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The results of five experiments reveal that when sampling a series of experiential products (e.g., beverages, music), consumers prefer the product sampled second in a series of two desirable products but relatively prefer the product sampled first in a series of two undesirable products. The underlying process for both outcomes is a recency effect, such that there is better recall for the most recently sampled experiential product. The recency effect observed for experiential products reverses to a primacy effect when sampling nonexperiential products (e.g., scissors). The authors also demonstrate that the placement of an undesirable experiential product in conjunction with two desirable experiential products can exaggerate preference for the later-sampled desirable product (when the undesirable product is sampled first) or result in preference for the earlier-sampled desirable product (when the undesirable product is sampled between the two desirable products). However, the preference for the earlier-sampled desirable product holds only if there is no time delay between the sampling of the products or between the sampling and the choice evaluations.

Keywords: experiential products, sampling, order effects, choice behavior, mixed choice set

How the Order of Sampled Experiential Products Affects Choice

Sampling of experiential products should appeal to sensory aspects of both the mind and the body (Holbrook and Hirshman 1982; Shiv and Nowlis 2004). Thus, marketers often try to reach out to consumers of experiential products before the actual purchase event to allow them to sample the product and thereby motivate them to make a purchase. Experiential products that consumers often sample before purchase include food and beverages given out in a supermarket or food court (Nowlis and Shiv 2005; Shiv and Nowlis 2004), music (Peitz and Waelbroeck 2006), movie clips (Childers et al. 2001), products at wine-tasting events (Lynch and Ariely 2000), and perfumes (Shapiro and Spence 2002).

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With companies spending well over a billion dollars annually on product sampling (Wadhwa, Shiv, and Nowlis 2008), it becomes important to examine the effects of sampling experiential products on subsequent product choices. Consumers sometimes sample only one item, though in many cases they might sample multiple items before making a purchase decision. Although researchers have explored the effects of sampling one item on subsequent choice decisions (e.g., Nowlis and Shiv 2005; Shiv and Nowlis 2004; Wadhwa, Shiv, and Nowlis 2008), no investigation has considered the sequential ordering of a series of experiential samples, which can be desirable and/or undesirable, and the influence on subsequent choice decisions.

Although normatively the serial positions of stimuli in a sequence should not influence evaluations or choice, two effects typically emerge: primacy effects, when the first stimulus encountered is more influential and/or better recalled, and recency effects, when the last stimulus is more influential and/or better recalled (Gürhan-Canli 2003). While prior studies, conducted in the context of nonexperiential product scenarios and using a limited number of sequential stimuli (e.g., two- or three-sequence environ-

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ments), have found primacy effects (e.g., Biswas, Biswas, and Chatterjee 2009; Büyükkurt 1986; Carlson, Meloy, and Russo 2006), we propose that for experiential products, the outcomes will be different; that is, recency effects will be observed, such that the experiential product sampled last will be better recalled. Moreover, when sampling a series of experiential products, consumers' preferences are likely to vary as a function of whether the products sampled are desirable or undesirable. For desirable products, we expect that consumers will express preference for the desirable product sampled second in a series of two desirable experiential products and express relative preference for the undesirable product sampled first in a series of two undesirable experiential products. We expect the underlying process for both outcomes to be due to a recency effect, such that the product sampled later is better recalled. In the case of two desirable (undesirable) experiential products, we expect that this recency effect, in terms of recall of the desirable (undesirable) aspects of the products, will result in greater preference for the product experienced serially second (first), a phenomenon we term "recency (primacy) preference." In addition, we consider mixed choice sets (both desirable and undesirable products) and examine how the serial position of an undesirable product in relation to two desirable products may influence product preference. Although it might not be common for a consumer to sample undesirable products, it is nevertheless a realistic possibility, especially when he or she samples a product for the first time or without much knowledge about that product. In addition, because of their sensory nature, experiential products are subjective in terms of desirability or undesirability, especially across cultures or age groups. For example, likes/dislikes for music and video types vary across age groups and gender (Greeson 1991).

In the next section, we present a conceptual framework for the serial position effects of sampling desirable versus undesirable experiential products on subsequent consumer preferences. Five experiments test the relevant hypotheses. We begin by examining consumer choice behavior for a sequence of either two desirable or two undesirable experiential products, as well as the moderating effects of memory capacity (Study 1a) and the moderating effects of a concurrent task (Study 1b), to demonstrate that a recency effect (greater recall of the most recently sampled item) leads to a preference for the most recently sampled item (recency preference) for desirable products and a preference for the first item (primacy preference) for undesirable products. Then, in Study 2, we show that though recency effects occur for experiential products (e.g., music), these effects reverse into primacy effects for nonexperiential products (e.g., scissors). In Study 3, we examine choice behavior when consumers evaluate a sequential mix of both desirable and undesirable experiential products and find that the serial position of an undesirable product affects preference for the desirable products. Finally, Study 4 extends some of the findings of Study 3 by demonstrating that a short time delay between or after product sampling can reverse a key result observed in Study 3.

BACKGROUND

Experiential Products

Sampling of experiential products should lead to somatosensory experiences and entail affective, sensory, and informational components (Nagata et al. 2005; Nowlis and Shiv 2005; Shiv and Nowlis 2004). The affective and sensory components pertain to the reactions that arise from the experience, associated with automatic processes, while the informational component is associated with controlled processes. For example, when tasting chocolate, the affective component includes the emotion experienced, such as pleasure or delight; the sensory component includes the perceived sweetness, texture, or smell; and the informational component pertains to informational thoughts about the chocolate, such as its health consequences, quality, packaging, or brand name (Nowlis and Shiv 2005). When a consumer samples experiential products, the sensory/affective components should carry more weight than the informational component. Thus, when a consumer samples two experiential products, he or she is likely to experience critical sensory experiences (e.g., taste, smell) related to both products (Feldman 1995), which become encoded in memory. Building on this theoretical foundation, we examine how the impact of sampling multiple experiential products and then choosing among them may depend on product serial position effects.

Serial Position Effects for Experiential Products

When consumers sample a sequence of experiential products, encode the critical sensory experiences in memory, and then retrieve them to make product judgments, they are likely to base their judgments on sensory experiences. Therefore, we expect a recency effect (e.g., Howard and Kahana 1999; Li and Epley 2006; Neath 1993). Specifically, when consumers sample experiential products in a sequence, information regarding the sensory experiences related to those products enters their short-term working memory; later, they retrieve that information when rating the product and expressing their choice preference (Neath 1993; Verhaeghen, Cerella, and Basak 2004). When sampling a series of experiential products, there will be strong reliance on recalling the distinctive aspects of the sensory experiences (Brown, Neath, and Chater 2007). As each additional experiential sensory stimulus enters short-term working memory, the memory traces for the earlier experiential sensory stimulus should decay (Estes 1997; Howard and Kahana 1999), causing the recall accuracy for the initially experienced product to diminish. In addition, sensory and affective reactions derived from a subsequent experience likely interfere with the memory retrieval of reactions generated during an earlier experience (Cowley 2007). In combination, these arguments suggest that when consumers recall and rate experiential products after sampling them sequentially, the experiential product sampled most recently should have a stronger impact in terms of subsequent memory recall (i.e., there will be a recency effect).

