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A Dragging-Down Effect:

Consumer Decisions in Response to Price Increases

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Contribution Statement (150 words)

Previous research has found that consumers anchor purchase decisions on maximum discounted quantities for price discounts, leading them to purchase more units as the maximum discounted quantity increases. The current work identifies cases in which consumers purchase fewer units of a product when more units are discounted, leading consumers to buy less when the average per-unit price is lower. This pattern persists across a variety of products in both lab and field settings. This paper provides both theoretical and practical insights for consumer behavior. Theoretically, this paper advances our understanding of how consumers react to non-linear pricing and numeric cues in price promotions. Consumers respond to external numeric cues (e.g., anchors, reference points) only if those values are perceived to be acceptable as purchase quantities. Practically, this paper provides insights into the effectiveness of pricing and promotion strategies, and it proposes a new method for nudging consumers to reduce undesirable consumption.

Abstract

Four studies, across a range of domains, find a *dragging-down effect* in which consumers purchase fewer units of a product when a discount applies to more units. For example, consumers buy fewer peaches when each customer can buy up to three peaches at a discount than when each customer can buy only one peach at a discount or when there is no discount at all. In contrast to basic economic principles, this dragging-down effect implies that consumers purchase less (more) when the per-unit price is lower (higher). We propose—and our results support—an acceptability account: consumers will adopt the price-increase point (i.e., maximum discounted quantity) as their purchase quantity if that point falls within an acceptable range, and will ignore that point and purchase their initially preferred quantity instead if the price-increase point falls below the acceptable range. The current work enriches existing research on anchoring and pricing, and carries implications for consumers, marketers, and policy-makers.

Keywords: price perception, discounts, reference prices, anchors, behavioral pricing

Promotions and discounts are key tools that marketers use to vary pricing, typically as a strategy to incentivize consumers to purchase more. Discounts commonly come with quantity limits, particularly in the case of large discounts. For example, the coupons offered by Costco typically have quantity limits (e.g., "limit 4 each" for a particular discount); coupons from other stores also come with fine-print limitations, such as "limit 1 per customer" or "limit of 4 like coupons in same shopping trip" (The Krazy Coupon Lady 2011). In these cases, consumers can buy up to the specified number of units at the discounted price and can buy additional units at the regular price. We consider quantity-limited discounts broadly in contexts in which consumers receive a discount that applies to a limited number of units.

This research focuses on cases where there is a *price-increase point*, described by the point at which the discounted price no longer applies in the above examples. It investigates how the quantity available at a lower price (i.e., before the price-increase point) influences purchase decisions. In most of the studies we report, the price-increase refers to an increase from a discounted level to a regular level and the price-increase point is equivalent to the *maximum discounted quantity*. Presumably, firms expect that consumers will purchase more when price-increase points are higher and corresponding average per-unit prices are lower. However, we identify cases in which this type of promotion instead leads consumers to purchase fewer units when price-increase points are higher. In these cases, a change intended to increase purchase quantity can have the opposite effect. We show this pattern in online, lab, and field studies across a range of consumer domains. We propose that people may adopt the price-increase points (i.e., maximum discounted quantities) as their purchase quantity, but only when that point is considered acceptable (i.e., within an acceptable range of their initial preference).

Numeric Cues Influence Consumption Quantities

In addition to economic factors (e.g., product costs and benefits), research in consumer behavior has explored psychological factors that influence consumers' purchase decisions in response to discounts (Cheng and Cryder 2018; Inman, Peter, and Raghubir 1997; Janiszewski and Cunha 2004; Lu and Hsee, 2019; Shampanier, Mazar, and Ariely 2007; Sussman and Olivola 2011). For example, perceptions of price depend on contextual factors, such as the framing of price and cost and the reference price for a particular transaction (Rajendran and Tellis 1994). In some cases, product features or unattractive items added to an otherwise attractive set can reduce the probability that a consumer will purchase the product or set (Hsee 1998; Simonson, Carmon, and O'Curry 1994).

Numeric cues conveyed through price promotions are one influential factor in purchase-quantity decisions (Manning and Sprott 2007; Wansink, Kent, and Hoch 1998). These numeric cues include the quantity in multiple-unit prices (e.g., "5 for $5") and suggestive selling (e.g., "buy 18 for your freezer") in addition to purchase-quantity limits. Prior research has examined situations in which these cues act as anchors (e.g., Hsee, Dube, and Zhang 2008; Mussweiler and Strack 1999; Tversky and Kahneman 1974) or target values (e.g., Heath, Larrick, and Wu 1999; Pope and Simonsohn 2011; Sackett et al. 2014). For example, Wansink, Kent, and Hoch (1998) found that promotions can increase purchase quantities by acting as anchors (e.g., "6 cans for $3" vs. "1 can for 50¢").[1] Consumers who were presented with high anchors in the form of higher purchase-quantity limits (e.g., "limit of 12 per person" vs. "limit of 4 per person") purchased more units of the target product. Typically, literature on anchoring has demonstrated that consumers move their *a priori* judgment or decision toward (but not all the way to) the anchor

[1] Manning and Sprott (2007) found that this pattern was specific to high-consumption products.

value.

Numeric cues can also serve as decision points for consumers (e.g., Cheema and Soman 2008; Soman and Cheema 2011; Tsiros and Hardesty 2010; Wansink, Kent, and Hoch 1998; Zhang, Sussman, and Hsee 2018) by attracting attention and prompting consumers to consider whether or not to purchase additional units. Cheema and Soman (2008) found that separating an aggregated quantity of food or money into smaller, partitioned units could reduce the quantity consumed. They reasoned that the partition introduced a small transaction cost that provided participants with a "decision point" at which they paused to consider whether to continue consuming or to stop. Beyond partitions, other numeric cues may serve as decision points. For example, Zhang, Sussman, and Hsee (2020) found that debtholders in their study took the timing of a future interest-rate increase as a decision point for debt repayment. If people realized that they could repay their credit card debt in full before the interest rate increased, then they were more likely to increase their monthly payments to avoid the higher interest rate. In sum, when swayed by decision points, consumers will typically move consumption quantities from the *a priori* value to the exact decision point.

CURRENT RESEARCH

We examine how price-increase points such as maximum discounted quantities, influence consumers' decisions about how much to purchase. Prior research has identified a wide range of cases in which consumer decisions shift toward an anchor (Manning and Sprott 2007; Wansink, Kent, and Hoch 1998). However, there are also exceptions to this effect. Specifically, existing evidence about the effect of implausible or extreme anchors is mixed. From the perspectives of

the anchoring and adjustment account and the selective accessibility account, no matter the extremity or implausibility of a numerical anchor, it can influence one's judgment of an uncertain value (e.g., Epley and Gilovich 2006; Jacowitz and Kahneman 1995; Mussweiler and Strack 1999; Strack, Bahnik, and Mussweiler 2016; Strack and Mussweiler 1997). On the other hand, other evidence suggests that implausible anchors exert less of an effect than plausible ones (e.g., Chapman and Johnson 1994; Wegener et al. 2001, 2010). Zhang, Hsee, and Yu (2018) found that participants' evaluations of fair compensation were influenced by a reasonable anchor but not by an unreasonable anchor. Similar patterns emerge in the context of extreme numeric goals as well (Zhang, Sussman, and Hsee, 2018).

Drawing from the literature showing moderation of consumer reactions to numeric cues such as anchors and goals, we propose that reactions to price promotions will also vary as a function of the specific value presented. As a consequence, while consumers will generally purchase more units of an item when more units are sold at a discount, there will be limits to this effect. Specifically, we predict that consumers may purchase fewer units of an item when more units are sold at a discount.

