, and Tsiros 2008; Roschk and Gelbrich 2014; Smith and Bolton 2002; Tang et al. 2018). Generally, the more disappointed consumers are, the greater the compensation they presumably demand to rectify their negative feelings (Goodwin and Ross 1992; Smith, Bolton, and Wagner 1999). Smith et al. (1999) argued that service failures are perceived as losses, which disrupt the balance in an exchange relationship between brands and consumers. The service failure magnitude determines the perceived loss, which, in turn, influences the amount of compensation required to address the loss (Smith et al.1999). Consequently, the greater the magnitude of the service failure, the greater the compensation needed. Furthermore, when consumers perceive a larger loss, they tend to be less satisfied with the compensation offered because the larger loss raises consumers' expectations of what constitutes adequate compensation (Gilly and Gelb 1982; Hess, Ganesan, and Klein 2003; Landon 1997). These findings suggest that consumer disappointment is negatively correlated with their satisfaction with a given compensation. Thus, if overdetermination reduces disappointment as shown in study 2 and study 3, then the reduced disappointment may result in greater satisfaction with a compensation offer.

5.1 Study 4A: Subsequent Impact on Compensation Satisfaction in A Hedonic Context

Brands often provide compensation to disappointed consumers when they have to cancel an event or cannot provide a product (Gelbrich and Roschk 2011a; Roschk and Gelbrich 2014). Compensation satisfaction plays a critical role in helping brands maintain positive relationships with consumers following service failures (Choi and Choi 2014; Maxham and Netemeyer 2002). As discussed above, greater service failure magnitude leads to higher levels of disappointment, which in turn increases consumers' expectations for compensation (Hess et al. 2003; Smith et al. 1999). Therefore, I propose that consumers in the overdetermined missing-out situation will have greater satisfaction with a compensation offer due to their reduced disappointment, compared to those in the non-overdetermined missing-out situation. The preregistration is available at https://aspredicted.org/zy67-fz8c.pdf.

Method

This study followed a 2-condition (missing-out: overdetermined vs. non-overdetermined) between-subjects design, as including a baseline condition (no missing-out) was not appropriate for examining compensation satisfaction. The missing-out reason was designed to involve brand cancellation in both conditions, ensuring that the brand's offer of compensation for the cancellation appeared logical and contextually appropriate. I set an a priori target sample size of N = 200 (N = 100 per condition), and recruited 200 participants from Prolific (56% female, M_{age} = 38.54, SD = 11.77). Sensitivity analysis using G*Power software indicated that, given my experiment design and sample size, the smallest effect size I was adequately powered to detect was d = 0.40 (with 200 participants, a 0.05 alpha error rate, and 80% power).

All participants were asked to read and imagine that they were on the way to see a live comedy show but were informed that the show was cancelled unexpectedly. Then, participants in the overdetermined condition additionally read that they would have missed the show anyway due to a flat tire.

Then, all participants completed a short survey. Disappointment was measured with the following question: “How disappointed do you feel about missing the show now?” (1 = Not disappointed at all, 7 = Very disappointed). To measure compensation satisfaction, participants were told that the show venue would compensate them for the cancellation. Then, they were randomly assigned to rate two out of four compensation options: “How satisfied would you be if they offer a full refund of the ticket price to your credit card/a ticket to the same show in six months/an 80% refund plus a T-shirt with the logo of the comedy club/a 70% refund plus a travel mug with a quote from the comedian as a compensation?” (1 = Not satisfied at all, 7 = Very satisfied). As an attention check, participants were asked if they had seen the live comedy show or not (1 = Yes, 2 = No, 3 = I am not sure). Finally, participants reported their age and gender. As preregistered, I coded participants who chose ‘yes’ and ‘I don’t know’ as failing the attention check. Twelve participants failed the attention check. The pattern of the results did not change after excluding those who failed the attention check. I retained all participants in the subsequent analyses.

Results

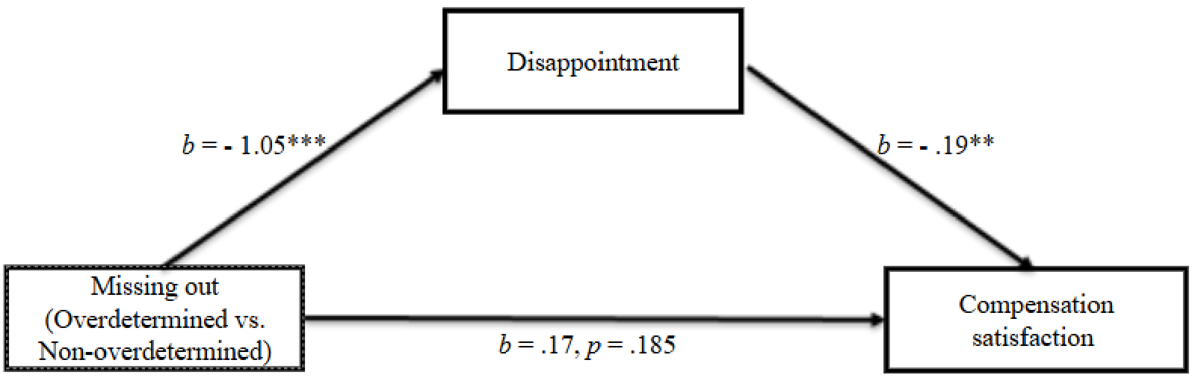
Disappointment. A t-test was conducted on disappointment using missing-out condition as the factor. Replicating study 2 and study 3, participants in the overdetermined condition felt less disappointed than those in the non-overdetermined condition ($M_{\text{non-overdetermined}}$ = 6.21, SD = 1.04 vs. $M_{\text{overdetermined}}$ = 4.10, SD = 2.11, $t(142.62) = -8.94$, $p < .001$, $d = 1.27$).

Compensation satisfaction. I first computed the average satisfaction score for the two options rated by each participant and collapsed them into one index of compensation satisfaction. Then, a t-test was conducted on compensation satisfaction using missing-out condition as the factor. I found that participants in the overdetermined condition were more satisfied with the compensation than those in the non-overdetermined condition ($M_{\text{overdetermined}}$ = 4.85, SD = 1.58 vs. $M_{\text{non-overdetermined}}$ = 4.12, SD = 1.50, $t(198) = 3.35$, $p < .001$, $d = .47$).

Mediation. Finally, I ran a mediation analysis on compensation satisfaction in SPSS (PROCESS Model 4), with missing-out condition as the IV and disappointment as the mediator. The result revealed that the effect of overdetermined missing-out on compensation satisfaction was mediated by disappointment ($b = .20$, SE = .07, 95% CI [.063, .336]; figure 7). Overdetermination of missing-out reduced disappointment ($b = -1.05$, SE = .12, $t(198) = -8.99$, $p < .001$), and reduced disappointment in turn improved compensation satisfaction ($b = -.19$, SE = .07, $t(197) = -2.86$, $p = .005$). Therefore, the overdetermination of missed opportunities enhanced consumer satisfaction with compensation by alleviating their disappointment.

FIGURE 7

PATH ANALYSIS (STUDY 4A)



Note: $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Discussion

This study replicated the effect of overdetermination on disappointment, that is, consumers felt less disappointed when their missing-out was overdetermined (vs. not overdetermined). Furthermore, this study investigated an important downstream consequence, namely, compensation satisfaction. I found that consumers were significantly more satisfied with the compensation offered by brands when their missing-out was overdetermined (vs. not overdetermined). The mediation analysis showed that the effect of overdetermination on compensation satisfaction was mediated by disappointment. Confirming my hypothesis, the reduced disappointment due to overdetermination made consumers more satisfied with the compensation offered.

Moreover, this study had participants to encounter cancellation by brand first, before experiencing another missing-out reason, which is different to previous study (participants experienced cancellation later). The results demonstrated that the order of experiencing cancellation does not have an effect on disappointment.

So far, I have only examined the hypotheses with hedonic experiences including yoga class (study 1a, study 2) art exhibition (study 1b), and comedy show (study 3). However, according to my theorizing, consumers should feel disappointed missing out on any opportunities that that align with their goals, regardless of hedonic value. Thus, I expect that the overdetermination effects on disappointment, and subsequently on compensation satisfaction, are applicable to non-hedonic context as well. I test this prediction in the next study.

5.2 Study 4B: Subsequent Impact on Compensation Satisfaction in A Non-Hedonic Context

In study 4a, I found that the reduced disappointment caused by the overdetermination of missing-out led to greater consumer satisfaction with the compensation offered. In the current study, I aim to replicate these results with a non-hedonic context as well as with a different population (students). Specifically, I ask the students to imagine missing out on a student registration session, which is a utilitarian event, but presumably aligns with their goal to make use of their student status. I expect that the students in the overdetermined missing-out condition will feel less disappointed than those in the non-overdetermined missing-out condition, and they will therefore be more satisfied with the compensation than those in the non-overdetermined missing-out condition. The preregistration is available at https://aspredicted.org/mb4n-4jbj.pdf.

Method

This study followed a 2-condition (missing-out: overdetermined vs. non-overdetermined) between-subject design. I set an a priori target sample size of N = 200 (N = 100 per condition). One hundred and ninety-four students from a university participant pool in the UK completed the study in exchange for course credits (68.2% female, M_{age} = 21.15, SD = 2.33). Sensitivity analysis using G*Power software indicated that, given my experiment design and sample size, the smallest effect size I was adequately powered to detect was d = 0.40 (with 194 participants, a 0.05 alpha error rate, and 80% power).

Students were asked to imagine that they were going to complete an in-person school registration but found the registration office closed unexpectedly. Students in the overdetermined condition additionally read that they forgot their ID and would not have been able to complete the registration anyway.

Then, all participants completed a short survey. Disappointment was measured with the same question as in the previous studies. To measure compensation satisfaction, participants were told that they received an email from the registration office later that day, and that they were offered a coffee voucher as compensation for the unexpected closure.

Then, participants indicated their compensation satisfaction with the following question: "How satisfied would you be with this compensation (a coffee voucher)?" (1 = Not satisfied at all, 7 = Very satisfied). As an attention check, participants were asked if they had finished the registration or not in this scenario (1 = Yes, 2 = No, 3 = I am not sure). Finally, participants reported their age and gender. As preregistered, I coded participants who chose "Yes" and "I don't know" as failing the attention check. Only 59.8% of participants passed the attention check (selected "No"). For consistency, I retained all participants in the subsequent analyses. The changed results by excluding those who failed the attention checked are reported below as well.

Results

Disappointment. A t-test was conducted on disappointment using missing-out condition as the factor. Replicating study 2, study 3, and study 4a, participants in the overdetermined condition felt less disappointed than those in the non-overdetermined condition ($M_{\text{non-overdetermined}} = 5.39$, SD = 1.50 vs. $M_{\text{overdetermined}} = 4.21$, SD = 1.84, $t(185.02) = -4.91$, $p < .001$, $d = .70$).

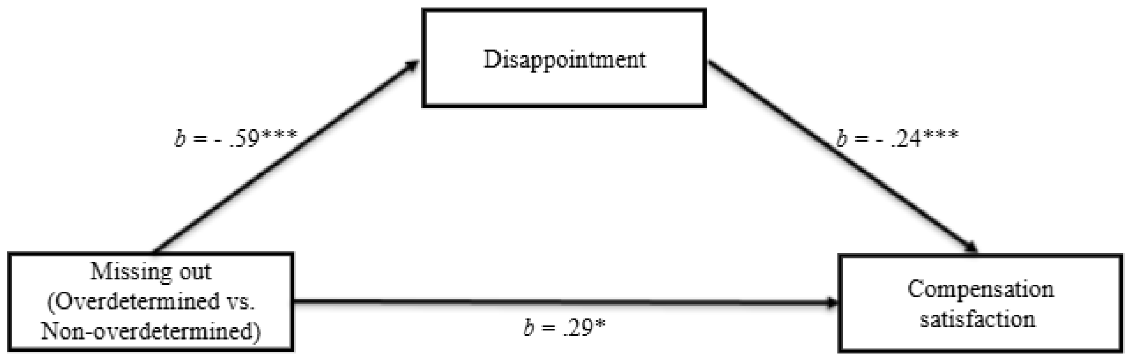
Compensation satisfaction. A t-test was conducted on compensation satisfaction using missing-out condition as the factor. Replicating study 4a, participants in the overdetermined condition were more satisfied with the compensation than those in the non-overdetermined condition ($M_{\text{overdetermined}} = 4.72$, SD = 1.63 vs. $M_{\text{non-overdetermined}} = 3.86$, SD = 1.71, $t(193) = 3.62$, $p < .001$, $d = .52$).

Mediation. Finally, I ran a mediation analysis on compensation satisfaction in SPSS (PROCESS Model 4), with missing-out condition as the IV and disappointment as the mediator. Replicating study 4a, the effect of overdetermined missing-out on compensation satisfaction was mediated by disappointment ($b = .43$, SE = .12, 95% CI [.197, .668]; figure

8). Overdetermination of missing-out reduced disappointment (*b* = - .59, SE = .12, *t*(193) = - 4.92, *p* < .001), and reduced disappointment in turn improved compensation satisfaction (*b* = - .24, SE = .07, *t*(192) = -3.46, *p* < .001). Hence, overdetermination of missing-out improved consumers' compensation satisfaction by reducing consumer disappointment of the missing-out. There was also a significant direct effect of overdetermination of missing-out on compensation satisfaction (*b* = - .29, SE = .12, *t*(192) = 2.35, *p* = .020). The significance of the direct effect changed when the mediation analysis was re-run excluding participants who failed the attention check. Specifically, the direct effect was not significant (*b* = - .20, SE = .16, *t*(192) = 1.19, *p* = .24).

FIGURE 8

PATH ANALYSIS (STUDY 4B)



Note: **p* < .05, ***p* < .01, ****p* < .001

Discussion

This study replicated the results in study 4a, which is that overdetermination of missing-out improved consumers' compensation satisfaction by reducing their disappointment. Importantly, this study showed that the effects of overdetermination on disappointment and compensation satisfaction were generalisable to non-hedonic context.

This study had a high attention check failure rate. A total of 19.1% of students chose "Yes", and 21.3% chose "I don't know". It is possible that the students interpreted the question as asking whether they had registered for school in real life, or they took the survey as a test related to their academic grades and wanted to avoid failing the test. Therefore, the attention check might not be valid, as students may have misunderstood it rather than failed to pay attention.

