Journal of Business Research 85 (2018) 91–104

Contents lists available at ScienceDirect

Journal of Business Research

journal homepage: www.elsevier.com/locate/jbusres

# Shopper marketing moderators of the brand equity – behavioral loyalty relationship

Vijay Ganesh Hariharan[a,*], Kalpesh Kaushik Desai[b], Debabrata Talukdar[c], J. Jeffrey Inman[d]

[a] Erasmus School of Economics, Erasmus University Rotterdam, 3000DR Rotterdam, The Netherlands
[b] The Henry W. Bloch School of Management, University of Missouri-Kansas City, Kansas City, MO 64110, USA
[c] School of Management, State University of New York at Buffalo, Buffalo, NY 14260, USA
[d] Joseph M. Katz Graduate School of Business, University of Pittsburgh, Pittsburgh, PA 15260, USA

ARTICLE INFO

*Keywords:*
Brand equity
Behavioral loyalty
Scanner-panel data
Multi-method approach
Shopper marketing

ABSTRACT

The branding literature assumes that the higher a brand's equity, the greater is its behavioral loyalty. In this research, we develop a conceptual framework that explains the off-diagonal relationship between brand equity and behavioral loyalty (i.e., high equity but poor loyalty and vice versa) by identifying five shopper marketing related factors that potentially moderate this relationship. We adopt a multi-method approach by mailing surveys to collect shoppers' attitudinal data on brand equity and the moderators for ten brands in two product categories, and then merging it with each household's corresponding purchase data from a frequent shopper scanner panel to empirically test our framework. Findings reveal that approximately 40% of consumers exhibit high brand equity but low behavioral loyalty or vice versa. The relationship between brand equity and behavioral loyalty is accentuated by perceived in-store presence and importance of brand choice decision, and attenuated by the brand equity of competitors. Our findings provide several implications for retailers and brand manufacturers.

## 1. Introduction

Brand managers strive very hard to create high equity for their brands hoping that it will result in high behavioral loyalty. This is because of the benefits of high behavioral loyalty, including reduced search for information (Moore & Lehmann, 1980), positive word-of-mouth (Westbrook, 1987), reduced cost of marketing (Aaker, 1991), and increased market share (Chaudhuri & Holbrook, 2001). However, the reality for many brands is that high brand equity does not always translate into the above benefits, making it a frustrating problem for managers because building brand equity is expensive and time consuming.

Prior studies in the branding literature have examined the relationship between specific dimensions of brand equity (e.g., brand trust) and attitudinal or stated measures of behavioral loyalty and have found a strong positive relationship between them. Specifically, Chaudhuri and Holbrook (2001) examined the effect of brand trust and brand affect on attitudinal loyalty and purchase intentions across > 100 brands. Netemeyer et al. (2004) examined the effects of different consumer-based brand equity dimensions, specifically brand quality, value for money and brand differentiation, on the willingness to pay and subsequently on purchase intentions. Taylor, Celuch, and Goodwin (2004) examined the effect of brand equity on both attitudinal and behavioral loyalty in the context of industrial equipment. Recently, Romaniuk and Nenycz-Thiel (2013) examined the role of brand associations on behavioral loyalty.

As highlighted in Table 1, in contrast to prior studies, we examine the role of brand equity on a revealed measure of behavioral loyalty and the factors that moderate the relationship. Consistent with prior literature that focuses on behavior-based brand loyalty (e.g., Ailawadi, Lehmann, & Neslin, 2003; Srinivasan, Park, & Chang, 2005), we define behavioral loyalty as consistency in revealed brand choice across several purchase occasions. This is different from attitudinal brand loyalty, which includes a degree of dispositional commitment in terms of some unique value associated with the brand (Aaker, 1991; Dick & Basu, 1994).[1] While these prior studies conceptualize (true) brand loyalty to entail both behavioral and attitudinal loyalties, the focus in the current

* Corresponding author.
*E-mail addresses:* hariharan@ese.eur.nl (V.G. Hariharan), desaika@umkc.edu (K.K. Desai), dtalukda@buffalo.edu (D. Talukdar), jinman@katz.pitt.edu (J.J. Inman).

[1] Our conceptualization of loyalty is different from Oliver's (1999) according to which consumers sequentially become loyal in cognitive sense (or brand beliefs) first, followed by affective (or liking) loyalty, conative loyalty (or intention to buy), and culminate in action loyalty (or motivated intention is transformed into readiness to act by overcoming any obstacle). We do not assume this sequential progression. Instead, our conceptualization starts with Oliver's first three loyalties which are captured by our key independent variable – brand equity – that we then relate to behavioral loyalty and identify moderators that either strengthen or weaken the brand equity-behavioral loyalty linkage. Our behavioral loyalty corresponds to Oliver's action loyalty but without the motivational and readiness to act elements.

https://doi.org/10.1016/j.jbusres.2017.12.002
Received 3 May 2016; Received in revised form 30 November 2017; Accepted 2 December 2017
0148-2963/ © 2017 Elsevier Inc. All rights reserved.

**Table 1**
Comparison with prior studies that examine the relationship between different brand attitudinal measures and behavioral outcome measures.

| Study | Attitudinal measures | Behavioral outcome measure(s) | Moderating effects | Categories | Number of brands |
|---|---|---|---|---|---|
| Chaudhuri and Holbrook (2001) | Brand trust and brand affect | Attitudinal and purchase brand loyalty (stated) | None | 49 categories | 149 |
| Netemeyer et al. (2004) | Brand quality, brand value for the cost and brand uniqueness | Willingness to pay a premium and purchase intention | None | Cola, toothpaste, athletic shoes and jeans | 3 brands per category |
| Taylor et al. (2004) | Satisfaction, value, resistance to change, affect, trust and brand equity | Attitudinal loyalty and behavioral loyalty (stated) | None | Waste management and heavy equipment | 11 |
| Horsky et al. (2006) | Liking | Brand choice (revealed) | None | Toothpaste | 7 |
| Romaniuk and Nenycz-Thiel (2013) | Brand associations | Behavioral loyalty (buying frequency and share of category requirements) | None | Two categories (hot beverages) | 6 |
| This study | Brand equity dimensions | Behavioral loyalty – share of wallet (scanner panel data) | • In-store presence | Toothpaste and tortilla chips | 10 |
| | • Brand trust | | • Price | | |
| | • Strength of brand's favorable associations | | • Brand equity of competitor brands | | |
| | • Brand quality | | • Importance of brand choice decision | | |
| | • Value for money | | • Category differentiation | | |
| | • Brand personality | | | | |

research is on understanding the influence of brand equity, which we believe is a richer substitute construct for attitudinal loyalty, on behavioral loyalty and factors that moderate this relationship. Moreover, we adopt Keller's (1993) popular definition of brand equity as *the differential effect of brand knowledge on consumer response to the marketing of that brand as compared to if the same product or service did not have that name*.

Our research addresses key important gaps in prior research. First, while prior research has merged attitudinal data with revealed data in other contexts (e.g., Ben-Akiva et al., 1994), ours is the first study to merge attitudinal data on brand equity with revealed data on behavioral loyalty. Researchers have long acknowledged the need for empirical studies that investigate the conceptual link between dimensions of brand equity and revealed measures of behavioral loyalty (Ailawadi et al., 2003; Erdem & Swait, 1998), yet there is a surprising paucity of such studies. This absence can be mostly attributed to the fact that the undertaking of such a study faces the challenge of implementing an empirical research design that can merge customer mind-set based measures of brand equity with customers' purchases over a period of time. A key contribution of our research is to successfully address that challenge through a field study that reveals empirical insights into important aspects of the conceptual link between brand equity and behavioral loyalty. Specifically, our study marries consumers' attitudinal brand equity data collected through surveys for multiple brands in two categories to their actual purchases over a time period of two years.

Second, we perform a comprehensive search of prior literature to develop a unidimensional, parsimonious and reliable scale for brand equity. A high variation in the operationalization of brand equity in prior research prompted us to fall back upon the conceptual definition of brand equity (Keller, 1993) and operationalize brand equity using five dimensions viz., brand trust, strength of brand's favorable associations, brand quality, value for money, and brand personality. The scale has strong face validity in that brands such as Crest and Doritos were rated as high equity brands compared to brands such as Aquafresh and Santitas.

Third, before suggesting specific guidelines to brands, it is important to ascertain the factors responsible for consumers straying away from the high equity-high loyalty segment. In other words, unlike prior research (e.g., Chaudhuri & Holbrook, 2001; Horsky, Misra, & Nelson, 2006) that only captures the main effect of brand equity on (attitudinal or behavioral) loyalty, we identify individual-level and brand-level moderators that accentuate or attenuate this linkage. Furthermore, we empirically identify which specific dimensions of brand equity mitigate the influence of distinct moderators responsible for consumers straying away from the high equity-high behavioral loyalty segment or accentuate the influence of moderators responsible for consumers to stay in the high equity – high behavioral loyalty segment.

Our choice of moderators recognizes the importance of shopper marketing factors (Shankar, Inman, Mantrala, Kelley, & Rizley, 2011), especially those, both outside and inside the store, that act as trigger points in consumers' shopping cycle influencing their attitudes and behaviors. Specifically, we include perceived *in-store presence* that captures whether consumers can easily find the brand in the store and if they find the brand on the shelf attractive, *price* paid by the consumer that captures the utilitarian cost of purchasing the brand, the perceived *equity of competing brands*, the perceived *importance of brand choice decision* within the category, and the perceived ease with which consumers are able to differentiate the brands within the category (*category differentiation*).

Fourth, unlike prior research that conceptualizes only the main effect of brand equity on behavioral loyalty, we conceptualize and empirically identify four distinct segments of consumers that vary in their perceptions of the brand's equity (low versus high) and their behavioral loyalty (low versus high). Since the percentages of consumers in the four segments vary from one brand to another, brands need guidelines to either focus on improving (lowering) the moderators that accentuate (mitigate) the brand equity – behavioral loyalty relationship or to strengthen the overall level of brand equity across all dimensions to move consumers from other three segments to the high equity-high loyalty segment.

Our research makes the following four theoretical contributions. First, we outline an approach that can be used by brand managers to

identify factors that strengthen or weaken the relationship between brand equity and behavioral loyalty. Second, we identify which moderators are more important than others. Third, while our moderators deal with shopping-related factors (e.g., in-store presence of the brand), they are based on consumer perceptions. This is important because managerial actions can influence those perceptions of say, in-store presence by working closely with retailers and of competitor's brand equity through comparative advertising. Finally, we provide a parsimonious measure of brand equity.

## 2. Conceptual background

As a strategic concept, brand equity has garnered widespread popularity among manufacturers, retailers and marketing academics (Keller, 2003). For the purpose of this research, we adopt Keller's (1993) popular definition of brand equity detailed earlier. While there are other measures of brand equity,[2] our operationalization of brand equity, is consistent with this conceptual definition and includes measures related to consumers' differential response and knowledge.

