# Variety Amnesia: Recalling Past Variety Can Accelerate Recovery from Satiation

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Consumers frequently consume items to the point where they no longer enjoy them. In a pilot study and two experiments spanning three distinct classes of stimuli, we find that people can recover from this satiation by simply recalling the variety of alternative items they have consumed in the past. And yet, people seem to exhibit "variety amnesia" in that they do not spontaneously recall this past variety despite the fact that it would result in a desirable decrease in satiation. Thus, rather than satiation being a fixed physiological process, it appears that it is at least partially constructed in the moment. We discuss some of the theoretical implications of these findings and provide some prescriptive measures for both marketers and consumers.

Consumers frequently consume products and experiences to the point where they no longer enjoy them, a process commonly referred to as "satiation" (Coombs and Avrunin 1977). This happens for a variety of stimuli ranging from the primarily physiological, such as food (Rolls, van Duijvenvoorde, and Rolls 1984) and sex (O'Donohue and Geer 1985), to the primarily nonphysiological, such as music (Ratner, Kahn, and Kahneman 1999), television programs (Nelson, Meyvis, and Galak 2009), art (Berlyne 1971), homes (Hsee et al., forthcoming), and cars (Frank 1999). In fact, satiation is often cited as a primary barrier to enduring happiness since, regardless of how satisfying a stimulus might be initially, that satisfaction tends to fade with repetition (Brickman and Campbell 1971).

One way to reduce unwanted satiation is to change the consumption experience. Prior work has shown that people satiate less when they consume more slowly (Galak, Kruger, and Loewenstein 2009), can more easily perceive the variety of an assortment being consumed (Kahn and Wansink 2004), or can subcategorize the consumption episodes (Raghunathan and Irwin 2001; Redden 2008). These approaches all act as preventive measures that slow satiation. In the present work, we instead explore remedies that can be used after satiation has occurred. If people can recover quickly and easily from a satiated state, then satiation poses a smaller problem for consumer enjoyment and happiness. In other words, people can fight satiation by either limiting it in the first place or reversing it after the fact. We focus on the latter.

Prior work has identified some antecedents of recovery from satiation, including the passage of time (Galak et al. 2009; Nelson and Meyvis 2008), and temporary exposure to a novel stimulus (Epstein et al. 1993; Hetherington et al. 2006). We build on this work by demonstrating that merely recalling the consumption of a variety of stimuli can have the same effect. Thus, we demonstrate how consumers can reduce their satiation using a simple and low-effort technique.

There has been little research to date on the extent to which people spontaneously recover from satiation. Generally speaking, the literature on satiation says very little about what drives recovery or to what extent it happens spontaneously. The present work provides a start by showing that considering the variety of other related stimuli to which one has been exposed since prior exposure to the satiated stimuli appears to considerably decrease satiation. Unfortunately, people do not seem to do so on their own, resulting in what we term "variety amnesia."

## THEORETICAL BACKGROUND

### Repeated Consumption and Enjoyment

Although people often equate satiation with reaching a physiological limit (e.g., feeling full), ample evidence sug-

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gests that satiation also results from more psychological processes such as habituation or adaptation (e.g., see McSweeney and Swindell [1999] for a review). Such a general process can help account for why people seem to satiate on nearly everything, whether it be more physiological, like eating food, or less physiological, like watching TV. For example, satiation has been found in a wide range of experiences, such as massages (Nelson and Meyvis 2008), nature and animal photographs (Redden 2008), and sexually arousing stimuli (O'Donohue and Geer 1985). As a general rule, people enjoy stimuli less as they are repeatedly exposed to them (though see Zajonc [1968] for an exception).

Although satiation is typically inevitable with enough consumption, it does not last forever. For example, listening to a song several times in a row will become tedious but presumably will not affect how much one enjoys hearing that song a year from now. People seem to recover and once again enjoy their favorites with the passage of time through a process termed "spontaneous recovery" (McSweeney and Swindell 1999; Thompson and Spencer 1966). In addition to time, satiation also seems to dissipate when people consume other items (commonly called dishabituators). For example, people salivate less from a taste of lemon after 10 trials, but a novel taste (such as chocolate) can immediately restore their salivation in subsequent lemon tastes (Epstein et al. 1993). It seems that the consumption of variety helps people recover from satiation. In this article, we focus on how the salience of that variety can also affect satiation.

## Construction of Satiation

There is little doubt that contextual cues affect liking (e.g., see Lichtenstein and Slovic [2006] for a review). Preferences seem to be more than just a function of past experiences; rather, they are at least partially constructed in the moment to reflect what is salient in the current context (Payne, Bettman, and Johnson 1993). If this is the case, then might it also be true that contextual cues affect how much past consumption influences current liking (i.e., satiation)? In other words, is satiation determined by some internal meter that keeps an ongoing balance of total consumption of a given stimulus (Cabanac 1971; McAlister 1982), or is satiation constructed based on the past consumption that readily comes to mind?

