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An empirical investigation of antecedents of brand loyalty: The role of product category, marketing mix and consumer-related characteristics in the light of niche brands proliferation.

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Abstract

Firms invest heavily in building and maintaining relationships with their customers. This is due to loyal customers being among the most profitable ones for firms. It is thus essential for managers and researchers to understand what drives customers to become loyal. Researchers have investigated brand loyalty antecedents at great length. These antecedents can be divided in three classes: product category, marketing mix and customer-related ones. Despite the large body of research on these antecedents, an update is necessary as markets have been changing in the last decades. One of the major changes has been the apparition and proliferation of niche brands (such as organic and private label brands) that are positioned to serve segments of consumers with specific needs. The aim of this Ph.D. research is to fill these gaps and get a better understanding of what influences brand loyalty in the light of niche brands' development. We specifically focus on two types of niche brands: organic and private label brands. This Ph.D. research is comprised of four studies, each one investigating one class of antecedents. Our results first enable us to reassess the effect of certain antecedents of brand loyalty using recent panel purchase data. It also gives us some insights on the role of niche brands. It shows that the proliferation of niche brands and more specifically the proliferation of private label brands has an effect on brand loyalty at an aggregate level. In the same way, niche brands have a moderating effect on the impact of some antecedents of brand loyalty. Theoretical, methodological and managerial implications of these findings are discussed.

Keywords: Brand loyalty, niche brands, product category-related antecedents, marketing mix-related antecedents, customer-related antecedents, panel data, experimentations.

Résumé

Les entreprises investissent de larges sommes dans la fidélisation de leur clientèle. La raison en est simple : les clients fidèles font partie des plus profitables pour les entreprises. Il est donc essentiel de comprendre ce qui amène les consommateurs à être fidèles. La recherche a ainsi considérablement étudié les antécédents de la fidélité à la marque. Ceux-ci peuvent être divisés en trois classes : les antécédents liés à la catégorie de produit, ceux liés au marketing mix du produit et ceux liés au consommateur. Cependant, et malgré l'intérêt des chercheurs pour ces questions, une étude plus approfondie est nécessaire du fait de la mutation des marchés ces dernières décennies. Un des changements les plus marquants est le développement des marques de niche. Le but de cette thèse est ainsi de mieux comprendre ce qui amène les consommateurs à être fidèle à la lumière de ces marques de niche. Nous étudions plus particulièrement les marques bio et de distributeur. Cette thèse comporte quatre études, chacune s'intéressant à une classe particulière d'antécédents. Nos résultats nous permettent, tout d'abord, de réexaminer l'effet de certains antécédents grâce à des données de panel récentes. Ils nous donnent ensuite des indications sur les effets des marques de niche sur la fidélité à la marque. Plus précisément, ils démontrent que le développement des marques de niche a un effet sur la fidélité à un niveau agrégé. De la même façon, on observe un effet modérateur du type de marques de niche sur l'effet de certains antécédents. Nous discutons les implications théoriques, méthodologiques et managériales de ces résultats.

Mots-clés : Fidélité à la marque, marque de niche, antécédent lié à la catégorie de produit, antécédent lié au marketing mix, antécédent lié au consommateur, données de panel, expérimentations.

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Introduction

The importance of consumer loyalty to business cannot be overestimated. Sales revenue and profits depend on the brand being purchased by customers on a repetitive basis (Reichheld, 1996). Considerable energy and dollars are invested in measuring metrics such as share of requirements, repeat rates, and purchase frequencies. Measures of brand loyalty are key inputs into brand valuations as they are indicators of future purchasing (e.g., Interbrand, 2015).

Brand loyalty is one of the major concepts in marketing. It is fundamental for marketers and researchers. Hundreds of articles have been published about brand loyalty and each year considerable amounts are spent to build, maintain, and study it (Pare & Dawes, 2012; Baldinger & Rubinson, 1996). It is also one of the oldest concepts ever studied in marketing, beginning with Copeland's seminal work "*Relation of consumers' buying habits to marketing methods*" in 1923. The reason behind this interest is pretty simple: in many sectors, loyal consumers are the most profitable customers for firms and brands (Reinartz & Kumar, 2000). According to some authors, there is a prevalent belief that in sectors with high acquisition costs, it is less expensive to encourage a loyal consumer to buy again than it is to encourage a non-buyer to commence buying the brand (Rosenberg & Czepiel, 1984; Bolton & Drew, 1991; Reichheld, 1996). It costs less to serve loyal customers because they place more frequent and similar orders. Bennett & Bove (2002) summarized the advantages of having loyal consumers for a firm in the following points: they tend to spend more than non-loyal consumers; they are more likely to purchase more intensively than newcomers; they increase their spending over time; they cost less to serve than new customers; they generate word-of-mouth advertising or referrals; they are less price sensitive than new customers and pay a premium price; and they are both less deal prone and more prone to give firms a second

chance in case of service failure. Finally, knowing the preferences of loyal consumers makes marketing activities more efficient. Reinartz & Kumar (2000) also showed that loyal consumers had a higher return on investment and customer lifetime value than regular consumers. Reichheld & Teal (2001) stated that an increase of 5% in loyalty leads to an increase of 25 to 85% in profit, depending on the sector in which the firm is located.

Managers and marketers also understand the importance of customer loyalty. A study conducted by the IBM Corporation in 2011 with more than 1,700 marketers shows that enhancing brand loyalty is their highest priority. This issue is of primary importance for e-retailers and researchers have thus started to take an interest in ways to enhance customer for e-retailers (N'Goala & Cases, 2012; Audrain-Pontavia, N'Goala & Poncin, 2013). This concern is also shared by retailers as a study from 2015 shows that 74% of U.S. retailers reveal that customer engagement is their number one concern; 62% of those retailers said they are increasing their budgets to enhance loyalty initiatives in 2015. One hundred percent of them said that they plan to use analytics to better understand shopping behaviors within the next two years (Boston Retail Partners, 2015). As a consequence, firms are heavily investing in schemes to enhance brand loyalty, such as loyalty programs. In the U.S. alone, companies spend a staggering $2 billion on loyalty programs every year (Capgemini Consulting, 2015). A more local example would be Carrefour, which spends $80 million a year on loyalty programs. This heavy investment pays off as nearly all the winners of the 2015 Loyalty360 Awards are investing more than 21% of marketing dollars in loyalty compared to one-third of the market at large. As a consequence, the number of loyalty programs is on the rise. Around 2.07 billion consumers worldwide are likely to be members of at least one coalition loyalty program, which is equivalent to approximately 28.4% of the world's adult population (Finaccord, 2015). This number has almost doubled since 2010, when there were an estimated

1.07 billion loyalty program members. These loyalty programs are divided between several markets. The largest markets for loyalty programs are the airline sector with 662 million loyalty program members, followed by the banking sector with 500.5 million members and the hospitability sector with 343.7 million members (Finaccord, 2015).The average household in the U.S. has over 21 loyalty program memberships (Capgemini Consulting, 2015). Reports also show that frequent flyer miles could be considered the world's second largest currency after the U.S. dollar (*The Economist*, 2002), and that co-branded airline customer loyalty cards generate more than 4 billion U.S. dollars in annual revenue for the top seven legacy airlines (Beirne, 2008).

Given the importance of loyalty for firms, academic research has investigated the evolution of brand loyalty and its antecedents for more than three decades. Such investigations try to determine the brand loyalty drivers and influencers and to give marketers and managers the tools and knowledge necessary to enhance brand loyalty through marketing actions.

However, there is a very prevalent and long-held anecdotal view that consumers' loyalty to the brands they buy is declining. For example, Dubow (1992) suggests a loyalty decline for Coke dating back to the 1960s. More recently, Kapferer stated as follows: "To say that brand loyalty is in decline today is, at the very least an understatement" (2005). Industry publications often report that the retail sector is being threatened by an alarming decline in customer loyalty and that shoppers are becoming less and less brand loyal (Lincoln, 2006; Van Belleghem, 2013).

It is no wonder that marketers are concerned by the specter of widespread loyalty declines. Moreover, the study conducted by the IBM Corporation shows that most marketers

consider themselves underprepared to manage a decrease in brand loyalty (IBM Corporation, 2011).

The empirical evidence in the academic literature is scarce and controversial; indeed, only a few empirical studies have investigated the medium-term (one to two years) evolution of brand loyalty in the beginning of the 1990s. More recent studies have investigated longer periods of time but with a relatively small number of product categories. However, analysis over a longer time period could yield greater insight and uncover trends that are otherwise obscured in shorter time spans. An additional problem with prior studies is that they were conducted in the 1980s or in the early 1990s; however, consumers and markets have changed significantly in recent years. Since that time, consumers have become more price conscious and deal prone than before (Mela, Jedidi, & Bowman, 1998). This phenomenon has been strengthened by the 2008 crisis, which has caused consumers to "tighten their belts" and to strengthen their versatility. This, in turn, could have prompted significant changes in loyalty. Consumers are also more cynical about brands and marketing in general (O'Dell & Pajunen, 2000), which could lead them to be less loyal. On the other hand, markets are more fragmented than before. Considerable growth in both the number of brands and stock-keeping units in the last twenty years has also been observed (Putsis Jr, 1997; Wan, Evers, & Dresner, 2012). However, the most important change is the appearance and growing popularity of specific brands, i.e., private label brands (PLB) and organic brands, which are niche brands that fit some specific consumers' tastes and needs. Their presence can disturb markets, and consumers' perception and behaviors toward them may be different than for regular brands.

These changes raise several concerns for marketers and researchers. First, an examination using more recent data over a longer time period could show more recent trends

in loyalty and clarify earlier findings based on shorter time frames if brand loyalty evolved. Second, it is important to know the antecedents of brand loyalty. Third, tests are important to check if niche brands have the same reactions to antecedents and if they follow the same evolution as classic brands. Finally, another concern is to test whether or not the changes that occurred caused the brand loyalty to decline.

There is thus a clear need for a study of brand loyalty evolution (decline, growth, or stability) antecedents, the presence of niche brands, and the effects of their proliferation. In line with calls for empirical generalizations in marketing as a means to advance marketing knowledge (Bass, 1995), we contribute by conducting a large-scale study in which we analyze the evolution of brand loyalty over time.

This introduction is structured as follows: we first define the concepts of brand loyalty and its antecedents. We then describe the rationale for eventual loyalty evolution. This is followed by a closer look at niche brands. In particular, two types of niche brands will be studied: PLB and organic brands. Finally, we conclude this introduction by discussing the contributions of this Ph.D. research.

I. Concepts and definitions.

Brand loyalty has been studied for a very long time in marketing. Copeland wrote the first article about brand loyalty in 1923. Historically, three different approaches that describe loyalty have emerged: a behavioral, an attitudinal, and a hybrid approach. We start by describing each of the approaches before focusing on the antecedents of brand loyalty.

I.1. Brand loyalty.

I.1.1. The behavioral approach to brand loyalty.

Within the behavioral approach, only behavior explains loyalty. A consumer is loyal to a brand as long as (s)he keeps buying it. Loyalty is measured by behavioral variables, such as the share of category requirement, purchase frequency, and repertoire size. The main limitation of this approach is that consumers might buy a given brand for different reasons not related to loyalty. Consumers could, for example, switch from their usually bought brands as soon as another brand appears that is less expensive due to sales promotions. They could also switch if they find another brand that satisfies them more. It thus appears to be difficult to make the distinction between loyalty and only repeat buying. This is called "spurious loyalty" (Dick & Basu, 1994; Day, 1969) and "inertial loyalty" (Bloemer & Kasper, 1995). Inertia means that a consumer stays loyal with the same brand because (s)he is not ready to spend effort or time to search for other brands. In this approach brand loyalty is seen as a consequence of behavior rather than an explanation. Commitment and feelings toward brands are not taken into account.

I.1.2. The attitudinal approach to brand loyalty.

Within the attitudinal approach a consumer is loyal if he has positive feelings toward a brand. Brand loyalty can be seen as an explanation of the behavior. A distinction between repeat buying and loyalty can thus be made. The main limitation of this approach is that important biases exist between what people declare they will do and what they actually do, and thus attitudinal measures may often prove incorrect. A consumer may rationalize his/her choice when questioned and make up an evaluation of brands even when (s)he does not make an explicit evaluation in reality. Other variables can also influence actual purchases. Although

a consumer might have a favorable attitude toward a given brand, (s)he may still not buy it due to the price. Moreover, when it comes to measuring feelings and attitudes toward a brand, such measures are often made at a given point in time, which does not represent a longitudinal view as attitudinal answers may change over time (Dall'Olmo, Ehrenberg, Castleberry, & Barwise, 1997). Despite all these disadvantages, scales measuring attitudinal loyalty are used mainly because of their simplicity (Chaudhuri & Holbrook, 2001, 2002; Matzler, Bidmon, & Grabner-Kräuter, 2006, 2008; Beatty, Homer, & Kahle, 1988).

I.1.3. The hybrid approach to brand loyalty.

The last approach considers a general agreement in the marketing literature that loyalty is multidimensional, which means that there must be repeated purchases and a positive attitude toward the brand. A consumer is considered loyal if (s)he buys a brand repeatedly and if this repeat purchase is the consequence of a positive attitude (Day, 1969; Assael, 1987; Lichtle & Plichon, 2008; Frisou, 2005). Commitment and trust are two of the main features of the attitudinal dimension (Jacoby & Chestnut, 1978; Morgan & Hunt, 1994).

Following this view of brand loyalty, Jacoby and Chestnut's definition (1978) is one of the best known and enjoys widespread support in the marketing literature (Assael, 1992; Mowen, 1993). According to their definition, brand loyalty is a biased behavioral answer, meaning that there is a systematic tendency to buy a certain brand or group of brands. Loyalty is thus not a zero-order process, and previous choices made by the consumers do have an impact on their future purchase. Loyalty is also a behavioral answer, and as a consequence, verbal statements of preference are not enough to ensure brand loyalty. As several researchers (Ehrenberg, 1972; Jacoby, 1971) have observed, loyalty does not necessarily mean sole loyalty as consumers can be loyal to more than one brand. Brand loyalty thus exists if more

than one brand is present on the market. People must have the opportunity to choose among different alternatives. The last requirement of brand loyalty is that it is a psychological process. Consumers receive some information that is used afterwards to form certain beliefs or attitudes about brands. Brands are then evaluated based on these beliefs, and some are preferred to others. Consumers might then develop commitment toward a brand, which is an essential element of brand loyalty (Jacoby & Chestnut, 1978). Brand loyalty thus results from a positive attitude toward the brand. (Oliver, 1999) supports this definition, noting as follows: "Loyalty is a deeply held commitment to rebuy or repatronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same-brand set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior."

Even though more definitions of loyalty exist, we chose to adopt this definition as it has the most support in the marketing literature.

I.2. Brand loyalty antecedents.

As stated earlier, brand loyalty is a major issue for managers. Having loyal consumers is a key priority for managers. It is thus crucial for them to understand what drives brand loyalty and where it comes from, both of which are of primary managerial and theoretical importance. This better understanding will enable retailers, marketers, and managers to adapt their strategy and to increase brand loyalty for their brand. The existing literature categorizes brand loyalty antecedents into three classes (see Figure 1): consumer, marketing mix and product category-related antecedents.

Consumer-related antecedents relate to consumer psychographics. They are antecedents that change from consumer to consumer and relate to consumers' internal

perceptions and habits toward products. These include satisfaction, perceived value of the product or service, consumer involvement in the category, variety-seeking behavior, and inertia.

Marketing mix-related antecedents are the products' marketing mix and positioning. They are characteristics and attributes that are specific to products and that vary across products. They make it possible to define the positioning of a specific product compared to others. These include the price, price and in-stores promotions, the product attributes, and the loyalty programs.

Finally, product category antecedents relate to the market conditions that characterize a product category. They are characteristics that do not change from one product to another or from one consumer to another. They remain the same for a whole market. These include the category penetration, the purchase frequency of the category, the number of products in the category, the share of PLB, and the competitive structure of the markets.

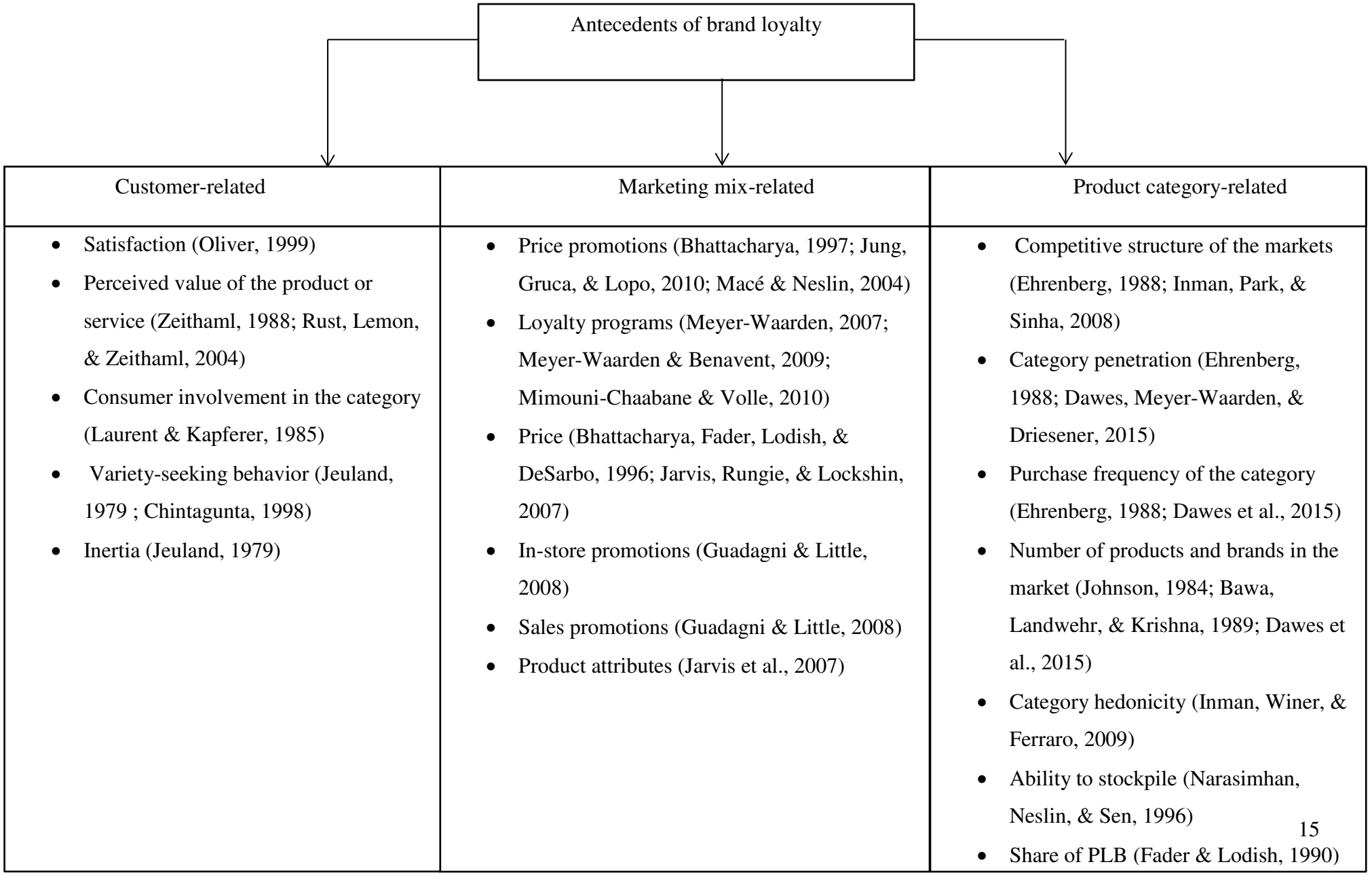

Figure 1: Typology of brand loyalty antecedents.