5.3 Summary

Prior research on service failures that are attributed to the brands have demonstrated negative consumer responses such as negative word-of-mouth, complaining, and brand switching (Bonifield and Cole 2007; Choi and Mattila 2008; Dunn and Dahl 2012; Wu and Wang 2017). I showed that attribution to fate reduces negative responses, and interestingly, service failures such as cancellation could serve as an overdetermining factor to induce fate attribution. Hence, service failures might be less damaging in an overdetermination situation. Indeed, study 4a and study 4b together provided strong evidence that the overdetermination of missing-out reduced consumer disappointment and subsequently enhanced consumers' satisfaction with the compensation offered by brands. Moreover, I theorized that consumers should experience a feeling of missing-out when the missed opportunity aligns with their goals, regardless of whether the missed opportunity is hedonic or non-hedonic. Indeed, these two studies demonstrated that the effects of overdetermination on disappointment and compensation satisfaction generalized to both hedonic and non-hedonic contexts.

Chapter 5 examined and discussed one downstream consequence of the overdetermination effect, however, there might be other aspects that brands should pay attention to. In addition to offering compensation when brands initiate consumers' missing-out, they may also provide alternatives or reengagement opportunities for the missed-out consumers. I am interested in how consumers *behave* in response to overdetermined missing-out. For instance, would they choose alternatives? Would they be interested in engaging with the missed products again? I will discuss these potential downstream behavioural consequences in the following chapter.

CHAPTER 6: BEHAVIOURAL CONSEQUENCES

In this chapter, I discuss other potential downstream consequences of the overdetermination effect on disappointment. First, I investigate how overdetermination may influence consumers' choice of alternatives when they miss out on an initial opportunity. Second, I assess whether overdetermination affects consumers' reengagement intention with the missed opportunities.

6.1 Choice of Alternative

When missing out on an opportunity, consumers may be offered alternatives. For example, in an online grocery shopping scenario, when a food item is unavailable, the retailer may recommend a similar product as an alternative. Consumers tend to choose alternatives having missed out on desired opportunities to improve the overall happiness, even if the alternatives are less attractive (Zhang, Smitizsky, and Amir 2021). Zhang et al. (2021) argued that the missing-out is perceived as a loss, and that loss motivates consumers to minimize the overall hedonic impact by engaging with alternatives. That is to say, consumers will compensate their loss by choosing an alternative over not having anything at all (Koles, Wells, and Tadajewski 2018). As I have found that overdetermination of missing-out reduces disappointment, I wonder whether overdetermined missing-out can lead to inaction toward alternatives. That is, consumers may feel less compelled to make up for the missed opportunity via alternatives when their missing-out is overdetermined. This may have important implications for brands to decide who and how to offer the alternatives when consumers miss out on the desired consumption. Moreover, there might be some insights for consumer well-being. When consumers miss out on desired opportunities, they may choose suboptimal alternatives, leading to potential problems such as overconsumption and waste of time and money. Choosing what is suboptimal or not initially aware of can also result in regret (Botti and Lyengar 2004; Landman 1987; Tsiros and Mittal 2000). To sum up, I propose that consumers who encounter overdetermined (vs. non-overdetermined) missing-out will be less likely to choose alternatives because of reduced disappointment. I test this prediction in the following four studies and summarize the results at the end this section.

6.1.1 Study 5: Another Seasonal Donut as Alternative

Study 5 has four goals. First, it tests choice of alternative by measuring participants' intention to buy an alternative product offered by the same brand. I preregistered the measurement as purchase intention, but for the writing consistency, I call it choice of alternative here. I expect that participants in the overdetermined (vs. non-overdetermined) condition are less likely to choose the alternative. Second, it measures fate attribution as well as self-, third-party, and brand attributions, aiming to replicate study 1b in terms of the independence of fate attribution. Third, unlike previous studies that focused on experiential contexts, the present study employs a physical product to test the generalizability of the overdetermination effect. I expect that the influence of overdetermined missing-out on fate attribution will hold regardless of whether the missed opportunity involves a purchase opportunity or a consumption experience. Finally, it examines whether fate attribution mediates the relationship between overdetermination and choice of alternative. The preregistration is available at https://aspredicted.org/z9kn-xjz5.pdf.

Method

This study followed a 2 (missing-out reason: internal vs. third-party) × 2 (overdetermination: overdetermined vs. non-overdetermined) between-subjects design. I included the factor of missing-out reason to test whether it moderates the effect of overdetermination on choice of alternative, as well as for measuring the other types of blame attribution. There was no need of a baseline condition (no missing-out) because it did not make sense to measure choice of alternative if participants did not experience missing-out. I set an a priori target sample size of N = 400 (N = 100 per condition). Four hundred and one participants from Prolific (67.6% female, M_{age} = 39.18, SD = 12.49) completed the experiment. Sensitivity analysis using G*Power software indicated that, given my experiment design and sample size, the smallest effect size I was adequately powered to detect was f = 0.14 (with 401 participants, a 0.05 alpha error rate, and 80% power).

Participants were randomly assigned to one of the four conditions. Participants read and imagined that they missed out on buying a seasonal maple donut either because they misremembered the availability date or were told the wrong information about it by a friend of yours. Then, those in the overdetermined condition additionally read that they cannot buy the donut anyway because they were out of town.

All participants then answered a short survey. I measured fate attribution, self-attribution, third-party attribution, and brand attribution by asking "To what extent do you think it is fate/your fault/someone else's fault/the café's fault that you missed the maple donuts? (1 = Not at all, 7 = Totally)". The measuring order of these blame attributions was randomised. Choice of alternative was measured by participants' purchase intention of another limited-edition donuts in the next season (1 = Very unlikely, 7 = Very likely). Additionally, to test whether overdetermination has an effect on missed opportunity, interest in missed-opportunity communication was measured by asking participants how likely they would be to like a post from the café that shared what they had missed, i.e., the maple donuts (1 = Very unlikely, 7 = Very likely). The measuring order of blame attributions, choice of alternative and interest in missed-opportunity communication was also randomised. The order effect is discussed in appendix D. I collapsed across the order conditions in the analyses. As an attention check, participants were asked if they had tried the maple donuts or not (1 = Yes, 2 = No, 3 = I am not sure). Finally, participants reported their age and gender. As preregistered, I coded participants who chose “Yes” and “I don’t know” as failing the attention check. Forty-three participants failed the attention check. The pattern of the results did not change after excluding those who failed the attention check. I retained all participants in the subsequent analyses.

Results

Fate attribution. A two-way ANOVA was conducted on fate attribution using missing-out reason and overdetermination as the factors, while controlling for the other attributions (self-, brand, and third-party attribution). I found a significant main effect of overdetermination on fate attribution ($M_{\text{non-overdetermined}} = 2.95$, SD = 1.91 vs. $M_{\text{overdetermined}} = 3.54$, SD = 1.95, $F(1, 394) = 7.97$, $p = .005$, $\eta^2_p = .020$) as predicted. There was no significant main effect of missing-out reason ($F(1, 397) = .00$, $p = .95$, $\eta^2_p = .000$) or interaction effect of missing-out reason and overdetermination ($F(1, 397) = 2.76$, $p = .10$, $\eta^2_p = .007$) on fate attribution.

Self-attribution. A two-way ANOVA was conducted on self-attribution using missing-out reason and overdetermination as the factors. The analyses yielded a significant main effect of missing-out reason on self-attribution ($M_{\text{internal}} = 5.67$, SD = 1.75 vs. $M_{\text{third-party}} = 2.93$, SD = 1.99, $F(1, 397) = 234.76$, $p < .001$, $\eta^2_p = .372$), as well as a significant main effect of overdetermination on self-attribution ($M_{\text{non-overdetermined}} = 4.70$, SD = 2.33 vs. $M_{\text{overdetermined}} = 3.90$, SD = 2.25, $F(1, 397) = 20.69$, $p < .001$, $\eta^2_p = .050$). Importantly, I found a significant interaction effect of missing-out reason and overdetermination on self-attribution ($F(1, 397) = 17.22$, $p < .001$, $\eta^2_p = .042$). The simple effect analysis showed that: in the third-party condition, people reported similar levels of self-attribution whether the missing-out was overdetermined or not ($M_{\text{non-overdetermined}} = 2.96$, SD = 1.98 vs. $M_{\text{overdetermined}} = 2.89$, SD = 2.01, $F(1, 397) = .08$, $p = .79$, $\eta^2_p = .000$); in the internal condition, people reported lower levels of self-attribution when the missing-out was overdetermined, compared to when it was not overdetermined ($M_{\text{non-overdetermined}}$ = 6.45, SD = .89 vs. $M_{\text{overdetermined}}$ = 4.89, SD = 2.03, $F(1, 397) = 37.93$, $p < .001$, $\eta^2_p = .087$).

Third-party attribution. A two-way ANOVA was conducted on third-party attribution using missing-out reason and overdetermination as the factors. I found a significant main effect of missing-out reason on third-party attribution (M_{internal} = 2.32, SD = 1.98 vs. $M_{\text{third-party}}$ = 3.29, SD = 2.18, $F(1, 396) = 22.96$, $p < .001$, $\eta^2_p = .055$), but no significant main effect of overdetermination on third-party attribution ($F(1, 396) = .56$, $p = .46$, $\eta^2_p = .001$). Importantly, I found a significant interaction effect of missing-out reason and overdetermination on third-party attribution ($F(1, 396) = 25.67$, $p < .001$, $\eta^2_p = .061$). The simple effect analysis showed that: in the third-party condition, people reported lower levels of third-party attribution when the missing-out was overdetermined, relative to when it was not overdetermined ($M_{\text{non-overdetermined}}$ = 3.87, SD = 2.24 vs. $M_{\text{overdetermined}}$ = 2.70, SD = 1.96, $F(1, 397) = 16.86$, $p < .001$, $\eta^2_p = .041$); in the internal condition, people reported higher levels of third-party attribution when the missing-out was overdetermined, compared to when it was not overdetermined ($M_{\text{non-overdetermined}}$ = 1.88, SD = 1.70 vs. $M_{\text{overdetermined}}$ = 2.75, SD = 2.14, $F(1, 397) = 9.35$, $p = .002$, $\eta^2_p = .023$).

Brand attribution. A two-way ANOVA was conducted on brand attribution using missing-out reason and overdetermination as the factors. There was no significant main effect of either missing-out reason ($F(1, 396) = .10$, $p = .75$, $\eta^2_p = .000$) or overdetermination ($F(1, 396) = .03$, $p = .86$, $\eta^2_p = 000$) on brand attribution, nor was there a significant interaction effect of missing-out reason and overdetermination on brand attribution ($F(1, 396) = 2.62$, $p = .11$, $\eta^2_p = .007$).

Choice of alternative. A two-way ANOVA was conducted on choice of alternative using missing-out reason and overdetermination as the factors. The results showed no significant main effect of missing-out reason ($F(1, 397) = .33$, $p = .565$, $\eta^2_p = .001$) on choice of alternative. However, I found a marginally significant main effect of overdetermination on choice of alternative ($F(1, 397) = 3.21$, $p = .074$, $\eta^2_p = .008$). Specifically, consumers who encountered overdetermined missing-out were less likely to purchase another seasonal donut, compared to those in the non-overdetermined missing-out condition ($M_{\text{non-overdetermined}} = 4.36$, SD = 2.11 vs. $M_{\text{overdetermined}} = 3.98$, SD = 2.13). There was no interaction effect of missing-out reason and overdetermination on choice of alternative ($F(1, 397) = .79$, $p = .375$, $\eta^2_p = .002$). As in study 1b, the effect of overdetermination on choice alternative held regardless of whether the initial missing-out reason was due to internal reason or not.

Underlying process. To test whether fate attribution mediated the effect of overdetermination on choice of alternative, I ran a mediation analysis in SPSS (PROCESS model 4) with overdetermination as the IV, fate attribution as mediator, and choice of alternative as the dependent variable (DV), controlling for other blame attributions. The results revealed that fate attribute did not mediate the relationship between overdetermination and choice of alternative ($b = .02$, SE = .02, 95% CI = [- .018, .055]). Specifically, overdetermination of missing-out increased fate attribution ($b = .28$, SE = .10, $t(396) = 2.85$, $p = .004$). However, fate attribution did not have a significant influence on choice of alternative ($b = .05$, SE = .06, $t(395) = .94$, $p = .350$). There was a marginally significant direct effect ($b = -.19$, SE = .11, $t(395) = -1.74$, $p = .083$).

Interest in missed-opportunity communication. A two-way ANOVA was conducted on interest in missed-opportunity communication using missing-out reason and overdetermination as the factors. There was no significant main effect of missing-out reason ($F(1, 397) = 1.89$, $p = .170$, $\eta^2_p = .005$) or overdetermination ($F(1, 397) = .01$, $p = .922$, $\eta^2_p = .000$) on interest in missed-opportunity communication. There was also no interaction effect of missing-out reason and overdetermination on interest in missed-opportunity communication ($F(1, 397) = 1.03$, $p = .312$, $\eta^2_p = .003$).

Discussion

This study replicated the effect of overdetermination on fate attribution, that is, controlling for other blame attributions, overdetermination of missing-out increased fate attribution. Furthermore. the patterns of other blame attributions aligned with what I observed in study 1b. Specifically, participants in the third-party condition attributed less blame to the third-party when the missing-out was overdetermined, and participants in the internal condition attributed less to themselves and more to the third-party when the missing-out was overdetermined. There was no effect on brand attribution. Consistent with study 1b, participants across the conditions reported very low mean scores, which suggests that they did not blame the café for their missing-out of the maple donuts.

This study provided some evidence that the overdetermination of missing-out reduced the choice of alternative. One reason that the result was only marginally significant might be that the alternative (other limited-edition donuts in the next season) was temporally distanced from the current missed opportunity. Zhang et al. (2021) pointed out that only when the first and alternative opportunities are considered in the same mental account, people would be more likely to choose the alternative opportunity after missing out on the first one. There was a measure similar to the choice of alternative in study 1b, where I measured participants' intention to book another exhibition, which was an alternative to the missed exhibition. I did not find significant effect of overdetermination on the booking intention, which might also be explained by the different mental accounts. In the following studies, I use alternatives that should be analysed in the same mental account as the missed opportunities; specifically, the alternative and the missed opportunity should be temporally close, and the alternatives should be consumed right after the missed opportunities (Evers, Imas, and Kang 2022; Thaler 1999; Zhang et al. 2021).

Additionally, this study measured interest in missed-opportunity communication and found no effect of overdetermination on it, suggesting that consumers' attitudes towards the missed opportunity was not affected by the overdetermination of missing-out.

6.1.2 Study 6: Art Exhibition as Alternative

This study has four goals. First, I will present a scenario in which the alternative is an immediate choice available after consumers missing out on the initial opportunity. Participants should thus evaluate both the missed opportunity and the alternative together rather than independently. Second, the alternative will not be offered by the same brand as the missed opportunity, as I argue that this should not influence the choice of the alternative. Third, since the 2 (missing-out reason: internal vs. third-party) × 2 (overdetermination: overdetermined vs. control) design used in previous studies consistently produced similar effects across the internal and third-party conditions, suggesting that the observed effects of overdetermination are driven not by the specific type of missing-out reason but by the number of reasons. Therefore, in the present study, I omit the manipulation of missing-out reason. I expect that individuals in the overdetermined (vs. non-overdetermined) missing-out condition will be less likely to choose an alternative. Finally, it examines whether disappointment mediates the relationship between overdetermination and choice of alternative. The preregistration is available at https://aspredicted.org/cr2v-d3xn.pdf.