Recent evidence suggests that satiation may be, at least in part, constructed in the moment. In particular, recall of past consumption seems to play an important role in determining satiation. For example, in a now classic experiment, diners ate soup from bowls that were surreptitiously refilled while they were eating. Those who ate from these "bottomless" bowls ate approximately 76% more than participants in a control group who simply had a single-bowl serving (Wansink, Painter, and North 2005). Additionally, amnesiacs have been found to eat multiple lunches if not reminded of their previous meal despite—somewhat remarkably—presumably feeling full each time (Rozin et al. 1998). It appears that noticing and remembering consumption are vital for satiation, presumably because satiation is a function of how much such past consumption people recall. However, whereas this prior work focuses on recalling consumption for just the satiated item, the present article focuses on recalling consumption for the variety of other items one may have also consumed.

## Variety Amnesia

If satiation depends on recalling past consumption, then it is appropriate to ask what consumers will spontaneously recall. Consumers are unlikely to recall every item they have ever consumed and are instead likely to focus on a particular option (Klayman and Ha 1987) or a salient shared characteristic (Kahneman and Miller 1986). This focalism suggests that when consuming an item, consumers will focus on and primarily recall the instances when they had the same item and ignore the variety of other items in the same category that they also consumed. Such memory-related myopia we call variety amnesia.

For example, when thinking about a particular song, one is more likely to think about previous exposures to that song as well as that artist (as it is focal) than exposure to other songs by other artists (as they are nonfocal). This focalism may leave the consumer feeling like he or she has been listening to the same song repeatedly, which could then lead to a heightened sense of satiation. If so, reminding people of the variety of other items they have had should accelerate recovery from satiation. In other words, merely recalling variety from the past may have a similar effect to actually consuming the variety, by acting as a "virtual" dishabituator.

It is, however, unlikely that focusing on any consumption experience from the past will accelerate recovery. Specifically, in the context of satiation, we predict that thoughts of unrelated experiences should have little impact on recovery. For example, thinking about music likely will not make one feel less satiated with, say, a favorite jelly bean, as music has little to do with food. In contrast, thinking about consumption experiences related to jelly beans, such as other flavors of jelly beans or other types of candies, should help the recovery process. More generally, we expect that recalling the variety of items one has had in the past will accelerate recovery primarily when these items belong to the same category or consumption context as the satiated item.

The remainder of this article focuses on testing these predictions in a series of empirical studies. We find that recalling the variety of alternative experiences one has had accelerates recovery from satiation. A pilot study demonstrates the proposed effect for recalling past social interactions and provides initial evidence for our predictions. The next study replicates this effect in a controlled 3-week longitudinal study related to music consumption. The final study rules out several alternative explanations and extends the effect to the more physiological setting of food consumption. Overall, we find our effects to be quite robust across a wide range of stimuli and time periods, yet also quite specific to recalling episodes since last consuming the satiated item and from the same general class as the satiated

item. We conclude with a discussion of the theoretical and practical implications of our findings.

## PILOT STUDY

This pilot study was designed as an initial test of our predictions in an ecologically valid manner. We allowed participants to self-report a satiating experience in the domain of social interactions and measured recovery by eliciting the expected time to the next interaction. We predict that highlighting social interactions with other people from the past will accelerate the recovery from satiation on a target person. Consequently, this should make participants want to spend time again with that person sooner than when they are not asked to recall past interactions with others.

We tested this prediction using two different control groups. First, we included a control condition where participants recalled celebrities they had heard something about in the past 2 weeks. If recalling these events that involve no social interaction does not accelerate recovery, then it suggests that recalling only related items from the past helps recovery from satiation. Second, we also included a control condition where participants thought of future interactions that they expected to have. This encouraged participants to think of other friends but not in the context of past interactions that could break up the repetition. As such, we do not expect any reduction in satiation. Said otherwise, we predict that much like actual dishabituators (McSweeney and Swindell 1999) that necessarily occur since the last time an item was consumed, mere thoughts of intervening interactions will also accelerate recovery beyond what naturally occurs because they break up what otherwise would be repetitive.

### Method

*Subjects and Design.* The experiment was a single factor (recall: past interactions, future interactions, or unrelated events) between-subjects design. A total of 91 (80 female, 11 male) participants from an online panel completed the experiment in exchange for entry into a $50 lottery. Two participants were removed from analysis because they provided responses to the primary dependent measure that were more than six standard deviations above the average. All instructions, manipulations, and dependent measures were administered on an Internet-based Web site.

*Procedure.* Participants first identified the person they "hung out with" the most during the past 2 weeks. Next, participants were randomly assigned to one of the three recall conditions. Participants in the past interactions condition listed as many other people as possible that they had hung out with in the previous 2 weeks. Participants in the future interactions condition listed as many other people as possible that they thought they would hang out with in the next 2 weeks. Participants in the unrelated events condition performed a similar task but instead listed celebrities they had heard news about in the past 2 weeks. After finishing the recall task, participants indicated the next time that they planned to hang out with the person they identified as hanging out with the most. They provided this time measure by separately entering the number of days and number of hours. They also indicated how much they thought they would enjoy the next experience with the target person on a 9-point scale (1 = "very little," 9 = "very much"). Finally, participants indicated to what extent they thought about "how many other people they hung out with since they last hung out with [person]" when responding to the primary dependent measure on the same scale. [Person] was substituted with the name of the person that the participant identified in the first task as the person with whom they hung out the most. Participants were then debriefed and thanked.

