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Research report

Does liking or wanting determine repeat consumption delay? ☆

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ABSTRACT

Does liking or wanting predict the delay between consumption episodes? Although these psychological processes are correlated, we find that memory for liking, rather than wanting, determines the number of days that pass until the consumption of a food is repeated. Experiment 1 found that liking (but not wanting) for a food at the end of a consumption experience predicted how many days passed until participants wanted to consume it again. Experiment 2 showed that mitigating the decrease in liking resulting from the repeated consumption of a food eliminates its effect on delay. Together, these findings suggest that end liking has a greater influence on when people will consume a food again in the future.

Introduction

Eating is not an isolated incident. People eat a variety of foods, but the consumption of most foods is repeated. People eat the same meals each month at their favorite restaurants. The same breakfasts (e.g., toast or cereal) and beverages (e.g., coffee or soda) are often consumed several times in a single week. In this paper, we examine how changes in the response to a food that occur as a result of its consumption influence the number of days that pass until its consumption is repeated. Specifically, we focus on the influence of two important changes that occur while eating: the reduction in the extent to which one enjoys or likes eating the food and the reduction in the extent to which one wants to eat more of it. The purpose of this investigation is to determine which process (i.e., liking vs. wanting) plays a greater role in determining the delay until one consumes that food again.

Liking vs. wanting

Although extant research has shown that how much one likes and wants a stimulus are related psychological constructs (Berridge, 1996; Berridge & Robinson, 2003), diverse physiological studies support the notion that these constructs are distinguishable (e.g., Berridge & Zajonc, 1991; Dai, Brendl, & Ariely, 2010; Havermans, 2012). While liking and wanting both decrease with repeated consumption in a single episode (Rolls, Rolls, Rowe, & Sweeney, 1981), liking and wanting do not always increase or decrease in conjunction. For example, difficulty acquiring a desired stimulus (e.g., a person or consumer good) results in increased wanting but decreased liking for that stimulus (Dai, Dong, & Jia, 2013; Litt, Khan, & Shiv, 2010). Additionally, intense wanting for addictive substances is not necessarily coupled with enjoyment of their consumption (Kelley & Berridge, 2002). Moreover, liking and wanting appear to have distinct neural substrates, such that liking is encoded by sensory and valuation regions such as the ventromedial prefrontal cortex whereas wanting is encoded by efferent regions such as the nucleus accumbens (Knutson, Fong, Adams, Varner, & Hommer, 2001).

Liking, or palatability, refers to one's hedonic responses to a food and is a triggered affective state that requires no motivation for further reward (Berridge, 2009). It is most commonly operationalized as the change in affect that is observed using a technique to analyze taste reactivity patterns in rats (Grill & Norgen, 1978). Such patterns are thought to provide a relatively accurate indication of liking because they can be decoupled from the desire to eat (which is typically associated with wanting; Berridge, Venier, & Robinson, 1989), and because they can be isolated from the sensory properties of taste (Berridge, 2000). In humans, however, liking is commonly operationalized as subjective ratings of palatability (Finlayson, King, & Blundell, 2007b).

Wanting, on the other hand, refers to one's motivation and appetitive drive to consume a food and can be triggered simply

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by imagining the sight, smell, and taste of a food (Berridge, 2009; Kavanagh, Andrade, & May, 2005). When wanting is high, it makes the desired food more attractive and attention grabbing. Increased wanting causes rats and pigeons to mistakenly perceive autoshaped cue light as the desired food because they attempt to eat it (Flagel, Akil, & Robinson, 2008; Jenkins & Moore, 1973). In humans, increased wanting can trigger thoughts of eating (Berridge, 2009).

