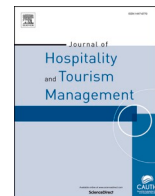




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How counterfactual thinking affects willingness to consume green restaurant products: Mediating role of regret and moderating role of COVID-19 risk perception

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ABSTRACT

Given the severe impact of the COVID-19 pandemic, one may wonder how this situation might have differed if green consumption had been prioritized. Counterfactual thinking is a psychological concept wherein people ponder alternative outcomes of events that have already happened. This paper presents two experiments to explore (a) the effect of counterfactual thinking on individuals' willingness to consume green restaurant products and (b) the roles that regret and risk perception play in the main effect. Study 1 revealed that consumers who think counterfactually express stronger willingness to consume green restaurant products than those who do not think counterfactually. A partial mediating effect of regret was also confirmed in this process. Study 2 showed that risk perception moderates the impact of counterfactual thinking on one's willingness to consume green restaurant products. Theoretical contributions of these findings to counterfactual thinking theories are discussed, and managerial implications for tourism marketing are provided.

1. Introduction

Amid expanding globalization and frequent personal mobility, public health emergencies have posed serious threats to many countries. The COVID-19 pandemic is one such example: this highly contagious, widely spreading virus has placed great pressure on healthcare systems and social economies (Sohrabi et al., 2020). Green consumption has received close attention since the outbreak. Meanwhile, as consumers' awareness of environmental issues (e.g., haze, pollution, vegetation destruction) and environmental protection continues to increase, their willingness to consume green products is rising in kind. Green consumption willingness has thus garnered academic interest (Hong, Kim, & Kim, 2003; Lin & Chang, 2012).

The consequences of the pandemic could inspire people to ponder how this crisis may have differed if green consumption had been prioritized. Such an exercise reflects counterfactual thinking. Counterfactual thinking is a psychological concept that refers to considering alternative outcomes for events that have already occurred (e.g., Beck & Riggs, 2014; Byrne, 2002; Kahneman & Tversky, 1981; Roese, 1997). Many scholars have discussed the effects of counterfactual thinking on consumption willingness. For example, after a poor shopping experience, consumers may think about what would have happened if they had

not entered that store; they may even refuse to visit the store again (Zeelenberg & Pieters, 2007). Although researchers have focused on the effect of counterfactual thinking on consumption intentions, however, little has explored the effect of counterfactual thinking of consumers on green consumption intentions. In particular, no studies have been conducted from the perspective of COVID-19. Yet exploring these perceptions can offer insight to help the public respond appropriately to the pandemic and to effectively manage risk.

On the other hand, due to that the spread of COVID-19 in China may be related to the cross-border transportation (i.e. high carbon emission) of cold-chain food (Chi, Zheng, Liu, & Wang, 2021). It reminds people that the virus can be transmitted through cold chain food, and relevant personnel should pay attention to self-protection and quarantine to prevent infection and spread. Therefore, people may think counterfactually that if more consideration was given to green products at the beginning, the spread of COVID-19 could have been slowed down to a certain extent. Based on research showing that counterfactual thinking can influence people's motivation, emotions, and behavior (Hammell & Chan, 2016; Roese & Epstude, 2017; Smallman & Summerville, 2018), this example illustrates why we focus on the impact of counterfactual thinking in terms of the green product in the context of COVID-19.

Drawing on earlier work, this study explores whether counterfactual

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thinking within the COVID-19 context shapes individuals' willingness to consume green restaurant products. We seek to address the following lines of inquiry: 1) Does counterfactual thinking significantly affect individuals' willingness to consume green restaurant products? and 2) What is the mechanism by which counterfactual thinking affects individuals' willingness to consume green restaurant products?

To address these questions, we first examine the impacts of counterfactual thinking on individuals' willingness to consume green restaurant products. Functional theory asserts that counterfactual thinking has a preparatory function that can facilitate one's willingness to act. In brief, by thinking counterfactually about preferable outcomes that could have been realized, people can prepare for future events and achieve better results. Yet some studies (e.g., Ferrante, Giroto, Stragà, & Walsh, 2013) have called into question this preparatory function. Second, we inspect the mechanism by which counterfactual thinking influences people's willingness to consume green restaurant products by exploring the mediating role of regret; investigations of counterfactual thinking and regret have documented a close relationship between these two elements. Finally, we collectively assess consumers' COVID-19 risk perceptions (i.e., perceived exceptionality, controllability, and closeness of the COVID-19 pandemic) as a moderating variable. Some counterfactual thinking research has identified exceptionality, controllability, and closeness as primers of counterfactual thinking (e.g., Medvec & Savitsky, 1997; Wrosch & Heckhausen, 2002). We scrutinize the moderating effect of COVID-19 risk perceptions to clarify the boundary conditions under which counterfactual thinking affects people's willingness to consume green restaurant products.

2. Literature review

2.1. Green consumption willingness

Consumption willingness refers to the subjective possibility of consumers to purchase or consume a specified product (Dodds, 1991). Based on this, green consumption willingness refers to the tendency of consumers to implement environmentally-friendly and low-carbon consumption (Peattie, 2010). For example, individuals may be willing to carry reusable bags when shopping, eat with reusable tableware when dining out, and try green foods at restaurants or hotels. Green consumption willingness encapsulates people's intentions to consume products with environmentally friendly attributes (Mostafa, 2007). Many researchers have explored consumer characteristics that can influence this willingness (Peloza, White, & Shang, 2013; White, Simpson, & Argo, 2014). Attributes include one's environmental awareness (Kumar, Prakash, & Kumar, 2021; Lin & Chang, 2012; Nekomahmud, Ramkissoon, & Fekete-Farkas, 2022; Schlegelmilch, Bohlen, & Diamantopoulos, 1996), personal values (Follows & Jobber, 2000; Kao & Tu, 2015; Wang, Wang, & Gao, 2020), and cultural background (Ceglia, de Oliveira Lima, & Leocádio, 2015; Chan, 2001; Minton, Spielmann, Kahle, & Kim, 2018; Sheng, Xie, Gong, & Pan, 2019). Broadly, collectivist people are more environmentally friendly than individualists (Laroche, Bergeron, & Barbaro-Forleo, 2001). Collectivist consumers also tend to show greater green consumption willingness than individualist consumers (Kim & Choi, 2005). In addition, people who hold green values normally have stronger pro-environmental attitudes, which affect green consumption behavior (Kao & Tu, 2015; Wang et al., 2020).