### Results

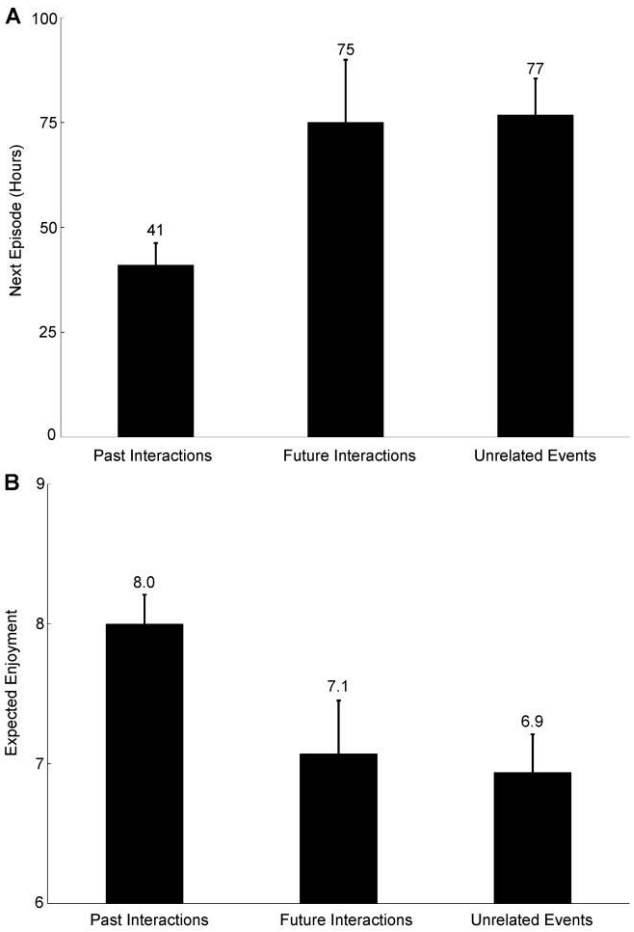
We first examined the primary dependent measure of time until the next exposure. A one-way (recall: past interactions, future interactions, or unrelated events) ANOVA on this measure revealed a reliable main effect ($F(2, 88) = 3.99$, $p < .05$). A planned contrast comparing the responses from the past interactions condition and the two control conditions showed that participants expected to hang out with the friend they reported having spent the most time with during the past 2 weeks sooner when they thought of all the friends that they hung out with in the past 2 weeks ($M = 41$ hours) than when they thought about the friends they planned on hanging out with in the future or celebrities they had heard of in the past 2 weeks (pooled $M = 76$ hours; $F(1, 88) = 7.91$, $p < .01$). As predicted and shown in figure 1A, general thoughts about other friends were not sufficient to accelerate recovery but, rather, only thoughts about past interactions with those other friends. We further confirmed this with a similar ANOVA on expected enjoyment. As shown in figure 1B, we again found a reliable main effect ($F(2, 88) = 3.97$, $p < .05$) showing that participants thought that they would enjoy hanging out with their closest friend more when they first thought about all the other friends they hung out with in the past 2 weeks ($M = 8.0$) than when they either thought of friends they may hang out with in the future or of celebrities they heard of in the past 2 weeks (pooled $M = 7.0$; $F(1, 88) = 7.74$, $p < .01$).

In order to rule out a potential alternative explanation that the number of people that participants could think of varied by condition, we examined the number of people that participants listed in the thought-listing task. We found no reliable differences for this factor ($F(2, 73) = 1.38$, NS) suggesting that the number of people thought of cannot explain our effect. Participants in the past condition ($M = 4.2$) had almost exactly the same number of thoughts as those in the future condition ($M = 4.3$; $t(56) < 1$, NS). Though participants in the unrelated condition did recall marginally more people ($M = 5.3$) than those in the past condition ($t(61) = 1.21$, $p = .23$), we would expect this to work against our predictions, if anything.

Next, we tested whether these differences in satiation were driven by the increase in thoughts of interactions with others

**FIGURE 1**

PILOT STUDY: ESTIMATED HOURS UNTIL THE NEXT EPISODE




NOTE.—Error bars represent standard errors.

in the past. We tested this by conducting a mediation analysis on the primary dependent measure, expected time until the next exposure, using the self-reported indicator of how much people thought about hanging out with others since last being with their closest friend. Following the procedure outlined in Baron and Kenny (1986), we first found that the independent variable with the pooled control conditions was related to both the dependent variable ($t = 2.84$, $p < .01$) and the mediator ($t = 4.58$, $p < .001$). Next, we found that the mediator was related to the dependent variable ($t = 3.05$, $p < .01$). Finally, when the dependent variable was simultaneously regressed on both the mediator and the independent variable, the mediator remained reliable ($t = 2.02$, $p < .05$) while the independent variable did not ($t = 1.71$, $p > .05$). A subsequent Sobel test confirmed a reliable drop in the effect of the independent variable ($t = 2.09$, $p < .05$), suggesting that an increase in thoughts of past interactions helps explain the reduction in anticipated time until the next interaction with a close friend.