Method

This study followed a 3-condition (control vs. missing-out vs. overdetermined missing-out) between-subjects design. I set an a priori target sample size of N = 300 (N = 100 per condition). Three hundred participants from Prolific (66.7% female, M_{age} = 37.30, SD = 11.49) completed the experiment. Sensitivity analysis using G*Power software indicated that, given my experiment design and sample size, the smallest effect size I was adequately powered to detect was f = 0.18 (with 300 participants, a 0.05 alpha error rate, and 80% power).

Participants were randomly assigned to one of the three conditions. Participants in the two missing-out conditions read and imagined that they missed the opportunity to see a wildflower super bloom due to misremembering the date. Those in the overdetermined missing-out condition additionally read that they found out they would not have made it anyway due to severe train delay. Participants in the control condition did not read any information about the super bloom. Then, participants in all three conditions read about an art exhibition taking place later that day in which they could participate.

All participants then answered a short survey. I first measured disappointment as previous studies. Choice of alternative was then measured by asking participants how likely they would be to see the art exhibition (1 = Definitely no, 7 = Definitely yes). As an attention check, participants were asked if they had seen the super bloom or not (1 = Yes, 2 = No, 3 = I am not sure). Finally, participants reported their age and gender. Thirteen participants failed the attention check[2]. The pattern of the results did not change after excluding those who failed the attention check. I retained all participants in the subsequent analyses.

Results

Disappointment. A one-way ANOVA was conducted on disappointment using condition as the factor. As predicted, I did find a significant effect of condition (F(2, 297) = 73.99, p < .001, η^2 = .333) on disappointment. Post-hoc comparisons using Tukey HSD test

[2] There was an issue with the attention check as participants in the control group did not read anything about the super bloom. Although I preregistered to exclude participants who did not choose 'No' in the attention check question, I now decide to not exclude participants in the control condition who choose ' I am not sure'.

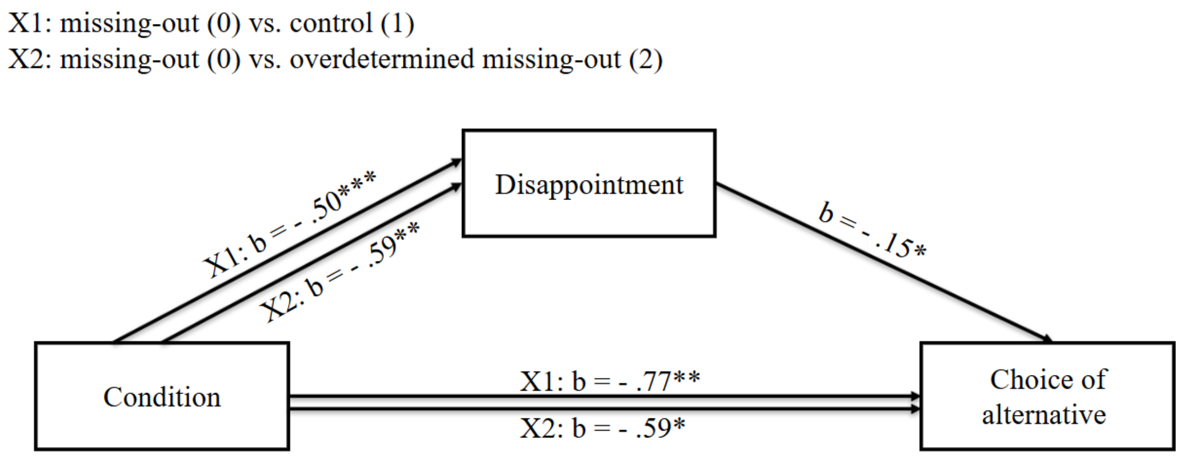
revealed that participants in the missing-out condition reported significantly higher disappointment than those in the control condition (M_{control} = 2.27, SD = 1.60 vs. $M_{\text{missing-out}}$ = 4.77, SD = 1.44, $p < .001$), as well as than those in the overdetermined missing-out condition ($M_{\text{missing-out}}$ = 4.77, SD =1.44 vs. $M_{\text{overdetermined}}$ = 4.19, SD = 1.49, $p = .017$).

Choice of alternative. A one-way ANOVA was conducted on choice of alternative using condition as the factor. I found a marginally significant effect of condition on choice of alternative ($F(2, 297) = 2.39$, $p = .093$, $\eta^2 = .016$). Post-hoc comparisons using Tukey HSD test revealed that participants in the missing-out condition were not significantly more likely to choose the alternative than those in the control condition (M_{control} = 3.99 SD = 1.81 vs. $M_{\text{missing-out}}$ = 4.39, SD = 1.67, $p = .240$), but were marginally significantly more likely to choose the alternative than those in the overdetermined missing-out condition ($M_{\text{missing-out}}$ = 4.39, SD = 1.67 vs. $M_{\text{overdetermined}}$ = 3.88, SD = 1.69, $p = .096$).

Mediation effect. I ran a mediation analysis in SPSS (PROCESS Model 4), with condition as the categorical IV (missing-out condition = 0, control condition = 1, overdetermined missing-out condition = 2), disappointment as the mediator, and choice of alternative as the DV. Disappointment did mediate between condition and choice of alternative, though in the opposite direction to what I predicted (figure 9). Specifically, disappointment mediated the relationship for control versus missing-out conditions ($b = .37$, SE = .18, 95% CI [.018, .723]) and for overdetermined missing-out versus missing-out conditions ($b = .09$, SE = .05, 95% CI [.002, .195]). In both pairs, condition was negatively related to disappointment (control vs. missing-out: $b = - .50$, SE = .21, $t(297) = -11.66$, $p < .001$; overdetermined missing-out vs. missing-out: $b = - .59$, SE = .21, $t\,(297) = -2.76$, $p = .006$). However, disappointment was negatively related to choice of alternative ($b = - .15$, SE = .07, $t(296) = -2.26$, $p = .025$). Furthermore, there were significant direct effects for both pairs (control vs. missing-out: $b = - .77$, SE = .29, $t(296) = -2.61$, $p = .010$; overdetermined missing-out vs. missing-out: *b* = - .59, SE = .24, *t*(296) = -2.43, *p* = .025). To summarize, these results indicated positive indirect effects between overdetermined missing-out and choice of alternative via disappointment, which was opposite to the negative direct effects.

FIGURE 9

PATH ANALYSIS (STUDY 6)



Note: **p* < .05, ***p* < .01, ****p* < .001

Discussion

I again replicated the overdetermination effect on disappointment in this study. This study showed that people felt disappointed when they experience missing-out on the desired experience (compared to not experiencing any missing-out), and they felt less disappointed when their missing-out was overdetermined. More importantly, individuals were less likely to choose the alternative when their missing-out was overdetermined. However, the analyses revealed contrasting direct and indirect effects of overdetermination of missing-out on choice of alternative. Specifically, the mediation analysis showed a positive indirect effect, that is, overdetermination of missing-out increased choice of alternative through reduced disappointment. Disappointment had a negative effect on choice of alternative, contrary to my prediction of a compensatory consumption response. The contrasting direct and direct effects suggest that omitted competing mechanisms may exist, explaining the effect of overdetermination on choice of alternative beyond disappointment (Zhao, Lynch, and Chen 2010). Moreover, there may also be an artefact issue because I presented the alternative choice information along with the vignette and before the measure of disappointment. Participants might have made mental choices before reporting their disappointment, and thus the measured disappointment was adjusted for having made the mental choices. I address this potential issue in the next study.

6.1.3 Study 7: Expected Enjoyment of Alternative

This study aims to replicate the effect of overdetermination on choice of alternative, and tests whether disappointment mediates this effect. In the previous study 6, information about alternative choice was presented to participants before they reported their disappointment, which might have created an artefact. In study 7, to exclude this potential issue, I present the information about the alternative choice only just before asking participants' expected enjoyment of it. Moreover, I control for a potential confound that I did not address in previous studies: the imagined effort involved in attending the event. Specifically, I design the scenarios so that all participants imagine themselves already at the café when they find out about missing-out, rather than discovering it beforehand. If participants imagine discovering the missed opportunity before versus after arriving at the café, their reactions might differ. Discovery of the missed opportunity at home may make participants feel less disappointed than if they discover it when they are at the café, where they would have already invested effort in traveling. Thus, variability in how participants imagine the scenario could confound the results. The preregistration is available at https://aspredicted.org/4sv7-y5tm.pdf.

Method

This study followed a 2 (missing-out reason: internal vs. third-party) × 2 (overdetermination: overdetermined vs. non-overdetermined) between-subjects design. I set an a priori target sample size of N = 600 (N = 150 per condition) based on the availability of a university participant pool in the UK. Six hundred and twenty-eight students completed the study in exchange for course credits (46.5% female, M_{age} = 21.30, SD = 2.06). Sensitivity analysis using G*Power software indicated that, given my experiment design and sample size, the smallest effect size I was adequately powered to detect was f = 0.11 (with 628 participants, a 0.05 alpha error rate, and 80% power).

Participants were randomly assigned to one of the four conditions. Depending on the condition, participants were asked to imagine that they visited a café for a limited-edition doughnut but only found out that they missed it due to either misremembering the availability date (internal condition) or being given the incorrect information about it by a food influencer (third-party condition). Then, participants in the overdetermined condition additionally read and imagined that they would have missed out the donut anyway because they were out of town.

Next, all participants answered a short survey. I measured disappointment by asking participants to rate "How disappointed are you with the situation right now?" (1 = Not disappointed at all, 7 = Very disappointed). Before measuring expected enjoyment of alternative, participants read "While you are at the café, the staff asks you whether you would like to try the new seasonal coffee." They then reported their expected enjoyment of alternative with the following question: "How much do you think you would enjoy the seasonal coffee? (1 = Not at all, 7 = Very much)". In this way, I tried to reduce the potential artefact. In addition, to test whether overdetermination has an effect on attitudes towards missed opportunity, I measured expected enjoyment of missed opportunity by asking participants "How much do you think you would have enjoyed the maple doughnuts if you had been able to try them?” (1 = Not at all, 7 = Very much). As an attention check, participants were asked if they had tried the maple doughnuts or not (1 = Yes, 2 = No, 3 = I am not sure). Finally, participants reported their age and gender. As outlined in my preregistration, participants who did not select “No” in the attention check were classified as having failed the check. Only 62.4% of participants passed the attention check (selected “No”). For consistency, I retained all participants in the subsequent analyses. The changed results by excluding those who failed the attention checked are reported below as well.

Results

Disappointment. A two-way ANOVA was conducted on disappointment using missing-out reason and overdetermination as the factors. As predicted, I found a significant main effect of overdetermination on disappointment ($M_{\text{non-overdetermined}}$ = 4.38, SD = 1.70, $M_{\text{overdetermined}}$ = 3.73, SD = 1.67, $F(1, 624) = 24.07$, $p < .001$, $\eta^2_p = .037$). I also found a significant main effect of missing-out reason on disappointment ($M_{\text{third-party}}$ = 4.30, SD = 1.72 vs. M_{internal} = 3.81, SD = 1.67, $F(1, 624) = 13.72$, $p < .001$, $\eta^2_p = .022$). However, there was no significant interaction effect of missing-out reason and overdetermination on disappointment ($F(1, 624) = 1.45$, $p = .230$, $\eta^2_p = .002$). This suggests that the effect of overdetermination on disappointment held regardless of whether the missing-out reason was internal or not.

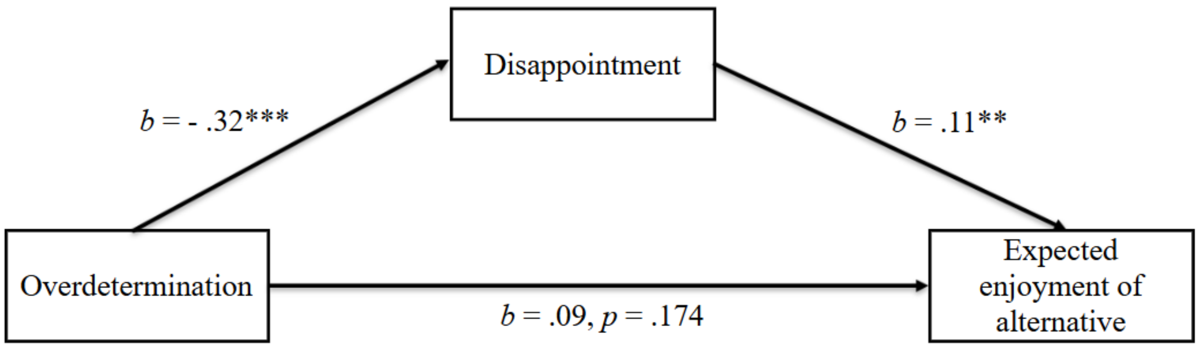
Expected enjoyment of alternative. A two-way ANOVA was conducted on expected enjoyment of alternative using missing-out reason and overdetermination as the factors. There was no significant main effect of either missing-out reason ($F(1, 624) = .38$, $p = .537$, $\eta^2_p = .001$) or overdetermination ($F(1, 624) = .67$, $p = .420$, $\eta^2_p = .001$) on the expected enjoyment of alternative. However, there was a marginally significant interaction effect of missing-out reason and overdetermination on the expected enjoyment of alternative (F(1,

624) = 2.91, p = .089, η^2_p = .005). Specifically, for participants in the third-party condition, there was no significant difference in expected enjoyment of alternative whether their missing-out was overdetermined or not ($M_{\text{non-overdetermined}}$ = 4.34, SD = 1.64 vs. $M_{\text{overdetermined}}$ = 4.22, SD = 1.63, F(1, 624) = 4.14, p = .529, η^2_p = .001); however, participants in the internal condition had higher expected enjoyment of alternative when their missing-out was overdetermined relative to when it was not overdetermined ($M_{\text{non-overdetermined}}$ = 4.04, SD = 1.59 vs. $M_{\text{overdetermined}}$ = 4.36, SD = 1.60, F(1, 624) = 3.18, p = .075, η^2_p= .005). Excluding those who failed the attention check, there was a significant interaction effect of missing-out reason and overdetermination on expected enjoyment of alternative (F(1, 388) = 6.02, p = .015, η^2_p = .015). Specifically, and different to analyses with the full sample, for participants in the internal condition, there was no significant difference in expected enjoyment of alternative whether their missing-out was overdetermined or not ($M_{\text{non-overdetermined}}$ = 3.97, SD = 1.54 vs. $M_{\text{overdetermined}}$ = 4.28, SD = 1.54, F(1, 388) = 1.86, p = .174, η^2_p = .005); however, participants in the third-party condition had lower expected enjoyment of alternative when their missing-out was overdetermined relative to when it was not overdetermined ($M_{\text{non-overdetermined}}$ = 4.46, SD = 1.64 vs. $M_{\text{overdetermined}}$ = 3.97, SD = 1.68, F(1, 388) = 4.14, p = .036, η^2_p = .011). The results should be taken with caution due to inconsistencies observed before and after excluding participants who failed the attention check.

