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Consumer reactions to price discounts across online shopping experiences

Daniel Sheehan[a,*], David M. Hardesty[a], Alexander H. Ziegler[b], Haipeng (Allan) Chen[a]

[a] University of Kentucky, 550 S Limestone, Lexington, KY, 40506, USA
[b] Wichita State University, 845 Fairmount St., Wichita, KS, 67260, USA

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ABSTRACT

Consumers generally encounter a multitude of price discounts during a single visit to a retailers' website, yet past research has predominantly examined price discounts in a singular manner. We examine how the influence of a price discount's magnitude on consumer purchase intentions evolves during an online shopping trip. In doing so, we demonstrate that a price discount's magnitude is less predictive of consumers' purchase intentions earlier, but it becomes more predictive later, during an online shopping trip. Thus, placing shallow price discounts early in a shopping visit may enhance the effectiveness of a firm's portfolio of price discounts.

1. Introduction

Online retailers present consumers with a series of purchase opportunities, many of them featuring discounts. In fact, we audited one of the largest US grocery retailer's website and found that 37% of their products options were discounted at the same time. Although there is a plethora of literature on price discounts (Blattberg and Neslin, 1990; Chandon et al., 2000; Laroche et al., 2001; Mela et al., 1997), the vast majority of that work has focused on static individual discounts, examining how individual discounts influence consumers' purchase intentions towards a specific product or basket of goods. That is, most research does not study the dynamics of multiple discounts and how to best present or structure those individual discounts over a single store visit. An exception to this singular focus is empirical work examining how consumers respond to multiple discounts on the same product (Chen and Rao, 2002; Davis and Bagchi, 2018; Ertekin et al., 2019). In contrast, this research focuses on how consumers evaluate a series of discounts on different products within the same shopping trip.

As such, this research provides important guidance for retailers' promotional campaigns. Beyond offering recommendations for when to target consumers with specific discounts, this research illustrates when a discounts' magnitude is more influential in consumers' decision making. As retailers have been increasing the frequency of their discounting and deepening the level of individual discounts in recent years (Carlson and Kukar-Kinney, 2018; Wahba, 2016; Wathieu, 2004), this research provides critical guidance to retailers concerning how to structure discounts and when to change a discount's magnitude to increase retailers' profit. Furthermore, online retailers have successfully implemented machine learning techniques to track consumers' shopping patterns that can be used to profile and predict their future shopping behavior (Wedel and Kannan, 2016). Thus, retailers can use this information to personalize discount presentation to different consumer segments, shopping profiles, and individual customers (McAfee et al., 2012; Bradlow et al., 2017).

We distinguish our work from previous research by explicitly examining how consumer reactions to discounts dynamically vary over an online shopping trip according to the information they have already encountered in the retailers' online store (e.g., prior discounts). We examine these discount responses in an online environment, as it is easy for retailers both to know what information (i.e., products and discounts) consumers have already encountered and to control the information that consumers will subsequently encounter (Zhang and Krishnamurthi, 2004; Zhang and Wedel, 2009). As such, we seek to understand how to optimally structure a set of discounts to both increase the attractiveness of specific discounts and optimize a store's overall discount strategy. In doing so, the current research fills a theoretical void and sheds light on how consumer reactions to price discounts vary within a shopping trip. In addition, the results provide insights to managers on such important decisions as when to introduce discounts of various magnitudes in online stores or where to place price discounts of various magnitudes in physical stores.

Although there are a variety of different structures or sequences we can investigate, this research establishes an initial foundation by focusing on two basic discount structures, "lead" and "build." A "lead" structure offers large discounts at the beginning of a shopping trip, whereas a "build" structure does the opposite by offering large

* Corresponding author.
E-mail addresses: dan.sheehan@uky.edu (D. Sheehan), david.hardesty@uky.edu (D.M. Hardesty), ziegler.alexander@gmx.de (A.H. Ziegler), allanchen@uky.edu (H.A. Chen).

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discounts towards the end of a shopping trip. While the effectiveness of either discount structure would lend more credence to adaptive decision-making (Payne et al., 1993), it is unclear which of the two structures is more effective in increasing sales. On the one hand, consumers may be lured into a buying mode by an early, large discount, and the momentum may carry over to subsequent purchases (Dhar et al., 2007). On the other hand, an early, large discount may serve as a reference point creating a counterproductive contrast effect for any smaller discounts that follow (Chen and Rao, 2002; Kahneman and Tversky 1979). The current research compares the two discount structures by examining how the influence of a discount's magnitude on purchase intentions systematically varies according to when it is encountered in an online shopping experience.

Retailers could implement and leverage discount dynamics in a variety of ways. First and foremost, retailers can utilize these dynamics when designing consumer shopping experiences in which retailers can control or predict the order in which consumers make purchase decisions and see information. For example, when making a purchase that involves a series of decisions instead of only a single decision, such as customizing a car or a computer, consumers often make a series of decisions about different components in succession (e.g., engine type/size, interior/exterior options, storage size, processor speed, etc.) that make up the ultimate purchase package. Or, retailers can alter the amount of the promotion "in real-time" according to what information consumers have already seen (Van Ittersum et al, 2013; Wedel and Kannan, 2016).

Second, retailers could leverage discount dynamics on a single page of their website. For instance, as they control the placement of content on homepage, promotional email or even the display of search results, they can arrange different discounts according to the Z-shaped scanning pattern consumers engage in when viewing a website (Nielsen and Pernice 2010). Finally, retailers could further enhance the effectiveness of these dynamics by using machine learning technologies to create personalized promotions according to the customers' experience, loyalty, and perceived motivation.

