

# Moderating and Mediating Influences on Unit Pricing Evaluation: Multiple Brand Size Cases

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## **Abstract**

**Purpose** – This paper aims to investigate the process by which a brand’s unit pricing for multiple package sizes influences consumer evaluations by incorporating several mediators and moderators. Two unit pricing formats were examined: i.e., quantity discounts and surcharges.

**Design/methodology/approach** – Two online experiments were conducted to test the hypotheses. Study 1 examined the mediating role of consumers’ inferred motives for sellers in setting quantity discounts or surcharges in the relationship between the formats and consumer evaluations. Study 2 incorporated affect as a mediator, and price consciousness and unit price usage as moderators in this relationship.

**Findings** – The results demonstrate that the inferred motives related to sales volume and manufacturing and retailing costs actively mediate this relationship. The hypothesized role was played by affect and unit price usage. Moreover, consumers who select small packages tend to perceive their quality to be higher than that for large packages.

**Research limitations/implications** – This study considered only one product type and future research should examine a variety of products.

**Practical implications** – This study highlights the importance of providing additional information to consumers when applying quantity surcharges to a product to preclude the possibility of consumers’ negative responses.

**Originality/value** – This study is the first to identify mediators, such as the inferred motives about sellers’ behavior and affect, and the moderator of unit price usage, both of which explain the underlying process of consumers’ responses to quantity discounts and surcharges. It is also the first to examine the effects of the unit pricing formats on perceived quality.

## Introduction

Unit pricing is commonly employed in consumer grocery markets. Consumers often use this unit price information to make intrabrand comparisons and assess the value of each package size when they need to select the appropriate product size for purchase in a brand that offers multiple packaging dimensions (e.g., Granger and Billson, 1972; Manning et al., 1998). Under these circumstances, consumers may have certain expectations about the unit prices. Consumers are known to make assumptions about unit prices in terms of quantity discounts (QD); i.e., they believe that larger packages are usually assigned lower unit prices than smaller packages (e.g., Nason and Della Bitta, 1983; Manning et al., 1998). This is called the quantity discount belief. Manning et al. (1998) argued that QD beliefs were strengthened by the proliferation of retailers emphasizing their lower prices for larger packages. In addition, ubiquitous price promotions that promote multiple purchases to consumers, such as “Buy 1, get 1 for 1/2 price,” “Save \$ \_\_\_ if you purchase 2,” “ \_\_\_ % off if you purchase 2,” and “2 for \$ \_\_\_” might have reinforced this belief. However, some smaller packages are assigned lower unit prices than larger packages in supermarkets (e.g., Dunphy, 2016). Sprott et al. (2003) confirmed that this type of situation could unintentionally occur when grocery price setters adjusted the prices for certain sizes without evaluating the prices for other sizes. If consumers with a strong QD belief assess unit prices that are inconsistent with this principle, they may respond negatively to these unexpected unit prices. Hence, decisions regarding the unit pricing of different brand sizes are important, and manufacturers and retailers are suggested to pay more attention to their pricing.

There are essentially three formats of unit pricing for different package sizes of the same brand (Widrick, 1985): i.e., QD, quantity surcharges (QS), and proportionate pricing (PP). QD pertains to situations in which unit prices for larger packages are lower than those for smaller packages. QS, on the other hand, refers to contexts in which unit prices for larger packages are higher than those for smaller packages. PP indicates instances where all package sizes have the same unit prices. QD is considered the most widely employed unit pricing format in the marketplace (Binkley and Bejnarowicz 2003; Gupta and Rominger 1996; Widrick 1985). However, numerous field

studies have confirmed incidences of QS in various grocery products and stores (e.g., Widrick 1979a; Dunphy 2016).

A growing body of research has explored consumer responses to unit pricing; however, when the scope of these studies is narrowed down to unit pricing considering different package sizes for the same brand, the research literature is still limited. As mentioned earlier, most of the extant studies on this type of unit pricing are field studies that have primarily scrutinized incidences of QS in the marketplace. Studies considering the effect of unit pricing on consumers' evaluations, such as attitudes toward pricing and brands, are still scarce. Thus, the objective of this current study is to address this gap and explain the underlying process of consumer responses to unit pricing. Specifically, the current study contributes to the existing literature in multiple ways. First, we focus on QD and QS, and offer predictions related to the influence of consumers' inferences about sellers' motives for setting QD or QS. The existing research literature has demonstrated the differences in consumers' reactions to the unit pricing format, but the role of consumers' inferred motives for sellers' behavior has not been investigated. Such inferred motives have been shown to play a causal role in consumers' evaluations about prices, promotions, and brands (Campbell, 2007; Kachersky, 2011; Raghubir and Corfman, 1995). As some consumers tend to have certain beliefs about the format, such inferences are proposed to mediate the effect of the format on consumers' evaluations. Second, stimulus-induced affective reactions to the format are proposed to influence consumers' evaluations. The role of affect in consumers' judgment has been demonstrated (e.g., Pham, 1998; Wirtz and Kimes, 2007). Thus, affective reactions to the format are considered relevant to consumers' evaluations. Third, the moderating effect of price consciousness is proposed. This concept has been widely adopted in various domains (Bogomolova et al., forthcoming), but studies regarding its role in consumers' reactions to the unit pricing format are limited. In addition, the usage level of unit price information was examined as a potential moderator. Not all price-conscious consumers use unit prices because their attention to unit prices is influenced by the prominence or layout of unit prices (Bogomolova et al., forthcoming; Miyazaki et al., 2000). Thus, these two moderators were examined separately. Finally, quality perceptions of large and small packages were examined. Yan et al. (2014) found that a small package generates a higher perceived quality than a large package when they are presented separately. We propose that this phenomenon becomes less salient when the two sizes are presented together and test this prediction.

These predictions were examined in two studies and the obtained findings demonstrate the proposed mediating effect of consumers' inferred motives for sellers' behavior and affect as well as the moderating effect of unit price usage. The outcomes of the current study have important implications for the theory of consumer behavior and practice.

This study is organized as follows: First, an exhaustive review of the relevant literature is presented and the under-researched aspects of this domain are indicated. Next, the hypotheses are presented to describe the features of the experiments conducted for the current investigation and explain the results. Finally, a discussion of the findings obtained from the present research initiative, an elucidation of the implications of the study, and a clarification of its limitations conclude the study.

## **Literature review**

The current study focuses on the existing literature exploring the unit pricing for different package sizes in the same brand. Most of these studies primarily aimed to measure the rate of occurrence of QS in several products available in multiple sizes. Notably, most of these were field studies conducted in supermarkets (Agrawal et al., 1993; Cude and Walker, 1984; Dunphy, 2016; Gerstner and Hess, 1987; Gupta and Rominger, 1996; Manning et al., 1998; McGoldrick and Marks, 1985; Nason and Della Bitta, 1983; Pala et al., 2010; Sprott et al., 2003; Walker and Cude, 1984; Widrick, 1979a, b; Zotos and Lysonski, 1993). The average QS incidence rate reported by these studies varied widely for different product categories: e.g., 1.2% (raisins) was the lowest (Agrawal et al., 1993), whereas 84.4% (tuna fish) was the highest (Widrick, 1979a). Some studies have also conclusively demonstrated that the probability of QS increases in congruence with the number of brand sizes (Pala et al., 2010; Walker and Cude, 1984; Widrick, 1979b; Zotos and Lysonski, 1993). Moreover, the occurrence of QS was found to be higher for products that were typically bought in large packages and products that were in greater demand (Agrawal et al., 1993).