Underlying process. To explore whether overdetermination had an indirect effect on expected enjoyment of alternative, I conducted a mediation analysis in SPSS (PROCESS Model 4; not preregistered), with overdetermination as the IV, disappointment as the mediator, and expected enjoyment of alternative as the DV. The results revealed a significant mediation (b = - .04, SE = .02, 90% CI [- .070, - .009]; figure 10). Specifically, overdetermination had a significant negative effect on disappointment (b = - .32, SE = .07, t(626) = -4.86, p < .001). Then, the reduced disappointment in turn reduced expected enjoyment of alternative (*b* = .11, SE = .04, *t*(625) = 2.92, *p* = .004). Thus, overdetermination of missing-out reduced expected enjoyment of alternative by reducing disappointment.

FIGURE 10 (STUDY 7)

PATH ANALYSIS



Note: *$p < .05$, **$p < .01$, ***$p < .001$

Expected enjoyment of missed opportunity. A two-way ANOVA was conducted on expected enjoyment of missed opportunity using missing-out reason and overdetermination as the factors. There was no significant main effect of either missing-out reason ($F(1, 388)$ = 2.81, p = .094, η^2_p = .007) or overdetermination ($F(1, 388)$ = 1.16, p = .283, η^2_p = .003) on the expected enjoyment of missed opportunity. Additionally, there was no significant interaction effect of missing-out reason and overdetermination on the expected enjoyment of missed opportunity ($F(1, 388)$ = .49, p = .484, η^2_p = .001).

Discussion

This study replicated the finding that the overdetermination of missing out reduces consumer disappointment. However, I also observed a main effect of the missing-out reason on disappointment. Specifically, individuals were less disappointed when they themselves, rather than others, caused the missing-out. This may be explained by self-serving bias (Miller and Ross 1975), whereby individuals downplay the importance of the missed event or justify their missing-out to protect their self-esteem, leading to less disappointment when they themselves caused the missing-out than when others were responsible.

Importantly, this study showed that overdetermination of missing-out reduced expected enjoyment of alternative through reduced disappointment. Specifically, individuals were less disappointed when their missing-out was overdetermined, compared to not overdetermined. Then, the reduced disappointment in turn reduced their expected enjoyment of alternative. Overdetermination had no impact on consumers' expected enjoyment of missed opportunity, meaning that the number of missing-out reason does not change how consumers perceive the missed opportunity.

This study had a high attention check failure rate. 15.8% of students gave the wrong answer (selected "Yes") and 21.8% were not sure (selected "I am not sure"). It might be because students misunderstood the question and thought the researcher was asking if they have ever tried a maple donut. It could also be that the students took the survey as a test related to their academic grades and wanted to avoid failing the test. Hence, the attention check might not be valid, as students may have misunderstood it rather than failed to pay attention. Given this, the interaction effect of missing-out reason and overdetermination on expected enjoyment of alternative warrants closer examination. Notably, the pattern of simple contrasts changed when comparing the full sample to the sample excluding participants who failed the attention check, suggesting that the effect may be sensitive to data quality.

6.1.4 Study 8: Real Behaviour Study

While my earlier studies measured choice intentions in hypothetical settings, study 8 is a real behaviour study that tests consumers' real choice of alternative by creating an online test that they miss out on. Based on the previous studies, I predict that overdetermination of missing-out reduces consumers' choice of alternative. Thus, participants who encounter overdetermined missing-out should be less likely to agree to participate another study. The preregistration is available at https://aspredicted.org/c7bv-3z35.pdf.

Method

This study followed a 2-condition (missing-out: overdetermined vs. non-overdetermined) between-subjects design. I set an a priori target sample size of N = 200 (N = 100 per condition). Two hundred and one participants from Prolific (49.3% female, M_{age} = 36.55, SD = 13.79) completed the experiment. Sensitivity analysis using G*Power software indicated that, given my experiment design and sample size, the smallest effect size I was adequately powered to detect was d = 0.40 (with 201 participants, a 0.05 alpha error rate, and 80% power).

Participants were randomly assigned to one of the two conditions. I first told participants that the main study was about a funny video evaluation, but to enter that main study, they needed to pass a social perception test that required them to judge whether a smile was real or fake (Steinmetz et al. 2016). Then, participants in the overdetermined condition were first told that the quota for the main study had been filled, and no more participants were eligible for the study, while those in the non-overdetermined condition did not receive this information. I then informed all participants that they failed the social perception test and thus could not participate in the main study. This was to ensure all participants experience the missing-out of the main study. Next, I told participants that there was another study about Instagram account evaluation they could participate in without any prerequisite, and they would receive an extra $0.25 as a bonus. This new study required them to write a review of the account. I recorded whether they chose to join the new study as the DV. Finally, since I used deception, I debriefed the participants carefully about the purpose ("For this research study we are interested in whether you will choose to participate in a new study after having missed out on the first one.") and design of this experiment.

Results and Discussion

A Chi-squared analysis was conducted to examine the relation between missing-out condition and choice of alternative. The relation between these variables was significant, X^2 (1, N = 201) = 4.67, p = .031. Participants in the overdetermined condition were less likely to choose the alternative when they missed out on the initial opportunity than participants in the non-overdetermined condition ($\%_{overdetermined} = 57.0$ vs. $\%_{non\text{-}overdetermined} = 71.6$).

Confirming my hypothesis, the result showed that consumers were less likely to choose alternative when they encountered overdetermined (vs. non-overdetermined) missing-out. That is, overdetermination of missing-out reduced consumers' choice of alternative. This aligns with the compensatory consumption logic, as the reduced disappointment from overdetermined missing-out reduced the need to compensate.

In this study, the missing-out reason was brand cancellation. Adding an additional overdetermining factor reduced the likelihood that consumers would choose an alternative offered by the same brand. This finding suggests that overdetermination may pose a challenge for brands attempting to persuade missed-out consumers to accept alternative offerings. The implications for brands will be discussed in the following section summary and further elaborated in chapter 7 (7.4 Limitations and Directions for Future Research).

6.1.5 Summary

In this section I discussed the impact of overdetermination of missing-out on choice of alternative. I predict that consumers are less likely to choose an alternative when they encounter overdetermined (vs. non-overdetermined) missing-out due to the reduced disappointment. Although there was evidence across study 5-8 that consumers are less interested in alternatives when their missing-out is overdetermined, my empirical results were inconsistent. Study 5 showed that this effect was marginally significant, and I suspect that it was due to the alternative (other limited-edition donuts in the next season) being temporally distanced from the current missed opportunity. In study 6, I used scenario where the alternative was an immediate choice available after consumers missing out on the desired opportunity. I found a contrasting direct and indirect effect of overdetermination on choice of alternative via disappointment, which suggests omitted competing mechanisms. I also suspect that the study design might have an artefact issue as the alternative choice was presented before measuring disappointment. Study 7 demonstrated a significant indirect effect of overdetermination on choice of alternative by reducing disappointment. However, the effect of overdetermination on choice of alternative was inconsistent before and after deleting samples that failed the attention check. Finally, study 8 was a real behaviour study in which I measured participants' real choice of alternative on whether they wanted to participate in another study after missing out on the first one. The results supported the prediction that overdetermination of missing-out reduces consumers' choice of alternative.

In chapter 5 I found that the missed-out consumers are more satisfied with the compensation offered by brands when the missing-out is overdetermined (vs. not overdetermined). This chapter showed that the missed-out consumers are less likely to choose the alternative when the missing-out is overdetermined (vs. not overdetermined). These findings can have meaningful implications for brands. Since overdetermination improves compensation satisfaction but reduces choice of alternative, should brands offer compensation or alternatives when consumers miss out due to the brands' fault? My findings suggest that they should address compensation than offer alternatives when the missing-out is overdetermined. Moreover, in the overdetermination scenario, it may be better for brands to frame an alternative as compensation than just as an alternative of the missed product or just another product. In specific situations where a brand-initiated missing-out (e.g., cancellation by brands) is overdetermined, instead of asking consumers whether they want an alternative, it might be better to offer consumers the alternative as a compensation.

6.2 Reengagement intention

6.2.1 Study 9: Replacement Ticket vs. Refund

Another potential downstream consequence I investigate is reengagement intention with the missed opportunity. When missing out on an event or product, consumers may be offered another chance to reengage with the same experience or purchase the same product. For example, individuals who missed out on a workout class may be offered a replacement ticket to the same class in the future. On one hand, overdetermination of missing-out may reduce consumers' reengagement intention with the missed opportunity due to decreased disappointment. On the other hand, in study 7, I measured expected enjoyment of missed opportunity, and found no difference between overdetermined and non-overdetermined conditions. Similarly, in study 5, I found no difference between overdetermined and non-overdetermined conditions in terms of interest in missed-opportunity communication. These results suggest that consumers in overdetermined and non-overdetermined conditions were equally interested in the missed opportunity. Thus, it is plausible that overdetermination has no impact on consumers' reengagement intention. In the following study, I test whether and how overdetermination of missing-out affects consumers' decisions to reengage with the same event or product. Since study 5 and study 7 found no effect of the missing-out reason on expected enjoyment of missed opportunity or interest in missed-opportunity communication, and for reasons of parsimony, I employ a simple two-condition design in this study. The preregistration is available at https://aspredicted.org/jvnw-y26z.pdf.

Method

This study followed a 2-condition (missing-out: overdetermined vs. non-overdetermined) between-subjects design. I set an a priori target sample size of N = 200 (N = 100 per condition). Two hundred participants from Prolific (60% female, M_{age} = 37.32, SD = 13.04) completed the experiment. Sensitivity analysis using G*Power software indicated that, given my experiment design and sample size, the smallest effect size I was adequately powered to detect was d = 0.40 (with 200 participants, a 0.05 alpha error rate, and 80% power).

Participants were randomly assigned to one of the two conditions. All participants were asked to imagine that they missed out on a live comedy show due to food poisoning. Then, those in the overdetermined condition additionally read that they would have missed the show anyway as they had misremembered its date.

Then, participants reported their disappointment. To measure reengagement intention, participants were told to choose between a replacement ticket to the same show in two weeks or a refund with a deduction of 20% admin fee. Next, they responded to an attention check by indicating whether they had seen the live comedy show they originally booked (1 = Yes, 2 = No, 3 = I am not sure). Finally, they reported their age and gender. As preregistered, I coded participants who chose "Yes" and "I don't know" as failing the attention check. Twelve participants failed the attention check. The pattern of the results did not change after excluding those who failed the attention check. I retained all participants in the subsequent analyses.

Results

Disappointment. A t-test was conducted on disappointment with missing-out condition as the factor. Replicating previous finding, participants in the overdetermined condition were less disappointed relative to those in the non-overdetermined condition ($M_{\text{overdetermined}} = 4.74$, SD = 1.94 vs. $M_{\text{non-overdetermined}} = 6.35$, SD = .94, $t(147.5) = -7.52$, $p < .001$, $d = 1.53$).

Reengagement intention. A Chi-squared analysis was performed to examine the relation between the missing-out condition and reengagement intention. The relation between missing-out condition and reengagement was not significant (X^2 (1, N = 200) = .72, $p = .396$). There was no difference of choosing a replacement ticket between overdetermined and non-overdetermined condition ($\%_{\text{overdetermined}} = 91.84$ vs. $\%_{\text{non-overdetermined}} = 88.24$.).

Mediation analysis. I conducted a mediation analysis in SPSS (PROCESS Model 4) to test whether there was an indirect effect of overdetermination on reengagement intention through disappointment. Missing-out condition was the IV, disappointment was the mediator, and reengagement intention was the DV. I did not find a significant indirect effect (b = -. 18, SE = .14, 95% CI [-. 458, .074]). Specifically, overdetermined missing-out reduced disappointment (b = - .81, SE = .11, $t(198) = -7.43$, $p < .001$), but this reduced disappointment did not have a significant impact on engagement intention (b = .22, SE = .14, Z =1.54, p = .123).

Discussion

In this study, I did not find evidence for how overdetermination of missing-out might have an influence on the reengagement intention. The results also suggest a ceiling effect on reengagement intention due to majority of participants in both conditions choosing replacement ticket. One possible explanation is that when a missed opportunity is highly attractive or closely aligned with consumers' goals—such as attending a long-anticipated concert or visiting a dentist out of necessity—individuals are equally likely to reengage whether they feel less disappointed about the missing-out or not. Another explanation could be that the two options were not equally attractive, for example, it is plausible that a refund with a 20% deduction was much less attractive to participants than waiting just two weeks for the show.

CHAPTER 7: CONCLUSIONS

7.1 Summary of Findings

In this thesis, I examine how consumers respond to missing-out. Specifically, I test whether overdetermined (i.e., multiple-causes) missing-out, compared to single-cause missing-out, affects consumers' reactions differently to the negative experience of having missed-out. I find that consumers feel disappointed when they miss out (vs. do not miss out) on a desired purchase or consumption opportunity, but this effect is mitigated when there is at least one other reason that explains having missed-out. I also find that fate attribution is the underlying mechanism driving this overdetermination effect on disappointment. That is, overdetermination of missing-out reduces consumers' disappointment due to consumers' greater fate attribution. Chapter 4 examines the core conceptual model. Study 1a and study 1b demonstrate that overdetermination of missing-out induces fate attribution and that this fate attribution is independent of the other blame attributions. Study 2 shows the basic effect of overdetermination on reducing consumer disappointment. Study 3 demonstrates the underlying process of the basic effect. I find that overdetermination of missing-out increases consumers' fate attribution which in turn reduces consumer disappointment. Consequently, consumers who encounter more than one reason explaining having missed-out feel less disappointed relative to those who only encounter one reason because they are more likely to attribute their missing-out to fate.

Chapter 5 and 6 explore several downstream consequences of the overdetermination effect. Chapter 5 provides two studies to demonstrate how overdetermination of missing-out influences consumers' satisfaction with compensation offered by brands. Brands sometimes offer compensation when they cause consumers' missing-out, for example, when they cancel an event or when a product is out of stock (Roschk and Gelbrich 2014; Smith et al. 1999). It is important to examine how satisfied consumers are with the compensation, as brands do not want to lose them for future business (Gelbrich, Gäthke, and Grégoire 2015; Roschk and Gelbrich 2014; Wirtz and Mattila 2004). I find that consumers are more satisfied with the compensation when they encounter overdetermined missing-out, that is, when there are other explanations beyond the brand cancellation for their missing-out. I replicate the effect with a scenario where participants missed out on a utilitarian task, showing that this effect is generalizable to both hedonic and non-hedonic context. I further show that this effect is mediated by disappointment. As such, in contexts where a brand cancels the event, consumers tend to be less disappointed when there is at least one other reason explaining the missing-out, compared to when there is no other reason. This reduced disappointment, in turn, improves consumers' satisfaction with the compensation.