I.3. Evolution of brand loyalty.

An important belief of marketers is that brand loyalty is declining. This decline has often been claimed in the managerial press. For example, (Kapferer, 2005) observed as follows: “To say that brand loyalty is in decline today is, at the very least an understatement.”

There are several reasons why brand loyalty might erode (Dawes et al., 2015). First, this can occur if heterogeneity between customers is not taken into account and they are treated in the same way by firms. This approach does not differentiate one brand from another and thus does not encourage consumers to be loyal to a particular firm.

The high frequency of brand and price promotions in the retail sector (Hendel & Nevo, 2006) might also reduce brand loyalty. The literature shows that repetitive promotions encourage consumers to buy only during a promotion (Mela et al., 1998). Consumers might be more price conscious than before and are more likely to buy products during promotions (Mela et al., 1998). This phenomenon has been strengthened by the 2007/08 crisis. This crisis may have caused consumers to “tighten their belts” and to strengthen their versatility by taking advantage of temporary promotions. This behavior of buying less expensive products can persist after the crisis is over (Lamey, 2014), lowering brand loyalty in the process.

Consumers are also more educated and empowered than in the past, which makes them at the same time more cynical about marketing and brands in general (O'Dell & Pajunen, 2000). They will be less likely to trust brands and are thus less likely to be loyal to them. They may also be less receptive to marketing actions in general.

Finally, the increasing fragmentation of markets, the growing popularity of niche brands such as PLB, and the proliferation of brands and stock-keeping units (Putsis Jr, 1997; Wan et al., 2012) may also explain a possible loyalty decline. Indeed, these phenomena

increase the breadth and depth of the range of products offered to consumers. As a consequence, they may be less loyal.

I.4. Niche brands.

There is evidence in marketing that when a product category evolves from the introduction to the maturity of its life cycle, certain segments of consumers start to develop specific tastes and needs (Kahn, Kalwani, & Morrison, 1988). These heterogeneous tastes and needs are an opportunity for niche brands to appear and grow. Niche brands are brands with relatively few buyers but whose users purchase them often (Kahn et al., 1988; Fader & Schmittlein, 1993). These brands are positioned to serve a small number of consumers exhibiting these specificities (Choi & Bell, 2011; Ehrenberg, Uncles, & Goodhardt, 2004). They differ from regular brands due to their specific appeal to particular consumer segments. They also display high levels of brand loyalty from their consumers (Ehrenberg et al., 2004). They are usually opposed to another type of brand, i.e. “change of pace” brands (Kahn et al., 1988). While niche brands are bought by only a small number of consumers that overemphasize their purchases (Day, Shocker, & Srivastava, 1979;Danaher, Wilson, & Davis, 2003), change of pace brands are bought very infrequently by a very large number of consumers (Fader & Schmittlein, 1993). The existence of change-of-pace brands is related to the tendency of consumers to have variety-seeking behavior in their purchases.

Being a niche brand is a favored strategy for small brands. Indeed, niche brands have a small number of loyal buyers that make the positioning profitable for the brand (Jarvis et al., 2007). Some researchers even present niche brands as a “holy grail” for brands (Jarvis & Goodman, 2005). Fader & Schmittlein (1993) show that while change of pace brands are not uncommon, few brands achieve a niche position.

Niche brands send signals that differ from regular brands (Kahn et al., 1988) to differentiate themselves and to appeal to specific and narrow segments of consumers. These signals could be, for instance, price signals or quality signals and have an impact on both brand loyalty and its antecedents. When evaluating products, consumers use extrinsic cues (Rao & Monroe, 1988; Alba, Mela, Shimp, & Urbany, 1999; Miyazaki, Grewal, & Goodstein, 2005), which impact consumers' perceptions, such as perceived quality or value (Miyazaki et al., 2005). Consumers' perceptions will in turn have an impact on brand loyalty. As niche brands exhibit different specific cues compared to non-niche brands, consumers' perceptions will differ between the two types of brands. This difference in perception would mean that the impact of some brand loyalty's antecedents previously studied would differ for niche brands. If niche brands are important in a specific market, it may even change brand loyalty at an aggregate level compared to a market where niche brands are weak.

Two specific sort of niche brands have become increasingly important and popular in the marketplace and send very different signals in terms of quality or price: The first are PLB and the second are organic brands. The positioning of these two niche brands is also very different as PLB are usually positioned as low-budget brands (Sethuraman & Gielens, 2014), while organic brands are positioned as premium brands (Van Doorn & Verhoef, 2015). We therefore focus on both of these types of brands in this PhD research. We provide a definition and description of both these types of brands and the reasons why both can be seen as niche brands.

I.4.1. PLB.

I.4.1.1. Definition and background.

PLB are brands owned by a retailer or a wholesaler (Hyman, Kopf, & Lee, 2008) that first appeared nearly two centuries ago. The first example of PLB goes back to clothes sold in 1818. Others followed, such as Brad's Drink in 1898, a cola drink, and Royal Crown in 1905, a soda water (Fitzell, 1982). Since then (particularly in the 1980s), they have become increasingly popular for consumers and retailers. PLB are thus becoming increasingly important and predominant in the marketplace and have managed to establish a considerable share in retail markets (Koschate-Fischer, Cramer, & Hoyer, 2014; Sethuraman & Gielens, 2014). In fact, the average global share of PLB has increased from 15.0% in 2010 to 16.5% in 2013 (Nielsen, 2011, 2014).

PLB have a lot of advantages for retailers and manufacturers. First, they increase overall profits in the product category (De Wulf, Odekerken-Schröder, Goedertier, & Van Ossel, 2005). Second, PLB have higher margins than national brands (NB) (this is particularly valid for high-market-share PLB brands) due to the following: a) lower costs (Liu & Wang, 2008; Wyatt, Gelb, & Geiger-Oneto, 2008); b) less spending in R&D, product launch, and marketing, as a large assortment of PLB allows the retailer to realize synergies (e.g., promotional activities) (Liu & Wang, 2008; Baltas, Doyle, & Dyson, 1997); c) less inter-brand competitions, which tend to shrink NB manufacturers' retail margins; d) and higher bargaining power compared to NB manufacturers.

Another advantage is that PLB are an important tool to differentiate a retailer's image. A retailer can position his PLB as an attractive, non-premium-priced alternative to NB for price-conscious consumers (Sethuraman & Cole, 1999). For example, Victoria's Secret is

known for sexy women's lingerie at a good price and Ikea is popular for fashionable and cheap furniture. PLB also increase consumers' store loyalty (Liu & Wang, 2008), but tend to simultaneously decrease loyalty to NB (Cotterill & Putsis, 2001). The more a consumer buys PLB, the higher their behavioral loyalty to the store will be (Ailawadi, Pauwels, & Steenkamp, 2008; Koschate-Fischer et al., 2014). A large number of PLB will also attract price-sensitive and deal-prone consumers that value less expensive PLB and who will then substitute them for NB.

From the manufacturers' point of view, producing PLB also has some advantages. First, gains could be obtained via scale economies achieved through joint NB–PLB production. However, at the same time this could result in loss through cannibalization of the manufacturers' own NB sales (Tarzijan, 2004; Cadenat & Pacitto, 2009). NB manufacturers can use PLB introduction to skim NB-loyal and price-insensitive consumers from the market through controlling for product quality (Wedel & Zhang, 2004). The introduction of PLB into a category of products can increase the overall category expenditures (Bontemps, Orozco, & Réquillart, 2008; Karray & Martín-Herrán, 2009). When NB and PLB advertisings are complementary, increased consumer demand for the category (NB and PLB) might appear. Spending in advertisements for PLB might also increase the profitability of the whole category even for NB (Pepe, Abratt, & Dion, 2011). Finally, the presence of both NB and PLB allows for better allocation of resources and for a market segmentation of consumers according to price sensitivity (Hyman et al., 2008).

I.4.1.2. PLB specificities.

PLB are not a homogenous set of brands. Price-premium and low-quality tiers of PLB were first introduced to fight hard discounters and were positioned at the bottom of the market

as cheap and low-quality products (Dekimpe, Gielens, Raju, & Thomas, 2011). More recently, other types of PLB were introduced (Geyskens, Gielens, & Gijsbrechts, 2010), including standard/mid-quality-tier PLB that tend to imitate mainstream-quality manufacturers' products (Geyskens et al., 2010) and premium/high-quality PLB positioned at the top end of the market allowing retailers to compete with high-quality NB (ter Braak, Geyskens, & Dekimpe, 2014; Geyskens et al., 2010). These two additional types of PLB have gained importance and are becoming central in both retailers' strategy and in research (Geyskens et al., 2010; ter Braak, Dekimpe, & Geyskens, 2013; Martos-Partal, González-Benito, & Fustinoni-Venturini, 2015).

Retailers use these types of PLB to compete with NB by offering products with the same quality as NB. In general, PLB are perceived as low-quality brands compared to NB (Nenycz-Thiel & Romaniuk, 2009). This low-quality claim is even leveled against premium PLB (Nenycz-Thiel & Romaniuk, 2016). This shows that despite the efforts made by retailers to offer good-quality products, consumers' knowledge may not have kept pace with the quality improvements in PLB (Boyle & Lathrop, 2013). PLB are still seen as low-price and low-quality products. Moreover, the literature shows that consumers tend to generalize cues of one PLB to other PLB (Nenycz-Thiel, Sharp, Dawes, & Romaniuk, 2010). Consumers view PLB as rather homogenous and interchangeable (Ailawadi & Keller, 2004; Richardson, 1997). Spillovers between PLB happen on both a quality level and on a familiarity level (Szymanowski & Gijsbrechts, 2012). This implies, for example, that the low-quality claim associated with PLB will be generalized to every other PLB by consumers. This also implies that when consumers use PLB and learn about this type of brand, they enjoy reduced uncertainty when buying other PLB.

In terms of price, PLB are usually priced lower than NB (Sethuraman & Cole, 1999; Dawes, 2013), with the exception of premium PLB that are perceived and priced similarly as their NB counterparts (ter Braak et al., 2014) and compete with NB on both these levels. However, when considered overall, PLB are still priced lower than NB (Sethuraman & Gielens, 2014).

I.4.1.3. PLB as niche brands.

PLB are considered niche brands. Niche brands are supposed to have low market shares and penetration and a high level of purchase frequency, which is called "excess loyalty" (Fader & Schmittlein, 1993). PLB are brands that are only sold within a certain retailer's stores. This restricted distribution means that their penetration across the market is relatively limited. It also means that a PLB is a bigger brand in its own stores than in the market generally, which artificially inflates the purchase frequency relative to its buyers (Bound & Ehrenberg, 1997; Pare & Dawes, 2012). This fits the definition of a niche brand. Previous authors reported that PLB are often niche brands (Uncles & Ellis, 1989). Furthermore, research shows that PLB often enjoy excess loyalty compared to NB (Pare & Dawes, 2012; Ehrenberg, Goodhardt, & Barwise, 1990; Dawes, 2013). This excess loyalty is reported over a wide range of product categories (Ehrenberg et al., 2004). Finally, PLB are also brands that appeal to specific segments of consumers due to their specificity.

PLB are more popular among large and more educated households, price-sensitive consumers, and consumers that are familiar with PLB and consider them to be of high quality (Sethuraman & Gielens, 2014; Binninger, 2007). On the contrary, households with high income, consumers who perceive the risk of buying in the category as being high, those who

perceive the quality variability in the category to be high, and those who are more quality sensitive are less prone to purchase PLB. Thus, PLB fit the criteria of niche brands.

I.4.2. Organic brands.

I.4.2.1. Definition and background.

Organic brands are defined as follows:

> "products produced by farmers who emphasize the use of renewable resources and the conservation of soil and water to enhance environmental quality for future generations. Organic meat, poultry, eggs, and dairy products come from animals that are given no antibiotics or growth hormones. Organic food is produced without using most conventional pesticides; fertilizers made with synthetic ingredients or sewage sludge; bioengineering; or ionizing radiation[…]". (USDA, 2016).

In recent decades, organic markets have become increasingly important in the marketplace. In France, a 10% increase in growth rate has been recorded from 1999 to 2005. More recently, the global organic market has also shown a steady growth from $17.9 billion in 2000 to $59.1 billion in 2010 (Sahota, 2012). It is now even possible to buy organic brands in both food (e.g., cereals, butter) and nonfood (e.g., personal care products, nutritional supplements) product categories.

I.4.2.2. Organic brands' specificities.

The reasons behind this growth are that organic brands appeal to certain segments of consumers for specific reasons (Hughner, McDonagh, Prothero, Shultz, & Stanton, 2007). First, consumers purchase organic brands because they perceive them to be healthier (Schifferstein & Ophuis, 1998; Zanoli & Naspetti, 2002; Van Doorn & Verhoef, 2015). The

absence of pesticides in organic brands and consumers' desires to avoid chemicals motivates consumers to buy organic brands (Ott, 1990; Wilkins & Hillers, 1994; Saba & Messina, 2003). The perceived healthiness of organic brands is thus a signal of quality for consumers (Magnusson, Arvola, Koivisto Hursti, Åberg, & Sjödén, 2001). This signal causes them to prefer organic brands to conventional ones. Second, the better taste associated with organic brands in certain product categories is another reason why consumers purchase organic food (Schifferstein & Ophuis, 1998; Magnusson et al., 2001; Fillion & Arazi, 2002). Third, environmental concerns are another reason impacting consumers' choices regarding organic foods. The use of chemicals in conventional food production is seen as harmful for the environment, thereby leading to organic brands being seen as environmentally friendly (Ott, 1990; Wilkins & Hillers, 1994). Fourth, organic brands are also seen as safer than conventional brands. Concern about food safety is thus another factor positively impacting organic brands' consumption (Schifferstein & Ophuis, 1998; Soler, Gil, & Sanchez, 2002). Following this concern for food safety, concern for animal welfare also plays an important role as they are believed to be treated better by companies that produce organic brands (Hill & Lynchehaun, 2002; Aarset et al., 2004). Finally, research also shows that some consumers choose organic consumption to help the local economy (Hughner et al., 2007).

Conversely, there are factors that limit the purchase of organic brands. The first and most important one is their price (Van Doorn & Verhoef, 2015; Aertsens et al., 2009; Van Loo, Caputo, Nayga, Meullenet, & Ricke, 2011; Bezawada & Pauwels, 2013). Organic brands are priced higher than conventional ones, which might constitute a barrier even for the core segment of organic consumers (Bezawada & Pauwels, 2013). However, the recent academic literature that examines the relationship between price and sales performance of organic food has not achieved a clear consensus. On the one hand, van Herpen, van Nierop, & Sloot (2012)

conclude that prices have no effect on sales for organic food. On the other hand, Bezawada & Pauwels (2013) suggest that sales for organic food decrease with higher prices. Furthermore, Ngobo (2011) finds an inverted U-relationship where demand increases with increasing prices up to a certain level. The lack of availability of organic brands is further cited as an important barrier (Zanoli & Naspetti, 2002; Van Doorn & Verhoef, 2015). Skepticism regarding certification boards and labels is also a setback as some consumers tend to distrust labels, which causes them to question the genuineness of organic brands (Ott, 1990; Canavari, Bazzani, Spadoni, & Regazzi, 2002; Aarset et al., 2004). Insufficient marketing for organic brands has negatively influenced consumers (Roddy, Cowan, & Hutchinson, 1994; Chryssochoidis, 2000). Indeed, these studies point out that organic brands are not sufficiently promoted and merchandized. Satisfaction with current food sources also prevents consumers from switching to organic brands (Roddy et al., 1994). Finally, cosmetic defects tend to deter consumers from purchasing organic brands (Ott, 1990; Thompson & Kidwell, 1998). Consumers are not always willing to accept the imperfections and blemishes often found in organic brands.

I.4.2.3. Organic brands as niche brands.

Organic brands thus convey particular attributes that attract a specific type of consumer. Such brands will only appeal to a relatively small number of consumers. Organic consumption can be seen as "a part of a way of life. It results from an ideology, connected to a particular value system, that affects personality measures, attitudes, and consumption behavior" (Schifferstein & Ophuis, 1998). Consumers of organic brands are more likely to buy only organic brands, which will thus inflate the purchase frequency of these brands. We can see that organic brands fit the definition of niche brands we support as they have low market shares and penetration as well as a high level of purchase frequency (Fader &

Schmittlein, 1993). It is also commonly accepted that organic food constitutes a niche market, and thus consumers are more responsive by showing greater levels of behavioral loyalty (Marian, Chrysochou, Krystallis, & Thøgersen, 2014; Batte, Hooker, Haab, & Beaverson, 2007; Krystallis & Chryssohoidis, 2005).

In summary, PLB and organic brands are both niche brands but are different in nature. Their positioning and signals differ in terms of quality and price. On the one hand, PLB are mostly considered cheap and generally as low-quality products (Nenycz-Thiel & Romaniuk, 2016). On the other hand, organic brands are high-quality and high-priced products (Marian et al., 2014). Using these two opposite types of niche brands is thus all the more interesting to investigate in marketing research. Indeed, as their positioning differs, one can expect different results concerning brand performance and loyalty depending on the niche brand considered.

II. Objectives, research questions, and contributions of this Ph.D. research.

II.1. Objectives.

Our problematic is thus the following one: *The long term impact of product category, marketing mix and customer-related antecedents of brand loyalty in light of the proliferation of niche brands.*

The objectives of this Ph.D. research are as follows. We first study the general antecedents of brand loyalty even though they have been extensively studied, which highlights the following gaps. One of the main limitations is the lack of research on the impact of niche brands. Most studies focus only on regular brands when examining the antecedents of brand loyalty. Therefore, in addition to studying the antecedents of brand loyalty, we study such antecedents in the light of niche brands and explain why niche brands could influence consumers' reactions to certain antecedents. This particular type of brands can

trigger consumers' reactions that differ from their reactions to regular brands and could exhibit differences in brand loyalty. We will thus study niche brands' moderating effect and the effect of their proliferation on brand loyalty. Finally, we integrate time and investigate the evolution of brand loyalty to test if it is declining, increasing, or staying stable.

II.2. Research questions.

This Ph.D. research is comprised of four research questions. Each of the research questions is going to be answered in a separate research paper, as depicted in Figure 2. We consider all three classes of brand loyalty antecedents (product category-, marketing mix-, and consumer-related). Each of the research questions will be related to one of the classes. The first two research questions and studies examine product category-related antecedents of brand loyalty. The first research question focuses on the impact of the levels and of the evolution trends of product category-related antecedents and the share of PLB on the evolution of brand loyalty for a product category. The second research question concerns the impact of a change in product category-related antecedents and in the share of PLB as well as the moderating effect of the share of PLB on these effects and the interaction effect between category penetration and category purchase frequency on brand loyalty. The third research question and study focus on marketing mix-related antecedents. The third study examines the moderating impact of the brand type (e.g., organic brands and PLB) on the effect of price on brand loyalty. Finally, the fourth research question and study focus on consumer-related antecedents. The fourth study examines the role of consumers' characteristics on brand loyalty formation through perceived value for money for organic brands, PLB, and organic PLB.