However, very few studies have examined how consumers evaluate the unit pricing of multiple brand sizes empirically. Table I summarizes these studies. Granger and Billson (1972) conducted an initial investigation in which the participants were asked to choose one package size from several sizes of the same brand before and after the unit prices were presented. They compared the selected sizes (weights) and confirmed that QS decreased the average weight, whereas QD

increased it. These results indicated a shift toward the best value size. No such change was observed in the case of PP. Manning et al. (1998) conducted two experiments to examine the effects of QS and QD. In the first experiment, the participants were shown a large-sized bottle and a small-sized bottle from the same brand and were asked to choose one package size. The unit pricing format for the two bottles was manipulated at three levels: i.e., small magnitude QS (12.8%), large magnitude QS (25.8%), and QD (12.8%). The results revealed that the pricing and brand attitudes evoked by QS (the two QS were aggregated) were lower than those elicited by QD, especially when participants exhibited a strong QD belief. Furthermore, the number of participants who purchased small packages was higher in the case of QS than in instances of QD. In the second experiment, participants were asked to buy 10 items at a hypothetical local grocery store. The following three types of stores were compared: moderate QS incidence (19 of the 83 brands applied QS), high QS incidence (37 of the 83 brands employed QS), and no QS incidence. The results showed that the number of purchases at the lowest unit price and the number of total package purchases were higher for the store with moderate/high QS than for the store that had no brands that applied QS. Moreover, Miyazaki et al. (2000) examined the effect of the prominence of unit price information. In an experiment, participants were asked to spend \$20 to \$30 at a hypothetical grocery store where 31 of a total of 53 brands offered multiple sizes and 29% employed QS pricing. The prominence of unit prices was manipulated by placing either the high or low prominence shelf label on the shelf below each item. The results showed that the use of the high prominence labels increased purchases of items with the lowest unit price and decreased purchases of QS items than the use of the low prominence labels. This prominence effect was further examined by Bogomolova et al. (forthcoming) using an eye-tracking method. The focus was not on unit pricing across different brand sizes, but they compared consumers' attention to the unit prices between inter- and intrabrand comparisons (employing QD pricing), and found that the former attracted more attention of high price-conscious consumers while the latter attracted more attention of low price-conscious consumers.

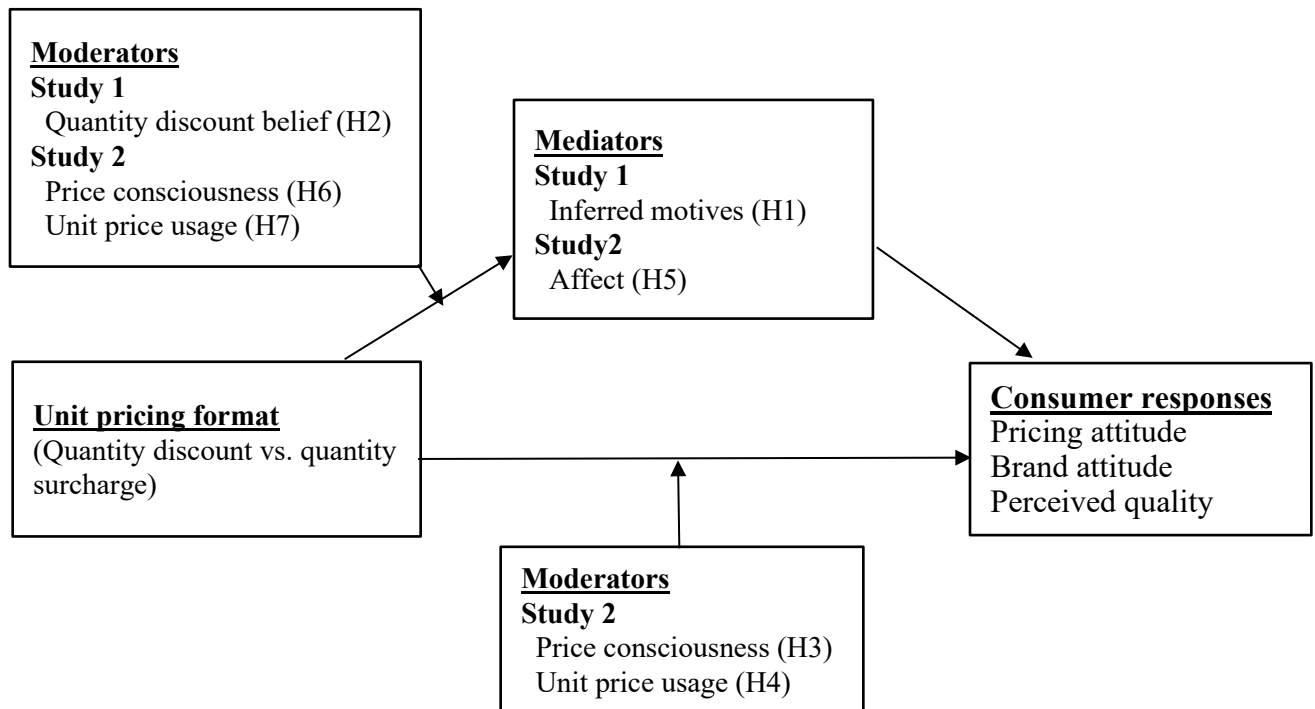
A couple of studies have examined consumer characteristics. Employing aggregate market data and demographic data published by the United States Census Bureau, Binkley and Bejnarowicz (2003) attempted to identify the attributes of consumers who typically purchase small surcharged packages by targeting three brands of canned tuna, which offered their products in two sizes. They found that attributes such as smaller households, apartment dwelling with storage constraints,

lower time cost (lower female labor force participation rate, lower income), and ease of information processing (college education, usage of tuna) were related to the purchases of small surcharged packages. The effect of the magnitude of the surcharge was weak compared to these variables. Hardesty et al. (2007) targeted the unit pricing for two different-sized bottles in three formats: small magnitude QS (15.4%), large magnitude QS (41.5%), and PP. Participants chose one package size and assessed their pricing tactic persuasion knowledge, persuasion knowledge confidence, price consciousness, sale proneness, and the need for cognition. The results showed that only pricing tactic persuasion knowledge created an impact on the effects of QS on consumer evaluation. QS decreased the purchase of a large package (surcharged items), especially when the participants displayed a superior level of persuasion knowledge. Finally, Gu and Yang (2010) proposed a choice model that incorporates transaction utility. This model frames purchasers of discounted larger packages as gains and purchasers of surcharged smaller packages as losses. They applied the model to scanner panel data on consumer purchases of two brands of canned beer that offered their products in three sizes. Both brands assigned QS to the three sizes. The results showed that gain-focused consumers were more price-sensitive and more responsive to product features than loss-focused consumers.

