

Cold Anticipated Regret versus Hot Experienced Regret: Why Consumers Fail to Regret Unhealthy Consumption

HAEEUN HELEN CHUN, JOOWON PARK, AND MANOJ THOMAS

ABSTRACT The goal of this research is to study why consumers might fail to experience regret after unhealthy consumption. Specifically, we examine how anticipated regret before the unhealthy consumption and experienced regret after the consumption differ. We find that immediate postconsumption regret tends to be less intense than anticipated regret. We additionally find that immediate postconsumption regret tends to be less intense than delayed postconsumption regret. These effects are stronger for people with stronger self-control goals. The results suggest that anticipated and delayed postconsumption regret are “cold” assessments based on the discrepancy between goals and behaviors, whereas immediate postconsumption regret is a “hot” emotional experience. Negative arousal activated by hot regret triggers a defensive response that reduces the intensity of immediate postconsumption regret. Somewhat paradoxically, the results suggest that consumers are likely to be least remorseful immediately after their unhealthy consumption, compared to prior to or long after the consumption.

Regret is considered a beneficial and adaptive emotion because it makes us mindful of our mistakes and helps prevent their reoccurrence. Several scholars have suggested that regret can prompt remediation of undesirable habits and can trigger desirable future behavior (e.g., Roesse 2005; Zeelenberg and Pieters 2007). An impulsive eater is less likely to continue gorging down bags of snacks if he regrets finishing the first bag. A chain smoker is less likely to smoke several cigarettes in a row if she regrets the first. However, habitual consumption of carbonated beverages and sugary snacks has contributed to a worldwide obesity epidemic (Ogden et al. 2014), and smoking has increased the danger of lung cancer and exposed smokers to other preventable diseases (US Department of Health and Human Services 2014). Widespread and persistent unhealthy consumption implies that consumers might not al-

ways feel regretful immediately after consuming a can of Coca Cola and therefore might proceed to consume yet another. When do people regret their unhealthy consumption behaviors, and when do they fail to do so?

In our quest to better understand consumption regret, we study how anticipated regret and postconsumption regret differ. Prior to consumption, people may anticipate how much regret they would experience if they engaged in unhealthy behavior. Alternatively, they may reflect on past unhealthy behavior—either immediately or long after the behavior. Does the time of assessment influence the intensity of their regret?

We propose that immediate postconsumption regret is different from anticipated or delayed postconsumption regret. Evaluation of unhealthy consumption immediately following the event triggers a spontaneous psychological im-

HaeEun Helen Chun (hc633@cornell.edu) is an associate professor of services marketing at the School of Hotel Administration, Cornell SC Johnson School of Business, 565E Statler Hall, Ithaca, NY 14853. Joowon Park (joowon.park@cityu.edu.hk) is an assistant professor of marketing at City University of Hong Kong. Manoj Thomas (manojthomas@cornell.edu) is an associate professor of marketing and Breazzano Family Term Professor of Management at the SC Johnson Graduate School of Management, Cornell SC Johnson College of Business, 369 Sage Hall, Ithaca, NY 14853. All three authors have contributed in equally important ways to this article. This research has benefited from discussions with Tom Gilovich and Rik Pieters (when he was visiting Cornell) and feedback from seminar participants at 2018 European Association for Consumer Research, Belgium, and 2016 Society for Consumer Psychology Conference, Florida. We thank the editor, Michel Pham, and the reviewers for very helpful guidance on improving the clarity of our conceptualization. This research would not have been possible without the cooperation of the management and staff at Taverna Banfi restaurant at Cornell's School of Hotel Administration. We hope that restaurants and retailers providing unrestricted access to irresistible but high-calorie delicacies will regulate intemperate consumption behaviors by priming customers to anticipate their consumption regret.

immune system to fight off the negative arousal caused by undesirable behavior and thus lowers the intensity of regret (Gilovich and Medvec 1995; Gilovich, Medvec, and Chen 1995). However, when people reflect on an unhealthy consumption event either before consumption or long after consumption, the assessment of regret is now distant from the hot arousal experienced immediately after consumption, rendering the activation of psychological immune system less likely. Our findings indicate that because of defensiveness, immediate postconsumption regret tends to be less intense than anticipated regret or postconsumption regret following a time delay, and that this effect of time course on regret is, paradoxically, stronger for people with stronger self-control goals (such as those who have an intention to control their diet or to quit smoking).

These results explain when and why consumers fail to regret their unhealthy consumption behavior; they also offer new insights into factors that inform regret intensity. Regret, we suggest, is influenced by two distinct, counteracting mental processes: (1) an evaluation of the discrepancy between goals and behaviors and (2) a more spontaneous, defensive reaction to the negative arousal generated by the goal-discrepant behavior. In summary, our focal hypothesis is that the regret consumers experience immediately after unhealthy consumption is not as intense as they anticipated it to be, and also not as intense as the regret they experience long after the behavior.

We tested this hypothesis in three experiments, including field studies with restaurant patrons and with smokers. In study 1, which was conducted in a restaurant, anticipated regret was stronger than experienced regret, especially for dieters. This pattern of results was replicated in another field setting (study 2): among smokers, anticipated regret was greater than experienced regret, especially for those with a stronger intention to quit smoking. For study 3, we recruited smokers online. Extending the temporal horizon to unhealthy behaviors that occurred in the distant past, we demonstrated that the work of defensive mechanism is stronger for past unhealthy behaviors that were committed in the near past than in the distant past.

In the following sections, we first describe the conceptual framework used to develop the main hypotheses and then present three studies. We follow up with implications for research and practice.

TIME COURSE OF REGRET

Regret is a painful emotion experienced when people realize that a previous decision resulted in an undesirable out-

come (Kahneman and Miller 1986; Gilbert et al. 2004). Regret is not always a post facto response, however: people can also anticipate how regretful they will feel if they were to make a certain decision in the future, and the anticipated feeling of regret can influence decisions (Simonson 1992; Tsiros and Mittal 2000; Cooke, Meyvis, and Schwartz 2001; Greenleaf 2004). For example, Inman and McAlister (1994) demonstrated that the use of coupons increases just before the expiration date because the expiration date increases the salience of anticipated regret. Zeelenberg and Pieters (2004) found that people are more likely to buy the type of lottery that makes them anticipate the regret of not winning.