Chapter 6 explores two behavioural downstream consequences. First, I examine consumers' choice of alternative with four studies. The results are somewhat inconsistent, but in general, I find that there is at least a tendency for consumers to be less likely to choose an alternative when their missing-out is overdetermined (vs. not overdetermined). Study 8 additionally provides behavioural evidence to support this effect of overdetermination in reducing choice of alternative. Second, I test consumers' reengagement intention with the missed opportunity and find no effect of overdetermination on reengagement intention.

Overall, this thesis investigates the phenomenon of overdetermined missing-out and its emotional and behavioural effects on consumers. In the next section, I discuss the theoretical and practical contributions of this research.

7.2 Theoretical Contributions

This thesis offers several theoretical contributions. First, this thesis contributes to the emerging literature that examines post missing-out experiences. While research on inaction inertia and stockouts addresses situations involving consumers who have already missed out, they have very different research foci. The literature on stockouts investigates how brand-initiated stockout of material products affects consumer responses (Campo et al. 2000; Fitzsimons 2000; Sloot et al. 2005); the literature on inaction inertia focuses on how missing out on an initial opportunity influences consumers' reaction to inferior (in terms of monetary value) second opportunity (Arkes et al. 2002; Tykocinski and Pittman 1998; Tykocinski et al. 1995). This thesis examines the post-missing-out feelings, disappointment, and more importantly, studies how to alleviate this negative response. Specifically, I identify a counterintuitive situation in which consumers feel less disappointed when they encounter multiple (vs. single) obstacles that lead to missed opportunities.

Second, I contribute to the research stream of overdetermination and extend it to the marketing research field. Existing research has investigated how people judge causation in overdetermined outcomes (Henne 2023; Henne et al. 2021) as well as how people reduce guilt when their self-standard or moral violation is overdetermined (Lin et al. 2023). This thesis examines overdetermination in a consumption context and explores how it affects consumers' attitudinal and behavioural reactions when a negative consumption outcome is overdetermined. My findings demonstrate that overdetermination of missing-out paradoxically *reduces* disappointment despite the accumulation of negative events. Moreover, I show that overdetermination of missing-out improves compensation satisfaction and reduces the tendency to choose alternatives.

Third, this work sheds light on the literature on fate attribution. Fate attribution is mainly studied in psychology and philosophy. The prior research focused on how trait fate attribution influences attitudes towards dramatic life events, especially tragedies (Cohen 1960; Solomon et al. 2004; Specht et al. 2011; Yau 1988). For example, Specht et al. (2011) found that fate beliefs serve to improve people's life satisfaction when coping with the death of a spouse. I argue that fate attribution can be elicited in mundane consumption situations and influence consumers' attitudes. Importantly, this thesis establishes fate attribution as a distinct psychological mechanism. Whereas prior research has largely focused on self- and others-blame attributions, I demonstrate that fate attribution uniquely mediates the relationship between overdetermination and consumer disappointment. Specifically, after controlling for other blame attributions, I find that overdetermined (vs. non-overdetermined) missing-out increases fate attribution, which then reduces consumer disappointment.

Fourth, my findings challenge prior research examining how individuals form global evaluations of experiences, particularly in relation to the averaging/summation model (Seta et al. 2008a, 2008b; Seta, Seta, and Wang 1991). According to this model, negative affect increases when individuals encounter two similarly negative experiences (summation), but decreases when the negative experiences differ in affective intensity (averaging). However, my research identifies a third possibility for consumer reactions to two or more negative events: when two or more negative experiences lead to the same outcome (overdetermination), individuals' global evaluations do not follow the principles of summation or averaging. Specifically, individuals experience less disappointment when they encounter two negative experiences that result in the same missing-out outcome, compared to when only one negative experience leads to that outcome.

Finally, this research adds to the research on service failure and recovery. Whereas the previous research suggests that service cancellations are detrimental to brands (Bonifield and Cole 2007; Choi and Mattila 2008; Dunn and Dahl 2012; Wu and Wang 2017), I find that cancellations can serve as overdetermining factors that encourage consumers to attribute their missing-out to fate and thus reduce their negative responses. Moreover, while prior work on service failure has primarily examined single-cause missing-out situations (Folkes 1984; Van Vaerenbergh et al. 2014), I extend this by demonstrating how multiple (vs. single) causes of a service failure shape consumer reactions. In addition, in study 4a and study 4b, I demonstrate that the number of missing-out reason should be considered in service recovery strategy planning, which has typically focused on fairness and compensation type (Choi and Choi 2014; Lee et al. 2020; Maxham and Netemeyer 2002; Roschk and Gelbrich 2014; Sinha and Lu 2019). My findings suggest that consumers are more satisfied with compensation offered by brands when their missing-out is caused by more than one (vs. by only one) reasons.

7.3 Practical Contributions

This research also has significant practical implications for various stakeholders including brands, consumers and policy makers. First, brands often face frustrated customers who have missed out on a consumption experience and seek to reduce these consumers' negative responses. My research suggests that communicating potential overdetermining factors is one way to alleviate negative consumer reactions and to ultimately increase the satisfaction of consumers even in the face of failure. In contexts where cancellations or stock shortages occur, brands can mitigate negative consumer reactions by highlighting the inevitability of the outcome due to multiple obstacles. If an event is cancelled or a product is out of stock due to several reasons, brands should avoid withholding these reasons. Instead, disclosing more detailed information is more effective than being vague. For example, airlines can explain that a cancelled flight is due to a combination of bad weather, mechanical issue, and air traffic restrictions. Moreover, consumers often receive a survey when they cancel a service or booking, but the question about the reason for cancellation is typically limited to a single-choice format. Allowing multiple responses may encourage consumers to consider a broader set of reasons, which could reduce their disappointment and lessen the likelihood of misplaced blame towards the brands. This is important because brands may not always have the opportunity to offer compensation such as when consumers initiate the cancellations which are beyond the brand's control. The problem is consumers may still direct blame towards the brand. Similarly, it may also be important for brands to identify consumers who encounter more than one reason of missing-out by conducting consumer survey, as paradoxically, these consumers tend to be less disappointed with the outcome and are easier to compensate. Identifying consumers who encountered overdetermined missing-out could help brands to avoid overcompensation which is a waste of company resources (Garrett 1999; Gelbrich and Roschk 2011b). These insights have implications for brands to allocate resources efficiently to manage service recovery while maintaining consumer satisfaction. However, some strategies may backfire if too many reasons for a missing-out are highlighted, potentially reinforcing a negative brand association. For example, the brand may seem incompetent, or the brand may be associated with being unlucky.

Second, consumers can better manage their disappointment by attributing to fate. For example, reminding themselves about the potential multiple reasons of missing-out is one way to elicit fate attribution to reduce disappointment. According to Lin et al. (2023), individuals actively seek evidence that an outcome from a sinful behaviour is overdetermined because overdetermination alleviates guilt. Similarly, missed-out consumers may also consider more reasons for their missing-out in order to alleviate their disappointment feelings. Additionally, consumers may misattribute blame to brands even when the fault does not lie with them. By recognizing the multiple reasons contributing to a missed opportunity and attributing blame more accurately, consumers may form fairer judgments toward brands and make more rational consumption decisions.

Finally, my research offers insights for policymakers, particularly in areas where consumer compensation is governed by standardized rules such as airline cancellations. Current policies sometimes treat all reasons for cancellation equally. However, since consumers may feel less disappointed and more satisfied with compensation when they perceive the cancellation as inevitable and beyond the brands' control, policymakers could consider asking consumers to disclose the reasons for the cancellation. This would allow compensation policies to be tailored accordingly, potentially improving perceived fairness and satisfaction.

7.4 Limitations and Directions for Future Research

This research has several limitations that may offer valuable directions for future studies. Across the studies, I manipulated overdetermination of missing-out using only two causes. However, from a theoretical standpoint, I expect that the findings should hold when a missed opportunity is explained by two or more independent and sufficient causes. Future research could empirically manipulate the overdetermination scenario by varying the number of causes and test whether the observed effects are strengthened or weakened. For example, I could manipulate three versus one missing-out reason(s). It is plausible that increasing the number of causes for a missed opportunity may amplify fate attribution—consumers may perceive the outcome as even more predetermined and unchangeable. Consequently, this heightened fate attribution stemming from an increased number of causes could further reduce consumers' disappointment.

Similarly, my studies have only used negatively valenced reasons for missing-out, such as misremembering the date or experiencing public transit delays. However, individuals might also miss out due to positively-valenced reasons, such as an unexpected visit from a best friend or acceptance to another exclusive event. In such cases, consumers may feel less disappointed, not merely due to the presence of multiple reasons (i.e., overdetermination), but also because at least one reason carries a positive valence. Future research should investigate whether and how the valence of missing-out reason affects the overdetermination effect. One direction is to examine whether the overdetermination effect generalizes to overdetermined missing-out with at least one positive reason. Another direction is to compare overdetermined missing-out involving at least one positive reason with overdetermined missing-out involving only negative reasons. It is plausible that the former leads to lower disappointment than the latter because the positive reason might dilute the negative emotional impact. For example, individuals may feel less disappointed because the missing-out happened for a good reason, and they may see the missed opportunity as a beneficial trade-off and focus on the positive side (e.g., one may think "Although I missed the gig, I got to see my best friend.").

In a similar vein, a fruitful extension is to vary the type of reasons to test when overdetermination does or does not trigger fate attributions. The current studies use reasons that are largely diagnostic and uncontrollable. Future work can, for example, compare natural vs. human reasons (e.g., weather vs. staff error), uncontrollable vs. controllable reasons (e.g., public transportation strike vs. oversleeping), and ordinary vs. extraordinary reasons (e.g., routine maintenance vs. once-in-a-decade storm). I predict fate attribution will be stronger when multiple reasons are natural**,** uncontrollable, and extraordinary, and weaker when reasons are human, controllable, and ordinary. Demonstrating that fate attribution depends on reason type and not just reason number would sharpen the construct boundary.

Another potential concern is that the sequential wording ("you missed the event, but then found out it was cancelled") may imply inevitability and subtly push participants toward a fate interpretation, which relates to conversational norms. Although studies 4B-5 already uses a non-sequential format and replicates the effect, future studies could present all causes simultaneously ("you could not attend the event for the following reasons…") to remove the implication that the second cause confirms the first. If the effect persists, it would strengthen the argument that overdetermination itself rather than scenario wording reduces counterfactual thinking and disappointment.

Moreover, the term "overdetermination" can be clarified further, as it fits some scenarios more naturally than others. In studies where the event remained available (e.g., tickets sold out, train delay), this interpretation is straightforward: any single cause would have guaranteed the missed outcome. In studies involving event cancellation, the notion of "missing-out" becomes more nuanced because the opportunity disappears for everyone, not only for the focal participant. In these cases, overdetermination still applies in the sense that both the participant's personal constraint and the event cancellation are sufficient causes, but the psychological meaning of missing out may differ. Future work could therefore examine overdetermination exclusively in contexts where the opportunity remains available to others while the focal consumer is prevented from participating or consuming, which would sharpen the conceptual boundary and test the robustness of the effect across different types of missed opportunities.

I did not examine any boundary conditions in this research, which could have important implications for brands. One of the potential moderators is compensation type. Chapter 5 demonstrated that consumers are more satisfied with compensation when their missing-out is overdetermined. It may be more insightful to test different types of compensation as this could help to provide more specific managerial suggestions. If overdetermined consumers are already satisfied with less compensation, spending extra resources on the compensation may bring small incremental benefit for the brand (Gelbrich and Roschk 2011b). In future studies, I could show participants either just an apology, a coupon, or a full refund plus extra gift and then measure their satisfaction. By running additional t-tests for each compensation option in study 4a, I found that compensation satisfaction was less different between overdetermined and non-overdetermined missing-out conditions when it came to higher-level compensation such as a full refund ($M_{\text{overdetermined}}$ = 2.79, SD = 3.31 vs. $M_{\text{non-overdetermined}}$ = 3.29, SD = 3.08, p = .271) and a replacement ticket

($M_{\text{overdetermined}}$ = 2.62, SD = 2.92 vs. $M_{\text{non-overdetermined}}$ = 2.16, SD = 2.49, p = .234), which aligns with the findings in study 9; however, the difference was more significant for lower-level compensation such as an 80% refund plus a T-shirt ($M_{\text{overdetermined}}$ = 2.08, SD = 2.58 vs. $M_{\text{non-overdetermined}}$ = 1.55, SD = 2.06, p = .113) and a 70% refund plus a mug ($M_{\text{overdetermined}}$ = 2.21, SD = 2.49 vs. $M_{\text{non-overdetermined}}$ = 1.24, SD = 1.89, p = .002). That is, consumers in overdetermined condition were more satisfied with compensation than those in the non-overdetermined condition when the compensation was a partial refund; however, this effect attenuated when the compensation was a full refund or a replacement ticket. Therefore, if future studies can replicate this finding, it would offer valuable insight for brands, suggesting they may not need to overcompensate in overdetermination situations (Garrett 1999; Gelbrich and Roschk 2011b).

Moreover, future research can test whether the overdetermination effect rely on the perceived rarity of encountering multiple obstacles leading to a missing-out. If consumers repeatedly experience overdetermined missing-out within a short period of time, the overdetermination effect may disappear because consumers may no longer interpret the missing-out as fated. It could also backfire, that is, repeated overdetermination might signal to consumers that the brand or context is systematically flawed. For example, if a consumer misses three flights within a month due to cancellations, and the airline consistently frames each instance as an overdetermined or fated event, the consumer may no longer view these situations as inevitable. Instead, they may start attributing the repeated disruptions to brand incompetence, thereby producing negative brand impression.

Another limitation of the present research is its cultural scope. All studies were conducted with participants from the U.S. or the UK, which may limit the generalizability of the findings to other cultural contexts. Cultural differences in fate beliefs could be one factor shaping how consumers respond to overdetermined missing-out. For example, Asian cultures tend to have stronger beliefs in fate compared to Western cultures (Chan et al. 2009; Kim, Kulow, and Kramer 2014; Norenzayan and Lee 2010). It is plausible that consumers from cultures with stronger (vs. weaker) beliefs in fate may be more susceptible to the effects of overdetermination of missing-out. As a result, they may show greater tolerance toward cancellations or stockouts and report higher satisfaction with compensation. In future research, I could examine cross-cultural differences by conducting studies in diverse cultural contexts, such as comparing consumers from China and the U.S. I expect the overdetermination effect to be more pronounced among Chinese consumers.