The studies summarized above are grouped into three types. The first type mainly elucidated the effect of the presence or the prominence of unit price information in the context of QS or QD. The second identified the characteristics of consumers who purchase QS or QD items. The last type examined the effects of QS in comparison to QD or PP and provided evidence that QS was less preferred than QD or PP. These studies have augmented awareness of the ways in which the unit pricing of multiple brand sizes affects consumers' judgment. However, we argue that studies of the last type are still rare. One critical issue is that potentially influential moderators and mediators on the effect of the format on consumers' evaluations have not been explored fully. This research issue must be tackled to understand the underlying process of consumer responses to the format and further investigations are considered necessary. Recent studies on unit pricing have successfully identified several mediators (e.g., cognitive ease of product comparisons, motivation for buying cheaper products) and moderators (e.g., time pressure, price consciousness) (Yao and Oppewal, 2016a, b). However, these studies targeted interbrand comparisons, but not intrabrand comparisons, and so the issue persists.



Therefore, the purpose of the current study is to explore this issue. We extend the work of Manning et al. (1998), which showed how QD and QS influence consumers' attitudes toward pricing and brand by including hypothesized moderators and mediators in the relationship. We focused our research on these two formats because they are opposites and elucidating the differences in consumer responses between these formats is expected to enrich existing knowledge. Also, as explained earlier, we took this opportunity to investigate the size effect on perceived quality in a context where different brand sizes were presented together in two studies. Study 1 examined the mediating role of the inferred motives of sellers in assigning QD or QS in the relationship between the unit pricing format and consumer evaluations. Study 2 incorporated affect as a mediator and price consciousness and unit price usage as moderators in that same relationship. Figure 1 summarizes the conceptual model guiding the current study. We next explain the hypotheses to be tested in Study 1 and then test them.



**Figure 1. Conceptual framework**

**Notes:** H1 and H5 are proposed mediation effects. H2, H6, and H7 are proposed moderated mediation effects. H3 and H4 are proposed moderation effects.

**Table I. Previous studies on unit pricing of multiple brand sizes**

Study	Description	Relevant findings
<b>Granger and Billson (1972)</b>	Compared the selected size before and after the unit prices were presented. The unit prices were in the format of QD, QS and PP.	<b>The average selected weight decreased when QS was observed, increased when QD was observed, and did not change when PP was observed.</b>
Manning et al. (1998)	Study 1: Examined the effect of QS and QD on consumers' evaluations and size choice. Study 2: Examined the effect of QS on the purchase of multiple products. Compared consumers' response between a store that has moderate/high QS incidence and a store that has no QS incidence (PP).	Study 1: QD generated more favorable attitudes toward pricing and brand than QS, especially when QD belief was high. Small packages were purchased more when QS was observed. Study 2: the number of purchases at the lowest unit price and the number of total package purchases were higher for the store that has QS incidence.
Miyazaki et al. (2000, Study 2)	Examined the effect of the prominence of unit price information on purchases of the lowest unit priced items and purchases of surcharged items.	Unit prices with high prominence labels increased purchases of the lowest unit priced items and decreased purchases of surcharged items than unit prices with low prominence labels.
Binkley and Bejnarowicz (2003)	Identified attributes of consumers who typically purchase small surcharged packages. Used aggregate market data and demographic data published by the Census of the U.S. Bureau.	They are smaller household size, apartment dwellers with storage constraints, lower time cost (lower female labor force participation rate, lower income), and ease of information processing (college education, usage of tuna). The effect of the magnitude of the surcharge was weak compared to these characteristics.
Hardesty et al. (2007, Study 2)	Examined the effect of QS and PP on consumers' size choice. Also examined the moderating role of their pricing tactic persuasion knowledge, persuasion knowledge confidence, price consciousness, sale proneness, and the need for cognition.	Pricing tactic persuasion knowledge was a moderator. QS decreased the purchase of a large surcharged item, especially when the level of persuasion knowledge was high.
Gu and Yang (2010)	Proposed a choice model that framed purchasers of discounted larger packages as gains and purchasers of surcharged smaller packages as losses. Used scanner panel data.	Gain-focused consumers were more price-sensitive and more responsive to product features than loss-focused consumers.

## Hypotheses development

### *The mediating role of deduced motives*

Previous studies have shown that consumers make assumptions about sellers' behavior. In the context of price promotions, Raghubir and Corfman (1995) found that when the frequency was perceived to be high, consumers tended to infer that the promotions were offered because of market competition instead of brand-specific factors. Chen et al. (1998) discovered that the presumption that the regular price might have been inflated or a permanent price reduction might follow was stronger for price discounts than for coupons. In the event of a price increase or decrease, Campbell (2007) revealed that the effect of the price change on perceived price unfairness was mediated by the deduced motive that the price change was intended to take advantage of the customer. More recently, Kachersky (2011) focused on two types of unit price increases: i.e., content reduction and total price increase, and concluded that consumers who were knowledgeable about the various pricing practices inferred a motive for profit margin increase instead of a motive for profit margin maintenance when the price increase was more linked to content reduction than to the rise of the total price.

These studies suggest that consumers may wonder why different unit prices are assigned to different package sizes of the same brand, i.e., QD or QS, and that they generate assumptions about the motives of sellers for employing such unit pricing. Because QD and QS are applied to different sizes of the same brand, consumers are likely to attribute motives to the sellers for reasons not related to quality. Himbert (2016) explained that the reasons given by seller companies for the use of QD included less packaging, transaction, and marketing costs for larger packages. However, the reasons for applying QS included increased margins, more expensive packaging and production costs, more inventory-carrying costs for large packages, and the identification of small packages as loss leaders. Kachersky (2011) explored the motives that consumers assigned to the sellers' increase of a product's unit price (content reduction and total price increase) through open-ended questions. Kachersky identified two inferred motives: i.e., profit margin and cost. These two motives are similar to the reasons indicated by Himbert (2016). Accordingly, the present study presumes that the consumer inferences about the motives of sellers in applying QD and QS relate to profit and costs, and these are classified into the following four motives: i.e., a higher unit price is assigned to the package size because 1) it has a higher sales volume than other sizes (sales

volume motive); 2) it has higher display and inventory-carrying costs than other sizes (retailer's cost motive); 3) it has higher production and packaging costs than other sizes (manufacturer's cost motive); and 4) it has a higher profit margin than other sizes (profit margin motive). Hence, the following hypothesis is proposed:

*H1.* The effects of the unit pricing format (QD vs. QS) on the attitudes toward pricing and brand are mediated by consumers' inferences of the sellers' motives in setting QD or QS.