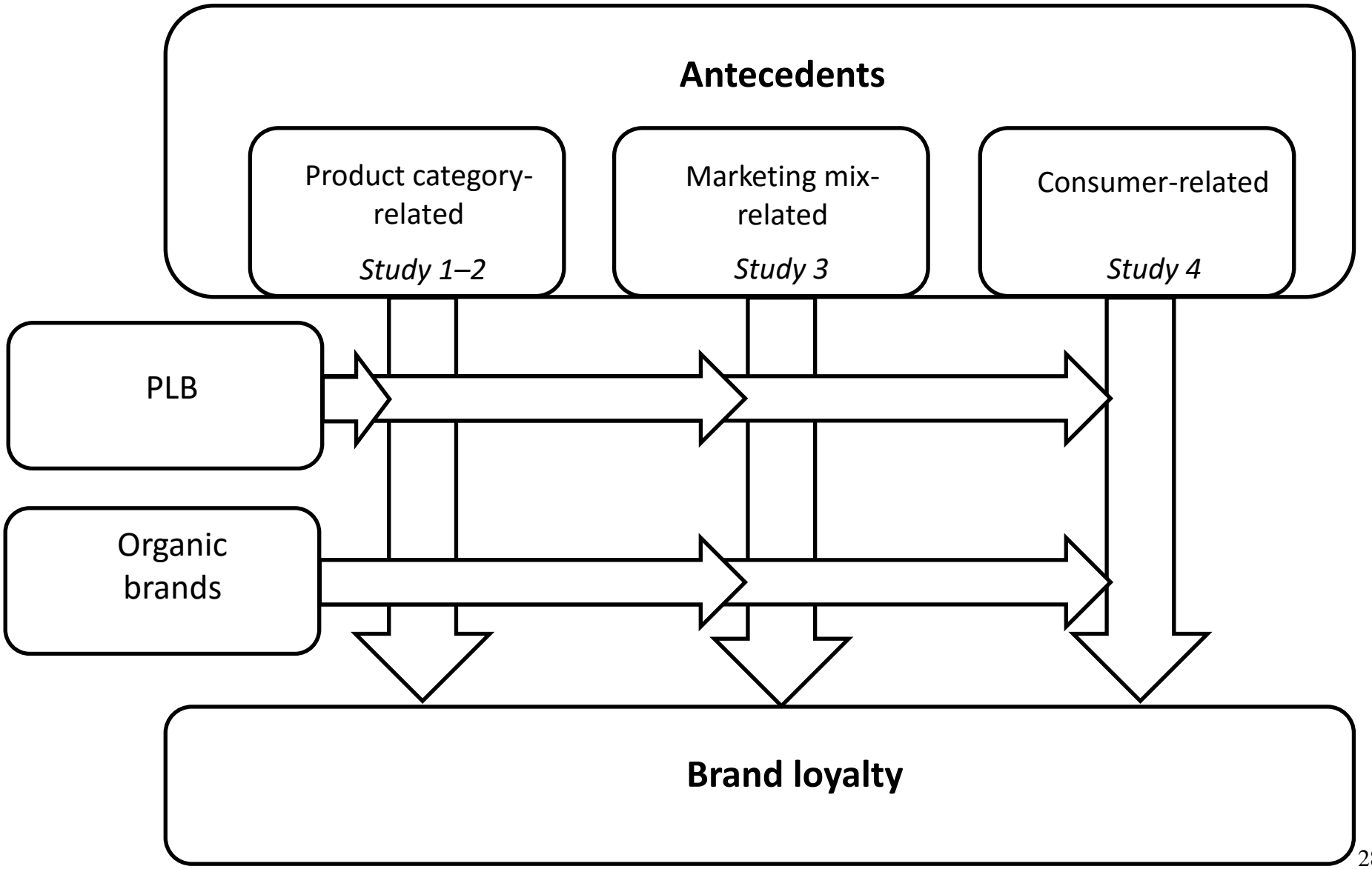

Figure 2: Plan for the Ph.D. research.

The research questions are summarized below:

RQ1: What is the impact of the level and of the trends of the following category-related loyalty antecedents on brand loyalty evolution: the number of stock-keeping units (SKU), the repertoire size, the category penetration, the category purchase frequency, and the share of PLB?

When considering product category-related antecedents, it is important to study two different aspects separately. The first aspect we study is the impact of the actual level of product category-related antecedents. Do differences in these levels and trends explain why brand loyalty increases, decreases, or stays stable? Leaving aside the effect of a change in these antecedents, can differences in brand loyalty evolution trends be explained by these levels? The first study provides a benchmark on brand loyalty evolution based on the level of product category-related variables and on their trends. In this context, we account for the effect of niche brands by studying if the share of PLB in a product category can also explain this evolution. Testing the effect of organic brands' share was impossible because of their low or non-existent market share in the vast majority of the product categories.

This paper is currently under review in Journal of the Academy of Marketing Science and was presented at the 2014 Association Française de Marketing (AFM) and European Marketing Academy (EMAC) conferences.

RQ2: What is the impact of a change of the following product category-related loyalty antecedents on brand loyalty: the number of SKUs in the category, the share of PLB, the category penetration, and the purchase frequency in the category?

Second, we study the impact of a change in these antecedents intracategory. When these antecedents vary, how does it impact brand loyalty inside the product category? Additionally, and with respect to their direct impact on brand loyalty, we also take into account the moderating impact of the share of PLB as well as the moderating effect between category penetration and category purchase frequency. Consumers in markets with a high share of PLB could react differently than consumers in markets with a low share of PLB. We do not test the effect of organic brands for the same reasons as in the first study. The data associated with both these studies is large-scale longitudinal consumer panel data analyzed with econometric panel analyses.

This paper is currently under review in Journal of Marketing and was presented at the 2015 AFM and EMAC conferences.

RQ3: Does the brand type (i.e., organic brand and PLB) moderate the impact of the price on brand loyalty?

As explained earlier, PLB and organic brands convey different quality signals. A vital variable that consumers use to evaluate a product's quality is price. Price can act as a positive signal (i.e., a sign of good product quality) but also as a negative one (i.e., a cost that consumers have to bear to acquire the product). It is thus possible that one of the price signals (negative or positive) may be predominant depending on the product considered. The third study tests whether or not the brand type, PLB, and organic brand moderates the impact of price on brand loyalty. The data associated with this study is large-scale longitudinal consumer panel and experimental data analyzed with econometric panel analyses, ANOVA and Hayes Macro PROCESS (Hayes, 2013).

This paper was presented at the 2015 and 2016 EMAC conferences.

RQ4: How do consumers' psychographics impact brand loyalty through value for money for different brand types (i.e., organic NB, PLB, and organic PLB)?

Finally, research question 4 focuses on the consumer-related brand loyalty antecedents. PLB and organic NB are brands that appeal to certain segments of consumers. Thus, depending on the consumers and their preferences, the formation of brand loyalty will be different. We focus more specifically here on the formation of brand loyalty through perceived value for money. The impact of consumers' characteristics for PLB and organic NB are well known. However, little is known about organic PLB that combine both types of products (organic NB and PLB). This study thus examines the role of consumers' characteristics in the formation of brand loyalty through perceived value for money for organic PLB. It also tests this role for PLB and organic NB. This way, we provide a benchmark against which we can compare the effect of consumers' characteristics for organic PLB to others types of brands (i.e. PLB and organic NB). It enables us to understand whether the positive or negative quality signal (coming from the organic label or PLB respectively) has the most powerful effect on brand loyalty for organic PLB according to different consumers' profiles. The data associated with this study are experimental data analyzed with ANOVA and Hayes Macro PROCESS (Hayes, 2013).

This paper is under review in Journal of Marketing Management and was presented at the 2016 AFM and EMAC conferences.

The research questions are summarized below.

Research question 1	
What is the impact of the level of the following category-related loyalty antecedents on brand loyalty evolution: the number of stock-keeping units (SKU), the repertoire size, the category penetration, the category purchase frequency, and the share of PLB?	
Class of antecedents	Product category-related
Methodology	NBD-Dirichlet model
Data	Panel data
Research question 2	
What is the impact of a change of the following product category-related loyalty antecedents on brand loyalty: the number of SKUs in the category, the share of PLB, the category penetration, and the purchase frequency in the category?	
Class of antecedents	Product category-related
Methodology	NBD-Dirichlet model
Data	Panel data
Research question 3	
Does the brand type (i.e., organic brand and PLB) moderate the impact of the price on brand loyalty?	
Class of antecedents	Marketing mix-related
Methodology	NBD-Dirichlet model ANOVA and Hayes Macro PROCESS
Data	Panel data Online experiments
Research question 4	
How do consumers' psychographics impact brand loyalty through value for money for different brand types (i.e., organic brand, PLB, and organic PLB)?	
Class of antecedents	Consumer-related
Methodology	ANOVA and Hayes Macro PROCESS
Data	Online experiments

Table 1: Research questions summary.

II.3. Contributions of the Ph.D. research.

The contributions of this PhD research are threefold. The first contribution is to provide deeper insights about the antecedents of brand loyalty. This will be done through the study of the different classes of brand loyalty antecedents. The second contribution is that we provide new insights regarding the role of niche brands in the formation of brand loyalty. More precisely, we study the impact of the proliferation and the moderating impact of PLB and organic brands. Finally, the third contribution is that we study the longitudinal evolution

of brand loyalty over a large range of product categories to determine whether or not overall brand loyalty is declining. We thus make theoretical, methodological, and managerial contributions.

II.3.1. Theoretical contributions.

This research makes a theoretical contribution to a better understanding of brand loyalty drivers. It fills gaps left in the literature with recent actual purchase data. Therefore, it even accounts for changes that may have occurred in markets in recent years, as since the 1980s a lot of market changes have occurred. It also covers a large variety of antecedents and thus affords a more complete understanding of loyalty instead of focusing on one particular antecedent and taking a more restricted approach.

Furthermore, it provides a better understanding about niche brands and brand loyalty. Research usually focuses more on the formation of brand loyalty for regular brands, whereas niche brands have been scarcely studied. It provides new insights about niche brands and further enhances the knowledge on brand loyalty drivers. To go more into detail, we provide new evidence on the effect of niche brands' proliferation on markets and their moderating effects.

When we analyze panel data in our first three studies, we use the polarization index (Fader & Schmittlein, 1993) as our core measure of brand loyalty. This index measures brand loyalty in a product category for a given period of time at an aggregate level. Researchers usually use other measures of brand loyalty, such as share of category requirement and repertoire size (Dawes et al., 2015). The use of the polarization index is thus uncommon compared to the traditional measures of brand loyalty. This is another contribution of this Ph.D. research.

Finally, in line with calls for empirical generalizations in marketing as a means to advance marketing knowledge (Bass, 1995), we contribute by conducting a large-scale study in which we analyze the evolution of brand loyalty over time. We test this evolution with recent purchase data over a large number of years (5 years) and a large number of product categories (55 product categories).

II.3.2. Methodological contributions.

This Ph.D. research offers methodological contributions as well. We use the NBD Dirichlet model for our first three studies. This model allows us to estimate brand loyalty for a market. Researchers usually use this model with an Excel macro (Kearns, 2010). The Excel macro is easy to use and does not require any prior knowledge in programming; however, it runs the model only for one category and one year at the time. This method is thus hard to use on a large scale (in terms of number of years considered and number of product categories). We therefore use the R Dirichlet package instead of the Excel macro. The first methodological implication is that it proved to be easier and faster to use the R Dirichlet package instead of the Excel macro. The R Dirichlet package also has other advantages. First of all, one can adapt it to any stochastical analysis method. For example, (Pare & Dawes, 2012) calculate the number of brands that display excess loyalty based on a difference of 10% between the theoretical Dirichlet values and the observed ones. This is something that could be easily coded on R and that only requires a short time period to complete. Secondly, one can quickly adapt the script to any dataset. Using the R Dirichlet package instead of the Excel macro is very useful in many ways.

Another methodological contribution is that the NBD-Dirichlet proves to be an adequate tool to investigate the repeat purchase behavior of consumers. To do that we use the polarization index, which is a reliable measure independent of market shares, and other

correlated measures indexes. This makes it very useful to describe behavioral loyalty (Corsi, Rungie, & Casini, 2011).

II.3.3. Managerial contributions.

Finally, we provide managerial contributions. Our findings can first be used by retailers and category managers to determine how the level of product category-related antecedents influences brand loyalty evolution at an aggregate level. This enables them to understand the kind of markets in which they are operating. It also helps them to better forecast the level of brand loyalty and to better understand the results in terms of brand loyalty. Finding the effect of a change in product category-related antecedents on brand loyalty enables retailers to better plan their marketing actions in order to enhance brand loyalty on the product category. They will thus be able to understand how they can successfully influence consumers' loyalty.

Our findings also provide insights for product managers regarding how price or other antecedents enhance brand loyalty according to their brand type. We show that the type of product is an important factor that has to be considered when determining the adequate price of a product. Moreover, our results help product managers to improve targeting by determining which consumers they should focus on to increase brand loyalty.

In the next chapter we explore the evolution of brand loyalty. We test if brand loyalty is changing and if this evolution is category-specific. Additionally, we investigate which product category characteristics have an impact on brand loyalty evolution. More specifically, we test the impact of number of SKUs, repertoire size, category purchase frequency, category penetration and PLB share as well as the shifts in these measures on brand loyalty.

Our study contributes to research in brand loyalty evolution and in its antecedents. It enables category managers and retailers to better predict and understand the evolution of brand loyalty in a given product category based of the characteristics of this category. It further gives insights on the role of these characteristics.

Chapter 1: Introduction

Chapter 2: A Longitudinal Analysis of Brand Loyalty Evolution and the Impact of Product Category Characteristics

Chapter 3: A longitudinal empirical investigation toward the understanding of product category antecedents of brand loyalty

Chapter 4: The impact of price tiers on brand loyalty and the moderating role of brand quality cues

Chapter 5: The role of consumer characteristics and the mediating role of perceived value for money on the formation of loyalty for organic private label brands

Chapter 6: Conclusion

Chapter 2: A Longitudinal Analysis of Brand Loyalty Evolution and the Impact of Product Category Characteristics

Abstract

A common managerial belief indicates that brand loyalty evolves over the years, with consumers becoming more heterogeneous in their choices. Earlier research that has investigated brand loyalty evolution has shown mixed results, without reaching a clear consensus. In addition, few studies report the reasons behind such evolution. In this study, we investigate brand loyalty evolution and further explore which product category characteristics have an impact on brand loyalty evolution. We do that across 55 product categories over a period of five years (2006-2010). Our findings show that brand loyalty evolution is category specific, with a significant proportion of product categories showing no evolution. The majority of product categories in which we observe a decline are food categories and categories for which consumers do not have the ability to stockpile; the opposite occurs in product categories that we observe an increase in brand loyalty in. Product category characteristics differ across those categories that show either an increase or a decrease in brand loyalty, both in terms of absolute measures but also in how they develop over time. We discuss the implications for theory and category management practices.

Keywords: brand loyalty; evolution; polarization index; private labels; category management

I. Introduction.

Marketers devote substantial effort to increasing loyalty towards their brands and thereby achieve greater profitability from loyal customers (Reinartz & Kumar, 2000). Anecdotal managerial evidence suggests that loyalty has been declining over time (Kapferer, 2005), a development with serious and troubling implications for marketing practice. A few studies that have taken an interest in brand loyalty evolution have found mixed results. Some studies postulate that a slight decline exists (Dawes, Meyer-Waarden, & Driesener, 2015; Johnson, 1984; Stern & Hammond, 2004; Uncles, Wang, & Kwok, 2010), whereas some studies suggest that brand loyalty does not decline (Dekimpe, Steenkamp, Mellens, & Abeele, 1997; East & Hammond, 1996). The reason behind such mixed results might be due to the different periods of time, time span, context and product categories upon which these studies are based (see Table 1). In fact, time is a critical factor since market-related and economic developments alter the shape of the markets. Furthermore, earlier studies postulate that brand loyalty evolution is product category specific (Dawes et al., 2015). Finally, the short time span and small number of product categories used are issues that neither allow the detection of long-term changes in loyalty nor the investigation of the reasons behind such changes. Overall, we conclude that no clear consensus exists behind brand loyalty evolution and the reasons that drive such evolution.

-- Insert Table 1 --

In this study, we provide further insight into the phenomenon of brand loyalty evolution. Contrary to earlier studies, we focus on a large number (n = 55) of product categories over a period of five years. Our objective is to study overall brand loyalty evolution and further explore if this phenomenon is product category specific and which product

category characteristics impact such evolution. The findings are relevant for category management practices, as it will enable category managers to understand the impact of their actions towards brand loyalty.

In the next section, we describe the rationale for brand loyalty evolution and develop hypotheses pertaining to the product category-related characteristics that might drive such an evolution. Afterwards, we describe the data and methodology we use to operationalize loyalty and assess its evolution. We continue by presenting the findings, and then we conclude with implications and directions for future research.

II. Background and Hypotheses.

II.1. Brand loyalty evolution.

There are several reasons why brand loyalty might erode (Dawes et al., 2015). First, this can occur if heterogeneity between customers is not taken into account and firms threat them all in the same way. If consumers feel like they are just one among many and that no effort is being made to better understand them and to address their needs, they will not be loyal to a particular firm.

The high frequency of brand and price promotions in the retail sector (Hendel & Nevo, 2006) might also reduce brand loyalty. The literature shows that repetitive promotions encourage consumers to buy products only during promotions (Mela, Jedidi, & Bowman, 1998). This phenomenon has been reinforced since the 2007-08 crisis, a time when consumers became more price conscious. The behaviour of buying less expensive products persisted even after the crisis ended (Lamey, 2014), lowering brand loyalty in the process.

Consumers are also more educated and empowered than in the past, which makes them more cynical about marketing and brands in general (O'Dell & Pajunen, 2000). They will be less likely to trust brands and, consequently, less likely to be loyal towards them. They may also be less receptive to marketing actions in general.

Finally, the increasing fragmentation of markets and the growing popularity of niche brands, such as private label brands (PLB), as well as the proliferation of brands and stock keeping units (SKU; Putsis Jr, 1997; Wan, Evers, & Dresner, 2012), may also explain a possible loyalty decline. Indeed, these phenomena increase the breadth and depth of the product range offered to consumers. Thus:

H_{1a}: Brand loyalty is decreasing over time.

When it comes to empirical evidence of the long-term evolution of brand loyalty, literature is scarce. We identified six studies that investigated brand loyalty evolution (Dawes et al., 2015; Dekimpe et al., 1997; East & Hammond, 1996; Johnson, 1984; Stern & Hammond, 2004; Uncles et al., 2010), which we summarize in Table 1 and compare against the present study. Their findings on brand loyalty evolution are inconclusive. Some studies find evidence of brand loyalty decline (Johnson, 1984; Stern & Hammond, 2004; Uncles et al., 2010), some find no evolution (Dekimpe et al., 1997; East & Hammond, 1996), while some suggest that brand loyalty evolution is product category specific (Dawes et al., 2015).