Which type of regret—anticipated or experienced—is more intense? Because people are not generally aware of the complex psychological mechanisms that govern their emotional responses, lay beliefs about the intensity of anticipated and experienced regret tend to be incorrect. People usually believe that immediate postconsumption regret is stronger than anticipated regret. In a short survey ($N = 151$; 51.7% female; average age = 37.0), we asked people to indicate in which of the two situations the regret would be greater: (1) when they are about to eat an unhealthy food (“How much regret do you anticipate feeling?”) or (2) immediately after they had just finished eating it (“How much regret would you feel?”). Only 4.7% of respondents believed that anticipated regret before consumption would be greater than experienced regret felt immediately following consumption, whereas 73.3% believed postconsumption regret would be greater, and 22% thought there would be no difference.

Another group of consumers ($N = 150$; 47.3% female; average age = 36.5) were presented with two separate scales and asked to indicate the intensity of anticipated and experienced regret. People believed immediate postconsumption regret would be significantly greater ($M = 7.81$, $SD = 1.83$) than anticipated regret ($M = 6.42$, $SD = 1.59$; $F(1, 150) = 49.46$, $p < .0001$).

Why are lay beliefs about the time course of regret incorrect? The answer, we propose, is that they do not take into account the differences between cold and hot regret.

Cold Anticipated Regret

Our conceptualization is based on the premise that anticipated and experienced regret are fundamentally different: anticipated regret is a cognitive expectation or a belief about emotions (Robinson and Clore 2002), whereas regret about past behavior is a more genuine emotion. Some literature supports the notion that anticipated emotions—cold, cognitive predictions (“virtual emotions”)—do not have the

same phenomenological quality as hot, experienced emotions (Metcalfe and Mischel 1999; Frijda 2004). Such a view would predict that anticipated regret is an emotionally inert, cold judgment rather than an actual, hot feeling.

The difference between anticipated and experienced regret has significant implications for their roles in regulating behaviors and emotions (e.g., Gilbert et al. 2004; Inman 2007; Roese, Summerville, and Fessel 2007; Zeelenberg and Pieters 2007). If a person anticipates regret about an undesirable future behavior, there is still plenty she can do to avoid engaging in the potentially regretful behavior. Anticipating future regret would thus prompt a person to reduce the regret by regulating behavior. This prediction is in line with prior research that anticipating regret prompts people to make more prudent and conservative decisions (Simonson 1992; Inman and McAlister 1994; Bar-Hillel and Neter 1996) and motivates future goal-directed behaviors (Baumgartner, Pieters, and Bagozzi 2008). For example, asking consumers to anticipate regret of making a wrong decision tends to shift their preferences in favor of safer options (e.g., choosing a more expensive, better-known brand over a less expensive, lesser-known brand; Simonson 1992). Similarly, people are reluctant to exchange a lottery ticket with others because they anticipate that losing a lottery with an exchanged ticket would cause more regret than losing with the original ticket (Bar-Hillel and Neter 1996).

Similarly, we expected that anticipated regret is likely to promote behavioral regulation when it comes to unhealthy consumption. If a consumer anticipates regret before eating a mouth-watering but calorie-heavy dessert, this anticipated negative state may help her regulate behavior by not eating the dessert (or by eating a justifiably small portion) and thus avoiding the experience of postconsumption regret. In this way, anticipated regret can guide future behaviors.

Hot Experienced Regret

The regret experienced immediately after the consumption is qualitatively different from anticipated regret. Because the goal-incongruent behavior has already happened, such regret cannot be regulated by changing the behavior. Therefore, the regret experienced immediately after the consumption tends to be more emotional, marked by negative arousal. Negative arousal makes people uncomfortable and motivates them to spontaneously engage in psychological repair work to reduce the arousal. The reduction of negative arousal, in turn, attenuates the intensity of regret (Gilovich and Medvec 1995; Gilovich et al. 1995).

Several studies suggest that negative emotions experienced after an undesirable or painful event are regulated by a “psychological immune system” that works to make the situation less threatening to one’s self-integrity by reframing the situation or reevaluating the decision in a more positive light (Yi and Baumgartner 2004; Andrade and Cohen 2007; Roese et al. 2007; Zeelenberg and Pieters 2007). According to Gilbert et al. (1998, 619), the psychological immune system reflects various psychological processes that have similar self-defensive effects: “Ego defense, rationalization, dissonance reduction, motivated reasoning, positive illusions, self-serving attribution, self-deception, self-enhancement, self-affirmation, and self-justification are just some of the terms that psychologists have used to describe the various strategies, mechanism, tactics, and maneuvers of the psychological immune system.” The psychological immune system has often been characterized as the root cause of “affective misforecasting”: because people are mostly unaware of the workings of the psychological immune system, the emotional impact of negative events—both in terms of intensity and duration—tends to be overestimated in their forecasts (Gilbert et al. 2004).

In fact, this line of work dates back to cognitive dissonance theory, specifically, postdecision dissonance (e.g., Festinger 1957; Festinger and Walster 1964). People are motivated to reduce post-decision cognitive dissonance, and the more dissonance people experience, the more likely they are to engage in dissonance-reduction strategies (Gilovich et al. 1995). The salience of dissonance has been shown to be greater shortly after than long after a decision (Walster 1964), suggesting that people are likely to engage in dissonance-reduction strategies immediately after the decision.

Such postdecision dissonance reduction is likely to extend to impulsive consumption. Accordingly, if consumers assess their regret immediately after devouring a sinful dessert, they would be motivated to reduce dissonance and regulate negative arousal, which in turn reduces the intensity of postconsumption regret. This line of reasoning brings us to a somewhat counterintuitive prediction: the intensity of regret experienced immediately after consumption will be lower than the degree of regret anticipated before consumption.