Effects on repeat consumption delay

Liking and wanting are thus distinct psychological processes that both contribute to in vivo food intake, but we argue that episodic memory for liking is a greater driver of the delay until one repeats a consumption episode. This hypothesis is based on research suggesting that changes in liking are more stable than changes in wanting (Berridge & Robinson, 1998, 2003). Past studies demonstrate that novel tastes can make wanting return to initial levels almost immediately (Epstein, Caggiula, Rodefer, Wisniewski, & Mitchell, 1993). Conversely, the passage of time is needed in order for liking to be restored to initial levels (Galak, Kruger, & Loewenstein, 2011). Furthermore, food aversion effects are found when people have an extremely unpleasant (i.e., negative liking) experience with a food, but are not typically found when people eat until they are overfull (i.e., negative wanting; Logue, 1985). We thus suggest that liking is more likely than wanting to influence decisions about when to repeat the consumption of a food.

We further speculate that the end, rather than beginning, level of liking is a key predictor of future consumption delay. Consistent with research examining whether an individual chooses to repeat the consumption of a food and how much they choose to consume (Galak, Redden, & Kruger, 2009; Robinson, Blissett, & Higgs, 2011), the decision of when to repeat the consumption of a food should also be influenced by the recollection of the most recent episode. Although the beginning and end of an episode are both likely to be prevalent in memory, recency effects have been shown to more potently influence choices of which experiences to repeat in the future (e.g., Redelmeier & Kahneman, 1996). For example, research participants exhibited a preference to repeat a trial in which they submersed their hands in a 14 C ice water bath for 60 s that was then raised to 15 C for an additional 30 s rather than a trial in which they only submerse their hand in a 14 C for 60 s, presumably because the former had a better ending (Kahneman, Frederickson, Schreiber, & Redelmeier, 1993). Furthermore, research on food aversion suggests that disgust experienced after a meal (e.g., nausea or illness resulting from ingestion) has a stronger influence on attitudes toward that food than disgust experienced prior to consumption (e.g., expectations instilled by one's culture; Rozin & Fallon, 1987). In line with this work, we suggest that a recency effect for liking will be similarly influential in deciding when to repeat the consumption of food.

We report two experiments conducted to test our hypothesis. In Experiment 1, we manipulated liking and wanting for chocolate truffles in a field experiment and examined whether end liking or end wanting determined the number of days that passed until participants wanted to consume those truffles again. Experiment 2 provides additional evidence that end liking determines delay by disrupting the encoding of liking in order to attenuate the previously documented effects and negate the difference in delay between participants who eat a small or large portion. Together, the results suggest that recollection of one's end liking of a consumption experience, and not end wanting, determines the observed and desired delay until one consumes that food again.

Experiment 1

Methods

Participants

Eighty undergraduate students in two classes (40 students in each class) taught by the same professor at a university in Pittsburgh, PA were invited to participate in the experiment. The second class was taught immediately after the first. Both classes were held in the afternoon during normal business hours, at 1 pm and 2 pm. Of the 80 students that were invited, 43 agreed to participate (58% male, $M_{age} = 20.12$). There were no significant differences in participation rate across classes, $\chi^2 = .21$, $p = .65$.

Procedure and design

Participants were assigned to condition by class. Liking and wanting were manipulated by varying the portion size of the food that participants ate. Participants assigned to the small portion size condition ate one milk chocolate Lindor truffle (70 calories). Participants assigned to the large portion size condition ate four milk chocolate Lindor truffles (280 calories). A pre-test ($N = 20$) revealed that four truffles are sufficient to produce changes in liking and wanting as four truffles was not significantly different from the mean number of truffles that participants ate when they were instructed to continue eating truffles until they no longer wanted to continue, ($M = 4.1$, $SD = 1.7$), $t(19) < 1$, $p = .79$.

Before consuming the truffle(s), all participants rated their current state of hunger on a 7-point scale with endpoints, *Not at all* (1) and *Extremely* (7). Next, they were given the truffle(s) and rated the extent to which they liked eating each truffle and the extent to which they wanted to continue eating these truffles immediately after consuming each truffle on two 7-point scales with endpoints, *Not at all* (1) and *Extremely* (7). These explicit measures were used in order to tap into the explicit component of wanting as liking is most commonly an explicit measure (Finlayson et al., 2007b). This rating approach is justified as it has been shown that explicit wanting, which is truer to the colloquial understanding of the word, implies both cognitive and conscious involvement (Berridge, 2004).