Although the present research focuses on situational overdetermination, individual differences may also shape reactions to missed opportunities. In particular, trait-level FOMO is relevant. Consumers high in FOMO experience stronger anticipatory regret and heightened sensitivity to missed experiences (Milyavskaya et al. 2018; Przybylski et al. 2013). Such individuals may experience more intense disappointment overall and may be less responsive to the mitigating effect of overdetermination, because counterfactual thoughts are chronically accessible for them regardless of how many causes are present. Conversely, low-FOMO individuals may show a stronger reduction in disappointment under overdetermination because they are less motivated to simulate alternatives. Future work could examine whether FOMO moderates the effect

Moreover, as I have discussed in chapter 6, brands' strategy choosing after cancellation deserves further exploration. My findings show that overdetermination of missing-out improves consumers' satisfaction with the compensation and decreases consumers' willingness to choose alternatives. This suggests that these two different strategies may lead to opposite outcomes. However, it also suggests that in cases of overdetermined missing-out, if a brand wishes to offer alternatives to consumers who missed out, it may be more effective to frame the alternatives as compensation, even though consumers may not actively seek alternatives. In future studies, I could manipulate how brands present alternatives and measure consumer satisfaction. For example, after showing participants a scenario where an event is cancelled and they cannot make it anyway due to another reason, I could manipulate the framing of the brand's response: one group would be told that the brand offers an alternative new event, while another group would be told that the brand offers compensation in the form of the new event. I expect participants who receive the new event as compensation (vs. alternative) to report greater satisfaction.

Another promising direction concerns the temporal position of overdetermination. In the present studies, participants learn about multiple sufficient causes after already missing the event, which makes counterfactual thinking difficult and promotes fate attribution. But the psychological process may differ when overdetermination is anticipated before the outcome occurs. If multiple sufficient barriers are known in advance, people may experience reduced motivation (e.g., "I won't make it anyway"), which may buffer negative emotion. Alternatively, prospective overdetermination could elicit frustration, because the individual can imagine the undesirable outcome unfolding but still has to wait for it to happen. A direct comparison between retrospective overdetermination and prospective overdetermination would clarify whether the effect is driven primarily by reduced counterfactual thinking after the fact, or by pre-emptive acceptance before the fact.

Although my findings suggest that brands can emphasize the overdetermination of missed opportunities by reminding consumers of multiple causes, I did not include an intervention study in my research. Chan et al. (2009) has shown that fate-suggestive brand names can reduce consumers' dissatisfaction with the service failure. Hence, it may be possible for future studies to design interventions to test the practical applicability of these implications. For instance, future studies could manipulate brand communications to consumers when cancelling an event, for example, by having the brands notify passengers that the cancellation is due to several independent reasons or pose questions such as “Could this be fate?”.

Finally, future research can examine how consumers could utilise the effect of overdetermination. Research on information avoidance suggests that individuals often avoid information to prevent disappointment (Golman, Hagmann, and Loewenstein 2017; Sweeny et al. 2010). Accordingly, when consumers miss out on desired opportunities, they may want to avoid further information related to those missed experiences. However, my findings imply the opposite, which is that seeking more information may reduce disappointment in some cases. When individuals miss out on a desired opportunity, actively seeking additional reasons to explain the missed opportunity may help alleviate their disappointment. I speculate that this process allows consumers to reframe the situation, particularly as a self-regulatory strategy to mitigate disappointment, and especially when the missed opportunity is due to internal reasons. By doing so, consumers may reduce self-blame and rumination. In addition, my findings suggest that overdetermination of missing-out can decrease the likelihood of consumers choosing inferior alternatives. Thus, in overdetermination situations, consumers may avoid potential regret and the waste of resources associated with purchasing inferior alternatives. This highlights the potential importance of information-seeking behaviours in helping consumers navigate missed opportunities and make better decisions. Therefore, future studies could ask participants to imagine missing an opportunity and prompt them to consider other possible reasons that would make their missed opportunity seem fated. By prompting participants to consider overdetermination, I expect them to feel less disappointed and therefore be less likely to choose alternatives.

7.5 Concluding Remark

This thesis proposes that consumers who miss out on a desired purchase or consumption opportunity feel less disappointed when there are multiple independent and sufficient reasons for the missed opportunity. In today's fast-paced world, where numerous events and commitments often occur simultaneously, it is not uncommon for consumers to miss desired opportunities due to multiple reasons. Intuitively, one might expect consumers to experience greater or at least equal levels of disappointment when faced with two or more negative events (compared to one event). However, my findings reveal that disappointment is, in fact, reduced in such cases. I also shed light on the underlying process of this effect by demonstrating that overdetermined missing-out reduces disappointment through consumers' increased attribution to fate. Furthermore, I found that this reduction in disappointment subsequently enhances consumers' satisfaction with compensation and decreases the likelihood of choosing alternative options. These findings have significant implications for brands, consumers and policymakers. Brands should emphasize the overdetermination of cancellations or product shortages and disclose as much information as possible. They should also actively collect information regarding the reasons behind consumers' no-shows, which can enable more effective segmentation of consumers based on missing-out reasons and facilitate strategic planning for compensation and alternative recommendations. Additionally, these findings carry positive implications for consumer well-being. Consumers who miss out on desired opportunities could recognize and utilise overdetermination effect by trying to attribute to fate, which might help them reduce disappointment and avoid suboptimal alternatives. Regarding for policymakers, this thesis suggests that they could consider asking consumers to disclose the cancellation reasons and adjust compensation policies accordingly. Finally, I hope this thesis will inspire further research and practical applications in both marketing strategies and consumer well-being, contributing to a deeper understanding of how overdetermination can influence emotional responses and decision-making processes.

APPENDIX A: ONLINE DISCUSSION EVIDENCE

r/Unexpected · 3y ago

When the universe conspired against you.

1.4K votes · 66 comments

r/ForeverAlone · 6y ago

Do you ever feel like the universe is actively working against you?

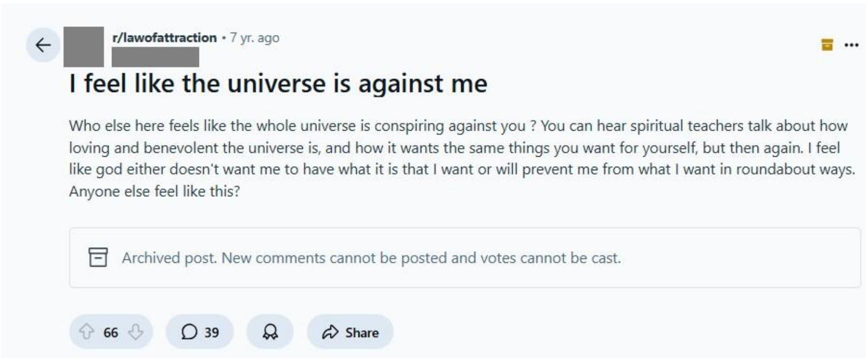
347 votes · 67 comments

r/physicsmemes · 2mo ago

The universe is conspiring against me!

100 votes · 3 comments

Source: Reddit



r/lawofattraction • 7 yr. ago

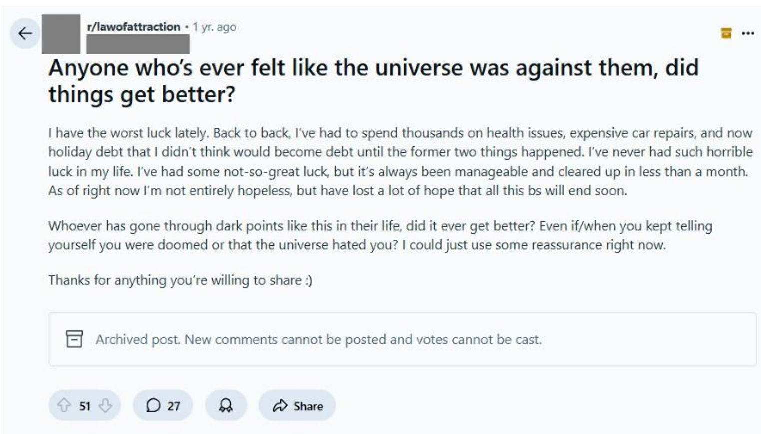
I feel like the universe is against me

Who else here feels like the whole universe is conspiring against you ? You can hear spiritual teachers talk about how loving and benevolent the universe is, and how it wants the same things you want for yourself, but then again. I feel like god either doesn't want me to have what it is that I want or will prevent me from what I want in roundabout ways. Anyone else feel like this?

Archived post. New comments cannot be posted and votes cannot be cast.

66 39 Share

Source: Reddit



r/lawofattraction • 1 yr. ago

Anyone who's ever felt like the universe was against them, did things get better?

I have the worst luck lately. Back to back, I've had to spend thousands on health issues, expensive car repairs, and now holiday debt that I didn't think would become debt until the former two things happened. I've never had such horrible luck in my life. I've had some not-so-great luck, but it's always been manageable and cleared up in less than a month. As of right now I'm not entirely hopeless, but have lost a lot of hope that all this bs will end soon.

Whoever has gone through dark points like this in their life, did it ever get better? Even if/when you kept telling yourself you were doomed or that the universe hated you? I could just use some reassurance right now.

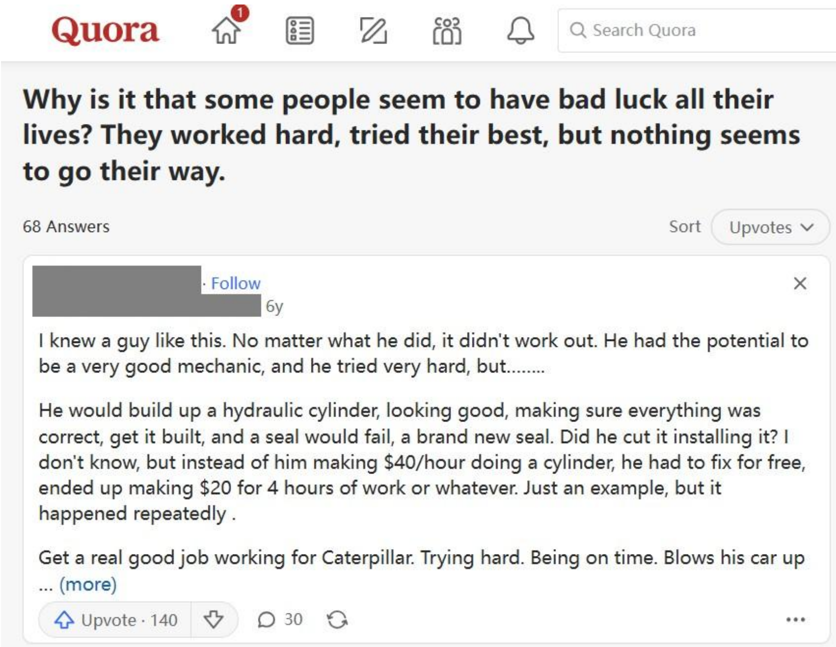
Thanks for anything you're willing to share :)

Archived post. New comments cannot be posted and votes cannot be cast.

51 27 Share

Source: Reddit

Source: Quora



Source: Quora

APPENDIX B: EXPLORATORY STUDIES ON BRAND ENGAGEMENT

In my previous studies, I primarily focused on how missed-out consumers respond to specific missing-out situations—such as how disappointed they feel, how satisfied they are with compensation, whether they choose alternatives, and whether they reengage with the missed opportunities. However, missing-out may also influence consumers' responses toward the associated brands. Study 2 and study 3 demonstrated that overdetermination of missing-out reduces consumers' dissatisfaction with brands; that is, consum ers are less dissatisfied with a brand when the missed-out experience is overdetermined compared to when it is not. Given that overdetermination reduces brand dissatisfaction, I am curious whether this shift in attitudes also translates into behavioural intentions towards the brands. This section aims to explore another consumer behavioural intention, namely, brand engagement. Specifically, with two studies, I examine whether the overdetermination of missing-out has an effect on consumers' intention to engage with the brands associated with the missed opportunities.

Study 10: Missing Out and Brand Engagement

In this study, I examine consumers' intention to engage with brands that offer the experiences that they missed out on. I also measure negative emotions as a potential mediator. I predict that overdetermination of missing-out will reduce negative emotions of consumers, which will then result in higher engagement intention with the brands. The preregistration is available at https://aspredicted.org/p83p-tkty.pdf.

Method

This study followed a 2-condition (missing-out: overdetermined vs. non-overdetermined) between-subjects design. I set an a priori target sample size of N = 200 (N = 100 per condition). Two hundred and ten participants from Prolific (52.4% female, M_{age} =

38.89, SD = 13.25) completed the experiment. Sensitivity analysis using G*Power software indicated that, given my experiment design and sample size, the smallest effect size I was adequately powered to detect was d = 0.39 (with 210 participants, a 0.05 alpha error rate, and 80% power).

Participants were told to imagine that they missed out on a comedy show due to misremembering the show time, and that the show was cancelled or went on as planned, depending on the condition assigned. Then, I measured brand engagement with three questions about how likely participants would want to engage with the comedy club, for example, “How likely would you join a loyalty program offered by the comedy club?” (1 = Extremely unlikely, 7 = Extremely likely; α =.734). In addition, I measured negative emotions by asking participants to rate to what extend did they feel regretful, guilty, and shameful (1 = Not at all, 7 = Very much; α = .799). The measuring order of brand engagement and negative emotions was randomised. There was no order effect on brand engagement and negative emotions, hence I collapsed across the order conditions in the analyses. An attention check asking whether the participants had watched the comedy show was conducted (1 = Yes, 2 = No, 3 = I am not sure). Finally, participants reported their age and gender. As preregistered, I coded participants who chose “Yes” and “I don’t know” as failing the attention check. Nine participants failed the attention check. The pattern of the results did not change after excluding those who failed the attention check. I retained all participants in the subsequent analyses.

Results

Negative emotions. A t-test was conducted on negative emotions with missing-out condition as the factor. Participants in the overdetermined condition reported less negative emotions than those in the non-overdetermined condition ($M_{\text{non-overdetermined}}$ = 3.87, SD = 1.05 vs. $M_{\text{overdetermined}}$ = 2.07, SD = 1.05, t(208) = -10.18, p < .001, d = 1.41).

Brand engagement. A t-test was conducted on brand engagement with overdetermination as the factor. There was no significant difference in brand engagement between the overdetermined and non-overdetermined condition ($M_{\text{non-overdetermined}}$ = 3.55, SD = 1.26 vs. $M_{\text{overdetermined}}$ = 3.43, SD = 1.48, t(202.89) = - .64, p = .525, d = .088).