A series of studies provide support for our theoretical framework and demonstrate how consumer responses to a price discount's magnitude evolve over the course of an online shopping trip. Study 1 is conducted in an experimental online grocery store that shows that an initial discount's magnitude (large vs. small) does not significantly alter the likelihood of purchasing the discounted product, but does affect the likelihood of purchasing a subsequent product with a moderate discount. Studies 2 and 3 demonstrate that a discount's magnitude is less predictive of purchase intentions at the beginning of an online shopping trip than at the end, suggesting that beginning with large discounts may be detrimental to subsequent purchase intentions. Furthermore, these studies also provide process evidence by demonstrating consumers' discount expectations vary according to the discounts they have already encountered and, subsequently, drive their evaluation and purchase intentions toward later online discounts.

Our work makes several contributions to theory and practice. First, we demonstrate that consumer discount expectations evolve over the course of an online shopping trip. In doing so, this research demonstrates that when a discount is offered and how it compares to prior discounts consumers encounter on the same shopping trip are important determinants of its effectiveness. Although extant research has shown that discounts can influence purchase of the discounted and related products, as well as basket size (Leeflang and Parreño-Selva, 2012; Walters, 1991), relatively limited attention has been paid to how consumer responses to price discounts and their subsequent purchase intentions vary across a series of discounts such as those encountered during a single shopping trip. We attempt to fill this gap in the literature.

Second, we contribute to the reference point and reference price literature by demonstrating that perceptions of discount magnitudes are susceptible to distinct reference point effects that persist over different types of products and purchase opportunities over a single shopping trip to affect their perceptions of discounts encountered later. The dynamics of reference point formation is an integrated part of judgment and decision-making (Chen and Rao, 2002; Kahneman and Tversky 1979). To our best knowledge, we are the first to examine how reference points for price discounts on different products shift over a single shopping trip.

Third, we add to understanding of in-store and sequential decision-making (Dhar et al., 2007; Khan and Dhar, 2006; Lee and Ariely, 2006; Sheehan and Van Ittersum, 2018) by examining how consumers' expectations and evaluative references evolve over a series of price discounts. In doing so, we not only demonstrate how consumer evaluations of numerical information are biased according to the information they have encountered previously, but we are also able to advance our understanding of how consumers evaluate price discounts at the beginning of an online shopping trip when their reference may be somewhat ill-defined and broad. These broad expectations make a discount's magnitude less predictive of consumer purchase intention at the beginning of an online shopping trip (vs. later in the online shopping trip). Furthermore, we examine how discount structure influences the summative effects of all discounts consumers encounter over a shopping trip at a retailer.

In the following section, we review the literature on price promotions and discuss their impact on purchase behavior. Then, we discuss how consumer responses to discounts are influenced by the information that consumers have encountered and propose our theoretical framework. We present three studies supporting our theoretical framework. We conclude by discussing theoretical and substantive contributions, limitations, and opportunities for future research.

2. Theoretical background

The practice of discounting a product's price in order to induce purchase behavior is one of the most widely utilized tactics by retailers (Ailawadi et al., 2001; Chandon et al., 2000; Grewal et al., 1998). In essence, discounting is a cue of added value and provides "temporary and tangible monetary incentive" for consumers to purchase specific products within particular time periods (Blattberg et al., 1995; Chandon et al., 2000, p. 65). Given that the magnitude of these incentives can be construed as the level of additional value they will gain through price discounts (Blattberg and Neslin, 1990; Erdem and Keane, 1996; Laroche et al., 2001; Mela et al., 1997), the attractiveness of a discount lies in a consumer's perceptions of its magnitude (Kahneman and Tversky 1979; Kalyanaram and Winer, 1995). As such, we investigate how and why consumers' perceptions of a price discount's magnitude are influenced by when they encounter a specific discount within a series of other discounts (e.g., during a single online shopping trip).

2.1. Discount attractiveness, price perception, and latitude of acceptance

Individual consumers tend to respond to various levels or intensities of stimuli according to their expectations (Herr et al., 1983; Mayhew and Winer, 1992; Rajendran and Tellis, 1994; Sherif, 1963; Winer, 1986). These expectations are formed from past experiences and provide consumers a basis from which to evaluate the intensities of the current stimuli (Kahneman and Tverky 1979). In line with this, research on price perception has shown that consumers base their evaluation of a focal price against the price they were expecting, and this comparison determines the attractiveness of the focal price (Klein and Oglethorpe, 1987; Kumar et al., 1998; Li et al., 2018; Mayhew and Winer, 1992; Mazumdar et al., 2005; Winer, 1986). Yet, rather than being focused on a specific price point, consumer price expectations are better characterized as a range or interval of prices that reasonably aligns with their expectations (Cheng and Monroe, 2013; Janiszewski and Lichtenstein, 1999; Kalyanaram and Little, 1994; Monroe, 1971). Consumers treat encountered prices that fall within this range as

expected and appropriate, whereas those that fall above (below) a consumer's range of expectations are considered expensive (inexpensive). Thus, consumers respond similarly to encountered prices within their latitude of acceptance for a purchase, but differently to prices outside their latitude of price acceptance (Janiszewski and Lichtenstein, 1999; Lichtenstein and Bearden, 1989; Lichtenstein et al., 1988; Mazumdar and Jun 1992; Rao and Sieben, 1992).

Although we believe consumers follow a similar process for evaluating price discounts, we suggest that there are important differences between price and price discounts. Most notably, absolute prices have idiosyncratic brand and product category variations, but many discounts are framed as percentages (e.g., 25% off) and are more easily linked with other purchase decisions (Chandran and Morwitz, 2006; Hsee, 1996). This suggests that when consumers encounter price discounts on different products in the same shopping trip, they may perceive that the discounts are related. As a result, their range of discount expectations may evolve and update according to the other discounts they have already encountered in the same shopping trip.