*The moderating role of quantity discount beliefs*

Consumers' QD beliefs signify the extent to which consumers accept as true that lower unit prices have been assigned to larger packages (Manning et al., 1998). The existence of QD beliefs has long been recognized and evidence of its presence and influence has been presented in earlier studies. For example, Granger and Billson (1972) reported that 75% of their respondents believed that smaller packages offered poorer value. Nason and Della Bitta (1983) found that 81% of their respondents expected a small package to have the highest unit price when compared to medium and large packages. Similarly, Zotos and Lysonski (1993) observed that 86% of their participants expected large packages to have lower per-unit prices when compared to medium and small packages. Furthermore, in comparing three sizes offered by 21 brands, Wansink (1996) found that consumers expected that 19 of the 21 brands would offer lower unit prices for the large package compared to the medium package. Wansink (1996) also discovered that the medium package was expected to have a lower unit price than the small package for all brands. Manning et al. (1998) revealed that the differences in terms of pricing and brand attitudes between QS and QD were greater when consumers exhibited a stronger QD belief primarily because the consumers significantly lowered their evaluations when presented with QS. These studies imply that consumers with a stronger QD belief are expected to infer the sellers' motives more easily for QD than for QS because the former is typically congruent with the consumers' beliefs. Thus, the impact of the assumed objectives assigned to sellers is expected to be more potent when consumers have a higher QD belief. For these reasons, the following hypothesis is proposed:

*H2.* The mediated relationships indicated in H1 are moderated by QD beliefs. The relationships are stronger when consumers have a stronger QD belief.

The above hypotheses focus on consumers' evaluations of attitudes toward the pricing and brand. We additionally investigate consumers' evaluation of quality. Notably, no investigation to date has examined the relationship between unit pricing on multiple package sizes and quality perception. Perhaps the quality perception was believed to be independent of package sizes when the same brand was viewed. However, Yan et al. (2014) demonstrated that small-sized packages generated higher perceived quality than large-sized packages of the same brand in a standalone evaluation context. The current study predicts that this phenomenon will not materialize when the differently sized products are presented together. When referring to the same brand, there seems to be no reason for consumers to assume that quality is dependent on package size. Widrick (1979b) also noted that when faced with QD and QS, consumers generally assumed that the quality of each differently sized package would be identical. Accordingly, this prediction will be examined.

## **Study 1**

### *Overview*

Study 1 examined the process through which the motives inferred by consumers for sellers employing a unit pricing format (i.e., QD or QS) mediated the relationship between the format and the consumers' attitudinal responses. The moderating effect of QD beliefs was also examined. The effects of a product picture were also tested to ascertain whether providing an additional visual cue affects the evaluations.

### *Design and stimulus*

A controlled experimental design was employed, which used a 2 (Format: QD/QS)  $\times$  2 (Photo: Present/Absent) between-subjects array. The two levels of photographs comprised the presence and the absence of package visuals. Liquid laundry detergent was selected as the target product category because numerous brands in this category offer multiple sizes. Also, this product was successfully used in previous experimental studies of QS (Granger and Billson, 1972) and was found to include the incidence of QS (Nason and Della Bitta, 1983).

A fictitious liquid detergent brand named *Super Clean* was created and it was said to be offered in two bottle sizes: large (610 g) and small (410 g). These sizes were the same as those sold by the top brand in this product category. Reflecting the typical prices in the marketplace, the large bottle was determined to cost JPY 467, resulting in a unit price of JPY 76.6 per 100 g.<sup>2</sup> This price was kept constant between the QD and QS conditions. The magnitude of QD and QS were determined to be JPY 6.1, which was an average magnitude observed in the marketplace. Thus, the unit and total prices for the small bottle were set to be JPY 82.7 per 100 g and JPY 339 in the QD condition. Also, the unit and total prices for the small bottle were set to be JPY 70.5 per 100 g and JPY 289 in the QS condition. We adopted 100 g for the unit of measure because the Tokyo municipal ordinance has suggested the use of this unit to express the laundry detergent unit prices. Table II shows the details of these prices.

**Table II. Experimental stimuli (Study 1 and Study 2)**

	QD		QS	
	Large	Small	Large	Small
Total price (JPY)	467.00	339.00	467.00	289.00
Size	610 g	410 g	610 g	410 g
Unit price per 100 g (JPY)	76.60	82.70	76.60	70.50

**Notes:** JPY is the currency symbol for the Japanese yen. 1USD  $\cong$  JPY100.

*Procedures and participants*

Participants were randomly assigned to one of the four conditions. They first responded to questions that were designed to measure their QD beliefs. Asking these questions at this time was considered appropriate for measuring their general view of QD. Subsequently, they were exposed to a scenario on a separate web page and instructed as follows: “Imagine that you are currently making a grocery shopping trip to your regular supermarket. One of the items you plan to buy is liquid laundry detergent. Since you have already used up your stock at home, you must purchase it on this trip. You are now at the sales floor where detergents are kept and you notice a brand,

<sup>2</sup> USD 1 is equivalent to JPY 100.

*Super Clean*, and decide to buy it. This brand is available in two bottle sizes: 610 g and 410 g. You must now decide which of the two bottles to buy.” Next, a supermarket shelf card including the retail price, unit price, size, brand name, and a brief review of the features of each bottle was presented to the participants. In the photo condition, the pictures of the two bottles were shown along with the shelf card. The two bottles were presented horizontally and their positions (left vs. right) were counterbalanced. The participants were then asked to choose between the two bottles and to indicate the number of items they want to purchase. Finally, the participants answered questions about the product and about themselves.

The sample comprised 574 participants who were recruited by an online panel through an Internet research company. Approximately 47.9% of the participants were women. Those aged 25 years and over were targeted because it was believed that they would be more familiar with or would have had more experience in shopping for laundry detergents. Consequently, the age of the respondents ranged from 25 to 87 years old. The participants were randomly assigned to one of the four experimental conditions.

### *Measures*

Table III lists multiple-item scales and their scale reliabilities. The QD belief scale was measured using a three-item seven-point Likert scale (Manning et al., 1998). The responses were collapsed into an overall evaluation index by averaging. Upon exposure to the scenario and stimuli, the participants responded to choice measures, which asked them to indicate the package size that they would purchase and the number of items they would buy. The participants then completed three dependent measures. First, attitudes toward pricing for the two sizes were measured by showing a phrase “Please indicate how you felt about the pricing of the two sizes” followed by a four-item seven-point SD scale (Manning et al., 1998). Second, attitudes toward the presented brand were measured with a phrase “Please indicate how you felt about the presented brand” followed by a two-item seven-point SD scale (Hamilton and Thompson, 2007). The last dependent measure was perceived quality, which was assessed by showing a phrase “Please indicate how you felt about the quality of the two sizes” and a two-item seven-point SD scale (Bornemann and Homburg, 2011; Yan et al., 2014). The responses to multiple items were then averaged to their respective indexes.