We also examine the mediating mechanism by which counterfactual thinking shapes one's willingness to consume green restaurant products. First, we summarize several theories regarding how counterfactual thinking can guide this intention. Appraisal theory (e.g., Smith & Lazarus, 1993) maintains that consumers initially make a basic appraisal of a stimulus (e.g., green consumption) and then construct their understanding of it, in turn producing emotions and thoughts about it (i.e., green consumption behavior). Put simply, values drive consumers' green consumption in relation to appraisal and meaning construction (Grappi, Romani, & Bagozzi, 2013; Hwang & Kandampully, 2015; Tong,

Xie, & Xiao, 2021). Moral emotion theory suggests that moral emotions differ from ordinary emotions in that the former are not related to one's self-interest but rather to the welfare of society or others (Haidt, 2003). Moral emotions are more pertinent than generic emotions to the mechanism of green consumption willingness. More precisely, consumers can earn others' favor by engaging in green consumption or by demonstrating a willingness to do so (Kim & Johnson, 2013; Monin, Pizarro, & Beer, 2007).

Impacts on green purchase intention could be moderated by variables such as consumer characteristics (Olson, McFerran, Morales, & Dahl, 2016; Reed, Aquino, & Levy, 2007; Xie, Bagozzi, & Grønhaug, 2019). Elliott (2013) observed significant differences in green purchase intention based on gender and education: women exhibited stronger green purchase intentions than men, and more highly educated people possessed greater green purchase intentions than those with less education (Elliott, 2013; Straughan & Roberts, 1999; Zeynalova & Namazova, 2022). Family composition plays a role as well. Elliott (2013) found that consumers with children under the age of 18 in their household, and consumers who identified as environmentalists, were more willing than others to use green products. Families with fewer members also appeared more willing to buy green products (Zeynalova & Namazova, 2022). Social class and income can further influence consumers' green product selection (Amin, Manzoor, & Farid, 2020; Diamantopoulos, Schlegelmilch, Sinkovics, & Bohlen, 2003; Zeynalova & Namazova, 2022). As an example, Yan, Keh, and Chen (2021) discerned that middle-class consumers are more inclined toward green consumption versus members of the lower and upper classes.

Knowledge is similarly impactful. Salespeople's environmental concerns have been found to influence their recommendations of green hotels to potential customers (Chen & Peng, 2014). Specifically, environmentally mindful salespeople suggested eco-friendly hotels to travel agency clients as the clients searched for hotel information and tried to evaluate options. The authors also examined the moderating effect of salespeople's green hotel knowledge, uncovering a stronger positive relationship between environmental concerns and environmentally friendly behavior among salespeople with more in-depth knowledge. Chen and Peng (2012) considered the role of tourists' knowledge about green hotels on green hotel consumption. Tourists who were more knowledgeable appeared more likely to stay in green hotels if these consumers were confident in their personal abilities (e.g., to stay within their budget, to be physically capable) and/or if they held positive attitudes toward such hotels. By contrast, tourists who were less familiar with green consumption relied on others' advice due to limited confidence in both the environmental benefits of green products and in their ability to use/purchase these items. Errmann et al. (2021) explored the role of focus in tourists' preferences for environmentally friendly choices; trait focus and temporary focus each increased tourists' penchant for eco-friendly hotels.

2.2. Counterfactual thinking and behavioral intention

Counterfactual thinking entails the mental simulation of events that could have transpired but did not (Decety & Ingvar, 1990; Kahneman & Tversky, 1981; Xie & Beck, 2022). To think counterfactually, one must ignore events that have happened and mull over alternative outcomes that could have transpired (Roese, 1997); one example is the counterfactual statement "If you had not bought the blue dress, you would have bought the red one." Scholars have identified antecedents that prompt counterfactual thinking, focusing on determinants that increase the likelihood of such thought. Several factors apply, such as closeness (e.g., Medvec, Madey, & Gilovich, 1995; Medvec & Savitsky, 1997; Meyers-Levy & Maheswaran, 1992), exceptionality (e.g., Kahneman & Tversky, 1982; Landman, 1987), and controllability (e.g., Kahneman & Tversky, 1982; Markman, Gavanski, Sherman, & McMullen, 1995; Wrosch & Heckhausen, 2002).

Functional theory (Epstude & Roese, 2008) posits that counterfactual

thinking helps people regulate their emotions (Roese, 1994). More importantly, the preparatory function of such thinking can promote behavioral intention (Epstude & Roese, 2008). By thinking counterfactually about favorable alternative outcomes, people can prepare for events and generate behavioral intentions. When people believe they will encounter similar experiences, they often have counterfactual thoughts under the assumption that prior events could have had preferable outcomes (Markman, Gavanski, Sherman, & McMullen, 1993). Epstude and Roese (2008) further suggested that when people anticipate similar situations, they can learn from past failures by thinking counterfactually. Specific (vs. general) information can especially inspire behavioral intention when thinking counterfactually and prompt subsequent actions (Smallman & Roese, 2009).