However, we also predict that this better recall for the most recently sampled experiential product will result in different preference outcomes, depending on whether the products are desirable or undesirable. The "distinctiveness" of the experiential product should play an influential role in

which affective sensory aspects of the product are recalled (Brown, Neath, and Chater 2007; Neath 1993). Thus, when consumers sample a series of desirable experiential products, the distinctiveness of the products in memory is related to the desirable aspects of the products. Similarly, when they sample a series of undesirable products, the distinctiveness should be related to undesirable aspects. Specifically, for two equally desirable products, we predict that consumers will better recall the desirable aspects of the experiential product sampled second in a sequence, which will cause them to prefer the product sampled second (recency preference). For two equally undesirable experiential products, we predict that consumers will better recall the undesirable aspects of the experiential product sampled second in the sequence, which will cause them to relatively prefer the product sampled first (primacy preference).

H_1: When sampling a sequence of two desirable experiential products, consumers will prefer the second product. When sampling a sequence of two undesirable experiential products, consumers will relatively prefer the first product. The underlying process for both outcomes is due to better recall of the product sampled second (recency effect).

The Moderating Effect of Memory Capacity

The preceding argument suggests better recall of the affective sensory aspects (e.g., desirable or undesirable tastes) of the most recently sampled product. If this argument holds, we should be able to reduce recency effects by enhancing memory for the initially sampled item. Rather than actually enhancing memory, in Study 1a, we create the belief that memory will be enhanced, consistent with research in the domain of placebo effects (e.g., Shiv, Carmon, and Ariely 2005), which reveals that a person's beliefs and expectations can influence behavioral outcomes. Similarly, Lachman and colleagues (1992) find that induced beliefs about memory ability improved participants' memories. With enhanced memory, consumers should be able to recall the sensory and affective aspects related to sampling both sequential products better. Thus, the initially sampled item should be better recalled, and the level of recall should be closer to the level associated with the most recently sampled item. Because of this enhanced recall for the first item, the serial position effects we predicted in H_1 should decrease:

H_2: The effects predicted in H_1 will hold in the absence of memory enhancement and diminish under conditions of enhanced memory. Specifically, (a) in the absence of any memory enhancement, when sampling a sequence of two desirable experiential products, consumers will prefer the second product, and when sampling a sequence of two undesirable experiential products, they will relatively prefer the first product. (b) In conditions of enhanced memory, these effects will diminish.

STUDY 1A: IMPACT OF THE SERIAL POSITION OF DESIRABLE AND UNDESIRABLE PRODUCTS AND THE MODERATING EFFECT OF MEMORY CAPACITY

Design and Participants

We tested H_1 and H_2 using a 2 (experiential product set: two desirable beverages versus two undesirable beverages) × 2 (memory capacity: enhanced versus not enhanced) between-subjects experiment, with a counterbalanced sequential ordering of beverages. Participants were 69 students (average age was 21.5 years, and 44% were women) from a northeastern U.S. university.

To determine desirable beverages, we asked participants in a pretest (N = 32) to rate flavored water products on a scale of 0 ("highly unfavorable") to 10 ("highly favorable"). The two highest-rated beverages served as the desirable products, with both earning similar ratings (7.34 versus 7.06; $t(31) = .51$, $p = .61$). The undesirable beverages were concentrated, flavored drinks manufactured by a local company that, though perfectly safe and hygienic, had strong and pungent tastes, making them undesirable. On a similar 0–10 scale, participants (N = 15) rated both these beverages as equally undesirable (2.47 versus 2.80; $t(14) = 1.05$, $p = .31$).

Procedure

To manipulate memory enhancement, we told participants in the enhanced-memory condition that "prior research has shown that drinking these beverages improves a person's memory," whereas we made no mention of memory to those in the nonenhanced-memory condition (e.g., Lachman et al. 1992). Participants then sampled two beverages (both either desirable or undesirable) by taking a single sip of the first beverage and then taking a single sip of the second beverage (counterbalanced across participants). We removed all identifying label information from the beverages to avoid potential confounding effects due to brand familiarity.

Dependent Measures

Participants ranked the beverages by responding to the following question: "Between the two beverages that you tasted, which one tasted relatively better?" They also rated the products from two questions: "How would you rate the taste of the first [second] beverage?" (1 = "extremely horrible," and 7 = "extremely tasty"). The difference between the ratings assigned to each beverage served as the product preferential rating. Participants then responded to two open-ended questions: "What words would you use to describe the taste of the first [second] beverage?" Toward the end of the experiment, participants indicated, on the basis of two questions, whether the beverages improved their memory (1 = "definitely no," and 7 = "definitely yes").

Results

Manipulation checks. As we expected, desirable beverages (M = 4.62) earned more favorable ratings than undesirable beverages (M = 2.74; $F(1, 67) = 57.76$, $p < .01$). Participants in the enhanced-memory condition had stronger beliefs (M = 2.34) that the beverages improved their memory than those in the nonenhanced-memory condition (M = 1.60; $F(1, 67) = 6.51$, $p < .05$).

Main tests. Consistent with H_1, for desirable experiential products, a greater proportion of participants preferred the second desirable beverage (first = 35%, second = 65%; $\chi^2 = 3.60$, $p < .05$). Similarly, the second desirable beverage had higher product ratings ($M_{first} = 4.28$, $M_{second} = 4.98$; $F(1, 39) = 4.59$, $p < .05$). For undesirable products, more participants relatively preferred the first undesirable beverage (first = 69%, second = 31%; $\chi^2 = 4.17$, $p < .05$) and

rated the first undesirable beverage relatively more favorably (M_{first} = 3.0, M_{second} = 2.48; F(1, 28) = 4.10, $p < .05$).