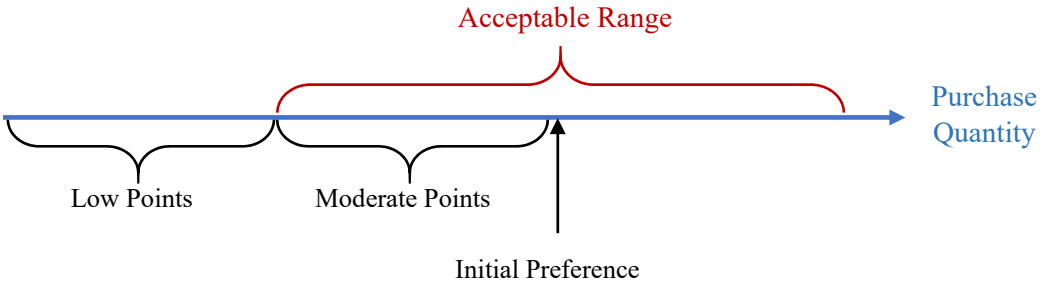
Purchasing Preferences

For many products, consumers have an idea of how much they want to consume before they ever receive specific pricing information. In a field study by Inman, Winer, and Ferraro (2009), for example, about half of all in-store purchases were planned. Similarly, in a pilot survey ($N = 104$; Mechanical Turk), we found that 79% of participants make a grocery shopping list and, for products they frequently purchase, 82% of grocery shoppers have an idea of how many of each product they would like to purchase. In our research, we define a consumer's

initial preference as their *a priori* idea of how much they intend to purchase in the absence of situation-specific information (e.g., knowledge of price promotions).

However, although consumers have an initial preference for how much to purchase, they may not buy exactly that amount. For example, the zone of tolerance in service management literature describes a range of acceptable or expected outcomes in a service experience (Johnston 1995; Strandvik 1994; Zeithaml, Berry, and Parasuraman 1993). Similarly, the latitude of price acceptance in consumer behavior describes a region of insensitivity around a reference price such that only price differences outside of that range are perceptible (Kalyanaram and Little 1994). In a similar vein, we propose that consumers are flexible about exactly how much to purchase as long as it is within a certain *acceptable range* surrounding their initial preference. We consider quantities below a consumer's acceptable range as *low points* and those within their acceptable range but below the initial preference as *moderate points.* See Figure 1 below.

Figure 1. Moderate points fall below the initial preference but are within the acceptable range, while low points fall below the acceptable range.



As an illustration of an acceptable range, suppose that Dave typically purchases six muffins at the grocery store each week, and is OK with buying anywhere between four and eight. Six is Dave's initial preference and the range between four and eight is his acceptable range. In

this case, five would be a moderate point (i.e., somewhat low but still acceptable), and two a low point (not acceptable).

The acceptable range of a consumer's purchase quantity depends on a variety of contextual factors including product type, the consumer's familiarity with the product, the frequency of product use, and transaction costs (e.g., the difficulty of purchasing the product). For example, consumers may have a wider range of preferences for quantities of durable goods (vs. perishable goods) or for products with low (vs. high) storage costs. Similarly, uncertainty about usage frequency or unfamiliarity with a product may lead to a wider preference range because consumers may not have strong reasons to restrict this range.

We predict that perceptions of a purchase quantity's acceptability underlie the effect of a price-increase point on the purchase quantity. Given the flexibility of purchase quantities within an acceptable range, we propose that numeric cues in the purchasing context will influence purchase quantity decisions within this range. Specifically, consumers will move away from their initial preference and instead use the price-increase point as a decision point. For example, in the case of Dave above, if the grocery store allows him to buy six muffins at a discount, he will buy six, and if the store allows him to buy only five muffins at a discount, he may buy just five. This movement within the acceptable range is consistent with most anchor-based accounts of promotions.

However, we propose that numeric cues outside of this acceptable range will be less likely to exert a significant influence. Consumers encountering these cues will instead be more likely to stick with their initial preference. While this pattern would be consistent with a subset of findings on extreme anchors examined in prior literature, our examination is distinct. Specifically, extreme anchors in prior research have typically been far from the non-extreme

values (e.g., $48 vs. $13,660 per year for annual salary; 68 vs. 158,020 years old for age in Wegener et al. 2001); by contrast, the focal values we examine (i.e., price-increase points) are similar in absolute value and are not likely to be considered numerically extreme (e.g., limit one vs. limit three in Experiment 1; limit two vs. limit six in Experiment 2). We propose that while the numeric difference between focal values in the current work is small, the psychological distance is large because certain values seem reasonable and others seem unreasonable as purchase quantities. Numeric cues that seem unreasonable in relation to consumers' preferences are less likely to affect decisions, even if the values are not extreme.

A Dragging-down Effect

We propose that consumers will buy fewer units of an item if the price of the item increases at a *moderate* point than if it increases at a *low point*. For example, we predict that Dave will buy *fewer* muffins if he could buy five muffins at a discount than if he could buy only three at a discount. We expect this pattern to hold even though this pattern differs from the traditional anchoring effect and seems counter-normative. Namely, the pattern implies that consumers will purchase *fewer* units when the per-unit price is *lower*. We label this phenomenon (described in H1) as the "dragging-down" effect because the pricing strategy of quantity-limited discounts can drag down purchase quantities. As explained above, we expect this pattern to emerge because consumers are trading off between their initial preference and the price-increase point as their purchase quantity. Consumers are more likely to take the price-increase point as their purchase quantity when it is within their acceptable range than when it is not. In other words, when consumers are provided with a *moderate* price-increase point (i.e., within their acceptable range and below their initial preference), they will take this moderate quantity as their

purchase quantity. When consumers are provided with a *low* price-increase point (i.e., below their acceptable range), they will reject this low quantity and purchase a quantity near their initial preference. Because their initial preference quantity is greater than the *moderate* point, they will purchase more with the *low* point than with the *moderate* point. In the Dave scenario, for example, if the store allows him to buy five muffins at a discount, he may just buy five, because even though five is lower than his initial preference of six, it is still within his acceptable range. However, if the store allows him to buy only two muffins at a discount, he may ignore the discounted quantity and instead buy his initially preferred quantity of six. Specifically:

> **H1:** Consumers will purchase fewer units of a product if the price-increase point is moderate (i.e., below their initial preference but still within their acceptable range) than if it is low (i.e., below their acceptable range).

> **H2:** Consumers are more likely to take the price-increase point (vs. their initially preferred quantity) as their purchase quantity if the price-increase point is within their *acceptable range* than if it is below that range.

Consequently, we expect a dragging-down effect when some consumers are provided with a *moderate* price-increase point and some with a *low* price-increase point. However, when comparing two *moderate* price-increase points, we would not expect the dragging-down effect, and we may even observe the traditional anchoring effect.

According to our theory, whether the price-increase point is perceived as within the acceptable range is a critical factor underlying the dragging-down effect. Consumers' belief

about acceptable purchase quantities drives the influence of the price-increase point relative to other relevant values (e.g., initial preferences) on purchase decisions. Specifically, we predict:

> **H3**: The perception that the price-increase point is an acceptable purchase quantity mediates the dragging-down effect.

Two clarifications. First, in reality, the boundaries of an acceptable range may be fuzzy, but for the purpose of experimental precision, we assume that the boundaries are clear. Second, this research focuses on the lower boundary of the acceptable range because this is where we expect to see the predicted dragging-down effect. Although we anticipate that a similar process would operate at the upper end of the acceptable range, we do not necessarily expect this process to lead to a dragging-down effect given additional considerations. For example, people may not be as confident about their upper (vs. lower) threshold, or a more traditional anchoring account may overshadow the dragging-down effect. An examination of a broader range of price-increase points is included in the online appendix (see Experiment A2).