As mentioned, counterfactual thinking can regulate subsequent behavior. Hammell and Chan (2016) provided corresponding evidence when testing whether counterfactual thinking leads to behavioral intention and actual behavioral change. Using video game tasks, they found that participants who engaged in counterfactual thinking for the just-ended task showed stronger behavioral intentions than other participants to attempt subsequent tasks. Other researchers have demonstrated that counterfactual thinking can spur behavioral intentions and better task performance through logical reasoning tasks (Kray, Galinsky, & Wong, 2006).

Green restaurant products refer to the products that are made from safe and environmentally friendly food and that use green technology in their production methods and processes (Han, 2020; TM, Kaur, Ferraris, & Dhir, 2021). Since the spread of COVID-19 in China may be associated with the virus risk of high-carbon-emission food transportation (Chi et al., 2021), consumers' preference for green food and awareness of food safety may lead consumers to think that green restaurants mean safety, environmental protection, and health for consumers (Rezai, Teng, Mohamed, & Shamsudin, 2012). Therefore, it is likely that one would now think counterfactually that COVID-19 pandemic could have been avoided if more consideration had been given to the consumption of green products. There is also the possibility of coronaviruses coming from animal consumption (Si, Lu, & Aziz, 2021). This leads to a demand for safety and health from animal consumption (Gauly, Chemineau, Rosati, & Sartin, 2021). As a result, consumers may prefer green restaurant products because consumers may gradually realize that green hospitality companies can provide consumers with a more hygienic and safer service to help them reduce the risk of being infected (Güney & Sangün, 2021; Hu, Yan, Casey, & Wu, 2021). In this case, consumers may generate counterfactual thoughts that COVID-19 could have been controlled if they consumed differently (Bertolotti & Catellani, 2023).

Accordingly, we hypothesize that counterfactual thinking will positively influence individuals' willingness to consume green restaurant products.

H1. People who think counterfactually are more willing to consume green restaurant products than those who do not think counterfactually.

2.3. Regret

Decision outcomes include an actual post-decision outcome and alternative outcomes. Regret arises when people compare an actual outcome with preferable choices (Bell, 1982). Individuals feel regretful when their outcomes are worse than other possibilities, implying that regret is a product of counterfactual thinking (Sommer, Peters, Gläscher, & Büchel, 2009). Park and Jang (2018) documented a significant positive correlation between counterfactual thinking and regret in the context of tourism product purchases. Regret is quite common in life (Saffrey, Summerville, & Roese, 2008)—in fact, it is one of the most frequently used words to express negative feelings (Shimanoff, 1984). Research in developmental psychology has demonstrated that, until age 7, children cannot experience regret by comparing what they have received with what they could have received; regret is therefore a

complex cognitive emotion (Guttentag & Ferrell, 2004).

The impact of regret on consumer behavior has long been a hot topic in academic circles. Expected regret can boost consumers' willingness to choose green hotels (De Freitas, Van Eeden, & Christie, 2020). Given that regret stems from the belief that an outcome would have been better if the alternative had been chosen, people usually modify their behavior to avoid repeating the experience (Baumeister, Vohs, Nathan DeWall, & Zhang, 2007). Coricelli et al. (2005) pointed out that individuals who experience regret due to choosing an option that is high-risk and high-reward are apt to select a low-risk, low-reward option in subsequent circumstances. Brassens, Gamer, Peters, Gluth, and Büchel (2012) adopted a sequential risky decision task and found that young participants took more risks on a subsequent trial if they missed many opportunities due to being conservative during the previous trial. In the marketing arena, M'Barek and Gharbi (2012) found that regret influences consumers' post-purchase evaluations via its impact on satisfaction. This emotion also carries behavioral consequences involving complaints, repurchase decisions, and word of mouth.

In addition, based on the literature related to counterfactual thinking and regret, we explore the potential mediating role of regret. Research has unveiled a close relationship between both factors, highlighting the experience of regret as an important function of such thinking (Davis, Lehman, Wortman, Silver, & Thompson, 1995; Landman, 1987; McMullen, 1997). For instance, Davis et al. (1995) interviewed people who had lost loved ones in car accidents and discovered that participants' reported regret could predict the frequency of counterfactual thoughts. Zeelenberg, Van den Bos, Van Dijk, and Pieters (2002) also identified that a negative event could spark counterfactual thinking and regret.

Scholars have also explored the effect of guilt on green consumption willingness, uncovering a strong correlation between regret and guilt in particular. Many studies have shown that when people do not anticipate consuming green products, they expect to feel guilty about their decision. This anticipated guilt can enhance individuals' willingness to consume green products (Basil, Ridgway, & Basil, 2006; Jordan, Flynn, & Cohen, 2015; Marks & Mayo, 1991; Pelozo et al., 2013). Anticipated guilt also increases green consumption willingness, driven by a desire to avoid guilt (Pelozo et al., 2013). Guilt and regret are often considered to be related (e.g., Berndsen, van der Pligt, Doosje, & Manstead, 2004; Gilovich & Medvec, 1995). asked participants to read a story in which the protagonist regretted having been negligent in caring for his child before the child died of a heart attack; most participants equated the protagonist's regret with guilt.

Based on previous research, we hypothesize that counterfactual thinking influences consumption willingness through the mediating role of regret.

H2. Regret mediates the effect of counterfactual thinking on people's willingness to consume green restaurant products.