2.2. The range of discount expectation

Although consumers likely begin their shopping experience with relatively stable estimates of absolute prices that are relatively consistent across stores and time (Lichtenstein and Burton, 1989), we expect that price discount ranges will be wider and less well-defined. This is because consumers encounter a vast amount of discounts over many shopping experiences (Briesch et al., 1997; Chandon et al., 2000) and those discounts (e.g., 20% off, save 50%) have been applied to a variety products and in different stores. This suggests that the range of consumer expectations for discounts is larger than their range of expectations for absolute prices. To examine this, we conducted a pilot study on participants' expectations of absolute prices and price discount magnitudes for eight grocery products. As displayed in Table 1, participants seem to have tighter estimates of the absolute prices of products than the expected magnitude of price discounts.

2.3. The malleability and evolution of discount expectations

Although consumers' discount expectations are rather broad and ambiguous at the beginning of a shopping trip, we suggest that they will be influenced, and subsequently adjusted, according to the other discounts consumers have already encountered (Janiszewski and Lichtenstein, 1999; Lichtenstein et al., 1988). As a result, consumers' range of discount expectations should adjust in the direction of the prior discount, given the relevance and diagnosticity of that information (Janiszewski and Lichtenstein, 1999; Urbany et al., 1988). Therefore, while the impact of an initial discount on purchase may be weak due to the broad range of initial expectations, the magnitude of the initial discount will be integrated into consumers' future discount expectations (Helson, 1964; Janiszewski and Lichtenstein, 1999; Upshaw, 1969) and affect how attractive the next discount will be perceived (Niedrich et al., 2009).

Table 1
Consumer expecations of absolute prices and discount magnitudes.

	M_{Price}	SD_{Price}	$M_{DiscountsMag}$	$SD_{DiscMagnitude}$
Kellogg's Raisin Bran	$3.76	1.19	17.32	12.24
Eggo Waffles	$4.45	1.53	17.17	11.34
Tide Detergent	$8.06	3.19	17.34	8.82
Tostitos	$3.42	1.13	18.16	13.18
Orbitz Gum	$1.62	0.84	15.51	17.30
Wheat Thins	$3.70	1.24	16.84	11.74
Hershey's Syrup	$3.36	1.34	15.71	11.45
Progresso Soup	$2.30	1.21	19.12	16.39

NOTE.— The results of a Levene's Test for Equal Variance across each product was significant in both its raw form (as presented above) and in an adapted form (i.e., SD/M) to control for differences in scales between prices and discounts.

As a result, we suggest that a smaller (larger) discount at the beginning of a shopping trip should make subsequent promotions more (less) attractive. Therefore, a "build" structure, increasing discount magnitudes throughout the course of a shopping trip, will be more likely to yield higher purchase intentions than a "lead" structure that leads with the highest discount and decreases magnitudes afterwards. Consequently, we predict:

H1. The influence of an initial price discount on purchase intentions is smaller earlier than later in the shopping experience.

H2. Purchase intentions across a set of discounts are higher (lower) for retailers that use a build (lead) discount structure.

H3. Discount expectations mediate the relationships predicted in H1 and H2.

3. Studies

3.1. Study overview

To empirically test hypotheses 1 through 3 and provide support for our theory of how and why shoppers' reactions to price discounts evolve over a shopping trip, we conducted a series of controlled experiments. Study 1 conducted in an online grocery store provided preliminary evidence that initial discounts affect consumers' subsequent purchase intentions of discounted products (H1 and H2). Study 2 provides converging support for our theoretical account (H1 and H2). Moreover, study 2 provides evidence of mediation confirming that discount expectations drive the effect of prior discounts on purchase intentions (H3). Study 3 replicates the results of studies 1 and 2 (H1 and H2) and tests a theoretically relevant moderator, to provide more evidence for our proposed process (H3).

3.2. Study 1: Shopping in online retail store

To lay the foundation for our research, we conducted study 1 in an experimental online grocery store to examine the influence of an initial discount on a shopper's purchase intention and to see if the shoppers' propensity to purchase subsequently discounted products varies according to that initially encountered discount.

3.2.1. Design and procedure

In exchange for monetary compensation, 89 participants (M_{age} = 28.4; 53.2% women) from Amazon's Mechanical Turk took part in a two-condition (large [50% off] vs. small [10% off]) initial discount) between-subject study. Participants were asked to purchase a few items from an experimental online grocery store containing over 3,000 products, with 18 main categories and 168 subcategories. As a cover for the experiment, participants were told that, together with their roommate, they made a shopping list of 5 items they planned to get at the store: pancake mix, syrup, bread, orange juice, and dishwashing soap. Although they were told they had to purchase one item from each of those categories, they were also told they could get any other items they wanted in those categories.

Once participants were directed to the store, they immediately saw our manipulation - a promotional banner for a brand of frozen pizza discounted 10% or 50%, along with four different flavors of the promoted product that participants could easily choose to add to their cart. (Appendix A, Panel A, shows a screenshot of the home page and the promotion provided in each condition). To mitigate any demand effects, this product category (i.e., pizza) was not included on the shopping list. The five items they needed to purchase could be found by searching for the name of products or using the navigational menu at

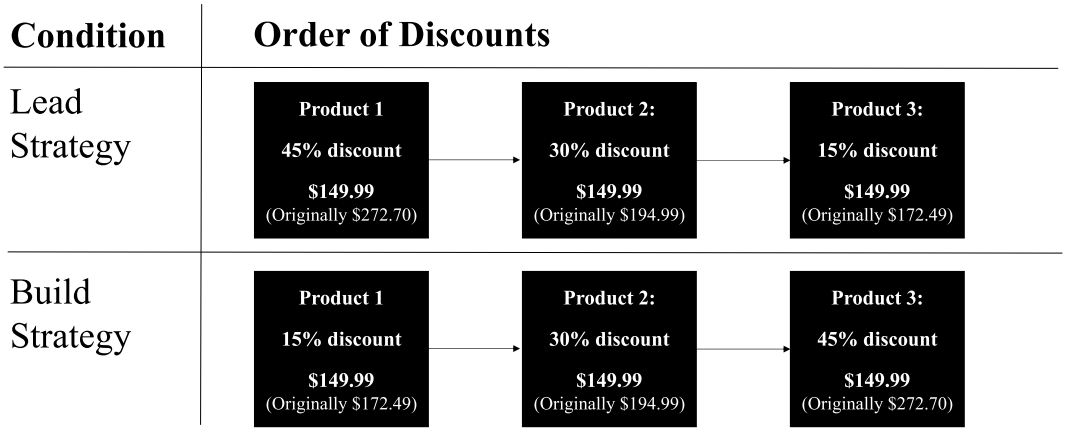


Fig. 1. Experimental design with order, discount, and price information.

the top of the page. Each product category in the store contained eight to 17 alternatives, with at least one alternative that was discounted 30% (Appendix A, Panel B, displays sample screenshots used for evaluating a product category).

