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The effects and mechanism of discounting unit price

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The Effects and Mechanism of Discounting Unit Price

Structured Abstract

Purpose – Supermarket promotions typically use a *standard* label, which displays the regular price, discounted price, and discounted unit-price. Visits to supermarkets across multiple countries found that none used a price label that also contains the regular (i.e., pre-discounted) unit-price. This study investigated the effectiveness of a *dual unit-price label* that includes the regular unit-price as a reference price, and what underpins its efficacy in enhancing promotion attractiveness.

Design/methodology/approach – We executed four studies, supported by three supplemental studies. Study 1 established external validity through a natural instore experiment. Study 2 and 3 tested the dual unit-price label with different pack sizes and assortment sizes, respectively. Finally, Study 4 tested the underpinning mechanism of the efficacy of the dual unit-price label.

Findings – In Study 1, daily sales records over four weeks showed that dual unit-price label promotions had larger sales volume than standard-label promotions. Study 2 showed that a larger pack size, a heuristic cue for greater economy, increased preference for dual unit-price label promotions. Study 3 similarly found that the dual unit-price label was preferred more as cognitive load was increased by assortment size. Finally, Study 4 demonstrated the dual processing of the dual unit-price label, using a conscious preference measure (information provided) and an unconscious implicit attitude test.

Research limitations/implications – Unit-price research has mainly considered a cognitive process. We demonstrated the importance of considering a heuristic process.

Practical implications – Supermarkets can use this simple and yet effective tool to improve promotion effectiveness.

Originality/value – Our findings offer a new and easy tool to enhance sales promotions, which academic research and managerial practice had never considered previously.

Keywords: Unit price; shelf labels; sales promotions; dual processing; heuristic cues

Paper type: Research paper

Introduction

In the highly competitive retailing environment, promotional discount strategies are an effective way to attract buyers, and influence consumer behaviour (Chen *et al.* 1998; Iyer *et al.* 2020; Ofosu-Boateng 2020; Sinha and Smith 2000; Urbany *et al.* 1988). Supermarket shelf-labels would normally highlight the value or extent of the discount to consumers by displaying the regular price together with the discounted price (Figure 1). Researchers have typically drawn on the theory of reference price framing to explain why displaying both prices is highly effective in influencing the perceived value of advertised products (Chandrashekaran 2004; Lichtenstein *et al.* 1991; Urbany *et al.* 1988; Yun and Suk 2022). This is consistent with a meta-analysis of the literature on price framing, which shows that the regular price provides a reference which enhances the perceived value of promoted deals (Krishna *et al.* 2002). Greenleaf (1995) similarly suggests that appropriately framing the reference price, in order to accentuate different discount levels at different times, can even increase the profitability of products under price promotions.

Insert Figure 1 here

Meanwhile, showing the unit price is another effective retail pricing tool (Bogomolova *et al.* 2020; Yao *et al.* 2020). Unit prices are prices per standardised unit of measure (e.g., $2.50 per pound), and consumers use them to numerically compare competing offerings and determine the most economical one (Houston 1972; Russo *et al.* 1975). Yan *et al.* (2014) also demonstrated that the unit price is more diagnostic than the actual price in a product-quality judgment task. However, academic research into unit-pricing (e.g., Bogomolova *et al.* 2020; Yao and Oppewal 2016b; Yao *et al.* 2020) typically involves unit-price labels (i.e., the left label in Figure 1), which displays the regular and discounted price,

together with the unit-price *after discount* (we refer to this typical label with just the discounted unit-price as a *standard label).* That is, the standard label contains only one unit-price information, which is the unit-price after discount.

However, if the regular price acts as a reference anchor to heighten the discount deal, then why isn't the same approach used with the unit price? That is, would displaying the regular unit price (i.e., before discount) along with the discounted unit-price be more effective than just displaying the discounted unit-price alone? (we term this label with both the regular and the discounted unit-prices as the *dual unit-price label* (i.e., the right label in Figure 1). For example, if the dual unit-price label displayed the regular and discounted unit prices of a clothes detergent in terms of cost per wash, consumers could easily determine that washing a load of clothes with Brand X would now cost them 40 cents per wash, instead of the regular price of 55 cents per wash. Although consumers can still calculate the regular unit price, given the regular price and the packaging size, studies have shown consumers may not find this calculation easy and often get the calculation wrong (Tan and Bogomolova 2016; Yao *et al.* 2020). Besides, outside of lab studies, consumers often shop under time pressure and have little motivation to carry out this effortful processing (Hoyer 1984; Yao and Oppewal 2016b).

In this research, we examine the potential merits of this dual unit-price label and explore the underlying mechanism of its effects via four experiments, further supported by three supplemental studies (in the web appendix). First, to provide externally valid evidence of the efficacy and practical feasibility of the dual unit-price label, Study 1 was a natural in-situ experiment in a real supermarket. Its results show how different pricing labels impacted actual sales volumes for two product categories over a four-week period.

Via two online experiments that mimicked the supermarket shopping experience, we then tested two brand strategies commonly used in supermarkets, pack size and assortment

size, as potential moderators of the effectiveness of the dual unit-price label. Larger packaging size typically suggests greater economy to consumers (Aurier and Mejía 2021; Ilyuk and Block 2016; Yan *et al.* 2014), and exploitation of this heuristic (Yao *et al.* 2020) was one of the reasons why unit price labels were first introduced (Houston 1972; Lamont *et al.* 1972; Russo *et al.* 1975). Study 2 examined the efficacy of the dual unit-price label using products with small versus large pack size. Prior research has found that standard unit-price labels are used more often under conditions of high cognitive load, such as time pressure (Yao and Oppewal 2016b). Hence, Study 3 extended this research with a new manipulation of cognitive load, larger assortment size (Oppewal and Koelemeijer 2005), to test whether cognitive load enhances preference for products with the dual unit-price label.

The dual unit-price label may increase value perceptions in two ways (Inman *et al.* 1990). First, consumers may consciously use the regular unit-price as a reference to compare with the discounted unit-price. Second, consumers may unconsciously process the dual unit-price label as a heuristic cue signalling that the product is being discounted, and hence represents a good deal, even without evaluating the actual discount. Prior research has shown that numerical anchors, such as reference prices, may be processed consciously or unconsciously (Wegener *et al.* 2010). Study 4 thus seeks to determine whether, and under what circumstances, the dual unit-price label provides additional information or merely serves as a heuristic cue.

In carrying out these four studies, we extend prior works on consumer responses to unit-price labels and make several key contributions. At the core is our novel proposition of a unit-price label that displays both the regular and discounted unit-price. An effective dual unit-price label would offer marketers a virtually free tool that is easy to implement. Yet, academic research and managerial practice have never considered this idea previously. An important contribution of our research was in carrying out Study 1 in-situ in an actual

supermarket with real products on shelves. Compared to studies that solely relied on hypothetical shopping experiences with online panel or lab-based experiments (Bogomolova *et al.* 2020; Yao and Oppewal 2016a; Yao and Oppewal 2016b), Study 1 enhances the external validity of our findings.

Another contribution is in demonstrating the combining pack size and unit-price label produces a synergistic effect on consumer choice decisions (Study 2). This analysis differed from studies, such as those that tested the effects of unit-price by keeping quantity constant (e.g., Yao and Oppewal 2016a), or the effects of keeping unit-price constant by changing selling price and pack size concurrently (e.g., Yao *et al.* 2020). Furthermore, unlike Study 3, no studies have tested unit-price labels with assortment sizes, another common brand practice. Notably, some studies propose that unit-price labels may serve as a heuristic to cue choice selection (Yao and Oppewal 2016a; Yao and Oppewal 2016b), but they did not explicitly test this speculation. We demonstrated in Study 4 that consumers may process unit-price labels heuristically.