In terms of the outcomes of brand equity, the literature implicitly assumes that consumers with a high (low) brand equity will have higher (lower) behavioral loyalty. In other words, the literature assumes that all consumers will belong to one of the two on-diagonal segments in a conceptual 2 × 2 market segmentation matrix of high vs. low brand equity with concomitantly high vs. low behavioral loyalty (see Fig. 1).[3] In line with Dick and Basu (1994), we refer to these two on-diagonal segments as *believing loyals* (high brand equity and high behavioral loyalty) and *doubting switchers* (low brand equity and low behavioral loyalty). However, two other off-diagonal segments potentially exist – *doubting loyals* (consumers whose behavioral loyalty to a brand is high even though their equity is low) and *believing switchers* (consumers who hold high equity towards a brand but do not purchase it very often).

It is expected and normal behavior for *believing loyals* to exhibit high behavioral loyalty to a brand whose equity they perceive to be high. Similarly, an argument in the opposite direction would explain the presence of *doubting switchers*. Buying out of habit, inertia to switch (Jeuland, 1979), high transaction costs, or high switching costs (Shugan, 1980) might explain consumers with low brand equity to exhibit high behavioral loyalty. Finally, prior research (e.g., Homburg & Giering, 2001; Kumar, Pozza, & Ganesh, 2013) has proposed several factors to explain the behavior of *believing switchers* including variety seeking, loyalty to more than one brand, and contextual factors influencing choice as explained by the Theory of Reasoned Action (Ajzen, Heilbroner, Fishbein, & Thurow, 1980). For instance, consumers may purchase both a high equity but unhealthy Doritos chips in the evening or at a party but purchase organic and healthy chips to consume at lunch.

Dissecting the brand equity – behavioral loyalty relationship in terms of these four segments is important because, in real life, different brands in a category might have different proportions of consumers in the four segments, reflecting distinct strengths of the linkage. More importantly, different brands in a category might enjoy a similar overall positive brand equity-behavioral loyalty relationship, but the proportions of consumers in these four segments can vary. Our approach assesses if the problem underlying weak linkage is at the level of brand equity or behavioral loyalty or both.

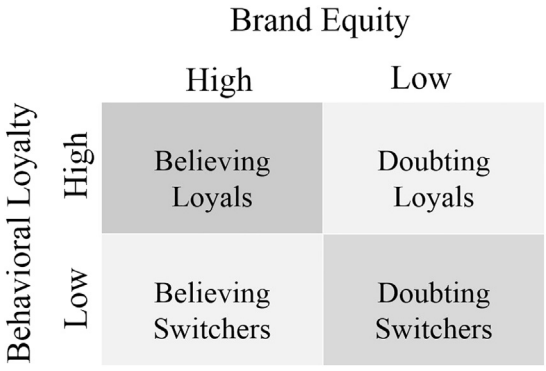


**Fig. 1.** Consumer segments based on brand equity – behavioral loyalty relationship.

We conceptualize the brand managers' problem of strengthening the brand equity-behavioral loyalty link as converting consumers from other three segments to the high brand equity-high behavioral loyalty (i.e., *believing loyals*) segment. The strategic guidelines to brands to attract more consumers into the high equity-high loyalty segment will differ depending upon which of the other three segments dominates the brand's users. Moreover, we examine the influence of moderators that capture the perceptions of individual shoppers (discussed next in the Hypotheses section) that may prompt them to switch from the on-diagonal segments to off-diagonal segments. We examine the moderating influences of shopper-related factors using the aggregate measure of brand equity as well as using individual dimensions of brand equity. While we hypothesize the former, we avoid hypothesizing the latter due to a lack of a priori theoretical support.

## 3. Hypotheses

Keller's definition of brand equity suggests that consumers who possess high brand equity will react more favorably to the brand. Keller (1998) further mentions that one of the characteristics of brands possessing strong brand equity is strong loyalty. Prior studies in the branding literature (e.g., Chaudhuri & Holbrook, 2001) have empirically demonstrated the positive relationship between specific dimensions of brand equity (e.g., brand trust) and attitudinal measures of brand loyalty. Extending these findings, we posit our first baseline hypothesis:

**H1.** Brand equity will have a positive effect on behavioral loyalty.

We now discuss the hypotheses for the moderators of the brand equity – behavioral loyalty relationship. These moderators have been chosen based on their relevance to shopper marketing, a recent phenomenon to which retailers and manufacturers are paying increasing attention (Shankar et al., 2011). It refers to the planning and execution of all marketing activities that influence a shopper along, and beyond, the entire path to-purchase, from motivation to shop, search, evaluation, category/brand/item selection, to store choice, purchase, and recommendation (Shankar et al., 2011). In other words, our choice of moderators recognizes the importance of shopper marketing factors, both outside and inside the store, that act as trigger points in consumers' shopping cycle and influence their attitudes and behaviors.

Specifically, we include perceived in-store presence of the brand, actual price paid by the shopper, perceived brand equity of competing brands, perceived importance of brand choice decision, and the perceived ease with which consumers are able to differentiate the brands within the category. We note that although these factors may directly influence behavioral loyalty, our focus is on their moderating influence on the brand equity-behavioral loyalty relationship. In other words, we explore reasons as to why, despite having strong (weak) brand equity, a consumer might have low (high) behavioral loyalty. Our conceptual

[2] Other measures of brand equity are based on consumers' marketplace behaviors that create value for the brand. Examples of such market-outcome based measures include residual market value (Simon & Sullivan, 1993), price premium (Agarwal & Rao, 1996), revenue premium (Ailawadi et al., 2003), the difference between the brand's profit and the profit it would earn without the brand name (Dubin, 1998) and intrinsic brand preference as captured through the intercept term in brand choice models (Kamakura & Russell, 1993).

[3] Our conceptual arguments can easily be extended to a greater number of segments based on brand equity and behavioral loyalty, where the on-diagonal segments exhibit a strong positive relationship between brand equity and behavioral loyalty and the relationship is weaker in case of off-diagonal segments.

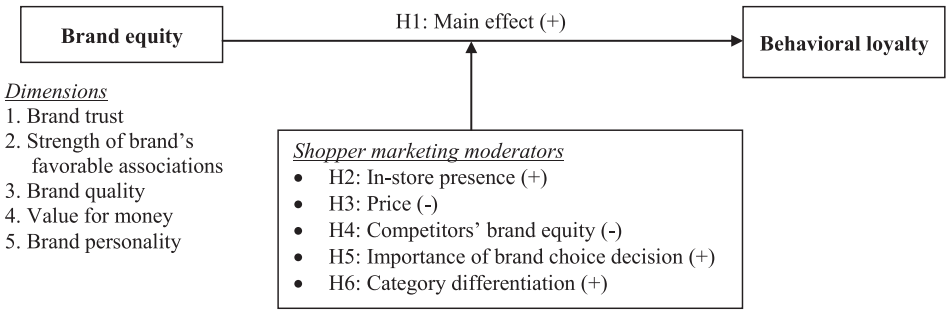


**Fig. 2.** Factors moderating the relationship between brand equity and behavioral loyalty.

model with hypothesized relationships is summarized in Fig. 2.

### 3.1. In-store presence

In-store presence refers to the visibility of the brand inside the store in terms of its availability, ease of finding it, and its attractiveness on store shelves. Consumers with high behavioral loyalty may find the brand in a store independent of its in-store presence and a better in-store presence is more likely to influence the behavior of consumers with low behavioral loyalty. Our research explores the influence of in-store presence and other factors that either strengthen or weaken the brand equity-behavioral loyalty relationship. Therefore, we compare brands with same level of brand equity but different levels of in-store presence.

Prior research suggests that if a product is given more shelf space, it is more likely to be seen by shoppers (Dhar, Hoch, & Kumar, 2001; Dreze, Hoch, & Purk, 1994). Consumers are less likely to comparison shop and are more likely to be influenced by their attitudinal equity in their brand choice when the brand has strong in-store presence (Sloot, Verhoef, & Franses, 2005). Thus, we posit our next hypothesis:

**H2.** The influence of brand equity on behavioral loyalty will be accentuated for consumers who perceive the target brand to have stronger compared to weaker in-store presence.

### 3.2. Price

A high level of equity enables brands to charge a premium price and enjoy a price inelastic demand (Keller, 1993). However, if a brand with a similar level of brand equity (and thus, similar price elasticity) charges a higher price than the other, we expect its behavioral loyalty to suffer. This is because high brand equity might justify a higher price, but setting too high a price will negatively affects its perceived value. Thus, we hypothesize,

**H3.** The brand equity – behavioral loyalty link of a target brand will be mitigated if its price is higher than that of another brand with the same level of brand equity.

### 3.3. Brand equity of competitor brands

All else equal, perceived stronger equity of other brands in the category signifies increased intensity of competition in terms of the consumer having several strong brands to choose from. Thus, the probability of repeatedly buying the same brand (i.e., high behavioral loyalty), decreases resulting in the weakening of the brand equity-behavioral loyalty relationship. Every time a consumer with high equity towards competitors makes a purchase in the category (even if it is a low involvement category), s/he is likely to start afresh and give different brands some consideration before finalizing the choice. This leads to the following hypothesis:

**H4.** The brand equity – behavioral loyalty link will be weaker for consumers who perceive the brand equity of other non-target brands in the category to be higher.

### 3.4. Importance of brand choice decision

Consumers are unwilling to devote a significant amount of effort in optimizing their purchase in a category that is of little perceived importance to them (Petty, Cacioppo, & Schumann, 1983). Consequently, they are likely to pay less attention to information about the brand equity and other factors such as the product attributes that distinguish the brands in such category (Alba & Hutchinson, 1987). This does not imply that brand equity has no influence on behavioral loyalty. However, a shopper for whom the importance of such brand decisions is low is more easily influenced by situational factors such as the target brand not being available an exciting advertisement, eye-popping display at the point of purchase, or a deep price discount by a competitor. In contrast, shoppers with higher importance of brand choice decision are less likely to be influenced by such factors and instead will focus on brand equity dimensions such as strong, favorable and unique brand associations, brand quality, and brand trust (Petty et al., 1983). Thus:

**H5.** The brand equity – behavioral loyalty relationship for a target brand will be accentuated among consumers for whom the importance of brand choice decision is higher.

### 3.5. Category differentiation

Consumers who perceive greater differentiation among brands in a category have a wider set of options to choose from. This increases the likelihood that such consumers will find the exact brand they prefer and are thus less likely to switch from their most preferred option. Moreover, greater differences between brands make them less substitutable, further strengthening the brand equity-behavioral loyalty relationship.