2.4. Risk perception

Risk perception reflects one's judgment of the extent to which risks are personally salient. This assessment is based on numerous information sources (e.g., Albers & Schwing, 1980). Factors such as frequent media use and conversations about risk (Lin & Lagoe, 2013; Liu, Zhang, & Huang, 2020), one's own risk experience (Han, Zhang, Chu, & Shen, 2014) and low perceived risk controllability (Renn, 2006) can produce strong risk perception. Bauer (1960, pp. 384–398) introduced this concept in consumer research by suggesting that perceived risk refers to subjective risks of negative consequences tied to purchase behavior. Cox (1967) argued that two factors affect perceived risk: the degree of adverse outcomes (i.e., the extent of loss) and consumers' perceptions of the uncertainty surrounding these outcomes. Later, Slovic (1987) defined perceived risk as a subjective judgment of potentially poor consequences of behavior and technologies. Consumers' perceived risk

has since been found to include several dimensions (e.g., financial risk, psychological risk, and social risk) and appears negatively correlated with online purchase behavior (Forsythe & Shi, 2003; Jacoby & Kaplan, 1972; Miyazaki & Fernandez, 2001).

Risk perception in the context of COVID-19 has been extensively discussed and shown to influence people's attitudes and behavioral intentions (Akhrani et al., 2022; Zhu & Deng, 2020; Zorlu, Tuncer, & Taşkın, 2022). Some scholars (e.g., Dai, Hao, & Wu, 2020; Qingyuan & Xiaofei, 2006) described risk perceptions of public health emergencies as including perceived risk controllability, risk intimacy, and risk familiarity. With respect to the pandemic, risk controllability embodies one's sense of whether effective medical treatment is available and whether the virus can be contained (e.g. Sobkow, Zaleskiewicz, Petrova, Garcia-Retamero, & Traczyk, 2020). Risk closeness refers to people's evaluations of whether they are likely to become infected. Risk exceptionality captures people's judgment of COVID-19 as novel and either unprecedented or unexceptional (e.g. Murray, 2005). In this paper, we considered previous work to explore COVID-19 risk perceptions (i.e., risk controllability, risk closeness, and risk exceptionality) and examine their moderating effects.

Research on risk perception has substantiated the relevance of risk controllability, risk closeness, and risk exceptionality. Meanwhile, studies involving counterfactual thinking have suggested why these features are germane when evaluating the possible moderating effects of risk perceptions. These aspects are central to counterfactual thinking as well—people are more inclined to engage in counterfactual thinking when exceptionality (e.g., Gavanski & Wells, 1989; Kahneman & Tversky, 1981), controllability (e.g., Markman et al., 1995; Wrosch & Heckhausen, 2002), and closeness (e.g., Medvec et al., 1995; Medvec & Savitsky, 1997; Meyers-Levy & Maheswaran, 1992) are present. Specifically, regarding exceptionality, researchers (Gavanski & Wells, 1989; Kahneman & Tversky, 1981) contended that people with counterfactual thoughts are more likely to focus on extraordinary events than mundane ones; as for controllability, based on scholars have documented a link between controllability and risk perception (e.g., Renn, 2006; Sobkow et al., 2020), we considered the perceived controllability of COVID-19 in this study (i.e., the extent to which consumers feel a sense of control over the pandemic); while closeness refers to the gap between an actual outcome and a counterfactual alternative (Gilbert, Morewedge, Risen, & Wilson, 2004; Roese, 1997; Roese & Olson, 1996).

As mentioned, risk perception influences people's responses to public health emergencies (e.g., O'Neill, Brereton, Shahumyan, & Clinch, 2016; Rosenstock, 1974; Weinstein, 1988). However, little work has focused on risk perceptions of public health crises such as COVID-19 by combining the counterfactual thinking and consumer research perspectives. Since exploring these perceptions can offer insight to help the public respond appropriately to the pandemic and to effectively manage risk, we consider the potential moderating role of risk perception. Consumers' irrational responses to COVID-19 are expected to exacerbate the pandemic's negative impact, presumably due to associated risk perceptions (Gupta, Nair, & Radhakrishnan, 2021).

Risk perception theory states that consumers identify myriad risks in the process of generating consumption willingness (Taylor, 1974). Varying degrees of perceived risk naturally influence consumption decisions (Garretson & Burton, 2003). However, findings on risk perception and consumption willingness are inconsistent. Some researchers have suggested that high levels of perceived risk are associated with strong consumption willingness. For example, Palm and Hodgson (1992) conducted a study on California house owners and identified high perceived risk as the most important factor affecting homeowners' intentions to purchase insurance. Similarly, Bastami, Mahdavi, and Zarei (2020) explored the level of perceived earthquake risk and its relationship with individuals' intentions to buy earthquake insurance; consumers' perceived risk again contributed significantly to these plans.

Other studies have identified a negative correlation between the level of perceived risk and consumption willingness (e.g., Bahli &

Benslimane, 2004). For instance, individuals' perceived risk of internet banking appears strongly negatively associated with their consumption willingness (Morrison & Roberts, 1998; Rogers, Gilbert, & Cabrera, 1997). Kotler and Turner (1997) discovered that a high level of perceived risk could lead people to adjust or even cancel certain consumption behaviors. Because consumers are classically risk-averse, consumers have high likelihood of displaying consumption willingness when the perceived risk is low (Mitchell, 1999).

Considering the contradictory findings on risk perception and consumption willingness, the relationship between these concepts requires further study. We propose that risk perception moderates the effect of counterfactual thinking on willingness to consume green restaurant products as follows.

H3a. When people have a high or low level of COVID-19 risk perceptions, those who think counterfactually will display less willingness to consume green restaurant products than those who do not think counterfactually.

H3b. When people have a moderate level of COVID-19 risk perceptions, those who think counterfactually will display greater willingness to consume green restaurant products than those who do not think counterfactually.