Theoretical Development

Comparative Pricing of Discount Labels

The use of comparative price advertisements, where a higher or regular price is displayed alongside a lower or sale price, is widespread in retail settings (Coulter and Coulter 2005; McKechnie *et al.* 2012; Mills and Zamudio 2018). For example, Lan *et al.* (2015) reported that almost 40% of all groceries purchased in UK supermarkets were on sale at any one time, and 68% of shoppers actively looked for discounted products. Similarly, a meta-analysis by Compeau and Grewal (1998) found that products that used comparative price advertising increased consumers' perceived value and purchase intention, while also reducing

intentions to search for competing alternatives (also see a thematic review of studies over four decades by del Barrio-García *et al.* 2020).

These studies primarily draw on the concept of a reference price to explain the efficacy of comparative advertising (Chandrashekaran 2004; Coulter and Coulter 2005; McKechnie *et al.* 2012; Yun and Suk 2022). A reference price is a standard or anchor price against which an actual price is compared (Monroe 1973). The effect of a reference price is typically explained using Helson's (1947) adaptation-level theory, which asserts that people evaluate an object (e.g., a discounted price) in proportion to how much the object deviates from a comparison reference (e.g., the regular price). There is a substantial body of evidence supporting the influence of reference price framing on consumer behaviour (e.g., see review by Mazumdar *et al.* 2005), including in a consumer packaged goods context (e.g., Chandrashekaran 2004; Kalyanaram and Little 1994).

Unit Pricing

When the U.S. legislated the requirement for retailers to display unit prices in the early 1970s, the practice was hailed as a win for consumerism (Lamont *et al.* 1972). Many other countries have similarly followed suit by mandating the practice of unit price labelling (e.g., see ACCC (2021) and CMA (2015)). Although unit-price labelling is presently not mandated or regulated by the government in Pakistan, the contextual country of this study, unit-price on labels can be found in some major supermarkets. Extensive evidence has since attested that the display of a unit price, the price per standardised unit (e.g., $1.35 per pound), allows consumers to compare competing offers and shift their preference towards the most economical choice (Houston 1972; Monroe and LaPlaca 1972; Russo *et al.* 1975; Yao and Oppewal 2016b; Yao *et al.* 2020); although some studies found no such effects (e.g., Kilbourne 1974). These studies typically lean on an information processing perspective to

reason that unit pricing facilitates cognitive processing of pricing information to guide choice decisions (e.g., Isakson and Maurizi 1973; Yan *et al.* 2014; Yao and Oppewal 2016a).

But as evidenced in academic research (e.g., Bogomolova *et al.* 2020; Yao and Oppewal 2016b; Yao *et al.* 2020), and similarly observed during visits by the authors and colleagues to supermarkets across multiple countries (Australia, Canada, Pakistan, Singapore, U.K., U.S.), *without exceptions*, discount promotion labels contain the regular and the discounted prices, together with the only the discounted unit-price (e.g., the left label in Figure 1).

As the above review shows, unit price enables consumers to select the most economic choice (Houston 1972; Monroe and LaPlaca 1972). Yao and colleagues (e.g., see Yao and Oppewal et al., 2016a; Yao and Opplewal, 2016b) similarly suggest that unit price increases price salience and makes consumers more price sensitive. It is also well-established from the review that displaying the (pre-discounted) retail price serves as a reference anchor to signal that the discounted price represents a good deal (Monroe 1973). Putting these arguments together, it thus stands to reason that displaying the regular (i.e., pre-discounted) unit-price would also serve as a reference to cue that the discounted unit-price offers the best discount deal. That is, a label with both regular and discounted unit prices would be more effective as a promotional tool than one with just the discounted unit price.

We further argue that although the regular unit price is redundant, as it can be calculated from the discounted unit-price and the discount level, putting the regular unit price on the label would similarly be a reference anchor to enhance the attractiveness of the discounted unit-price. Besides, consumers may find the calculation tedious or get the calculation wrong (Tan and Bogomolova 2016; Yao *et al.* 2020), or may not be motivated to carry out this effortful processing because they shop under time constraints (Hoyer 1984; Yao and Oppewal 2016b). By providing both the regular and discounted unit prices (e.g., the

righthand label in Figure 1), this dual unit-price label may also enhance price salience, making consumers more price-sensitive, and therefore bias their preference towards a product advertised with both unit prices (Yao and Oppewal 2016a).

Study 1 – An Instore Experiment

Following from the above review, we proposed the following hypothesis:

H1: Consumers are more likely to purchase a product advertised with a dual unit-price label than the same product advertised with a standard label.

To address this hypothesis, we conducted an in-situ natural experiment with the assistance of a mid-size privately-owned supermarket in the Pakistani city of Lahore, which sells typical supermarket goods mostly of Pakistani origin[1]. Executing this study as an in-situ natural experiment would demonstrate the practical feasibility of the dual unit-price label and enhance the external validity of this research.

Prior to executing the instore experiment, we carried out three supplementary studies (reported in the web appendix). First, as the required resources and complexity of the instore experiment were substantial, we wanted to first validate the fundamental contention of this research that a dual unit-price label would elicit more favourable consumer responses than a standard label before conducting the instore experiment. As reported in Supplementary Study A, the dual unit-price label elicited more positive evaluation and purchase intention towards the discounted product than the standard label. Further, we ruled out potential alternative

[1] All the experiments reported in this article (including those in the web appendix) were approved by the Ethics Review Board of the University of XXXX (blinded for review), Approval number: 026/2021. Informed consent was not possible for this in-store experiment, but was obtained for all the other experiments.

explanations for the effects of the dual unit-price label (past purchasing, price consciousness, consumer scepticism with promotions, age, and gender).

The second supplementary study (B) was to determine whether labels with different format were processed more or less easily. This was to ensure that the product perceptions and choice decisions were not due to ease of processing of the labels (Jacoby *et al.* 1974b; Thomas and Morwitz 2009; Yao and Oppewal 2016a) or the different formatting (Bogomolova *et al.* 2020; Feng *et al.* 2017). The results found no difference in ease of processing between the two labels. Because the dual unit-price label contained an additional pricing information (retail unit price) compared to the standard label, we executed the Supplementary Study C to determine if price salience influenced perception of discount value (Ku *et al.* 2020; Yao and Oppewal 2016a). The results suggested that price salience did not play a role in how consumers perceived the product's value of discount.

Following these supplementary studies, an author visited the supermarket to identify suitable products. We chose two perishable product categories with short shelf-life (fresh milk and bread) that are frequently purchased so that the large sales quantities would facilitate statistical analyses. As the participating supermarket carried only four brands for each of these categories, the total sales for the four brands represented the category sales. All the brands were of local Pakistani origin, thus eliminating potential bias due to consumer ethnocentrism (Shimp and Sharma 1987) or brand foreignness (Leclerc *et al.* 1994). All milk products were sold in standard one-litre paper packaging, and the bread products were standard loaves weighing about 750 grams, with about 15 slices in each package. Over a four-week period, we captured the daily sales quantity for the three brands (Brands A–C) plus a control brand (Brand D) in each category (see Table 1). We also measured the daily sales for an additional control brand, in a third category (tea bags); we explained its purpose later.

Insert Table 1 here

A research assistant visited the supermarket each Monday morning prior to the shop opening to arrange the shelf-labels according to the design in Table 2. Over the four-week period, each brand's daily sales volume (by units) was supplied by the supermarket, from the electronic cash register system. Throughout the four weeks, the regular prices across all products remained constant, and there were no other promotions, advertisements, or point-of-sales displays for these products.

Week 0 was the baseline week, when all products were sold at their regular price without discount. After establishing the baseline, in the following three weeks, the shelf-labels for three brands (A, B, C) were rotated using a Latin-square design, such that each brand was assigned a no-discount label, a standard label, and a dual unit-price label once over the three-week period (see Weeks 1–3 in Table 2). Brand D used the no-discount label for all four weeks, i.e., brand D was a control brand that was not discounted throughout the experimental period.

Although we carried out this experiment over a four-week period that did not include any special events or holidays on the Pakistani calendar, we used control brands to determine whether the variations in sales might be due to some timing or seasonal effects. To do this, we monitored the daily sales of a control brand from each of the two main categories, and the daily sales of a non-discounted brand from another category (tea bags) for the same four-week period.