Participants were then given a coupon that entitled them to a free bag of truffles that could be obtained from an administrative assistant at any time during normal business hours any day in the subsequent two weeks. A coupon code matched the responses of each participant to the delay until they redeemed their coupon. The administrative assistant noted the day upon which the coupon was redeemed. All participants (100%) redeemed their coupon to obtain their free bag of truffles.

Results and discussion

Liking and wanting

To rule out alternative explanations, we compared initial hunger, liking, and wanting ratings between the small and large portion conditions. No significant differences were found in hunger levels at the time the study was completed, $t(41) = .38$, $p = .71$, initial liking ratings of the truffles, $t(41) = .31$, $p = .76$, or initial ratings of wanting, $t(41) = .97$, $p = .34$.

Analyses of the final ratings revealed a significant effect of condition, $t(41) = 5.21$, $p < .001$, such that participants in the large portion condition reported significantly lower end liking ($M = 4.80$, $SD = 1.67$) than did participants in the small portion condition ($M = 6.70$, $SD = .47$). An independent samples t-test was also conducted on the end wanting rating, revealing a significant effect of condition, $t(41) = 6.56$, $p < .001$, such that participants in the large portion condition reported significantly lower end wanting

($M = 2.75$, $SD = 1.62$) than did participants in the small portion condition ($M = 6.09$, $SD = 1.70$). Thus, the manipulation successfully reduced both liking and wanting in the large portion relative to the small portion condition. End liking and end wanting were also significantly positively correlated ($r = .72$, $p < .001$), consistent with past research.

Days delayed

As predicted, an independent samples t-test conducted on observed delay before participants redeemed their coupons for their free bag of truffles revealed a significant effect of condition on observed delay, $t(41) = 3.66$, $p = .001$, such that participants in the small portion condition redeemed their coupons sooner ($M = 3.91$ days, $SD = 2.92$) than did participants in the large portion condition ($M = 7.75$ days, $SD = 3.93$) (see Table 1).

Mediation analysis

In support of our proposed mechanism, a mediation analysis was conducted using a bootstrapping procedure. Bootstrapping is a nonparametric re-sampling procedure that involves repeatedly sampling from the data set and estimating the indirect effect in each re-sampled set. The bootstrapping method works by repeating the re-sampling process thousands of times, building an empirical approximation of the sampling distribution of the indirect effect *ab*, and using this approximation to construct confidence intervals for the indirect effect (Preacher & Hayes, 2008). In our case, the indirect effect is the path from portion condition to the proposed mediator multiplied by the path from the proposed mediator to observed delay.

The bootstrapping method is preferred over the Sobel *z*-test because it does not impose the assumption of normality on the sampling distribution. Because the indirect effect is the product of two parameters, the sampling distribution of products and Sobel's *z* are not normal. The bootstrap test implemented by Preacher and Hayes (2004, 2008) solves this problem by generating an empirical sampling distribution of *ab* and relying on the 95% confidence intervals from the empirical distribution of *ab* estimates rather than relying on the non-normal mean estimates of *ab*, as is the case with the Sobel test (Zhao, Lynch, & Chen, 2010). Thus, we used bootstrapping procedures to obtain estimates of the indirect effects and to test their significance by using confidence intervals.