2.5. Theoretical framework

Based on regret aversion theory, regret is an emotion with negative valence which people develop a psychological tendency to avoid (Reb, 2005; Sage & White, 1983). Therefore, when making decisions, individuals first consider the option that triggers the least amount of regret rather than the option that minimizes risk (Loomes & Sugden, 1982). Many scholars have proposed that individuals engage in behavior that mitigates potential regret (Josephs, Larrick, Steele, & Nisbett, 1992; Richard, Van Der Pligt, & De Vries, 1996; Simonson, 1992). Zeelenberg and Pieters (2004) noticed that people controlled their desire to purchase postal lottery tickets if they believed that the purchase would lead to regret. As with counterfactual thinking, regret can motivate positive behavioral change by inspiring individuals to avoid repeating mistakes, essentially guiding (and optimizing) subsequent actions (Beike, Markman, & Karadogan, 2009; Coricelli et al., 2005; Galinsky, Seiden, Kim, & Medvec, 2002; Roese, 1997; Van de Ven & Zeelenberg, 2011; Zeelenberg & Pieters, 1999). In this vein, we postulate that regret motivates people to learn from their experiences and can contribute to green consumption willingness.

Studies of green consumption have explored how psychological factors and consumers' characteristics influence associated intentions. However, relatively little work has examined the relationship between green consumption willingness and counterfactual thinking. The role of counterfactual thinking is most often discussed in terms of general behavioral intentions and consumption willingness (e.g., Siros & Mittal, 2000; Zeelenberg & Pieters, 2007). When exploring individuals' willingness to consume green restaurant products, it is crucial to consider the preparatory function of counterfactual thinking in fostering behavioral intention (e.g., Smallman & Roese, 2009). Additionally, to determine whether counterfactual thinking can guide one's willingness to consume green restaurant products, it is necessary to account for the potential mediating variable of regret and the moderating variable of risk perception. The conceptual model underpinning this paper is illustrated in Fig. 1.

3. Study 1

In Study 1, we investigated the effect of counterfactual thinking (vs. non-counterfactual thinking) about COVID-19 on willingness to consume green restaurant products. Research on counterfactual thinking (e.g., Smallman & Roese, 2009) suggests that such thinking can promote behavioral intention (especially consumption willingness). We

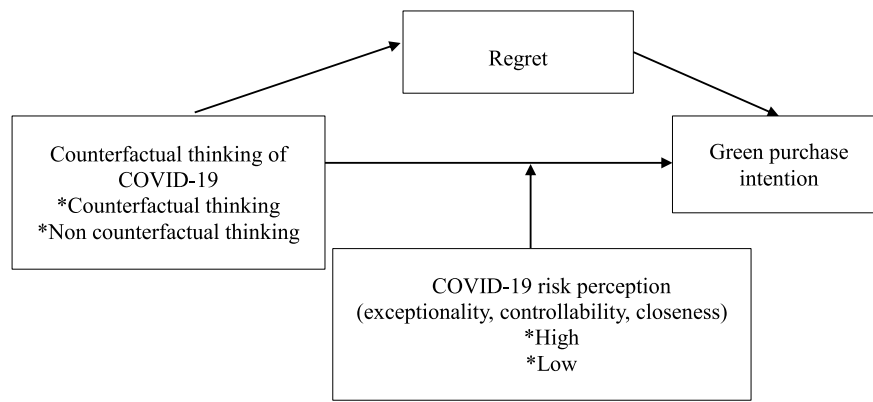


Fig. 1. Conceptual framework.

therefore theorized that people who engaged in counterfactual thinking would be more willing to consume green restaurant products than those who did not engage in such thinking. Based on earlier work on counterfactual thinking, regret, guilt, and green consumption willingness (e.g., Davis et al., 1995; Giroto et al., 1991; Pelozo et al., 2013), we also postulated that regret would mediate the impact of counterfactual thinking on people’s intentions to consume green restaurant products.

Studies in this paper were completed during the period from mid-October to early November 2022. During this period, the COVID-19 pandemic in China (where we collected data) was generally under control, with some localized clusters of confirmed cases, as well as some imported cases from the abroad.

3.1. Design & participants

We recruited 200 participants from Wenjuanxing, a well-known online survey platform in China. The site is similar to SurveyMonkey and Amazon Mechanical Turk. Its database contains more than 1 million members, which is considered effective, diverse, and representative (Cao, Wang, & Wang, 2020; Shah & Hall-Phillips, 2018). More than 2000 studies have recruited participants via this site (Zheng & Zheng, 2014). In addition to examining the impact of counterfactual thinking on willingness to consume green restaurant products, this experiment examined the mediating role of regret. Participants were obtained randomly, and they held a variety of occupations and varied academic qualifications. Most participants had completed higher education: college students accounted for 12%, undergraduate students accounted for 76.5%, and graduate students accounted for 10.5% (9.5% with a master’s degree and 1% with a doctorate).

3.2. Materials & procedures

The method of Study 1 was survey. The variable of counterfactual thinking was scored on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree). The scales in this study were adapted from prior research. All items were originally written in English; a reverse translation procedure was followed to translate them into Chinese while ensuring consistency across contexts. We also verified the scales to make sure they were not familiar to the participants.

The experiment proceeded as follows. First, all participants read a short description of the adverse effects of COVID-19 and world leaders’ approaches to dealing with this crisis. Each participant was then asked a series of questions regarding counterfactual thinking, regret, willingness to consume green restaurant products, and personal demographics. Table 1 presents the questionnaire items and corresponding references; complete source versions appear in the Appendix.

Table 1
Questionnaire items.