We examine price increases across a range of consumer purchase domains and product types. For example, studies include products that are perishable (Experiments 1, and 4) and durable (Experiments 2 and 3), material (Experiments 1, 2, and 4) and experiential (Experiment 3), hedonic (Experiments 1, 2, and 3) and utilitarian (Experiment 4), and high cost (Experiments 2 and 3) and low cost (Experiments 1 and 4). This paper focuses on quantity limits for large (vs. small) discounts because such discounts are typically large in magnitude when implemented in practice. Marketers tend to use large discounts to incentivize customers to visit their stores or to acquire new customers. To control costs, marketers attach quantity limits to these discounts.

Experiment 1 provides initial evidence of the dragging-down effect (H1) in a field setting, examining grocery shoppers. Next, Experiment 2 tests the acceptable range as a moderator of the observed patterns by manipulating this range, finding that the dragging-down effect emerges only when the lower price-increase point is below (vs. within) the acceptable range (H2). Experiment 3 explores possible underlying mechanisms through mediation, providing additional evidence that the acceptability of the price-increase point as a purchase quantity underlies the dragging-down effect (H3). Experiment 4 explores implications for encouraging healthier eating decisions. See Table 1 for a summary of studies. All data and materials can be accessed online through the Open Science Framework at: https://bit.ly/draggingdown.

Table 1. Summary of Studies.

No.	Study Stimuli	Design	Purpose
1	Peaches	3 Price-increase points (zero, one, or three)	Test basic effect (H1) in the field
2	Wines	2 Price-increase points (two vs. six) x 2 Acceptable range (narrow vs. wide)	Test moderation effect of acceptable range (H2)
3	Museum Visits	3 Price-increase points (zero, one, or three)	Test underlying mechanisms and mediation through acceptability (H3)
4	Calories	2 Price-increase points (within vs. out of range)	Explore marketing implications

EXPERIMENT 1: A FIELD EXAMINATION OF THE DRAGGING-DOWN EFFECT

Experiment 1 examined whether there are situations in which consumers purchase fewer

units of an item when more (vs. fewer) units were offered for free (H1). Importantly, the experiment examines findings in a field setting, allowing us to test not only whether patterns are present, but whether they are strong enough to operate outside of a controlled laboratory context and affect consumers spending regular income in their everyday lives.

Method

Participants. We partnered with two fruit shops on the east coast of China (in Hangzhou and Shanghai) to vary peach prices for one week in August 2017. We observed 212 peach buyers (148 females; M_{age} = 31.42) out of 1,299 total customers walking by the peach stand during this period. Customers generally lived nearby and visited the shop once or twice per week.

Design and Procedure. Prior to the experiment, we talked to shop staff about fruit sales patterns, and we directly observed purchasing behaviors. Peaches were a popular summer fruit and customers typically bought four to five at a time. Therefore, we assumed that four to five was the initial preference. Consequently, we set three peaches as the *moderate point* (below the initial preference, but within the acceptable range) and one peach as the *low point* (below the acceptable range).

This experiment adopted a 3 (price-increase point: zero-discounted control, one-discounted, or three-discounted) between-subjects design. We rotated the three conditions every one and a half hours from 5:30pm to 10:00pm, and we also rotated the first condition each day. The experiment was run over six days across two different store locations. In the two discount conditions, customers received a 3 RMB (equivalent to $0.45) discount on each peach, limited to either one or three per customer, depending on condition. The discount was displayed beside the price for peaches so every customer walking by could see the promotion (an image is included in

the online appendix). The regular price for peaches was 13.8 RMB per 500g. Roughly speaking, each peach cost around 8 RMB (equivalent to $1.20). In addition to the posted sign, a research assistant told customers in the discount conditions who approached the stand about the sale. After communicating the discount, the research assistant then left customers to make independent decisions (i.e., without watching them directly).

The main dependent variable was the number of peaches purchased. When buying peaches, customers usually pick one at a time. Thus, research assistants were able to record purchase data without being noticed. Research assistants also recorded the total number of customers who walked by the peach stand, whether each customer purchased other fruits at the same time,[2] and basic demographic information such as gender and estimated age.

Results and Discussion

We found no effects of location, so we combined the data for all analyses (see Table 2). A one-way ANOVA revealed a significant effect of condition ($F(2,209) = 17.04$, $p < .001$, $\eta^2 = 0.14$). Consistent with overall sensitivity to discounts, planned comparisons found that customers in the one-discounted condition ($M = 5.14$, $SD = 2.34$, *Median* = 5.00, *Mode* = 4.00) bought significantly more peaches than those in the control condition ($M = 4.37$, $SD = 1.48$, *Median* = 4.00, *Mode* = 4.00; $t(209) = 3.31$, $p = .001$, $d = 0.46$).

Furthermore, customers in the three-discounted condition ($M = 3.38$, $SD = 1.40$, *Median* = 3.00, *Mode* = 3.00) bought significantly fewer peaches than those in the one-discounted condition ($t(209) = 5.82$, $p < .001$, $d = 0.81$), and also purchased significantly fewer peaches than those in the control condition ($t(209) = 2.59$, $p = .011$, $d = 0.36$), consistent with H1.

[2] This data was not available for the first two days.

We next examined the distribution of responses to gain insight into whether participants were differentially likely to take the price-increase point as their decision point across conditions. Consistent with H2, significantly more customers in the three-discounted condition (52%) purchased exactly three peaches, relative to customers in the control (13%) or in the one-discounted conditions (13%; $\chi^2(2, N = 212) = 26.00$, $p < .001$), whereas we found no differences in the number of one-peach purchases across conditions (1% in control, 3% in one-discounted, and 4% in three-discounted; $\chi^2(2, N = 212) = 1.14$, *n.s.*).

Table 2. Results of Experiment 1.