The moderating effect of category differentiation is different from that of the brand equity of competitor brands (H4) in several respects. First, the perceived brand equity of competitor brands will be different for each target brand whereas the perceived differentiation among brands is a category-level factor and is the same for all brands within the category. Second, the relationship between brand equity and behavioral loyalty of a low equity brand is expected to be lower if consumers perceive high equity for the competitors whereas it is expected to be higher if the consumer perceives the brands within a category to be different from each other. Specifically, the consumer may have a low brand equity but still have high behavioral loyalty if s/he does not consider the other brands within the category to be close substitutes. Based on the above arguments, we hypothesize:

**H6.** The brand equity – behavioral loyalty relationship will be accentuated for consumers who perceive greater differentiation among brands in the category.

## 4. Data

### 4.1. Data collection process

We designed a unique field study that merges customer attitudinal brand equity data with their corresponding revealed purchase or behavioral loyalty data. The cooperation of a major grocery supermarket chain in the northeastern region of the U.S. made the study possible. This cooperating supermarket chain has a well-established customer loyalty card program with a usage rate of approximately 95%.

We selected two product categories – tortilla chips and toothpaste – for the analyses.[4] We chose these categories since they have: (a) high penetration; (b) relatively few brands (i.e., the top five brands comprise 90% of the purchases) in order to keep the length of the survey reasonable; and (c) heterogeneity in brand purchase across consumers. We chose the brands Chi-Chi's, Doritos, private label,[5] Santitas, and Tostitos in the tortilla chips category, and Aquafresh, Arm & Hammer, Colgate, Crest, and Sensodyne in the toothpaste category.

We considered two aspects while selecting households for the analyses. First, we chose households that are loyal to the chain, such that we capture their entire basket. We consider a household to be loyal to the chain if it has a high ratio of actual to potential spending for the chain.[6] This ensures that the chosen households shop almost exclusively at the cooperating grocery chain. Second, we selected households that exhibited multiple purchase incidences in the chain over our two-year time period in the selected product categories.

Using this sampling frame of households, we randomly selected two non-overlapping groups – a group of 3505 households for the toothpaste category survey and a group of 3575 households for the tortilla chips category survey. The groups were non-overlapping to ensure that each household was surveyed for only one product category so as to reduce potential response fatigue and reduce consequent adverse impact on survey response rates. As an incentive to the households to fill out the survey, we awarded several cash lottery prizes worth $400 to randomly chosen households who returned completed surveys. The primary shopper of the household was requested to complete the survey.

We obtained 610 responses for the survey in the tortilla chips category and 635 responses for the survey in the toothpaste category.[7] Due to incomplete responses, data for the attitudinal constructs were available only for 501 responses in the tortilla chips category and for 488 responses in the toothpaste category. These survey responses provided us the data for the various measures of brand equity of the target brand, shopper marketing moderators (i.e., in-store presence, importance of brand choice decision, brand equity of competitor brands, and category differentiation), and demographic variables such as age, education, and income. These demographic variables are used to explain household heterogeneity in our analysis.

Data for behavioral loyalty and price came from the cooperating chain's scanner database.[8] Specifically, we used the chain's scanner database to extract each responding household's purchase history in the respective product categories for a period of two years – one year before administering the survey and one year after administering the survey.

### 4.2. Key measures

#### 4.2.1. Behavioral loyalty

We obtain the dependent variable, consumers' behavioral loyalty, from the scanner-panel data. For a given household and a given brand, it is measured as the household's category spending share in the brand over the period of one year before and one year after administering the survey.[9] We do this in order to test if the household's exposure to the survey changed the nature of the brand equity-behavioral loyalty relationship (Janiszewski & Chandon, 2007).

Although we could have increased the degrees of freedom in our model by using more disaggregate transaction level data, we believe that annual data are more appropriate for several reasons. First, the relationship between brand equity and behavioral loyalty is a relatively stable behavior. Second, except for price, none of the other moderators vary at a weekly or at a monthly basis. Finally, it is extremely difficult to obtain weekly or monthly measures of brand equity from the same set of households in order to track disaggregate patterns in the relationship between brand equity and behavioral loyalty.

#### 4.2.2. Brand equity

A comprehensive search of prior behavioral literature revealed that there is a very high variation in the operationalization of brand equity. This prompted us to fall back upon the conceptual definition of brand equity (Keller, 1993): *the differential effect of brand knowledge on consumer response to the marketing of that brand as compared to if the same product or service did not have that name*. Our operationalization of brand equity is consistent with this conceptual definition. Prior research in brand equity suggests that consumers' (differential) response towards high equity brands typically involves greater trust (e.g., Chaudhuri & Holbrook, 2001; Christodoulides, de Chernatony, Furrer, Shiu, & Abimbola, 2006; Lassar, Mittal, & Sharma, 1995), greater credibility (Erdem & Swait, 1998), willingness to pay a price premium, more price inelastic demand, and greater brand loyalty (Keller, 2003; Keller & Lehmann, 2006; Yoo & Donthu, 2001). The knowledge component for high equity brands is typically characterized by among other things, perceptions of higher quality (Kamakura & Russell, 1993; Keller, 2003; Netemeyer et al., 2004), good value for money, interesting personality (Aaker, 1997), and strong, favorable, and unique (or differentiated) brand associations (Keller, 1993; Netemeyer et al., 2004), some of which are formed by making attribute claims (Darby & Karni, 1973).

We address the challenge posed by the variation in the operationalization of customer mind-set measures of brand equity in prior research by first identifying and then combining distinct dimensions into a composite brand equity construct. Surprisingly, very little research has looked into the dimensionality of brand equity. We dropped some dimensions that either were labeled differently but referred to the same underlying construct or were actually outcome and not consumer attitudinal measures.

Therefore, we use the following five dimensions for brand equity: (i) brand trust, (ii) strength of the brand's favorable associations, (iii) brand quality, (iv) value for money, and (v) brand personality.[10] While

[4] We also conducted a pilot study, using yogurt as the product category, to pretest the survey questionnaire and relevant constructs for our consumer survey.

[5] We identify the private label products as those products with the store's brand name within the category. The private label brand is present only in a single price-quality tier in our data set.

[6] Data on spending potential for each household is obtained from a syndicated source, provided by Tetrad Computer Applications.

[7] Although we do not have any attitudinal characteristics or demographics of non-responders, we have information on their purchase behavior from our scanner panel data set. We observed that the purchase behavior of the chosen brands is similar between the responders and non-responders during our sample period. Detailed results can be obtained from the authors upon request.

[8] The supermarket did not offer online purchasing during the period of our study. Therefore, all purchases measured in our data set are offline purchases.

[9] We tested for robustness of our results using scanner panel data two years before and two years after administering the survey. Our substantive findings remained unchanged.

[10] We had collected a measure of brand awareness in our survey but could not include them in the operationalization of brand equity because it was measured as a binary yes-no questions (versus scale items): *Please indicate which brands you have heard of*. In order to ascertain if brand awareness is positively correlated with our brand equity scale, we conducted an independent sample *t*-test to examine whether the mean brand equity is higher for consumers with high brand awareness than those with low brand awareness. We observed that the mean brand equity for consumers with high brand awareness is 4.87 and the mean brand equity for consumers with low brand awareness is 4.61 and this difference is significant at the 1% confidence level. Therefore, we concluded that the omission of brand awareness from our brand equity measure is not a major limitation.

the other dimensions are self-explanatory, the strength of favorability of target brand association measure is based on the recognition in the brand equity literature (e.g., Aaker, 1996; Keller, 2003) that brands with high equity should be characterized by favorable and unique brand associations that are strong or easy to retrieve.[11] The survey items that we used to measure the five dimensions of brand equity and their sources are given in Appendix A. The Cronbach's alphas of the various dimensions of brand equity are reported in Table 2. We averaged the underlying items for brand trust and brand quality, while for the strength of brand's favorable associations, we summed the individual items.

We performed principal component analysis on the revised five dimensions of brand equity. As suggested by Stewart (1981), we decided on a single-component solution based on the roots criterion and the scree test. Specifically, the Eigenvalue was greater than one only for the first component. Moreover, the scree plot (see Fig. 3) indicated that there is a break in the Eigenvalues starting from the second component. The single component solution accounts for more than half (56.1%) of the variance of the overall measure of brand equity. Table 3 presents the component loadings of the individual dimensions. In line with Aaker's recommendation (1996), we consider the underlying dimensions as reflective of the brand equity construct. Therefore, we use the mean of all five dimensions to obtain an overall measure of brand equity.

The brand equity scale we use has strong face validity for the brands employed in the study. For instance, we observe that Crest and Doritos have higher equity compared to Aquafresh and Santitas respectively (see Table 4a). Further evidence about the high quality of the scale is provided by pretest findings from Dalman, Agarwal, and Desai (2015) that employed the same scale to measure brand equity for 18 different brands in seven categories (airlines, courier service, noise-isolating headphones, cars, car battery, car tires, and oven). Dalman et al. (2015) report that the Cronbach's alpha for the scale was 0.92 and the scale had strong face validity in terms of non-student mTurk participants (ranging from 61 to 123 per category), rating high equity brands employed in that study higher on this scale than low equity brands ($p$-values ranging from $< 0.02$ to 0.001). In addition, for the three focal categories (car tire, web retailers, and noise-isolating headphones) used in their research, as one would expect, the participants exhibited higher familiarity, entertained higher product expectations on focal experience attributes, and expressed higher buying likelihood for high equity (vs. low equity) brands.

#### 4.2.3. Moderating variables

For each brand, we measure competitive brand equity as the average of the other brands' equities. We measured the other moderating variables through our consumer survey: perceived in-store presence of the target brand, perceived importance of brand choice decision, and perceived category differentiation. We report the questions used to obtain these measures and the sources of these questions in Appendix A. We test the reliability of multi-item measures by calculating their Cronbach's alpha values, which are given in Table 2. The Cronbach's alphas are $> 0.7$ for all the multi-item measures used in our study.

We obtain price from the scanner database of the cooperating chain. Specifically, for each consumer, we obtain the average price paid (shelf price minus coupons) during one year before and one year after administering the survey for the brands that the consumer purchased during this time period. For non-purchased brands, we obtain the average price paid by other consumers in the same store.

[11] Response latency is used to measure how easily a stimulus (e.g., attribute of a brand) comes to mind or can be retrieved from memory (e.g., Alba & Hutchinson, 1987; Pullig, Simmons, & Netemeyer, 2006). In absence of the opportunity to actually measure latencies among survey participants, we asked them this specific "coming to mind" question. It measures the ease with which participants associate the favorable and unique attributes and the brand; the greater the ease, the stronger the association between the favorable and unique attributes and the brand.