However, consistent with H_2, these effects were moderated by perceived memory capacity. A 2 (desirable versus undesirable beverages) × 2 (memory enhancement: present versus absent) logistic regression showed a significant interaction effect for product ranking (–2LL = 10.62, $p < .01$; see Figure 1), and a corresponding analysis of variance (ANOVA) revealed a significant interaction effect for product preferential rating (F(1, 65) = 4.70, $p < .05$). Follow-up analyses indicated that for desirable products, in the absence of memory enhancement, more participants preferred the second desirable beverage (rankings: first = 25%, second = 75%; $\chi^2 = 5.0$, $p < .05$; ratings: M_{first} = 4.10, M_{second} = 5.10; paired sample t-test, t(19) = 2.21, $p < .05$). However, when perceived memory was enhanced, these effects were attenuated for both ranking (first = 45%, second = 55%; $\chi^2 = .20$, $p = .65$) and ratings (M_{first} = 4.45, M_{second} = 4.85; paired sample t-test, t(19) = .85, $p = .41$).

In the undesirable products conditions, in the absence of memory enhancement, more participants preferred the first beverage (rankings: first = 80%, second = 20%; $\chi^2 = 5.40$, $p < .05$; ratings: M_{first} = 3.27, M_{second} = 2.47; paired sample t-test, t(14) = 2.35, $p < .05$). However, with perceived enhanced memory, these results were attenuated for both ranking (first = 57%, second = 43%; $\chi^2 = .29$, $p = .59$) and ratings (M_{first} = 2.71, M_{second} = 2.50; paired sample t-test, t(13) = .56, $p = .58$).

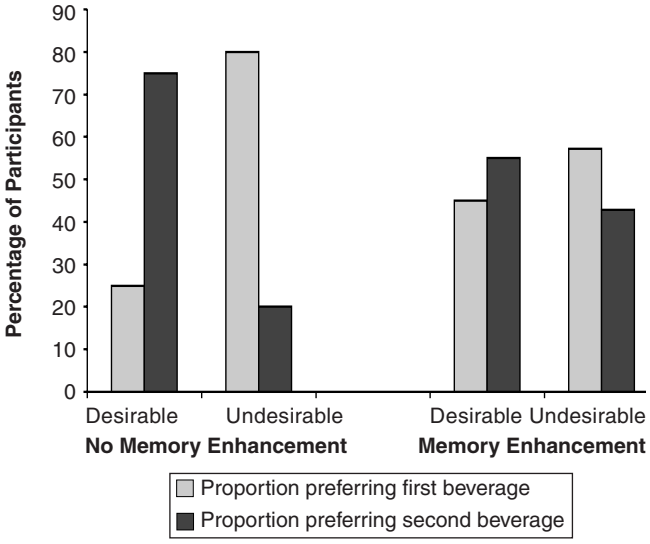
Process results. To examine the processes underlying these results, we analyzed the number of words that participants used to describe the products in response to the open-ended questions about how they would describe the beverage tastes; this served as a measure of memory recall (e.g., Biswas, Biswas, and Chatterjee 2009). Consistent with H_1, participants used more words to describe the taste of the second beverage (M_{first} = 2.56, M_{second} = 3.30; paired sample t-test, t(68) = 3.82, $p < .01$), in support of our contention that participants better recall the experiential product sampled later in the sequence (recency effect).

In support of H_2, the process results also revealed that this effect can be moderated by memory enhancement. Specifically, in the absence of perceived memory enhancement, participants used more words to describe the taste of the second beverage (M_{first} = 2.11, M_{second} = 3.23; paired sample t-test, t(34) = 4.20, $p < .01$), but with enhanced memory, they used an equal number of words to describe both beverages (M_{first} = 3.03, M_{second} = 3.38; paired sample t-test, t(33) = 1.31, $p > .20$), which indicates that they recalled the first and second sampled products similarly when memory was enhanced. In addition, by comparing across conditions, we found that memory enhancement resulted in more words used to describe the first beverage ($M_{first\ (nonenhanced\ memory)}$ = 2.11 versus $M_{first\ (enhanced\ memory)}$ = 3.03; t(67) = 3.11, $p < .01$). Finally, consistent with our expectations, memory enhancement resulted in more words being used by participants to describe both beverages ($M_{nonenhanced\ memory}$ = 5.51 versus $M_{enhanced\ memory}$ = 6.56; t(67) = 1.96, $p < .06$).

Discussion

The results of Study 1a show that when consumers sample beverages sequentially, the serial positions of the beverages influence their subsequent evaluation and product preferences. The serial position effects on choice reflect recency effects, in terms of better recall of the beverage sampled later, and the preference outcomes depend on whether the beverages are desirable or undesirable. For desirable beverages, participants evaluated the second beverage as better tasting than the first. In contrast, for undesirable beverages, they evaluated the first beverage as relatively better than the second. As we expected, the products' serial position effects became attenuated when participants' perceived memory capacities were enhanced. To further confirm that the underlying process is differential recall of the sampled items, in Study 1b, we used a different mechanism to equate the ability to recall both items. That is, in Study 1a, we equated product experience recall by enhancing memory capacity; in Study 1b, we equated product experience recall by reducing memory capacity through a concurrent task.

Figure 1
STUDY 1A: PROPORTION OF PARTICIPANTS PREFERRING FIRST VERSUS SECOND BEVERAGE



STUDY 1B: MODERATING EFFECTS OF CONCURRENT TASK

Prior research studies (e.g., Fischer, Miller, and Schubert 2007; Rohrer and Pashler 2003) have shown that participants' memory retrieval is affected by additional concurrent tasks. Consistent with such prior studies, we expect that when consumers are given a concurrent task, their memory is affected such that their ability to remember the sampled products is diminished. As a result, the second product experience should not be recalled in any greater detail than the first product experience, and consumers should become indifferent between the two sampled products in subsequent recall and rating tasks. That is, the effects we predicted in H_1 should weaken when consumers are given an additional concurrent task.

H_3: The effects predicted in H_1 will hold in the absence of any concurrent tasks but diminish in the presence of a concurrent task. Specifically, (a) in the absence of a concurrent task, when sampling two desirable experiential products, consumers will prefer the second product, and when sam-

pling two undesirable experiential products, consumers will prefer the first product. (b) In the presence of a concurrent task, these effects will diminish.

Design and Participants

To test H_1 and H_3, we employed a 2 (experiential product set: desirable versus undesirable) × 2 (concurrent task: absent versus present) between-subjects experiment, with the sequential ordering of experiential products counterbalanced. Study 1 used music as a product. Participants were 90 university students (average age was 22 years, and 29% were women).

Pretest

A pretest (N = 14) and a subsequent interactive session with four additional participants helped identify sets of desirable and undesirable music pieces. Digitally modified versions of 25-second clips of two American rock music tunes emerged as desirable. These 25-second clips featured only the musical tunes, without any lyrics, to avoid any potential confounding effects related to the words/language in the lyrics. Digitally modified versions of 25-second clips of two Asian classical music tunes represented the undesirable samples.