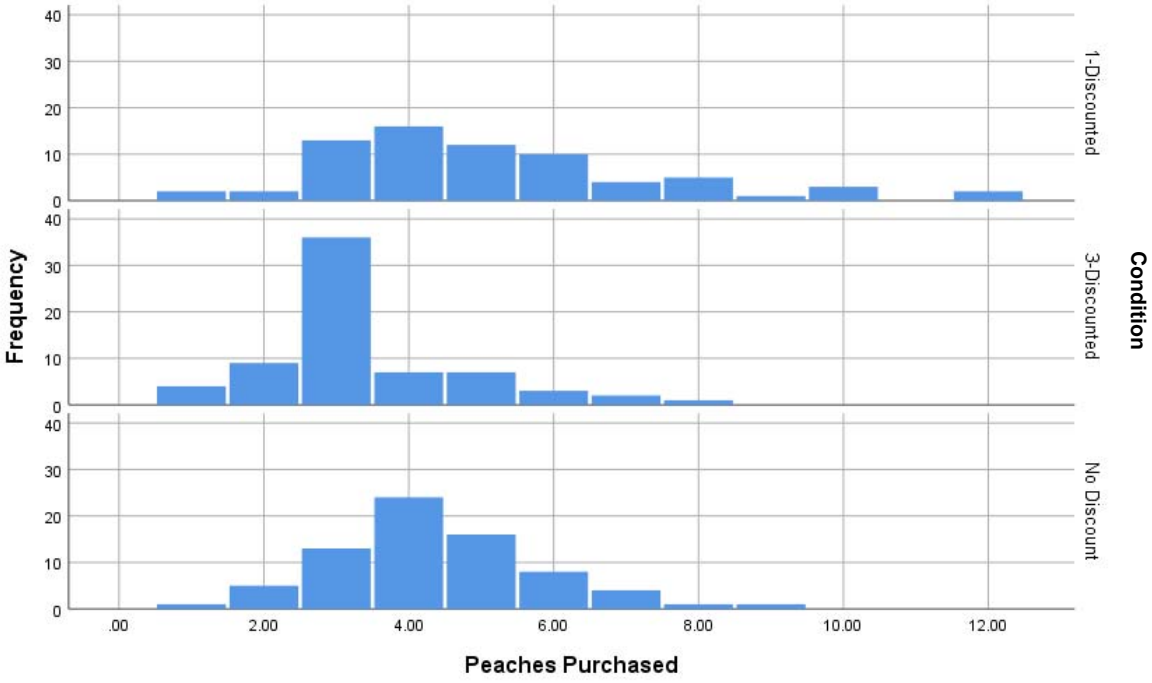
	No Discount	One Discounted	Three Discounted
Peaches Purchased (Mean/SD)	4.37 (1.48)	5.14 (2.34)	3.38 (1.40)
Total Purchase Amount (in RMB)	30.59 (10.34)	33.00 (16.35)	15.38 (8.95)
Per-Unit Purchase Price (in RMB)	7.00	6.26	4.34
Likelihood of Peach Purchase	15.57%	16.83%	16.67%
Likelihood of Peach Buyers Buying Other Fruits	77.59%	76.47%	73.08%

*The total purchase amount and the per-unit purchase price were calculated assuming a pre-discount average price per peach of 7 RMB, consistent with a standard-sized peach.

Examining the histogram by condition (Figure 2), we observed a peak in the number of customers purchasing three peaches in the three-discounted condition as well as a decrease in the number of customers purchasing four or five peaches in that condition, as compared with the other two conditions. These distributions suggest that a price discount limited to three peaches led customers to stop at three peaches—even though they may have originally intended to purchase four or five. The asymmetric data flow from right above the price-increase point to the exact price-increase point also suggests that customers treated the price-increase point as a

decision point, such that it took on properties of a target value rather than an anchor (Bartels and Sussman 2018). To the extent that this value was acting as a traditional anchor, we would expect the purchase quantity to move in the direction of the price-increase point, but not to reach or exceed it.

Figure 2. Histogram indicating the number of customers who purchased a given quantity of peaches as a function of discount condition in Experiment 1.



One alternative explanation for these results is that customers in the three-discounted condition found the discount more attractive and were therefore more likely to purchase peaches at all, compared to customers in the one-discounted condition. In this case, the low purchase quantity may have come from customers who would not have purchased any peaches in the absence of the discount. However, across conditions, we found no difference in the percentage of peach buyers out of the total customers who walked by the peach stand ($\chi^2(2, N = 1299) < 1$, *n.s.*;

see Table 2).

Another possibility is that customers who bought fewer peaches in the three-discounted condition were more likely to purchase other fruit during their visit. That is, they might have considered spending the money they saved on peaches on other fruits. However, we found no significant differences between the three conditions in the likelihood of peach buyers buying other fruits during the same visit ($\chi^2(2, N = 161) < 1$, *n.s.*; see Table 2). Thus, our evidence does not support the possibility that the customers who purchased fewer peaches in the three-discounted condition were more likely to purchase other fruits instead.[3]

Experiment 1 found that customers purchased slightly more peaches in the one-discounted condition than in the control condition, consistent with a traditional reaction to lower prices. This may be a straightforward reaction to the discounted price. One alternative possibility is that the presence of a research assistant introducing the discount in the two discount conditions might have increased purchase quantities. Although the research assistant was present in all conditions, she did not say anything to customers in the control condition, consistent with procedures in the store when no promotions were present. While differences in the research assistant interactions could potentially explain the increased purchase quantity in the one-discounted condition as compared with the control condition, it would not explain the difference between the one-discounted and the three-discounted conditions.

Consistent with H1, the results of this field experiment suggest that relative to increasing price at a low level, increasing price at a *moderate point* can drag down purchase quantities. To

[3] We continued to find a significant effect of condition on purchase quantity after controlling for the percentage of peach buyers and their probability of buying other fruits. In a regression with these controls and condition dummy coded, we find that participants remain less likely to purchase peaches in the three-discounted condition than in either the control or one-discounted conditions (three-discounted reference group; $\beta_{Control} = 1.15$, $SE=.32$, $p<.001$; $\beta_{One\text{-}Disc} = 1.70$, $SE=.33$, $p<.001$).

test for the robustness of this finding, Experiment A1 in the online appendix provides a conceptual replication of Experiment 1. Experiment A1 uses an incentive-compatible design in a controlled laboratory setting examining the purchase and consumption of M&Ms.

One limitation of the current experiment is that we infer the acceptable range based on informal discussions with the supermarket. However, we cannot confirm this range, nor can we manipulate it. Therefore, in the next experiment, we test H2 by directly providing and manipulating the consumers' acceptable range.

EXPERIMENT 2: THE MODERATING ROLE OF THE ACCEPTABLE RANGE

Experiment 2 tested whether directly manipulating the acceptable range would moderate the purchasing pattern observed thus far. We compared purchase decisions when the same price-increase point fell within versus below the acceptable range, shifting whether the price-increase point was considered acceptable as a purchase quantity. Consistent with H2, we predicted that consumers would be more likely to take the price-increase point as their purchase quantity if the price-increase point was a *moderate quantity* (i.e., it fell within the acceptable range but below the initial preference) than if it is *low* (i.e., it fell below that range). Consequently, we expected a dragging-down effect when a *moderate* price-increase point was compared with a *low* point, but not when the *moderate* point was compared with another *moderate* point.

Method

Participants. We recruited 384 participants (51% female; M_{age} = 33.83, from 21 to 86) online through Amazon's Mechanical Turk (MTurk) platform, and they completed the study for

nominal monetary compensation.

Design and Procedure. This study adopted a 2 (price-increase point: two vs. six discounted) x 2 (acceptable range: narrow vs. wide) between-subjects design. Participants were asked to imagine they were buying wine to consume while they were staying in a new town for several weeks. All wines were 30% off, but the discount was limited to either two or six bottles per person.

To keep the initial preference constant across conditions, all participants were told to imagine that they were thinking of buying ten bottles of wine, but they could be flexible within a range depending on pricing. The range was six to fourteen bottles in the narrow-range conditions versus two to eighteen bottles in the wide-range conditions. Thus, the discounted quantity of six bottles was within the acceptable range in both conditions, but the discounted quantity of two bottles was within the range in only the wide-range condition.

For all studies conducted on the MTurk platform, we included several comprehension questions (see online appendix for details), which were intended to ensure participants understood key characteristics of each study scenario (Downs et al. 2000; Goodman, Cryder, and Cheema 2013). After answering the comprehension questions, participants reported (as a free response) how many bottles of wine they would buy. Additional details on this and all remaining studies in this paper can be found in the online appendix.