**Table 2**
Reliability of the scales.

| Construct | Number of items | Cronbach's alpha |
|---|---|---|
| Brand trust | 2 | 0.872 |
| Brand quality | 2 | 0.795 |
| In-store presence | 3 | 0.732 |
| Importance of brand choice decision | 2 | 0.924 |
| Category differentiation | 2 | 0.722 |

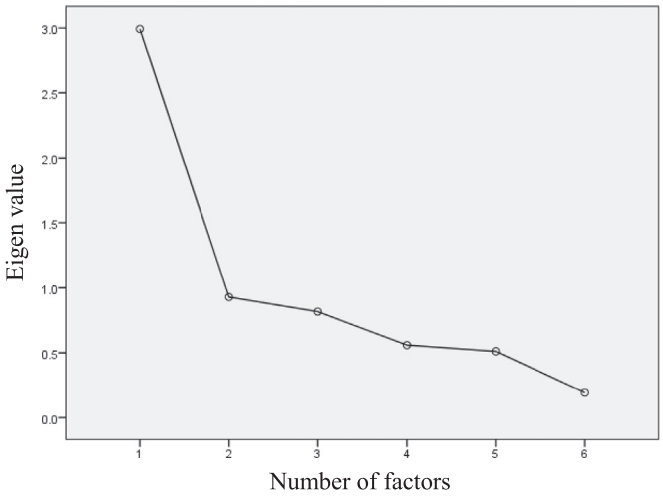


**Fig. 3.** Scree plot of Eigenvalues obtained from factor analysis.

**Table 3**
Component loadings of various dimensions of brand equity.

| Brand equity dimension | Component loading |
|---|---|
| Brand trust | 0.861 |
| Strength of brand's favorable associations | 0.494 |
| Brand quality | 0.898 |
| Value for money | 0.741 |
| Brand personality | 0.682 |

Note: We applied principal components extraction method. The eigenvalue is greater than one (2.805) only when we consider a single component solution.

**Table 4a**
Characteristics of selected brands.

| Brand name | Mean brand equity | Market share | Price ($/oz) |
|---|---|---|---|
| *Tortilla chips category* | | | |
| Chi-Chi's | 4.80 | 4.5% | 0.136 |
| Doritos | 5.53 | 35.5% | 0.194 |
| Private label | 4.12 | 14.8% | 0.112 |
| Santitas | 4.92 | 4.9% | 0.133 |
| Tostitos | 5.54 | 32.4% | 0.246 |
| *Toothpaste category* | | | |
| Aquafresh | 4.29 | 10.2% | 0.335 |
| Arm & Hammer | 4.19 | 3.6% | 0.485 |
| Colgate | 5.50 | 37.8% | 0.376 |
| Crest | 5.52 | 37.9% | 0.389 |
| Sensodyne | 4.90 | 1.5% | 1.153 |

### 4.3. Sample summary statistics

Table 4a summarizes the mean values of brand equities, prices and market shares of the five chosen brands in the tortilla chips and toothpaste categories and Table 4b lists the household characteristics of

**Table 4b**
Mean (SD) of demographic characteristics

| | Tortilla chips category | Toothpaste category |
|---|---|---|
| Age (years) | 47.20 (8.92) | 52.26 (9.32) |
| Education (years) | 14.66 (2.35) | 14.63 (2.50) |
| Income ('000 dollars) | 74.01 (28.81) | 72.57 (29.91) |
| Number of households | 501 | 488 |

the survey respondents. As noted earlier, the five selected brands in each category constitute > 90% of the respective category sales. The correlations between the variables are reported in Table 5. We notice that the correlations between the moderators are relatively modest.

## 5. Empirical analyses and findings

### 5.1. Descriptive insights

We first examine the relative distributions of consumers across the four market segments for a brand as shown in Fig. 1. Table 6 shows the sizes of the *believing loyals*, *doubting loyals*, *believing switchers*, and *doubting switchers* segments across the brands in the tortilla chips and toothpaste categories. Recall that we define *believing loyals* as shoppers with high brand equity and high behavioral loyalty, *doubting switchers* as shoppers with low brand equity and low behavioral loyalty, *doubting loyals* as shoppers whose behavioral loyalty to a brand is high even though their equity is low, and *believing switchers* as shoppers who hold high equity towards a brand but do not purchase it very often. Specifically, for each brand, we calculate the median brand equity and behavioral loyalty, and then classify consumers into the segments based on their brand equity and behavioral loyalty compared to the respective median values.

If the brand equity-behavioral loyalty relationship is perfect – high (low) brand equity always result in high (low) behavioral loyalty – then all households should be classified as either *believing loyals* or *doubting switchers*. However, Table 6 clearly underscores that it is not the case; about 40% of consumers exhibit high brand equity but low behavioral loyalty and vice versa. That, of course, in turn raises the important question of the moderating factors that drive households to the off-diagonal segments.

In order to obtain detailed descriptive insight into this issue, we compared the values of the hypothesized moderators across the segments for a selected brand in each category. Based on their contrasting segment sizes, we chose Doritos and Santitas from the tortilla chips category (shown in Tables 7a and 7b, respectively), and Colgate and Aquafresh from the toothpaste category (shown in Tables 8a and 8b, respectively). As indicated by the *F*-values (obtained from performing an ANOVA on each variable), the means of most variables vary significantly across the four segments for each brand.

We performed pairwise *t*-tests to examine whether the mean values of the moderators are significantly different between the segments for the four chosen brands. In addition, we performed a MANOVA to examine if the moderators are significantly different across the segments. We find that for Doritos, the believing loyals, on average, have higher values of all consumer-level moderators than doubting loyals and doubting switchers. There is very little or no difference between the values of moderators between believing loyals and believing switchers. Particularly interesting are the significantly lower level of competitors' brand equity for believing loyals compared to believing switchers for Santitas, Colgate and Aquafresh. While these mean differences suggest the likely influence of moderators on the brand equity-behavioral loyalty relationship, we now report econometric tests of our hypotheses.

### 5.2. Empirical model

To systematically investigate whether our theory-based shopper-related factors moderate the relationship between brand equity and behavioral loyalty, we now specify the empirical model corresponding to our conceptual model (see Fig. 2). For household $i$ ($i$ = 1, …,488, for the toothpaste category, and $i$ = 1, …,501, for the tortilla chips category) for brand $j$ (j = 1, …5) in category $c$ ($c$ = 1 for tortilla chips category and $c$ = 2 for toothpaste category) at time $t$ ($t$ = 1 for data corresponding to one year before filling the survey and $t$ = 2 for data corresponding to one year after filling the survey), the estimation model is specified as follows:

$$\begin{aligned} BL_{cijt} = {} & \alpha_i + \beta_1 BE_{cij} + \beta_2 (BE_{cij} \times Survey_t) + \beta_3 SP_{cij} + \beta_4 PR_{cijt} + \beta_5 CBE_{cij} \\ & + \beta_6 IBD_{ci} \\ & + \beta_7 CD_{ci} + \gamma_1 (BE_{cij} \times SP_{cij}) + \gamma_2 (BE_{cij} \times PR_{cijt}) + \gamma_3 (BE_{cij} \times CBE_{cij}) \\ & + \gamma_4 (BE_{cij} \times IBD_{ci}) + \gamma_5 (BE_{cij} \times CD_{ci}) + \varepsilon_{cijt}, \end{aligned} \quad (1)$$

where $BL_{cijt}$ denotes behavioral loyalty, operationalized as the spending

**Table 5**
Correlations.

| | BL | BE | BT | SBFA | BQ | VM | BP | SP | PR | COMP | IBD | CD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BL | 1.000 | 0.312 | 0.299 | 0.177 | 0.331 | 0.242 | 0.206 | 0.213 | − 0.095 | − 0.116 | − 0.026 | 0.001 |
| BE | | 1.000 | 0.805 | 0.594 | 0.855 | 0.709 | 0.754 | 0.518 | 0.052 | 0.160 | 0.086 | 0.045 |
| BT | | | 1.000 | 0.268 | 0.821 | 0.602 | 0.507 | 0.498 | − 0.008 | 0.075 | − 0.063 | − 0.067 |
| SBFA | | | | 1.000 | 0.330 | 0.228 | 0.226 | 0.257 | − 0.110 | 0.057 | 0.087 | 0.060 |
| BQ | | | | | 1.000 | 0.602 | 0.577 | 0.520 | 0.048 | 0.050 | − 0.001 | − 0.037 |
| VM | | | | | | 1.000 | 0.436 | 0.368 | − 0.011 | 0.166 | 0.078 | 0.001 |
| BP | | | | | | | 1.000 | 0.415 | 0.022 | 0.231 | 0.104 | 0.091 |
| SP | | | | | | | | 1.000 | 0.001 | 0.096 | 0.066 | − 0.010 |
| PR | | | | | | | | | 1.000 | − 0.030 | 0.231 | − 0.119 |
| COMP | | | | | | | | | | 1.000 | 0.159 | 0.089 |
| IBD | | | | | | | | | | | 1.000 | 0.453 |
| CD | | | | | | | | | | | | 1.000 |

Note: BL refers to brand loyalty, BE refers to the overall brand equity measure, BT refers to brand trust, SBFA refers to strength of brand's favorable associations, BQ refers to brand quality, VM refers to value for money, BP refers to brand personality, SP refers to in-store presence, PR refers to price, COMP refers to competitive brand equity (using the aggregate brand equity measure), IBD refers to importance of brand choice decision, and CD refers to category differentiation.

**Table 6**
Segmenting consumers by brand equity and behavioral loyalty.

| Brand name | Believing loyals | Doubting loyals | Believing switchers | Doubting switchers | On-diagonal (believing loyals & doubting switchers) | Off-diagonal (doubting loyals and believing switchers) |
|---|---|---|---|---|---|---|
| *Tortilla chips category* | | | | | | |
| Chi-Chi's | 16.37% | 15.57% | 30.14% | 37.92% | 54.29% | 45.71% |
| Doritos | 30.14% | 19.76% | 18.76% | 31.34% | 61.48% | 38.52% |
| Private label | 28.54% | 21.36% | 17.96% | 32.14% | 60.68% | 39.32% |
| Santitas | 20.36% | 10.98% | 27.15% | 41.52% | 61.88% | 38.12% |
| Tostitos | 29.34% | 20.56% | 19.36% | 30.74% | 60.08% | 39.92% |
| *Toothpaste category* | | | | | | |
| Aquafresh | 23.98% | 9.84% | 23.16% | 43.03% | 67.01% | 32.99% |
| Arm & Hammer | 21.72% | 5.94% | 23.36% | 48.98% | 70.70% | 29.30% |
| Colgate | 31.56% | 18.44% | 17.42% | 32.58% | 64.14% | 35.86% |
| Crest | 29.30% | 20.70% | 20.08% | 29.92% | 59.22% | 40.78% |
| Sensodyne | 18.24% | 5.53% | 26.43% | 49.80% | 68.03% | 31.97% |

**Table 7a**
Distribution of focal variables across the four segments for Doritos brand in tortilla chips category.

| Variable | Mean (S.D.) | | | | F-value for differences across segments | MANOVA Pillai's trace F-value for moderators | Differences between segments | | |
|---|---|---|---|---|---|---|---|---|---|
| | Believing loyals | Doubting loyals | Believing switchers | Doubting switchers | | | Believing loyals vs. doubting loyals | Believing loyals vs. believing switchers | Believing loyals vs. doubting switchers |
| Brand equity | 6.23 (0.43) | 4.66 (0.72) | 6.25 (0.40) | 4.59 (0.68) | 315.42*** | Not applicable | 1.58*** | − 0.02 | 1.64*** |
| Behavioral loyalty | 0.54 (0.21) | 0.50 (0.22) | 0.06 (0.09) | 0.08 (0.09) | 291.83*** | | 0.05** | 0.48*** | 0.47*** |
| In-store presence | 6.68 (0.47) | 5.93 (0.98) | 6.75 (0.40) | 6.03 (0.88) | 39.84*** | 1416*** | 0.75*** | − 0.07 | 0.65*** |
| Competitors' brand equity | 4.89 (0.82) | 4.59 (0.74) | 4.93 (0.77) | 4.72 (0.69) | 4.37*** | | 0.30*** | − 0.04 | 0.17* |
| Importance of brand choice decision | 5.31 (1.28) | 4.48 (1.59) | 5.24 (1.57) | 4.21 (1.74) | 16.04*** | | 0.83*** | 0.07 | 1.10*** |
| Category differentiation | 5.68 (1.29) | 5.03 (1.54) | 5.71 (1.30) | 5.16 (1.49) | 6.99*** | | 0.65*** | − 0.04 | 0.52*** |

* $p < 0.100$.
** $p < 0.050$.
*** $p < 0.010$.