Although in this study we reasoned that participants had satiated with respect to their closest friend, there is no way for us to know how much satiation (if any) actually existed. The next study will remedy this by both inducing and measuring satiation. Similarly, a related shortcoming of this study is that we use ratings of only the predicted time until the next exposure and expected enjoyment to capture the extent of recovery. The next study measures actual enjoyment. This will allow us to demonstrate that our manipulation not only does increase expected enjoyment but also makes subsequent consumption more enjoyable. Finally, it is possible that thinking about past episodes causes liking for anything in that category to increase, not just a satiated item. For example, one could imagine that thinking about all the songs one has recently heard could lead to an increase in liking of all music. If this is the case, then this could provide an alternative interpretation of our results. Our next study was designed to address all of these concerns. Finally, given that we predict that our effect is quite general, we chose a different stimulus for our next study: music.

# STUDY 1

This study builds on the previous study by replicating the effect with a different stimulus (music) and by inducing and measuring satiation in a lab setting. By inducing satiation and then measuring the subsequent enjoyment of a favorite song, we were able to measure the degree of satiation that participants experienced. We were also concerned about the possibility that overall enjoyment for a product category might increase with thoughts about that category. In other words, simply thinking about music might make all music seem more enjoyable and not just the focal song. This study addressed this concern by including a second song that participants did not hear to the point of satiation. We have proposed that thinking about other items from the past increases liking only for a satiated item. If so, our manipulation should not affect the liking of this nonsatiated song. Finally, this study was conducted over the course of 3 weeks. Participants who were satiated during the first portion of the experience returned to the laboratory 3 weeks later to receive our manipulation and indicate their subsequent level of satiation. If reminding participants of other music they have also heard still speeds up recovery 3 weeks after being satiated, then we can be reasonably confident about the robustness of this effect.

## Method

*Subjects and Design.* The experiment was a 2 (recall: similar items or unrelated items) × 2 (song: favorite or second favorite) × 3 (time: immediately, 30 minutes later, or 3 weeks later) mixed design with the first factor being between subjects and the last two within subject. A total of 50 students (34 women, 16 men) enrolled in an introductory marketing course at New York University completed the

experiment in exchange for partial course credit. One participant did not return for the third part of the study and was omitted. Due to a computer error, responses from eight participants during the second part of the study were lost, and they were omitted for all analyses related to those data. Although responses from this computer error were lost, all participants completed this section, and so we will exclude only those responses to the measures associated with the second part of the study rather than all of the dependent measures. All instructions, manipulations, and dependent measures were administered via computer in groups of participants ranging in size from four to 10.

*Procedure.* The experiment was divided into three parts. The first part was identical for all participants and served to induce and measure satiation. The second part, conducted roughly 30 minutes after the first part, provided a secondary measure of satiation and recovery for both the favorite and nonfavorite songs. The third part, held 3 weeks after the first two parts, included our manipulation and dependent measures.

*Part 1.* Participants were told that they would be taking part in a music-listening study. They started by selecting their favorite and second-favorite songs from a list of the top-15 Billboard songs for that week. We then created two audio clips, each lasting, on average, 29 seconds, using just the choruses of these songs. Participants next listened to the chorus of their second-favorite song and indicated how much they enjoyed it on an unmarked 101-point slider scale anchored with "hated it" and "loved it." We used an unmarked scale to reduce any carryover effects from previous responses. To induce satiation, participants then listened to the chorus of their favorite song 20 times in a row, indicating how much they enjoyed the song after each trial (on the same scale). Participants then completed unrelated filler studies that involved the completion of several tasks unrelated to satiation or music.

*Part 2.* Approximately 30 minutes later, participants completed the second part of the study. Participants again listened to and indicated their enjoyment of their favorite and second-favorite songs (on the same scale used in pt. 1). They were then thanked and intentionally not told anything about any follow-up studies.

*Part 3.* Approximately 3 weeks after the first session, participants returned to the lab and were told that they would be participating in another music-listening study. They were then randomly assigned to one of the two recall conditions. Participants in the similar items condition listed all the musical artists that they had listened to since the last experiment session, while participants in the unrelated items condition listed all the TV shows that they had watched. All participants then listened to and rated the same favorite and second-favorite songs they selected in part 1. Order of presentation was counterbalanced, but it had no effect on the results so is not discussed further. Next, participants indicated how much they would like to listen to the full version of their favorite and second-favorite songs (1 = "very little," 9 = "very much") and which of the two songs they would prefer to listen to in its entirety at that moment. Finally, participants were debriefed and thanked.