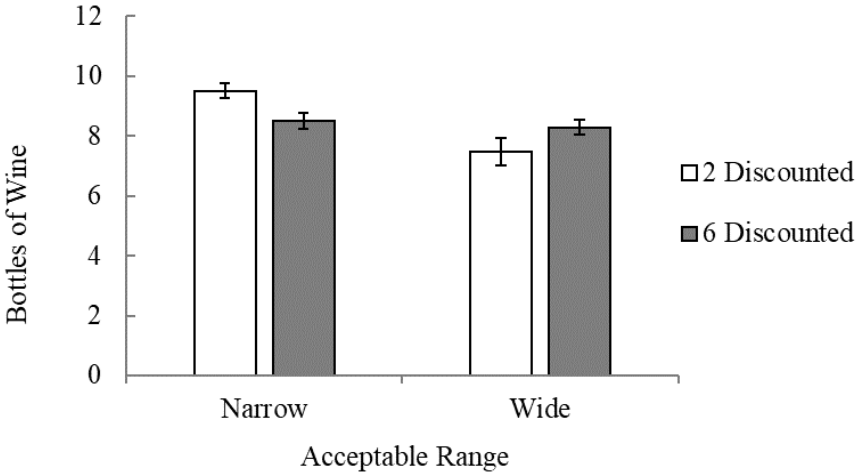
Results and Discussion

Prior to data analysis, we excluded 48 participants who failed to answer at least half of the comprehension questions correctly, because this indicated that participants either were not paying attention or misunderstood the scenario. We applied this rule to all studies conducted on

MTurk. Across all studies, results remained consistent when all participants were included. After exclusions, the sample size was $N = 336$ (52% female; $M_{age} = 34.19$, from 21 to 86).

A 2 (price-increase point: two vs. six discounted) x 2 (acceptable range: narrow vs. wide) ANOVA revealed no main effect of price discount ($F(1, 332) < 1$, *n.s.*), a significant main effect of acceptable range ($F(1, 332) = 11.90$, $p < .001$, $\eta^2 = 0.03$), and a significant interaction between price discount and acceptable range ($F(1, 332) = 8.58$, $p = .004$, $\eta^2 = 0.02$), see Figure 3. A comparison within the narrow-range conditions replicated the dragging-down effect: participants purchased significantly fewer bottles of wine when six bottles were discounted—a *moderate point* within their acceptable range ($M = 8.50$, $SD = 2.34$, *Median* = 10.00, *Mode* = 6.00)—than when two were discounted—a *low point* outside of their acceptable range ($M = 9.50$, $SD = 2.23$, *Median* = 10.00, *Mode* = 10.00; $t(332) = 2.80$, $p = .024$, $d = 0.44$). By contrast, in the wide-range conditions, in which both six and two bottles were *moderate points*, participants purchased directionally more bottles when six were discounted ($M = 8.28$, $SD = 2.48$, *Median* = 10.00, *Mode* = 6.00) than when two were discounted ($M = 7.48$, $SD = 3.98$, *Median* = 10.00, *Mode* = 10.00; $t(332) = 1.62$, $p = .11$, $d = 0.25$), consistent with a more traditional pricing or anchoring explanation.

Figure 3. Average number of bottles of wine purchased as a function of price discount and acceptable range in Experiment 2. (Error bar represents ±1 SEM.)



Within the two-discounted conditions, participants in the narrow-range condition purchased significantly more bottles of wine than those in the wide-range condition ($t(332) = 3.94$, $p < .001$, $d = 0.63$). Moreover, significantly more participants in the wide-range condition (27%) chose to purchase exactly two bottles of wine than participants in the narrow-range condition (4%; $\chi^2(1, N = 157) = 15.00$, $p < .001$). These results indicate that participants were more likely to take the price-increase point as their purchase quantity if the value was within (vs. below) the acceptable range, consistent with H2. Within the six-discounted conditions, we found no difference in purchase quantities between the narrow-range and wide-range conditions ($t(332) < 1$, *n.s.*), consistent with our predictions for cases in which the price-increase point falls within the preference range. As expected, we found no difference in participants' likelihood of purchasing exactly six bottles across the two range conditions (narrow = 35% and wide = 43%; $\chi^2(1, N = 179) < 1$, *n.s.*).

To test the component of the acceptability explanation regarding the tradeoff between initial preference and price-increase point (H2) further, we examined how many participants chose the specified initial preference (10 bottles) versus the price-increase point (2 bottles or 6

bottles) in each condition. In the narrow range conditions (i.e., buying 6 bottles was acceptable but buying 2 bottles was not), more participants chose the initially-preferred quantity (10 bottles) in the two-discounted condition (69%) than in the six-discounted condition (37%; $\chi^2(1, N = 164) = 15.41$, $p < .001$), but more participants chose the price-increase point in the six-discounted condition (i.e., 6 bottles) (42%) than in the two-discounted condition (i.e., 2 bottles) (4%; $\chi^2(1, N = 164) = 31.00$, $p < .001$). These results suggest that participants chose the price-increase point if it was acceptable as a purchase quantity, or chose their initially-preferred quantity if the price-increase point was not acceptable. Moreover, in the wide range conditions (i.e., buying 2 bottles and buying 6 bottles were both acceptable), we found no differences in choosing the initial preference of 10 bottles between the two-discounted (51%) and the six-discounted conditions (43%; $\chi^2(1, N = 172) < 1$, *n.s.*). These results suggest that when the same price-increase point (i.e., 2 bottles and 6 bottles) both fell within the acceptable range, participants were equally likely to choose the price-increase point rather than the initial preference.

Results in this study demonstrate the role of acceptable range as a moderator of the dragging-down effect, supporting H2. Consumers were more likely to respond to a price-increase point within their acceptable range than to one below that range. The acceptable range is likely related to a variety of contextual factors, such as the usage frequency of the focal product, the consumer's frequency of shopping, their familiarity with the product, and the durability and storage cost of the product. Consequently, these additional contextual factors likely influence the observed dragging-down effect to the extent that the factors alter a consumer's perceived acceptable range.

In the next experiment, we explored the underlying mechanism for this pattern. Additionally, we tested whether the patterns extend to a context outside of food consumption—in

this case, museum visit purchases.

EXPERIMENT 3: THE MEDIATING ROLE OF ACCEPTABILITY

We propose that the effect of a price-increase point on purchase quantity operates in two steps. In the first step, the consumer takes the price-increase point as a decision point. In the second step, the consumer evaluates the perceived acceptability of that point and determines whether it is within their acceptable range (i.e., a moderate quantity) or below it (i.e., a low quantity). Consumers are likely to choose to stick with their initial preference if the price-increase point is too low as a purchase quantity, but they give up the initial preference and choose the *moderate* price-increase point when that point is an acceptable purchase quantity. We therefore predict that acceptability of the price-increase point (vs. the initial preference) mediates the dragging-down effect (H3).

We also tested a variety of alternative explanations, including good deal, norms, reference prices, decision weights, and anticipated regret. The good deal explanation suggests that consumers derive extra utility from taking full advantage of price promotions, which causes their decisions to be based on the value of the deal. The norms explanation suggests that consumers might interpret the number of units offered at a discount as a norm (e.g., a social norm) and, consequently, as a suggested purchase quantity. The reference price explanation posits that consumers might form lower reference prices when more units are discounted (Grewal, Monroe, and Krishnan 1998; Rajendran and Tellis 1994). A lower reference price might discourage consumers from purchasing the product at its regular price. The decision weights explanation suggests that a better discount might increase the weight consumers place on

price discounts. The anticipated regret explanation suggests that consumers might anticipate more regret if they fail to minimize costs (Inman and Zeelenberg 2002; Tsiros and Hardesty 2010) as the value of the deal increases.

Method

Participants. Two hundred and eighty-eight participants (46% female; M_{age} = 33.77, from 18 to 73) from MTurk participated in exchange for nominal monetary compensation.