3.2.2. Measures

We recorded whether each participant purchased the 10% or 50% discounted pizza on the home page to provide a preliminary test of the weak effect of an initial price discount on purchase intentions (H1). In addition, we recorded their purchases of the discounted products in the five required categories. This allowed us to test hypothesis 2 by examining (1) whether they purchased any discounted product at all (0 = purchased non-discounted products only; 1 = purchased at least one discounted product); and (2) the number of discounted products purchased.

3.2.3. Results and discussion

Consistent with hypothesis 1, participants were not more likely to purchase the initially discounted product when it was discounted by 50% versus 10% ($M_{10\%} = 0.11$ vs $M_{50\%} = 0.16$, $t(87) = -0.60$; $p = .62$). However, a logistic regression revealed that participants were more likely to purchase at least one subsequently discounted product after first seeing a small (i.e., 10%), relative to large (i.e., 50%), discount on the home page ($M_{10\%} = 64.4\%$ vs. $M_{50\%} = 40.9\%$; $\chi^2 = 4.95$, $p = .02$). Furthermore, the results of an independent sample *t*-test with the initial discount predicting the number of promoted products purchased demonstrated that consumers purchased more discounted products when the initial discount was small ($M_{10\%} = 0.80$ vs $M_{50\%} = 0.45$, $t(87) = 2.53$; $p = .01$). As differences in the magnitude of the initial discount did not lead to higher purchase incidences of that product but affected the purchase of other promoted products, these results support hypotheses 1 and 2 in a realistic shopping environment. It is possible, however, that consumers may simply have not purchased the initially promoted product because they were not instructed to do so. Furthermore, to demonstrate that the influence of a discount grows over the course of the shopping trip, we conducted our next studies.

3.3. Study 2: Changes in latitudes and discount perceptions

In this study, we manipulated whether a set of discounts followed a "build" structure (15%, 30%, 45%, respectively) or a "lead" structure (45%, 30%, 15%, respectively). This setup allowed us to compare (1) the relative influence of a small (15%) and large (45%) discount at the beginning and end of the shopping trip (H1); (2) the purchase intentions of each discount structure across the entire shopping trip (i.e., across all purchase decisions); and (3) the purchase intentions of the product with an identical discount (i.e., 30% discount that was preceded by either a small or large discount; H2). Furthermore, we also examine the process behind this effect by directly measuring consumer's discount expectations. This allows us to investigate the mediational role these discount expectations play in driving consumers' purchase intentions.

3.3.1. Participants and design

In exchange for monetary compensation, 200 participants from Amazon's Mechanical Turk completed this mixed-design experiment. The experiment was a 2 (discount structure: build [15%, 30%, 45%] vs. lead [45%, 30%, 15%]; between-subject factor) by 3 (discount order: first discount, second discount, and third discount; within-subject factor) mixed-design. For each discount, we assess participants' purchase intentions and how each discount compared to their expectations.

3.3.2. Stimuli and procedure

At the beginning of the study, participants were told they would evaluate three products that were featured in a national retailer's weekly sales advertisement. The three products presented with the discounts were a television, high-quality headphones, and a laptop computer. Each of these items was featured in a sales advertisement from a national electronics retailer with an equivalent post-discount price ($149.99). Although the order of the promotions varied according to prior-discount condition, we randomized the products that were paired with those discounts to control for product-specific effects. Thus, some participants saw product one discounted first for 15%; others saw it last with a 45% discount. For each product, participants saw the brand name and model of the product, the original price, the discount percentage, and the final discounted price (Fig. 1).

After viewing a product and its discount, participants indicated their purchase intentions on a 7-point scale (1 = *not at all likely* to 7 = *very likely*). Next, participants were asked to determine whether each discount fell within a participant's discount expectations to examine our proposed underlying process. Although the majority of literature on consumers' latitude of acceptance would infer one's range of acceptable discounts from a consumer response to those discounts (i.e., purchase intention, which is our dependent variable), we measured discount expectations directly by whether each discount fell within (or above or below) their range of discount expectations (below expectations = 1; within the range of expectations = 2; higher than expectations = 3).

3.3.3. Results

3.3.3.1. Purchase intentions. To test our predictions, we conducted a repeated measures ANOVA with the order of purchase decisions as a within-subject factor, discount structure as the between-subject variable, and purchase intentions as the dependent variable. Consistent with our expectations, the analysis revealed a main effect of discount structure on purchase intentions ($M_{Lead_Structure} = 3.90$ vs. $M_{Build_Structure} = 4.52$; $F(1, 199) = 10.16$, $p < .01$), suggesting that