Construct	Survey item(s)	α	Source(s)
Counterfactual thinking	1) If strict quarantine measures had been taken earlier, the outbreak could have been mitigated by now. 2) If the practice of herd immunization had not been adopted, the pandemic could have been effectively controlled now.	0.848	Allen, Greenlees, & Jones (2014)
Regret	1) Decision makers regret that they didn’t think it through to avoid problems that arose in the course of preventing the pandemic. 2) Decision makers regret that they made decisions without fully understanding the pandemic. 3) Decision makers feel regretful for not putting more thought into making decisions in the first place.	0.879	Marcatto & Ferrante (2008)
Willingness to consume green restaurant products	1) If you often eat at restaurants, would you be willing to eat at a green restaurant? 2) If you often eat at restaurants, to what extent would you be willing to eat at a green restaurant? 3) Would you be willing to recommend a green restaurant to friends who often eat at restaurants?	0.851	CHOU, 2013; Oliver, 1997

3.3. Results & discussion

Table 2 presents demographic information for this study’s 200 participants.

Table 3 presents results of the regression analysis.

We conducted the causal stepwise regression analysis (Wen & Ye, 2014), and the detailed process is as follows: The *p* value of coefficient *c* was 0.000, suggesting the significance. The confidence interval of *a* was 0.385–0.609 and that of *b* was 0.054–0.298, indicating that coefficient *a***b* was significant. The value of coefficient *c*’ was 0.399, *p* < 0.000. As such, the direct effect was significant. We also observed a partial mediating effect (*a***b*/*c* = 17.50%). Counterfactual thinking therefore directly influenced participants’ willingness to consume green restaurant products, with regret having a partial mediating impact on this process (accounting for 17.50% of the total effect); see Fig. 2 for details.

Table 2
Demographic information.

<u>N = 200</u>	<u>Mean/frequency</u>	<u>Percentage/SD</u>
Age	28.00	5.42
Monthly income	6389.20 (yuan)	4604.77 (yuan)
Gender		
Male	111	55.5
Female	89	44.5
Education		
Undergraduate	153	76.5
Master	19	9.5
Doctoral	2	1.0
Other	26	13.0

4. Study 2

Study 2 focused on consumers’ pandemic-related risk perceptions. Based on the literature regarding risk perception and counterfactual thinking (e.g., Gavanski & Wells, 1989; Medvec & Savitsky, 1997; Qingyuan & Xiaofei, 2006; Wrosch & Heckhausen, 2002), we considered whether participants’ risk perceptions (including exceptionality, controllability, and closeness) moderated the effect of counterfactual thinking on their willingness to consume green restaurant products. Specifically, consumers’ COVID-19 risk perceptions were expected to play a moderating role on the impact of counterfactual thinking on their green restaurant purchase intentions.

4.1. Design & participants

Studies 1 and 2 were conducted during the same period. This study featured a 2 (counterfactual thinking: present vs. absent) × 2 (risk perception level: high vs. low) between-subjects design. Participants’ COVID-19 risk perceptions represented a potential moderating variable under the same framework as in Study 1. Study 2 was completed on the same questionnaire platform as Study 1, so the sample source is same as Study 1. The difference between Study 2 and Study 1 is that participants in Study 2 were randomly assigned to one of four groups (50 participants each). The test results showed that there were differences between the experimental groups in terms of gender and educational level.

4.2. Materials & procedures

4.2.1. Procedures

Participants were randomly assigned to different risk perception conditions based on the story they read prior to the experiment. Participants then answered several questions related to this experiment and were asked to report various indicators.

4.2.2. Materials

The questionnaire in Study 2 was similar to that in Study 1 with the addition of three items measuring risk perception in terms of exceptionality, controllability, and closeness: 1) “The COVID-19 pandemic is an exceptional outbreak of a disease that is unfamiliar to people, and this

Table 3
Regression analysis.

Model	Coefficient ^a		Standardized coefficient	t	Significance	95.0% CI		
	Unstandardized coefficient					Beta	Lower limit	Upper limit
	B	Std Error						
Constant	3.16	0.343		9.209	0	2.483	3.836	
Counterfactual thinking	0.497	0.057	0.527	8.736	0	0.385	0.609	
Constant	2.737	0.368		7.429	0	2.01	3.463	
Counterfactual thinking	0.399	0.066	0.424	6.085	0	0.27	0.529	
Regret	0.176	0.062	0.198	2.848	0.005	0.054	0.298	

^a . Dependent variable: Green purchase intention.

outbreak is a very rare situation”; 2) “The spread of COVID-19 is difficult to control due to widespread individual mobility”; and 3) “Individuals are likely to become infected by COVID-19” The reliability for the four questionnaire groups was 0.847, 0.842, 0.765, and 0.791, respectively, reflecting a valid sample.

4.3. Results & discussion

4.3.1. Manipulation check

Meanwhile, to make sure the manipulation is successful, we did a manipulation check for participants’ counterfactual thinking. We used a seven-point scale to test the degree that participants tend to think counterfactually about how the COVID-19 pandemic could have been different. The results demonstrated that participants in the counterfactual thinking group ($M = 4.08, SD = 0.9775$) are more likely to think counterfactually than participants in the no counterfactual thinking group ($M = 3.38, SD = 1.1228, p = 0.002$).

4.3.2. Demographics

Table 4 displays demographic information for the 200 participants in this study.