Regarding the factors explaining brand loyalty evolution, Johnson (1984) finds a negative impact of category growth and the number of brands on brand loyalty evolution. East and Hammond (1996) indicate a positive impact of a market leader brand and a negative impact of market concentration on brand loyalty evolution. Dekimpe et al. (1997) determine that relative price has no impact on brand loyalty evolution, whereas brand leaders and

concentrated markets result in negative impact. Stern and Hammond (2004) identify a negative impact of the number of purchases on brand loyalty evolution. Uncles et al. (2010) determine brand loyalty decline as a result of differences in the economic and brand retail development. Finally, Dawes et al. (2015) note that SKU and category purchase frequency correlate negatively with brand loyalty evolution. They further propose that brand loyalty evolution is category specific. Indeed, studies show that product category-related characteristics can have an influence on overall brand loyalty. For instance, product category-related characteristics, such as number of SKU, repertoire size, category purchase frequency, category penetration and share of PLB, have an impact on brand loyalty and brand loyalty-related behaviors (Johnson, 1984; Ehrenberg, 1988; Sethuraman & Gielens, 2014; Dawes et al., 2015). These characteristics diverge across product categories. Thus, brand loyalty might evolve differently in product categories depending on the levels of these characteristics.

The aforementioned studies have some weaknesses. First, the studies by Johnson (1984), East and Hammond (1996) and Dekimpe et al. (1997) use data from more than 15 years ago, and since then markets and consumers have changed considerably. Second, the time spans in the studies by East and Hammond (1996) and Dekimpe et al. (1997) are small (two years), which is not enough time to allow observing long-term changes in loyalty. Third, while some more recent studies overcome the previously mentioned weaknesses (Dawes et al., 2015; Uncles et al., 2010), the number of product categories necessary to provide evidence on the reasons behind brand loyalty evolution is small. Our take on this study, and similar to Dawes et al. (2015), is that brand loyalty evolves, but it is more a product category specific phenomenon rather than a general one. Therefore:

H_{1b}: Brand loyalty evolution is a category-specific phenomenon.

II.2. Number of stock keeping units (SKU).

The number of SKU (i.e. the unique product code that refers to a particular brand, pack size and formulation) has historically followed an upward trend. For example, in the United States, 9,700 new food and beverage products were launched in 1992, whereas in 2010, the number of launches reached 21,000 (USDA, 2010). A large number of SKU results in greater assortment sizes, and in such product categories research has shown that consumers express weaker preferences and are more likely to buy products other than what they initially planned to purchase (Bawa, Landwehr, & Krishna, 1989; Chernev, 2003; Johnson, 1984). In addition, the set of alternatives expands, which results in consumers increasing their variety-seeking behavior (Chintagunta, 1998). Thus, we propose that in product categories in which the average brand loyalty increases, the number of SKU will be lower. Furthermore, we expect that the number of SKU will decrease over time, and this decrease will be stronger than in product categories in which the average brand loyalty decreases. Therefore:

H_{2a}: The average number of SKU will be lower (higher), for product categories with increasing (decreasing) brand loyalty.

H_{2b}: For product categories with increasing brand loyalty, the average number of SKU will decrease, and this decrease will be stronger, compared to categories with decreasing brand loyalty.

II.3. Repertoire size.

Repertoire size is the average number of different brands that a consumer buys within a given period of time (Ehrenberg, 1988). Consumers' repertoire size is expected to increase in categories in which the number of SKU increases. Therefore, we expect that the impact of repertoire size will be similar to that of SKU. Thus, we propose that in product categories in

which the average brand loyalty increases, the repertoire size will be lower. Furthermore, we expect that the repertoire size will decrease over time, and this decrease will be stronger than in product categories in which the average brand loyalty decreases. Thus:

> *H_{3a}: The average repertoire size will be lower (higher), for product categories with increasing (decreasing) brand loyalty.*

> *H_{3b}: For product categories with increasing brand loyalty, the average repertoire size will decrease, and this decrease will be stronger, compared to categories with decreasing brand loyalty.*

II.4. Category purchase frequency.

Category purchase frequency is the average number of purchases a consumer makes from the category within a given period of time. Product categories with higher category purchase frequency result in consumers establishing habitual processes (Ji & Wood, 2007), which likely leads to greater loyalty to the brands they buy. For example, consumers who increase their purchase frequency eventually become more loyal to the brand (Liu, 2007). Thus, we propose that in product categories in which the average brand loyalty increases, the category purchase frequency will be higher. Furthermore, we expect that the category purchase frequency will decrease over time, and this decrease will be stronger for product categories with decreasing brand loyalty compared to product categories in which the average brand loyalty increases. Therefore:

> *H_{4a}: The average category purchase frequency will be higher (lower) for product categories with increasing (decreasing) brand loyalty.*

H_{4b}: For product categories with increasing brand loyalty, the average category purchase frequency will decrease, and this decrease will be weaker, compared to categories with decreasing brand loyalty.

II.4. Category penetration.

Category penetration is the percent of households that buy from the category at least once within a period of time. High category penetration implies a larger pool of consumers who have a higher probability to be brand switchers (Narasimhan, Neslin, & Sen, 1996); thus, each brand attracts relatively lower loyalty levels. In contrast, product categories with low category penetration are niche markets, and brands in these product categories should display the characteristics of niche brands with a larger pool of consumers who have a higher probability to be brand loyal (Fader & Schmittlein, 1993; Sharp & Sharp, 1997), thereby invoking higher average brand loyalty. Thus, we propose that in product categories in which the average brand loyalty increases, the category penetration will be lower. Furthermore, we expect that the category penetration will decrease over time, and this decrease will be stronger than in product categories in which the average brand loyalty decreases. Therefore:

H_{5a}: The average category penetration will be lower (higher) for product categories with increasing (decreasing) brand loyalty.

H_{5b}: For product categories with increasing brand loyalty, the average category penetration will decrease, and this decrease will be stronger, compared to categories with decreasing brand loyalty.

II.5. Share of private-label brands.

Private-label brands (PLB) have established considerable shares in many retail markets (Koschate-Fischer, Cramer, & Hoyer, 2014; Sethuraman & Gielens, 2014), such that their average global share increased from 15.0% in 2010 to 16.5% in 2013 (Nielsen, 2011, 2014). Compared with national brands, PLB offer lower prices and usually equivalent product quality (Hyman, Kopf, & Lee, 2010; Sethuraman & Cole, 1999). In product categories marked by high shares of PLB, consumers are more price sensitive, price promotions are more frequent and consumer price elasticity is negative (Sethuraman & Gielens, 2014). Thus, it is reasonable to assume that consumer preferences are driven mainly from price rather than the brand; therefore, consumers are less loyal to brands in these product categories (Hendel & Nevo, 2006). Thus, we propose that in product categories in which the average brand loyalty increases, the PLB share will be lower. Furthermore, we expect that the PLB share will decrease over time, and this decrease will be stronger than in product categories in which the average brand loyalty decreases. Formally:

> *H_{6a}: The average PLB share will be lower (higher) for product categories with increasing (decreasing) brand loyalty.*
>
> *H_{6b}: For product categories with increasing brand loyalty, the average PLB share will decrease, and this decrease will be stronger, compared to categories with decreasing brand loyalty.*

III. Method.

III.1. Data and modelling.

We used consumer panel data from GfK in Denmark. The panel consisted of approximately 2,500 households and was geographically and demographically representative

of the Danish population, as Table 2 details. These data cover purchases for a period of five years (2006 to 2010) across 55 fast-moving consumer good categories.

--- Insert Table 2 ---

We approached brand loyalty from a behavioral perspective (Dick & Basu, 1994). Prior literature uses various behavioral brand loyalty measures, such as purchase frequency, share of category requirements or repeat buying rates (Dawes et al., 2015; East & Hammond, 1996). However, these measures are confounded with changes in category purchase rates and market share because market share and loyalty are systematically related (Danaher, Wilson, & Davis, 2003; Fader & Schmittlein, 1993; Pare & Dawes, 2012). In addition, they depend on the time frame of analysis (Sharp, 2010). To control for these confounding factors, we used the polarization index (φ) (Fader & Schmittlein, 1993), which is independent of the time frame, category purchasing and market share (Rungie & Laurent, 2012).

We computed φ using the equation $\varphi = 1/(1+S)$, where S is a category-switching parameter from the Dirichlet model (Ehrenberg, 1988). The Dirichlet model is stochastic and is a combination of two distributions: the negative binomial distribution and the Dirichlet multinomial distribution (Ehrenberg, Uncles, & Goodhardt, 2004; Goodhardt, Ehrenberg, & Chatfield, 1984; Uncles, Ehrenberg, & Hammond, 1995). Some assumptions underlie the Dirichlet model: first, markets are unsegmented; second, markets are stationary; third, the model belongs to a group of zero-order models with Poisson distribution, which implies that each purchase is unrelated to previous ones.

The polarization index captures changes in the heterogeneity of consumer choice, using values that range between zero and one. Values close to zero indicate pure homogeneity in consumer choice, signaling more brand switching and lower loyalty (i.e. all buyers have the

same propensity to buy individual brands). Values close to one indicate maximum heterogeneity in consumer choice, which signals less brand switching and higher loyalty (i.e. each buyer buys only his/her favorite brand; Fader & Schmittlein, 1993).

III.2. Procedure.

We fitted the Dirichlet model in R for every product category and each year, using the following measures (Ehrenberg et al., 2004):

1. *Market share*, which is the total purchases of the brand divided by the total purchases in the category.

2. *Brand/category penetration*, which is the number of households buying the brand/category at least once divided by the number of total households.

3. *Brand/category purchase frequency,* equal to the total number of purchases of the brand/category divided by the number of households buying the brand/category.

We only considered brands with market shares higher than one percent to avoid bias due to small brands. Therefore, we grouped all remaining brands as 'other brands' to include them in the analysis (Ehrenberg, 1988).

We also calculated product category characteristics for every category and each year: *SKU*, which is the number of stock keeping units; *repertoire size*, which is the average number of different brands that consumers buy; and *PLB share*, which is the total volume of PLB divided by the total volume of all brands in the category. We considered volume market share as more appropriate than value market share because average PLB prices tend to be lower than those of national brands (Batra & Sinha, 2000; Sethuraman & Cole, 1999); therefore, a measure based on value would underestimate their actual share. Finally, we

grouped product categories into *food* (vs. non-food) and ability for consumers to *stockpile* (i.e. the expiry period is large enough).

Next, we distinguished product categories into three groups, according to their evolution in the polarization index. To do this, we ran a semi-log growth model with the polarization index as the dependent variable and time as the independent variable for each product category. We then assigned each product category to one of the following groups: a) *increasing loyalty*, when the effect of time was positive and significant; b) *decreasing loyalty,* when the effect of time was negative and significant; *c) no change*, when the effect of time was insignificant. We further ran semi-log growth models with product category characteristics as dependent variables and time as an independent variable for each product category.

IV. Results.

IV.1. Description of product category characteristics.

Table 3 presents product category characteristics for every category, averaged across years. The polarization index ranges from 0.14 for cheese to 0.77 for beer. The SKU measure spans from 45 in toilet block to 1,505 in meat. For repertoire size, we find values from 1.3 in toilet block to 9.8 in meat. The category purchase frequency ranges from 2.4 in mustards to 113.2 in beer, and category penetration is between 8% in diapers and 96% in milk. PLB share ranges from 0.05 in toothbrushes to 0.63 in toilet paper. Finally, 73% of the categories are food and 67% have an ability to stockpile.

--- Insert Table 3 ---

IV.2. Hypotheses testing.

Results of the semi-log model with annual growth rates for each product category are shown in Appendix 1. According to the criteria we established for the loyalty evolution groups, 13% of the product categories are categorized as increasing loyalty, 16% as decreasing loyalty and 71% as no change (Table 4). From those categories that show increasing loyalty, 43% are food categories, and all of them have the ability to stockpile. Categories with decreasing loyalty are all food categories, and only 33% of them have the ability to stockpile.

--- Insert Table 4 ---

Table 5 presents the evolution of product category measures across each loyalty evolution group, while Figure 1a-1f depicts this evolution. Product categories that are grouped as increasing loyalty have a significant positive growth rate of 6.2%, whereas those with a decreasing loyalty show a significant negative growth rate of -3.6%. For the total categories, as well as the categories with no change, the annual growth rate is -0.7% and -0.2% respectively and non-significant. Thus, we reject H_{1a}, as brand loyalty overall remains stable and is not declining. We also conclude that brand loyalty evolution is category specific, providing support for H_{1b}.

--- Insert Table 5 and Figure 1---

To test our hypotheses, we performed a repeated measures analysis of variance with loyalty evolution groups as between-subjects factors, and SKU, repertoire size, category purchase frequency, category penetration and PLB share as within-subjects factors (see Table 6). Since our focus was in observing differences between product categories with increasing brand loyalty and product categories with decreasing loyalty, we report post hoc comparison

tests between these two groups. Finally, we compared the average annual growth rates in product category characteristics across loyalty evolution groups using group comparison t-tests.

--- Insert Table 6 ---

In relation to SKU, there is no significant effect of the loyalty evolution group, ($F(2,52) = 1.14$, $p = 0.327$, $\eta^2 = 0.04$). Furthermore, post hoc comparisons using the Scheffe test indicate that the average SKU in product categories with increasing loyalty ($M = 315.2$) is not significantly different compared to product categories with decreasing loyalty ($M = 439.2$; $p = 0.648$). Thus, we do not provide support for H_{2a}: The average number of SKU is not different for product categories with increasing or decreasing brand loyalty. In addition, t-test shows that in product categories with increasing loyalty, the average SKU decrease (-6%) is not significantly different ($t = 0.92$; $p = 0.385$) to the decrease in product categories with decreasing loyalty (-3.5%), thus making us reject H_{2b}: The average number of SKU is not different for product categories with increasing/decreasing brand loyalty.

For repertoire size, we found a significant effect of the loyalty evolution group ($F(2,52) = 4.55$, $p = 0.015$, $\eta^2 = 0.15$). Furthermore, post hoc comparisons using the Scheffe test indicates that there is a marginally significant difference, with the average repertoire size in product categories with increasing loyalty ($M = 2.52$) being smaller compared to categories with decreasing loyalty ($M = 4.64$; $p = 0.047$). Therefore, we support H_{3a}: The average repertoire size is lower (higher) for product categories with increasing (decreasing) brand loyalty. In product categories with increasing loyalty, t-test shows that average repertoire size decreases (-2%) significantly more ($t = 4.34$; $p = 0.002$) than in product categories with

decreasing loyalty (0.8%), which supports H_{3b}: The average repertoire size decreases more (less) in product categories with increasing (decreasing) brand loyalty.

With regard to category purchase frequency, we find a significant effect of the loyalty evolution group ($F(2,52) = 4.90$, $p = 0.011$, $\eta^2 = 0.16$). In more detail, post hoc comparisons using the Scheffe test indicate that there is a marginally significant difference, with the average repertoire size in product categories with increasing loyalty ($M = 7.40$) being smaller compared to categories with decreasing loyalty ($M = 35.12$; $p = 0.035$). Although significant, the effect is actually opposite to our overarching hypothesis; thus, we reject H_{4a}: The average category purchase frequency is lower (higher) for product categories with increasing (decreasing) brand loyalty. In product categories with increasing loyalty, t-test shows that the average category purchase frequency decrease (-0.7%) is significantly smaller ($t = 3.64$; $p = 0.007$) than the average category purchase frequency in product categories with decreasing loyalty (-3.5%). Thus, we support H_{4b}: The category purchase frequency decreases less (more) in product categories with increasing (decreasing) brand loyalty. In relation to category penetration, there is a significant effect of the loyalty evolution group ($F(2,52) = 7.84$, $p = 0.001$, $\eta^2 = 0.23$). Furthermore, post hoc comparisons using the Scheffe test indicate that the mean category penetration in product categories with increasing loyalty group ($M = 0.45$) is significantly smaller compared to product categories with decreasing loyalty ($M = 0.84$; $p = 0.001$). Thus, we provide support for H_{5a}: The average category penetration is lower (higher) for product categories with increasing (decreasing) brand loyalty. Then in product categories with increasing loyalty, t-test shows that average category penetration decreases significantly ($t = 2.15$; $p = 0.064$) at a higher rate (-4.3%) than in product categories with decreasing loyalty (-2.4%); therefore, we find support for H_{5b}: The average category penetration decreases more (less) in product categories with increasing (decreasing) brand loyalty.

In relation to PLB share, there is no significant effect of the loyalty evolution group, ($F(2,52) = 0.30$, $p = 0.740$, $\eta^2 = 0.01$). Furthermore, post hoc comparisons using the Scheffe test indicate that the average PLB share in product categories with increasing loyalty ($M = 0.26$) is not significantly different compared to product categories with decreasing loyalty ($M = 0.31$; $p = 0.740$). Thus, we do not provide support for H_{6a}: The share of PLB is not different for product categories with increasing or decreasing brand loyalty. Furthermore, in product categories with increasing loyalty, t-test shows that the average PLB share (4.4%) significantly increases more ($t = 3.53$; $p = 0.008$) than in categories with decreasing loyalty (0%); therefore, we reject H_{6b}: The share of PLB increases more (less) in product categories with increasing (decreasing) brand loyalty.

V. Discussion.

Our study shows that, at the aggregate level, brand loyalty does not decline, and it seems rather stable. However, when taking into account growth rates for each individual product category, we show that brand loyalty is a product category specific phenomenon (Dawes et al., 2015). However, we observe that the majority of the product categories with increasing brand loyalty are non-food, and they all have the ability to be stockpiled. In contrast, the majority of product categories with decreasing brand loyalty are food categories without the ability to be stockpiled. This pattern implies that buyers display more brand loyalty in product categories in which they can stockpile items (e.g. when a brand is on sale; Hendel & Nevo, 2006). This phenomenon may be particularly plausible during economic downturns, such as the global financial crisis in 2008–09, a period covered by our data. Finally, the fact that most previous studies identify a decline in brand loyalty (Dawes et al., 2015; Johnson, 1984; Uncles et al., 2010) could be due to their including only food and perishable product categories.

Product category characteristics differ across categories that show either an increase or a decrease in brand loyalty, both in terms of absolute measures but also in how they develop over time. Compared to product categories in which brand loyalty increases, product categories with a decline in brand loyalty have a higher repertoire size, category purchase frequency and category penetration. Their repertoire size and category penetration decrease at a lower rate, while category purchase frequency decreases at a higher rate compared to product categories that show an increase in brand loyalty. PLB share does not change for product categories that show a decrease in brand loyalty, whereas PLB share increases for product categories that indicate an increase in brand loyalty.

In all of the product categories we analyzed, the number of SKU declined over time, which goes against arguments that they increase (USDA, 2010). This is likely the result of recent efforts from companies to rationalize their product range (Kumar, Umashankar, & Park, 2014). However, we do not find any difference in the number of SKU between loyalty evolution groups, nor in the rate SKU numbers decline over the years. In fact, the decline of SKU seems to be a global phenomenon that occurs for the majority of the product categories that we analyzed.

Compared to product categories that show a decline in brand loyalty, in product categories in which brand loyalty increases, the average repertoire size is lower and decreases at a higher rate. Similarly, Dawes et al. (2015) report a negative correlation between repertoire size and brand loyalty. In other words, in product categories with increasing brand loyalty, consumers exhibit less variety-seeking behavior. This phenomenon supports earlier literature that postulates that loyalty programs increase average brand loyalty by decreasing consumers' repertoire size (Meyer-Waarden, 2007; Meyer-Waarden & Benavent, 2009).