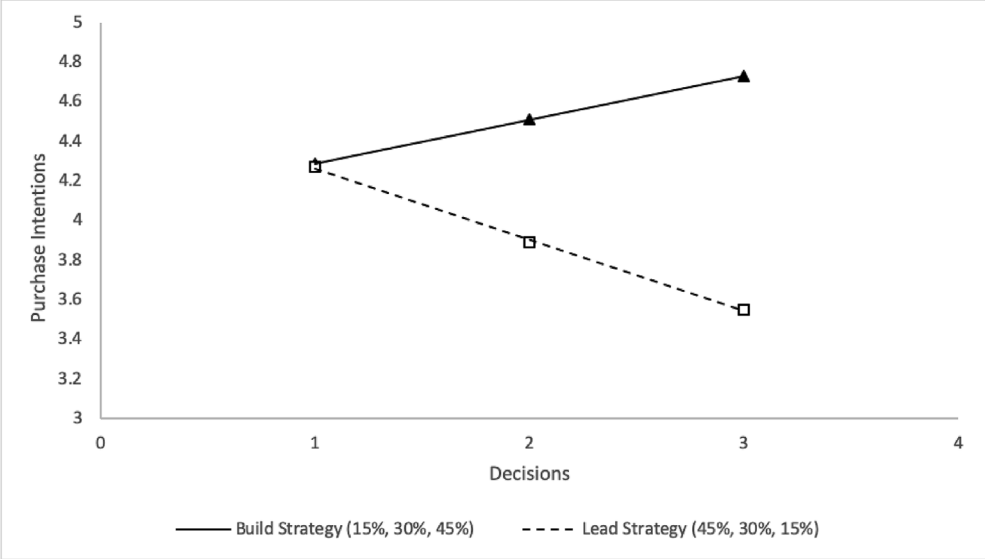


Fig. 2. Purchase intentions by discount structure.

retailers can increase consumer's purchase intentions (across all three products) by presenting consumers discounts with a "build" (vs. "lead") structure.

More critical to our purpose, the interaction effect is also significant ($F(1, 199) = 13.88$; $p < .001$; Fig. 2). Consistent with hypothesis 1, the difference in purchase intentions between a small and a large discount was significant in the third decision ($M_{15\%} = 3.55$ vs. $M_{45\%} = 4.75$; $F(1, 199) = 20.59$; $p < .001$), but not in the first decision ($M_{15\%} = 4.29$ vs $M_{45\%} = 4.27$; $F(1, 199) = 0.01$; $p = .91$). Consistent with hypothesis 2, participants were more likely to purchase the middle product, with a 30% discount, when it was presented after a smaller 15% discount rather than a bigger 45% discount ($M_{Lead_Structure} = 3.89$ vs $M_{Build_Structure} = 4.51$; $F(1, 199) = 5.93$; $p = .02$).

3.3.3.2. Discount expectations. A repeated measures ANOVA on the expectations measures provided similar results. Consistent with our theorizing, there was a significant main effect of discount structure ($M_{Lead_Structure} = 2.01$ vs. $M_{Build_Structure} = 2.21$; $F(1, 199) = 13.47$, $p < .01$), and a significant interaction between discount structure and order of discounts ($F(1, 199) = 57.16$, $p < .001$). Individual regressions demonstrate that, as participants moved through a shopping trip, discounts were more likely to exceed participants' expectations with the build structure ($b = .25$, $SE = 0.05$; $t = 5.39$, $p < .01$), and more likely to fall below a participant's discount expectations with the lead structure ($b = -0.21$, $SE = 0.04$; $t = -5.11$, $p < .01$).

A bootstrapping procedure (PROCESS model 7, Hayes, 2017) with 5,000 resamples (IV = order of discount; mediator = comparison to discount expectations; DV = purchase intentions; Moderator = discount structure [0 = lead, 1 = build]) confirmed that participants' purchase intentions were driven by how each discount compared to their expectations. There was a significant main effect of order ($b = -0.21$, $SE = 0.04$; $t = -4.98$, $p < .01$), a significant effect of discount structure ($b = -0.70$, $SE = 0.13$; $t = -5.29$, $p < .01$), and a significant interaction between the two ($b = 0.46$, $SE = 0.06$; $t = 7.44$, $p < .01$) on whether a discount fell within a consumer's range of discount expectations. Discount expectations, in turn, significantly predicted consumer purchase intentions (mediator - > DV: $b = 0.95$; $SE = 0.11$, $t = 8.49$, $p < .01$). Furthermore, we find a negative indirect effect of how a discount compared to a participant's range of expectations on their purchase intentions with the lead structure (95% CI: −0.31, −0.11), and a positive indirect effect with the build structure (95% CI: 0.14, 0.34), suggesting the positive (negative) change in purchase intentions over a shopping trip is driven by how a build (lead) discount structure changes consumers' discount expectations.

3.3.4. Discussion

The results of Study 2 suggest that consumers' purchase intentions were less influenced by a discount's magnitude in the first purchase decision than in later purchase decisions, supporting hypothesis 1. In addition, we find that purchase intentions varied according to a retailer's (lead vs. build) discount structure, supporting hypothesis 2. Our process measures demonstrate that participants' purchase intentions were shaped by how each discount compared to their discount expectations, and how these expectations evolved over the series of discounts according to the discount structure, supporting hypothesis 3. Specifically, compared to a lead structure, a build structure seems to constrict the range of expected discounts in the future, which boosts the effectiveness of the discounts later in the shopping experience. This finding is consistent with our argument that consumers have broad expectations at the beginning of their shopping experiences before calibrating their expectations according to the discounts they encounter.

If our theory is correct and a consumer's range of discount expectations changes according to the magnitude of prior discounts, we should be able to counter the observed effect of discount structure by giving consumers *a priori* knowledge about the discounts they will encounter (Spencer et al., 2005). In other words, we should obtain more support for our conceptual framework by demonstrating that (1) consumers' initial broad and abstract expectations minimize the influence of an initial discount on purchase intentions, and (2) consumers rely heavily on previously encountered discounts when evaluating subsequent discounts, but only when consumers lack knowledge of the range of discount magnitudes they may encounter and not when they have knowledge of the range. We examine this prediction next.