Regretting the Distant Past

The psychological immune system, however, does not always get activated to regulate postconsumption regret. The effect of the psychological immune system on postconsumption

regret can vary with temporal distance from the consumption episode: thinking about one's mistakes committed in the distant past does not evoke as much negative arousal as thinking about one's mistakes committed in the immediate past. When people reflect on an unhealthy consumption event from the distant past, spontaneous defensive responses are likely to be weaker than for a more recent event. The attenuation of intensity of regret is therefore also likely to be weaker. Although the irreversible nature of the behavioral outcome remains unchanged, the assessment of regret is now distant from the hot arousal experienced immediately after the consumption, rendering the activation of psychological immune system less likely.

The prediction that temporal distance reduces defensive regret regulation is consistent with the finding that dissonance is greater shortly after having made a decision than long after (Walster 1964). The prediction is also in line with recent work on affect being a "system of the present" (Chang and Pham 2013, 2018). It has been shown that affect is experienced more intensely over outcomes closer to the present, both prospectively and retrospectively (2013) and to the immediate self in terms of social and physical distance (2018). In a similar vein, people pay more attention to concerns about their internal subjective experiences and affective consequences when the decision involves an immediate versus a distant event (Pronin, Olivola, and Kennedy 2008).

Thus, the subjective emotional experience of negative arousal is likely to be felt more intensely and viscerally immediately following unhealthy consumption than in the distant future. Therefore, when reflecting on the distant versus recent past, defensive regulation of visceral arousal (and thus regret mitigation) is less likely to occur. For this reason, we make a second counterintuitive prediction: immediate postconsumption regret will be less intense than delayed postconsumption regret.

The Effect of Behavioral Regulation Goals

The intensity of an emotion is also influenced by the discrepancy between people's behaviors and goals. In the experience of emotions, we consider whether the behavior is beneficial by assessing whether it is congruent or incongruent with our goals (Folkman and Lazarus 1988; Lazarus 1991). If the event is appraised as beneficial (e.g., exercising is congruent with one's goal of health), the valence of the resulting emotion will be positive; if the event is appraised as harmful or threatening (e.g., eating unhealthy food), the resulting emotional experience will be negative.

Behavior-goal incongruence typically triggers negative arousal. Because the regulation of immediate postconsump-

tion regret is caused by a spontaneous defensive reaction to the negative arousal following consumption, such regulation is likely to be more pronounced in the case of a person whose unhealthy consumption episode deviates from their personal goal. In other words, we expect the regulation of immediate postconsumption regret to be more pronounced for consumers who, for example, are on a diet. The stronger one's behavioral regulation goals, the greater the gap between cold (anticipated) regret and hot (experienced) regret.

STUDY 1: REGRET REGULATION AMONG DIETERS

Study 1 tested the prediction that the regret experienced immediately after consuming an unhealthy food item will be lower than that anticipated before consumption. We conducted a field study at an upscale restaurant called Taverna Banfi in Ithaca, New York. The restaurant is popular for its lunch buffet, which includes a dessert buffet with several appealing, calorie-rich choices such as tiramisu torta, crème brûlée, and chocolate crunch, creating a situation where many lunch guests eat dessert as well. The guests were approached either before their meal, to evaluate anticipated regret prior to dessert consumption, or after their meal, to evaluate experienced regret immediately after consumption. We also asked participants whether they were on a diet. For the reasons discussed earlier, anticipated regret was expected to be greater than experienced regret, especially for patrons on a diet.

Method

Of 401 patrons who initially participated, 372 (52.2% female; average age = 42.7) completed the main variables tested in the study. One Amazon Kindle Fire was offered as a prize by random draw. The study was conducted over 4 weeks with a brief break after the first 2 weeks.

The study was administered by trained servers in the restaurant. Servers told guests that university researchers were conducting a short survey on their dining experience. On half of the days, the server handed out the questionnaire with the menu before the meal. The completed survey was picked up when the server returned to take the order. On the other days, the server handed out the questionnaire with the check after the meal; the completed survey was picked up after the patrons left the restaurant. The condition was alternated by day.

In the anticipated regret condition, restaurant patrons were asked to indicate whether they planned on having the lunch buffet and whether they planned on having dessert.

In the experienced regret condition, patrons were asked whether they had the buffet and dessert. Regret anticipators indicated how much regret they will feel about eating desserts, whereas regret experiencers indicated how much regret they feel now, having eaten desserts (1 = not at all, 7 = very much). Regret anticipators also indicated how satisfied they will feel after eating desserts, whereas regret experiencers indicated how satisfied they are now, having eaten desserts (1 = not at all, 7 = very much). (Guests in the retrospection condition who did not eat dessert were instructed to skip these questions.) As a measure of the self-control goal, participants reported whether they are currently on a diet (yes, no). Finally, they indicated their age, gender, whether they had eaten at this restaurant before, and how much they usually like eating dessert—none of which had a significant effect on the results.

Results

As the self-control goal was an independent variable in the design, two respondents who answered both “yes” and “no” to the diet question were excluded from the analysis. Two respondents who did not pass the quality check were also dropped from the analysis.¹ Patrons in the experienced regret condition who did not eat dessert ($N = 45$) were also excluded, resulting in a final sample of 323.

Intensity of Regret. A 2 (type of regret: anticipated vs. experienced) \times 2 (self-control goal: on a diet vs. not) ANOVA on regret revealed significant main effects of type of regret ($F(1, 319) = 11.93, p = .001$) and self-control goal ($F(1, 319) = 17.82, p < .0001$), qualified by the interaction ($F(1, 319) = 4.31, p < .04$). Dieters anticipated more intense regret than nondieters ($M_{\text{dieters}} = 4.32$ vs. $M_{\text{nondieters}} = 2.25$; $F(1, 319) = 43.16, p < .0001$), but immediate experienced regret of dieters was not different from that of nondieters ($M_{\text{dieters}} = 2.50$ vs. $M_{\text{nondieters}} = 1.79$; $F(1, 319) = 1.50, p = .22$). Among dieters, anticipated regret was greater than experienced regret ($M_{\text{anticipated}} = 4.32$ vs. $M_{\text{experienced}} = 2.50$; $F(1, 319) = 8.54, p = .004$). Among nondieters, the difference in regret was also significant, but the difference was smaller ($M_{\text{anticipated}} = 2.25$ vs. $M_{\text{experienced}} = 1.79$; $F(1, 319) = 4.55, p < .04$; see fig. 1).