Procedure

Participants listened to two sequential 25-second tunes (both desirable or both undesirable) on a computer. We counterbalanced the order across participants. We manipulated concurrent task by asking participants to keep a running tab of the number of times they blinked (e.g., Posavac et al. 2004). That is, in the concurrent-task condition, participants counted the number of eyeblinks while listening to the music and completing the survey.

Dependent Measures

We measured participants' product ranking by asking, "Between the two musical pieces that you heard, which one did you like more?" To measure product rating, we asked two questions: "How would you rate your liking of the first [second] musical piece?" (1 = "hated it," and 7 = "loved it"). Participants also responded to two open-ended questions: "What words would you use to describe the first [second] musical piece?" Finally, we asked participants two questions to check the degree of mental effort required by the concurrent task (Monga and Houston 2006).

Results

Manipulation checks. As we expected, participants had higher product ratings for the desirable (versus undesirable) musical pieces (M = 4.89 versus 3.43; t(88) = 8.67, $p < .001$), as well as greater mental effort in the presence of a concurrent task (M = 4.70 versus 3.68; t(88) = 3.59, $p < .01$).

Main tests. Consistent with H_1, for desirable music, a greater proportion of participants preferred the second music they heard (rankings: first = 38%, second = 62%; $\chi^2 = 2.69$, $p < .05$; ratings: $M_{first} = 4.58$, $M_{second} = 5.20$; t(44) = 2.03, $p < .05$). We also found that for undesirable music, more participants relatively preferred the first music (rankings: first = 64%, second = 36%; $\chi^2 = 3.76$, $p < .05$; ratings: $M_{first} = 3.67$, $M_{second} = 3.20$; t(44) = 2.06, $p < .05$).

The results also support H_3. A 2 (desirable versus undesirable music clips) × 2 (concurrent task: absent versus present) logistic regression revealed a significant interaction effect for product ranking (–2LL = 7.90, $p < .01$), and a corresponding ANOVA showed a significant interaction effect on product preferential rating (F(1, 86) = 4.86, $p < .01$). Follow-up contrasts revealed that in the absence of a concurrent task, for desirable music, the second piece was more preferred (rankings: first = 30%, second = 70%; $\chi^2 = 3.52$, $p < .05$; ratings: $M_{first} = 4.30$, $M_{second} = 5.35$; paired sample t-test, t(22) = 2.46, $p < .05$). However, the presence of a concurrent task produced no such effects; an equal proportion of participants ranked each musical piece as preferable (first = 45%, second = 55%; $\chi^2 = .18$, $p = .67$) and rated them equivalently ($M_{first} = 4.86$, $M_{second} = 5.05$; paired sample t-test, t(21) = .42, $p = .68$).

In the absence of a concurrent task, for undesirable music, a greater proportion of participants expressed relative preference for the first piece (rankings: first = 70%, second = 30%; $\chi^2 = 3.52$, $p < .05$; ratings: $M_{first} = 3.39$, $M_{second} = 2.74$; paired sample t-test, t(22) = 2.29, $p < .05$). The presence of a concurrent task attenuated the effects (rankings: first = 59%, second = 41%; $\chi^2 = .73$, $p = .39$; ratings: $M_{first} = 3.95$, $M_{second} = 3.68$; paired sample t-test, t(21) = .77, $p = .45$).

Process results. We examined the number of words participants used to describe each musical piece. Consistent with our theorizing, participants used more words to describe the second musical piece in the absence of a concurrent task ($M_{first} = 2.65$, $M_{second} = 3.02$; t(45) = 2.23, $p < .05$), but they used an equivalent number of words to describe both pieces in the presence of a concurrent task ($M_{first} = 2.23$, $M_{second} = 2.29$; t(43) = .34, $p = .73$). Note also that across conditions, the presence of a concurrent task reduced the number of words participants used to describe the second piece (Ms = 3.02 versus 2.29; t(88) = 2.18, $p < .05$).

Discussion

This study again shows that the underlying process reflects a recency effect, such that consumers better recall the item sampled last. As a result, in the absence of concurrent tasks, consumers express greater preference for the second (first) sampled product when the products are desirable (undesirable). However, by reducing their ability to recall the last item through a concurrent task, we reduced the recency effect of product recall and allowed for similar degrees of recall of each product. In Study 2, we extend these findings by examining how the serial position effects of sampling experiential products differ from those of nonexperiential products.

STUDY 2: SERIAL POSITION EFFECTS OF EXPERIENTIAL VERSUS NONEXPERIENTIAL PRODUCTS

Study 2 has three objectives: (1) to examine how serial position effects might differ for experiential versus nonexperiential products, (2) to provide further support that memory recall is the underlying mechanism for the results, and (3) to rule out an alternative explanation for the effects observed for experiential products in Studies 1a and 1b.

Experiential Versus Nonexperiential Products

Evaluations of experiential products depend more on sensory reactions to the product experience, whereas evaluations of nonexperiential products rely more on informational components; for example, for nonexperiential products, such as scissors, evaluations will be based on informational components, such as color, material, blade shape, and sharpness. Prior studies on order effects, conducted only in the context of nonexperiential product scenarios to examine the sequential order effects of a limited number of stimuli (e.g., in two- or three-sequence environments), have reported primacy effects in the absence of any moderators. For example, Biswas, Biswas, and Chatterjee (2009) report that consumers had better recall of product cues (e.g., brand reputation, warranty) encountered earlier in the sequence and expressed more favorable product evaluations when the stronger cue was sequentially first. Other studies (e.g., Anderson 1965; Büyükkurt 1986; Carlson, Meloy, and Russo 2006; Gürhan-Canli 2003; Smith 1993) have found similar primacy effects involving nonexperiential products in other contexts.

Studies in the psychology literature have attempted to explain primacy effects through the roles of working memory and information rehearsal. Specifically, when people internally rehearse a given piece of information, they retain it in their short-term working memory more distinctively than in the absence of any such rehearsal (Oberauer and Lewandowsky 2008). Moreover, when evaluating sequential pieces of information, a consumer's short-term working memory is less crowded during the encounter with the first piece of information, which gives the consumer better opportunity and ability to rehearse the product information that he or she evaluated earlier (Page and Norris 1998). As the consumer encounters additional information later in the sequence, the more crowded short-term working memory offers less scope to rehearse the additional information. Consistent with such theorizing, studies in the domain of sequential nonexperiential products/attributes, with limited number of stimuli, have found that primacy effects occur in the form of better recall of earlier pieces of information (e.g., Biswas, Biswas, and Chatterjee 2009; Büyükkurt 1986; Smith 1993).