Insert Table 2 here

Results

The dependent variable, average daily quantity sold, was not normally distributed (skewness = 2.0), so we applied a natural log transformation to make its distribution more normal (skewness = 0.03). First, as the experiment took place over four weeks, we tested for confounding timing or seasonal effects, using the data from all three control brands (see Table 1). A 4 (week: 0, 1, 2, 3) × 7 (day) repeated measures ANOVA revealed no significant effects of week ($F(3, 6) = 2.49$, $p = .16$), day ($F(6, 12) < 1$), or the week × day interaction ($F(18, 36) = 1.23$, $p = .29$). This suggested there were no issues due to timing or seasonal effects.

Next, we tested the effects of the different labels across weeks 1 to 3 of the experiments. As expected, there was a large and significant effect of week—because the discount labels varied across weeks—in the two treatment samples: the bread category ($F(3, 6) = 15.38$, $p = .003$, $\eta_p^2 = .89$) and the milk category ($F(3, 6) = 13.49$, $p = .004$, $\eta_p^2 = .87$). We concluded that because the effect of the labels occurred in both product groups, we could combine the data from both groups to increase sample size for the main analysis.

Two additional findings were noteworthy. First, it appeared that promoting one or more brands of a category had boosted the total category sales, compared to when no brands were promoted (see Table 3). Average daily sales of bread for Weeks 1-3 ($M = 34.33$) were significantly higher than when no bread brands were discounted, during Week 0 ($M = 23.57$; one-sample t-test, $t(20) = 12.23$, $p < .001$). The results were similar for average daily sales of milk for Weeks 1-3 ($M = 55.76$) compared with Week 0 ($M = 42.38$; one sample t-test, $t(20) = 8.50$, $p < .001$). The extra buying of the promoted brands would explain the slight dip in sales for the no-discount label brands (see Figure 2), and the negative effect of the dual unit-price label on control brand sales (see Table 3).

Insert Table 3 here

Second, using the sales in Week 0 as the baseline market share for each brand, the smaller brands seemed to enjoy a bigger boost in sales with the dual unit-price label compared with the bigger brands (see the % growth for Brand B for both products in Table 3). This latter finding is consistent with prior research suggesting that weak brands tend to gain more from sales promotions than strong brands do (Guadagni and Little 1983; Raju *et al.* 1990).

To test the effects of the labels on daily sales, we first re-arranged the weekly data to align with the levels of the label manipulation (see Table 1). A 4 (label: baseline, no-discount, standard-label, dual unit-price-label) × 7 (day) repeated measures ANOVA revealed a significant effect of label ($F(3, 15) = 34.69$, $p = .001$, $\eta_p^2 = .87$), but no significant effects of day, or the label × day interaction (both $F < 1$). Mauchly's test of sphericity was significant ($\chi^2(5) = 17.29$, $p = .005$), so we used Huynh-Feldt corrected significance tests. Planned Helmert contrasts revealed a significant difference ($F(1, 5) = 11.33$, $p = .02$, $\eta_p^2 = .69$) between the baseline ($M_{\text{baseline}} = 7.31$, $SE = 0.25$, 95% CI [3.70, 13.69]) and the three experimental conditions ($M_{\text{no-discount label}} = 4.16$, $SE = 0.34$, 95% CI [1.45, 9.87]; $M_{\text{standard label}} = 9.58$, $SE = 0.24$, 95% CI [5.06, 17.49]; $M_{\text{dual unit-price label}} = 22.82$, $SE = 0.20$, 95% CI [13.97, 36.91]). There was also a significant difference between the no-discount label and the two discount-label conditions ($F(1, 5) = 29.12$, $p = .003$, $\eta_p^2 = .85$); and between the standard label and the dual unit-price label ($F(1, 5) = 214.32$, $p < .001$, $\eta_p^2 = .98$). Figure 2 illustrates this result graphically. Table 3 lists the results for the individual brands, including the control brand from each category. The pattern of results for the aggregate test, in which sales with the dual unit-price label were higher than sales with a standard label, or no label, or during the baseline week, were replicated in both categories (bread and milk), and for all three test brands in both categories. Collectively, these results supported hypothesis H1, which

proposed that the dual unit-price label would lead to greater sales, because it would elicit more favourable consumer responses than a standard label.

Insert Figure 2 here

Study 1 demonstrated, with high external validity, that the dual unit-price label worked better than a standard label in a real-world supermarket. The next two studies tested the moderating effects on the effectiveness of the dual unit-price label, of two brand strategies commonly used by consumer goods in supermarkets, varying pack size (Study 2) and assortment size (Study 3).

Study 2 – Synergistic Effect of Pack Size on Dual Unit-Price Labels

Research, and common consumer knowledge, attests that a large pack-size is typically associated with economies of scale, quantity discounts, fewer transactions, and therefore better value for money because they are cheaper on a per unit basis (Ilyuk and Block 2016; Prendergast and Marr 1997; Silayoi and Speece 2004). Indeed, unit-price labels were introduced to prevent brands from exploiting this association (CMA 2015; Russo *et al.* 1975). Study 1 showed that dual unit-price labels increase sales, because they elicit more favourable consumer responses than a standard label. In Study 2, we begin our examination of what these favourable responses are, which mediate between exposure to a dual unit-price label and greater sales. One potential favourable response is that a dual unit-price label increases the perceived value of the discount, even when a standard label shows the same discount. Another speculation tested in Study 2 is that this increase in perceived value does not have a ceiling, but can be further increased when combined with the higher perceived discount associated with a larger pack size (Prendergast and Marr 1997; Silayoi and Speece 2004). If

pack size increases the effect of a dual unit-price label, that would also suggest that pack size and unit-price labels are both heuristic cues that influence perceived value (as suggested by Yao and Oppewal 2016a; Yao and Oppewal 2016b). Study 2 tested whether the presence of a dual unit-price label would interact with a large pack size, such that the effect of the dual unit-price label will be stronger when it promotes a larger pack size. Since Study 1 was the first study to test the effects of dual unit-price labels, we have no previous literature to support a hypothesis about this potential interactive (or synergistic) effect. Instead, Study 2 tests the following research question:

RQ1: Is there a significant interaction between the presence of a dual unit-price label and a larger pack size, such that the label's effect, on the perceived value of the discount, will be larger when a dual unit-price label is used on a larger pack size, versus a smaller pack size?

Experimental Design and Stimuli

For stimuli, we selected toilet rolls sold either as a 4-roll (small) pack or a 24-roll (large) pack. To minimize potential brand effects, the products were digitally created with a fictitious brand name (*Fluffy).* We priced the 4-roll product as it would realistically be priced in Pakistani supermarkets. However, we adjusted the price of the 24-roll product so that the unit-price was identical to the 4-roll product (i.e., the large pack was not more economical). The labels for both products indicated a 20% discount off the regular price.

This study was conducted as a hypothetical shopping experience via an online survey with consumers in Pakistan. Data collection took place via a snowballing approach within Pakistan, where an author of this study first asked two university colleagues to complete an online survey before requesting them to share the survey link with others. To test our

research question, the experiment used a 2 (label: dual unit-price vs standard) × 2 (pack size: small vs large) between-subjects design, with the participants randomly allocated to one of the four groups. Each group saw just one combination of label and pack size. Out of 178 participants who took part in the survey, six cases were deleted for missing data, yielding a final sample size of 172. Table 4 shows the sample size for each group, together with its demographic characteristics.

Insert Table 4 here

At the start of the online survey, participants first read an introduction stating that a product that they were about to see was on promotion in a supermarket near them. They were to imagine that they were shopping at the supermarket and were interested to buy the promoted product. They were then asked to look at the displayed product and its shelf label, before responding to four 7-point items measuring their perceived value of the discount (VOD) for the product (Sinha and Smith, 2000; Cronbach's $\alpha = .86$). Finally, participants responded to potential covariates: purchase intention (single-item), age and gender. As there were no differences between groups on these potential covariates (all $p > .69$), they were not included in further analyses. Appendix I lists these measures.