The Effect of Regret Anticipation on Intention to Consume Dessert. We examined whether asking the patrons to

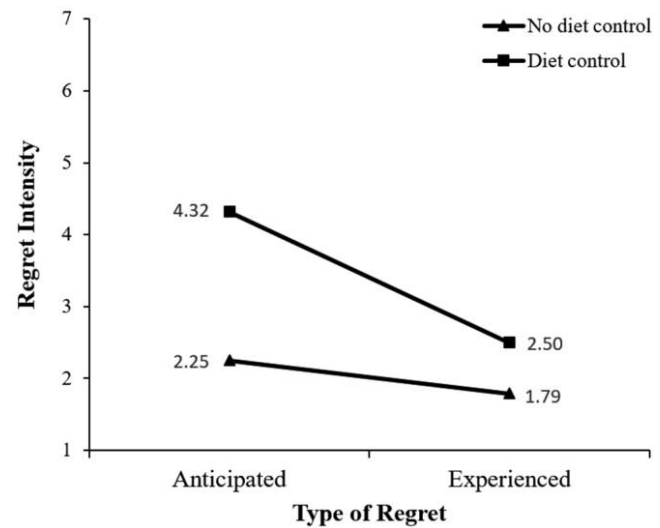


Figure 1. Study 1: Experienced regret was lower than anticipated regret, and the discrepancy was greater for the dieters.

anticipate regret made them less likely to consume desserts. Of patrons in the anticipated regret condition, 38.97% reported that they did not plan to have dessert, but 26.01% of the patrons in the experienced regret condition reported that they did not have dessert ($z = 2.64, p < .01$). Interestingly, merely prompting anticipated regret may have discouraged some from planning to have dessert—for both dieters (43.24%) and nondieters (37.97%).

Discussion

This study examined regret mitigation among customers in a restaurant. As predicted, experienced regret measured immediately after consumption was lower than anticipated regret before consumption, and the discrepancy was especially pronounced for diners on a diet. As conceptualized, such a gap between anticipated and experienced regret may have been caused by a spontaneous defensive response to protect one’s self-image when behavioral regulation is no longer an option. It is also intriguing to note that merely asking patrons to anticipate regret associated with eating desserts may have decreased their intention to indulge. This result suggests that the widespread phenomenon of overconsumption could be at least partially due to consumers’ failure to anticipate regret. Interventions that increase the salience of anticipated regret might help to reduce the incidence of consumption of calorie-rich food.

We also measured and compared anticipated and experienced “satisfaction” with consumption in studies 1–2 and found no differences between anticipated regret and experienced regret groups (and also no significant interactions with self-control goals). This rules out the possibility that

1. Two respondents reported having the buffet dessert, but according to restaurant receipts, they did not actually have the buffet. When these participants are included in the analysis, the findings are the same.

differences in satisfaction, or potentially positive emotional states triggered by visceral effects (e.g., “I am so content after eating the dessert” or “I am so happy recalling eating dessert”), drove the differences in consumption regret in these studies.

Despite intriguing findings, it should be noted that the design of the study presents a potential self-selection problem. The patrons in the anticipation condition all reported on anticipated regret regardless of whether they eventually consumed the desserts, whereas for the patrons in the experienced condition, no rating of regret was available among those who didn’t consume. This could create a problem with self-selection in the experienced condition (i.e., likely drawing those who have strong preferences for dessert). We take care of this issue in studies 2 and 3 by recruiting only those who are smokers.

STUDY 2: REGRET REGULATION AMONG SMOKERS

Study 2 was conducted to replicate the study 1 findings in a different field setting and to avoid the potential self-selection bias noted in study 1. We recruited smokers from Cornell University’s Ithaca campus and asked them to reflect on their immediate past smoking experience or to think about their next smoking session. We expected smokers’ immediate post-consumption regret to be less intense than their anticipated regret. In addition, we measured their intention to quit smoking as the strength of their self-control goal. Again, the gap between anticipated and experienced regret was expected to be more pronounced among smokers who intended to quit.

Method

Seventy-one smokers (38% female; average age: 26.7) completed the study and were each paid \$3.00. To recruit participants, research assistants were stationed at commonly frequented smoking areas on the university campus. Smokers who had just finished smoking were invited to participate. Half of the smokers completed a questionnaire on the smoking experience they just had (experienced regret condition), whereas the other half completed the questionnaire with respect to the next time they will be smoking (anticipated regret condition). It is important to note that because smokers in both conditions had just finished smoking, they were not different in terms of visceral craving or any potential physiological influence of nicotine.

Smokers in the experienced condition indicated how much regret they feel now after smoking (1 = not at all, 7 = very much); smokers in the anticipated condition in-

dicated how much regret they will feel the next time they smoke. All respondents indicated the extent to which they intended to quit smoking (1 = not at all, 7 = very much) as a measure of a self-control goal. They also reported age, gender, smoking frequency, and the extent to which they live a healthy life—none of which had a significant effect on the results reported.

Results

Responses from two smokers who participated more than once were not included in the analysis.

Intensity of Regret. Type of regret (−1 = anticipated, 1 = experienced), mean-centered intention to quit smoking, and their interaction were regressed on reported regret. As predicted, there were significant effects of regret type ($b = -.66, t = -3.14, p < .01$) and self-control goal ($b = .28, t = 2.49, p < .02$), which were qualified by a marginally significant interaction ($b = -.19, t = -1.70, p < .10$). Specifically, smokers with a high self-control goal anticipated more intense regret than those with a low self-control goal ($b = .47, t = 2.93, p < .01$), but there was no difference in postconsumption regret ($b = .09, t = .56, p = .58$). Additionally, among smokers who have a stronger self-control goal (i.e., 1 standard deviation above the mean value of the intention to quit smoking), immediate experienced regret was significantly lower than anticipated regret ($M_{\text{anticipated}} = 5.07$ vs. $M_{\text{experienced}} = 3.08$; $b = -.99, t = -3.47, p < .001$). However, among those who have a weaker self-control goal (i.e., 1 standard deviation below the mean), the difference in regret was not significant ($M_{\text{anticipated}} = 3.36$ vs. $M_{\text{experienced}} = 2.76$; $b = -.30, t = -.995, p > .32$; see fig. 2).