In contrast, experiential products offer little scope for information rehearsal because the experiences are mostly sensory in nature. Instead, as we argued previously, and as the results of Studies 1a and 1b support, for experiential products, consumers will have better recall for the products experienced later in the sequence, which will result in greater preference for the desirable product experienced later. Thus, we hypothesize the following:

H_4: (a) When sampling two desirable experiential products, consumers will prefer the second product (recency preference) because of better recall of the product sampled second (recency effect). (b) When sampling two desirable nonexperiential products, consumers will prefer the first product (primacy preference) because of better recall of the product sampled first (primacy effect).

Design, Participants, and Procedure

To test H_4, we used a single-factor (type of products sampled: experiential versus nonexperiential) between-subjects design experiment. We used only desirable products because the key objective was to examine whether the recency effects observed for experiential products might change to primacy effects for nonexperiential products. Participants were 58 students from a northeastern U.S. university (average age was 21 years, and 55% were women).

Music again served as the experiential product, and scissors represented the nonexperiential product. The results of a pretest (N = 25) showed that, on 1–7 scales, participants rated listening to musical pieces higher on sensory experiential aspects than using scissors (M_{music} = 6.17 versus $M_{scissors}$ = 1.99; paired sampled t-test, t(24) = 17.11, p < .01). For the experiential products, we employed the same two desirable music clips from Study 1b, which participants sampled sequentially on a computer. For the nonexperiential product condition, participants sequentially sampled (physically examined and used) two scissors that had similar quality and price levels. The results of a between-subjects pretest (N = 30) showed that in independent evaluations, participants rated these two scissors as equally desirable (Ms = 5.20 versus 5.40; t(28) = .53, p = .60). In Study 2, we counterbalanced the ordering of the two product samples. For both the experiential and nonexperiential products, participants could sample the products (two musical clips or two scissors) for 25 seconds each.

Consistent with Study 1b, we measured product rankings and product ratings, and we employed the same two open-ended questions. The dependent measures for both the experiential and the nonexperiential products were collected through a computer with a software program that also measured participants' response latencies for the two product rating questions. These measures provide further insight into the underlying process and rule out an alternative explanation for the results from Studies 1a and 1b. The computer unobtrusively measured the amount of time participants spent on the Web pages related to the musical pieces.

Results

Main tests. Consistent with H_4, for desirable experiential products, more participants preferred the second piece of music (rankings: first = 31%, second = 69%; χ^2 = 4.17, p < .05) and also rated the second music higher (ratings: M_{first} = 4.21 versus M_{second} = 4.86; paired sample t-test, t(28) = 2.26, p < .05). In contrast, for desirable nonexperiential products, there was greater preference and higher ratings for the scissors evaluated first (rankings: first = 76%, second = 24%; χ^2 = 7.76, p < .01; ratings: M_{first} = 5.24 versus M_{second} = 4.52; paired sample t-test, t(28) = 2.25, p < .05).

Process results. As in Studies 1a and 1b, for experiential products, participants demonstrated a recency effect, recalling a greater number of words when describing the second musical piece than the first (M_{first} = 3.20 versus M_{second} = 5.16; paired sample t-test, t(24) = 5.47, p < .01). In contrast, and as we expected, for nonexperiential products, participants demonstrated a primacy effect, recalling a greater number of words when describing the first pair of scissors than the second (M_{first} = 6.24 versus M_{second} = 4.52; paired sample t-test, t(28) = 3.66, p < .01). Thus, consistent with H_4, preference for the second desirable experiential product sampled seems to be due to a recency effect, and preference for the first nonexperiential product sampled seems to be due to a primacy effect.

We also examined participants' response latencies to provide additional direct evidence that the relative strength of memory recall provides the underlying process for the serial position effects of experiential products. Prior research indicates that strength of memory recall influences response latencies (Murdock and Okada 1970). That is, the stronger the memory for an item, the lower are the latencies related to recalling that item and responding to questions about that item (MacLeod and Nelson 1984; Ratcliff 1978). Therefore, for experiential (nonexperiential) products, our theorizing suggests that consumers should take less time to answer questions related to the product sampled second (first). Consistent with this, for experiential products, participants took less time to answer the product rating question related to the product sampled second (M_{first} = 8.07 seconds versus M_{second} = 4.69 seconds; paired sample t-test, t(28) = 7.12, $p < .01$). In contrast, and as we expected, for nonexperiential products, participants took less time to answer the product rating question related to the product sampled first (M_{first} = 11.00 seconds versus M_{second} = 13.31 seconds; paired sample t-test, t(28) = 2.08, $p < .05$).

Ruling out an alternative explanation for serial position effects of experiential products. To rule out the possibility that recency effects occurred because participants elaborated more on the stimulus that is sequentially last, we measured the amount of time participants spent listening to and reflecting on the music. As prior research (Shiv, Edell-Britton, and Payne 2004) notes, the amount of time consumers spend reflecting on a stimulus correlates with their degree of cognitive elaboration for that stimulus. The results of Study 2 showed that for experiential products, consumers spent an equal amount of time listening to the musical piece and reflecting on it, regardless of whether the product was sequentially first or last (M_{first} = 38.69 seconds versus M_{second} = 37.07 seconds; paired sample t-test, t(28) = 1.01, $p = .31$). This result rules out cognitive elaboration as a potential alternative explanation for the key results obtained in Studies 1a and 1b. We also examined the potential role of cognitive elaboration through self-reported measures (e.g., Shiv, Edell-Britton, and Payne 2004). Participants were asked about the amount of time they spent thinking about each of the two musical pieces, the extent to which they thought about the musical pieces, and the degree of attention they paid to each of the two musical pieces (all questions were anchored by 1 = "very low" and 7 = "very high"). For the experiential products, participants undertook similar levels of elaboration for the first versus the last musical piece (Ms = 3.82 versus 3.92; paired sample t-test, t(28) = .51, $p = .61$). These results again rule out cognitive elaboration as a potential alternative explanation.

Discussion

This study confirms that for experiential products, consumers have better product recall of the item sampled sequentially last (recency effect), resulting in a preference for the second desirable experienced product. In contrast, for nonexperiential products, consistent with the findings of prior studies (e.g., Büyükkurt 1986), consumers have better recall of the product evaluated sequentially first (primacy effect), resulting in their preference for the first sampled product. Next, in Studies 3 and 4, we extend the findings even further by examining mixed choice sets in which consumers sample both desirable and undesirable experiential products.

STUDY 3: MODERATING EFFECT OF POSITIONING OF AN UNDESIRABLE PRODUCT IN A SERIES OF DESIRABLE PRODUCTS

When consumers sample experiential products in the real world, they do not always encounter product sets that are only desirable or only undesirable. Rather, in many cases, they likely find some products they consider desirable and others they consider undesirable. The question we investigate in this study is how the serial order in which an undesirable product gets sampled, along with two desirable products, affects consumer preferences and evaluations.