The total indirect effect associated with the two proposed mediators was tested using the formula $a_1b_1 + a_2b_2$, where the two terms represent (a) the indirect effect of portion size on observed delay through end liking and (b) the indirect effect of portion size on observed delay through end wanting. Calculation of the specific indirect effects (i.e., $a_1b_1 + a_2b_2$) involved four steps (Preacher & Hayes, 2008): (a) from our original dataset of 43 cases, a bootstrap sample of 43 cases was generated using random sampling with replacement; (b) the regression coefficients (*a* and *b*) and the indirect effect estimates (*ab*) were calculated based on this bootstrap sample; (c) by repeating this process 5000 times, 5000 estimates of the indirect effect of interest were obtained; and (d) the mean of the 5000 indirect effect estimates was calculated. If a zero was not included in the 95% confidence interval of the estimate, we concluded that the indirect effect was statistically significant (Preacher & Hayes, 2008; Shrout & Bolger, 2002). These bootstrapped indirect estimates were used in the multiple mediation model. The investigation of a multiple mediation model allowed us to test the significance of the specific indirect effects associated with each mediator.

We proceeded to investigate the significance of the specific indirect effects associated with the two possible mediators. The following indirect effects were tested: (a) the indirect effect of portion size on observed delay through end liking and (b) the indirect effect of portion size on observed delay through end wanting.

The specific indirect effect of portion size on observed delay through end liking was statistically significant, as its confidence interval did not contain zero (see Fig. 1). That is, end liking was found to be a significant mediator. The direction of the associations was as expected: the relation between portion size and end liking was negative ($\beta = -.63$, $p < .001$) and the relation between end liking and observed days delayed was negative ($\beta = -.55$, $p < .001$; see Fig. 1). Larger portion sizes resulted in lower end liking, and lower end liking was in turn associated with a longer observed delay.

The specific indirect effect of portion size on observed delay through end wanting was not statistically significant, as its confidence interval included zero (see Fig. 1). Although the indirect effect was not statistically significant, the direction of both associations was as expected: the relation between portion size and end wanting was negative ($\beta = -.72$, $p < .001$) and the relation between end wanting and observed delay was negative ($\beta = -.38$, $p = .01$; see Fig. 1).

These results suggest that lower end liking due to the larger portion size was responsible for a greater observed delay in consumption for participants in the large portion size condition as compared to participants in the small portion size condition. Participants who consumed four Lindor truffles exhibited lower end liking than did participants who consumed one Lindor truffle, and they waited almost twice as many days before retrieving their free bag of truffles. Moreover, the results suggest that end liking, not end wanting, was responsible for the greater observed delay in consumption among participants who ate the larger portion.

Experiment 2

Whereas Experiment 1 demonstrated that liking at the end of a consumption episode determines how long the subsequent consumption of that food is delayed, the objective of Experiment 2 was to gain insight into the mechanism underlying this effect. If memory for end liking mediates the relationship between portion size and delay, as we suggest, then disrupting the encoding of liking should attenuate the previously documented effects and negate

Table 1
Observed delay in days for both conditions of Experiment 1.

1 Truffle (SD)	4 Truffles (SD)
3.91 $(2.92)_a$	7.75 $(3.93)_b$

Notes: Standard deviations in parentheses. Means within rows that do not share a common subscript differ significantly at $p < .05$.

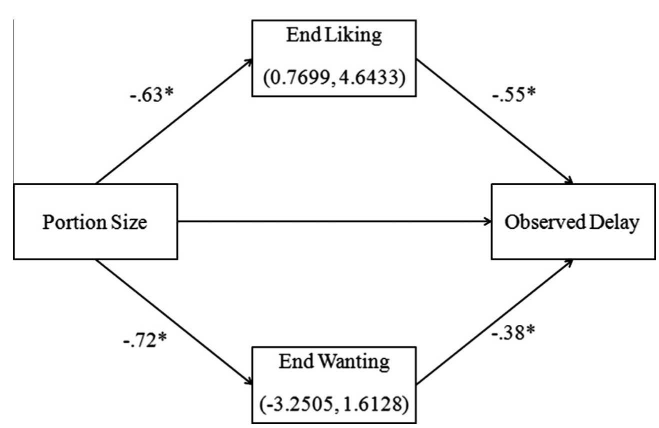

Fig. 1. Mediation model for Experiment 1. The confidence interval for end liking excludes zero while the confidence interval for end wanting does not.

the difference in delay between participants who eat a small or large portion.