Discussion

Replicating the results from study 1, experienced regret measured immediately after smoking was lower than anticipated regret measured before smoking, and the discrepancy was more prominent among smokers with a stronger intention to quit. Although this field study replicated the pattern of the results found in study 1, it suffers from a relatively small sample size. We conceptually replicate the findings in the next study in an online study conducted with a larger group of participants.

STUDY 3: REGRETTING THE DISTANT PAST

Study 3 was conducted to replicate the findings from studies 1 and 2, and further test the spontaneous psychological immune system account by varying temporal distance from

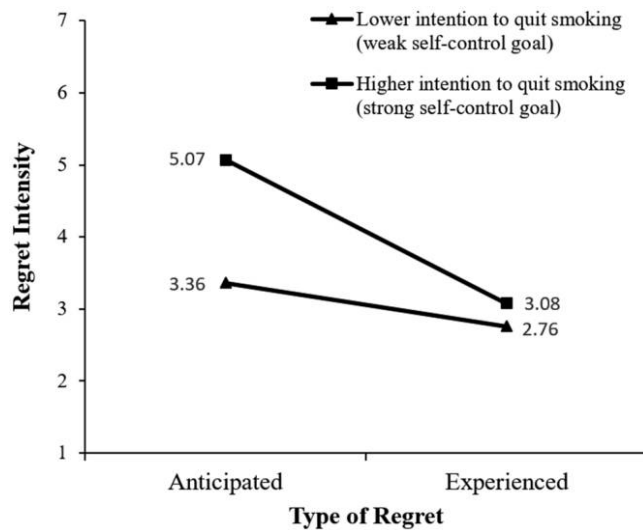


Figure 2. Study 2: Experienced regret was lower than anticipated regret. The discrepancy was greater for the smokers with stronger intention to quit smoking. The means were computed at 1 standard deviation below (for those who are low on a self-control goal) and above (for those who are high on a self-control goal) the mean value of the intention-to-quit-smoking scale.

past behavior. We propose that visceral defensive responses are likely to be strong immediately after the unhealthy behavior to regulate negative arousal, but after a substantial time delay, the “hotness” or emotionality of regret is reduced, making the activation of psychological immune system less likely.

Smokers were recruited online. In order to capture the temporal distance from past unhealthy consumption, we asked those in the retrospection condition to indicate how many hours had passed since the last time they smoked. As before, the strength of their intention to quit smoking was taken as the self-control goal. We predicted that for smokers with a stronger intention to quit smoking, postconsumption regret experienced immediately after consumption would be lower than anticipated regret before consumption or postconsumption regret experienced long after consumption. Such effects were expected to be less pronounced for smokers with a weaker intention to quit.

Method

Participants were smokers ($N = 302$; 54.6% female; average age: 39.1) recruited from Amazon’s Mechanical Turk. Half of the participants were asked to think about the next time they will be smoking (anticipation condition) and how much regret they will feel about smoking (1 = not at all, 7 = very much). The other half were asked to think about

the last time they smoked (retrospection condition) and to indicate, on a slider bar ranging from 0 to 48 hours, how many hours had passed since the last time they smoked. They were then asked to indicate how much regret they feel now about smoking on that occasion (1 = not at all, 7 = very much).

All respondents indicated the extent to which they intend to quit smoking (1 = not at all, 7 = very much). They also reported gender, smoking frequency, and the extent to which they live a healthy life, none of which had a significant effect on the results. Participants’ age ranged from 20 to 70 years. In this study, the effects of age were significant, so the results reported include age as a control variable.

Results

Two participants did not indicate the extent to which they intend to quit smoking, so the analysis included 300 respondents.

Intensity of Regret. We analyzed the data using two different approaches. Because we expected a parabolic effect of the timing of evaluation (i.e., temporal distance from consumption) on regret and a moderation of this effect by self-control goal strength, we first tested the following quadratic regression model:

$$\text{Regret} = b_0 + b_1 * (\text{temporal distance})^2 + b_2 * \text{goal strength} + b_3 * (\text{temporal distance})^2 * \text{goal strength}.$$

A parabola is described by the equation $Y = bX^2$, where X can take positive and negative values. This mathematical form is useful to model functions where Y is low when the values of X are close to 0 but increases for values of X that are further away from 0 in both directions. In the present case, $Y =$ regret intensity, and $X =$ temporal distance from unhealthy consumption. With 0 as the point of consumption, the model can test the hypothesis that regret is lower immediately after unhealthy consumption, and higher before and long after consumption.

As in studies 1 and 2, there were two regret conditions. In the anticipation condition, participants thought about the regret they would feel the next time they smoke. In the retrospection condition, they evaluated their previous smoking event, which was immediate for some and more distant for others. As noted, participants in this condition reported the number of hours since their previous smoking event on a 0–48 scale. To create a temporal distance variable, we first coded the anticipation condition as -1 . For those in the ret-

rospection condition, we rescaled the number of hours since the last smoking to range from 0 to 1 by dividing the reported hours by 48. Thus, a temporal distance variable was created, ranging from -1 to 1 . The self-control goal strength variable was mean-centered.

The results of the quadratic regression model² showed a significant effect of self-control goal on regret ($b = .52, t = 7.71, p < .0001$) and a marginally significant interaction effect ($b = .17, t = 1.81, p = .071$). These results suggest that, as predicted, regret intensity varies as a parabolic function of temporal distance: it is high before and long after unhealthy consumption, but lower immediately after the consumption. However, the parabolic relationship between temporal distance and regret intensity was mitigated when self-control goals were weak or nonexistent (see fig. 3). As mentioned, age was also a significant predictor of regret ($b = .02, t = 2.69, p < .01$).