Results

RQ1 asked whether there is a significant interaction between the presence of a dual unit-price label and a larger pack size. To test RQ1, we ran a two-way ANOVA with VOD as the dependent variable, and label (dual unit-price vs standard) and pack size (large vs small) as the fixed factors. The ANOVA results revealed significant and positive main effects of label ($F(1, 172) = 33.77$, $p < .01$, partial $\eta^2 = .17$) and pack-size ($F(1, 171) = 10.37$, $p < .01$,

partial $\eta^2 = .06$) on VOD. But these main effects were qualified by the presence of a significant and positive interaction between label and pack size ($F(1, 171) = 4.14$, $p = .04$, partial $\eta^2 = .03$). This suggested that their combined effect was synergistic rather than additive (Klink and Wu 2014).

RQ1 had asked whether this interaction, if it existed, was due to the dual unit-price label's effect being larger when used on a larger pack size. Pairwise comparisons showed that the difference between labels was larger (i.e., the slope of the label effect was steeper) when a dual unit-price label was used on a larger pack size ($M_{\text{dual unit-price label}} = 6.38$, $SD = .89$ vs $M_{\text{standard label}} = 4.77$, $SD = 1.16$, $\Delta M = 1.61$, $p < .001$, $d = 1.57$), compared to when it was used on a smaller pack size ($M_{\text{dual unit-price label}} = 5.30$, $SD = 1.60$, vs $M_{\text{standard label}} = 4.52$, $SD = 1.59$, $\Delta M = 0.78$, $p = .02$, $d = .49$). Figure 3 illustrates these results graphically, showing that the slope of the label effect was steeper for the larger pack size, not parallel as it would have been if the two effects were merely additive. Collectively, these results suggest that dual unit-price label and pack size combined synergistically to enhance perceived VOD.

Insert Figure 3 here

Discussion

The findings of Study 1 established the efficacy of the dual unit-price label over the standard label for supermarket promotions. Study 2 further showed that the dual unit-price label is more effective than the standard single unit-price label because it enhances perceptions of the value of the discount, even when the same discount is offered by both labels. Study 2 also showed that this label effect is stronger when combined with a large pack size. This suggests that pack size, and unit-price labels, are treated as heuristic cues when perceiving the value of a discount. In Study 4 below, we investigate in more depth whether

unit-price labels are treated as heuristic cues. Future replications of Study 2 are needed to shed more light on how larger pack sizes increase the perception of greater discount value offered by dual unit-price labels. Often, due to increasing costs, brands maintain prices by reducing the pack size or otherwise increasing unit price (Northrup 2017; Yao *et al.* 2020). An implication of Study 2 is that brands could effectively promote their large-sized (e.g., original-sized) products with a dual unit-price label, even though the unit price is the same higher unit price on the smaller packs, thus increasing their profitability.

Study 3 – Moderating Effect of Assortment Size on Dual unit-price labels

Besides varying pack size, another common brand strategy with consumer goods is to expand an existing product line by increasing its variety, that is, line extension (Sun 2010; Tookanlou and Wong 2020). For example, a shampoo brand might offer different fragrances, or a juice brand might have different fruit flavours. Research suggests that the number of choices available to consumers may influence their perceptions and selection (Oppewal and Koelemeijer 2005; Scheibehenne *et al.* 2010), although the findings are inconclusive. While some suggests that consumers prefer larger assortment size (Oppewal and Koelemeijer 2005), others have argued that a large assortment leads to lower satisfaction for the chosen option (Diehl and Poynor 2010).

A particular argument against large assortment size is that brand choice behaviour is a function of information load, such that information overload through the presentation of too many options would impair decision making by making accurate assessment more difficult or tedious, leading consumers to make decisions more heuristically (Jacoby *et al.* 1974a; Malhotra 1982). Similarly, an early study found that increasing complexity would lead consumers to choose more impulsively (Hendrick *et al.* 1968). Malhotra (1982) further contends that under overload conditions, consumers tend to adopt simplifying strategies or

heuristics to cope with decision tasks. Hence, we hypothesize that as assortment size increases, a dual unit-price label would be treated as a signal that a product is under promotion, and hence would increase the chances of the product being chosen:

H2: When consumers pick a product within an assortment, the larger the assortment size, the more likely that consumers would choose the product with a dual unit-price label.

Experimental Design and Stimuli

To enhance external validity, the experimental stimuli comprised nine identical 350ml bottles of shampoo with different fragrances. The nine fragrances were based on what are popularly available in supermarkets: aloe vera, apple, blossom, jasmine, lavender, lime, peach, rose, strawberry. To minimise potential brand effects, a fictitious brand, *Fresh-n-Clean*, was used. Images of the bottles (were digitally created to be identical except for an image of the fragrance (e.g., a picture of aloe vera) and the fragrance name (Figure 4 shows examples)

Insert Figure 4 here

The experiment used a between-subjects design with three groups (assortment size: 3, 6 or 9 bottles). Data collection took place in the same Pakistani supermarket as in Study 1. Two trained interviewers intercepted shoppers near the supermarket entrance to participate in the survey on a tablet. No incentives were given for participation.

The online survey started by stating that *Fresh-n-Clean* shampoo was currently being promoted and its shampoo fragrances were discounted by 20% and had the same price. Discounting and pricing the shampoo equally across all fragrances eliminated any pricing

effects. Next, participants saw an image with either 3, 6 or 9 shampoo bottles. For the 3-bottle and 6-bottle assortment sizes, the fragrances were randomly selected from the nine available fragrances. Each shampoo bottle was paired with either a dual unit-price label or a standard label, similar to the ones in the previous studies. In all three assortment sizes, one-third of the bottles had dual unit-price labels. So, for example, the 6-bottle assortment size had two bottles with dual unit-price labels and the rest with standard labels. The presented order of the fragrances, as well as of the labels, was randomized.

Participants were then asked to pick the fragrance they would buy during this shopping trip. The picked bottle, together with the label, was then shown again on an augmented page with the instruction "*Now that you have chosen this bottle of shampoo, please answer the following questions regarding how you view the offered promotion*." Identical to Study 2, participants responded to four questions regarding their perceived value-of-discount (VOD; Cronbach's $\alpha = .82$), as well as potential covariates of purchase intention, age and gender. As there were no differences between groups on these potential covariates, they were not included for further analyses.

Results

As described above, in each group, one-third of the bottles displayed the dual unit-price label. Thus, *ceteris paribus*, we would expect that if participants were choosing fragrances at random, bottles with the dual unit-price label would be chosen one-third of the time (see the 'Theoretical frequency' column in Table 5). However, as the last column in Table 5 shows, participants chose bottles with dual unit-price labels more often as assortment size increased. A cross-tabulation test showed that label type (dual unit-price vs standard) and assortment size (3, 6, 9) were not independent ($\chi^2(2, N = 172) = 8.52$, $p = .014$; $\eta^2 = .22$) across the assortment sizes.

Next, we performed a Cochran-Armitage test (Armitage 1955; Cochran 1954) to check whether participants selected products with dual unit-price labels more often as the assortment size increased progressively. This test is used to determine how the proportion of a binary variable (i.e., dual unit-price vs standard label) may change with an ordinal variable with k-levels (i.e., assortment size with 3-levels) (Armitage 1955). The results ($z = 2.92$, $p = .004$) showed a significant increasing trend in the proportions of promoted products with dual-unit price labels, being selected as the assortment size increased. This result supported the hypothesis H2, that as the assortment size increases, consumers would choose products with dual unit-price labels disproportionally more often.

Insert Table 5 here

Discussion

Study 1 has provided externally valid evidence that consumers prefer products promoted with dual unit-price labels showing both the regular and discounted unit price, compared with standard labels just showing the discounted unit price. Studies 2 and 3 further showed that the effectiveness of the dual unit-price label is moderated by two common brand strategies, variations in pack size and assortment size, respectively. What we have yet to determine is the underlying mechanism that explains why the dual unit-price label is more effective, and why these strategies increase its effectiveness.