Mediation analysis. To explore whether there may be an indirect effect of overdetermined missing-out on brand engagement, I conducted a mediation analysis in SPSS (PROCESS Model 4) with missing-out condition as the IV, negative emotions as the mediator, and brand engagement as the DV. The results revealed a significant indirect effect (b = - .15, SE = .07, 95% CI [- .298, - .014]. Overdetermined missing-out reduced negative emotions (b = - .90, SE = .09, t(208) = -10.18, p < .001), and then the reduced negative emotions in turn reduced brand engagement (b = .17, SE = .07, t(207) = 2.29, p = .023).

Discussion

The results of study 10 suggest that overdetermined missing-out reduced brand engagement by reducing negative emotions. At first glance, this finding appears contradictory to earlier findings from study 2 and study 3, where overdetermination of missing-out reduced brand dissatisfaction—implying improved brand attitudes. Unlike Study 2 and study 3, which employed a 2 (initial missing-out: yes vs. no) × 2 (cancellation: yes vs. no) design, study 10 used a simpler two-condition (missing-out: overdetermined vs. overdetermined) design. As a result, it could not test for an interaction effect between initial missing-out and cancellation on brand engagement. Study 2 and study 3 demonstrated a significant interaction: the positive effect of cancellation on brand dissatisfaction was weakened when individuals initially missed out, relative to when they did not initially miss out. It is plausible that a similar interaction exists for brand engagement. Specifically, cancellation may reduce brand engagement more strongly when there is no initial missing-out, and this negative effect may be attenuated when initial missing-out is present. To examine whether the effects of overdetermination on brand engagement mirror its effect on brand dissatisfaction, the next study will adopt a similar design to study 2 and study 3.

Study 11: Examination of Interaction Effect on Brand Engagement

Prior studies (study 2 and study 3) have shown an interaction effect of initial missing-out and cancellation on brand dissatisfaction. Specifically, the increase in brand dissatisfaction due to cancellation was weakened when participants experienced (vs. did not experience) initial missing-out. Building on this, the present study adopts a two-by-two design to test whether the effect of overdetermination on brand engagement mirror its effects on brand dissatisfaction. I expect there is an interaction effect of internal missing-out and cancellation on brand engagement. The preregistration is available at https://aspredicted.org/t65h-rhnz.pdf.

Method

This study followed a 2 (initial missing-out: yes vs. no) x 2 (brand cancellation: yes vs. no) between-subjects design. I set an a priori target sample size of N = 400 (N = 100 per condition). Four hundred participants from Prolific (62% female, Mage = 37.67, SD = 13.32) completed the experiment. Sensitivity analysis using G*Power software indicated that, given my experiment design and sample size, the smallest effect size I was adequately powered to detect was $f = 0.14$ (with 400 participants, a 0.05 alpha error rate, and 80% power).

Participants were told to first imagine that they were going to see a comedy show, and that they either missed it due to misremembering the show time or got ready early to not miss it. Then, they were told that the show was cancelled or went as planned, depending on the condition assigned.

Participants then answered a short survey. They indicated their negative emotions by rating the extent to which they feel painful, upset, and unhappy (1 = Not at all, 7 = Very much; $\alpha = .866$). I also measured fate attribution. The measuring order of negative emotions and fate attribution was counterbalanced. There was no order effect on negative emotions, fate attribution, or brand engagement, hence I collapsed across the order conditions in the analyses. Finally, similar to study 10, I measured brand engagement with five questions about how likely participants were to engage with the comedy club ($\alpha = .846$). An attention check was conducted by asking participants to indicate whether they had watched the comedy show (1 = Yes, 2 = No, 3 = I am not sure). Finally, participants reported their age and gender. As preregistered, I coded participants in the no initial missing-out and no cancellation condition who chose "Yes", and all other participants who chose "No", as passing the attention check. Thirty-six participants failed the attention check. The attention check failure was not balanced across conditions, as 20 participants in the no initial missing-out and no cancellation condition failed the check (12 of them chose "I don't know"). Similar to study 1a and study 2, this may have been due to the vignette being unclear. For example, the phrase "got ready early to ensure you would not miss it" does not necessarily imply that they actually made it to the show. The pattern of the results did not change after excluding those who failed the attention check. I retained all participants in the subsequent analyses.

Results

Negative emotions. I conducted a two-way ANOVA analysis on negative emotions with initial missing-out and brand cancellation as the factors. The results revealed a significant main effect of initial missing-out on negative emotions ($M_{no\_initial\ \_missing\text{-}out}$ = 2.94, SD = 1.74 vs. $M_{initial\_missing\text{-}out}$ = 3.68, SD = 1.61, $F(1, 396) = 28.83$, $p < .001$, $\eta^2_p = .068$). There was also a significant main effect of brand cancellation on negative emotions ($M_{no\_cancellation}$ = 3.08, SD = 1.88 vs. $M_{cancellation}$ = 3.61, SD = 1.49, $F(1, 396) = 19.50$, $p < .001$, $\eta^2_p = .047$). In addition, there was a significant interaction effect of initial missing-out and brand cancellation on negative emotions ($F(1, 396) = 181.20$, $p < .001$, $\eta^2_p = .314$). Specifically, in the no brand cancellation condition, participants reported greater negative emotions when they initially missed out, relative to when they did not initially miss out ($M_{no\_initial\ \_missing\text{-}out}$ = 1.71, SD = 1.22 vs. $M_{initial\_missing\text{-}out}$ = 4.30, SD = 1.48, $F(1, 396)$ = 172.70, $p < .001$, $\eta^2_p = .304$); however, this effect was reversed in brand cancellation condition ($M_{no\_initial\ \_missing\text{-}out}$ = 4.17, SD = 1.26 vs. $M_{initial\_missing\text{-}out}$ = 3.06, SD = 1.49, $F(1, 396) = 33.63$, $p < .001$, $\eta^2_p = .078$). A second set of simple contrasts revealed that, in the no initial missing-out condition, participants reported greater negative emotions when the show was cancelled by the brand, compared to when it was not cancelled ($M_{no\_cancellation}$ = 1.17, SD = 1.22 vs. $M_{cancellation}$ = 4.17, SD = 1.26, $F(1, 396) = 154.94$, $p < .001$, $\eta^2_p = .281$); however, this effect was reversed in initial missing-out condition ($M_{no\_cancellation}$ = 4.30, SD = 1.48 vs. $M_{cancellation}$ = 3.06, SD = 1.49, $F(1, 396) = 42.23$, $p < .001$, $\eta^2_p = .096$).

Brand engagement. I conducted a two-way ANOVA analysis on brand engagement with initial missing-out and brand cancellation as the factors. The analyses revealed no significant main effect of initial missing-out on brand engagement ($F(1, 396) =.078$, $p = .78$, $\eta^2_p = .000$), but there was a significant main effect of brand cancellation on brand engagement ($F(1, 396) = 7.58$, $p = .006$, $\eta^2_p = .019$). As predicted, people showed less willingness to engage with the brand when the event was cancelled than when it was not cancelled ($M_{no\_cancellation}$ = 3.62, SD = 1.40 vs. $M_{cancellation}$ = 3.24, SD = 1.35). However, there was no interaction effect of initial missing-out and brand cancellation on brand engagement ($F(1, 396) = 2.24$, $p = .135$, $\eta^2_p = .006$).

Mediation analysis. To explore whether there was an indirect effect of overdetermination on brand engagement, I performed a moderated mediation analysis in SPSS (PROCESS Model 7), with initial missing-out as the IV, brand cancellation as the moderator, negative emotions as the mediator, and brand engagement as the DV. The results showed that there was no significant indirect effect (b = - .12, SE = .17, 95% CI [- .455, .216]). The interaction of initial missing-out and brand cancellation had a significant impact on negative emotions (b = -3.70, SE = .27, $t(396) = -13.46$, $p < .001$), however, the negative emotions did not have significant impact on brand engagement (b = .03, SE = .04, $t(397) = .79$, $p = .427$).

Fate attribution. Fate attribution was measured by asking participants to rate two statements: “Whether I see the comedy show or not at the end was meant to be.” and “Whether I miss out on the comedy show or not was predetermined.” (1 = Totally disagree, 7 = Totally agree). A reliability check indicated that the measure of fate attribution had low internal consistency (α = .48), suggesting that the items may not reliably assess the same construct. I conducted a two-way ANOVA analysis on fate attribution with initial missing-out and brand cancellation as the factors. The results should be taken with caution due to insufficient reliability. The analyses showed that there was no significant main effect of either initial missing-out ($F(1, 396) = .06$, $p = .805$, $\eta^2_p = .000$) or brand cancellation ($F(1, 396) = 2.29$, $p = .131$, $\eta^2_p = .006$), and no significant interaction effect of them ($F(1, 396) = .90$, $p = .343$, $\eta^2_p = .002$) on fate attribution.

Discussion

Although this study replicated study 10 that overdetermination reduced negative emotional responses, this did not translate into behavioural responses, i.e., brand engagement. While I found a significant main effect of brand cancellation on brand engagement (with lower engagement when brands cancelled events), there was no significant interaction effect of initial missing-out and brand cancellation on brand engagement. These findings suggest that cancellation consistently reduced engagement intentions regardless of whether the missing-out was overdetermined or not. Furthermore, unlike study 10, there was no evidence that overdetermination of missing-out had an indirect effect through negative emotions on brand engagement.

Summary

This section tested whether and how overdetermination of missing-out might affect consumers' responses towards brands. While I found that overdetermination reduces negative emotions among consumers who missed out, and that in study 2 and study 3, consumers are less dissatisfied with brands that cancelled their desired events when the missing-out is overdetermined, these less negative attitudinal responses do not appear to translate into greater brand engagement intention. The divergence between emotional and behavioural responses to brands in overdetermined missing-out situations warrants further investigation.

APPENDIX C: STUDY MATERIALS

1. Study 1A Study Material

Scenarios

Participants assigned to the no initial missing-out [initial missing-out] and no cancellation [cancellation] condition read:

You were eagerly looking forward to attending a special fitness class at a fitness studio. You got ready early to ensure you would not miss it [Unfortunately, you missed it because you needed to deal with an unexpected leak in your kitchen]. The class went on as planned and many people attended [Later, you found out that the class had to be cancelled because the whole building was evacuated due to a false fire alarm].

Measure

Fate attribution: Whether I attend the fitness class or not at the end was meant to be. (1 = Totally disagree, 7 = Totally agree).

2. Study 1B Study Material

Scenarios

Participants randomly assigned to the internal [third-party] condition read:

"Imagine that you booked an art exhibition featuring a renowned artist at a gallery tonight. However, you missed it because you took a nap before heading out and ended up oversleeping [because your boss gave you a last-minute urgent task that she forgot to inform you earlier, which kept you working late]."

Then, participants randomly assigned to the overdetermined condition read:

"Then, you found out that the underground was severely delayed, and you would have missed the art exhibition anyway."

Participants in the non-overdetermined condition did not have further text to read.

Measure

Engagement intention: How likely would you be to book tickets for another exhibition at this gallery? (1 = Very unlikely, 7 = Very likely).

3. Study 2 Study Material

Scenarios

Participants randomly assigned to the no initial missing-out [initial missing-out] and no cancellation [cancellation] condition read:

"You were eagerly looking forward to attending a free fitness class at a nearby fitness studio. You got ready early to ensure you would not miss it [Unfortunately, you missed it as you mistakenly believed it was scheduled for the following week]. The fitness studio hosted the class as planned and many people attended [Later, you found out that the fitness studio had actually cancelled the class]."

4. Study 3 Study Material

Scenarios

Participants randomly assigned to the no initial missing-out [initial missing-out] and no cancellation [cancellation] condition read:

"Imagine a comedian you like had a one-off show in your city. You got ready early to ensure you would not miss it [Unfortunately, you missed it because you misremembered the show time]. The comedy club hosted the show as planned and many people attended [Later, you found out that the comedy club cancelled the show]."

Measures

1) Fate attribution: Whether I see the comedy show or not at the end was meant to be. (1 = Totally disagree, 7 = Totally agree).
2) Negative emotions: Please rate the extent to which the following statements describe how you feel in the scenario (1 = Not at all, 7 = Very much).

   I experience pain. / I'm upset. / I'm unhappy.
3) Disappointment:

   How do you feel about the comedy show experience?

   How would you rate your overall experience with the comedy show?

   (1 = Very disappointed, 7 = Very happy)
4) Brand dissatisfaction:

   In general, how do you feel about the comedy club?

   How would you rate your satisfaction with the comedy club?

   (1 = Very dissatisfied, 7 = Very satisfied)

5. Study 4A Study Material

Scenarios

All the participants read:

"Imagine that you are on your way to see a live comedy show that you booked months ago. When you're already on your way, you receive a text message from the comedy venue telling you they have to cancel the show unexpectedly."

Then, participants randomly assigned to the overdetermined condition read:

"As you read the message, something else happens: You realize that your car's tire is about to go flat. You think: 'By the time help arrives and the tire is fixed, I would have missed the show anyway even if it hadn't been cancelled.'"

Participants in the non-overdetermined condition did not have further text to read.

6. Study 4B Study Material

Scenarios

All the participants read:

"Imagine that you signed up for a timeslot to complete an in-person registration to receive your new student card. When you arrive at the registration office, you find that it is unexpectedly closed."

Then, participants randomly assigned to the overdetermined condition read:

"At the same time, you realize that you forgot to bring your ID, which is essential for the registration. Therefore, even if the office had been open, you still wouldn't have been able to complete the registration."

Participants in the non-overdetermined condition did not have further text to read.

7. Study 5 Study Material

Scenarios

Participants assigned to the internal [third-party] condition read:

"Imagine a friend told you that a café near you was offering seasonal maple donuts until this Friday, and you wanted to try them. However, you missed the special offer because you misremembered and thought it was available until next Friday [you missed the special offer because your friend was mistaken—the offer had actually ended last Friday]."

Then, participants in the overdetermined condition read:

"At the same time, you realized that you would have missed the maple donuts anyway because your boss asked you to go on a last-minute business trip, and you were out of town the whole week."

Participants in the non-overdetermined condition did not have further text to read.

Measures

1) Choice of alternative:

   If this café offers limited-edition chocolate orange donuts in the next season, how likely would you be to buy one? (1 = Very unlikely, 7 = Very likely).

2) Interest in missed opportunity communication:

   If you see the social media post below from this café showing the maple donuts you didn't have the chance to try, how likely would you be to like the post? (1 = Very unlikely, 7 = Very likely).

8. Study 6 Study Material

Scenarios

Participants assigned to the missing-out [overdetermined missing-out] condition read:

“Imagine you book to see a wildflower super bloom in a state park today. However, you miss it because you misremember the date. [Then, you find out you would’ve missed the super bloom anyway due to severe train delays earlier.] Later, you look online and find out that you can sign up for an art exhibition at a gallery later today, featuring an artist you don’t know. ”

Participants in the control condition read:

“Imagine you have no plans for today. You look online and find out that you can sign up for an exhibition at a gallery later today, featuring an artist you don’t know. ”

9. Study 7 Study Material

Scenarios

Participants randomly assigned to the internal [third-party] condition read:

“Imagine you see a post by a food influencer saying that a café near you offers special maple doughnuts for their anniversary this Friday [Saturday], and you want to try them. However, you misremember the date [the influencer is mistaken—the offer is only available on Friday]. Thus, you find out that the maple doughnuts are not available anymore when you visit the café on Saturday.”