**Table 7b**
Distribution of focal variables across the four segments for Santitas brand in tortilla chips category.

| Variable | Mean (S.D.) | | | | F-value for differences across segments | MANOVA Pillai's trace F-value for moderators | Differences between segments | | |
|---|---|---|---|---|---|---|---|---|---|
| | Believing loyals | Doubting loyals | Believing switchers | Doubting switchers | | | Believing loyals vs. doubting loyals | Believing loyals vs. believing switchers | Believing loyals vs. doubting switchers |
| Brand equity | 5.82 (0.61) | 4.28 (0.51) | 5.70 (0.52) | 3.91 (0.90) | 209.97*** | Not applicable | 1.54*** | 0.12 | 1.90*** |
| Behavioral loyalty | 0.24 (0.23) | 0.15 (0.15) | 0.00 (0.00) | 0.00 (0.00) | 120.81*** | | 0.09*** | 0.24*** | 0.24*** |
| In-store presence | 5.84 (0.86) | 4.45 (1.16) | 5.74 (0.97) | 4.73 (1.30) | 31.09*** | 1242*** | 1.39*** | 0.10 | 1.10*** |
| Competitors' brand equity | 4.91 (0.70) | 4.47 (0.38) | 5.22 (0.62) | 4.71 (0.61) | 22.36*** | | 0.45*** | − 0.31*** | 0.20** |
| Importance of brand choice decision | 4.86 (1.55) | 4.50 (1.38) | 4.97 (1.53) | 4.67 (1.70) | 1.26* | | 0.36 | − 0.12 | 0.19 |
| Category differentiation | 5.25 (1.53) | 4.65 (1.69) | 5.58 (1.34) | 5.36 (1.45) | 2.87** | | 0.60 | − 0.34 | 0.12 |

* $p < 0.100$.
** $p < 0.050$.
*** $p < 0.010$.

share (in logistic form)[12] for consumer $c$ for brand $i$ in category $j$ during the year $t$, $BE_{cij}$ denotes brand equity, and $Survey_t$ is a dummy variable that equals one if the observation corresponds to the year after the survey was administered and equals zero if the observation corresponds to the year before the survey was administered. $SP_{cij}$ denotes in-store presence, $PR_{cijt}$ denotes the average price paid by the customer, $CBE_{cij}$ refers to competitive brand equity, $IBD_{ci}$ denotes importance of brand choice decision, and $CD_{ci}$ refers to category differentiation. $\beta_1$ denotes the main-effect of brand equity ($BE_{cij}$) on behavioral loyalty, $\beta_2$ captures the change in the brand equity – behavioral loyalty relationship due to consumers' exposure to the survey, $\beta_3 - \beta_7$ capture the main effects of the aforementioned variables on behavioral loyalty, and $\gamma_1 - \gamma_5$ capture the moderating effects. The heterogeneity across households is captured through $\alpha_i$, which is expressed as a function of household characteristics such as age, education, and income. The hierarchy on $\alpha_i$ is given as follows:

[12] Since the range of the dependent variable is bound between 0 and 1, we use a logistic transformation of the variable in our analyses (Ailawadi, Pauwels, & Steenkamp, 2008).

**Table 8a**
Distribution of focal variables across the four segments for Colgate brand in toothpaste category.

| Variable | Mean (S.D.) | | | | F-value for differences across segments | MANOVA Pillai's trace F-value for moderators | Pairwise contrasts | | |
|---|---|---|---|---|---|---|---|---|---|
| | Believing loyals | Doubting loyals | Believing switchers | Doubting switchers | | | Believing loyals vs. doubting loyals | Believing loyals vs. believing switchers | Believing loyals vs. doubting switchers |
| Brand equity | 6.15 (0.44) | 4.66 (0.67) | 6.18 (0.45) | 4.23 (0.94) | 274.74*** | | 1.49*** | − 0.03 | 1.92*** |
| Behavioral loyalty | 0.65 (0.30) | 0.50 (0.29) | 0.02 (0.04) | 0.02 (0.04) | 301.21*** | | 0.15*** | 0.64*** | 0.64*** |
| In-store presence | 6.55 (0.44) | 6.03 (0.68) | 6.59 (0.52) | 5.86 (0.81) | 40.64*** | 1395*** | 0.52*** | − 0.04 | 0.69*** |
| Competitors' brand equity | 4.84 (0.80) | 4.33 (0.60) | 5.03 (0.74) | 4.52 (0.70) | 19.86*** | | 0.51*** | − 0.19** | 0.32*** |
| Importance of brand choice decision | 6.07 (1.13) | 5.41 (1.48) | 6.13 (1.18) | 5.80 (1.35) | 6.70*** | | 0.66*** | − 0.06 | 0.26* |
| Category differentiation | 5.41 (1.28) | 4.64 (1.63) | 5.32 (1.42) | 5.27 (1.41) | 6.35*** | | 0.77*** | 0.09 | 0.13 |

* $p < 0.100$.
** $p < 0.050$.
*** $p < 0.010$.

**Table 8b**
Distribution of focal variables across the four segments for Aquafresh brand in toothpaste category.

| Variable | Mean (S.D.) | | | | F-value for differences across segments | MANOVA Pillai's trace F-value for moderators | Pairwise contrasts | | |
|---|---|---|---|---|---|---|---|---|---|
| | Believing loyals | Doubting loyals | Believing switchers | Doubting switchers | | | Believing loyals vs. doubting loyals | Believing loyals vs. believing switchers | Believing loyals vs. doubting switchers |
| Brand equity | 5.46 (0.83) | 3.34 (0.93) | 5.24 (0.67) | 3.32 (0.84) | 234.24*** | Not applicable | 2.12*** | 0.22** | 2.15*** |
| Behavioral loyalty | 0.35 (0.29) | 0.31 (0.30) | 0.00 (0.00) | 0.00 (0.00) | 148.58*** | | 0.04 | 0.35*** | 0.35*** |
| In-store presence | 6.36 (0.71) | 5.90 (0.70) | 6.29 (0.71) | 5.58 (1.06) | 24.01*** | 1311*** | 0.46** | 0.07 | 0.78*** |
| Competitors' brand equity | 4.93 (0.82) | 4.72 (0.66) | 5.17 (0.71) | 4.69 (0.69) | 12.12*** | | 0.21 | − 0.24** | 0.24** |
| Importance of brand choice decision | 5.58 (1.43) | 5.88 (1.34) | 5.68 (1.49) | 6.08 (1.09) | 3.81* | | − 0.29 | − 0.10 | − 0.50*** |
| Category differentiation | 4.80 (1.56) | 5.20 (1.42) | 5.04 (1.52) | 5.40 (1.32) | 3.85* | | − 0.40 | − 0.24 | − 0.60*** |

* $p < 0.100$.
** $p < 0.050$.
*** $p < 0.010$.

$$\alpha_i = \theta_0 + \theta_1 Age_i + \theta_2 Education_i + \theta_3 Income_i + \omega_i. \quad (2)$$

Since household's loyalty across different brands in a category will be correlated, we let the error term in Eq. (1), $\varepsilon_{cijt}$, be correlated across brands within the same category. We estimate our empirical model using maximum-likelihood estimation.

## 5.3. Results

### 5.3.1. Model fit

We compare our full model in Eq. (1) with two alternative model specifications. In the first alternative specification (Model 1) we denote behavioral loyalty only as a function of brand equity (i.e., we set $\beta_3 - \beta_7$ and $\gamma_1 - \gamma_5$ to zero). In the second alternative specification (Model 2) we denote behavioral loyalty only as a function of brand equity and the main effects (i.e., we set $\gamma_1 - \gamma_5$ to zero.). In both alternative specifications, we only model the main effect of brand equity on behavioral loyalty and the shopper marketing factors do not have an influence on this relationship. In other words, these two models do not explicitly account for the off-diagonal brand equity-behavioral loyalty relationship (see Fig. 1). Since the alternative models are nested within the full model, we compare the various model specifications through Bayesian Information Criteria (BIC). Table 9 presents the parameter estimates, number of observations and fit measures (BIC and log-likelihood) for the full model and the alternative specifications. Based on the BIC values, the full model with interaction effects fits the data better than both alternative specifications. This evinces support for most of the hypothesized factors' moderating effect on the brand equity-behavioral loyalty relationship. Thus, we focus on the results of the full model.

### 5.3.2. Main effects

We mean-center all independent variables (brand equity and the shopper marketing factors) such that the main effects denote the relationship between the specific independent variables and behavioral loyalty when other independent variables are at their mean levels. In confirmation of the expected positive relationship between brand equity and behavioral loyalty (H1), we find that $\beta_1$ is positive and significant ($\beta_1 = 0.869$; $p$-value $< 0.01$).

Although we do not have a priori hypotheses regarding other main effects, they provide several interesting diagnostic insights. We find that $\beta_2$ is not significantly different from zero ($\beta_2 = 0.008$; $p$-value $> 0.10$), implying that exposure to the survey did not change the relationship between brand equity and behavioral loyalty.

Parameters $\beta_3$ through $\beta_7$ capture the main effects of the shopper marketing factors. The main effect of in-store presence ($\beta_3 = 0.187$; $p$-value $< 0.01$) is positive, indicating that a higher perceived presence of the brand in the store increases behavioral loyalty. Consistent with expectations, the main effect of price ($\beta_4 = -1.133$; $p$-value $< 0.01$) is negative. Competitive brand equity has a negative main effect on behavioral loyalty ($\beta_5 = -0.776$; $p$-value $< 0.01$), indicating that households' perceived equity towards other brands in the category is negatively correlated with behavioral loyalty. Finally, perceived importance of brand choice decision and category differentiation do not have any significant main effect on behavioral loyalty ($\beta_6 = -0.030$; $p$-value $> 0.10$ and $\beta_7 = -0.018$; $p$-value $> 0.10$).