In product categories in which brand loyalty declines, category purchase frequency and category penetration are higher. Furthermore, category penetration and category purchase frequency decrease overall, and this decrease is higher for categories that show an increase in brand loyalty for category penetration and lower for categories that show an increase in brand loyalty for category purchase frequency. In other words, product categories that are bought more often and by fewer buyers show an increase in brand loyalty. This finding affirms prior literature that shows that strategies designed to increase purchase frequency (e.g. new product applications, category extensions) or penetration (e.g. sales promotions) eventually erode brand loyalty (Papatla & Krishnamurthi, 1996). The finding about category purchase frequency differs from what we hypothesized (i.e. in product categories with increasing brand loyalty, category purchase frequency is higher). A possible explanation for this is that, in a product category with a high level of category purchase frequency, consumers have more possibilities to switch when they purchase. This would in turn decrease overall brand loyalty (Ehrenberg, 1988).

For all product categories, the share of PLB increased with an average growth rate of 1.8%, and the average PLB share was approximately 28%. We find no difference in PLB share between product categories that display an increase in brand loyalty and those that display a decrease. A possible explanation for this finding is that PLB have started to be considered very similar to national brands in terms of product quality and price (Geyskens, Gielens, & Gijsbrechts, 2010; ter Braak, Geyskens, & Dekimpe, 2014) and that their presence on a market does not influence consumers' behaviors and brand loyalty. In product categories that showed an increase in brand loyalty, PLB share showed an increase. However, in product categories with a decline in brand loyalty, the share of PLB has remained unchanged. To explain this finding, we note that product categories with increasing loyalty tend to be those

marked by high competition and strong brands (e.g. diapers). Thus, retailers must devote more effort to gain additional market share. Alternatively, these product categories might not be sufficiently saturated, which would leave room for retailers to expand their efforts.

VI. Conclusion, Limitations and Future Research Directions.

Our study contributes to research on brand loyalty evolution. The source of brand loyalty evolution is related to product category measures, as well as the shifts in these measures. Specifically, product categories that exhibit decreasing loyalty have a greater repertoire size, category purchase frequency and category penetration. These product categories also show higher negative growth rates for category purchase frequency. Product categories with increasing loyalty instead indicate a higher positive growth rate for the share of PLB and stronger negative growth rates for repertoire size and category penetration. Finally, product categories that show increasing brand loyalty are more likely to be non-food and non-perishable product categories, thus allowing consumers to stockpile. Overall, changes in brand loyalty appear difficult to achieve due to the fact they depend not only on product category and marketing managers but also on the unique characteristics of the product category. Thus, our study gives category managers insight into the role of these characteristics, and it enables them to better understand and forecast the evolution of brand loyalty depending on the characteristics of the product category they operate and on the marketing actions they launch.

Our study is not free of limitations. First, the data came from a single country; therefore, the data may reflect local market conditions. More data from other contexts are needed to generalize these findings. Second, our main finding asserts that brand loyalty evolution is category specific; therefore, logically, our results must depend on the product

categories we used to increase external validity. Third, other product category characteristics (e.g. sales promotions, competitive structure) could also affect brand loyalty evolution; therefore, these characteristics should be explored in future research. Fourth, with our approach, we cannot distinguish whether the effect of product category characteristics on brand loyalty evolution is due to their evolution or due to differences in average brand loyalty, which might be lower for product categories with decreasing loyalty. However, as the product categories that showed no change in brand loyalty have similar average brand loyalty levels and patterns consistent with those categories showing an increase; we can reasonably conclude that interaction effects do not influence our results.

Study characteristics	Johnson (1984)	East and Hammond (1996)	Dekimpe et al. (1997)	Stern and Hammond (2004)	Uncles et al. (2010)	Dawes et al. (2015)	This study
Country	US	Germany, US, UK	The Netherlands	UK	China	US, UK	Denmark
Years	8	2	2	5	5	6–13	5
Product categories	20	9	21	2	2	26	55
Brand loyalty evolution	Decline	No decline	No decline	Decline	Decline	Category-specific	Category-specific
Measure of loyalty	Share of category requirements, loyal buyers, repertoire size	Repeat-buying rate	Intrinsically loyal buyers	Share of category requirements, polarization index	Share of category requirements, 100% loyal consumers	Share of category requirements, polarization index	Polarization index
Level of analysis	Brand	Brand	Category	Brand	Brand	Category	Category
Analytical approach/model	Descriptive analysis	Dirichlet model	Colombo and Morrison's (1989) model	Dirichlet model	Dirichlet model	Dirichlet model	Dirichlet model
Explanatory factors	Category growth, number of brands in the category	Market leader, market concentration	Relative price, market concentration, brand market share	Number of purchases	Stage of economic and retail development	SKU, category purchase frequency	Repertoire size, category purchase frequency, category penetration, SKU, PLB share
Main findings	Negative impact of category growth and number of brands in category	Positive impact of being a market leader and negative impact of market concentration	Less variability in brand loyalty for brand leaders and less concentrated markets, no effect of relative price	Negative impact of the number of purchases	Differences in economic and brand retail development result in brand loyalty decline	Negative correlation of the number of SKUs with category purchase frequency and brand loyalty	Negative impact of repertoire size, category purchase frequency and category penetration

Table 2: Studies on brand loyalty evolution and comparison on their main characteristic.

Demographics	Percentage of sample (%)
Age of the main shopper	
<25 years	4
25-34 years	15
35-44 years	19
45-54 years	20
55-64 years	20
>64 years	22
Household income (Danish Krone)	
<200k	22
200k-400k	36
400k-600k	23
600k-800k	11
>800k	8
Household size	
1	34
2	39
3	12
>3	16

Table 3: Characteristics of the panel (average across years).

Product category	φ	SKU	Repertoire size	Purchase frequency	Penetration	PLB share	Food category	Ability to stockpile
Beer	0.77	730	4.7	113.2	0.66	0.14	Yes	Yes
Liqueur	0.72	92	1.5	6.8	0.35	0.10	Yes	Yes
Toilet block	0.70	45	1.3	3.2	0.16	0.14	No	Yes
Coffee	0.64	281	2.6	22.1	0.77	0.25	Yes	Yes
Conditioner	0.63	129	1.5	3.2	0.22	0.13	No	Yes
Pasta/rice dish	0.61	81	1.5	6.4	0.31	0.12	No	Yes
Soft drinks	0.61	162	2.1	10.6	0.34	0.46	Yes	Yes
Instant coffee	0.58	160	2.0	5.2	0.50	0.26	Yes	Yes
Shampoo	0.58	322	2.0	5.4	0.60	0.14	No	Yes
Fruit juice	0.58	141	1.8	7.0	0.48	0.16	Yes	No
Frozen pizza	0.57	116	2.0	6.2	0.30	0.23	Yes	Yes
Soup	0.56	172	2.0	5.9	0.53	0.24	Yes	Yes
Diapers	0.55	86	1.9	8.5	0.08	0.44	No	Yes
Toothpaste	0.55	149	1.9	4.9	0.72	0.06	No	Yes
Deodorant	0.53	430	2.0	4.9	0.49	0.08	No	Yes
Bubble bath	0.51	198	1.7	3.5	0.40	0.13	No	Yes
Tea	0.50	270	2.1	6.2	0.53	0.20	Yes	Yes
Hand soap	0.50	193	1.8	4.0	0.56	0.29	No	Yes
Toothbrush	0.49	182	1.6	3.4	0.39	0.05	No	Yes
Soda	0.45	619	4.0	60.0	0.80	0.11	Yes	Yes
Toilet paper	0.45	135	2.7	9.2	0.83	0.63	No	Yes
Ketchup	0.45	127	2.1	5.7	0.70	0.22	Yes	Yes
Margarine	0.45	94	2.9	16.4	0.78	0.36	Yes	No
Butter	0.44	96	2.9	25.2	0.90	0.15	Yes	No
Detergent	0.43	171	2.6	4.1	0.73	0.48	No	Yes
Asian and Mexican food	0.42	234	2.2	5.2	0.47	0.53	Yes	No
Mustard	0.40	103	1.6	2.4	0.52	0.35	Yes	Yes

Product category	φ	SKU	Repertoire size	Purchase frequency	Penetration	PLB share	Food category	Ability to stockpile
Juice	0.39	375	3.9	22.4	0.78	0.49	Yes	No
Liver pate	0.39	154	2.9	12.7	0.83	0.21	Yes	No
Spaghetti	0.38	401	3.1	9.4	0.72	0.43	Yes	Yes
Sugar	0.38	127	2.1	11.0	0.80	0.23	Yes	Yes
Jam	0.37	408	2.8	8.5	0.71	0.33	Yes	Yes
Biscuit	0.36	486	4.3	10.9	0.75	0.21	Yes	Yes
Cereals	0.36	321	3.7	13.7	0.79	0.45	Yes	Yes
Milk	0.36	323	6.4	105.6	0.96	0.34	Yes	No
Oil	0.34	198	2.0	3.4	0.63	0.50	Yes	Yes
Eggs	0.34	213	2.6	14.4	0.87	0.18	Yes	No
Honey	0.33	185	3.3	9.8	0.78	0.46	Yes	Yes
Sauce mix	0.31	430	3.4	9.4	0.73	0.26	Yes	No
Cosmetics	0.30	152	1.7	2.5	0.13	0.14	No	Yes
Ice cream	0.30	401	3.4	10.3	0.69	0.24	Yes	Yes
Chips	0.29	463	4.1	14.6	0.68	0.31	Yes	Yes
Bacon	0.28	211	3.8	10.3	0.81	0.45	Yes	No
Spices	0.28	392	2.3	5.0	0.63	0.19	Yes	Yes
Skin care	0.27	656	2.8	5.7	0.53	0.27	No	Yes
Cream	0.26	127	3.7	18.7	0.85	0.46	Yes	No
Sausages	0.25	379	3.6	10.1	0.79	0.35	Yes	No
Other biscuit	0.24	487	3.8	10.1	0.74	0.29	Yes	Yes
Other detergent	0.23	253	2.3	4.2	0.69	0.40	No	Yes
Rye bread	0.22	307	6.2	32.8	0.93	0.33	Yes	No
Meat	0.20	1505	9.8	44.3	0.93	0.53	Yes	No
Wheat bread	0.18	684	7.8	58.1	0.94	0.25	Yes	No
Chocolate	0.17	1039	7.0	25.6	0.77	0.11	Yes	No
Chicken	0.16	659	4.9	12.8	0.85	0.30	Yes	No

Product category	φ	SKU	Repertoire size	Purchase frequency	Penetration	PLB share	Food category	Ability to stockpile
Cheese	0.14	699	6.6	21.5	0.92	0.24	Yes	No
Average / %	**0.42**	**322**	**3.1**	**15.4**	**0.63**	**0.28**	**73%**	**67%**

Table 4: Product category measures (average across years).

	Increasing loyalty	Decreasing loyalty	No change
N (%)	7 (13%)	9 (16%)	39 (71%)
Product category	Bubble bath; chips; diapers; other biscuit; skin care; tea; toilet block	Bacon; coffee; eggs; ice cream; margarine; meat; milk; rye bread; soda	*All remaining*
Food category	43%	100%	72%
Ability to stockpile	100%	33%	67%

Table 5: Loyalty evolution groups.

Loyalty evolution group	Year					Total	Annual growth rate (*b*)
	2006	2007	2008	2009	2010		
				Polarization index			
No Change	0.43	0.43	0.42	0.42	0.42	0.42	-0.7%
Increasing	0.39	0.40	0.44	0.47	0.49	0.44	6.2%**
Decreasing	0.38	0.38	0.37	0.35	0.33	0.36	-3.6%*
All Categories	***0.41***	***0.42***	***0.41***	***0.41***	***0.41***	***0.41***	***-0.2%***
				SKU			
No Change	333	300	282	267	278	292	-4.8%*
Increasing	383	319	294	273	306	315	-6.0%
Decreasing	478	446	437	421	413	439	-3.5%**
All Categories	***363***	***326***	***309***	***293***	***304***	***319***	***-4.6%***
				Repertoire size			
No Change	2.9	2.9	2.9	2.9	2.9	2.9	0.0%
Increasing	2.6	2.6	2.5	2.5	2.4	2.5	-2.0%*
Decreasing	4.6	4.6	4.6	4.8	4.7	4.7	0.8%
All Categories	***3.2***	***3.1***	***3.1***	***3.2***	***3.1***	***3.1***	***-0.3%***
				Category purchase frequency			
No Change	13.7	13.2	12.8	13.1	12.4	13.0	-2.1%*
Increasing	7.5	7.4	7.4	7.5	7.2	7.4	-0.7%
Decreasing	37.9	36.0	34.4	34.8	32.4	35.1	-3.5%*
All Categories	***16.9***	***16.2***	***15.6***	***15.9***	***15.0***	***15.9***	***-2.6%****
				Category penetration			
No Change	0.66	0.65	0.63	0.64	0.59	0.63	-2.4%
Increasing	0.48	0.47	0.45	0.44	0.40	0.45	-4.3%*
Decreasing	0.87	0.86	0.84	0.84	0.78	0.84	-2.4%*
All Categories	***0.67***	***0.66***	***0.64***	***0.64***	***0.60***	***0.64***	***-2.5%****
				PLB share			
No Change	0.26	0.28	0.28	0.29	0.28	0.28	1.8%
Increasing	0.23	0.24	0.27	0.27	0.27	0.26	4.4%*
Decreasing	0.31	0.31	0.30	0.31	0.31	0.31	0.0%
All Categories	***0.27***	***0.28***	***0.28***	***0.29***	***0.29***	***0.28***	***1.8%****

Table 6: Evolution of category measures for all categories and across loyalty evolution groups.

** p<0.01; *p<0.05

Product category characteristics	Repeated-measures ANOVA		Hypothesis	Comparison of annual growth rates		Hypothesis
	F	*p*		*t*	*p*	
SKU	1.14	0.327	H_{2a} rejected	0.92	0.385	H_{2b} rejected
Repertoire size	4.55	0.015	H_{3a} accepted	4.34	0.002	H_{3b} accepted
Category purchase frequency	4.90	0.011	H_{4a} rejected*	3.64	0.007	H_{4b} accepted
Category penetration	7.84	0.001	H_{5a} accepted	2.15	0.064	H_{5b} accepted
PLB share	0.30	0.740	H_{6a} rejected	3.53	0.008	H_{6b} rejected

Table 7: Summary of hypothesis testing.

* The effect is opposite to what originally hypothesized.

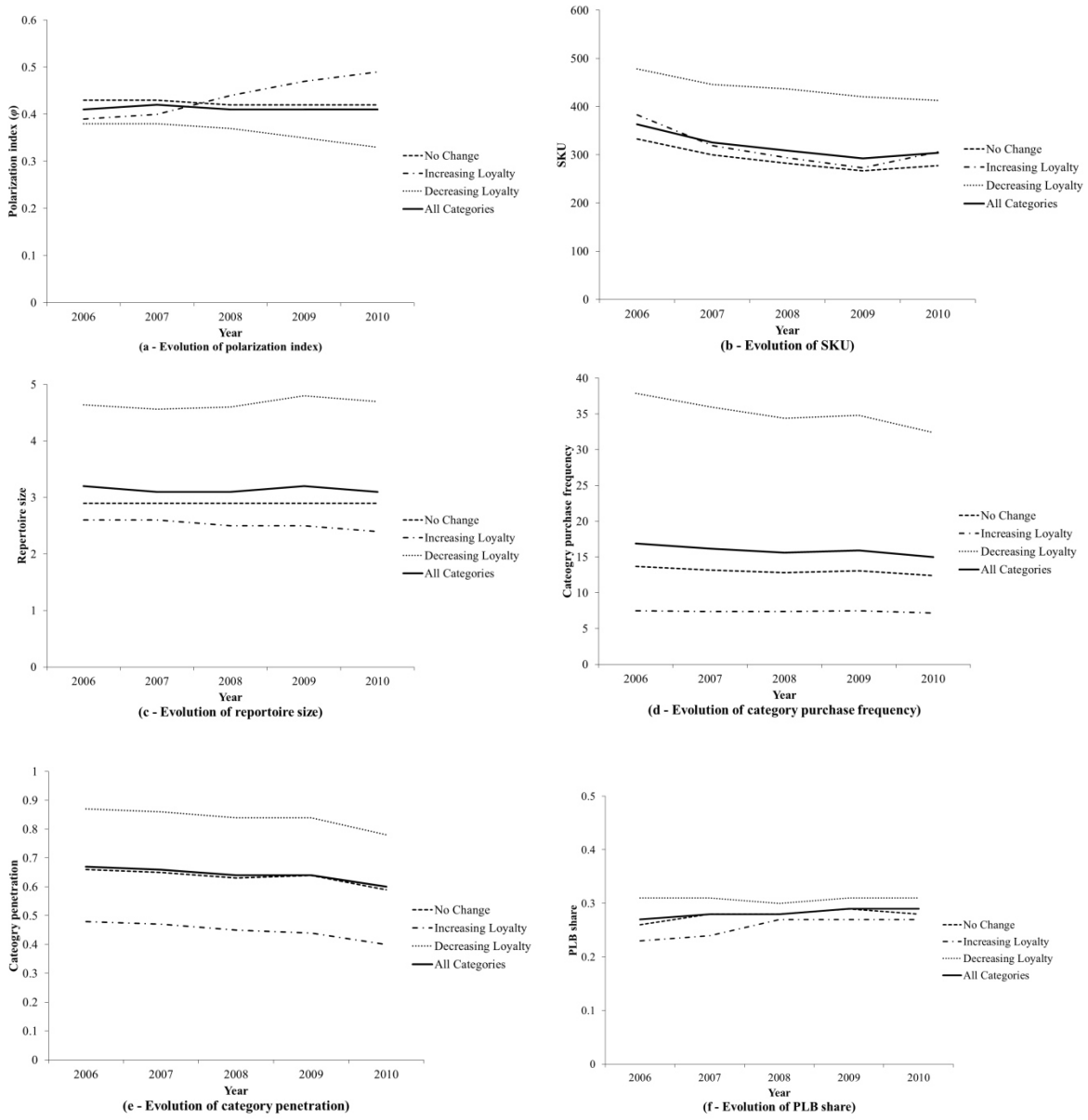

Figure 3 : Evolution of polarization and product category measures across loyalty evolution groups.