Pretest. We ran a pretest with a separate sample from MTurk (N = 196) to determine preferences for the focal stimulus: the number of museums consumers would like to visit during a two-week vacation to New York City. Specifically, we elicited the ideal, minimum, and maximum number of museums that the pretest participants would like to visit. The average ideal was five museums (*Mean* = 5.27, *SD* = 2.53, *Mode* = 5.00), with a minimum of two museums (*Mean* = 2.78, *SD* = 1.75, *Mode* = 2.00) and a maximum of eight museums (*Mean* = 7.61, *SD* = 3.86, *Mode* = 8.00; see supplementary materials for details).

Design and Procedure. This study adopted a 3 (price-increase point: zero, one, or three discounted) between-subjects design. Based on pretest results, we chose one discounted museum visit as the *low point* (outside of the average consumer's acceptable range of two to eight), three discounted museum visits as a *moderate point* (within the acceptable range, though lower than the ideal number of five), and a control condition in which no visits were discounted and prices remained constant.

All participants read that they were travelling to New York City for two weeks on a vacation and wanted to visit museums there. Ideally, they would like to visit five museums, but they could be flexible depending on pricing. They decided to purchase all the museum visits on a museum pass that gave them additional benefits. They could use the museum pass for

themselves, only. Participants read one of the following about the benefits of the museum pass: "each museum visit costs $30" (zero-discounted control), "the first museum visit costs $20, and each additional costs $30" (one-discounted), or "the first three museum visits each cost $20, and each additional costs $30" (three-discounted). After answering comprehension questions, all participants then reported how many museum visits they would purchase.

To explore underlying processes, we included an open-ended question on the next screen asking participants to explain their decision. We then presented several follow-up questions to test possible explanations directly. Specifically, these questions tested 1) acceptability of the price-increase point as a purchase quantity (H3): "To what extent do you think it is acceptable for you to visit only X museums for your trip to make this trip worthwhile?" (1 = definitely not acceptable, 7 = definitely acceptable; X is the price-increase point in each of the price-increase conditions); 2) perceptions of a good deal: "Given the pricing, how good of a deal do you think it is for you to purchase exactly 1 (or 3) museum visit(s) on the museum pass?" (1 = not a good deal at all, 7 = a very good deal); 3) norms: "Given the pricing, how many museum visits do you think a typical buyer of the Museum Pass would usually purchase?" (free response); 4) reference prices: "How do you feel about the price: $20 (or $30) per museum visit?" (1 = very low, 7 = very high); 5) decision weights: "When making your purchase decision, to what extent did you base your decision on the price discounts and to what extent did you base it on your museum-going preferences?" (1 = my decision was entirely based on the price discounts, 7 = my decision was entirely based on my museum-going preference); and 6) anticipated regret: "If I purchase additional museum visits with the higher price on the pass (i.e., purchase more than X visit), I will regret it later," (1 = strongly agree, 7 = strongly disagree; adapted from Tsiros and Hardesty 2010). Questions testing acceptability, good deal, and anticipated regret were only asked in the

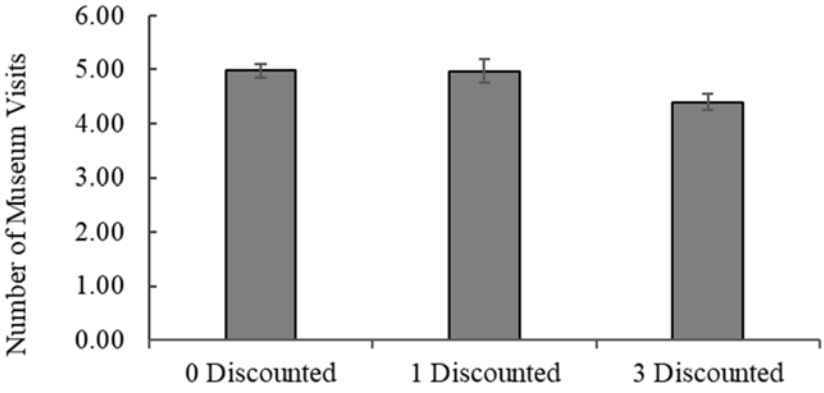
price-increase conditions because they relied on an available discount.

Results and Discussion

Consistent with our prior exclusion criteria, we excluded from all analyses 21 participants who failed the comprehension check and one outlier who was more than three standard deviations from the mean. After exclusions, the sample was $N = 267$ (48% female; $M_{age} = 34.03$, from 18 to 73).

Purchase Quantity. A one-way ANOVA revealed a significant effect of condition ($F(2,264) = 4.33$, $p = .014$, $\eta^2 = 0.03$; see Figure 4). As predicted, planned comparisons revealed that participants in the three-discounted condition purchased significantly fewer museum visits ($M = 4.40$, $SD = 1.43$, *Median* = 5.00, *Mode* = 5.00) than either those in the one-discounted condition ($M = 4.98$, $SD = 1.91$, *Median* = 5.00, *Mode* = 5.00; $t(264) = 2.51$, $p = .013$, $d = 0.31$) or those in the zero-discounted condition ($M = 4.98$, $SD = 1.19$, *Median* = 5.00, *Mode* = 5.00; $t(264) = 2.55$, $p = .012$, $d = 0.31$). In addition, significantly more participants in the three-discounted condition purchased exactly three museum visits (24%) than did participants in the zero-discounted condition (3%) or those in the one-discounted condition (8%; $\chi^2(2, N = 267) = 20.08$, $p < .001$). We did not find any differences in the likelihood of purchasing exactly one museum visit between the one-discounted (1%), zero-discounted (1%), and three-discounted conditions (3%; $\chi^2(2, N = 267) = 1.33$, *n.s.*). These results suggest that participants were more likely to take the price-increase point as their purchase quantity when this point fell within, rather than outside of, the acceptable range (H2).

Figure 4. Average number of museum visits purchased as a function of price-increase point in Experiment 3. (Error bar represents ±1 SEM.)



Thought Listing. We next analyzed participants' responses to the open-ended question about their thought process. A research assistant blind to the hypotheses first indicated whether participants mentioned any of the following explanations or thoughts: acceptability of the price-increase point as a purchase quantity, initial preferences, taking advantage of discounts, norms, reference prices, cost and benefit analysis, anticipated regret, and perceived scarcity, collected all other distinctive thoughts outside of that list, and tracked the number of times each thought (in and outside of the predetermined list) was mentioned by condition (see online appendix B for additional details). We found that significantly more participants in the three-discounted condition (24%) mentioned the price-increase point (i.e., buying three visits) than participants in the one-discounted condition (i.e., buying one visit; 4%; $\chi^2(1, N = 179) = 13.68, p < .001$). Moreover, 16% of participants in the three-discounted condition reported considering whether it would be acceptable or sufficient to visit exactly the maximum discounted quantity of museums compared to 0% in the one-discounted condition ($\chi^2(1, N = 179) = 12.49, p < .001$). These results provide evidence supporting H3, in which the acceptability of the price-increase point as the

final purchase quantity underlies its effect on decision making. Furthermore, participants were less likely to mention their initial preference in the three-discounted condition (43%) than in the one-discounted (63%) and the zero-discounted conditions (60%; $\chi^2(2, N = 267) = 8.58, p = .014$).

Additionally, an unpredicted result—orthogonal to our hypothesis—emerged, in which participants in the zero-discounted condition (17%) were more likely to consider cost-benefit tradeoffs than those in the other conditions (7% and 3%; $\chi^2(2, N = 267) = 11.28, p = .004$). We did not observe any other differences across conditions; see online appendix (B and Table S3) for additional results of the thought listing question.