**Table III. Scale items and reliability**

Scale items	Cronbach's $\alpha$ or correlation coefficient $r$	
	Study 1	Study 2
<i>QD belief</i>		
Brands in larger-sized packages generally cost less per unit than brands in smaller-sized packages.		
The unit cost for a brand in a small package is usually higher than the same brand in a larger package.	0.87	0.85
Larger-sized packages are typically a better value than smaller-sized packages.		
<i>Pricing attitude</i>		
Bad/good		
Unfavorable/favorable	0.95	0.96
Negative/positive		
Unfair/fair		
<i>Brand attitude</i>		
Bad/good	0.96 <sup>a</sup>	0.97 <sup>a</sup>
Unfavorable/favorable		
<i>Perceived quality</i>		
The large size has better quality / both sizes have the same quality/ the small size has better quality	0.88 <sup>a</sup>	0.85 <sup>a</sup>
The large size has more reliable quality/ both sizes have the same quality/ the small size has more reliable quality		
<i>Price consciousness</i>		
I usually buy consumer products when they are on sale.		
I buy the lowest price brand that will suit my needs.	–	0.80
When it comes to choosing most consumer products, I rely heavily on price.		
<i>Unit price usage</i>		
I use unit price information when making my product selections if it is available.	–	0.83 <sup>a</sup>
I think unit price information is useful for product selections.		
<i>Affect</i>		
Negative/positive		
Bad/good	–	0.95
Sad/happy		
<b>Notes:</b> Cronbach's alpha was calculated for three-item and four-item scales. Correlation coefficient was calculated for two-item scales. a: $p < 0.01$		



The next set of measures assessed consumers' inferred motives of sellers for setting QD or QS. The participants were asked to indicate their agreement on a seven-point Likert scale (strongly disagree/strongly agree) with the following four statements: "The smaller (larger) bottle was assigned a higher unit price because 1) it has a higher sales volume than the larger (smaller) bottle (sales volume motive); 2) the former involves higher display and inventory-carrying costs than the latter (retailer's cost motive); 3) the former incurs higher production and packaging costs than the latter (manufacturer's cost motive); and 4) the former incorporates a higher profit margin than the latter (profit margin motive)." These motives were determined in accordance with Himbert (2016) and Kachersky (2011). Following this step, the participants were asked about their demographic information.

### *Results*

*Effects of format.* Table IV presents the means and standard deviations by treatment conditions. First, the effects of the format on consumers' evaluations were confirmed by two-way analyses of variance (ANOVAs) on pricing and brand attitudes. Manning et al. (1998) found that the effects were such that the QD condition generated higher pricing and brand attitudes than the QS condition. Since the current study is an extension of Manning et al. (1998), an attempt to replicate the findings was considered necessary before testing the hypotheses. The results revealed that the format had a significant main effect on both pricing and brand attitudes ( $F(1, 570) = 53.94, p < 0.01, \eta_p^2 = 0.09$  for pricing;  $F(1, 570) = 5.14, p < 0.05, \eta_p^2 = 0.01$  for brand). Participants in the QD condition had more positive pricing and brand attitudes than those in the QS condition ( $M_{QD} = 4.47, M_{QS} = 3.88$  for pricing;  $M_{QD} = 4.46, M_{QS} = 4.29$  for brand). No significant main effect of the photos and an interaction effect between the format and photos were observed. Manning et al. (1998) also found that the effects were more salient for consumers who exhibited strong QD beliefs. To confirm this finding, the moderation model was tested using the PROCESS macro (Hayes, 2018). The results confirmed that the QD belief (mean-centered) interacted with the format for pricing attitude ( $\beta = 0.28, t = 4.04, p < 0.01$ ) so that the moderating effect of QD beliefs was observed for pricing attitude. A spotlight analysis at one standard deviation above the mean of QD belief showed a significant difference, such that participants with high QD beliefs had a higher difference in pricing attitude between the QD and QS conditions.

**Table IV. Means, standard deviations, and test statistics (Study 1 and Study 2)**

		QD		QS	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<b>Study 1</b>					
Pricing attitude	Photo	4.49	0.85	3.77	1.19
	No photo	4.45	0.81	4.00	0.92
Format: $F = 53.94^{***}$ , Photo: <i>n.s.</i> , Interaction: <i>n.s.</i>					
Brand attitude	Photo	4.49	0.90	4.35	0.99
	No photo	4.43	0.79	4.23	0.84
Format: $F = 5.14^{**}$ , Photo: <i>n.s.</i> , Interaction: <i>n.s.</i>					
Perceived quality	Photo	4.02	0.66	3.99	0.64
	No photo	3.98	0.52	4.09	0.63
Format: <i>n.s.</i> , Photo: <i>n.s.</i> , Interaction: <i>n.s.</i>					
<b>Study 2</b>					
Pricing attitude		4.57	0.95	3.88	1.67
		Format: $t = 5.70^{**}$			
Brand attitude		4.72	0.88	4.44	1.09
		Format: $t = 2.49^{**}$			
Perceived quality		3.99	0.55	4.06	0.83
		Format: <i>n.s.</i>			

Notes: \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Next, the perceived quality was examined. As explained earlier, this measure has never been tested in unit pricing research. The mean of this measure was found to be 4.02 (SD = 0.62) and one sample t-test confirmed that the mean did not differ from the neutral point (4.0, the middle option in the scale), which indicated that the quality of the large and small bottles are perceived to be the same ( $t(573) = 0.82$ , *n.s.*). As predicted, the size effect on perceived quality shown by Yan et al. (2014) did not appear in the context where both sizes were observed together. A subsequent two-way ANOVA did not find significant main effects of the format and photo nor any interaction effect between them, implying that the perceived quality was not influenced by the format and the visual cue.

*Hypotheses testing.* Following this phase, we assessed the indirect effect of the format on pricing and brand attitudes, as predicted in H1. H1 envisaged that the inferred motives would mediate the relationship between the format and the attitudes. A bootstrap mediation analysis with 5,000

bootstrapped samples was performed to determine whether the four inferred motives mediated the effects of the format (QD vs. QS) on each dependent variable. For pricing attitude, this analysis indicated a mediation effect of the three inferred motives: sales volume motive ( $a \times b = 0.03$ , 95% confidence interval [CI] = 0.00 to 0.07), retailer's cost motive ( $a \times b = 0.03$ , 95% CI = 0.00 to 0.07), and manufacturer's cost motive ( $a \times b = 0.06$ , 95% CI = 0.02 to 0.12). The implications were that QD (as compared to QS) increased the inferred motives: i.e., the bottle with a higher unit price gained a higher sales volume, and was assigned higher retailing and manufacturing costs. These inferred motives, in turn, enhanced pricing attitude. The direct effect of the format on pricing attitude decreased when the mediation effect through inferred motives was included. Furthermore, a bootstrap mediation analysis for brand attitude revealed only the inference of the manufacturer's cost motive as a mediator ( $a \times b = 0.04$ , 90% CI = 0.00 to 0.08). Thus, QD increased the presumed motive; i.e., the bottle with a higher unit price was assumed to incur a higher manufacturing cost. Subsequently, this presumption positively influenced brand attitude. The direct effect of the format on brand attitude was diminished to an insignificant level when the mediation effect through the inferred motive was included. These results were consistent with H1.

H2 posited that the mediation effects of inferred motives on the relationship between the format and the attitudes would be moderated by the QD beliefs. This moderated mediation model was tested using 5,000 bootstrapped samples for both attitudes. The results confirmed the inferred motives of manufacturing cost and sales volume as mediators. When participants had a strong belief (mean-centered), QD increased the manufacturer's cost motive, which in turn influenced pricing ( $a \times b = 0.11$ , 95% CI = 0.03 to 0.21) and brand attitudes ( $a \times b = 0.07$ , 90% CI = 0.01 to 0.14). Also, QD increased the sales volume motive, which in turn influenced pricing attitude ( $a \times b = 0.05$ , 90% CI = 0.01 to 0.11). We obtained no significant effect for participants with a weak belief. These results supported H2.