Product Categories	Polarization index		SKU		Repertoire size		Category purchase frequency		Category penetration		PLB share	
	b	***p***	***b***	***p***	***b***	***p***	***b***	***p***	***b***	***p***	***b***	***p***
Product categories with increasing brand loyalty												
Other Biscuits	**0.05**	**0.09**	**-0.07**	**0.05**	-0.01	0.16	-0.01	0.64	**-0.03**	**0.08**	**0.08**	**0.06**
Bubble Bath	**0.04**	**0.01**	**-0.14**	**0.02**	**-0.02**	**0.02**	-0.02	0.22	**-0.04**	**0.00**	**-0.06**	**0.06**
Chips	**0.03**	**0.05**	-0.04	0.12	-0.01	0.54	0.00	0.89	**-0.02**	**0.00**	**0.07**	**0.01**
Diapers	**0.10**	**0.01**	-0.16	0.12	**-0.05**	**0.02**	-0.01	0.72	**-0.09**	**0.07**	0.08	0.18
Skin care	**0.01**	**0.08**	-0.03	0.49	-0.01	0.17	-0.01	0.13	**-0.04**	**0.02**	**0.04**	**0.05**
Tea	**0.07**	**0.01**	-0.04	0.51	**-0.02**	**0.01**	**0.03**	**0.02**	**-0.05**	**0.03**	0.00	0.87
Toilet Blocks	**0.08**	**0.01**	**-0.18**	**0.01**	**-0.07**	**0.02**	**-0.10**	**0.01**	**-0.24**	**0.04**	0.05	0.37
Product categories with decreasing brand loyalty												
Coffee	**-0.02**	**0.08**	**-0.08**	**0.02**	0.01	0.20	-0.01	0.28	**-0.03**	**0.05**	**0.03**	**0.01**
Eggs	**-0.05**	**0.00**	**-0.04**	**0.02**	0.02	0.20	0.00	0.70	**-0.02**	**0.03**	**-0.22**	**0.07**
Ice Cream	**-0.05**	**0.08**	-0.03	0.20	0.01	0.66	0.01	0.72	**-0.02**	**0.00**	0.00	0.86
Margarine	**-0.03**	**0.02**	**0.04**	**0.10**	**0.03**	**0.05**	-0.01	0.49	**-0.03**	**0.05**	**0.04**	**0.01**
Meat	**-0.06**	**0.04**	**-0.04**	**0.00**	**-0.02**	**0.05**	**-0.01**	**0.10**	**-0.02**	**0.03**	**-0.03**	**0.01**
Milk	**-0.04**	**0.00**	0.02	0.22	0.02	0.17	**-0.04**	**0.03**	**-0.01**	**0.03**	**0.11**	**0.02**
Bacon	**-0.07**	**0.05**	0.00	0.93	0.02	0.11	0.00	0.83	**-0.03**	**0.05**	0.03	0.38
Rye Bread	**-0.03**	**0.04**	**-0.06**	**0.06**	0.01	0.30	-0.02	0.27	**-0.02**	**0.02**	**-0.06**	**0.01**
Soda	**-0.02**	**0.09**	**-0.05**	**0.01**	-0.01	0.17	**-0.10**	**0.01**	**-0.03**	**0.01**	**0.09**	**0.06**
Product categories with stable brand loyalty												
Asian and	-0.02	0.58	-0.03	0.37	0.00	0.97	0.01	0.31	0.01	0.32	**0.04**	**0.05**
Beer	0.01	0.60	**-0.06**	**0.00**	**-0.02**	**0.08**	**-0.05**	**0.01**	**-0.04**	**0.01**	-0.08	0.20
Biscuits	0.00	0.81	**-0.04**	**0.08**	**-0.04**	**0.01**	0.02	0.25	**-0.03**	**0.02**	**0.16**	**0.00**
Butter	-0.01	0.84	0.04	0.24	**0.04**	**0.01**	-0.02	0.11	**-0.03**	**0.03**	**0.07**	**0.09**
Cereals	0.00	0.81	-0.02	0.25	**0.00**	**0.07**	0.01	0.30	-0.02	0.12	0.00	0.79
Cheese	0.00	0.78	**-0.05**	**0.01**	-0.01	0.20	-0.02	0.15	**-0.02**	**0.05**	-0.01	0.11
Chocolate	-0.03	0.24	-0.02	0.27	**0.02**	**0.03**	0.00	0.74	0.01	0.43	**0.11**	**0.04**
Conditioner	0.00	0.84	**-0.13**	**0.01**	**-0.02**	**0.02**	-0.05	0.14	**-0.07**	**0.01**	-0.04	0.33
Cosmetics	0.03	0.34	**-0.21**	**0.00**	-0.02	0.12	0.00	0.77	**-0.05**	**0.02**	0.04	0.54
Cream	0.00	0.80	0.00	0.39	**0.03**	**0.04**	-0.01	0.45	**-0.02**	**0.08**	**0.09**	**0.01**
Deodorants	0.00	0.79	**-0.08**	**0.04**	0.00	0.45	0.02	0.14	**-0.04**	**0.01**	**-0.08**	**0.08**
Detergents	0.00	0.44	-0.02	0.33	-0.01	0.12	0.00	0.81	**-0.03**	**0.08**	**0.02**	**0.03**
Other Detergents	0.01	0.33	**-0.04**	**0.07**	-0.01	0.46	**-0.02**	**0.08**	**-0.04**	**0.02**	**-0.03**	**0.08**
Oil	0.02	0.61	**-0.04**	**0.03**	0.00	0.85	0.01	0.32	**-0.02**	**0.04**	0.00	0.89
Frozen Pizza	-0.01	0.61	**-0.08**	**0.04**	-0.01	0.50	-0.03	0.15	-0.01	0.64	**0.19**	**0.01**
Fruit Juices	-0.01	0.67	-0.05	0.18	**-0.01**	**0.05**	**-0.02**	**0.04**	**-0.03**	**0.04**	**-0.14**	**0.02**
Hand Soap	-0.01	0.72	**-0.09**	**0.02**	0.00	0.76	**0.02**	**0.02**	**-0.03**	**0.09**	0.05	0.21
Instant Coffee	0.01	0.64	-0.05	0.14	0.00	0.91	0.00	0.82	**-0.02**	**0.01**	**0.05**	**0.00**
Jam	0.01	0.83	-0.03	0.13	0.00	0.71	**-0.02**	**0.09**	**-0.03**	**0.06**	**0.03**	**0.05**
Juice	0.02	0.17	-0.02	0.15	-0.01	0.34	**-0.03**	**0.00**	**-0.03**	**0.03**	0.00	0.93
Ketchup	-0.01	0.83	**-0.07**	**0.01**	0.00	0.81	**-0.01**	**0.04**	**-0.03**	**0.01**	**0.08**	**0.01**
Chicken	-0.03	0.48	-0.04	0.26	-0.03	0.34	-0.05	0.25	**-0.03**	**0.04**	0.05	0.20
Liqueur	-0.06	0.29	0.20	0.39	**0.06**	**0.10**	**0.14**	**0.06**	0.07	0.10	**-0.22**	**0.01**
Liver Pate	-0.01	0.45	0.00	0.76	**0.01**	**0.03**	**-0.01**	**0.05**	**-0.02**	**0.04**	0.01	0.14
Honey	-0.02	0.32	-0.04	0.30	**0.01**	**0.09**	**0.02**	**0.06**	-0.02	0.12	**-0.03**	**0.00**

Mustard	0.01	0.80	**-0.08**	**0.07**	0.01	0.63	0.00	0.83	**-0.03**	**0.09**	**0.05**	**0.00**
Pasta/Rice Dish	0.00	0.85	**-0.11**	**0.01**	-0.01	0.50	-0.02	0.40	**-0.05**	**0.00**	0.11	0.17
Sauce Mix	0.00	0.99	**-0.06**	**0.00**	-0.01	0.35	-0.01	0.55	**-0.02**	**0.04**	**0.12**	**0.00**
Sausages	-0.02	0.46	**-0.06**	**0.04**	0.01	0.60	0.00	0.45	**-0.02**	**0.06**	-0.01	0.55
Shampoo	0.01	0.47	**-0.08**	**0.03**	**-0.02**	**0.07**	**-0.03**	**0.03**	**-0.04**	**0.03**	0.03	0.26
Soft Drink	0.00	0.85	**-0.10**	**0.04**	-0.01	0.35	-0.01	0.76	**-0.06**	**0.00**	**0.09**	**0.02**
Soups	-0.02	0.76	**-0.13**	**0.00**	-0.01	0.13	0.01	0.64	-0.02	0.25	-0.06	0.29
Spaghetti	-0.05	0.17	**-0.05**	**0.00**	0.00	0.61	**-0.02**	**0.08**	**-0.02**	**0.01**	**-0.04**	**0.08**
Spices	-0.05	0.16	-0.07	0.24	0.02	0.20	0.02	0.14	-0.01	0.16	**0.02**	**0.05**
Sugar	-0.04	0.38	**0.12**	**0.06**	**0.08**	**0.02**	**0.04**	**0.07**	-0.02	0.20	-0.06	0.25
Toilet Paper	-0.01	0.75	**-0.10**	**0.03**	0.00	0.70	0.00	0.96	**-0.02**	**0.04**	-0.04	0.16
Toothbrushes	-0.02	0.32	**-0.04**	**0.07**	**0.00**	**0.03**	**-0.03**	**0.04**	**-0.04**	**0.05**	-0.06	0.36
Toothpaste	0.00	0.93	-0.04	0.17	0.00	0.38	**0.01**	**0.01**	**-0.04**	**0.02**	**0.09**	**0.01**
Wheat Bread	0.10	0.34	**-0.05**	**0.05**	**-0.03**	**0.04**	**-0.06**	**0.01**	**-0.02**	**0.01**	0.02	0.10

Appendix 1: Annual growth rates for polarization index and product category characteristics across product category.

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Summary of the chapter

In the previous study our goal was to explore the evolution of brand loyalty and the role of product category-related characteristics in this evolution. Therefore we explore brand loyalty evolution and the effect of the level of product category-related antecedents (e.g. number of SKUs, repertoire size, category purchase frequency, category penetration and PLB share) on this evolution using actual purchase data from 55 product categories over 5 years. Our results first show that brand loyalty does not evolve at an aggregate level. Furthermore, this evolution is category-specific. Most of the product categories that display a decrease in brand loyalty are food categories and product categories for which consumers do not have an ability to stockpile. Most of brand loyalty increasing categories display opposite characteristics. When it comes to the impact of product category characteristics, we show that in a product category with higher repertoire size, category purchase frequency and category penetration brand loyalty decreases. We find no difference in the number of SKUs between product categories exhibiting either decreasing brand loyalty or increasing brand loyalty. This result is the same for PLB share in a product category as it has no effect on brand loyalty evolution trends. We further show that product category characteristics differ in how they develop over time across categories that show either an increase or a decrease in brand loyalty. Product categories with increasing loyalty exhibit a stronger rate of decrease in repertoire size and category penetration compared to product categories with decreasing loyalty. We find a stronger increasing rate of PLB share and a weaker rate of decrease in category purchase frequency for increasing loyalty categories. Finally, we find no difference in the growth rate of SKUs across product categories.

This study gives us theoretical and managerial contributions. It first shows that the source of brand loyalty evolution is related to product category measures, as well as the shifts in these measures. Moreover, product categories that show increasing brand loyalty are more likely to be non-food and non-perishable product categories, so that they allow consumers to stockpile. These findings give precious managerial insights to retailers and category managers on the role of these characteristics. It enables them to better understand and forecast the evolution of brand loyalty depending on the characteristics of the product category they operate on.

This study is not free of limitations. One of the main ones is that testing the impact of the level of product category-related antecedents on brand loyalty evolution does not enable us to know what the direct impact of a change in these characteristics is. We did not investigate what happens intra-category when one of these characteristics changes. For instance, what would be the impact of an increase in SKUs on brand loyalty in a given product category? Does an increase in PLB share affect brand loyalty? These questions are crucial for retailers and category managers as it would enable retailers and category managers to better understand the impact of their marketing action on the product category they operate on. Furthermore, we also leave aside any moderating effect that could exist between product category characteristics.

To fill these gaps, we study the direct impact of a change in product category-related antecedents (i.e. number of SKUs, the category penetration and the category purchase frequency) as well as PLB share on brand loyalty intra-category in the next study. Moreover, we study the moderating effects between the share of PLB and other product category antecedents (i.e. number of SKUs, the category penetration and the category purchase frequency) and also between category penetration and category purchase frequency.

Chapter 1: Introduction

Chapter 2: A Longitudinal Analysis of Brand Loyalty Evolution and the Impact of Product Category Characteristics

Chapter 3: A longitudinal empirical investigation toward the understanding of product category antecedents of brand loyalty

Chapter 4: The impact of price tiers on brand loyalty and the moderating role of brand quality cues

Chapter 5: The role of consumer characteristics and the mediating role of perceived value for money on the formation of loyalty for organic private label brands

Chapter 6: Conclusion

Chapter 3: A longitudinal empirical investigation toward the understanding of product category antecedents of brand loyalty

Abstract

In this paper, we investigate the impact of product category antecedents on brand loyalty. More specifically, we study the impact of the number of stock keeping units (SKU), category penetration, category purchase frequency, and share of private label brands (PLB) on brand loyalty. We further test the moderating effects between the share of PLB and other product category antecedents (i.e., the impact of the number of SKU, the category penetration, and the category purchase frequency), and the moderating effect between category penetration and category purchase frequency. The article draws on a large-scale empirical study using a household panel for 55 fast-moving goods product categories. The results show that purchase frequency has a positive impact on brand loyalty, whereas the number of SKU and category penetration have a negative impact. The share of PLB has a U-shaped impact on brand loyalty, first negative and then shifting to positive after a certain point. When it comes to the moderating effects, a higher PLB market share enhances the negative impact of an increase in the number of SKU. Furthermore, a higher category penetration decreases the positive effect of an increase in category purchase frequency. Finally, the results show no significant moderating effect on the category penetration and category purchase frequency.

Keywords: Category management, brand loyalty, panel data, time series modeling.

I. Introduction.

Category management has become a key issue for retailers (Gajanan, Basuroy, & Beldona, 2007); Gooner, Morgan, & Perreault Jr, 2011). As the competitiveness of markets increases, this management approach is increasingly valued by retailers, managers, and academics (Gooner et al., 2011). It is essential that category managers as well as retailers understand the effects of their marketing actions on performance in the category. Nevertheless, some of these effects remain unknown. In particular, the effect of category management on brand loyalty is unclear, but is highly relevant for category managers and retailers, as loyal customers are an important asset for firms being very profitable (Gupta, Lehmann, & Stuart, 2004). Firms therefore invest heavily in building and maintaining relationships with their customers. For instance, the following questions are especially relevant for category managers and retailers: How does the number of stock keeping units (SKU) impact brand loyalty? Does an increase in the category purchase frequency influence brand loyalty? How do private label brands (PLB) in a category impact brand loyalty?

The literature has widely studied antecedents of brand loyalty, which can be grouped into consumer-related, marketing–mix related, and product–category related ones (see figure 1). Consumer antecedents are consumers' perceptions and habits toward products, as well as consumer traits and psychographics (e.g., satisfaction, perceived value of the product or service, consumer involvement in the category, variety-seeking behavior, and inertia). These antecedents vary across consumers. Marketing mix antecedents are product-specific marketing mix and positioning characteristics (e.g., price, price and in-store promotions, product attributes, and loyalty programs). These antecedents define the positioning of a product and vary across

products. Finally, product category antecedents relate to the market conditions that characterize a product category. These antecedents do not vary across products or consumers, remaining the same for a whole market (e.g., category penetration, purchase frequency of the category, number of products and brands in the category, category hedonicity, impulse buying of the category, ability to stockpile, share of PLB, and competitive structure of the markets).

---Insert Figure 1 about here---

Our study takes the product category antecedents of brand loyalty as a point of departure, as several researchers (Ehrenberg, 1988; Dawes et al., 2015) point out the necessity of determining this possible link. In fact, product category antecedents are of particular relevance for category management. However, although some extant studies have taken an interest in this issue, gaps exist in the literature, and the effect of some antecedents is unclear. Moreover, some studies take an interest in brand–loyalty related behaviors such as promotional elasticity (Narasimhan et al., 1996; Bolton, 1989) but do not specifically study brand loyalty itself.

In line with calls for empirical generalizations in marketing as a means to advance marketing knowledge (Bass, 1995), we contribute to this debate in the literature in the following ways. First, we explore the effect of product–category related antecedents on brand loyalty with a large-scale, longitudinal study, using data from 55 product categories over a period of six years. More specifically, we focus on measuring the impact of product-category purchasing metrics (i.e., number of SKU, category penetration, and category purchase frequency) and PLB on brand loyalty. We further test the interaction effect between the share of PLB in a market and the

category purchasing metrics as well as the interaction effect between category penetration and purchase frequency.

We organize the paper as follows. First, we provide a literature review of product category antecedents of brand–loyalty related consumer behaviors and develop our hypotheses. Second, we outline our methodology and describe the data and loyalty metrics we use. Next, we develop the model in which we test our hypotheses and provide the results. We continue with a discussion section and conclude the paper with implications and directions for future research.

II. Theoretical background.

II.1. Review of the effects of product category antecedents on brand–loyalty related behaviors.

The impact of product category antecedents on brand–loyalty related consumer behaviors, such as promotional elasticity or impulse purchases, has been studied extensively (Johnson, 1984; Hoyer, 1984; Ehrenberg, 1988; Bawa et al., 1989; Bolton, 1989; Van Trijp, Hoyer, & Inman, 1996; Narasimhan et al., 1996; Fader & Lodish, 1990 ; Liu, 2007; Inman et al., 2008; Inman et al., 2009; Michaelidou & Dibb, 2009; Dawes et al., 2015). We provide a summary of the results of these investigations, which are sometimes mitigated, with a particular focus on the following product category antecedents that we study in this paper: number of SKU in the category, category penetration, purchase frequency of the category, and proliferation of PLB in the category.

Research shows that buyers use simple heuristics and are not motivated to engage in cognitively intensive in-store decision making when products are purchased repeatedly.

Therefore, consumers are likely to be more loyal in product categories with a higher purchase frequency, to decrease their cognitive energy (Hoyer, 1984). Despite this argument, empirical evidence shows that the impact of category penetration and category purchase frequency on brand loyalty is negative (Ehrenberg, 1988; Dawes et al., 2015). The number of brands in the market and category growth also have a negative effect on brand loyalty (Johnson, 1984). The width of product assortment negatively influences brand loyalty (Dawes et al., 2015) and positively affects promotional sensitivity (Bawa et al., 1989). Consumers are more likely to switch brands when the brands are part of a promotion if the width of product assortment is large. Category penetration and the degree to which a product category is easy to stockpile have a positive impact on promotional elasticity (Narasimhan et al., 1996). The higher the category penetration and the ability to stockpile a product, the more strongly consumers will react to a promotion and switch brands. Therefore, consumers will end up being less loyal to a particular brand. On the other hand, interpurchase time and the number of brands in the category have a negative effect on promotional elasticity. The higher the number of brands in the market and the lower the interpurchase time, the weaker the effect of a promotion will be (Narasimhan et al., 1996). Consumers will then be more likely to be loyal to a particular brand. The share of PLB in the market and the impulse buying behavior in the category have no effect on promotional elasticity. In the same vein, the coupon magnitude as well as the display activity have a positive effect on promotional elasticity, while the category price activity has no effect (Bolton, 1989; Inman et al., 2009). Category hedonism has a positive effect on variety seeking and brand switching, particularly on unplanned purchases (Van Trijp et al., 1996; Michaelidou & Dibb,

2009; Inman et al., 2009). The more hedonic a category is, the more likely consumers are to switch and be less loyal.

II.2. Hypotheses.

Our study focuses on behavioral loyalty – that is, observed repeat purchasing over time (e.g., Kahn, Kalwani, & Morrison, 1988; Dick & Basu, 1994) — at the category and not the brand level. The rationale for focusing on behavioral loyalty is that:

- the study attempts to add to previous investigations of behavioral loyalty,
- extensive data exists on such behavior, while no equivalent long-term information on consumer attitudinal brand loyalty is available, and
- marketers are specifically interested in behavioral loyalty, since it directly translates to sales revenue.