In a sampling set of two desirable experiential and one undesirable experiential product, three combinations can occur. Combination 1 consists of the first desirable (D1), the second desirable (D2), and the undesirable (U) products, or D1-D2-U. Combination 2 is U-D1-D2, and Combination 3 is D1-U-D2. In Combination 1 (D1-D2-U), after experiencing D1 and D2, consumers should prefer D2 (as observed in Studies 1a, 1b, and 2). Consumers then sample the third option, U, but because it is undesirable, that option should be eliminated from the choice set. Thus, the preference pattern should follow the findings in the previous studies, resulting in a preference for the second desirable product and reflecting a recency preference.

Combination 2 involves U-D1-D2. Because the consumer samples U first, the undesirable product forms the context for evaluating D1. When participants process sequential experiential stimuli of varying characteristics, their evaluation of a particular stimulus should be influenced by the stimulus immediately preceding it (Novemsky and Ratner 2003; Stewart, Brown, and Chater 2005). Specifically, there can be two possible outcomes from evaluating a sequence of stimuli with varying characteristics: contrast effects versus assimilation effects. Contrast effects predict that when an undesirable product precedes a desirable product, the evaluation of the desirable product will be enhanced (Novemsky and Ratner 2003), whereas assimilation effects imply that when an undesirable product precedes a desirable product, the evaluation of the desirable product will be diminished (Stewart, Brown, and Chater 2005).

Prior literature also notes that contrast effects might occur when the sequential stimuli unfold over more time (e.g., more than a day; Brown et al. 2008; Novemsky and Ratner 2003; Tversky and Griffin 1991), whereas assimilation effects are more likely to occur when the sequential stimuli immediately follow each other (Petrov and Anderson 2005; Stewart, Brown, and Chater 2005). In our studies, sampling of the experiential products immediately follow each other, so we posit that assimilation effects are more likely to occur, such that "participants are systematically biased to respond as if the current stimulus is nearer to the previous stimulus than it actually is" (Stewart, Brown, and Chater 2005, pp. 883–84). When trying to evaluate sequential experiential stimuli, people must adjust between stimuli that vary in characteristics (e.g., loudness or taste) (Petrov and Anderson 2005). Thus, the evaluation of a particular experiential stimulus tends to assimilate with the immediately preceding stimulus (Petrov and Anderson 2005; Stewart, Brown, and Chater 2005).

In Combination 2, for the sequence U-D1-D2, the desirability of D1 should be lower because of its assimilation with U. Then, after consumers sample D2, they should have better recall of and preference for D2 (as in our previous studies). In addition, the preference for D2 over D1 should be even greater than it would have been if the consumer had not sampled U before D1. That is, we expect the desirability of D1 to decline because of the initial exposure to and assimilation with the undesirable experience of U. Thus, preference for D2 should be exaggerated because of reduced desirability of D1, resulting in an enhanced recency preference.

Finally, in Combination 3, D1-U-D2, the experience of the undesirable product sets the context for the experience of D2, which should cause the assimilation of D2 with the undesirable product (e.g., Petrov and Anderson 2005; Stewart, Brown, and Chater 2005) and thus reduce the desirability for D2. That is, in this combination, as a result of assimilation effects, consumers should remember D2 relatively less favorably and therefore should prefer the item evaluated most positively, D1, resulting in a primacy preference. Formally,

H_{5a}: In a mixed choice set of two desirable and one undesirable experiential products, when consumers experience the undesirable product last (D1-D2-U), they will prefer the second desirable product (recency preference).

H_{5b}: In a mixed choice set of two desirable and one undesirable experiential products, when consumers experience the undesirable product first (U-D1-D2), they will prefer the second desirable product even more (enhanced recency preference).

H_{5c}: In a mixed choice set of two desirable and one undesirable experiential products, when consumers experience the undesirable product second (D1-U-D2), they will prefer the first desirable product (primacy preference).

STUDY 3: METHOD

Design, Participants, and Procedure

We tested four between-subjects conditions: the three combinations of D1-D2-U, U-D1-D2, and D1-U-D2, as well as a control group D1-D2. We counterbalanced the order of the desirable products, so D1 and D2 indicate only the serial positions of the experiential products and not the actual products. As in Study 1b and Study 2, we used music as the experiential product. Seventy-eight executive MBA students from a northeastern U.S. university participated in exchange for course credit. Their average age was 31 years, and 32% were women. As in Study 1b, participants listened to sequential, 25-second music clips, timed and played on a computer. We employed the same two desirable music clips and one of the undesirable clips. We also used the same dependent measures of product ranking and rating.

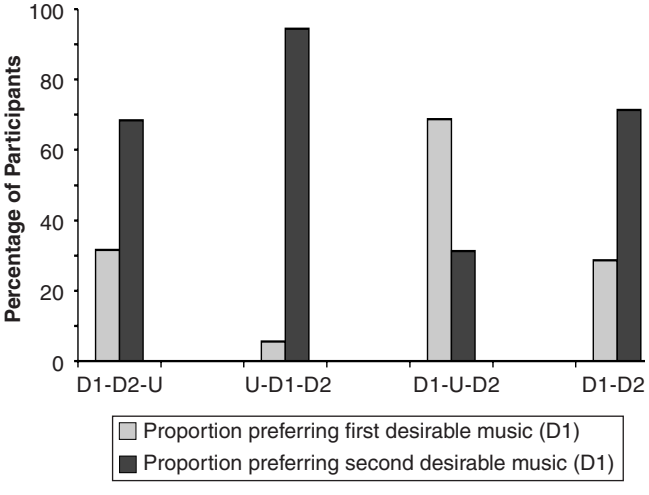
Results

In the control group (i.e., D1-D2), consistent with H_1, we found a recency preference, such that a greater proportion of participants ranked the second piece of desirable music as better than the first (first = 29%, second = 71%; $\chi^2 = 3.86$, $p < .05$) (see Figure 2). Similarly, the ratings of the second piece of music were higher ($M_{first} = 4.57$, $M_{second} = 5.29$; $t(20) = 2.66$, $p < .05$).