*Additional analyses.* Finally, to further understand consumers' responses to the unit pricing format, two behavioral responses were analyzed, i.e., the choice of size and the purchased quantity (i.e., the number of items purchased). Manning et al. (1998) showed that the proportion of consumers who purchased a small-sized package was higher in the case of QS compared to QD. While Manning et al. (1998) simply compared the proportions, the current study conducted a logistic regression analysis incorporating not only the format, but also the evaluations regarding pricing,

brand, and quality. This leads to a deeper understanding of influential factors in the size choice. The selected size was the dependent variable and was coded as “1” if the large bottle was chosen and “0” if the small bottle was chosen. The independent variables were format dummy (coded as “1” for QD and “0” for QS), photo dummy (coded as “1” for the addition of a picture and “0” for no picture), pricing and brand attitudes, and perceived quality. The results revealed that the format dummy was significant ( $\beta = 1.57$ , Wald  $\chi^2(1) = 67.35$ ,  $p < 0.01$ ), which means that the QD condition encouraged more participants to choose the large bottle (see Table V). The significant effects of pricing attitude and perceived quality indicated that the large bottle was selected when pricing attitude was more positive ( $\beta = 0.38$ , Wald  $\chi^2(1) = 10.31$ ,  $p < 0.01$ ) and the small bottle was selected when it was perceived to be of higher quality compared to the large bottle ( $\beta = -0.36$ , Wald  $\chi^2(1) = 4.93$ ,  $p < 0.05$ ).

**Table V. Logistic regression results (Study 1 and Study 2)**

Source	$\beta$	SE	Wald
Dependent variable: Size choice			
<b>Study 1</b>			
Format dummy	1.57	0.19	67.35***
Photo dummy	-0.03	0.19	0.02
Pricing attitude	0.38	0.12	10.31***
Brand attitude	0.13	0.13	1.10
Perceived quality	-0.36	0.16	4.93**
Intercept	-1.64	0.87	3.53
Cox & Snell $R^2$	0.19		
<b>Study 2</b>			
Format dummy	1.43	0.27	29.00***
Pricing attitude	0.75	0.17	18.54***
Brand attitude	-0.05	0.18	0.09
Perceived quality	-0.50	0.22	5.16**
Intercept	-1.32	0.99	1.77
Cox & Snell $R^2$	0.24		

**Notes:** \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . Size choice: 1 = large bottle, 0 = small bottle. Format dummy: 1 = QD and 0 = QS. Photo dummy: 1 = present, 0 = absent.

Next, responses pertaining to purchase quantity were analyzed using a zero-truncated Poisson regression. Independent variables were the same as those used in the logistic regression. Separate analyses were undertaken for participants who selected the small bottle and for those who selected the large bottle. The results showed that those who chose the small bottle increased their purchase quantity when QS was presented ( $\beta = -1.01, z = -2.66, p < 0.01$ ) and when the smaller bottle was perceived to be of higher quality in comparison to the larger bottle ( $\beta = 0.54, z = 3.65, p < 0.001$ ). Marginally significant effects were indicated for those who selected the large bottle; i.e., they tended to increase the purchase quantity when QS was presented ( $\beta = -0.57, z = -1.9, p < 0.1$ ) and when pricing and brand attitudes were more positive ( $\beta = 0.32, z = 1.67, p < 0.1$ ;  $\beta = 0.3, z = 1.78, p < 0.1$ ). The increase in the buying of large bottles in the QS condition seems irrational because the large bottle was surcharged in this situation. It was presumed that these participants had a general preference for larger bottles in addition to their favorable attitudes. Notably, such irrational behavior in the purchasing of QS items was also reported by Hardesty et al. (2007).

### *Discussion*

Study 1 provided evidence for the mediating role of consumers' inferred motives for sellers to set dissimilar unit prices on different sizes of the same brand. Participants tended to presume reasons why sellers set diverse unit prices and used these inferences to form pricing and brand attitudes. While the objective of manufacturing cost was a common deduction for both attitudes, the sales volume and retailing cost motives were activated only for pricing attitude. When participants had a strong QD belief compared to QS, the QD condition strengthened the mediating role of the inference of manufacturing cost motive on both attitudes and the mediating role of the inference of sales volume motive on pricing attitude. Moreover, the influence of the size in quality perception was indicated. Although the qualities of the two sizes were perceived to be similar when they were presented simultaneously, the participants who chose a small package perceived its quality as being better than for a large package. Considering the results obtained by Yan et al. (2014) that a small package generates a higher perceived quality than a large package of the same brand in a standalone evaluation context, it may be concluded that the effect of package size on quality perception depends on the evaluation context. Finally, while the choice of a small package was fostered by QS and perceived quality, the choice of a large package was fostered by QD and pricing attitude.

## Study 2

### *Overview and design*

The main purpose of Study 2 was to provide further insight into the underlying process. We proposed several individual distinctions that were anticipated to account for some variations in the responses made by the respondents. To factor out these individual differences, price consciousness and unit price usage were selected as moderating variables and affect as a mediating variable. For Study 2, we excluded the photo manipulation and presented package pictures for all conditions. This change was made because outcomes from the inclusion of the photo manipulation were not significant in Study 1. Thus, Study 2 employed a single-factor between-subjects design. The same prices were used as in Study 1.

### *The moderating role of price consciousness and unit price usage*

In Study 2, we assessed two potential moderators: price consciousness and unit price usage. Lichtenstein et al. (1993) defined price consciousness as the degree to which the consumer focuses exclusively on paying low prices. Previous studies demonstrated the effect of price consciousness on consumers' price-related reactions. Compared to consumers with a low price consciousness, consumers who exhibited a high price consciousness spent more time looking at store advertisements and purchased more products on sale (Lichtenstein et al., 1993), had a narrower latitude of acceptable prices (Lichtenstein, Block, and Black, 1988), used the manufacturers' messages to form judgments (Inman et al., 1997), displayed higher store-brand usage (Ailawadi, Neslin, and Giadenk, 2001), and believed themselves to possess superior price knowledge (Magi and Julandar, 2005). In unit pricing studies, Yao and Oppewal (2016a) targeted an interbrand context where brands' package sizes were identical and found that consumers with a low price consciousness were more motivated to purchase cheaper products when unit prices were present than when they were absent. For consumers with a high price consciousness, their motivation was high regardless of the presence or absence of unit prices. Bogomolova et al. (forthcoming) used an eye-tracking method to show that the layout enhancement of unit prices increased the eye fixations by less price-conscious consumers. In a comparison between QS and PP, no significant effect of price consciousness was found on consumers' retailer evaluations (Manning et al., 1998) and size

choice (Hardesty et al., 2007). Since these studies did not examine the effects in a comparison between QD and QS, the role of price consciousness as a moderator is not examined fully. We predict that price consciousness plays a role in consumers' reactions to QD and QS. When consumers have a higher price consciousness, they are likely to focus more on paying low unit prices so that the differences in their reactions to QD and QS are expected to be larger. Thus, the effects of the format are likely to be stronger when consumers have a higher price consciousness.