Distracting participants while they are consuming disrupts the encoding of that meal into memory (Higgs & Woodward, 2009). Specifically, participants who consumed lunch while watching television showed reduced vividness ratings of the lunch when asked to reflect upon it a few hours later compared to participants that did not watch television while consuming. Follow-up studies have revealed that participants who consume lunch while distracted are also less accurate in recalling the order in which they ate different food items (Oldham-Cooper, Hardman, Nicoll, Rogers, & Brunstrom, 2011) as well as the amount of food that they consumed (Mittal, Stevenson, Oaten, & Miller, 2011), suggesting that distraction disrupts the encoding of the consumption experience.

We thus had half of the participants perform a cognitive load task while eating to disrupt their memory of end liking for the food that they ate. A benefit of this method is that the task manipulates the proposed process (i.e., memory for end liking) while holding constant the amount of food eaten in the initial episode by participants in the small and large portion conditions. We predicted that controls (i.e., participants who did not perform the cognitive load task while consuming) would desire a shorter delay in the small than large portion conditions, and that this would be mediated by end liking for the food that they ate. In contrast, participants assigned to perform the cognitive load task while consuming would not exhibit a difference in desired delay between the small and large portion condition.

Methods

Participants

One hundred thirty-nine pedestrians (47% male, $M_{age} = 32.31$) in Pittsburgh, PA were paid $3 to participate in a consumer behavior study. Pedestrians were recruited off a street to take part in a "consumer survey" in a mobile laboratory (i.e., a truck with 8 separate cubicles). Data collection lasted an entire day (9 am to 5 pm) and all eligible pedestrians (i.e., people over the age of 18) that wanted to participate were allowed to do so.

Procedure and design

All participants were randomly assigned to a condition. They first rated their current state of hunger on a 7-point scale with endpoints, *Not at all* (1) and *Extremely* (7). Next, they sampled four flavors of Nut Thins crackers: pecan, smokehouse, cheddar cheese, and hazelnut. Then, they told the experimenter which flavor they wanted to consume for the study. Participants in the small portion size condition were given a plate with 5 crackers of their preferred flavor (40 calories). Participants in the large portion size condition were given a plate with 15 crackers of their preferred flavor (120 calories). A pre-test ($N = 15$) revealed that 15 crackers are sufficient to produce changes in liking and wanting as the average number of crackers that participants ate when they were instructed to continue eating crackers until they no longer wanted to continue was less than 15 ($M = 14.1$, $SD = 6.9$ from pre-test).

Those assigned to the high cognitive load condition were told that the purpose of the study was to examine whether snacking affects arithmetic performance and thus, were asked to perform an arithmetic task while eating the crackers. This task (adapted from Litt, Reich, Maymin, & Shiv, 2011) required participants to count the occurrences of the letter 'e' in a series of short passages subject to a certain set of rules for each passage (e.g., if an 'e' is the second to last letter in a word, count it twice). Those in the no load condition were not given any task to complete while eating. Once all of the crackers had been consumed, liking and wanting measures were obtained on scales identical to those used in Experiment 1. Finally, participants provided their e-mail address so that a follow-up survey could be sent to them the next day. Upon providing this address, all participants were compensated and then encouraged to complete the follow-up survey as soon as they received it.

The next day, all participants received an e-mail that provided them with a link to the follow-up survey. Those who completed the survey first reported their current state of hunger. Then, participants were told that completing the follow-up survey automatically entered them in a drawing to receive a free box of crackers of the same flavor they ate the day before. As a result, participants were asked to indicate when they would like this box delivered if they won the lottery. Eighty-three participants completed the follow-up survey the next day, yielding a 60% response rate. There was no significant difference in response rate across conditions, $\chi^2 = 1.35$, $p = .72$.