While the majority of research concurs that price information allows consumers to evaluate the economic value of products objectively (Sinha and Smith 2000; Tan and Bogomolova 2016; Thaler 1985), others have suggested that pricing information may be processed heuristically (Grewal *et al.* 1996; Yao and Oppewal 2016b) or even subconsciously

(Coulter and Coulter 2005; Monroe and Lee 1999). In the next study, we explored what underpins the efficacy of the dual unit-price label. Does the dual unit-price label work better than the standard label because it facilitates cognitive processing of price information, thereby allowing consumers to determine the most economic choice? Or does the dual unit-price label merely act as a heuristic to signal better value in the discounted product without elaborative processing? Heuristic processing would explain why the participants in Study 2 perceived a higher value of discount for the larger pack with a dual unit-price label, even though it had the same unit price as all the other pack sizes, including the larger and smaller packs with standard labels. Similarly, does heuristic processing underpin the results of Study 3? In that study, participants disproportionally chose the fragrance with a dual unit-price label more often as cognitive load was increased by the size of the assortment.

Study 4 – The Underpinning Mechanism of Dual Unit-Price labels

The usefulness of unit pricing is generally thought to rest on the provision of standardised price information that facilitates consumers' identification of the most economical option (Sinha and Smith 2000; Tan and Bogomolova 2016; Thaler 1985). However, Yao and colleagues (Yao and Oppewal 2016a; Yao and Oppewal 2016b) argued that unit pricing may also work as a heuristic to signal a good deal implicitly. They demonstrated that the mere display of a unit price, versus no unit price, heightened consumers' price sensitivity and motivated them to choose cheaper products. This assertion reflects similar research showing that value perceptions are implicitly affected by how a discount label is displayed. For example, Coulter and Coulter (2005) found that increasing the font size for price information led consumers to evaluate a discounted product more positively in terms of cost savings.

The potential for dual processing of discount labels was also suggested by Inman *et al.* (1990), who posited that displaying both the regular and the discounted price leads to increased value perceptions in two ways. First, the regular price functions as a reference price to enable consumers to determine the level of discount objectively. Second, displaying both prices acts as a signal to consumers that the product is under promotion, and hence represents a good deal, even without consumers evaluating the actual discount. Similarly, Wegener *et al.* (2010) demonstrated that numerical anchors, such as reference prices, may be processed consciously or unconsciously.

Collectively, these prior studies imply two things. First, when both the regular and discounted unit-price are provided, as in the dual unit-price label, consumers are better able to evaluate a deal cognitively (they don't have to do as many calculations). Second, the inclusion of the regular unit price may serve as a heuristic cue. We thus present the following hypotheses:

H3: Compared to a standard label, a dual unit-price label provides more information utility to denote a better deal when consumers evaluate a promotion cognitively.

H4: Compared to a standard label, a dual unit-price label signals a better deal when consumers evaluate a promotion heuristically,

Experimental Design and Stimuli

Hypothesis H3 and H4 were addressed in two separate experiments. Undergraduate students in a Pakistani university volunteered their participation in one of the two experiments, without compensation or course credit. Similar to Study 2 and 3, the first experiment to address H3 was implemented as a hypothetical shopping experience via an

online survey. We used a fictitious brand of insect spray (*FlySwat*) promoted with either a standard or a dual unit-price label. Participants in both experiments were told that the purpose of the study was to understand how consumers normally shop at supermarkets, and to imagine that they were interested to buy an insect spray product from a supermarket that they usually visit.

Experiment 1

Participants (n=143) were randomly allocated to one of the two groups. *Group 1* participants were first exposed to the *FlySwat* insect spray product with a dual unit-price label, and explicitly asked if they could afford the product. This instruction ensured that participants examined the price label. They then responded to the same items used in Study 2 to measure perceived value of discount (VOD; Cronbach's $\alpha = .75$). Additionally, participants answered a three-item perceived information utility (INFO; Cronbach's $\alpha = .76$) scale that measured the usefulness of the label's information for guiding their purchase decision (Matthes and Wonneberger 2014). Individual consumers may vary in their motivation to engage in effortful cognitive processing when faced with choice decisions (Cacioppo and Petty 1982; Diamantopoulos *et al.* 2020). We therefore controlled for consumers' need-for-cognition (NFC; Cronbach's $\alpha = .79$), measured via a five-item scale (Verplanken and Pieters 1988). All constructs (i.e., VOD, INFO and NFC) were measured by the average of their items.

All scale items were randomly ordered to minimise common method bias (Podsakoff *et al.* 2012). Finally, participants were asked to recognise the sale price and discounted unit-price by picking from a list of six options (i.e., the guess rate was 17%). *Group 2* was identical to Group 1, except that the participants were exposed to a standard label for the insect spray product (see Table 6 for details of the three groups). Seven cases were deleted

for incomplete data, leaving a final sample size of 136. The questionnaire items are listed in Appendix 1.

Insert Table 6 here

All the measured items loaded satisfactorily onto their expected factors with adequate reliability (Cronbach's α ranged from .75 to .79) (Nunnally 1978). Confirmatory factor analysis supported convergent and discriminant validity ($\chi^2(51, N = 136) = 76.93$, $p = .01$; CFI = .94; IFI = .94; RMSEA = .06) (Hair *et al.* 2010). There was no evidence of common method bias, using the common latent factor (CLF) method (Podsakoff *et al.* 2003). The model assuming zero loadings on the CLF ($\chi^2(51, N = 136) = 76.93$, $p = .01$) did not result in a significantly worse fit ($\Delta\chi^2 = 2.15$, $\Delta df = 1$, $p = .14$), compared with model with unrestricted CLF loadings. This, together with the significant and high loadings on the expected factors, provided evidence of convergent validity. Evidence for discriminant validity is provided by the fact that the smallest average variance extracted (minimum AVE = .51) was greater than the largest squared correlation between factors (maximum $r^2 = .01$) (Fornell and Larcker 1981).

To test hypothesis H3 regarding cognitive processing of the labels, we ran Process Model 4 (mediation model) with label-type (standard vs dual unit-price) as the independent variable, VOD as the dependent variable, INFO as mediator, and NFC as covariate. The results show that the direct effect of label-type on VOD was not significant (b = .45, SE = .28, LLCI = -.01, ULCI = .92). By contrast, the indirect effect of label-type on VOD was significant (b = .16, SE = .11, LLCI = .01, ULCI = .35). These results supported H3, which conjectured that compared to the standard unit-price label, the dual unit-price label would provide more information utility which in turn increases the perceived value of the discount.

This hypothesis was further supported by the significantly higher level of INFO for Group 1 ($M_{\text{dual unit-price label}}$ = 5.19, SD = 1.58) compared with Group 2 ($M_{\text{standard label}}$ = 4.70, SD = 1.71, t = 1.74, p = .04), as well as higher VOD for Group 1 ($M_{\text{dual unit-price label}}$ = 5.09, SD = 1.62) compared with Group 2 ($M_{\text{standard label}}$ = 4.44, SD = 1.75, t = 2.22, p = .01). Although the format differed between the standard label and dual unit-price label, the discounted unit price information was identical, so there was no difference in correct recognition of the discounted unit price (χ^2 (1, 136) = 3.09, p = .24). Similarly, both labels displayed the same information about the product's selling price, and there was no difference between the two groups in correct recognition of the selling price (χ^2 (1, 136) = .46, p = .68).

Experiment 2

To address H4 regarding the heuristic processing of dual unit-price labels, participants in the second experiment completed a Brief Implicit Association Test (B-IAT), following the procedure of Sriram and Greenwald (2009). A standard implicit association test (Greenwald *et al.* 2003) would investigate whether participants unconsciously associate two concepts (e.g., standard vs dual unit-price label) with two polar attributes (e.g., good value vs bad value). However, in this experiment, neither label could be categorised as bad value (both promoted the same 20% discount). The simplified B-IAT procedure was better suited to this experiment because it is designed to associate two concepts (e.g., standard vs dual unit-price label) with a single attribute (e.g., good value). In other words, the B-IAT procedure in this experiment attempted to determine whether participants were more likely to associate 'good value' with the standard label or with the dual unit-price label.