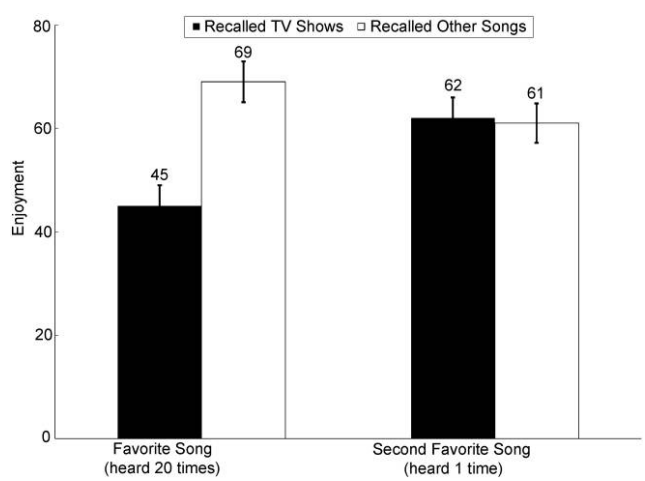
## Results and Discussion

We started by testing whether we had successfully induced satiation. Participants rated their favorite song as much less enjoyable after 20 trials than after one trial ($M_{\text{trial}20} = 35$ vs. $M_{\text{trial}1} = 78$; $t(48) = 9.44$, $p < .0001$). This satiation did somewhat dissipate over the next 30 minutes as enjoyment recovered ($M_{\text{trial}20} = 35$ vs. $M_{\text{pt.2rating}} = 49$; $t(40) = 3.52$, $p < .001$). However, as expected, participants did not fully recover and still exhibited satiation even after 30 minutes had passed ($M_{\text{pt.2rating}} = 49$ vs. $M_{\text{trial}1} = 78$; $t(40) = 6.49$, $p < .0001$). Participants also experienced a small drop in enjoyment of their second-favorite song ($M_{\text{trial}20} = 65$ vs. $M_{\text{trial}1} = 71$; $t(40) = 2.05$, $p < .05$) but not nearly as much as with the first, as evident by the two-way interaction ($t(40) = 4.68$, $p < .001$). This decrease in enjoyment for the second-favorite song is unsurprising, given that category level satiation is often found even if people consume only a particular item from that category (Rolls, Rowe, and Rolls 1982). In short, the manipulation appeared to successfully induce satiation in the favorite song.

We next examined how much recovery occurred over a 3-week period as a function of condition. The final enjoyment ratings were submitted to a 2 (recall: similar items or unrelated items) × 2 (song: favorite or second favorite) repeated measures ANCOVA that included the initial enjoyment ratings as covariates (all reported means are unadjusted). As shown in figure 2, we found a main effect for which episodes were recalled ($F(1, 45) = 7.28$, $p < .01$), but this was qualified by the two-way interaction ($F(1, 45 =$

**FIGURE 2**

STUDY 1: EXPECTED ENJOYMENT




NOTE.—Error bars represent standard errors.

14.48), $p < .001$). For the favorite song previously heard 20 times, participants recalling other songs recovered from their satiation much more than those recalling TV shows ($M = 69$ vs. $M = 45$; $F(1, 45) = 19.36$, $p < .0001$). As a gauge of the extent of recovery, the enjoyment of just the former group recovered to 89% of their initial rating ($M = 82$) compared to only 59% for the latter group. The recall treatment did not have any effect (nor was it predicted to) on the enjoyment of the second-favorite song ($M = 62$ vs. $M = 61$; $F < 1$). Thus, recalling related consumption experiences from the past appears to increase enjoyment only for a previously satiated item rather than all items in the category.

We also measured recovery using the desire to listen to a full-length version of the two songs and the choice between the favorite and second-favorite songs. A 2 (recall: similar items or unrelated items) × 2 (song: favorite or second favorite) repeated measures ANOVA on the desire to listen to the full versions yielded only the predicted two-way interaction ($F(1, 47) = 5.49$, $p < .05$). The recall manipulation did not change the desire for the second-favorite song ($M_{\text{related}} = 4.4$ vs. $M_{\text{unrelated}} = 4.3$; $F < 1$), but it did affect the desire for the previously satiated favorite song ($M_{\text{related}} = 5.2$ vs. $M_{\text{unrelated}} = 3.1$; $F(1, 47) = 9.49$, $p < .01$). Likewise, when asked to choose between the two songs, participants wanted to listen to the favorite song more if they recalled the other songs than if they recalled the TV shows (64% vs. 38%; $\chi^2(1) = 3.36$, $p < .07$). Overall, we find the same results whether we measure recovery using subsequent enjoyment, the desire to hear more, or choice.

This study adds to our previous findings in several important ways. First, we replicate our results with a different consumption experience, with much greater satiation, and with more time to recover. This suggests the effect is quite robust across stimuli, satiation levels, and time. Second, a simple manipulation was able to largely erase the satiating effects of prior consumption that a full 3-week delay did not. Participants just needed to recall other songs they had recently heard to enjoy their favorites nearly as much as before. Third, this study focused on the actual enjoyment of an experience rather than expected enjoyment as in the previous studies. This not only adds to our understanding of the full cycle of recovery from satiation but also suggests that the current findings may have implications for consumer well-being and happiness (a point to which we return in the "General Discussion" section). Finally, we show that the effect appears only for a satiated experience and not for the category in general. The lack of an effect for the category lends support to our contention that these findings are driven by an acceleration of recovery from satiation with a specific item and not some general increase in enjoyment.