Results and discussion

Liking and wanting

(The following analyses were conducted on the participants that completed both parts of the study.) As a manipulation check, an ANOVA conducted on end liking revealed a significant interaction between portion size and cognitive load, $F(1,79) = 10.40$, $p < .01$, indicating that the cognitive load manipulation was successful. Planned comparisons revealed a significant difference in end liking for participants under no cognitive load, $t(79) = 3.70$, $p < .001$, such that participants in the large portion size condition showed significantly lower end liking ($M = 3.05$, $SD = 1.82$) than did participants in the small portion size condition ($M = 5.00$, $SD = 1.28$). No significant difference was observed for end liking between the small portion size condition ($M = 4.63$, $SD = 1.69$) and the large portion size condition ($M = 4.95$, $SD = 1.50$) for participants under high cognitive load, $t(79) = .67$, $p = .49$.

An ANOVA conducted on end wanting also revealed a significant interaction between portion size and cognitive load, $F(1, 79) = 5.81$, $p = .02$. Planned comparisons revealed a significant difference in end wanting for participants under no cognitive load, $t(79) = 2.35$, $p = .02$, such that participants in the large portion size condition showed significantly lower end wanting ($M = 2.25$, $SD = 1.41$) than did participants in the small portion size condition ($M = 3.53$, $SD = 1.70$). No significant difference was observed for end wanting between the small portion size condition ($M = 2.83$, $SD = 1.66$) and the large portion size condition ($M = 3.32$, $SD = 1.81$) for participants under high cognitive load, $t(79) = .99$, $p = .32$.

Thus, the manipulation for the no load participants successfully significantly reduced both liking and wanting in the large portion relative to the small portion condition. End liking and end wanting were also significantly positively correlated for those in the load, $r(42) = .29$, $p = .05$, and no load conditions, $r(37) = .48$, $p < .01$, consistent with previous research.

Days delayed

(In the follow-up survey, four participants indicated that they would not like to receive a free box of crackers. As a result, the following analyses on desired delay do not include these four participants). As predicted, an ANOVA conducted on desired delay revealed a significant interaction between portion size and cognitive load, $F(1,75) = 7.23$, $p < .01$. Planned comparisons revealed that participants under no load in the small portion size condition reported that they wanted their free boxes delivered sooner

($M = 8.46$ days, $SD = 7.65$) than did participants under no load in the large portion size condition ($M = 24.91$ days, $SD = 22.68$), $t(75) = 3.06$, $p < .01$. Given the discrepancy in standard deviations between the large and small portion size conditions, a planned comparison that does not assume equal variances was conducted. This too revealed a significant difference in desired delay between portion size conditions for participants under no load, $t(22.46) = 2.98$, $p < .01$. More importantly, no significant difference between the small portion size condition ($M = 17.21$, $SD = 8.17$) and the large portion size condition ($M = 14.01$, $SD = 9.74$) was observed for participants under high load, $t(75) = .65$, $p = .52$ (see Table 2). In addition, no significant differences across all four conditions were found in hunger levels at the time the follow-up survey was completed, $F(1,79) = .001$, $p = .97$, eliminating this as an alternative explanation.

Mediation analysis

Replicating the underlying mechanism (same procedure used as in Experiment 1), a separate mediation analysis was conducted just among participants in the no load condition. We proceeded to investigate the significance of the specific indirect effects associated with the two possible mediators. The following indirect effects were tested: (a) the indirect effect of portion size on desired delay through end liking and (b) the indirect effect of portion size on desired delay through end wanting.

The specific indirect effect of portion size on desired delay through end liking was statistically significant, as its confidence interval did not contain zero (see Fig. 2). That is, end liking was found to be a significant mediator. The direction of the associations was as expected: the relation between portion size and end liking was negative ($\beta = -.53$, $p = .001$) and the relation between end liking and desired delay was negative ($\beta = -.50$, $p < .01$; see Fig. 2). Larger portion sizes resulted in lower end liking, and lower end liking was in turn associated with a longer desired delay.