We analyzed the independent variable (counterfactual thinking) and the moderating variable (risk perception) using a centralized method based on the following models. Model 1 included counterfactual thinking; risk perception was included in Model 2, and the interaction term (counterfactual thinking × risk perception) was included in Model 3. Model 1 was intended to explore the independent variable’s effect on the dependent variable of willingness to consume green restaurant

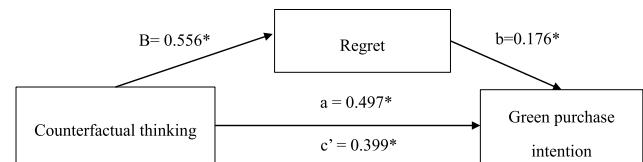


Fig. 2. Main effect and mediating effect.

Table 4
Demographic information.

<u>N = 200</u>	<u>Means/frequency</u>	<u>Percentage/SD</u>
Age	28.72	5.0675
Monthly income	6787.12 (yuan)	3762.098 (yuan)
Gender		
Male	117	58.5
Female	83	41.5
Education		
Undergraduate	141	70.5
Master	23	11.5
Doctoral	0	0
Other	36	18.0

products without interference from the moderating variable of risk perception.

Table 5 shows that counterfactual thinking significantly affected participants' willingness to consume green restaurant products ($t = 8.821, p < 0.001$). The interaction term in Model 3 clarifies this moderating effect. As listed in Table 4, the interaction term between counterfactual thinking and risk perception was significant ($t = -3.602, p < 0.001$). The magnitude of the effect of counterfactual thinking on green consumption willingness thus differed significantly across levels of risk perception (i.e., the moderating variable). Table 6 and Fig. 3 respectively depict the simple slope analysis and simple slope diagram.

5. General discussion

5.1. Conclusions

The COVID-19 pandemic has brought severe challenges to public health. On the one hand, the possibility that the coronavirus comes from animal consumption leads people to have a demand of safety and health for animal consumption (Gauly et al., 2021). On the other hand, people may gradually realize that green hospitality companies can provide consumers with more hygienic and safer services, helping them to reduce the risk of being infected (Hu et al., 2021). Therefore, consumers may be inclined to choose green hospitality products due to the organic and healthy characteristics of products (Güney & Sangün, 2021). Under this background, people may think counterfactually that the pandemic could have been contained if the outbreak had been addressed differently (Bertolotti & Catellani, 2023). Amplified environmental concerns, especially in the hospitality industry, have led many individuals to begin purchasing green products in an effort to protect the environment (Hu, 2012). Although green consumption may well rise in tourism, no evidence suggests that this trend would be attributable to consumers' intentions to protect the environment. The increase might instead manifest from circumstantial (vs. deliberate) green tourism consumption (Peng & Chen, 2019). Against this backdrop, how might counterfactual thinking influence people's willingness to consume green restaurant products? We manipulated three characteristics to answer this question: consumers' counterfactual thinking about COVID-19, pandemic-related risk perceptions (controllability, exceptionality, and closeness), and regret regarding the pandemic. This paper particularly explored the impact of counterfactual thinking on willingness to consume green restaurant products, the moderating effect of consumers' COVID-19 risk perceptions, and the mediating effect of consumers' regret.

5.2. Theoretical contributions

This article makes the following theoretical contributions. First, we identified the moderating role of risk perception (including perceived

Table 5
Main effect and moderating effect analysis.

	Model 1	Model 2	Model 3
Counterfactual thinking	0.353**	0.337**	0.330**
Risk perception	-8.821	-8.849	-8.931
Counterfactual thinking × Risk perception		0.173**	0.184**
R ²	0.282	0.361	0.401
F	$F(1,198) = 77.807, p < 0.001$	$F(2,197) = 55.616, p < 0.001$	$F(3,196) = 43.656, p < 0.001$
ΔR ²	0.282	0.079	0.04
ΔF	$F(1,198) = 77.807, p < 0.001$	$F(1,197) = 24.277, p < 0.001$	$F(1,196) = 12.976, p < 0.001$

Table 6
Simple slope analysis.

Moderating variable levels	Regression coefficient	Std error	t	p	95% confidence interval
Moderate level of risk perception	0.33	0.037	8.931	0	0.258,0.403
High level of risk perception (+1SD)	0.206	0.052	3.985	0	0.105,0.307
Low level of risk perception (-1SD)	0.454	0.049	9.213	0	0.358,0.551

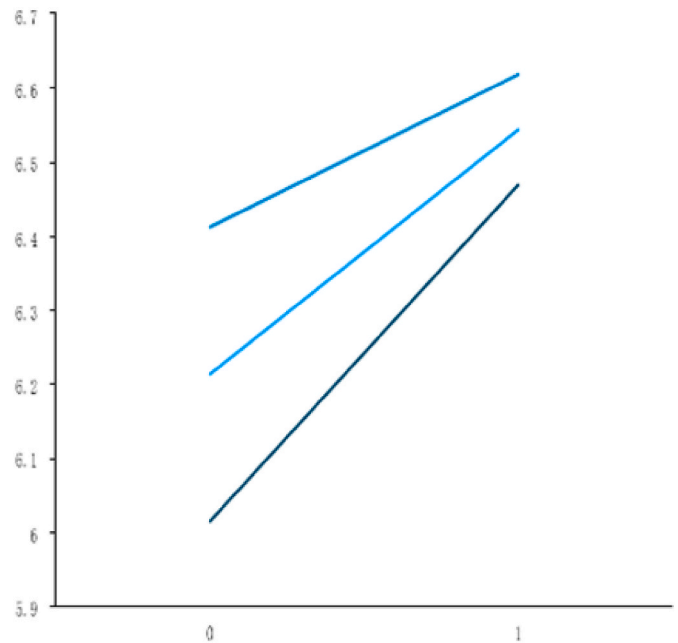


Fig. 3. Simple slope diagram.