There are a large number of behavioral measures for loyalty, such as purchase frequency (Morrison, 1966; Sharp & Sharp, 1997), repeat-purchase rate (Colombo, Ehrenberg, & Sabavala, 2000; Fader & Schmittlein, 1993), share of category requirements (e.g. Bhattacharya, Fader, Lodish, & Desarbo, 1996; Jung et al., 2010; Pare & Dawes, 2012), lifetime duration (that is, the length of time a buyer remains as a buyer) (East, Lomax, & Narain, 2001; Reichheld & Teal, 1996), repertoire size (e.g. Banelis, Riebe, & Rungie, 2013; Uncles & Ehrenberg, 1990; Banelis, Riebe, & Rungie, 2013) , and the proportion of brand buyers who are solely loyal (e.g. Raj, 1985). A criticism of the use of these measures is that they are confounded by changes in category purchase rates and market share, since market share and loyalty are systematically related (Danaher, Wilson, & Davis, 2003; Fader & Schmittlein, 1993; Pare & Dawes, 2012). This

is the double jeopardy effect: small brands tend to have lower loyalty, while larger brands have more, regardless of how this is measured (Ehrenberg & Goodhardt, 2002; Ehrenberg, Goodhardt, & Barwise, 1990). In addition, these measures are dependent on the time frame of analysis (Sharp, 2010). To control for these confounding factors, we use the polarization index (φ) (Fader & Schmittlein, 1993). The advantage of the polarization index is that it is independent of time frame of analysis, category purchasing, and market share (Rungie & Laurent, 2012).

The number of SKU (SKU are the unique product codes that refer to a particular brand, pack size, and formulation) has historically followed an upward trend. In the United States, for example, 9,700 new food and beverage products launched in 1992, whereas the number of launches reached 21,000 in 2010 (USDA, 2010). In product categories with a higher number of SKU, consumers express weaker preferences and are more likely to buy products other than what they initially planned to purchase (Bawa et al., 1989; Chernev, 2003; Johnson, 1984). A higher number of SKU also expands the set of alternatives, which increases the degree of consumers' variety-seeking behavior (Chintagunta, 1998). Therefore:

H_1: An increase in the number of SKU in a category decreases brand loyalty in the category.

Category penetration is the percent of households that buy from the category at least once within a given period of time. High category penetration implies a larger pool of consumers who are brand switchers (Narasimhan et al., 1996), so each brand attracts relatively lower loyalty levels. In contrast, product categories with low category penetration are niche markets, and brands in these product categories should display the characteristics of niche brands (Fader &

Schmittlein, 1993; Sharp & Sharp, 1997), thereby invoking higher average purchase frequencies and brand loyalty. Therefore:

H_2: An increase in the category penetration decreases brand loyalty in the category.

Category purchase frequency is the average number of purchases a consumer makes from the category within a given period of time. Product categories with higher category purchase frequency result in consumers establishing habitual processes (Ji & Wood, 2007), which likely leads to greater loyalty to the brands they buy. For example, consumers who increase their purchase frequency eventually become more loyal to the brand to decrease the their cognitive energy (Liu, 2007). Therefore:

H_3: An increase in the category purchase frequency increases brand loyalty in the category.

PLB *are those brands manufactured or provided by one company for offer under a retailer's brand. PLB* have managed to establish a considerable share in retail markets (Koschate-Fischer, Cramer, & Hoyer, 2014; Sethuraman & Gielens, 2014). In fact, the average global share of PLB has increased from 15.0% in 2010 to 16.5% in 2013 (Nielsen, 2011, 2014). PLB are often positioned as lower-cost alternatives to (inter)national brands (NB), although recently some PLB have been positioned as "premium" brands to compete with existing NB, and the differential in product quality perception between PLB and NB has become blurred (Hyman, Kopf, & Lee, 2010; Sethuraman & Cole, 1999). In product categories with a high share of PLB, consumers are more price-sensitive, price promotions are more frequent, and consumer price elasticity is negative (Sethuraman & Gielens, 2014). Research suggests that price promotions make

consumers more prone to buy PLB, as high price promotion intensity reduces consumers' internal reference prices and induces a search for a cheaper offer (Dawes & Nenycz-Thiel, 2013; Nenycz-Thiel & Romaniuk, 2016). A raise of the PLB share likely has a negative impact on brand loyalty at first, until a certain level, as consumer preferences might switch from the brand to price, and then consumers become less loyal to the brands in these product categories (Hendel & Nevo, 2006). After this level of PLB share is achieved in a product category, brand loyalty probably increases, as consumers might become more familiar with PLB. This may lead consumers to update as well as improve their quality perceptions of PLB (Steenkamp, Van Heerde, & Geyskens, 2010) and have a higher propensity to buy them (Ailawadi, Pauwels, & Steenkamp, 2008). This, in turn, means that PLB share should have a positive effect on brand loyalty after a certain level. An increase in PLB share thus should have a U-shaped effect on brand loyalty. Therefore:

H_4: An increase in the category PLB share has a U-shaped effect on brand loyalty in the category (e.g., first a negative and then a positive effect on brand loyalty).

Based on the previous argument, it becomes plausible that the PLB market share in a market moderates the impact of product category antecedents (i.e., the number of SKU, the category penetration, and the purchase frequency). Consumers in markets with a high PLB market share are more prone to switch between different brands and to buy during a sale, as their loyalty to pricing tiers is higher than that of consumers in markets with a low PLB market share (Mela, Jedidi, & Bowman, 1998; Dawes & Nenycz-Thiel, 2013). Moreover, product categories with high PLB share are usually product categories with frequent NB promotions (Dawes & Nenycz-Thiel, 2013). A higher PLB market share in a market might increase variety-seeking

behavior as well as decrease brand loyalty in the category. This phenomenon might in turn enhance the impact of product category antecedents that have a negative effect on loyalty, namely, the number of SKU and the category penetration. This means that if the PLB market share increases in a category, the negative effects of an increase in the number of SKU and penetration will also be enhanced. It should also negatively impact the positive effect of an increase in purchase frequency. Therefore:

H_5: The higher the PLB market share, the stronger the negative impact of an increase in the number of SKU on brand loyalty in the category.

H_6: The higher the PLB market share, the stronger the negative impact of an increase in the category penetration on brand loyalty in the category.

H_7: The higher the PLB market share, the weaker the positive impact of an increase in purchase frequency on brand loyalty in the category.

As seen earlier, product categories with low category penetration can be considered niche markets. These product categories attract consumers with specific tastes that make them more brand-loyal (Sharp, 2007). Indeed, such consumers will "stick" to the same products or brands, as these brands match their specific tastes, and so these consumers purchase them more frequently (Fader & Schmittlein, 1993; Sharp & Sharp, 1997). The entry of more consumers in the market entails more consumers with heterogeneous tastes (Narasimhan et al., 1996), who are more likely to switch products or brands when they purchase. Thus, an increase in category purchase frequency has a weaker positive effect in a product category with high penetration, as consumers have tastes that are more heterogeneous. Therefore:

H_8: The higher the category penetration, the weaker the positive impact of an increase in category purchase frequency on brand loyalty in the category.

III. Data, methodology, and analysis of brand loyalty.

III.1. Data.

We use GfK consumer panel data from about 2500 households in Denmark who recorded their purchases after each shopping trip over a period of six years (2006 to 2011). The panel is geographically and demographically representative of the Danish population (see table 1). In total, we analyze 55 fast-moving consumer goods (FMCG) categories (see table 2).

---Insert table 1 about here---

We calculate a set of product–category related loyalty metrics from the data for every category *i* and each year *t* separately.

First, we compute the number of SKU in the category in the category *i* for year *t*:

$$Ait = Number\ of\ SKUs \quad (1)$$

Where:

- Ait is the number of SKU in the category *i* for year *t*.

We then estimate the PLB market share (*SPLit*) in each product category, which is the total volume of PLB divided by the total volume of all brands in the category, as:

$$SPLit = \frac{msPLit}{msTOTit} \quad (2)$$

Where:

- SPLit is the PLB market share in the category *i* for year *t*,

- mSPLit is the PLB share value in the category *i* for year *t*, and
- msTOTit is the total share value in the category *i* for year *t*.

The category penetration in the category is the number of buyers purchasing the brand/category at least once divided by the number of total households, computed as:

$$Bit = \frac{NBit}{NPit} \quad (3)$$

Where:

- Bit is the penetration of the category *i* for year *t*,
- NBit is the number of buyers of the category in the category *i* for year *t*, and
- NPit is the total number of buyers in the sample in the category *i* for year *t*.

The purchase frequency is the category *Wit,* which the total number of purchased units in the brand/category divided by the number of households buying the brand/category, computed as:

$$Wit = \frac{NUit}{NBit} \quad (4)$$

Where:

- Wit is the purchase frequency in the category *i* for year *t*,
- NUit is the number of purchased units in the category *i* for year *t*, and
- NPit is the total number of buyers in the sample in the category *i* for year *t*.

Table 2 shows the product category characteristics and loyalty index over time.

---Insert Table 2 about here---

The total number of SKU in a category (*Ait*) is on average 322 SKU, and it ranges from 44 (toilet blocks) to 1458 (meat). The average purchase frequency (*Wit*) across the product categories is 15.4 per year. The highest purchase frequency can be observed for beer (108.4), and the lowest is seen in the cosmetics category (2.4). The average category penetration (*Bit*) is 63% and ranges from 8% (diapers) to 95% (milk). The average PLB share (*SPLit*) is 28%; the highest ratio can be found in the toilet paper category (63%), and the lowest ratio is in the toothbrushes category (5%).

III.2. Operationalization of loyalty.

As stated above, we approach brand loyalty from a behavioral perspective (Dick & Basu, 1994). To control for the confounding factors of category purchase rates and market share, we use the polarization index Phi (φ) (Fader & Schmittlein, 1993).

We compute φ from the following equation: $\varphi = 1/(1+S)$, where S is a category switching parameter from the Dirichlet model (Ehrenberg, 1988). The Dirichlet is a stochastic model that is a combination of two main distributions: the negative binomial distribution (NBD) and the Dirichlet multinomial distribution (DMD) (Ehrenberg, Uncles, & Goodhardt, 2004; Goodhardt, Ehrenberg, & Chatfield, 1984; Uncles, Ehrenberg, & Hammond, 1995). There are some underlying assumptions behind the Dirichlet model: first, the markets are supposed to be unsegmented; second, the markets are stationary; and, finally, each purchase is unrelated to the previous ones (this model belongs to the group of zero-order models with a Poisson distribution).

The polarization index captures changes in the heterogeneity in consumer choice. Its values range between zero and one. Values close to zero indicate pure homogeneity in consumer

choice, which signals more brand switching and lower loyalty (i.e., all buyers have the same propensity to buy individual brands). Values close to one indicate maximum heterogeneity in consumer choice, which signals less brand switching and higher loyalty (i.e. each buyer buys only his/her favorite brand; Fader & Schmittlein, 1993).

III.3. Model estimation.

We estimated the Dirichlet model in R for every product category and for each year. To fit the model, we introduced a) the market share (e.g., total purchases of the brand divided by the total purchases of the category; b) the brand/category penetration (*Bit*); and c) the brand/category purchase frequency (*Wit*) (Ehrenberg et al., 2004). We only considered brands with a market share higher than 1% in order to avoid bias caused by small brands. Therefore, we grouped all remaining brands as "other brands" and included them in the analysis (Ehrenberg, 1988). We further calculated the following product–category related measures for every category and each year: a) the number of SKU in the category (*Ait*) and b) the PLB market share in the category (*SPLit*). We believed that *SPLit* is more appropriate than value market share for this calculation, since the average price of PLB is lower than that of national brands (Batra & Sinha, 2000; Sethuraman & Cole, 1999), which would lead to underestimating their actual share.

III.4. Model development.

We develop the following models,

$$\ln\left(\frac{POLit}{1-POLit}\right) = \alpha + \beta 1Ait + \beta 2Bit + \beta 3\mathrm{W}it + \beta 4sPLit + \beta 5sPLit^2 + \varepsilon it \quad (5)$$

$$\ln\left(\frac{POLit}{1-POLit}\right) =$$

$$\alpha + \beta 1Ait + \beta 2Bit + \beta 3\mathrm{W}it + \beta 4sPLit + \beta 5sPLit^2 + \beta 6(sPLit \text{ x } Ait) + \beta 7(sPLit \text{ x } Bit) +$$

$$\beta 8(sPLit \text{ x } Wit) + \beta 9(Bit \text{ x } Wit) + \varepsilon it \quad (6)$$

by integrating the number of SKU (*Ait*), the penetration in the category (*Bit*), the purchase frequency (*Wit*), and the PLB share (*SPLit*) in the category *i* for year *t*. In the equation,

- POLit is the polarization index of category i in year t, and
- ε represents an error term.

The first model tests the direct impact of the product category antecedents on brand loyalty. The second one incorporates the moderating effects. Changes observed are not affected by the time period considered.

Given that our loyalty estimate (the polarization index) varies between zero and one, it does not follow a normal distribution. We therefore conduct a logistic transformation (Ailawadi et al., 2008; Koschate-Fischer et al., 2014). To rule out problems of collinearity between our independent variables, we compute the variance inflation factors. With all values being below 10, we find no support for multicollinearity (Rawlings, Pantula, & Dickey, 1998).

We conduct a one-way error component regression with fixed effects (Baltagi, 2008) that takes into account the correlations of the different terms according to time and examines whether the intercepts vary across time periods (Koschate-Fischer et al., 2014). A Hausman test shows the validity of the method (p <.001; Wooldridge, 2010).We find the intercepts non-significant, meaning these are time-invariant (Baltagi, 2008).

We test the endogeneity of our independent variables one by one for a single year (ter Braak, Dekimpe, & Geyskens, 2013). In a first-stage regression, we regress the potentially endogenous variables on the same variables as in the main equation (5). We compute the residuals from this regression and add them as an additional regressor in the polarization index equation, after removing the PLB market share for identification purposes. The parameter estimates for the residuals were found not significant and did not reveal any violation of the exogeneity of the independent variables. Thus, endogeneity is not an issue.

IV. Results.

IV.1. Overall results.

Table 2 shows the loyalty indexes for the categories. Polarization φ is within the bounds typically observed for FMCG (Fader & Schmittlein, 1993). The average polarization index is 0.42 and ranges from 0.14 (cheese) to 0.78 (beer).

IV.2. Impact of product–category related antecedents on brand loyalty.

Table 3 provides descriptive data for the sample and correlations between key variables of the study. Table 4 shows the model's results.

---Insert Table 3 about here---

---Insert Table 4 about here---

IV.2.1. Direct effects.

All explanatory variables of our base model (5) are significant. Our model explains 60% of the total variance. Our hypotheses about the impact of the product–category related variables on loyalty are all confirmed. The number of SKU (*Ait*) in a market and the category penetration

(*Bit*) have a negative effect on the polarization index and loyalty (β_1=-1.15 x 10^{-3}, p<.001; β_2=-1.72, p<.001), which confirms H_1 and H_2. The purchase frequency (*Wit*) has a positive effect on the polarization index and loyalty (β_3=1.25 x 10^{-2}, p<.001), which confirms H_3. The direct effect of the PLB market share (*SPLit*) on the polarization index is negative (β_4=-4.5, p<.001), and the effect of the square of the PLB market share is positive (β_5=6.13, p<.001), suggesting a U-shaped effect. We confirm H_4.

IV.2.2. Moderating effects.

When we include the interaction effects, the direct effects all stay significant and in the same direction. The coefficient for the interaction of the PLB market share and the number of SKU (*Ait*) is significantly positive (β_6=3.11 x 10^{-3}, p<.001). We confirm H_5; the higher the PLB market share, the stronger the negative impact of an increase in the assortment size will be on brand loyalty in the category. The interaction between the PLB market share and the purchase frequency (*Wit*) and the category penetration (*Bit*) are negative but non-significant (β_7=8.47 x 10^{-3}, p>.05; β_8=-1.19, p>.1). This result means that we reject H_6; a higher PLB market share does not increase the negative impact of an increase in category penetration on brand loyalty in the category. We also reject H_7; a higher PLB market share does not decrease the positive impact of category purchase frequency on brand loyalty in the category. Finally, the interaction effect between category penetration (*Bit*) and category purchase frequency (*Wit*) is negative and significant (β_9=-0.07, p<.001). We confirm H_8; the higher the category penetration, the weaker the positive impact of an increase in category purchase frequency on brand loyalty in the category.

V. Discussion and managerial implications.

Our study contributes to establishing empirical generalizations (Bass, 1995) in relation to the impact of product category antecedents on brand loyalty, and we offer theoretical as well as managerial implications. We do this by estimating brand loyalty over time by using an unbiased indicator for a large range of products categories. We then test the impact of product–category related loyalty antecedents, such as the number of SKU, penetration, purchase frequency, and PLB market share on brand loyalty by using a time series model that takes time effects into account. All our hypotheses on the main effects of product category antecedents on brand loyalty are confirmed. Concerning the moderating effect of the PLB market share, a higher PLB market share enhances the negative impact of an increase in the number of SKU. On the other hand, we find no significant moderating effect of the PLB market share on the category penetration and category purchase frequency. Finally, we find a negative interaction effect between category purchase frequency and category penetration.

V.1. Theoretical implications.

Our investigation helps deepen the understanding of product–category related antecedents on brand loyalty and has several theoretical contributions.

First, the results reveal that the number of SKU has a negative impact on brand loyalty. This is in line with previous literature (Bawa et al., 1989; Dawes et al., 2015) that shows that the more consumers' choices increases, the less loyal they are. This finding indicates variety-seeking behavior (Chintagunta, 1998).Thus, the more competitive a category is (i.e., the higher the number of SKU), the higher the probability that brand loyalty decreases.

Second, we show that category penetration has a negative impact on brand loyalty. This finding is in line with previous research (Narasimhan et al., 1996). The more consumers buy from a product category, the higher the probability that these consumers are variety seekers and opportunists, and therefore they are less loyal.

Third, we find, in line with previous research, that category purchase frequency has a positive impact on brand loyalty by decreasing variety-seeking behavior and increasing repeat purchases (Van Trijp et al., 1996). Consumers are also less likely to purchase unplanned products in frequently purchased categories (Inman et al., 2009).

Fourth, an increase in the number of PLBs has a U-shaped impact on brand loyalty in the category. An increase of the PLB share in a category has a negative impact on brand loyalty at first, until a certain threshold, after which brand loyalty increases with the growth of PLB share. One possible explanation behind this result is that consumers' preferences might switch from the brand to price when PLB are first introduced, and so consumers become less loyal to the brands in the product category. After a certain point, however, PLB monopolize the product category, and consumers may become more loyal to brands due to this concentration. Our study confirms a supposition in previous research, one that has never before been empirically tested, stating that PLB might be a possible reason for brand loyalty decline (Dekimpe, Steenkamp, Mellens, & Abeele, 1997; Dawes et al., 2015). We further contribute to the literature by showing the U-shape of this effect.

Fifth, we test the moderating impact that PLB share has on product category-related antecedents of brand loyalty in the category. In categories with a higher share of PLB, the

negative effect of the number of SKU is enhanced. Consumers of categories with a high number of PLB are likely to be more prone to buy during a sale, as their price loyalty is higher than in markets with a low PLB share (Mela et al., 1998). We also test the negative moderating effect of category penetration on category purchase frequency. Product categories with a higher category penetration attract consumers that are variety seekers and opportunists and therefore less loyal, which in turn decreases the positive effect of category purchase frequency on brand loyalty in the category (Narasimhan et al., 1996).