3.4. Study 3: Discount range knowledge as a moderator

Study 3 builds off the findings of the previous studies and tests whether explicit information about the range of a store's discounts moderates the dynamic influence of discount structure on purchase intentions over the course of an online shopping trip by setting consumers' expectations at the beginning of the shopping trip instead of dynamically updating consumers' expectations. Such an experience is akin to retailers providing information about the range of discounts available from a specific sale or event (i.e., "Items discounted 20–50% for President's Day Weekend"). As such, while some participants

followed procedures similar to what were used in the prior studies, others were given explicit information about the range of the discounts they would encounter. The setup allowed us to test whether this information regarding discount range would both mitigate the effect of a prior discount on the purchase intentions induced by a subsequent discount and boost the influence of a discount in the first decision.

3.4.1. Participants and design

In exchange for monetary compensation, 449 participants from Amazon's Mechanical Turk completed a mixed-design experiment in which discount order (first discount vs. second discount vs. third discount) was the within-subject variable, and discount structure (build or lead) and discount range (known or unknown) were between-subject variables.

3.4.2. Stimuli and procedure

The study was similar to study 2 with two changes. First, we removed the expectations measure. Second, we manipulated knowledge of the discounts by displaying a banner on the first screen of the survey that did or did not provide range information of the discounts (see Appendix B for stimuli).

3.4.3. Results

We conducted a repeated measures ANOVA with the order of purchase decisions as a within-subject factor, discount structure and range information as between-subject variables, and purchase intentions as the dependent variable. Recall that we expected that a "build" discount structure would result in higher purchase intentions than a "lead" discount structure, but only when range information was not known. To test this prediction, we investigated participants' aggregate responses across the entire shopping trip. When looking at participants' aggregate purchase intentions, the results of a repeated measures ANOVA with discount information and discount structure as between-subject factors, and purchase decision as a within-subject factor, show a significant interaction between discount information and discount structure ($F(1, 445) = 3.97$; $p = .04$). Follow-up analyses show that this is driven by the influence of discount structure when the range of discounts is not known ($M_{Lead_Structure} = 3.57$ vs $M_{Build_Structure} = 4.08$; $F(1, 445) = 9.60$; $p < .01$). This difference is not significant when the range of discounts is known ahead of time ($M_{Lead_Structure} = 3.80$ vs $M_{Build_Structure} = 3.85$; $F(1, 445) = 0.42$; $p > .83$).

To further understand the influence of knowing the range of discounts on the effectiveness of the different discount structures, we examined the evolution of purchase intentions within the series of discounts and found a marginally significant three-way interaction between the order of the purchase decisions, discount structure, and knowledge of discount range ($F(1, 445) = 2.75$, $p = .09$; Fig. 3). Follow-up analyses show that this interaction is driven by the moderating influence discount range information has on the first two purchase decisions.

In the first decision, there was a significant interaction between discount structure and discount range ($F(1, 445) = 17.16$, $p < .01$). Follow-up analyses show that participants' purchase intentions for the first discount were only significantly different when participants had range information ($M_{45\%} = 4.29$ vs. $M_{15\%} = 3.23$, $F(1, 445) = 3.78$; $p = .05$), but not when range information was absent ($M_{45\%} = 3.96$ vs. $M_{15\%} = 3.72$, $F(1, 445) = 1.71$; $p = .19$). These findings suggest that discount magnitude was more important in the first decision when participants were given an explicit range to evaluate the initial discount. When examining the second decision, in which the discounts were identical, there was a marginally significant interaction ($F(1, 445) = 12.41$, $p = .06$). Follow-up analysis demonstrated there was a marginally significant difference in the purchase intentions of participants when discount range information was absent ($M_{Build_Structure} = 4.02$ vs. $M_{Lead_Structure} = 3.43$; $F(1, 445) = 7.37$; $p < .01$), but not when range information was present ($M_{Build_Structure} = 3.73$ vs. $M_{Lead_Structure} = 3.84$; $F(1, 445) = 1.29$; $p > .70$). These results suggest that when consumers have knowledge of the discount range they do not update their expectations according to the initial discount they encounter; thus, the benefit of a "build" structure is negated. Together, these results support our prediction that providing discount range information mitigates the dynamic effect of discount structure on purchase intentions during a shopping trip.

3.4.4. Discussion

The results of this study provide further support for our proposed theoretical framework. When we examine the response of participants who lacked information about the range of discounts they would encounter, the results replicate the findings of the previous studies. When consumers were given explicit information about the range of the discounts they would encounter (e.g., "prices discounted 15%–45%"), however, the discount dynamics over a shopping trip and the benefits of a "build" discount structure are mitigated. This supports the notion that consumer expectations appear to drive discount evaluations and purchase intentions.

4. General discussion

Given its profitability implications, an optimal price discount strategy has always been a top priority for retailers. The advent of machine learning technologies enables online retailers to personalize what information consumers are exposed and control the order in which information is presented to individual consumers (Wedel and Kannan, 2016; Bradlow et al., 2017). Therefore, an important but understudied research question is whether online retailers can structure their discounts to affect consumer purchase. Although past research has illustrated many factors that influence consumer responses to online price discounts, this research demonstrates that special consideration

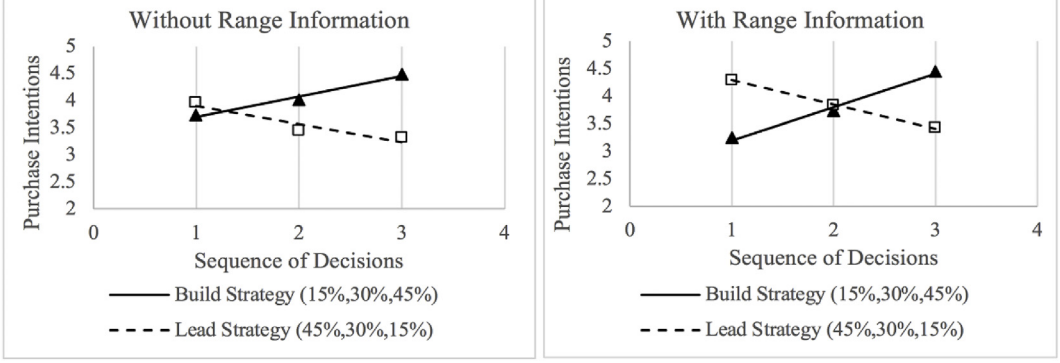


Fig. 3. Purchase intentions by discount structure and discount knowledge.