controllability, exceptionality, and closeness) along with counterfactual thinking's impact on willingness to consume green restaurant products. These findings offer new evidence regarding the association between counterfactual thinking and behavioral intention. Despite research indicating that counterfactual thinking can promote behavioral intention (Smallman & Summerville, 2018), scholars' positions vary. Researchers have suggested that counterfactual thinking can provide excuses for failure by seeking justification for undesirable outcomes; this function may weaken future behavioral intention (Myers, McCrea, & Tyser, 2014; Thürmer, McCrea, & Gollwitzer, 2013). This supposition directly contradicts the claim that counterfactual thinking can spur behavioral intentions around future tasks (Huang, Xie, & Chen, 2021). Therefore, by exploring the moderating variable of risk perception, we have partly explained these inconsistent findings. In particular, we examined how different risk perception levels could moderate the role of counterfactual thinking on consumers' green restaurant purchase intentions.

Additionally, studies on topics apart from counterfactual thinking substantiate our results on its role in green restaurant purchase intention. Sustainable tourism is inevitable (Streimikiene, Svagzdiene, Jasinskas, & Simanavicius, 2021) in promoting tourism recovery and development after the pandemic. Consumers' intentions to purchase green restaurant products may be primed by thinking about being environmentally friendly and by a desire to protect the environment (Line & Hanks, 2016; Tanford, Kim, & Kim, 2020). The priming effect indicates that processing a stimulus will affect one's response to a subsequent stimulus; put simply, earlier activities can influence people's

subsequent judgments, decisions, and behavior (e.g., Janiszewski & Wyer, 2014; Mittal, Laran, & Griskevicius, 2020). Our findings on the impact of counterfactual thinking on one's willingness to consume green products in the tourism sector are also consistent with recent research. For example, tourists' counterfactual thinking about the pandemic apparently contributes to their intentions to travel to tax-free tourism destinations (Xu, Ma, Xu, & Xie, 2022).

5.3. Managerial implications

Our findings also provide meaningful managerial implications to boost individuals' willingness to consume green restaurant products. Below, we give tailored guidance on how counterfactual thinking can foster one's willingness to consume green restaurant products and inspire green consumption behavior.

First, the government and media outlets can offer consumers opportunities to think counterfactually about environmental protection (e.g., "The environment would have been better if we consumed more green restaurant products") when faced with decisions about whether to consume green restaurant products. Consumers who think counterfactually (compared with those who do not) will more likely be willing to consume green restaurant products and may accordingly exhibit that behavior.

Second, we analyzed the mechanism through which counterfactual thinking affects willingness to consume green restaurant products to identify ways to enhance such intention. Counterfactual thinking was found to influence willingness to consume these products via experienced regret. Hospitality corporations could present cues related to environmental degradation in consumption areas to elicit regret among guests: through the mediating role of regret, counterfactual thinking increases people's intentions to purchase green restaurant products and promotes their consumption thereof.

Finally, we described the boundary conditions (e.g., risk perceptions) under which counterfactual thinking affects people's willingness to consume green restaurant products. Promoting these intentions requires explicit managerial knowledge. Our detailed analysis revealed that, when developing risk perceptions, consumers may emphasize perceived exceptionality, controllability, and closeness. Only those individuals who are highly capable of perceiving risk are most likely to engage in counterfactual thinking and exhibit stronger willingness to consume green restaurant products.

5.4. Limitations and future research directions

This research features several limitations which future studies can address in depth. First, we only discussed the impact of counterfactual thinking on willingness to consume green restaurant products (rather than on actual consumption behavior). Subsequent work is needed to determine whether our results can be replicated in terms of actual consumption. It remains unclear whether hypothetical behavioral intentions can inspire actual behavioral changes. For example, Camerer and Mobbs (2017) pointed out that when imagining hypothetical scenarios, people's behavioral intentions varied from their real-world actions. Researchers can build on previous work by testing whether the difference between thinking about hypothetical and real situations also applies to the consumption of green restaurant products.

Moreover, even with studies regarding the impact of counterfactual thinking on behavioral intention (including purchase intention), little is known about this effect relative to prefactual thinking (i.e., the counterpart of counterfactual thinking). Compared with counterfactual thinking about past alternatives that might have occurred but did not, prefactual thinking involves pondering how future events might differ from the present (Epstude, Scholl, & Roese, 2016; Schacter, Addis, & Buckner, 2007). Scholars have argued that prefactual thinking entails direct speculation about the future and planning for behavior. Therefore, different from counterfactual thinking, prefactual thinking might

more readily guide behavioral intention (e.g., Ferrante et al., 2013; Mercier et al., 2017). Studies can further explore potential discrepancies between willingness to consume green restaurant products generated by counterfactual thinking versus prefactual thinking. Resultant findings would enrich theories related to both counterfactual thinking and green consumption.

In addition, when we designed the questionnaire for Study 1, we did not consider the inconsistency in personification of the three survey items. Specifically, survey items of counterfactual thinking and regret were written in the 3rd person, whereas survey item of willingness to consume green products is written in the 1st person. This inconsistency may have an impact on the results. For example, survey items in the 3rd person imply no personal control by the survey respondents, while survey items in the 1st person imply personal control (e.g. Cho & Boster, 2008; Denisova & Cairns, 2015). This could be further improved in future studies.

Finally, the scale we used to measure counterfactual thinking was adapted from Allen et al. (2014). However, the original scale was not focusing on COVID-19. Due to that there was no questionnaire combining the topics of both counterfactual thinking and COVID-19 at the time we conducted the studies, so we adapted the related scale. Future research could further develop specific counterfactual thinking and COVID-19 questionnaire based on this.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jhtm.2023.05.001>.

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