Follow-up Questions. Examining the questions that were included to test alternative explanations, we found significant differences only when examining participants' responses to the question on acceptability. Specifically, participants in the three-discounted condition reported that it was more acceptable to visit exactly the number of museums available at the discount ($M = 4.76$, $SD = 1.89$) than did participants in the one-discounted condition ($M = 3.13$, $SD = 1.87$; $t(177) = 5.77, p < .001, d = 0.87$).[4] These results add to the evidence supporting H3.

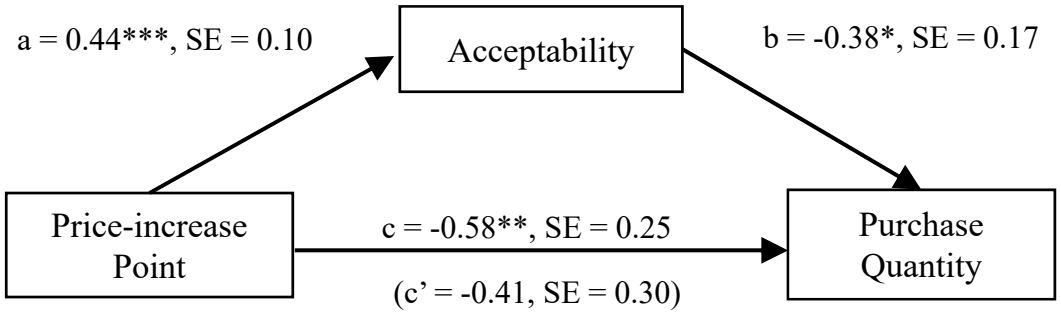
Mediation Analyses. We next tested the mediating role of acceptability in the dragging-down effect (H3). To the extent that beliefs about acceptable purchase quantities drive the relative influence of the price-increase points versus initial preferences on purchase decisions, we aim to understand the role of both acceptability and the corresponding tradeoff between the price-increase point and initial preference. Therefore, we create a single measure to examine the relative weight participants put on the acceptability of price-increase points versus their initial preferences. This relative weight measure took on a value of 1 if the participant mentioned only

[4] Conceptually, acceptability can be considered a categorical variable, so we also measured the acceptability question using a binary scale ("yes" or "no") and found the responses consistent with the 7-point scale measure ($r = 0.78, p < .01$; see Figure S4 in the online appendix for more details). Since the scale is more informative for the mediation analyses, we focused on the 7-point scale measure for this question.

the acceptability of the price-increase point, a value of -1 if the participant mentioned only their initial preference, or a value of 0 if the participant mentioned both or neither.

Our mediation analysis included condition as the independent variable (with one-discounted coded as 0 and three-discounted coded as 1), the relative weight variable as the mediator[5], and purchase quantity as the dependent variable. We used a bootstrap procedure with 10,000 resamples[6] and found a significant indirect effect of *acceptability* (indirect effect = -0.17, *SE* = 0.09, biased-corrected 95% confidence interval = [-0.37, -0.02]; see Figure 5). The three-discounted condition significantly increased *acceptability* ($a = 0.44$, $p < .001$), and *acceptability* was negatively associated with purchase quantity ($b = -0.38$, $p = .027$). Including *acceptability* in the model reduced the effect of the price-increase point on purchase quantity (from $c = -0.58$, $p = .023$ to $c' = -0.41$, $p = .16$).

Figure 5. Acceptability mediates the effect of the price-increase point on purchase quantity in Experiment 3. *$p<.05$; **$p<.01$; ***$p<.001$.



We also conducted a similar mediation analysis directly using participants' responses to

[5] A similar analysis was conducted jointly examining acceptability of the price-increase point and initial preferences as independent binary mediators of condition on purchase quantity, and found consistent results. Specifically, these two factors jointly mediated the effect, with a significant total indirect effect (total indirect effect = -0.19, SE = 0.08, biased-corrected 95% confidence interval = [-0.39, -0.05]).

[6] This procedure was implemented by bootstrapping the sureg command in STATA.

the acceptability rating question as the mediator. This factor was also a significant mediator of the effect (indirect effect = -.38, *SE* = .13, bias-corrected 95% confidence interval = [-.67, -.15]).

Supporting our theory (H3), these results highlight the mediating role of acceptability in the dragging-down effect. When participants considered the price-increase point to be an acceptable purchase quantity, they based their decisions on that point and purchased less. When participants found the price-increase point unacceptable, they based their decisions on their initial preferences instead and purchased more.

EXPERIMENT 4: ENCOURAGING HEALTHY EATING

This experiment tested the dragging-down effect in a consumer context with implications for consumer well-being. Specifically, we asked participants to choose among a series of entrée options whose calorie count ranged from 600 (most healthy) to 1200 (least healthy), and whose price was high ($11.80) when its calorie count was below a certain level, or low ($9.80) when its calorie count was above that level. The pricing of healthier entrées at a higher price in this study mimics broad perceptions that healthier foods are more expensive (Haws, Reczek, and Sample 2016). We manipulated whether the price-increase point (i.e., the calorie level at which the price changed) was within an acceptable range as recommended by the doctor, and examined how this manipulation affected participants' purchasing choices.

Method

Participants. One hundred and sixty participants (41% female; M_{age} = 33.51, from 18 to 65) recruited on MTurk participated in exchange for nominal monetary compensation.

Design and Procedure. This study adopted a 2 (price-increase point: within range or out of range) between-subjects design. Participants were randomly assigned to one of the conditions. All participants were asked to imagine that they were on a diet. Their doctor recommended that they limit their calorie intake to about 700 calories per meal, with an acceptable range of about 500 to 900 calories per meal. Participants were then asked to select a lunch entrée, assuming the options were equally tasty.

In the within-range condition (prices in parentheses below), the price of the entrée increased by two dollars when the caloric content of the entrée reached 800. In other words, the cost of reducing the caloric content to 900 calories was free, but further reduction in calories cost two dollars. Consequently, it was possible for participants to select an entrée with a cheaper price (Entrée D) that fulfilled the doctor's recommendation for calorie intake, although the choice that matched the doctor's recommendation exactly (Entrée B) was more expensive.

Entrée A: contains 600 calories. Costs ($11.80) [$11.80].
Entrée B: contains 700 calories. Costs ($11.80) [$11.80].
Entrée C: contains 800 calories. Costs ($11.80) [$11.80].
Entrée D: contains 900 calories. Costs ($9.80) [$11.80].
Entrée E: contains 1000 calories. Costs ($9.80) [$11.80].
Entrée F: contains 1200 calories. Costs ($9.80) [$9.80].

In the out-of-range condition (prices in brackets above), the price of the entrée increased by two dollars when the caloric content of the entrée reached 1000. Consequently, it was not possible for participants to select an entree with a cheaper price that fulfilled the doctor's recommendation.