In executing this experiment, we followed closely the procedure of Sriram and Greenwald (2009), which we briefly describe below (see the article for a detailed description of the B-IAT procedure). Sitting in front of a lab computer, participants would see either

picture-A (picture of a standard label with "Value promotion" written under the label) or picture-B (picture of a dual unit-price label with "Value promotion" written under the label). This picture was positioned at the top-half of the computer screen. A stimulus word would also appear at the bottom half of the screen. Participants had to respond as quickly as possible, such that they would press the 'I' key if they thought the stimulus word matched the picture, otherwise the 'E' key. This procedure was explained to the participants on an instruction page prior to the actual experiment. The stimuli words would signal either good-value promotion (e.g., exceptional, fantastic, great, wonderful), or mediocre-value promotion (e.g., usual, typical, normal, expected).

To familiarise themselves with the B-IAT matching procedure, the participants first performed the matching trials twenty times (the responses from this training block were not used). They then performed the matching trials for another two blocks of twenty times each (block 1-4). Block 1 would show picture-A, while block 2 would show picture-B (counter-balanced). During each block, ten good-value promotion and ten mediocre-value promotion words would appear in random order. Thus, in total, a participant would perform 60 matching trials (20 × 3 blocks). Following Greenwald *et al.* (1998), responses under 300ms (suggesting that the participants prematurely completed a matching task immediately after the picture appeared) or over 3000ms (suggesting cognitive deliberation or inattentiveness) were deleted. This led to 26 out of 85 cases (30%) being deleted, leaving a final sample size of 59.

Like the standard IAT, the B-IAT tests for implicit processing under time constraint. Studies have used the IAT procedure to test for heuristic processing because a faster response time may indicate heuristic rather than effortful processing (Lee *et al.* 2016; Popa-Roch and Delmas 2010; Spence and Townsend 2008). To test hypothesis H4 regarding the possible heuristic processing of the labels, we analysed the *d*-scores generated by the B-IAT software (see Sriram and Greenwald (2009) for a detailed discussion on *d*-score calculation). In B-

IAT, *d*-scores range from −2 to +2 and indicate the strength of association with the tested concepts. In our results, a more positive value indicated that participants associated "good value" with the dual unit-price label, whereas a negative score indicated "good value" was associated with the standard label. Against a test-value of zero, a one-sample *t*-test found that the overall *d*-score was significantly positive ($M = .17$, $t(58) = 2.41$, $p = .02$, Cohen's $d = .31$).

After the B-IAT procedure, participants were also asked to pick from four options what they believed was the discounted sale price and discounted unit-price in the picture. The *d*-scores did not differ between those who recognised the selling price ($t(57) = .95$, $p = .35$, Cohen's $d = .58$) or unit price ($t(57) = -0.44$, $p = .66$, Cohen's $d = .54$) correctly or incorrectly. Collectively, these results supported H4, that a dual unit-price label signals a good deal to consumers better than a standard label does, when consumers evaluate a deal heuristically.

Discussion

It would appear from Study 4 that a dual processing mechanism explains the effects of the dual unit-price label. First, the dual unit-price label provides more information utility, so that consumers evaluating a deal cognitively can identify the most economical option (Sinha and Smith 2000; Tan and Bogomolova 2016; Thaler 1985). Second, the dual unit-price label also serves as a heuristic cue to signal a good deal, when consumers are using unconscious heuristic processing, consistent with prior studies showing that discount pricing information may be processed heuristically (Grewal *et al.* 1996; Yao and Oppewal 2016b) or even subconsciously (Coulter and Coulter 2005; Monroe and Lee 1999). Our findings that consumers may process the dual unit-price label cognitively or as a heuristic cue are consistent with research, which suggests that the two processing routes can take place in

parallel rather than are mutually exclusive (e.g., Dröge 1989). Similarly, advertising research in supraliminal primes (Fukawa and Niedrich 2015; Ohme and Boshoff 2019) supports that consumers may react unconsciously to ad stimuli even though they are consciously aware of the stimuli's presence. Study 4's results also corroborated Study 2 and 3 in demonstrating that a dual unit-price label increased the perceived value of a discounted item.

Overall Discussion

The efficacy of using sales promotions to increase brand sales is well established (Chen *et al.* 1998; Ofosu-Boateng 2020; Sinha and Smith 2000; Urbany *et al.* 1988). In supermarkets, standard shelf labels for promoted products state the regular price and the discounted price, with the regular price acting as a reference to highlight the price reduction and hence the value proposition of the promotion. Reference price theory is typically used to support the display of both prices (Chandrashekaran 2004; Lichtenstein *et al.* 1991; Urbany *et al.* 1988). However, standard shelf labels typically only show the discounted unit-price, without showing the regular unit price as a reference. In this research, we addressed the question of whether unit price information should also follow the same practice of displaying both the regular and the discounted unit-price on shelf labels. Over four studies, we demonstrated the merits of displaying both the regular and discounted unit-price on shelf labels in influencing consumers' perceptions of the discount value and subsequently their choice decisions.

In carrying out these four studies, we extend prior works on consumer responses to unit-price labels. At the core is our novel proposition of a unit-price label that displays both the regular and discounted unit-price. Another key contribution of our research was in carrying out Study 1 in-situ in an actual supermarket with real products on shelves. Compared to studies that solely relied on hypothetical shopping experiences with online

panel or lab-based experiments (Bogomolova *et al.* 2020; Yao and Oppewal 2016a; Yao and Oppewal 2016b), Study 1 enhances the external validity of this research. Furthermore, to our knowledge, no studies have tested unit-price labels with assortment sizes, a common brand practice. Notably, some studies propose that unit-price labels may serve as a heuristic cue for expedient choice selection (Yao and Oppewal 2016a; Yao and Oppewal 2016b), but they did not explicitly test this speculation. We demonstrated in Study 4 that consumers may process unit-price labels heuristically.

Our findings generalised the use of reference prices from selling prices to unit prices. A dual unit-price label with both the regular and discounted unit-prices was able to elicit greater sales, in a real-supermarket experiment. Subsequent studies showed that the dual unit-price label increases the perceived value of a discount. Our results also suggest that a dual processing mechanism, cognitive vs heuristics, explains the effects of these dual unit-price labels.

First, the dual unit-price labels provided additional information useful for cognitive processing. Highly motivated consumers would already be able to calculate the extent or value of the discounted unit price from information on a standard label. But providing both the discounted and the regular unit prices eliminated the need for this calculation and made this information available to less motivated consumers, who were similarly interested in identifying the most economical option. The dual unit-price label approach may also be particularly useful for price-sensitive consumers, as they are able to expediently identify the most economic choice by determining how much they would save from a standardised unit (i.e., per use, per pound, etc.) basis. Take the example of dishwashing machine tablets. By providing the regular and discounted unit price per tablet, consumers can easily determine how much they would save each time they run the machine.

Second, our findings suggest that showing both unit prices also served as a heuristic cue for consumers processing promotions unconsciously. The heuristic use of these dual unit-price labels is consistent with research showing that discount pricing information may be processed heuristically (Grewal *et al.* 1996; Yao and Oppewal 2016b). More broadly, the finding also aligns with research asserting that consumers often process information heuristically rather than rationally (Ehrenberg *et al.* 2000; Zajonc 1980). Thus, the dual unit-price label would enable brands to appeal to consumers, who may prefer a large discount from a high-priced product rather than the most economical choice. With the regular unit-price acting as a reference, the dual unit-price label would such consumers make their choice decision.

Collectively, the above results imply that the effectiveness of the dual unit-price label is broad based as it appeals to consumers, regardless of their processing preference. A key managerial implication is that this dual unit-price label offers managers another strategic tool for promoting their brands. An advantage of this strategy is that it is virtually free and takes little effort to implement. Yet, academic research and managerial practice had ignored this approach previously.