To corroborate our interpretation and to better understand the observed interaction effect, we analyzed the data using another approach. Three groups of participants were created by recoding temporal distance as anticipation, immediate retrospection, and delayed retrospection. Then dummy variables were created for the groups. Because 56.9% of smokers in the retrospection condition reported that it had been only one hour since the last time they smoked, we used a median split to create immediate retrospection (near past: up to 1 hour) and delayed retrospection (distant past: more than 1 hour) categories in the retrospection condition. Then we regressed regret scores on the two dummy variables (D1: anticipation = 0, immediate retrospection = 1, delayed retrospection = 0; D2: anticipation = 0, immediate retrospection = 0, delayed retrospection = 1), mean-centered intention to quit smoking (as a measure of self-control goal strength), and their interactions.

Consistent with the previous results, the analysis revealed significant simple effects of self-control goal strength ($b = .69, t = 10.69, p < .0001$) and D1 ($b = -.46, t = -2.09, p < .04$), showing that regret was higher for those with a self-control goal, and that regret was lower in the

2. In this study, we also measured consumption satisfaction (i.e., how satisfied they will feel after smoking in the anticipation condition and how satisfied they are with their smoking experience in the retrospection condition) after measuring regret, and examined whether satisfaction would vary as a parabolic function of temporal distance. The results of the quadratic regression model showed a significant effect of self-control goal on regret ($b = -.38, t = -5.66, p < .0001$) but no significant interaction effect ($b = .05, t = 0.53, p > .59$). As in studies 1 and 2, this again rules out the possibility that differences in satisfaction drove the differences in consumption regret.

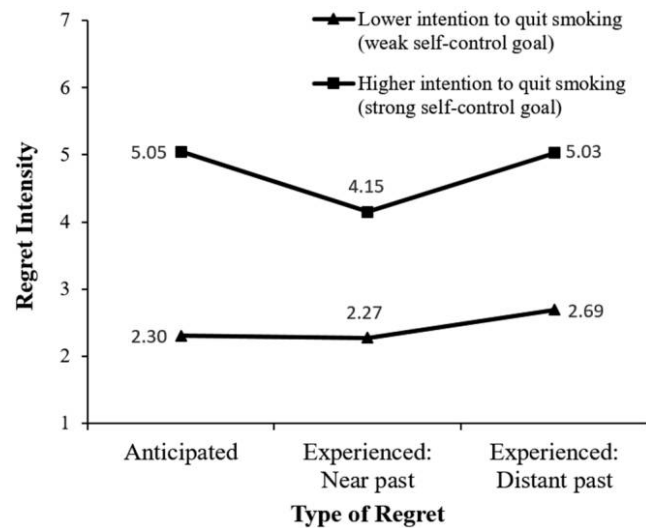


Figure 3. Study 3: For smokers with high intention to quit smoking, immediate experienced regret was lower than anticipated regret and delayed experienced regret. This parabolic relation between temporal distance and regret intensity was mitigated when self-control goals were weak. The means were computed at 1 standard deviation below (for those low on a self-control goal) and above (for those high on a self-control goal) the mean value of the intention-to-quit-smoking scale. For the retrospection condition, a median split of the last time they smoked (0–48 hours ago) was used to create the near past (up to 1 hour since smoking) and distant past (>1 hour since smoking) conditions.

immediate retrospection condition than in the anticipation condition. That is, anticipated regret was high before smoking, but experienced regret was lower immediately after smoking.

There was also a significant interaction effect between D1 and goal strength ($b = -.22, t = -2.10, p < .04$), such that the effect of a self-control goal on regret was weaker immediately after smoking. Also, as expected, the interaction of D2 (a contrast between anticipation and delayed retrospection conditions) and goal strength was not significant ($b = -.10, t = -.84, p > .39$).

To further explore the interaction effect between D1 and goal strength, we conducted a spotlight analysis (see fig. 3). The analysis at 1 standard deviation above the mean value of goal strength (i.e., those who have a relatively high intention to quit smoking) showed that immediate experienced regret (measured less than an hour after last smoking) was significantly lower than anticipated regret ($M_{\text{anticipated}} = 5.05$ vs. $M_{\text{immed-retrospective}} = 4.15; b = -.90, t = -2.71, p < .01$). However, there was no significant difference between anticipated regret and delayed-retrospective regret ($M_{\text{anticipated}} = 5.05$ vs. $M_{\text{delayed-retrospective}} = 5.03; b = -.03,$

$t = -.08, p = .932$). Also, as expected, the spotlight analysis at 1 standard deviation below the mean value of goal strength showed no significant difference between anticipated and experienced regret, regardless of whether the past experience was recent ($M_{\text{anticipated}} = 2.30$ vs. $M_{\text{immed-retrospective}} = 2.27$; $b = -.03, t = -.09, p > .92$) or distant ($M_{\text{anticipated}} = 2.30$ vs. $M_{\text{delayed-retrospective}} = 2.69$; $b = .39, t = 1.03, p > .30$). Controlling for the frequency of smoking ($p > .90$) did not change the significance of the results.

Discussion

The results of this study support the prediction that among those who have a relatively strong behavioral regulation goal, immediate experienced regret would be lower than both anticipated and delayed postconsumption regret. The defensive regulation of regret seems to be strongest immediately after the unhealthy behavior. The intensity of postconsumption regret measured after a substantial time delay was as high as that of anticipated regret measured prior to consumption. Although the study was designed to test predictions involving three different time courses of regret (anticipation, immediate retrospection, delayed retrospection), the fact that the anticipated condition did not have a continuous time window symmetrical to the retrospective condition should be noted as a limitation.