must also be afforded to how these discounts are structured within a consumer's shopping trip. Specifically, our findings demonstrate that the influence of an online discount varies over a shopping trip according to evolving expectations consumers have about upcoming discounts. Although normative theory and conventional wisdom suggest that the attractiveness of a discount should be primarily based on the magnitude of the discount itself, our results show that this is not always the case. Specifically, our findings suggest that the influence of a discount's magnitude on purchase intention is muted at the beginning of a shopping trip because consumer expectations have not yet been calibrated. Yet, as consumers progress through their online shopping trip and their expectations become calibrated according to the discounts they encounter, a discount's magnitude becomes more predictive of purchase intentions.

Past price research has focused on antecedents and consequences of promotions and discounts, such as how product- and promotion-level factors (i.e., product type, discount framing) or individual differences influence consumer responses to discounts (Ailawadi et al., 2001; Palazon and Delgado-Ballester, 2011; Trusov et al., 2009). For example, some researchers recommend using percent off for utilitarian products but freebies for hedonic products (Chandon et al., 2000; Khan and Dhar, 2010). Although some recent research has suggested that some consumers with extra money left in their budget are more likely to purchase discounted items at the end of the shopping trip (Stilley et al., 2010), research has yet to examine how online discount attractiveness can vary according to other discounts that consumers encounter over a shopping trip. Furthermore, research is lacking on how consumers respond to promotions at different times in an online shopping trip and how early promotions may set the stage for subsequent promotional responses.

Our research contributes by attempting to fill the void and showing that the relationship between a discount's magnitude and purchase intentions dynamically evolves over an online shopping experience. Our findings show that consumers begin an online shopping trip with relatively broad and ambiguous discount expectations. In fact, our findings demonstrate that consumers are less influenced by a discount's magnitude at the beginning of a shopping trip. Over the course of the trip, however, they calibrate their expectations according to the discounts they have already encountered. Thus, the structure in which a set of discounts is presented influences not only the effectiveness of an individual discount (according to the discounts that preceded it), but also the effectiveness of the entire set of discounts (i.e., aggregate purchase intentions).

4.1. Managerial implications

A better understanding of how price discounts influence consumer perceptions and online sales has important implications for retailers. Our findings demonstrate how consumer responses to a given price discount are contingent on (1) what other discounts they have already encountered, and (2) what information they have about the range of discounts. This research shows that retailers can leverage the structure of a sequence of discounts to optimize their overall discount strategy.

Furthermore, at a time when both the frequency and magnitude of online price discounts in the marketplace seem to be increasing (Wahba, 2016), understanding discount dynamics allows retailers to maximize the effectiveness of given promotions, while minimizing their costs. Specifically, it provides retailers guidance on how to position discounts with varying magnitudes in relation to each other to maximize a given discount's effectiveness, and tactics to mitigate the effect if one's discount structure or placement is less favored. For example, many retailers provide discount range information in promotional emails (e.g., "Prices discounted between 15% and 50% storewide") to encourage purchases. However, providing customers with discount ranges limits the effectiveness of a retailer's build strategy and can therefore limit the success of a promotion campaign.

Given that marketing budgets are limited, understanding these dynamics allows retailers to more effectively manage their portfolio of discounts by varying a discount's magnitude in situations where it will help the most. Managing each discount's magnitude can also have downstream consequences, as it will help retailers manage consumers' future price expectations for the products after the discount period. Thus, understanding these discount dynamics helps minimize consumers' future price expectations that are unfavorable to retailers (Mayhew and Winer, 1992).

4.2. Directions for future research

Although we have demonstrated the potential benefits of implementing a build strategy across studies, it is likely that there are contexts and situations that will mitigate or alter the effects of these discount dynamics. One important factor to consider is a consumer motive in the shopping trip, such as whether they are in browsing or purchasing mindset. Not only could this practically influence how much information consumers view, but this could also influence how they process the promotional information they encounter. It could be that small discounts offered in the beginning of a build strategy may not encourage a shopper to browse a retailer's website. Alternatively, it could also be possible that any discount cue, regardless of its magnitude, may be sufficient to encourage consumers to browse a website and that a gradual increase in the magnitude of discounts could even incentivize shoppers to keep shopping. Future research should investigate the effectiveness of lead and build strategies for consumers with these and other motivations.

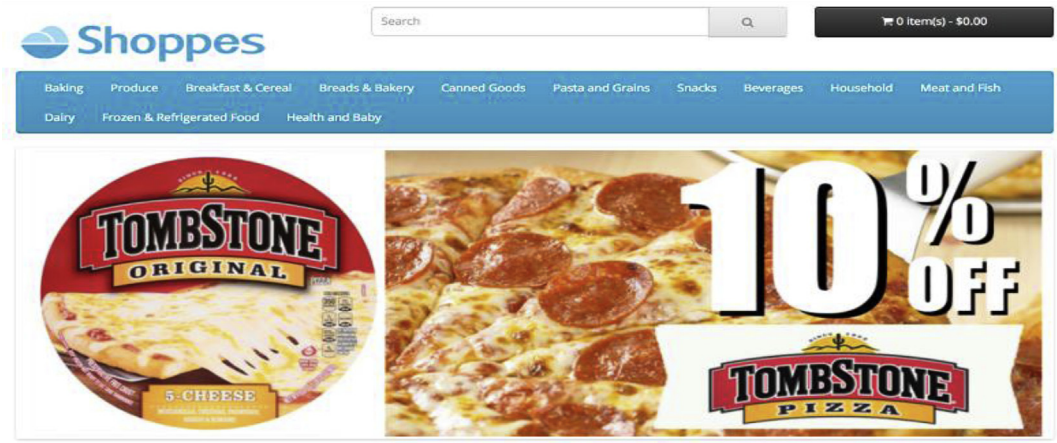
Another research opportunity is to examine how the specific influence of these discount strategies may be contingent on consumers' preexisting impressions of the retailer. Our results demonstrate that promotions both influence consumers' expectations and subsequent effectiveness of other promotions. This suggests the effectiveness a retailer's discount strategy is driven by what expectations, if any, consumers have about the retailer's promotional level before shopping. Not only could a shopper's initial impression of a retailer influence their discount expectations, but a shopper's experience with that retailer may also influence the malleability of consumers' discount expectations and the likelihood that the documented discount dynamics will occur, such as whether the retailer is known for offering small or large discounts (i.e., EDLP vs. HILO). For example, a loyal customer of a retailer who always offers small discounts may actually benefit more from a lead strategy as a large discount would be perceived as attractive and would not be considered typical. Furthermore, loyal shoppers may purchase the product but not increase their future discount expectations because their discount expectations are already calibrated. This means that subsequently encountered moderate discounts, albeit smaller than the initial discount, may still be considered attractive. As such, additional research is needed to better understand how a consumers' preexisting impression of a retailer influences consumer reactions to different discount strategies.