Unit price usage is defined as the tendency of consumers to use unit price information in their purchasing decisions. Manning et al. (2003) showed that unit price usage was influenced by the knowledge of unit price and Himbert (2016) demonstrated that unit price usage moderated the relationship between unit price prominence and perceptions of store prices. These studies imply that when consumers use unit price information more frequently, they are motivated to process unit price information more deliberately and are likely to be more sensitive to the unit pricing format. We examined price consciousness and unit price usage separately because not all price-conscious consumers necessarily use unit prices. Previous studies demonstrated that the prominence or a layout of unit prices influence attention to unit prices (Bogomolova et al., forthcoming; Miyazaki et al., 2000). Based on these assumptions, the following hypotheses are proposed:

*H3.* The effects of the unit pricing format on pricing and brand attitudes are stronger when consumers are more price conscious.

*H4.* The effects of the unit pricing format on pricing and brand attitudes are stronger when consumers have higher unit price usage.

#### *The mediating role of affect*

Affect has been addressed as a source of information in judgment, choice, and behavior (e.g., Pham, 1998). O'Neill and Lambert (2001) proved that positive affect influenced the price-quality inferences made by consumers. Xia et al. (2004) and Wirtz and Kimes (2007) suggested that affect was evoked when consumers observed advantageous or disadvantageous price inequality, considering their expected price. Campbell (2007) demonstrated that the effect of price increase or decrease on perceptions of price fairness was mediated by affect. As these studies addressed the presence of affect in the price experiences of consumers, we presumed that affect would also be

evoked when observing different unit prices on different package sizes for the same brand. It was expected that QD elicited a positive affect more strongly than did QS and that the affect served as a mediator in the relationship between the unit pricing format and product evaluation. Although previous studies demonstrated that the assessments of QD were more favorable when QD was presented rather than when QS was presented, the existence and role of affect in this context has not been examined and the current study is the first to explore this area. Based on the assumption outlined above, the following hypotheses are proposed:

*H5.* The effects of the unit pricing format on pricing and brand attitudes are mediated by affect.

*H6.* The mediation effect of affect is stronger when consumers are more price conscious.

*H7.* The mediation effect of affect is stronger when consumers have a higher unit price usage.

#### *Participants and measures*

The sample for the study comprised 312 participants who were recruited by an online panel through an Internet research company. Approximately 51% of the participants were women and their ages ranged from 25 to 81 years old. The respondents were randomly assigned to one of the two experimental conditions.

The list of multiple-item scales and their scale reliabilities are shown in Table III. Participants responded to measures of QD belief, affect, choice of size and purchase quantity, pricing and brand attitudes, perceived quality, price consciousness, and unit price usage. A mediating variable, i.e., affect was assessed using a three-item seven-point SD scale (Chang, 2013). Two moderating variables, i.e., price consciousness (three items; Lichtenstein et al., 1988) and unit price usage (two items) were measured using a seven-point Likert scale. The responses to multiple items were averaged to form an index.

#### *Results*

*Effects of format and choices of size and quantity.* Table IV presents the means and standard deviations by treatment conditions. We first conducted analyses to confirm the effect of the format and the results of Study 1. Consistent with Manning et al. (1998), QD condition evinced more favorable pricing ( $M_{QD} = 4.57$ ,  $M_{QS} = 3.88$ ,  $t(310) = 5.7$ ,  $p < 0.01$ , Cohen's  $d = 0.65$ ) and brand attitudes ( $M_{QD} = 4.72$ ,  $M_{QS} = 4.44$ ,  $t(310) = 2.5$ ,  $p < 0.05$ , Cohen's  $d = 0.28$ ) than the QS condition.



The effect on pricing attitude was stronger when consumers had a strong QD belief (mean-centered;  $\beta = 0.2$ ,  $t = 2.05$ ,  $p < 0.05$ ). Again, perceived quality was not influenced by the format and package size. In size selection, participants selected the large bottle when QD was presented compared with when QS was presented ( $\beta = 1.43$ , Wald (1) = 29.0,  $p < 0.01$ ) and pricing attitude was more favorable ( $\beta = 0.75$ , Wald (1) = 18.54,  $p < 0.01$ ). The participants selected the small bottle when it was perceived to be of higher quality than the large bottle ( $\beta = -0.5$ , Wald (1) = 5.16,  $p < 0.05$ ) (see Table V). For the purchase quantities, those who chose the small bottle increased their purchase quantity when QS was presented ( $\beta = 1.63$ ,  $z = -2.24$ ,  $p < 0.05$ ) and those who chose the large bottle increased their purchase quantity when brand attitude was more favorable ( $\beta = 0.48$ ,  $z = 2.33$ ,  $p < 0.05$ ).

*Hypotheses testing.* H3 predicted that the effect of the format on pricing and brand attitudes would be moderated by price consciousness. To test this hypothesis, a moderation analysis was conducted for both attitudes. The results found no significant moderation effect of price consciousness (mean-centered). Hence, we conclude that H3 is not supported. We note that these results were consistent with the findings of previous studies, which showed that price consciousness did not moderate the effect of the unit pricing format (QS vs. PP) on consumers' retailer evaluations and size choice (Hardesty et al., 2007; Manning et al., 1998). Subsequently, we tested H4, i.e., the moderating role of unit price usage. A moderation analysis revealed that unit price usage (mean-centered) interacted with the format for pricing attitude ( $\beta = 0.21$ ,  $t = 2.24$ ,  $p < 0.05$ ). A spotlight analysis at one standard deviation above the mean of unit price usage showed a significant difference such that high usage participants had a higher difference in pricing attitude between the QD and QS conditions. This result was consistent with H4.

We next analyzed H5, i.e., the mediating effect of affect. A bootstrap mediation analysis with 5,000 bootstrapped samples for pricing and brand attitudes indicated a significant mediating effect of affect for pricing ( $a \times b = 0.17$ , 95% CI = 0.03 to 0.32) and brand attitudes ( $a \times b = 0.17$ , 95% CI = 0.03 to 0.33). The findings implied that QD evoked affect more strongly compared to QS. This resulting affect, in turn, enhanced pricing and brand attitudes. These outcomes significantly support H5.

H6 posited a moderated mediation effect in which affect was treated as a mediator and price consciousness was treated as a moderator. The results of a bootstrap analysis did not reveal a

significant moderating effect of price consciousness (mean-centered) on the mediated relationship for both pricing and brand attitudes. Thus, we conclude that H6 is not supported. We then repeated the bootstrap analysis using unit price usage (mean-centered) as a moderator to test H7. The results showed that when participants maintained a high unit price usage, QD (as compared to QS) increased pricing ( $a \times b = 0.31$ , 90% CI = 0.13 to 0.5) and brand attitude through affect ( $a \times b = 0.32$ , 90% CI = 0.13 to 0.53). These results support H7.

The above results indicate that the influences of price consciousness and unit price usage are not similar. While price consciousness did not moderate the effect of the format on pricing and brand attitudes, unit price usage moderated the effect for both attitudes. A subsequent correlation analysis showed that the correlation between them is moderate (correlation coefficient  $r = 0.49$ ,  $p < .01$ ). Hence, they capture somewhat different aspects of consumer characteristics.