GENERAL DISCUSSION

We examined factors that influence consumers' regret about their unhealthy consumption behaviors—particularly, when and why consumers might fail to experience consumption regret. We found that immediate postconsumption regret tends to be less intense than anticipated regret or delayed postconsumption regret, and the effect is stronger for those with stronger self-control goals. Evaluating regret immediately after unhealthy consumption poses a greater threat to self-image and triggers a defensive mechanism to counteract negative arousal and dissonance, reducing regret intensity. Thus, consumers are likely to be least remorseful immediately after their unhealthy consumption than either prior to or long after a consumption event.

The results contribute to a clearer conceptualization of the emotional experience of regret, suggesting that regret intensity is informed by two distinct and counteracting mental processes—evaluation of the discrepancy between goals and behaviors, and a more spontaneous defensive reaction to the negative arousal generated by the goal-discrepant behavior. Like affective judgment in Chang and Pham (2013, 2018), the emotional experience of regret depends in part on

distance from the present. The motivation to regulate the aversive experience of consumption regret tends to be stronger when the unhealthy consumption episode is temporally proximal than when it is distant.

Researchers have long debated whether regret is a cognitive judgment or an emotional experience (Russell and Mehrabian 1977; Landman 1987). Our findings underlie the dynamics of the emotional experience of regret: immediately after consumption, regret can be characterized as hot: an emotion accompanying physiological arousal and defensiveness; prior to consumption or after a substantial delay, it can be characterized as cold: a deliberative cognitive judgment.

Viewed from this angle, our findings may look similar to those suggested by the hot-cold empathy gap, whereby people underestimate the influence of current states and visceral drives (Loewenstein 1996; Metcalfe and Mischel 1999). However, some of our findings cannot be explained by this account. Recall that in the field study with smokers (study 2), participants in both the anticipation and immediate retrospection conditions were recruited immediately after finishing a cigarette. Because participants in both conditions had just fulfilled their desire for smoking—and therefore were not in an impulsive, “hot” state—all must be considered to have been in the same visceral state. This context rules out the possibility that different visceral states were what led to different degrees of regret in the anticipation and immediate retrospection conditions in our study. Therefore, the defensive regret regulation documented here goes beyond underestimating the influence of current states.

This research suggests that people's tendency to spontaneously regulate regret may partially explain why unhealthy consumption continues. Regret, it is said, helps us evaluate the situation and motivates us to make a better decision next time (Inman, Dyer, and Jia 1997; Inman 2007; Zeelenberg and Pieters 2007); were it not for regret, people would persist with their unhealthy behaviors. However, the present research points to the prevalence of regret mitigation in our daily lives. When we think about the unhealthy snack we just gulped down, or the cigarette we just smoked, we may, at least in the short run, unconsciously defend and pardon our behavior. In particular, with ever-increasing access to instant purchases through smart devices (voice-activated devices such as Alexa, mobile phones, etc.), it is easy to make fast, ill-considered decisions on what to purchase and eat. To the extent that immediate postconsumption regret is reflexively regulated down by the psychological immune system, correcting unhealthy consumption behavior is not easy. Future research should examine intervention devices that can re-

duce or reverse the regret-mitigating effect of the psychological immune system.

The present findings may shed light on the potential effectiveness of different intervention strategies. According to our results, intervention programs following unhealthy consumption in the near past may not be as successful as those designed to intervene before unhealthy consumption or following unhealthy consumption in the distant past. In this respect, the restaurant field study (study 1) pointed to the intriguing possibility that merely asking patrons to imagine regret may be an effective intervention strategy. In that study, when patrons were prompted to anticipate regret, the number who said they planned to have dessert was significantly lower than the number who actually consumed dessert. Despite the limitation that we could not track how many diners in the anticipation condition actually did have dessert, this finding is still worth investigating, especially given the close link between intention and behavior (Eagly and Chaiken 1993).

Based on the insights from our findings, to curb smoking habits, we can imagine creating an advertisement designed to invoke anticipated regret from future events (“Think of the next time you smoke and how that will affect your lungs”), or experienced regret from past smoking incidents (“Think of the last time you smoked and how that affected your lungs”). Our results suggest that the former is likely to be a more effective intervention strategy; the effectiveness of the latter would depend on how recently the person smoked.

We examined the regret-mitigating effect associated with unhealthy behavior in the context of action regret (i.e., the regret caused by committing an indulgent behavior). Future research may examine whether regret mitigation also occurs when the regret is due to inaction (e.g., the regret of not working out today; Gilovich and Medvec 1995). People consider undesirable outcomes brought about by actions more troublesome than outcomes due to inactions (Gilovich and Medvec 1995; Gilovich et al. 1995). Thus, inaction regret for unhealthy behavior may not require as much psychological repair work as action regret and, as a result, less regret regulation may be necessary, at least in the short term. Nevertheless, would the same pattern hold for the delayed evaluation of undesirable outcomes? There are many such interesting questions for future research.