## STUDY 2

The previous two studies have supported our predictions and provided some insight into boundary conditions. Although the previous studies used very different domains, they did not require ingestion or use items of a more physiological nature. The current study addresses this limitation by using food, arguably the stimuli most used in satiation research. A demonstration of our effect with a physiological stimulus, such as food, would not only further extend the generalizability of our effects but also support the notion that the underlying process is quite general and not limited to nonphysiological stimuli. Additionally, this study rules out the possibility that our effect is driven by a mere contrast effect. It is possible that rather than accelerating recovery from satiation, thoughts of intervening experiences simply act as a contrast to the target stimulus as they may be less enjoyable than the target itself (Herr, Sherman, and Fazio 1983). In this study we explicitly manipulate the relative preference of the intervening experiences so that for some participants they are less preferred than the target experience and for others they are more preferred. If we observe a similar effect for the latter condition, than we can be reasonably certain that our effect is not driven by evaluative contrasts.

### Method

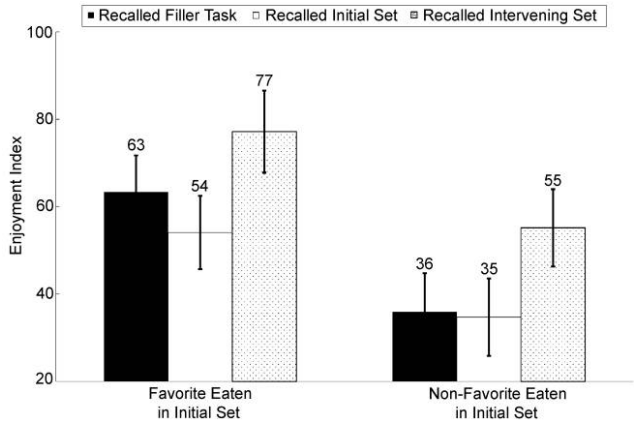
*Subjects and Design.* The experiment was a 3 (recall: intervening set, initial set, or control task) × 2 (preference: favorite or nonfavorite) fully between-subjects design. A total of 55 students (30 female, 25 male) at New York University completed the experiment in exchange for $10. All instructions, manipulations, and dependent measures were administered on a computer in groups of participants ranging in size from two to six.

*Procedure.* Upon arriving at the lab, participants were told that they would be participating in a jelly bean taste test. They then rank ordered their liking for six different flavors of jelly beans (green apple, orange juice, tangerine, licorice, watermelon, and raspberry). These rankings were used to create two sets of 12 jelly beans each for participants to consume. For participants in the favorite condition, the first set (or "initial set") contained only their top-ranked jelly beans. Participants in the nonfavorite condition received only their fifth-ranked jelly beans. The least preferred flavor was not used to reduce the chance that someone received a jelly bean they would be unable (or unwilling) to consume. For all participants, the second (or "intervening set") consisted of a random combination of four jelly beans from each of their second-, third-, and fourth-ranked flavors. In this way, for some participants (those in the favorite condition) the intervening set of jelly beans was necessarily inferior than the initial set, while for other participants (those in the nonfavorite condition) the intervening set was necessarily superior to the initial set. If having people recall eating the intervening set reduces satiation for the flavor eaten in the initial set, regardless of whether it is a more preferred or less preferred flavor, then evaluative contrast will be ruled out as an explanation for our effect.

To induce satiation, participants started by eating the initial set of jelly beans one at a time indicating their enjoyment of each on a 101-point unmarked slider scale anchored with

**FIGURE 3**

STUDY 2: IMMEDIATE AND FINAL ENJOYMENT RATINGS (AFTER ADJUSTING FOR INITIAL RATINGS)




NOTE.—Error bars represent standard errors.

"hated it" and "loved it." Participants were next given a cup of 12 jelly beans (the intervening set) and told to eat them at their own pace while watching three short animated videos ("Mike's New Car," "Lifted," and "For the Birds"; all by Pixar Animation Studies and lasting approximately 12 minutes in total). The videos were included to give participants time to consume the intervening set of jelly beans. After watching all of the videos, participants completed an unrelated filler task for approximately 20 minutes. The filler task was an unrelated experiment that focused on competition between firms and had nothing to do with food consumption or satiation.

After completing the filler task, participants were randomly assigned to one of the three recall conditions. Participants assigned to the intervening set condition saw a screen on the computer with 12 pictures of the variety of jelly beans that they consumed while watching the videos. They then wrote a few sentences about how this set of jelly beans tasted. Participants in the initial set condition performed the same task but saw pictures of and described the initial set of jelly beans that they consumed. Participants in the control condition saw no pictures and wrote instead about the unrelated filler task that they had just completed. Thus, regardless of the condition, everyone had to write a few sentences about a previous task. The manipulation was designed to make participants focus on either the intervening set of jelly beans, the initial set of jelly beans, or no jelly beans at all.

Following the manipulation, participants consumed two more jelly beans depending on the preference condition that they were in. Participants in the favorite (nonfavorite) condition ate two more of their top- (fifth-) ranked jelly beans and then, as a primary measure of recovery, indicated their enjoyment of each on the same scale used in the initial part of the experiment. Next, as a secondary measure of recovery, participants made a hypothetical choice of jelly beans to take home. They were told to pick exactly 10 jelly beans from the set of six that they had ranked at the start of the experiment. Finally, participants were debriefed and thanked.