The specific indirect effect of portion size on desired delay through end wanting was not statistically significant, as its confidence interval contained a zero (see Fig. 2). Although the indirect effect was not statistically significant, the direction of both associations was as expected: the relation between portion size and end wanting was negative ($\beta = -.39$, $p = .02$) and the relation between end wanting and desired delay was negative ($\beta = -.14$, $p = .37$; see Fig. 2).

In summary, these results suggest that mitigating the memory for lower end liking associated with the larger portion was sufficient to eliminate the effect of portion size on delay until repeated consumption. For participants who did not rehearse a cognitive load, the observed differences in desired delay between those in the large and small portion size conditions appeared to be due to differences in lower end liking and not differences in lower end wanting. Participants who rehearsed a cognitive load showed no differences in desired delay, suggesting that memory for end liking rather than the amount that participants ate determined delay until repeated consumption.

Table 2
Desired delay in days for all four conditions of Experiment 2.

	5 Nut Thins (SD)	15 Nut Thins (SD)
Control	8.46 $(7.65)_a$	24.91 $(22.68)_b$
Cognitive Load	17.21 $(8.17)_a$	14.01 $(9.74)_a$

Notes: Standard deviations in parentheses. Means within rows that do not share a common subscript differ significantly at $p < .05$.

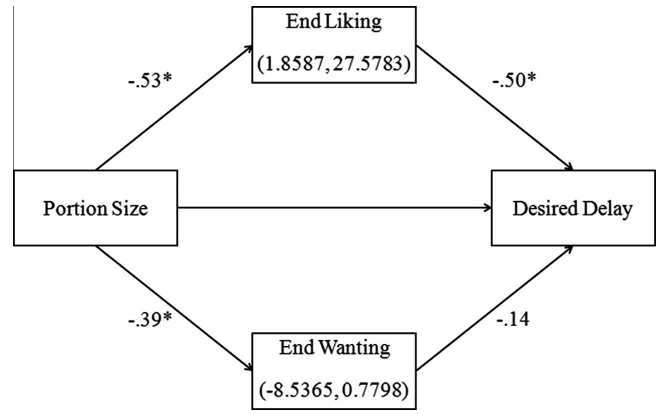

Fig. 2. Mediation model for control conditions in Experiment 2. The confidence interval for end liking excludes zero while the confidence interval for end wanting does not.

General discussion

The findings of two experiments show that liking at the end of the consumption of a food determines the delay until the food is consumed again in the future. This effect was demonstrated for both observed and predicted delay such that participants with lower end liking waited more days before repeating their consumption of chocolates in Experiment 1, and desired a longer delay in days before repeating their consumption of crackers in Experiment 2. Moreover, this effect was mitigated by disrupting the encoding of liking; participants who rehearsed a cognitive load while eating a smaller or larger portion of food exhibited no differences in desired delay (Experiment 2). In short, the results of the experiments identify an important factor that substantively influences the delay until people repeat the consumption of a food.

Contributions

This research adds to the growing body of work on liking and wanting that shows that they are distinguishable constructs (Berridge & Zajonc, 1991; Havermans, 2012). Past research suggests that liking and wanting have distinct neural substrates (Knutson et al., 2001) and thus, can be individually measured and influenced (Berridge, 1996; Berridge & Zajonc, 1991). Our work adds to this body of knowledge by showing that liking and wanting are not equally predictive of decisions regarding when to repeat consumption. Specifically, we show that end liking, rather than end wanting, drives one's decision of when to repeat a meal, demonstrating an additional means by which liking and wanting can be distinguished. To date, the majority of research dissociating liking from wanting has been conducted with animals, but it has proven more difficult to separate the two constructs in humans (Havermans, 2011). Although several researchers have demonstrated differences between these constructs using self-report ratings as we do in the present research (Finlayson, King, & Blundeel, 2007a; Lemmens et al., 2009; Litt et al., 2010), liking and wanting are highly correlated and thus many manipulations affect liking and wanting in conjunction. It is thus important to consider these challenges when interpreting our findings. It is possible, for example, that self-reported liking better predicted desired delay because it more sensitively measured the change in the reward value of the food during the consumption episodes we observed than did self-reported wanting.