REFERENCES

- Andrade, Eduardo B., and Joel B. Cohen (2007), “Affect-Based Evaluation and Regulation as Mediators of Behavior: The Role of Affect in Risk-Taking, Helping and Eating Patterns,” in *Do Emotions Help or Hurt Decision Making: A Hedgefoxian Perspective*, ed. Kathleen Vohs, Roy Baumeister, and George Loewenstein, New York: Sage, 35–68.
- Bar-Hillel, Maya, and Efrat Neter (1996), “Why Are People Reluctant to Exchange Lottery Tickets?” *Journal of Personality and Social Psychology*, 70 (1), 17–27.
- Baumgartner, Hans, Rik Pieters, and Richard P. Bagozzi (2008), “Future-Oriented Emotions: Conceptualization and Behavioral Effects,” *European Journal of Social Psychology*, 38 (4), 685–96.
- Chang, Hannah H., and Michel Tuan Pham (2013), “Affect as a Decision-Making System of the Present,” *Journal of Consumer Research*, 40 (1), 42–63.
- (2018), “Affective Boundaries of Scope Insensitivity,” *Journal of Consumer Research*, 45 (2), 403–28.
- Cooke, Alan D. J., Tom Meyvis, and Alan Schwartz (2001), “Avoiding Future Regret in Purchase-Timing Decisions,” *Journal of Consumer Research*, 27 (4), 447–59.
- Eagly, Alice H., and Shelly Chaiken (1993), *The Psychology of Attitudes*, London: Harcourt Brace.
- Festinger, Leon (1957), *A Theory of Cognitive Dissonance*, Evanston, IL: Row, Peterson.
- Festinger, Leon, and Elaine Walster (1964), “Post-Decision Regret and Decision Reversal,” in *Conflict, Decision, and Dissonance*, ed. Leon Festinger, Stanford, CA: Stanford University Press, 100–112.
- Folkman, Susan, and Richard S. Lazarus (1988), “Coping as a Mediator of Emotion,” *Journal of Personality and Social Psychology*, 54 (3), 466–75.
- Frijda, Nico H. (2004), “Emotions and Action,” in *Feelings and Emotions: The Amsterdam Symposium*, ed. Anthony S. R. Manstead, Nico Frijda, and Agneta Fischer, Cambridge: Cambridge University Press, 158–73.
- Gilbert, Daniel T., Carey K. Morewedge, Jane L. Risen, and Timothy D. Wilson (2004), “Looking Forward to Looking Backward: The Misprediction of Regret,” *Psychological Science*, 15 (5), 346–50.
- Gilbert, Daniel T., Elizabeth C. Pinel, Timothy D. Wilson, Stephen J. Blumberg, and Thalia P. Wheatley (1998), “Immune Neglect: A Source of Durability Bias in Affective Forecasting,” *Journal of Personality and Social Psychology*, 75 (3), 617–38.
- Gilovich, Thomas, and Victoria H. Medvec (1995), “The Experience of Regret: What, When, and Why,” *Psychological Review*, 102 (2), 379–95.
- Gilovich, Thomas, Victoria H. Medvec, and Serena Chen (1995), “Commission, Omission, and Dissonance Reduction: Coping with Regret in the ‘Monty Hall’ Problem,” *Personality and Social Psychology Bulletin*, 21 (2), 182–90.
- Greenleaf, Eric A. (2004), “Reserves, Regret, and Rejoicing in Open English Auctions,” *Journal of Consumer Research*, 31 (2), 264–73.
- Inman, Jeffrey J. (2007), “Regret Regulation: Disentangling Self-Reproach from Learning,” *Journal of Consumer Psychology*, 17 (1), 19–24.
- Inman, Jeffrey J., James S. Dyer, and Jianmin Jia (1997), “A Generalized Utility Model of Disappointment and Regret Effects on Post-choice Valuation,” *Marketing Science*, 16 (2) 97–111.
- Inman, Jeffrey J., and Leigh McAlister (1994), “Do Coupon Expiration Dates Affect Consumer Behavior?” *Journal of Marketing Research*, 31 (3), 423–28.
- Kahneman, Daniel, and Dale T. Miller (1986), “Norm Theory: Comparing Reality to Its Alternatives,” *Psychological Review*, 93 (2), 136–53.
- Landman, Janet (1987), “Regret: A Theoretical and Conceptual Analysis,” *Journal for the Theory of Social Behaviour*, 17 (2), 135–60.
- Lazarus, Richard S. (1991), “Progress on a Cognitive-Motivational-Relational Theory of Emotion,” *American Psychologist*, 46 (8), 819–34.
- Loewenstein, George (1996), “Out of Control: Visceral Influences on Behavior,” *Organizational Behavior and Human Decision Processes*, 65 (3), 272–92.

- Metcalfe, Janet, and Walter Mischel (1999), "A Hot/Cool-System Analysis of Delay of Gratification: Dynamics of Willpower," *Psychological Review*, 106 (1), 3–19.
- Ogden, Cynthia L., Margaret D. Carroll, Brian K. Kit, and Katherine M. Flegal (2014), "Prevalence of Childhood and Adult Obesity in the United States, 2011–2012," *JAMA*, 311 (8), 806–14.
- Pronin, Emily, Christopher Y. Olivola, and Kathleen A. Kennedy (2008), "Doing unto Future Selves as You Would Do unto Others: Psychological Distance and Decision Making," *Personality and Social Psychology Bulletin*, 34 (2), 224–36.
- Robinson, Michael D., and Gerald L. Clore (2002), "Belief and Feeling: Evidence for an Accessibility Model of Emotional Self-Report," *Psychological Bulletin*, 128 (6), 934–60.
- Roese, Neal J. (2005), *If Only*, New York: Broadway Books.
- Roese, Neal J., Amy Summerville, and Florian Fessel (2007), "Regret and Behavior: Comment on Zeelenberg and Pieters," *Journal of Consumer Psychology*, 17 (1), 25–28.
- Russell, James A., and Albert Mehrabian (1977), "Evidence for a Three-Factor Theory of Emotions," *Journal of Research in Personality*, 11 (3), 273–94.
- Simonson, Itamar (1992), "The Influence of Anticipating Regret and Responsibility on Purchase Decisions," *Journal of Consumer Research*, 19 (1), 105–18.
- Tsiros, Michael, and Vikas Mittal (2000), "Regret: A Model of Its Antecedents and Consequences in Consumer Decision Making," *Journal of Consumer Research*, 26 (4), 401–17.
- US Department of Health and Human Services (2014), "The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General," Atlanta: US Department of Health and Human Services.
- Walster, Elaine (1964), "The Temporal Sequence of Post-decision Processes," in *Conflict, Decision, and Dissonance*, ed. Leon Festinger, Stanford, CA: Stanford University Press, 112–28.
- Yi, Sunghwan, and Hans Baumgartner (2004), "Coping with Negative Emotions in Purchase-Related Situations," *Journal of Consumer Psychology*, 14 (3), 303–17.
- Zeelenberg, Marcel, and Rik Pieters (2004), "Consequences of Regret Aversion in Real Life: The Case of the Dutch Postcode Lottery," *Organizational Behavior and Human Decision Processes*, 93 (2), 155–68.
- (2007), "A Theory of Regret Regulation 1.0," *Journal of Consumer Psychology*, 17 (1), 3–18.