## Results and Discussion

As with the previous experiment, we first examined whether we successfully induced satiation. We measured satiation for each individual as their enjoyment rating for their first jelly bean minus that for their twelfth jelly bean. Participants clearly satiated whether they consumed their favorite ($M_{1st} = 82.8$, $M_{12th} = 51.2$; one-sample $t(27) = 5.89$, $p < .001$) or nonfavorite jelly bean ($M_{1st} = 52.9$, $M_{12th} = 32.6$; one-sample $t(27) = 3.34$, $p < .005$). The extent of satiation did not differ between these two groups ($t(53) = 1.39$, $p > .15$).

Next, we turned to the enjoyment ratings of the final two jelly beans consumed, which were the same flavor as those in the initial set. The enjoyment ratings for these two jelly beans were highly correlated ($r = .91$, $p < .001$), so we averaged them into a single index of enjoyment. We predict that recalling the intervening set of jelly beans would lead to greater recovery from satiation on the initial flavor eaten, regardless of whether the intervening set consists of more preferred or less preferred jelly beans. As such, the final enjoyment index was submitted to a 3 (recall: intervening set, initial set, or control task) × 2 (preference: favorite or nonfavorite) ANCOVA that (as in study 1) included the enjoyment ratings of the first stimulus consumed as a covariate (all reported means are unadjusted). The analysis resulted in only the predicted main effect of recall ($F(2, 48) = 5.21$, $p < .01$). As figure 3 shows, regardless of whether participants consumed their favorite or nonfavorite jelly bean, reminding them of the intervening set of jelly beans resulted in greater enjoyment of the subsequently consumed jelly beans ($M =$

66.2) than reminding them of the initial set of jelly beans or the filler task (pooled $M = 47.0$; $F(1, 48) = 10.32$, $p < .01$).

One might question why any recovery should occur in the case of eating the nonfavorite jelly beans again since they are not liked that much. In this case, recalling other things that are more preferred still reduces satiation with the less liked flavor. We propose that we still see a reduction in satiation because recalling other items highlights that consumption has been varied, possibly making eating the candy seem less repetitive. Such dishabituation should occur regardless of whether the recalled items are more or less preferred. For example, dishabituation has often been created using mundane yet different habituators like sirens and lights (McSweeney and Swindell 1999), as well as unpleasant interruptions like irritating guitar feedback (Nelson and Meyvis 2008). Given this, it is not surprising that recalling either less liked or more liked items from the past speeds up recovery from satiation.

As a secondary measure of recovery, we also examined participants' choices. A similar ANOVA on how many of the initially consumed jelly beans people chose revealed a main effect of preference ($F(1, 49) = 6.64$, $p < .05$), a main effect of recall ($F(2, 49) = 19.22$, $p < .001$), but no interaction ($F < 1$). Regardless of whether the intervening jelly beans were more or less preferred to the initially consumed jelly beans, participants chose more of the initially consumed jelly bean when they were reminded of the intervening jelly beans ($M = 3.5$) than when reminded of either the initially eaten jelly beans or the filler task (pooled $M = 1.0$; $F(1, 49) = 38.17$, $p < .001$). Thus, against the prediction made by a contrast effect alternative explanation, participants recovered faster from satiation when recalling other items they had also eaten regardless of whether those items were more preferred or less preferred than the satiated item.

## GENERAL DISCUSSION

Many see satiation as an inevitable, but temporary, consequence of consumption (Thompson and Spencer 1966). The present research questions this view by showing that satiation is constructed at the time of evaluation and can be substantially reduced by the simple act of recalling other consumption experiences one has had since last consuming the temporarily disliked target stimulus. It seems that consumers construct and recover from satiation based on which past episodes easily come to mind. In many ways, people self-inflict much (but not all) of the satiation that makes their favorites less enjoyable. Furthermore, the temporary nature of this satiation is questionable. In the current studies, people did not seem to "spontaneously" recover that well on their own. For example, in study 1, people still found themselves satiated on a particular song after 21 days had passed. Even so, recovery became spontaneous as soon as they recalled other musical artists they had also heard during that time. This suggests that recovery may not be quite so spontaneous after all.

Three empirical studies support this notion of recovery from satiation being constructed in the moment. The results were quite consistent across the studies: reminding people of the variety of consumption experiences they had in the past accelerated recovery. We find this effect whether the domain is primarily physiological (food) or primarily nonphysiological (spending time with a friend and listening to a song). We also demonstrate two boundary conditions: the items recalled must have been consumed in the past, and they must be related to the satiated item. Additionally, we demonstrate that recovery does not occur for an entire category of stimuli but, rather, only for the satiated item. In sum, our results are consistent with the notion that people construct satiation, at least in part, based on the past episodes they recall.