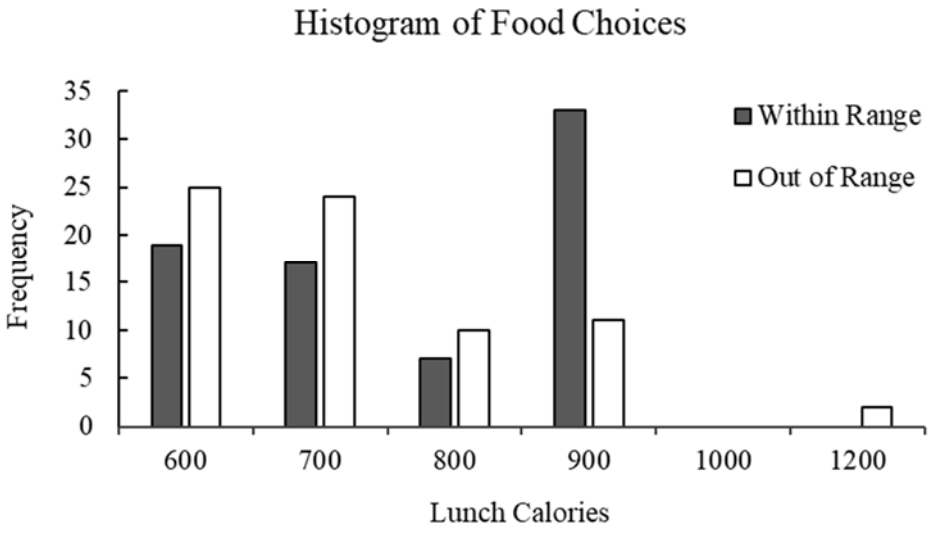
Results and Discussion

Following the same exclusion criteria as for the other studies, we excluded 12

participants who failed the comprehension check, leaving a sample of $N = 148$ (41% female; $M_{age} = 33.66$, from 18 to 65).

An independent-samples t-test revealed that participants in the out-of-range condition selected entrées with a significantly lower average caloric content than did participants in the within-range condition (*Ms* = 723.61 and 771.05 calories, *SDs* = 132.68 and 126.30, *Medians* = 700 and 800 calories, *Modes* = 600 and 900; $t(146) = 2.23$, $p = .027$, $d = 0.37$), consistent with H1. In addition, significantly more participants chose the 900-calorie option in the within-range condition (in which 900 calories was the healthiest cheap option) than in the out-of-range condition (43% vs. 15%; $\chi^2(1, N = 148) = 12.70$, $p < .001$; see Figure 6 for a distribution of responses). In other words, participants were more likely to select the option at the price-increase point when it fell within the acceptable range of choices than when it fell out of the range, consistent with H2. Findings in this study suggest that strategically selecting the price-increase point can help consumers who are sensitive to both price and dietary impact select healthier options.

Figure 6. Histogram of food calorie choices by condition in Experiment 4.



GENERAL DISCUSSION

In this paper, we demonstrated that the quantity of a product available at a reduced price can become a decision point and take on properties of numeric cues. However, consumers place less weight on the cue when it is outside of the acceptable range. This moderation builds upon prior literature on extreme anchors and elucidates specific conditions under which numeric cues may not be incorporated into judgments and decisions. In contrast to prior literature, our experiments used numbers that were *not* extreme in absolute terms but still below the acceptable range. Furthermore, while the mechanism behind the dragging-down effect may contain elements of anchoring, the patterns we describe—in which consumers purchase *less* as the focal value *increases*—go beyond what has been documented in prior literature on anchoring. Additionally, our findings have implications for demand that run counter to basic economic principles; we demonstrated conditions in which consumers purchase more units of a product

when the average per-unit price is higher.

We found that the distribution of consumers' choices in response to the price-increase point mimics that of a typical distribution of responses around target values rather than around anchors (e.g., see Figure 2 for a representative histogram of responses, and Appendix E in the online supplement for histograms from all reported studies). Specifically, we see asymmetric piling at the decision point, suggestive of a response to a target value, rather than a symmetric distribution that would be suggestive of an anchor (see Bartels and Sussman 2018).

One alternative reason why people might purchase fewer units when more are available at a discount is that consumers infer a motivation (e.g., inferior quality) for price promotions with a higher price-increase point. If this inference leads consumers to develop an unfavorable impression of the product or the marketer, it could lead to lower purchase quantities. However, we manipulated the source of the price increase in several ways (e.g., free samples and discounts with quantity limits), and we found the dragging-down effect in each case—despite different inferences that people may have made about the reason for each price discount. To address the quality inference concern further, we ran an additional study with a purchasing scenario in which the price increase took the form of an interest cost increase through a third party rather than through the company selling the focal product. We found similar patterns (see online appendix, Experiment A3), and it is unlikely that this design led to inferences about the retailer's motives.

We focused on the effect of a price increase on purchase decisions in this paper, but a price increase is only one example of a numeric cue that may signal a decision point for consumers to consider whether to purchase additional units. We propose that other factors may also trigger such a decision point. For example, setting a default value (Goswami and Urminsky 2016; Haggag and Paci 2014) or presenting a social norm by indicating how many units of an

item others consume (Goldstein, Cialdini, and Griskevicius 2008) may produce the same effect. As in the case of a price increase, we would expect that when the default value (or social norm) suggests a consumption level that falls within a consumer's acceptable range, they would be more likely to adopt this amount as their purchase quantity. When the default value (or social norm) is below their acceptable range, however, the consumer would be more likely to ignore the default value (or the social norm) and stick with their initial preference. In the case of a price increase, discounts add to the motivation for consumers to adopt the external cue as their decision point. In other cases, alternative motivations (e.g., the need to conform) may be operating instead. Although the underlying reason for such effects would be different from the effect caused by price increases, these alternative cues could have similar effects on consumer decisions by acting as plausible numeric cues. In the case of price increases, the resulting effects yield counter-intuitive purchasing patterns in which people purchase fewer units of a product when they are offered at a lower per-unit cost.

Implications

We show that pricing strategy can influence consumers' purchase and consumption decisions in counterintuitive ways. One implication is that marketers can avoid producing the dragging-down effect by setting the quantity limit of a price promotion either low enough for consumers to ignore as a decision point or high enough to exceed the consumers' initial preference. If the price-increase point falls between these two levels, however, then consumers may purchase lower quantities at a lower price—thus causing damage both because the firm will sell the product at a lower price and because they will reduce consumer demand.

Another possible implication is that marketers could use inverse price-increase points as a

new kind of behavioral nudging. In the context of energy consumption, researchers have been exploring possible ways to reduce consumption, such as emphasizing energy use as a health hazard (Dietz 2015) or introducing time-varying electricity pricing (Badtke-Berkow et al. 2015). Some countries have adopted inverse tiered pricing for electricity. For example, in South Korea, the electricity rates vary from 8.1 to 62.0 South Korean won, depending on energy use (Bojanczyk 2012). As households consume more energy, the price increases at discrete intervals. In an additional experiment with an electricity consumption scenario using a pricing strategy similar to the South Korea case, we found that participants chose to consume less energy if the unit price increased at a reasonably low household consumption level than if it increased at an unreasonably low consumption level (see the online appendix, Experiment A4, for additional details). These findings suggest that the price-increase point can be used to alter consumption decisions, and careful selection of this point may be useful for changing consumption behavior.

The current findings also suggest that non-linear pricing strategies can help consumers regulate unhealthy consumption in other domains. For example, an extra tax on soda drinks exceeding a certain consumption quantity may help consumers reduce the quantity of sugar consumed. Compared with a flat soda tax, a tax increase at a reasonable consumption level may provide consumers with additional decision points to reconsider their choices. In the context of financial decision making, extra credits or reduced tax on predetermined levels of savings (e.g., the UK Personal Savings Allowance) may encourage consumers to save more. Importantly, to avoid an unintended effect, the tax-free income level should exceed the average household's savings.

The current research addresses a fundamental issue in consumer behavior, examining how consumers respond to price increases. Consumers encounter price increases in various

forms, such as limited free samples, discounts with quantity limits, price surcharges or additional interest costs above a specified quantity, or tax breaks below a certain amount. This paper adds to the literature on pricing by identifying cases in which price increases can lead consumers to purchase *less* when the per-unit price is *lower*.

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