Another interesting finding from this research is aligned with research showing that consumers respond similarly to varying magnitudes of discounts (Gupta and Cooper, 1992). When this research was published 25 years ago, the differential threshold was thought to be 15%–30%, but our results suggest that the range may now be much larger. This may be due to the growth of internet shopping and an increased level of online discount activities. Although our results clearly demonstrate that a discount's magnitude has more impact toward the end of an online shopping trip, more research is needed to better understand these thresholds and the factors that may influence them. For example, it may be that consumers have different thresholds, and thus evaluate discounts differently, depending on whether they made the purchase in isolation or as part of a series of purchases. Stated differently, shoppers may respond to discounts differently if they are planning to make one purchase or many.

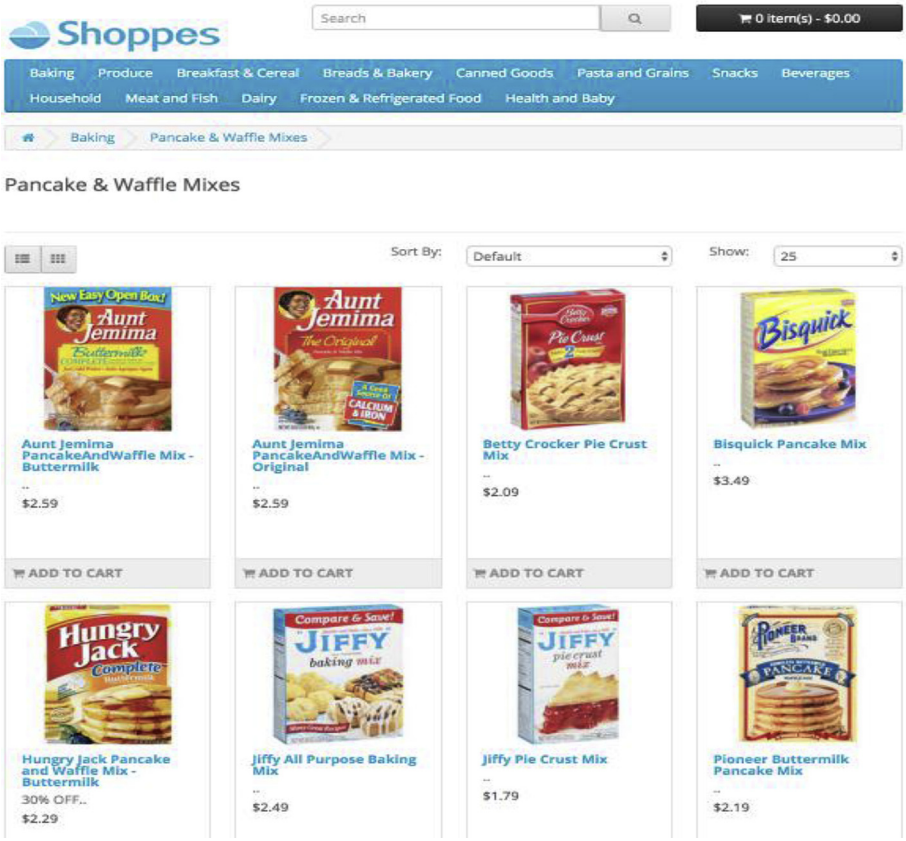
A related opportunity for future research would be to determine how these dynamics influence the number and type of purchases consumers make on retailer's websites. Although the majority of our studies measured consumers purchase intentions, this would likely translate into more purchases of the promoted products. The consequence of these discounts may be even more dramatic if one considers how they would impact other consumer purchases. Research has shown that consumers may spend additional money and purchase more products if they feel that they are saving money and getting a better deal on the products they are purchasing (Janakiraman et al., 2006; Stilley et al., 2010). This also may suggest that these additional gains will come largely in the form of unplanned purchases.

One final avenue for future research is to examine the extent to which each purchase decision, and attached discount information, are related to one another. In this research, we focused on discounts that occur in the same shopping trip. Given that consumers tend to base expectations and evaluations on information that is relevant to their current evaluations, it is likely that the relatedness of these purchases influences how consumers update their expectations and evaluate new discounts. For example, the effects may manifest more often when consumers scan multiple stores for the same product (e.g., searching for tires at three websites), rather than when they shop for distinct products in different environments.

Appendix A. Study 1 Stimuli



Panel A. Example Home Page (with 10% discount):



Panel B. Sample Screenshots:

Appendix B. Study 3 Stimuli

Stimuli with (without) discount range information on left (right):

Stimuli with (without) discount range information on left (right):



Appendix C. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jretconser.2019.06.001.

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