### *Discussion*

Study 2 demonstrated the role of affect in consumer responses to QD and QS. QD was observed to elicit positive affect more strongly than QS. This positive affect subsequently led to better pricing and brand attitudes. The study also identified unit price usage as a major moderator in addition to QD beliefs. Consumers who used unit price information more intentionally exhibited a stronger effect of the format on pricing attitude than consumers who did not. Unit price usage also mediated the relationship between the format and pricing and brand attitudes. When the usage increased, the format indirectly increased the attitudes through intensified affect. Moreover, price consciousness was not a moderator of the effect. Although unit price usage and price consciousness seem to be highly related, they are not the same and their influence differs in consumers' reactions to the unit pricing format.

### **General discussion**

Research on unit pricing has attracted the attention of marketing scholars for over 40 years. Nevertheless, very few studies have examined the effects of the unit pricing of multiple package sizes within a brand on the consumers' evaluations. The current investigation seeks to address this gap by concentrating on an unexplored research issue. The identification of two mediators is a key contribution of this study. One confirmed mediator is the consumers' inferences regarding the

intentions of sellers in assigning different unit prices to different packaging sizes. Compared to QS, QD improves pricing and brand attitudes through these inferred motives. While the rationale of manufacturing costs is a common inference drawn for both pricing and brand attitudes, the assignation of the motives of sales volume and retailing costs are activated only for pricing attitudes. In addition, when consumers have strong QD beliefs, QD improves pricing and brand attitudes through the inference of manufacturing cost motives and improves pricing attitude through the inference of sales volume motives. Another mediator is affect; e.g., QD generates a more favorable affect than QS and these outcomes improve consumer attitudes toward both the pricing and the brand. The second pivotal contribution is that this study has distinguished one moderator: i.e., unit price usage. In response to QD compared with QS, consumers who display a high unit price usage tend to generate a more favorable pricing attitude. Also, these heavy users of unit prices improve pricing and brand attitudes through affect generated from QD rather than QS. In addition, the study has confirmed that price consciousness was not a moderator. Hence, the role of unit price usage and price consciousness differ in terms of unit pricing reactions. The third significant input is the examination of the relationship between the unit pricing format and quality perception. Yan et al. (2014) discovered that the perceived quality of the large and small packages differed when they were presented separately. The current study has shown that the qualities of these packages are perceived to be similar when they are presented together. It has also shown that consumers who chose a small package tend to perceive it as having higher quality than a large package. These results imply that the decision context and the chosen size are vital factors that determine the effect of package size on quality perception. The fourth contribution is finding sources that foster the choice of a certain size. While the choice of a small package is fostered by QS and favorable quality perceptions, the choice of a large package is fostered by QD and favorable pricing attitude. Overall, these findings effectively further the understanding of the process by which consumers respond to unit pricing.

This study supplements the existing literature pertaining to unit pricing. A substantial number of scholarly investigations have examined the effects of unit pricing on consumer behaviors. Much of the existing research, however, has been devoted to analyzing the more general aspects of unit pricing such as display formats, consumer awareness, and the effects of consumer characteristics (e.g., Aaker and Ford, 1983; Russo, 1977; Yao and Oppewal, 2016). Studies have largely omitted the assessment of the impact of unit pricing on multiple brand sizes. Thus, this examination of the

underlying process of consumer responses to QD and QS has increased the store of knowledge on this topic. The findings of the current investigation also extend prior research on affect. To the best of the authors' knowledge, no study has so far examined whether affect was elicited from the observation of unit prices. This research project demonstrates conclusively that observing QD or QS can create different levels of affect, which are transferred to product appraisal, indicating the reliance of consumers on affect in such evaluations.

The present study produces several implications for the marketing of consumer goods. First, it may be beneficial to attach an accompanying message to recommend the smaller packages when applying QS to a product. For example, if a product is new, a message urging customers to try a small pack as a test sample would be effective. Suggesting that infrequent users purchase a small package while promoting product benefits may also be effective. Such communications would enable consumers to understand the seller's reasons for establishing a QS. It would also preclude the possibility of negative responses. Second, for products or in stores where smaller packages are in higher demand, offering QS may improve the consumers' attitudes toward the retailer and the retailer's price image. Third, the consistent employment of the same format for most merchandise stocked in a store could become a tool to differentiate the store's price images. This benefit applies to both the QS and the QD formats. Finally, the use of QD increases sales by a significant margin because retail prices for larger packages are higher than that for small packages. Wansink (1996) demonstrated that a large package increases the usage volume of food as well as nonfood products (i.e., cleaner) than a small package. Although QD results in customers buying lesser quantities, large packages may increase the usage volume, and consequently, the purchased quantity of the product may increase in the long run. However, we note that this increase in usage volume may vary among products. Products which have high substitutability (e.g., foods) are expected to increase the volume more than for other products.

The study has a number of limitations. First, further investigation into the mechanism of quality assessment of different sizes of the same brand is merited. Consumer perception was discovered to be influenced by the chosen package size. It is important to determine whether other components also function as factors in this context. Second, a similar investigation should be conducted regarding price promotions. Many studies have indicated that price discounting influences consumers' purchasing behaviors (Anderson and Simester, 2004; Blattberg and Neslin, 1989). If product prices are discounted, consumers may use other heuristics. As a result, different responses

to unit pricing may be observed. Notably, there is limited research on unit pricing within this framework. Third, in our experiments, the unit price of the small bottle in the QD condition was in a higher first-digit bracket compared to the unit prices in the QS condition and the large bottle (80s vs. 70s). These differences might have influenced the results. Thus, an additional investigation is necessary using unit prices having the same first-digit bracket. Fourth, it is important to investigate the 9-ending effect in the context where unit prices are displayed. The 9-ending effect has been found to influence consumers' price and quality perceptions (Schindler et al., 2001). Comparing the 9-ending and unit price effects may generate some interesting findings. Fifth, an additional study is necessary by including a control condition. Our experimental design was adopted from Manning et al. (1998), which compared QD and QS without including a control condition. The control condition can be a situation where all sizes have the same unit prices (PP) or a situation where no unit prices are displayed. The selection of the situation for the control condition needs to be carefully determined. Sixth, an investigation of situations where the effects of the unit pricing format are reversed should be examined. Some participants purchased the package size which has a higher unit price. In Study 1, 27% of participants selected the large size in the QS condition and 32% selected the small size in the QD condition. Hardesty et al. (2007) also found that on average 19% of participants selected the large size across QS conditions. We conducted a t-test to compare the level of the perceived quality between the groups who purchased the high- or low-unit priced sizes. The results did not show any significant difference in the means. Thus, the reverse pattern was not due to the perceived quality. A preference for a certain size is a possible factor. In any case, further investigation is needed to explore the factors influencing the reverse pattern. Seventh, it is equally important to target other product categories. Examining a variety of goods will enable researchers to determine whether the findings presented in this study can be generalized. Finally, it must be noted that the study design does not entirely replicate real-world conditions and field experiments are required to confirm the obtained results.

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