Then, participants randomly assigned to the overdetermined condition read:

“Then, you realize that you would have missed the maple doughnuts anyway because you were away out of town on Friday.”

Participants in the non-overdetermined condition did not have further text to read.

10. Study 8 Study Material

Social perception test

Is this smile real or fake? (Real/Fake) (Pictures of smiles were shown).

Nine more similar questions for fake smile test were used in the study.

Instagram account evaluation study

I have another study ready in which I ask you to evaluate posts from an Instagram account focused on puppy pictures. You can participate now without any prerequisite, and you will receive extra $0.25 as a bonus payment. You will look at a few dog pictures like the one below and write a brief review of the posts.

(A dog picture was shown here).

Would you like to participate in the Instagram account evaluation study? (by choosing 'Yes', I will send you a link to that task after you complete the current study.) (Yes/No).

11. Study 9 Study Material

Scenarios

Participants randomly assigned to the control [overdetermined] condition read:

"Imagine that you were looking forward to seeing a live comedy show that you booked several months ago. Unfortunately, you got food poisoning on the day of the show and could not attend [Later, you checked your ticket and realized that you would have missed it anyway because you had misremembered the date—the show was actually the day before]."

Measures

1) Disappointment: How disappointed do you feel do you feel about missing the show

now? (1 = Not disappointed at all, 7 = Very disappointed).

2) Reengagement intention: You contacted the show organizer and explained what happened. They kindly informed you that you could either get a replacement ticket to the same show scheduled in two weeks at no extra cost or apply for a refund with a deduction of 20% administration fee. Which option would you choose? (Get a replacement ticket/Refund minus 20% admin fee).

12. Study 10 Study Material

Scenarios

Participants randomly assigned to the control [overdetermined] condition read:

"Imagine a comedian you like had a one-off show in your city. Unfortunately, you missed it because you misremembered the show time. Later, you find out that the show is actually cancelled because the comedian is sick, meaning you could not have seen it anyway even if you had not misremembered the show time [you find out that the show has gone on as planned and many people attended, meaning you could have seen it if you had not misremembered the show time]."

Measures

1) Negative emotions:

   On a scale from 1 (not at all) to 7 (very much), please rate to what extent you feel the emotions below in this scenario.

   Regret / Guilt / Shame.

2) Brand engagement:

   How likely would you join a loyalty program offered by the comedy club?

How likely would you subscribe to a newsletter from the comedy club to receive updates on upcoming shows and events?

How likely would you buy a comedy club branded T-shirt?

(1 = Extremely unlikely, 7 = Extremely likely).

13. Study 11 Study Material

Scenarios

Participants randomly assigned to the initial missing-out [no initial missing-out] and cancellation [no cancellation] condition read:

"Imagine a comedian you like had a one-off show in your city. Unfortunately, you missed it because you misremembered the show time [You got ready early to ensure you would not miss it]. Later, you found out that the show was actually cancelled [The show went on as planned and many people attended]."

Measures

1) Negative emotions

   On a scale from 1 (not at all) to 7 (very much), please rate to what extent you feel the emotions below in this scenario.

   Pain/ Upset/ Unhappy.

2) Brand engagement:

   How likely would you be to join a loyalty program offered by the comedy club?

   How likely would you be to subscribe to a newsletter from the comedy club to receive updates on upcoming shows and events?

   How likely would you be to buy a comedy club branded T-shirt?

   How likely would you be to recommend the comedy club to your friends?

How likely would you be to follow the comedy club on social media?

(1 = Extremely unlikely, 7 = Extremely likely).

APPENDIX D: SUPPLEMENTARY MATERIAL OF STUDIES

1. Study 3 Supplementary Material

Fate attribution. A gender effect[3] was observed on fate attribution. A three-way ANOVA was conducted on fate attribution using initial missing-out, cancellation, and gender as the factors. The analyses revealed a significant main effect of gender on fate attribution ($F(1, 387) = 5.49$, $p = .020$, $\eta^2_p = .014$). Specifically, female participants reported greater fate attribution than male participants ($M_{\text{female}} = 4.23$, SD = 1.70 vs. $M_{\text{male}} = 3.81$, SD = 1.75). There were no significant interaction effects between gender and initial missing-out, gender and cancellation, or the three-way interaction among gender, initial missing-out, and cancellation on fate attribution (*ps* > .05).

Brand dissatisfaction. A gender effect was observed on brand dissatisfaction. A three-way ANOVA was conducted on brand dissatisfaction using initial missing-out, cancellation, and gender as the factors. The analyses revealed a marginally significant main effect of gender on dissatisfaction ($F(1, 387) = 3.42$, $p = .065$, $\eta^2_p = .009$), with male participants reporting slightly higher dissatisfaction than female participants ($M_{\text{male}} = 4.25$, SD = 1.63 vs. $M_{\text{female}} = 4.03$, SD = 1.71). There was a significant interaction between gender and initial missing-out ($F(1, 387) = 4.67$, $p = .031$, $\eta^2_p = .012$). Specifically, in no initial missing-out condition, gender had no effect on brand dissatisfaction ($F(1, 387) = .05$, $p = .829$, $\eta^2_p = .000$); however, in initial missing-out condition, male participants reported higher brand dissatisfaction than female participants ($M_{\text{male}} = 4.31$, SD = 1.25 vs. $M_{\text{female}} = 3.85$, SD = 1.35, $F(1, 387) = 8.40$, $p = .004$, $\eta^2_p = .021$). There was no significant interaction between gender and cancellation, nor was there a significant three-way interaction among gender, initial missing-out, and cancellation on brand dissatisfaction (*ps* > .05).

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[3] I excluded participants who answered 'Other / Prefer not to say' in response to the gender question when testing for gender effect in all studies because the sample sizes were very small across studies (<5% of total N).

2. Study 4A Supplementary Material

Compensation satisfaction. An age effect was observed on compensation satisfaction. A regression analysis was performed to examine whether age and missing-out condition predict compensation satisfaction. The overall model was significant ($F(3, 196) = 5.79$, $p < .001$, $R^2 = .08$, $R^2_{Adjusted} = .07$). Results showed that age was a significant negative predictor of compensation satisfaction ($\beta = -.15$, $t(199) = -2.16$, $p = .032$). This suggested that older participants were less satisfied with the compensation than the younger participants. Additionally, the interaction between age and missing-out condition was not significant ($\beta = .28$, $t(199) = 1.26$, $p = .211$).

3. Study 5 Supplementary Material

Order effect on fate attribution. A three-way ANOVA was conducted on fate attribution with missing-out reason, overdetermination, and measure order (interest in missed-opportunity communication first = 1, blame attributions first = 2, choice of alternative first = 3) as fixed factors on fate attribution, while controlling for the other attributions. Replicating previous analysis, there was a main effect of overdetermination on fate attribution ($M_{non\text{-}overdetermined} = 3.54$, SD = 1.95 vs. $M_{overdetermined} = 2.95$, SD = 1.91, $F(1, 386) = 9.49$, $p = .002$, $\eta^2_p = .024$) and no main effect of missing-out reason on fate attribution ($F(2, 386) = .016$, $p = .901$, $\eta^2_p = .000$). However, a significant interaction effect of missing-out reason and overdetermination on fate attribution was observed ($F(1, 386) = 3.93$, $p = .048$, $\eta^2_p = .010$): overdetermination increased fate attribution for third-party condition ($M_{third\text{-}party} = 2.78$, SD = 1.87 vs $M_{overdetermined\_third\text{-}party} = 3.80$, SD = 1.97, $p < .001$) but not for internal condition ($M_{internal} = 3.16$, SD = 1.93 vs. $M_{overdetermined\_internal} = 3.36$, SD = 1.92; $p = .461$). The results revealed a significant main effect of order of measures ($F(2, 386) = 3.89$, $p = .021$, $\eta^2_p = .020$). Specifically, participants who responded first to the choice of alternative reported higher fate attribution than those responded first to interest in missed-opportunity communication ($M_{\text{choice\_of\_alternative}}$ = 3.57, SD = .18 vs. $M_{\text{missed-opportunity communication}}$ = 2.91, SD = .16, p =.007). It is likely that the question of interest in missed-opportunity communication reminded participants about the brand (the café) and thus they attributed blame to the brand. There were no significant interaction effects of missing-out reason and measure order, overdetermination and measure order, or the three-way interaction among missing-out reason, overdetermination, and measure order on fate attribution (*ps* > .05).

Choice of alternative. A gender effect was observed on choice of alternative. A three-way ANOVA was conducted on choice of alternative using gender, missing-out reason, and overdetermination as the factors. The analyses revealed a significant main effect of gender on choice of alternative (F(1,389) = 4.27, p = .040, η^2_p = .011). Specifically, male participants reported greater choice of alternative than female participants (M_{female} = 4.01, SD = 2.23 vs. M_{male} = 4.52, SD = 1.82). There were no significant interaction effects between gender and missing-out reason, gender and overdetermination, or the three-way interaction among gender, missing-out reason, and overdetermination on choice of alternative (*ps* > .05).

In addition, an age effect was also observed on choice of alternative. A regression analysis was performed to examine whether age, missing-out reason, and overdetermination predict choice of alternative. The overall model marginally significant (F(7, 393) = 1.88, p = .072, R^2 = .03, R^2_{Adjusted} = .02). Results showed that the interaction of age and overdetermination was a significant negative predictor of choice of alternative (β = - .02, t(393)= -2.45, p = .015). This suggested that age significantly moderated the relationship between overdetermination and choice of alternative, that is, as age increased, the positive effect of overdetermination on choice of alternative decreased. Other predictors, including age, missing-out reason, overdetermination, and their interactions, were not statistically significant (*ps* > .05), though the main effects of missing-out reason ($\beta = .282$, $p = .087$) and overdetermination ($\beta = .296$, $p = .072$) showed marginal significance.

4. Study 6 Supplementary Material

Choice of alternative. A gender effect was observed on choice of alternative. A two-way ANOVA was conducted on choice of alternative using condition and gender as the factors. The analyses revealed a significant main effect of gender on choice of alternative ($F(2, 291) = 3.74$, $p = .025$, $\eta^2_p = .025$). Different to study 5, female participants reported greater choice of alternative than male participants ($M_{female} = 4.27$, SD = 1.67 vs. $M_{male} = 3.69$, SD = 1.78). There was no interaction effect between gender and condition on choice of alternative ($p > .05$).

5. Study 7 Supplementary Material

Disappointment. A gender effect was observed on disappointment. A three-way ANOVA was conducted on disappointment using initial missing-out, missing-out reason, and overdetermination as the factors. The analyses revealed a significant main effect of gender on disappointment ($F(1, 618) = 1.67$, $p = .001$, $\eta^2_p = .017$). Specifically, female participants reported greater disappointment than male participants ($M_{female} = 4.30$, SD = 1.63 vs. $M_{male} = 3.84$, SD = 1.74). There were no significant interaction effects between gender and missing-out reason, gender and overdetermination, or the three-way interaction among gender, missing-out reason, and overdetermination on disappointment (*ps* > .05).

Expected enjoyment of alternative. A gender effect was observed on expected enjoyment of alternative. A three-way ANOVA was conducted on expected enjoyment of alternative using gender, missing-out reason, and overdetermination as the factors. The analyses revealed a significant main effect of gender on expected enjoyment of alternative ($F(1, 618) = 9.85$, p

= .002, η^2_p = .016). Specifically, female participants reported greater expected enjoyment of alternative than male participants (M_{female} = 4.43, SD = 1.63 vs. M_{male} = 4.06, SD = 1.58). There were no significant interaction effects between gender and missing-out reason, gender and overdetermination, or the three-way interaction among gender, missing-out reason, and overdetermination on expected enjoyment of alternative (*ps* > .05).

Expected enjoyment of missed opportunity. A gender effect was observed on expected enjoyment of missed opportunity. A three-way ANOVA was conducted on expected enjoyment of missed opportunity using gender, missing-out reason, and overdetermination as the factors. The analyses revealed a significant main effect of gender on expected enjoyment of missed opportunity ($F(1, 618) = 5.44$, $p = .020$, η^2_p = .009). Specifically, female participants reported greater expected enjoyment of missed opportunity than male participants (M_{female} = 4.90, SD = 1.39 vs. M_{male} = 4.62, SD = 1.53). There were no significant interaction effects between gender and missing-out reason, gender and overdetermination, or the three-way interaction among gender, missing-out reason, and overdetermination on expected enjoyment of missed opportunity (*ps* > .05).

6. Study 10 Supplementary Material

Negative emotions. An age effect was also observed on negative emotion. A regression analysis was performed to examine whether age, overdetermination, and their interaction predict negative emotions. The overall model was statistically significant ($F(3, 206) = 43.34$, $p < .001$, $R^2 = .39$, Adjusted $R^2 = .38$). Results showed that the interaction of age and overdetermination was a significant positive predictor of negative emotions ($\beta = .600$, $t(206) = 3.52$, $p < .001$). This suggested that age significantly moderated the relationship between overdetermination and negative emotions, such that as age increased, the negative effect of overdetermination on negative emotions weakened. Age (β = - .11, $p = .040$) and overdetermination ($\beta = -1.15$, $p < .001$) were also significant negative predictors, indicating that older age and overdetermination independently predicted less negative emotions.

Brand engagement. A gender effect was observed on brand engagement. A two-way ANOVA was conducted on brand engagement using gender and overdetermination as the factors. The analyses revealed a significant main effect of gender on brand engagement ($F(2, 204) = 3.73$, $p = .026$, $\eta^2_p = .035$). Specifically, male participants reported greater brand engagement than female participants ($M_{male} = 3.77$, SD = 1.48 vs. $M_{female} = 3.29$, SD = 1.27). There were no significant interaction effects between gender and overdetermination on brand engagement ($p = .429$).

7. Study 11 Supplementary Material

Brand engagement. An age effect was observed on brand engagement. A regression analysis was performed to examine whether age, initial missing-out, brand cancellation, and their interactions predict brand engagement. The overall model was statistically significant ($F(7, 392) = 3.88$, $p < .001$, $R^2 = .07$, Adjusted $R^2 = .05$). Results showed that age was a significant positive predictor of brand engagement ($\beta = .20$, $t(392) = 1.98$, $p = .048$). This suggested that as age increased, brand engagement scores also increased. Other predictors, including missing-out reason ($\beta = -.09$, $p = .674$), brand cancellation ($\beta = -.17$, $p = .415$), and all interaction terms ($ps > .05$), were not statistically significant.

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