From a regulatory perspective, the mandatory practice of unit pricing in many developed markets (e.g., see ACCC (2021) and CMA (2015)) is to enable consumers to expediently compare options in order to identify the most economical one. However, displaying the regular unit-price on the same label does not help with this identification; the discounted unit-price alone suffices for this purpose. As the findings in this study suggest, the dual unit-price serves more as a marketing tool to enhance the efficacy of sales promotion. This begets the question whether the dual unit-price label may be viewed as manipulative. However, using the regular unit-price as an anchor is similar to the current and prevalent practice of displaying the regular price as the reference price against the promoted price.

Thus, there is little rationale in curbing the use of dual unit-price labels via regulatory policies.

Future Research

Several future research avenues are opened by this study. Besides generalising across countries or categories, an eye-tracking experiment would provide further evidence about how consumers look at shelf labels, and how best to format unit-price information (Tan and Bogomolova 2016). An ensuing question is whether different store formats moderate the effects of these dual unit-price labels. Study 1 was conducted in a mid-sized supermarket selling mainly products of local origin. The dual unit-price labels may be less effective in smaller neighbourhood stores, which compete more on convenient location than on low prices, and even more effective in larger discount stores. The emergence and prevalence of online shopping adds another dimension to this issue.

These studies took place in Pakistan, a developing market. This begs the question as to whether these findings would apply similarly in highly competitive and developed markets like the US or UK. Additionally, future studies should consider the moderating effects of foreign versus local brands. Also, consumers often shop in supermarkets under time pressure (Dickson and Sawyer 1990), and hence future research should ascertain how the cognitive and heuristic processing of these dual unit-price labels may be impacted by time constraints. This study focuses predominantly on the purchase behaviour of consumers. Thus, it would be useful to determine whether consumer perceptions of the retailers differ depending on which discount label-type is used instore. This may matter because the increased information utility provided by the dual unit-price label may enhance the retailer's image. Similarly, the heuristic value of the dual unit-price label may facilitate shopping.

Future research can also extend this study to other contexts or scenarios. For example, consumers may be less price sensitive with certain products (e.g., medicine for children). Would dual unit-price labels be as effective with these products? Similarly, the online shopping sites often have functions to sort product listing by selling price, unit price, discount level, etc. It would be interesting to test how providing both regular and discounted unit-price may influence online shopping behaviour.

While we show that a dual unit-price label would enhance the effectiveness of a promotion, other studies suggests that price discount may have negative effects such as perceived quality degradation (Monroe and Krishnan 1985) or reduced purchase intentions (Cai *et al.* 2016). Future research should include these negative consequences as outcome variables. Clearly, the limited time afforded by the IAT rules out the explanation that our participants carefully calculated the difference in reference price and confirmed the savings percentage advertised. In other words, in an IAT test, slow, effortful processing is not possible. Only rapid processing is possible. Exactly what that processing consisted of is difficult to be sure of. Future research might be able to address this by testing subtle differences in the stimuli (e.g., the font size). Finally, it is a common practice among supermarkets to use the standard label; thus it would be worthwhile to understand the retailers' perspectives regarding implementing the dual unit-price labels at their stores. This could be done via a qualitative approach.

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Appendix 1. Scale Items for Study 2-4

Factor/Item	Description
Value of discount (VOD); 7-point (strongly disagree….strongly agree)	
VOD1	I would end up getting great savings with this promotion
VOD2	This promotion would reduce the price I have to pay
VOD3	This promotion would save me money
VOD4	This promotion appears to me to be a good bargain
Purchase likelihood (PURCHASE); 7-point (very unlikely...very likely)	
PurcLike1	If you were shopping for <product>, how likely are you to purchase this promoted product
Information utility (INFO); 7-point (strongly disagree….strongly agree)	
INFO1	Looking at the promotion label, I find most of the information useful
INFO2	The promotion label is helpful for my buying decision
INFO3	The promotion label delivers the information that I need for my buying decision
Need-for-cognition (NFC); 7-point (strongly disagree….strongly agree)	
NFC1	I would prefer complex to simple problems
NFC2	I like to have the responsibility of handling a situation that requires a lot of thinking
NFC3	Thinking is my idea of fun
NFC4	I would sure to challenge my thinking abilities rather than doing something that requires little thought
NFC5	I find satisfaction in deliberating hard and for long hours

Table 1. Cell Means for Study 1

Brand	Baseline*	No Label	Standard Label	Dual unit-price label
Bread				
Brand A *Bread & Beyond* 130 R / 110 R[#]	6.4 (2.0)	1.6 (0.8)	7.7 (0.8)	18.7 (2.3)
Brand B *Bunny's* 120 R / 102 R	3.3 (1.5)	3.4 (1.9)	4.3 (1.7)	11.9 (1.5)
Brand C *Dawn* 120 R / 102 R	9.1 (4.4)	7.7 (1.0)	11.9 (3.0)	27 (1.9)
Milk				
Brand A *OLPER'S* 160 R / 136 R	9.4 (2.1)	2.0 (0.0)	13.4 (1.9)	25.7 (5.0)
Brand B *MilkPak* 160 R / 136 R	5.1 (1.9)	4.9 (4.0)	6.7 (0.5)	19.7 (2.2)
Brand C *Prema* 165 R / 140 R	19.6 (6.3)	15.4 (1.6)	22.4 (4.5)	47.6 (6.1)
*Control (**Brand D**)*^^				
Bread *Lighthouse* 120 R	4.7 (2.1)	3.1 (1.1)	3.0 (1.0)	2.7 (1.1)
Milk *Adams* 110 R	10.7 (3.9)	2.6 (0.5)	3.9 (0.4)	3.0 (0.8)
Tea *Tapal* 220 R	6.6 (4.6)	6.0 (3.9)	8.4 (5.0)	3.7 (3.2)

***** Numbers are daily average quantities sold (standard deviations in parentheses), $n = 7$ (days) in each cell.
# The numbers under the brand names are the regular price in rupees (R) / 15% discounted price.
^^ For the Control condition, no labels were used; the columns list the daily quantities for Weeks 0, 1, 2, and 3.

Table 2. Latin-Square Design for Study 1

Brand	Baseline	Week 1	Week 2	Week 3
Brand A	No-Discount Label	No-Discount Label	Standard Label	Dual unit-price label
Brand B	No-Discount Label	Standard Label	Dual unit-price label	No-Discount Label
Brand C	No-Discount Label	Dual unit-price label	No-Discount Label	Standard Label
Control (Brand D)	No-Discount Label	No-Discount Label	No-Discount Label	No-Discount Label

No-Discount Label = regular label without discount
Standard Label = standard label with 15% discount and discounted unit price
Dual unit-price label = dual unit-price label with 15% discount and regular and discounted unit prices

Table 3. Weekly Sales, Market Shares, and Growth in Sales from Dual unit-price label (Study 1)

Brand	Baseline*	No Label	Standard Label	Dual unit-price label	% Growth^
Bread					
Brand A	45 27%	11 10%	54 29%	131 31%	191%
Brand B	23 14%	24 22%	30 16%	83 20%	261%
Brand C	64 39%	54 49%	83 44%	189 45%	195%
Control	33 20%	22 20%	21 11%	19 5%	-42%
Total Sales	**165**	**111**	**188**	**422**	**156%**
Milk					
Brand A	66 21%	14 8%	94 29%	180 27%	173%
Brand B	36 11%	34 20%	47 14%	138 21%	283%
Brand C	137 44%	108 62%	157 48%	333 50%	143%
Control	75 24%	18 10%	27 8%	21 3%	-72%
Total Sales	**314**	**174**	**325**	**672**	**114%**

***** All numbers are weekly total quantities sold, with percentage market share (brand/category total) underneath.
^ Percentage growth is dual unit-price label sales minus baseline sales, as a percentage of baseline sales.