In addition to contributing to research on liking and wanting, our work also contributes to literature on recency effects by refining how recency effects influence future consumption. The results suggest that the pleasure experienced at the end of a consumption experience may play a more important role than the motivation to continue a consumption episode in predicting future consumption. As recency effects have been shown to influence the choice of which experience to repeat again (Kahneman et al., 1993), we show that a recency effect is similarly influential in decisions regarding when to repeat the consumption of a food. Furthermore, the results are consistent with past findings that the end of a food consumption experience in which a single food is consumed can have a disproportionate influence on overall remembered enjoyment of that experience (Robinson et al., 2011) and that greater remembered enjoyment makes people more likely to eat that food in the future (Robinson, Blissett, & Higgs, 2012). Our results thus contribute to an understanding of the crucial role that memory plays in food consumption decisions, such as what and how much a person eats (Higgs, 2008; Higgs, Williamson, & Attwood, 2008; Rozin, Dow, Moscovitch, & Rajaram, 1998), by identifying how memory influences when people will consume a food again in the future.

One potentially interesting inconsistency that warrants resolution is with previous work that examined the consumption of multiple foods in a single episode, and did not find a recency effect in global evaluations of multi-food consumption episodes (Robinson et al., 2011). Similarly, other research has found that people do not show as pronounced a recency effect for multi-episode events such as an entire day as they do for a single experience (Miron-Shatz, 2009). Thus, future research may find that the overconsumption of a meal consisting of several foods, or courses, does not induce the same increase in delay that we observed with respect to a single food. Indeed, there may be different dynamics determining the desired delay of a consumption episode consisting of a set of foods (e.g., a holiday dinner or meal at a restaurant) than what we found for a single food in the experiments we report.

Lastly, it is important to note that this research shows effects that are separate from those of food aversion, which is defined as the loss of acceptability of a food following its association with discomfort (Mattes, 1991). Whereas research on food aversion has examined its effects on repeat consumption (Logue, 1985), our investigation is distinct as participants in our experiments did not consume enough of a food to induce a negative response to the food; mean liking and wanting ratings of the foods were greater than 2 (on a 1–7 scale) at the end of the consumption episode for participants in the large portion conditions. Participants in the large portion size condition in both experiments consumed an amount consistent with the serving size indicated on the package. Additionally, the majority of participants in Experiment 2 wanted another free box of Nut Thins (95%) when they were offered it, and all participants (100%) in Experiment 1 utilized their coupon to obtain a bag of free truffles, which are inconsistent with food aversion.

Implications

Our cognitive load manipulation suggests a way in which the influence of end liking on delay can be mitigated, but also has important implications for consumer welfare and public health. Whereas people prefer larger portions of their favorite foods (DiDomenico, 1994), the decrease in liking that accompanies the consumption of larger portions can ultimately decrease the frequency of the consumption of those foods, causing people to eat foods they like less often than they would if they consumed a smaller portion. This suggests that the goals of marketing and consumer welfare may both be best served by reducing portion sizes. In addition to increasing the frequency of repeat purchase, consuming smaller portion sizes has health-related benefits, as the increase in large portion sizes has been linked to the obesity epidemic (Young & Nestle, 2002). Electing to consume the smaller portion size should thus encourage people to eat fewer calories in one sitting as well as increase the frequency with which they purchase foods they enjoy.

Conclusion

In sum, we find that liking for a food at the end of a consumption episode determines how long people desire to delay its repeated consumption. This influence appears to be contingent on memory for liking at the end of the consumption episode rather than the portion of food consumed. From this perspective, the current research identifies factors affecting the desire to repeat a meal and sheds light on the memory bias that is at play when people make repeat consumption choices. It further elucidates the critical role of memory for liking in guiding our repeat consumption choices, and suggests a way to decrease the delay between consumption episodes and increase the consumption of consummatory goods.

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