As H_{5a} predicted, in Combination 1 (D1-D2-U), we found a recency preference. A higher proportion of participants ranked the second desirable piece as better than the first (first = 32%, second = 68%; $\chi^2 = 2.58$, $p < .05$) and rated it more highly ($M_{first} = 4.70$, $M_{second} = 5.45$; $t(19) = 2.88$, $p < .01$). In Combination 2, in which the undesirable product immediately preceded the first desirable product (U-D1-D2), we found an enhanced recency preference. The second piece of desirable music was ranked higher than the first (first = 6%, second = 94%; $\chi^2 = 14.22$, $p < .001$), and the product rating judgments were in a similar direction ($M_{first} = 3.89$, $M_{second} = 5.53$; $t(18) = 4.75$, $p < .001$). That is, as H_{5b} predicted, we found an enhanced recency preference in Combination 2, such that 94% of participants preferred the second desirable option compared with 71% in the control condition ($\chi^2 = 3.75$, $p < .05$) and 68% in Combination 1 ($\chi^2 = 5.36$, $p < .05$).

Finally, consistent with H_{5c}, when the undesirable music immediately preceded the second desirable music option (D1-U-D2), a primacy preference emerged, such that a greater proportion of participants ranked the first piece as better than the second (first = 69%, second = 31%; $\chi^2 = 2.25$, $p < .07$) and also rated it as better ($M_{first} = 5.05$, $M_{second} = 4.39$; $t(17) = 2.13$, $p < .05$). Across all studies, because D1-U-D2 is the only condition in which primacy preference is observed for an experiential desirable product, we examined the underlying process to ensure it is consistent with that for the other studies. That is, as in our prior studies, we examined the total number of words participants used to recall D1 and D2. A trained researcher, who was blind to the manipulation conditions, coded the positive and negative words, in addition to counting the total number of words. Words such as "fun," "upbeat," "vibrant," and "melodic" were coded as positive. Words such as "boring," "bland," "nondescript," and "dull" were coded as negative. For the D1-U-D2 condition, consistent with the pattern of results we obtained in Studies 1a, 1b, and 2, participants had better recall of D2 than D1 (in terms of total number of words), but the recall (in terms of word valence) of D2 was relatively less favorable because of the assimilation with U. Specifically, although participants used a greater number of total words to describe D2 than D1 ($M_{D1\ total\ words} = 2.78$

Figure 2
STUDY 3: PROPORTION OF PARTICIPANTS PREFERRING FIRST VERSUS SECOND DESIRABLE MUSIC



versus $M_{D2\ total\ words}$ = 4.39; paired sample t-test, t(17) = 3.90, $p < .01$), they used fewer positive words to describe D2 than D1 ($M_{D1\ positive\ words}$ = 2.33 versus $M_{D2\ positive\ words}$ = 1.28; paired sample t-test, t(17) = 2.33, $p < .05$) and used relatively more negative words to describe D2 than D1 ($M_{D1\ negative\ words}$ = .11 versus $M_{D2\ negative\ words}$ = .72; paired sample t-test, t(17) = 2.27, $p < .05$).

Discussion

This study demonstrates the impact of sampling an undesirable experiential product along with two desirable experiential products. The serial position of an undesirable product actually changes consumer preference for the desirable products. Consistent with H_5, when consumers experience the undesirable product last (D1-D2-U), the second desirable product is preferable. When consumers experience the undesirable product first (U-D1-D2), their preference for the second desirable product is enhanced. Finally, when consumers experience the undesirable product second (D1-U-D2), they prefer the first desirable product. In Study 4, we examine whether a short time delay reverses the effects observed for D1-U-D2.

STUDY 4: EFFECTS OF A TIME DELAY IN THE CONSUMPTION EXPERIENCE

The results of Study 3 demonstrate that when the undesirable experiential product precedes the second desirable experiential product (D1-U-D2), there is greater preference for the first desirable product, implying a possible boundary condition. Thus, in Study 4, we attempt to examine whether this might change to a greater preference for the second desirable product when there is a short time delay between or after the product sampling. In an evaluative experiential choice set in which the undesirable product appears between the desirable products, a time delay could occur in three patterns: Pattern 1: D1-delay-U-D2-evaluation; Pattern 2: D1-U-delay-D2-evaluation; and Pattern 3: D1-U-D2-delay-evaluation. Recall of the affective reaction to a sampled item preceding a time delay should decline because short-term working memory decays over time (Estes 1997). Thus, for Pattern 1 (D1-delay-U-D2-evaluation), participants should focus on U and D2 and not recall D1 in as much detail. Despite the expected assimilation between U and D2, in the set recalled in detail at the time of the evaluation (U-D2), D2 is preferable. For Pattern 2 (D1-U-delay-D2), D2 is the only choice recalled in detail and thus is the preferred choice. Prior research indicates that lags or time delays reduce the assimilation effects of preceding stimuli (e.g., Brown et al. 2008). Thus, for Pattern 3 (D1-U-D2-delay), because evaluations are taking place after a delay, we expect the assimilation effect between U-D2 to be reduced. If D1 is not recalled in as much detail as D2 and the preference for D2 is not reduced by its assimilation with U, we expect D2 to be the preferred choice. Thus, in the presence of a time delay during the sampling/evaluation experience (Patterns 1–3), there will be a recency preference; without such a time delay (i.e., D1-U-D2), we expect that the results will replicate the primacy preference observed in Study 3.

H_6: In a mixed choice set of two desirable experiential and one undesirable experiential products, when consumers sample the undesirable product second (D1-U-D2), (a) in the absence of a time delay, they will have greater preference for the first desirable product, and (b) in the presence of a time delay between or after product sampling, they will have greater preference for the second desirable product.

Design, Participants, and Procedure

We tested four between-subjects conditions: (1) D1-delay-U-D2-evaluation, (2) D1-U-delay-D2-evaluation, (3) D1-U-D2-delay-evaluation, and (4) a control group D1-U-D2-evaluation. The product, procedure, and measures were identical to those in Study 3. We manipulated time delay by giving participants an unrelated filler task (e.g., Shapiro and Spence 2002). Participants were 87 university students (average age was 21 years, and 36% were women).

Results

In the absence of any time delay (i.e., D1-U-D2), consistent with the results we obtained in Study 3, a greater proportion of participants ranked the first desirable music as better than the second desirable music (first = 70%, second = 30%; $\chi^2 = 3.20$, $p < .05$) and also rated the first desirable music higher (M_{first} = 5.30, M_{second} = 4.60; t(19) = 1.97, $p < .05$ [one-tailed]).