Table 4. Experimental Design for Study 2

Group	Experiment Conditions (Size-label type)	Sample Descriptives
1 (n = 43)	4-roll toilet paper with standard label	Male = 20 (47%); Age range 19-62, M = 34
2 (n = 46)	4-roll toilet paper with dual unit-price label	Male = 25 (54%); Age range 18-66, M = 33
3 (n = 39)	24-roll toilet paper with standard label	Male = 18 (46%); Age range 21-64, M = 34
4 (n = 44)	24-roll toilet paper with dual unit-price label	Male = 25 (45%); Age range 19-66, M = 30

Table 5. Dual unit-price label Choice by Assortment Size (Study 3)

Frequency of participants choosing bottles with the dual unit-price label			
Assortment size	**Sample size**	**Theoretical frequency (%)**	**Actual frequency (%)**
3 bottles	57	19 (33.3%)	33 (58%)
6 bottles	57	19 (33.3%)	40 (70%)
9 bottles	58	19 (33.3%)	48 (83%)

Table 6. Experimental Design for Study 3

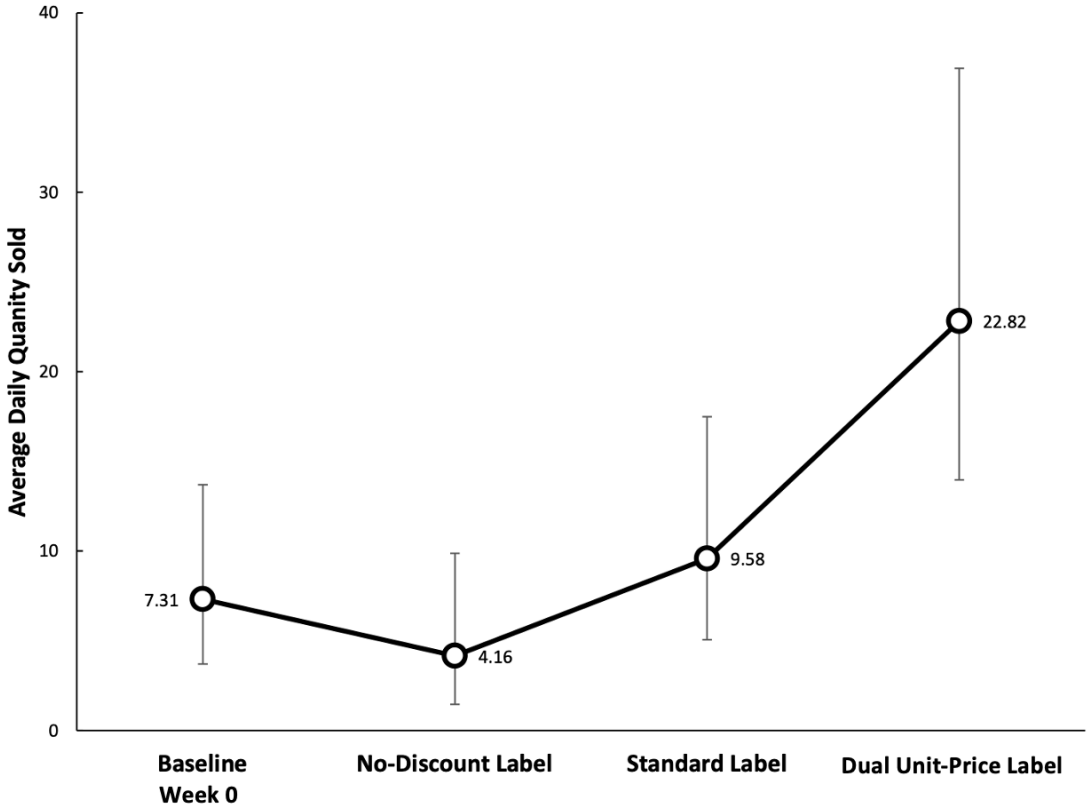
Experiment / Group	Task	Questionnaire	Sample Descriptives
1 (Group 1, n = 70)	Exposed to dual unit-price label	- Recall of unit-price - 6-item NFC scale - 4-item VOD scale - 3-item INFO scale - Purchase Likelihood	Male = 52 (74%); Age range 21-36, M = 25
1 (Group 2, n = 66)	Exposed to standard label	- Recall of unit-price - 6-item NFC scale - 4-item VOD scale - 3-item INFO scale - Purchase Likelihood	Male = 44 (67%); Age range 21-36, M = 27
2 (B-IAT, n = 59)	Exposed to both labels	- 6-item NFC scale - Purchase Likelihood	Male = 47 (80%); Age range 18-36, M = 22

B-IAT = Brief implicit association test; NFC = Need-for-cognition; VOD = Value of discount; INFO = perceived information utility.

Figure 1. Standard Label vs Dual Unit-Price Label

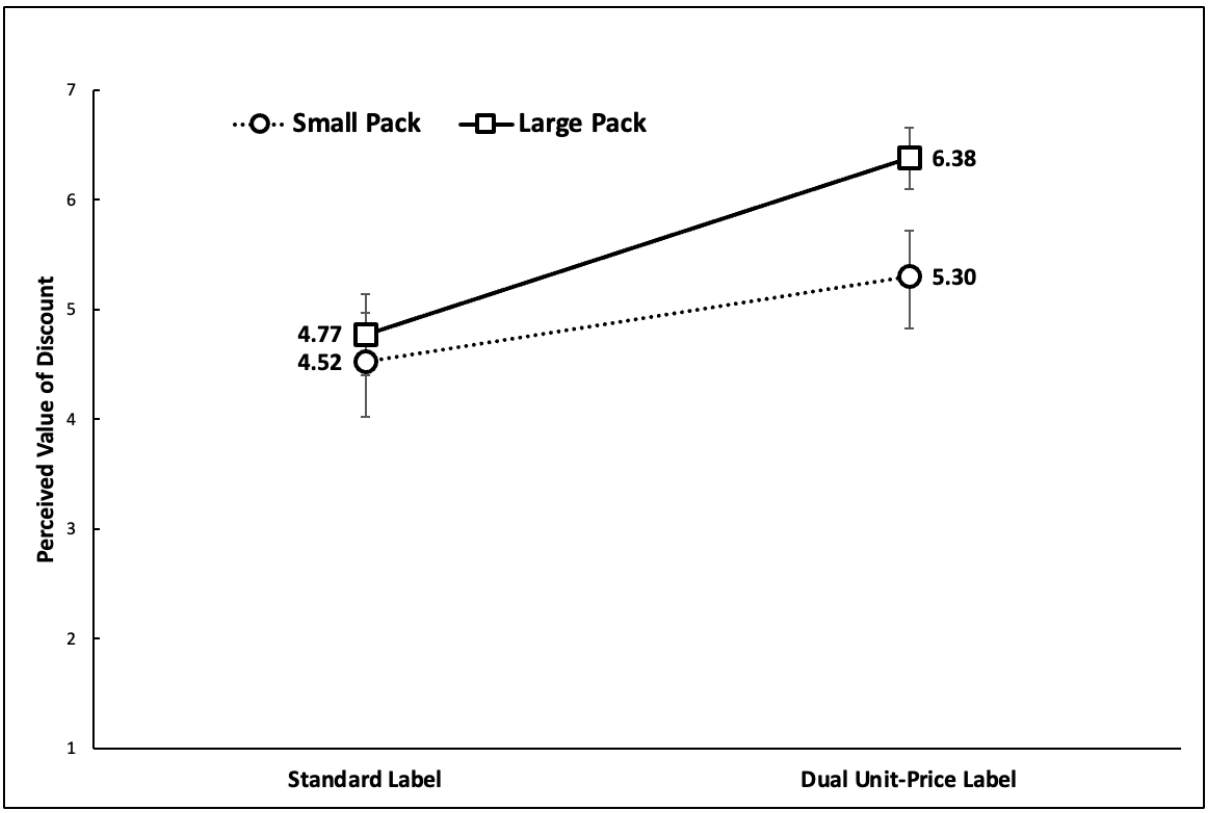
Standard label (left) with only discounted unit-price, and Dual unit-price label (right) with both regular and discounted unit-price.

Figure 2. Brand Sales for Different Label Conditions (Study 1)



Error bars show the 95% confidence interval.

Figure 3. Value of Discount for Different Pack-size and Label combinations (Study 2)



Error bars show the 95% confidence interval.

Figure 4. Experimental Stimuli (Study 3)