The present work differs from typical approaches found in the literature. Prior work on the effect of recalling past consumption has generally examined how it makes people more satiated on the recalled item (Rozin et al. 1998; Wansink 2004). In a way, we test whether the complement of this, forgetting consumption of other items, also affects satiation. Specifically, we find that recalling the varied experiences one has had in the past can have the inverse effect of reducing satiation and accelerating recovery for that item. Our work also differs from the few studies that have shown that subcategorization of consumption experiences can affect liking during repeated consumption (Raghunathan and Irwin 2001; Redden 2008). These prior works focused on preventing changes in liking before they happen, making particular aspects more salient during consumption, and considering fewer episodes from the past as relevant. In contrast, the present work focuses on recovering from satiation after it happens, making salient other items besides the satiated item and explicitly recalling more episodes from the past. Although both approaches share the goal of reducing the ultimate effect of satiation, the key difference is that prior work has focused on limiting it in the first place while we focus on quickly recovering from it once it happens.

These findings raise some interesting questions about the nature of satiation. When consumers ponder their preference for a given item, to what extent is satiation predetermined by their past experiences versus constructed in the moment? Does satiation continually build up as we consume more of something (i.e., an internal meter), or is it created in part when we consider consuming something? Can merely thinking about variety provide some of the same benefits of actually having variety? For example, in one study, people ate 23% more yogurt if the flavors were varied (Rolls et al. 1981); how much more would they have eaten if they were merely asked to recall other flavors they had ever had? Given the current findings, it is possible that just thinking of variety may reduce satiation much like having the variety itself. Satiation seems to be a fluid and contextual phenomenon and thus opens the door to many ways to fight it. Future work should continue to better understand the specific mechanisms involved in constructing and recovering from satiation.

Although spontaneous recovery was included as a defining feature of habituation over 40 years ago (Thompson and

Spencer 1966), very little research has examined the extent to which this phenomenon happens. This article provides a start to understanding how people recover from satiation. We document the generalizability of this effect in three fairly diverse settings. Future research should explore the extent to which our effects generalize across people. For example, it could be that the effect depends on how much a person believes past variety should make him or her feel less satiated (i.e., a sort of self-fulfilling prophesy). Such individual differences in the ability to recover from satiation might be linked even further to happiness. After all, the person who can recover from satiation more quickly and enjoy favorite products and experiences again should lead a happier life.

The current findings also suggest potential explanations for other related phenomena. For example, the rate of recovery from satiation appears to vary widely across product categories. Some people seem to recover and eat the same cereal for breakfast each morning, yet would never consider eating the same entrée for dinner each night. Perhaps this is related to differences in the memorability due in part to the importance placed on these meals in Western society. For example, the routinization of breakfast is unlikely to cause it to become particularly memorable, while the emphasis placed on dinner could lead to more specific memories. When deciding what to eat for dinner, it then becomes easy to recall all the previous times one has had, say, pasta, while that same type of memory is less likely to come to mind when deciding which breakfast food to consume. Similarly, some people may experience a more rapid recovery from satiation across most experiences, and perhaps this individual difference is linked to how readily they recall past variety. Future research should better understand the factors that make a consumption episode particularly satiating far into the future and those that make an episode with variety lead to greater recovery more quickly. In sum, research on the spontaneous recovery from satiation seems to be a promising area for studying consumer happiness.

Another consideration is the categorization of past consumption experiences. Satiation during consumption varies as a function of how stimuli are categorized (Redden 2008), so it is reasonable to assume that the same may be true for recovering from satiation. In our second study, had we framed the decision not as that of listening to a favorite song but, rather, as doing something entertaining, then perhaps thoughts of television shows (our control condition) would also have helped people recover from satiation since they would fall into that category. This suggests that another way to accelerate recovery may be to change the width of consumption categories that consumers think about. By construing experiences in wider categories, perhaps consumers would recall a wider variety of other "related" stimuli they have also experienced, which could reduce satiation.

These findings also lead to an interesting prescription for marketers. If marketers find themselves with customers who are satiated on their product, one potential remedy may be to highlight other related products in their advertisements. For example, an ad for chocolate might include some other desserts in the background. By doing so, consumers might be made to think of other desserts that they recently consumed and thus feel less satiated toward chocolate. Of course, firms should balance this effect with the likely concurrent opposite effect of inadvertently advertising other products and driving the consumer away.

The current findings likely provide more actionable advice to consumers fighting satiation. The recommendation is straightforward: if consumers wish to keep enjoying their favorite experiences, then they should simply think of all the other related experiences they have recently had. For example, the next time you find yourself in the all too common situation of not wanting to eat the same thing for lunch, try to recall all of the other things you have eaten since yesterday's lunch. Our findings suggest that this will make your current lunch taste just a little bit better.

More generally, satiation presents a real challenge to lasting happiness. Consumers trying to maintain their enjoyment face a moving target in that the enjoyment of the good things in life is fleeting (Brickman and Campbell 1971). Although seeking out variety certainly helps to counter this satiation, the present research suggests that variety may not be enough, as people seem to forget how varied their lives are. Despite the fact that consumers work hard and pay a price to surround themselves with a great deal of variety, they seem to succumb to some sort of variety amnesia and forget the abundance that they live in. If they would only stop and think about how varied their lives really are, they might find themselves less satiated with the things they love and happier as a result.

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