**Table 9**
Empirical estimates on behavioral loyalty with unidimensional brand equity measure.

| Variable | Hypotheses | Benchmark Model 1 | Benchmark Model 2 | Full model | |
|---|---|---|---|---|---|
| | | | | Parameter estimates | Relative importance |
| *Main effects* | | | | | |
| Brand equity ($\beta_1$) | H1 (+) | 0.580*** | 0.869*** | 0.869*** | 36.4 |
| Brand equity × survey ($\beta_2$) | | 0.000 | 0.007 | 0.008 | 0.2 |
| In-store presence ($\beta_3$) | | | 0.070** | 0.187*** | 7.0 |
| Price ($\beta_4$) | | | − 1.190*** | − 1.133*** | 8.4 |
| Competitors' brand equity ($\beta_5$) | | | − 0.769*** | − 0.776*** | 19.7 |
| Importance of brand choice decision ($\beta_6$) | | | − 0.009 | − 0.030 | 1.5 |
| Category differentiation ($\beta_7$) | | | − 0.003 | − 0.018 | 0.8 |
| *Interaction effects* | | | | | |
| In-store presence ($\gamma_1$) | H2 (+) | | | 0.141*** | 8.7 |
| Price ($\gamma_2$) | H3 (−) | | | − 0.023 | 0.2 |
| Competitors' brand equity ($\gamma_3$) | H4 (−) | | | − 0.147*** | 5.1 |
| Importance of brand choice decision ($\gamma_4$) | H5 (+) | | | 0.038* | 2.2 |
| Category differentiation ($\gamma_5$) | H6 (+) | | | − 0.033 | 1.8 |
| *Random effects* | | | | | |
| Intercept ($\theta_0$) | | − 4.217*** | − 4.195*** | − 4.279*** | N.A. |
| Age ($\theta_1$) | | − 0.009*** | − 0.009*** | − 0.009*** | 2.8 |
| Education ($\theta_2$) | | − 0.023** | − 0.029** | − 0.026** | 2.1 |
| Income ($\theta_3$) | | 0.003*** | 0.003*** | 0.003*** | 3.0 |
| *N* (number of observations) | | 9388 | 8900 | 8900 | |
| Bayesian Information Criterion | | 49,510 | 46,613 | 46,563 | |
| Log likelihood | | − 24,638 | − 23,189 | − 23,165 | |

* $p < 0.100$.
** $p < 0.050$.
*** $p < 0.010$.

*5.3.3. Effects of moderators*

We find evidence for three out of the five hypotheses regarding factors moderating the relationship between brand equity and behavioral loyalty. We find support for H2 ($\gamma_1 = 0.141$; $p$-value $< 0.01$); a stronger perceived presence of the target brand in retail stores accentuates the brand equity-behavioral loyalty relationship. This implies that making the brand easier to spot in-store helps consumers follow through with their proclivity towards the brand. Hypothesis H3 is not supported ($\gamma_3 = -0.023$; $p$-value $> 0.10$), indicating that price does not moderate the brand equity-behavioral loyalty relationship.

Perceived competitors' brand equity mitigates the target brand equity – behavioral loyalty relationship, thus confirming H4 ($\gamma_3 = -0.147$; $p$-value $< 0.01$). Consumers who have higher equity towards competitive brands have a larger set of such brands to choose from. In addition, perceived importance of brand choice decision accentuates the brand equity-behavioral loyalty relationship ($\gamma_5 = 0.038$; $p$-value $< 0.10$), thus supporting H5. This suggests that when the brand choice decision is important to consumers, they tend to rely more on brand equity. However, we did not find support for H6 – the moderating effect of perceived category differentiation on the brand equity – behavioral loyalty relationship ($\gamma_6 = -0.033$; $p$-value $> 0.10$).

*5.3.4. Relative importance of distinct moderators*

Next, we report results of analysis conducted to answer the question − which of the five moderators is most important for brand managers to focus upon in influencing brand equity - behavioral loyalty linkage. We note that this analysis is exploratory because we do not have any a priori theoretical basis to posit a specific moderator as more or less important.

The managerial relevance of this analysis is in helping brand managers ascertain the moderator they need to focus upon because of it being most responsible for steering consumers away from the *believing loyals* segment or pulling consumers from the *doubting loyals* segments. We measure the relative importance as the ratio of the absolute value of standardized coefficient of the corresponding variable to the sum of absolute values of all standardized coefficients (Volckner & Sattler, 2006). We find that among the significant moderators, in-store presence is the most important moderator of the relationship between brand equity and behavioral loyalty followed by competitive brand equity and importance of brand choice decision. Based on the above, brand managers need to regularly monitor the perceived in-store presence of the brands if their objective is to build a strong brand equity - behavioral loyalty relationship.

*5.3.5. Dimension-specific analyses*

Here we substitute individual brand equity dimensions in place of aggregate brand equity when analyzing the impact of factors that moderate the brand equity - brand loyalty relationship. Managers can use the findings from this analysis to identify the specific brand equity dimension to highlight in brand advertising to weaken (strengthen) the influence of those moderators that mitigate (accentuate) the brand equity - brand loyalty linkage. As mentioned earlier, we do not have an a priori theoretical basis to posit how a specific dimension will interact with the moderating variable. For the dimension-specific analyses, we estimated the full model with each individual dimension of brand equity instead of the overall measure of brand equity. We replaced the competitive brand equity with the average value of the corresponding dimension across the other four brands within the category.

Our dimension-specific analyses revealed several interesting results (see Table 10). First, the accentuating effect of in-store presence on brand equity-behavioral loyalty is statistically highest for the brand quality dimension of brand equity. This means that by highlighting product quality (vs. aggregate equity) in the brand's advertising, the current level of influence of the in-store presence moderator in accentuating the brand equity-brand loyalty linkage will be even stronger. The implication from the dimension specific analysis is distinct from the implication from hypothesis H2 i.e., the brand should strengthen its in-store presence to strengthen the relationship between brand equity and behavioral loyalty. In contrast, the dimension specific analysis suggests that highlighting quality (vs. aggregate equity) will not only increase the overall brand equity but also strengthen the relationship between brand equity and behavioral loyalty for consumers who perceive the in-

**Table 10**
Effects on behavioral loyalty with individual dimensions of brand equity.

| Variable | Hypothesis | Dimension of brand equity used to examine the effect on behavioral loyalty | | | | |
|---|---|---|---|---|---|---|
| | | Value for money | Brand trust | Strength of brand's favorable associations | Brand quality | Brand personality |
| *Main effects* | | | | | | |
| Brand equity ($\beta_1$) | H1 (+) | 0.533*** | 0.734*** | 0.233*** | 0.792*** | 0.405*** |
| Brand equity × survey ($\beta_2$) | | − 0.019 | − 0.026 | − 0.009 | − 0.011 | 0.047 |
| In-store presence ($\beta_3$) | | 0.290*** | 0.216*** | 0.408*** | 0.209*** | 0.315*** |
| Price ($\beta_4$) | | − 0.785*** | − 1.382*** | 0.083 | − 1.520*** | − 1.224*** |
| Competitors' brand equity ($\beta_5$) | | − 0.547*** | − 0.659*** | − 0.236*** | − 0.694*** | − 0.486*** |
| Importance of brand choice decision ($\beta_6$) | | − 0.013 | − 0.109 | − 0.017 | − 0.008 | − 0.005 |
| Category differentiation ($\beta_7$) | | − 0.003 | − 0.385* | − 0.055* | − 0.047** | − 0.012 |
| *Interaction effects* | | | | | | |
| In-store presence ($\gamma_1$) | H2 (+) | 0.071*** | 0.114*** | 0.105*** | 0.135*** | 0.077*** |
| Price ($\gamma_2$) | H3 (−) | − 0.186* | − 0.034 | 0.246** | − 0.125 | − 0.055 |
| Competitors' brand equity ($\gamma_3$) | H4 (−) | − 0.052*** | − 0.097*** | − 0.003 | − 0.168*** | − 0.051 |
| Importance of brand choice decision ($\gamma_4$) | H5 (+) | 0.015 | 0.041** | 0.007 | 0.052*** | 0.058*** |
| Category differentiation ($\gamma_5$) | H6 (+) | − 0.000 | − 0.045** | 0.011 | − 0.048** | − 0.081 |
| *Random effects* | | | | | | |
| Intercept ($\theta_0$) | | − 4.177*** | − 4.245*** | − 4.048*** | − 4.263*** | − 4.168*** |
| Age ($\theta_1$) | | − 0.010*** | − 0.009*** | − 0.014*** | − 0.008*** | − 0.009*** |
| Education ($\theta_2$) | | − 0.024** | − 0.024** | − 0.042* | − 0.024** | − 0.021* |
| Income ($\theta_3$) | | 0.003*** | 0.003*** | 0.001 | 0.003*** | 0.003*** |
| *N* (number of observations)† | | 8708 | 8840 | 6144 | 8824 | 8532 |
| Bayesian Information Criterion | | 45,866 | 46,352 | 33,173 | 46,144 | 45,048 |
| Log likelihood | | − 22,816 | − 23,059 | − 16,470 | − 22,955 | − 22,408 |

* $p < 0.100$.
** $p < 0.050$.
*** $p < 0.010$.

store presence to be high. However, the increase in behavioral loyalty due to an increase in perceived brand quality will be smaller for consumers that perceive the in-store presence to be low.

Second, the mitigating effect of competitive brand equity becomes insignificant under the strength of brand's favorable associations and brand personality dimensions. These suggest that by highlighting the brand's personality or its favorable associations in its advertising, the brand will be able to weaken or even eliminate the negative influence of the equity of competitor brands.

Third, the accentuating effect of the importance of brand choice decision is positive and not significantly different between brand trust, brand quality and brand personality dimensions. This implies that highlighting the brand's trust, quality or personality in advertising will not only improve brand equity, but also strengthen the relationship between brand equity and behavioral loyalty for consumers who perceive the importance of brand choice decision to be high. However, the increase in behavioral loyalty due to an increase in the brand's trust, quality or personality will be smaller for consumers that perceive the importance of brand choice decision to be low.

## 6. Discussion

We matched purchase data from a frequent shopper program with survey data collected from a sample of the program's members to test the relationship between attitudinal brand equity and revealed behavioral loyalty and the factors that moderate this relationship. Although we find a strong main effect of brand equity on behavioral loyalty, several factors that capture consumer perceptions about the brand and the category moderate this relationship. Specifically, perceived in-store presence of the brand and perceived importance of brand choice decision accentuate the relationship between brand equity and behavioral loyalty and perceived brand equity of competitor brands mitigates the relationship. Our conceptual framework and empirical findings offer implications for retailers, manufacturers, and marketing theory.