However, when there was a time delay, the effects were reversed. That is, with a time delay after the first piece of music (D1-delay-U-D2), a greater proportion of participants ranked the second piece of desirable music as better than the first piece (first = 26%, second = 74%; $\chi^2 = 4.26$, $p < .05$) and rated it higher (M_{first} = 3.84, M_{second} = 4.74; t(18) = 2.30, $p < .05$). A similar pattern of results emerged when the time delay immediately preceded the second desirable music (D1-U-delay-D2), such that a greater proportion of participants ranked the second desirable music better than the first desirable music (first = 27%, second = 73%; $\chi^2 = 5.54$, $p < .05$) and rated it higher (M_{first} = 4.69, M_{second} = 5.42; t(25) = 2.42, $p < .05$). Finally, when the time delay followed all music pieces (D1-U-D2-delay), again, a greater proportion of participants ranked the second desirable music better than the first (first = 29%, second = 71%; $\chi^2 = 3.86$, $p < .05$) and rated it more highly (M_{first} = 4.19, M_{second} = 5.14; t(20) = 2.12, $p < .05$). These results support H_6.

Discussion

The results of Study 3 show that when the undesirable product immediately precedes the second desirable product (D1-U-D2), there is greater preference for the first desirable product. The results of Study 4 show that when there is a time delay anytime during the experience, the outcome reverses to greater preference for the second desirable product.

GENERAL DISCUSSION

Summary and Conclusions

We conducted five experiments to investigate the impact of the sequential sampling of experiential products on preference for those products and the related serial position order effects. Despite extant research on the impact of sequential order effects, prior studies have focused on scenarios involving nonexperiential product situations and/or attributes (e.g., Büyükkurt 1986; Carlson, Meloy, and Russo 2006). This research is the first to examine how sampling

multiple experiential products (judged independently as equally appealing) influences preference for these products. We demonstrate that the serial position of a sampled experiential product in a sequence matters in terms of subsequent consumer preferences and ratings.

The results of prior studies in the domain of nonexperiential product scenarios, with a limited number of sequential stimuli, indicate that consumers are more strongly influenced by the information pieces evaluated earlier in the sequence (primacy effect) (e.g., Carlson, Meloy, and Russo 2006). In a related vein, for scenarios involving nonexperiential, information-rich contexts with a limited number of sequential stimuli, prior studies have found that people have better recall of the information encountered sequentially first (e.g., Biswas, Biswas, and Chatterjee 2009; Büyükkurt 1986). In contrast, we find that for experiential products, consumers exhibit better recall for items sampled later in the sequence (recency effect). As a result, when sampling two equally desirable experiential products (e.g., beverages in Study 1a), consumers prefer the product experienced second. When sampling two equally undesirable experiential products, they prefer the first product. We also find support for the moderating effects of memory enhancement; that is, memory enhancement reduces the serial position effects for both desirable and undesirable products. We expect that conditions that engender greater involvement with the products, such as high prices or gifts for special occasions, may create situations similar to our enhanced memory condition and reduce serial position effects of sampling. In Study 1b, we used similar procedures but changed the experiential product to music rather than beverages. The results remain consistent; in the absence of any moderators, when sampling two desirable (undesirable) music clips, consumers prefer the serially second (first) music clip. We also find support for the moderating effects of inhibiting memory through a concurrent task; that is, serial position effects can be reduced by the presence of a concurrent task, which inhibits memory for the experienced products. Other conditions that could inhibit memory might include overly crowded retail outlets and too many product features.

Study 2 replicates the results of Studies 1a and 1b and shows that for desirable experiential products, consumers have better recall of and preference for the product experienced last. In contrast, and consistent with prior literature (e.g., Biswas, Biswas, and Chatterjee 2009), Study 2 shows that for desirable nonexperiential products (e.g., scissors), consumers have better recall of and preference for the product evaluated first. Process measures from Study 2 provide further empirical evidence that the underlying process for the serial position effects of experiential products is due to differential memory recall of sampled products.

Studies 3 and 4 explore the impact of mixed choice sets with two desirable and one undesirable experiential products. The order in which consumers sample the mixed product set still affects their preferences. When they sample the undesirable product last, they prefer the second desirable product. When the undesirable product appears first, consumers have an even stronger preference for the second desirable product. However, when the undesirable product precedes the second desirable product, assimilation effects lead consumers to prefer the first desirable product. However, Study 4 confirms that this preference for the first desirable product holds only if there is no time delay between the sampling of the goods or between the sampling and the evaluations. If a time delay occurs, consumers prefer the second desirable product.

The results of these five experiments all highlight that the order in which consumers sample experiential products is critical and can have strong ramifications for companies in various industries. For example, the results can be extrapolated to suggest that in the domain of food outlets in malls, vendors should consider their adjacent tenants in food courts. If a Japanese food restaurant offers a taste sample, and the next tenant is a Chinese food restaurant that also offers samples, recency effects for experiential products favor the Chinese food vendor (assuming both are equally desirable to the consumer, in independent evaluations). On a related note, a food outlet might be prudent in not being adjacent to a vendor giving out food samples that is deemed to be undesirable to this food outlet's target customer group (e.g., a vendor giving out nonspicy food samples next to a vendor giving out hot-and-spicy food samples). Similarly, placement in vendor shows, where customers likely sample products, may be critical. Marketers in these settings should consider direction of traffic flow and the location of other experiential products. The ramifications and implications for such settings should be explored using field studies. The findings of this research can also be extended to the domain of sequential ordering of experiential products for personal music systems (e.g., iPods) or on Web sites (e.g., Amazon.com); that is, the most desirable product should be placed last. However, our experiments establish a fixed sampling set (e.g., two beverages, three music clips), whereas in the real world, the number of products sampled might vary across consumers. Thus, further research should examine when consumers might stop sampling a series of experiential products.

Limitations and Future Research Directions

The results of the experiments show that when sampling sequential experiential products, there is a recency effect, such that consumers exhibit greater recall of the product they sampled most recently. However, this may not be the only process, and there might be other potential mechanisms that can also explain the results we observed in the studies; further research should examine this in greater detail. In addition, participants may evaluate desirable and undesirable options using different frames. It can be speculated that people might evaluate desirable options using a selection frame (i.e., choose the best) but employ an elimination frame (i.e., eliminate the worst) for undesirable options. Thus, additional research might focus on whether mental frames (e.g., promotion versus prevention) moderate the effects observed herein. Further research should also consider the potential sequential order effects of listening to political arguments versus reading the arguments in printed form. This study implies that when listening (reading) to a candidate's arguments, consumers might have better recall of the arguments of the candidate evaluated last (first). Across the studies, the experiential products that participants evaluated are of similar types, such as flavored water products or music genre. What are the serial position effects of experiential products that are equally desirable to a consumer but are dissimilar in type, such as milk versus a diet

cola for a consumer who finds the two dissimilar products equally desirable in terms of taste? This can extend the findings from recent studies that show that people have different degrees of memory recall for lists of items that are similar versus dissimilar (Brown, Chater, and Neath 2008). Finally, further research might explore the effects of sampling choice sets that include more than three options.

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