### 6.1. Managerial implications

Manufacturers of high equity brands and retailers can work together to develop shopper marketing programs that overcome the adverse impact of moderators that attenuate the influence of brand equity on behavioral loyalty and strengthen the influence of moderators that accentuate the brand equity – behavioral loyalty linkage. Our finding that in-store presence has the greatest moderating effect on the brand equity – behavioral loyalty relationship suggests that manufacturers should integrate trade promotions and retailer-specific programs to improve the perceived in-store presence of their brands (Shankar et al., 2011). Through such programs, retailers can improve the availability of the brand in the store as well as enhance accessibility and visibility of the product in the store through shelf placement, number of facings, and end-of-aisle displays.

Similarly, retailers can emphasize to consumers the importance of brand choice decision to strengthen the brand equity-behavioral loyalty linkage in categories in which they generate greater profits by selling more high equity brands. They can achieve this, for instance, by creating messages (e.g., to buy the right products to cook the best meal for the family) in the path to purchase that reinforce the importance of brand choice decision. However, there is a fine line between engaging customers in the store and interrupting their shopping experiences.

An important reason for retailers to pay attention to the relationship between brand equity and behavioral loyalty is due to its impact on their assortment and promotion decisions. Retailers might expect high equity brands to be consistently purchased by shoppers and hence may order large quantities of such brands. However, before building large inventories of brands with high equity, retailers should consider consumers' perceptions about the factors that moderate the brand equity-behavioral loyalty relationship.

Since market share and brand equity arguably exhibit regional variations (Bronnenberg, Dhar, & Dube, 2007), retailers cannot use a national-level measure of brand equity for their store level decisions. Individual retail chains can administer their own surveys to a representative sample of their consumers. In addition, retail chains

commonly employ store loyalty programs that include names, addresses and purchase history of participating shoppers in its database. Merging the attitudinal data collected from periodic surveys and behavioral data obtained from loyalty programs can provide a 360 degree view of the shopper to develop effective shopper marketing programs.

Our study offers important implications for manufacturers regarding focusing on specific moderators that accentuate the relationship between specific dimensions of brand equity and behavioral loyalty or highlighting specific brand equity dimensions in their advertising to move consumers into the *believing loyals* segment. Brands vary in terms of the percentage distribution of consumers in the four segments of *believing loyals*, *doubting loyals*, *believing switchers*, and *doubting switchers*. Aggregate level information in terms of the brand equity-behavioral loyalty relationship can mask important differences at the disaggregate level in terms of the distribution in each of the four segments and focusing upon the former can mislead marketers. For example, referring back to Table 6, Colgate and Aquafresh share a similar proportion of consumers in the two on-diagonal segments and the two off-diagonal segments. Yet, they differ dramatically in terms of the percentages of consumers in each of the four segments. In the case of Colgate, around 60% of the believers (31.6% out of 31.6 + 17.4 = 49%) and the doubters (32.6% out of 32.6 + 18.4 = 51%) fall onto the on-diagonal segments (i.e., classified as *believing loyals* or *doubting switchers*). Thus, while Colgate is unable to convert all of its believers into loyal buyers, this is offset by the consumers who are behaviorally loyal while not believing Colgate to be a particularly strong brand.

The pattern is markedly different for Aquafresh. Only 50.9% of the believers (24% out of 24 + 23.2 = 47.2%) fall onto the on-diagonal segment (*believing loyals*), while > 80% of the doubters (43% out of 9.8 + 43 = 51.8%) fall onto the on-diagonal segment (*doubting switchers*). This indicates that although only a small proportion of consumers who perceive Aquafresh to have high brand equity exhibit high behavioral loyalty, most consumers who do not hold Aquafresh in high regard behave accordingly by exhibiting low behavioral loyalty. Similar contrast exists between Santitas and the Doritos in the tortilla chips category. Santitas, similar to Aquafresh, has a large proportion of *believing switchers* and the Doritos, similar to Colgate, has a higher proportion of *doubting loyals*.

The findings from our study suggest that these brands need to adopt very different strategies. Specifically, Aquafresh and Santitas face a long-term challenge since their relatively large segment of *believing switchers* makes its behavioral loyalty unstable and vulnerable to competitors' actions. Our dimension-specific analysis suggests that such brands have to emphasize favorable associations in their advertisements to attenuate the negative effects of high equity of competitors. Aquafresh and Santitas thus need to focus on improving in-store presence of their brands or highlight the importance of brand choice decision in their advertising to increase the return on brand equity.

These recommendations are contrary to the generic guidelines of most prior brand equity research and the commonly accepted belief among many brand managers, that strengthening brand equity is one fix that will address branding problems in all situations. Our findings suggest that distinct problems (e.g., having a dominant *doubting loyals* vs. *believing switchers* segment) require very different solutions. As for Colgate and Doritos, our findings suggest that they are enjoying demand in the short-term from its *doubting loyals* segment. Hence, they need to focus on strengthening brand equity so that the underlying basis of behavioral loyalty among its consumers is augmented and made more immune to attacks from competitors.

### 6.2. Theoretical implications

Our study also provides clear implications for theory. First, we contribute to prior literature that has examined the relationship between brand equity and behavioral loyalty by identifying shopper marketing factors that strengthen or weaken this relationship. Next, to weaken the effect of mitigating moderators, we determine the specific dimension(s) of brand equity that managers need to highlight in brand advertising.

Second, streamlining the measurement of the brand equity construct represents an important theoretical contribution. We integrate the behavioral brand equity literature to develop a parsimonious, reliable, unidimensional measure of brand equity with strong face validity. Our comprehensive search of the literature revealed different and occasionally overlapping attitudinal dimensions of brand equity. We combined them into a single construct based on theoretical arguments and statistical analysis. Theoretically, the single factor solution implies that the five dimensions align and simplifies the operationalization of brand equity.

Finally, we show that the positive relationship between attitudinal measures of brand equity and attitudinal loyalty shown in prior literature (e.g., Netemeyer et al., 2004) also holds for revealed behavioral loyalty measure collected through scanner panel data.

### 6.3. Future research

We identify the following avenues to extend our study. We tested the empirical models based on linking consumers' brand equity perceptions to their behavioral loyalty in only two categories at a single retailer. Future research should examine whether the findings generalize to other product categories and with other retailers. Specifically, research can examine the variation in brand equity across geographical markets and determine if that explains the variation in market share (Bronnenberg et al., 2007).

Further, our analyses relied on a brand equity measure collected at a single point in time (i.e., cross-sectional data). Further research can conduct brand equity surveys to the same set of households longitudinally to examine the stability of the inputs and the parameters.

Although we collected data on the different dimensions of brand equity and several shopper marketing moderators for ten brands, we did not include detailed multi-item scales or collect data on additional variables due to concerns about survey length. Further research can collect data on additional attitudinal variables (e.g., brand meaning) or alternate measures of our focal moderators to examine their moderating effects on the relationship between brand equity and behavioral loyalty. One way to do this is to focus on two major brands and examine the different dimensions of brand equity and the moderators for these two brands.

Additionally, by manipulating brand equity and selected moderators (e.g., in-store presence) in an experimental setting, future research can investigate if the theoretical explanations underlying some of the interactive influences of brand equity and moderators on behavioral loyalty hold. This would bolster the internal validity of our findings and help advance branding theory.

Finally, although we identify the share of consumers in each of the four segments, we do not identify which brand consumers switch to and from for each brand. Identifying which specific brands are closest to each other in terms of switching patterns may help brand managers to target their competitive marketing actions accordingly.

## Acknowledgements

The authors thank the Center for Relationship Marketing at the State University of New York at Buffalo for providing access to the data used in this paper.

## Appendix A. Questionnaire items

*Brand trust* (Chaudhuri & Holbrook, 2001)

- I trust this brand (1 = “disagree”, and 7 = “agree”)

- This brand can be counted on (1 = “disagree”, and 7 = “agree”)

*Strength of brand's favorable associations* (Aaker, 1996; Keller, 2003; Yoo & Donthu, 2001)

Please check the box if that brand tends to come to mind when you think about the particular attribute.

Tortilla: (i) My favorite flavors; (ii) Feels good in mouth; (iii) Always fresh; (iv) Right thickness; and (v) Attractive packaging

Toothpaste: (i) Whitens teeth; (ii) Protects against decay; (iii) Promotes fresh breath; (iv) Promotes healthy gums; and (v) Attractive packaging

*Brand quality* (Aaker, 1996; Washburn & Plank, 2002)

- This is a high quality brand (1 = “disagree”, and 7 = “agree”)
- When you take everything into account, how do you feel about each brand? (1 = “awful”, and 10 – “outstanding”)

*Value for money* (Aaker, 1996)

This brand offers good value for the money (1 = “disagree”, and 7 = “agree”).

*Brand personality* (Aaker, 1997).

This brand has an interesting personality (1 = “disagree”, and 7 = “agree”).

*Importance of brand choice decision* (Mittal, 1989; Zaichkowsky, 1985)

- I care a lot as to which brand of tortilla chips I buy (1 = “definitely disagree”, and 7 = “definitely agree”)
- Deciding which brand of tortilla chips to buy is… (1 = “completely unimportant”, and 7 = “extremely important”)

*In-store presence* (Bemmaor & Mouchoux, 1991; Chandon, Hutchinson, Bradlow, & Young, 2009; Inman, Winer, & Ferraro, 2009; Wilkinson, Mason, & Paksoy, 1982)

- In the supermarket, this brand is (1 = “never available”, and 7 = “always available”)
- On the supermarket shelves, this brand looks (1 = “unattractive”, and 7 = “attractive”)
- This brand is always easy to find in supermarket shelves (1 = “disagree”, and 7 = “agree”)

*Category differentiation* (Bawa, Landwehr, & Krishna, 1989; Raju, 1992)

- Brands of tortilla chips are very different from one another (1 = “definitely disagree”, and 7 = “definitely agree”)
- All tortilla chips brands are alike (1 = “definitely disagree”, and 7 = “definitely agree”)

## References


Aaker, D. A. (1991). *Managing brand equity*. New York: The Free Press.

Aaker, D. A. (1996). *Building strong brands*. New York: The Free Press.

Aaker, D. A. (1997). Dimensions of brand personality. *Journal of Marketing Research, 34*(3), 347–356.

Agarwal, M. K., & Rao, V. R. (1996). An empirical comparison of consumer-based measures of brand equity. *Marketing Letters, 7*(3), 237–247.

Ailawadi, K. L., Lehmann, D. R., & Neslin, S. A. (2003). Revenue premium as an outcome measure of brand equity. *Journal of Marketing, 67*(October), 1–17.

Ailawadi, K. L., Pauwels, P., & Steenkamp, J. B. E. M. (2008). Private-label use and store loyalty. *Journal of Marketing, 72*(6), 19–30.

Ajzen, I., Heilbroner, R. L., Fishbein, M., & Thurow, L. C. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Alba, J. W., & Hutchinson, J. W. (1987). Dimensions of consumer expertise. *Journal of Consumer Research, 13*(4), 411–454.

Bawa, K., Landwehr, J. T., & Krishna, A. (1989). Consumer response to retailers' marketing environments: An analysis of coffee purchase data. *Journal of Retailing, 65*(Winter), 471–495.

Bemmaor, A. C., & Mouchoux, D. (1991). Measuring the short-term effect of in-store promotion and retail advertising on brand sales: A factorial experiment. *Journal of Marketing Research, 28*(May), 202–214.

Ben-Akiva, M., Bradley, M., Morikawa, T., Benjamin, J., Novak, T., Oppewal, H., & Rao, V. (1994). Combining revealed and stated preferences data. *Marketing Letters, 5*(4), 335–349.

Bronnenberg, B. J., Dhar, S. K., & Dube, J. P. (2007). Consumer packaged goods in the United States: National brands, local branding. *Journal of Marketing Research, 44*(1), 4–13.

Chandon, P., Hutchinson, J. W., Bradlow, E. T., & Young, S. H. (2009). Does in-store marketing work? Effects of the number and position of shelf facings on brand attention and evaluation at the point of purchase. *Journal of Marketing, 73*(6), 1–17.

Chaudhuri, A., & Holbrook, M. B. (2001). The chain of effects from brand trust and brand affect to brand performance: The role of brand loyalty. *Journal of Marketing, 65*(2), 81–93.

Christodoulides, G., de Chernatony, L., Furrer, O., Shiu, E., & Abimbola, T. (2006). Conceptualising and measuring the equity of online brands. *Journal of Marketing Management, 22*, 799–825.

Dalman, D., Agarwal, M., & Desai, K. K. (2015). *Does brand equity help or hurt the brand? The moderating influence of numerical claim and experience ambiguity*. (Working Paper).

Darby, M. R., & Karni, E. (1973). Free competition and the optimal amount of fraud. *Journal of Law and Economics, 16*(1), 67–88.

Dhar, S. K., Hoch, S. J., & Kumar, N. (2001). Effective category management depends on the role of the category. *Journal of Retailing, 77*, 165–184.

Dick, A. S., & Basu, K. (1994). Customer loyalty: Toward an integrated conceptual framework. *Journal of the Academy of Marketing Science, 22*(2), 99–113.

Dreze, X., Hoch, S. J., & Purk, M. E. (1994). Shelf management and space elasticity. *Journal of Retailing, 70*(4), 301–326.

Dubin, J. A. (1998). The demand for branded and unbranded products: An econometric method for valuing intangible assets. Chapter 4. *Studies in consumer demand: Econometric methods applied to market data* (pp. 77–127). Norwell, MA: Kluwer Academic Publishers.

Erdem, T., & Swait, J. (1998). Brand equity as a signaling phenomenon. *Journal of Consumer Psychology, 7*(2), 131–157.

Homburg, C., & Giering, A. (2001). Personal characteristics as moderators of the relationship between customer satisfaction and loyalty—An empirical analysis. *Psychology and Marketing, 18*(1), 43–66.

Horsky, D., Misra, S., & Nelson, P. (2006). Observed and unobserved preference heterogeneity in brand-choice models. *Marketing Science, 25*(4), 322–335.

Inman, J. J., Winer, R. S., & Ferraro, R. (2009). The interplay among category characteristics, customer characteristics, and customer activities on in-store decision making. *Journal of Marketing, 73*(5), 19–29.

Janiszewski, C., & Chandon, E. (2007). Transfer-appropriate processing, response fluency, and the mere measurement effect. *Journal of Marketing Research, 44*(2), 309–323.

Jeuland, A. P. (1979). Brand choice inertia as one aspect of the notion of brand loyalty. *Management Science, 25*, 671–682.

Kamakura, W., & Russell, G. (1993). Measuring brand value with scanner data. *International Journal of Research in Marketing, 10*(1), 9–22.

Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. *Journal of Marketing, 57*(January), 1–22.

Keller, K. L. (1998). *Strategic brand management: Building, measuring and managing brand equity*. Upper Saddle River, NJ: Prentice Hall.

Keller, K. L. (2003). Brand synthesis: The multidimensionality of brand knowledge. *Journal of Consumer Research, 29*(4), 595–600.

Keller, K. L., & Lehmann, D. R. (2006). Brands and branding: Research findings and future priorities. *Marketing Science, 25*(6), 740–759.

Kumar, V., Pozza, I. D., & Ganesh, J. (2013). Revisiting the satisfaction–loyalty relationship: Empirical generalizations and directions for future research. *Journal of Retailing, 89*(3), 246–262.

Lassar, W., Mittal, B., & Sharma, A. (1995). Measuring customer-based brand equity. *Journal of Consumer Marketing, 12*(4), 11–19.

Mittal, B. (1989). A causal model of consumer involvement. *Journal of Economic Psychology, 10*(3), 363–389.

Moore, W. L., & Lehmann, D. R. (1980). Individual differences in search behavior for a nondurable. *Journal of Consumer Research, 7*(3), 296–307.

Netemeyer, R. G., Krishnan, B., Pullig, C., Wang, G., Yagci, M., Dean, D., ... Wirth, F. (2004). Developing and validating measures of facets of customer-based brand equity. *Journal of Business Research, 57*(2), 209–224.

Oliver, R. L. (1999). Whence consumer loyalty? *Journal of Marketing, 63*, 33–44.

Petty, R. E., Cacioppo, J. T., & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research, 10*(2), 135.

Pullig, C., Simmons, C. J., & Netemeyer, R. G. (2006). Brand dilution: When do new brands hurt existing brands? *Journal of Marketing, 70*(2), 52–66.

Raju, J. S. (1992). The effect of price promotions on variability in product category sales. *Marketing Science, 11*(Summer), 207–220.

Romaniuk, J., & Nenycz-Thiel, M. (2013). Behavioral brand loyalty and consumer brand associations. *Journal of Business Research, 66*, 67–72.

Shankar, V., Inman, J. J., Mantrala, M., Kelley, E., & Rizley, R. (2011). Innovations in

shopper marketing: Current insights and future research issues. *Journal of Retailing, 87*, 29–42.
Shugan, S. (1980). The cost of thinking. *The Journal of Consumer Research, 7*, 99–111.
Simon, C. J., & Sullivan, M. W. (1993). The measurement and determinants of brand equity: A financial approach. *Marketing Science, 12*(1), 28–52.
Sloot, L. M., Verhoef, P. C., & Franses, P. H. (2005). The impact of brand equity and the hedonic level of products on consumer stock-out reactions. *Journal of Retailing, 81*(1), 15–34.
Srinivasan, V., Park, C. S., & Chang, D. R. (2005). An approach to the measurement, analysis, and prediction of brand equity and its sources. *Management Science, 51*(9), 1433–1448.
Stewart, D. W. (1981). The application and misapplication of factor analysis in marketing research. *Journal of Marketing Research, 18*(1), 51–62.
Taylor, S. A., Celuch, K., & Goodwin, S. (2004). The importance of brand equity to customer loyalty. *Journal of Product and Brand Management, 13*(4), 217–227.
Volckner, F., & Sattler, H. (2006). Drivers of brand extension success. *Journal of Marketing, 70*(April), 18–34.
Washburn, J. H., & Plank, R. E. (2002). Measuring brand equity: An evaluation of a consumer-based brand equity scale. *Journal of Marketing Theory and Practice, 10*(1), 46–62.
Westbrook, R. A. (1987). Product/consumption-based affective responses and post-purchase processes. *Journal of Marketing Research, 24*(3), 258–270.
Wilkinson, J. B., Mason, J. B., & Paksoy, C. H. (1982). Assessing the impact of short-term supermarket strategy variables. *Journal of Marketing Research, 19*(February), 72–86.
Yoo, B., & Donthu, N. (2001). Developing and validating a multidimensional consumer-based brand equity scale. *Journal of Business Research, 52*(1), 1–14.
Zaichkowsky, J. L. (1985). Measuring the involvement construct. *Journal of Consumer Research, 12*, 341–352.

**Vijay Ganesh Hariharan** is Associate Professor of Marketing at Erasmus University Rotterdam. He is also a member of Erasmus Research Institute of Management and co-director of the Erasmus Center for Marketing and Innovation. He holds a Ph.D. in Marketing and M.A. in Economics from the State University of New York at Buffalo. His primary research interests lie in empirical modeling of issues related to new product introductions and retail brand management. He is also interested in modeling endogeneity and dynamics in various marketing phenomenon. His research has been published in scholarly journals such as *International Journal of Research in Marketing*, *Journal of Product and Brand Management* and *Management Science*, and have been presented in various international conferences.

**Kalpesh Kaushik Desai** is Professor of Marketing and Chairman of the Department of Marketing and Supply Chain Management at the University of Missouri-Kansas City. With Ph.D. in Marketing from the University of Texas at Austin and MBA from Jamnalal Bajaj, Bombay University, Desai has 5-years of industry experience in brand management. Desai's theoretical research interests include self-regulation, time-money, construal level, social comparison, and categorization. His substantive research interests are in branding and retailing issues. His research has been published in several prestigious scholarly journals including *Journal of Consumer Research, Journal of Marketing, Journal of Marketing Research, Journal of Consumer Psychology, Journal of the Academy of Marketing Science*, and *Journal of Retailing*. Additionally, Desai is the Associate Editor-Consumer Behavior track of *Journal of Business Research*, and serves on the editorial boards of *Journal of the Academy of Marketing Science* and *Psychology & Marketing*.

**Debabrata Talukdar** is Professor of Marketing at the State University of New York at Buffalo. His primary research interests lie with economic modeling and empirical analyses of business strategy as well as public policy issues related to the provision of both private and public goods to consumers. The substantive areas of his current research works include retail market dynamics, consumer health behavior, consumer and firm decisions under information uncertainty, new product diffusion process, the environment and sustainable development, and urban poverty issues. His research works have been presented and published in various international conferences and leading journals in the areas of economic development and business management like the *World Development*, *Land Economics*, *Urban Studies*, *Journal of Public Policy & Marketing*, *Journal of Business Ethics*, *Annals of Applied Statistics*, *International Journal of Production Economics*, *Journal of Retailing*, *Journal of Consumer Research*, *Journal of Marketing*, *Journal of Marketing Research*, *Management Science* and *Marketing Science*.

**J. Jeffrey Inman** is Associate Dean for Research and Faculty, and Albert Wesley Frey Professor of Marketing and Professor of Business Administration at the University of Pittsburgh. He is president of the Society for Consumer Psychology, and is past president of the Association for Consumer Research. Inman's interests include consumer decision making, shopper marketing, and eating behaviors. His work has appeared in scholarly journals such as the *Journal of Consumer Research*, *Journal of Marketing Research*, *Marketing Science*, and *Journal of Marketing*.