Finally, an additional result of this study is the constant effect of time, which plays no role in brand loyalty. Our findings are thus in line with the existing research (Dawes et al., 2015) that states that brand loyalty is stable and does not decrease over time. Furthermore, the average year by year change in the polarization loyalty parameter is very slight, only -0.4% (and this is not statistically significant).

V.2. Managerial implications.

Our results have important managerial implications for retailers and category managers, as these results show that changes in product category characteristics have a strong impact on brand loyalty. This means that category managers and retailers should expect changes in brand loyalty when developing category-management strategies.

As stated earlier, brand loyalty is measured at an average level in this study, and the effects might have differed from brand to brand. However, if a marketing action decreases brand loyalty at an average level, consumers will be less loyal and more prone to brand switching for all brands altogether, and every brand in the product category will be weakened.

Our finding that the number of SKU negatively impacts brand loyalty contrasts with (Dhar, Hoch, & Kumar, 2001), who find that a broader assortment size increases retailer performance (measured as the volume and the levels of sales of the retailer with respect to the whole market). Our findings suggest that marketing actions aiming at broadening the assortment size, expanding the market, and increasing penetration jeopardize brand loyalty in the category in the long term, as these tactics make consumers more opportunistic and prone to brand switching as well as less profitable for specific brands. On the other hand, marketing actions that aim to increase category purchase frequency (e.g., by finding new product usages) should have a double beneficial effect, as these increase both the performance of the brands and brand loyalty. The fact that proliferation of PLB has a U-shaped impact on brand loyalty is an interesting finding for retailers, as they can better predict the impact that the introduction and the development of PLB will have on brand loyalty and performance. The results about the moderating effects of the PLB share give valuable insights to retailers and category managers, as this enables them to know which categories are most likely to respond strongly to their marketing actions (e.g., categories with more PLB are more receptive). Additionally, our results about the moderating effect of category penetration on category purchase frequency suggest that consumers in markets with high penetration will be more versatile and variety-seeking and less brand-loyal. This idea is in line with (Narasimhan et al., 1996), who show that in product categories with a high category penetration, the pool of consumers who are brand switchers is higher. Our results can also help retailers and category managers to better predict the results of their actions.

VI. Limitations and future research directions.

There are some limitations of the study that ought to be mentioned. Future research is necessary to better understand some phenomenon to see if these results hold under different conditions.

One confounding factor for our results may be the market conditions of the country that the data comes from. These results should be interpreted with that reservation in mind, and replications should be done elsewhere, such as in the USA or other large European countries. Our investigation analyzed brands within categories but reported the average results for each category. However, within any category, some brands might exhibit different loyalty paths over time. An avenue for future research would be to study the evolution brand by brand to see if some brands react differently than others, and, if so, why that is.

In this study, we find a weak and inverse relationship between the breadth of offerings in a category and brand loyalty. In many markets that are outside the scope of investigation here, the number of brand and product alternatives available has become almost unlimited due to the Internet. Based on the results here, one could conjecture that this wider choice might result in lower loyalty. On the other hand, in the face of bewildering variety, consumers may prefer their known and safe choices, and loyalty could be stable or even increase. This is an avenue for future investigation.

Demographic Characteristic	Percentage of sample
Age[a]	
<25 years	4
25-34 years	14
35-44 years	20
45-54 years	20
55-64 years	20
>64 years	22
Household Brut Income[b]	
<200k	21
200k-400k	36
400k-600k	23
600k-800k	11
>800k	9
Household Size[c]	
1	34
2	39
3	12
>3	16

[a]Age of main shopper in household.
[b]Annual brut income of household in DKK.
[c]Number of people in household.

Table 8: Panelists' characteristics.

Categories	Category penetration	Category Purchase frequency	Number of SKU	PLB Market Share	Phi*
Beer	0.64	108.42	743	0.14	0.78
Toilet Blocks	0.15	3	44	0.14	0.73
Liqueur	0.35	6.8	154	0.11	0.69
Conditioner	0.21	3.21	133	0.14	0.65
Coffee	0.75	21.36	280	0.25	0.64
Soft Drink	0.33	10.36	160	0.48	0.62
Pasta/rice dish	0.3	6.22	82	0.11	0.61
Fruit Juices	0.46	6.84	141	0.16	0.59
Instantaneous Coffee	0.49	5.07	160	0.27	0.58
Shampoo	0.58	5.22	328	0.14	0.58
Diapers	0.08	8.05	86	0.45	0.57
Soups	0.52	5.83	170	0.23	0.57
Frozen Pizza	0.3	6.13	120	0.26	0.56
Toothpaste	0.7	4.84	155	0.06	0.55
Deodorants	0.47	4.84	432	0.08	0.54
Body bubble bath	0.39	3.45	206	0.13	0.52
Hand Soap	0.54	3.93	198	0.30	0.50
Tea	0.51	6.15	274	0.20	0.50
Toothbrushes	0.38	3.33	183	0.05	0.48
Margarine	0.77	15.93	95	0.37	0.45
Soda	0.78	57.42	612	0.11	0.45
Toilet Paper	0.81	8.96	135	0.63	0.45
Ketchup	0.69	5.6	123	0.23	0.44
Butter	0.89	24.29	97	0.16	0.43
Detergents	0.72	4.06	173	0.49	0.42
Asian and Mexican Food	0.48	5.26	241	0.53	0.41
Mustard	0.51	2.41	102	0.35	0.40
Juice	0.76	21.45	389	0.50	0.39
Liver Pate	0.82	12.33	152	0.21	0.38
Spaghetti	0.7	9.16	410	0.44	0.38
Jam	0.69	8.32	417	0.33	0.37
Sugar	0.79	10.75	130	0.23	0.37
Biscuits	0.74	11.02	508	0.22	0.36
Cereals	0.77	13.35	329	0.45	0.36
Food edible oil	0.61	3.32	196	0.51	0.35
Milk	0.95	102.14	325	0.36	0.35
Cosmetics	0.12	2.4	151	0.15	0.33
Eggs	0.86	14.02	205	0.17	0.33
Honey	0.76	9.66	184	0.46	0.33
Sauce Krydmix	0.72	9.25	433	0.27	0.32
Chips Snacks	0.67	14.11	474	0.32	0.30

Ice Cream	0.68	10.13	401	0.26	0.30
Skin care	0.52	5.56	681	0.28	0.28
Spices	0.62	4.99	384	0.20	0.28
Pate Bacon	0.79	10.03	207	0.44	0.27
Cream	0.83	18.09	123	0.47	0.26
Sausages	0.77	9.89	374	0.36	0.26
Other Biscuits	0.72	9.71	488	0.30	0.25
Other Detergents	0.67	4.1	253	0.39	0.23
Rye Bread	0.91	31.75	298	0.33	0.22
Meats	0.92	43.1	1458	0.53	0.20
Chocolate	0.76	24.98	1076	0.11	0.17
Chicken	0.83	12.24	637	0.30	0.16
Wheat Bread	0.93	55.53	687	0.25	0.16
Cheese	0.91	20.82	704	0.25	0.14
Average value	**0.63**	**15.44**	**322**	**0.28**	**0.41**

Table 9: Category characteristics.

*) Phi: Polarization index

Correlations	M	SD	Polarization index	Category Purchase Frequency	Category Penetration	Number of SKU
1. Polarization index	0.42	0.16				
2. Cat. Purchase Frequency	15.44	21.18	-0.04			
3. Category Penetration	0.63	0.22	-0.61**	0.42**		
4. Number of SKU	322	264	-0.46**	0.44**	0.41**	
5. Share of PLB	0.28	0.15	-0.32**	-0.024	0.26**	0.024

Table 10: Correlations matrix.

** p<.01, *p<.05

	Full model		Base Model	
Effect on Logit Polarization index	**Estimate[a]**	**z-Value**	**Estimate[a]**	**z-Value**
Direct effects				
Number of SKU	-2.33×10^{-3}	-10.26***	-1.15x10-3	-10.19***
Category Penetration	-0.69	-2.52*	-1.72	-11.97**
Category Purchase Frequency	6.93×10^{-2}	11.03***	1.25×10^{-2}	8.82***
Share of Private Label Brands	-4.73	-6.49***	-4.50	-5.77***
Share of Private Label Brands^2	5.98	5.47***	6.13	5.14***
Interaction effects				
Share of Private Label Brands x Number of products	3.11×10^{-3}	5.06***		
Share of Private Label Brands x Category Purchase Frequency	8.47×10^{-3}	0.59		
Share of Private Label Brands x Category Penetration	-1.19	-1.48		
Penetration x Purchase frequency	-0.072	-7.45***		
R-square	0.70		0.60	
Adjusted R-square	0.67		0.58	
F-statistic	80.92 (p<0.0001)		96.19(p<0.0001)	

Table 11: Models Regression Results.

[a]Unstandardized results are presented

*** p<0.001, **p<0.01, * p<0.05

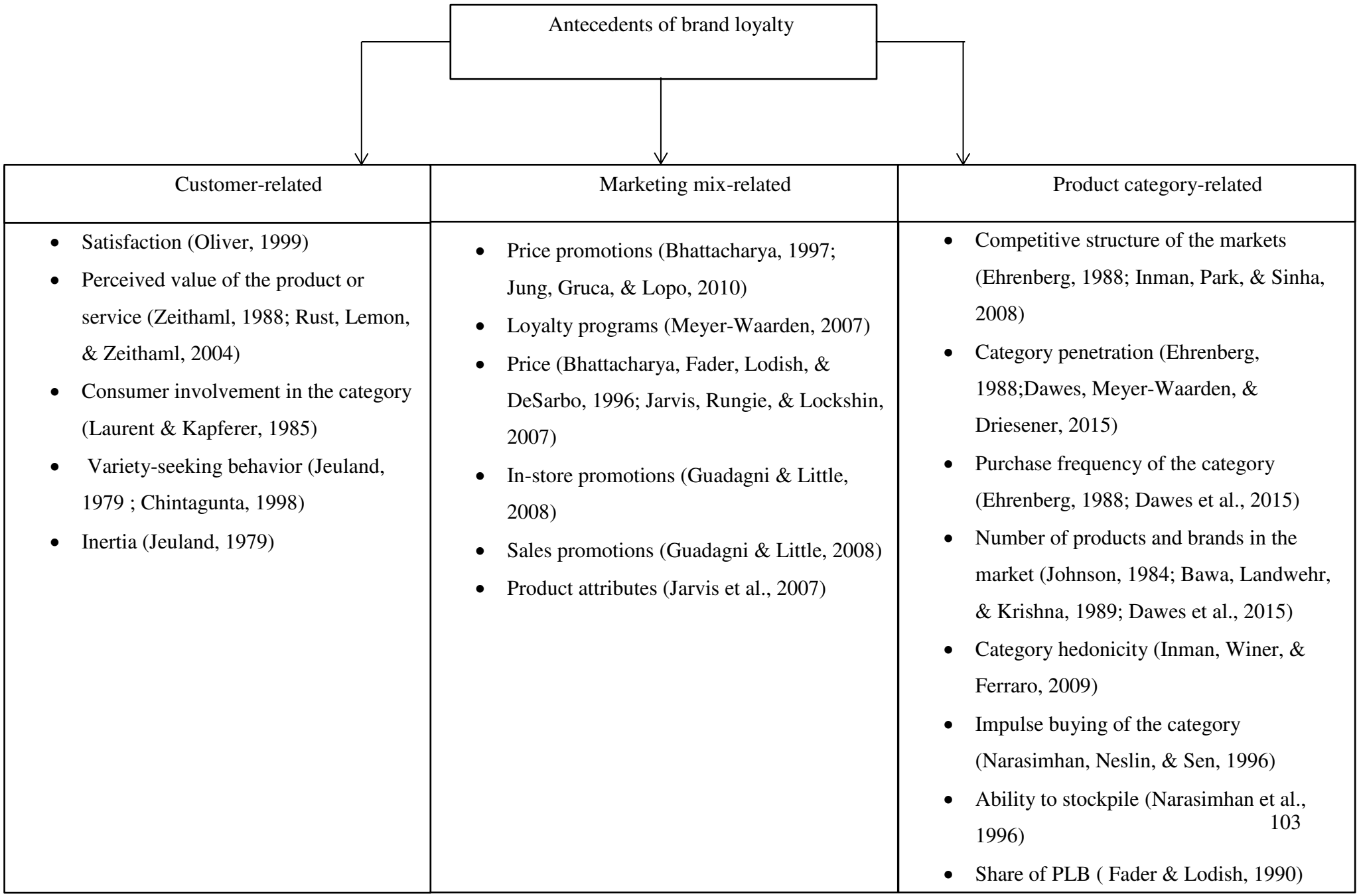

Figure 4: Typology of brand loyalty antecedents.

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Summary of the chapter

The previous paper studies the impact of a change in product category-related antecedents (e.g. number of SKUs, category penetration and category purchase frequency) as well as the impact of PLB share and the moderating impact between PLB share and other product category antecedents (i.e. impact of the number of SKUs, the category penetration and the category purchase frequency) and between category penetration and category purchase frequency. We do that using panel purchase data from Denmark from 2006 to 2011 for 55 different product categories. We find that the number of SKUs and category penetration have a negative impact on brand loyalty while the effect of category purchase frequency is positive. The PLB share has a U-shaped impact (i.e. first negative then positive). We find a significant moderating effect between the share of PLB and the effect of the number of SKUs as well as a significant moderating effect between category penetration and category purchase frequency.

Our results have important theoretical and managerial implications for retailers and category managers. Our investigation helps deepen the understanding of product category related antecedents on brand loyalty and have several theoretical contributions. We show the direct impact of product category-related characteristics on brand loyalty in a given category. We also confirm a never empirically tested supposition in previous research stating that PLB might be a possible reason for the decline in brand loyalty by showing the U-shape impact. Finally, we show the moderating effect of PLB share on other product characteristics and between category penetration and category purchase frequency. Our results show that changes in product category characteristics have a strong impact on brand loyalty. This suggests that category managers and retailers should expect changes in brand loyalty when developing

category management strategies. Therefore it helps retailers and category managers better understand the effect of their strategies on brand loyalty and better plan their actions in order to enhance it at a category level.

This study has some limitations. The positioning of our analysis at a category level does not enable us to provide specific insights for product managers and does not take into account the differences that may exist between products. Within any category, some products might exhibit different loyalty paths over time or different reactions to some antecedents. An avenue for future research would be to study brand loyalty antecedents at a brand level to see if some brands react differently than others and why. This would also enable us to take into account important variables that cannot be considered at a category level such as price and brand type.

To fill these gaps, we study marketing mix-related antecedents of brand loyalty in the next study. We specifically focus on price. We do so for the following reasons. Price is one of the most important product cues and forms an essential choice criterion for consumers. It is present in every purchase occasion hence it has a major impact on consumers' purchase behaviors such as brand loyalty and makes it a very interesting antecedent to study. We study the impact of price on brand loyalty and we test if this impact is different for brands exhibiting product attributes signaling high or low quality cues. The impact of price could depend on the presence on these attributes. We thus study if price has a differentiated impact for brands associated with high quality (e.g. organic brands) and with low quality (e.g. PLB). Moreover, to better understand why this effect occurs, we test the impact of price on perceived quality for organic brands and PLB. Finally, we check if this effect is moderated by price related consumer psychographics (i.e. price consciousness and price quality inference).

Chapter 1: Introduction

Chapter 2: A Longitudinal Analysis of Brand Loyalty Evolution and the Impact of Product Category Characteristics

Chapter 3: A longitudinal empirical investigation toward the understanding of product category antecedents of brand loyalty

Chapter 4: The impact of price tiers on brand loyalty and the moderating role of brand quality cues

Chapter 5: The role of consumer characteristics and the mediating role of perceived value for money on the formation of loyalty for organic private label brands

Chapter 6: Conclusion

Chapter 4: The impact of price tiers on brand loyalty and the moderating role of brand-quality cues

Abstract

Price is one of the most important product attributes that consumers use as quality cue. However, the price-quality inferences consumers make may depend on the existence of additional product attributes that signify quality, which could be either high (e.g. organic labels) or low (e.g. private labels). In this paper we propose that price may act more as a quality cue for private label brands (PLB) compared to organic brands, and subsequently influence its impact on consumer brand loyalty. We first test this proposition with panel purchase data and show that price indeed has a negative impact on brand loyalty for organic brands and a positive one for PLB. We further conduct two experiments and show that price has a negative impact on brand loyalty for both organic brands and PLB. We further find that price-conscious consumers react more negatively to an increase in price for both organic brands and PLB, while consumers with high price-quality inference react more positively to an increase in price for both types of brands. Theoretical and managerial implications are discussed.

Keyword: *Organic labels, private label brands, brand loyalty, panel data*

I. Introduction

Price is one of the most important product cues (Lichtenstein, Ridgway, & Netemeyer, 1993) and forms an essential choice criterion for consumers. As such, it has an impact on consumers' purchase behaviors (such as loyalty) toward a product or a brand. Moreover, this impact may depend on product cues and positioning elements that signal product quality (such as organic label and private label brand, PLB). Indeed, consumers create price-quality inferences, thus perceiving high-priced brands as being of greater quality and vice versa (Yoo, Donthu, & Lee, 2000). Price is thus viewed as a guarantee of product quality. Price further acts as a cost (Lichtenstein et al., 1993) representing what a consumer has to give in order to get a product. The direct impact of price on brand loyalty is thus related to price being at the same time a quality cue and a cost (Marian, Chrysochou, Krystallis, & Thøgersen, 2014). This means that some effect may differ depending on the presence of other product-quality cues associated to the brand. It may differ on whether the product carries a cue indicating high quality (e.g. quality labels, such as organic brands, Marian et al., 2014) with price acting more as a cost, or on whether it carries a cue indicating low quality (e.g. PLB, Nenycz-Thiel & Romaniuk, 2016) with price acting more as a quality cue.

Organic brands and PLB are brand types that have become preponderant in the marketplace. The global organic market has shown a steady growth from 17.9 billion $ in 2000 to 59.1 billion $ in 2010 (Sahota, 2012). PLB have managed to establish a considerable share in retail markets (Koschate-Fischer, Cramer, & Hoyer, 2014; Sethuraman & Gielens, 2014). In fact, the average global share of PLB has increased from 15.0% in 2010 to 16.5% in 2013 (Nielsen, 2011, 2014). In 2014, PLB in the UK captured a 41% share in dollar sales of consumer-packaged goods categories, compared to an 18% share in the US (Nielsen, 2014).

In Europe, for every $3 spent in the consumer-packaged goods category, private labels account for one third (Nielsen, 2014). The huge success of PLB in Europe has been attributed to these programs covering all types of quality tiers (sometimes outperforming national brands, NB), and that European retailers devote more resources and time into developing their private label programs (Hoch & Banerji, 1993).

The impact of price on sales for these brand types has been previously studied. For organic brands, recent academic literature that examines the relationship between price and sales performance has not reached a clear consensus. While van Herpen, van Nierop, & Sloot (2012) conclude that prices have no impact on sales for organic brands, Bezawada & Pauwels (2013) suggest that sales for organic brands decrease with higher prices. Furthermore, Ngobo (2011) finds an inverted U-relationship where demand increases with increasing prices up to a certain level. In regards to PLB this relationship is clearer, with earlier literature showing that share for PLB decreases when the difference in price between NB and PLB is small (Sethuraman & Gielens, 2014). When it comes to the impact of price on brand loyalty gaps exist for these types of brands.

Given the importance of organic brands and PLB, our contribution is to test the differentiated impact of price on brand loyalty for these brands. We furthermore test if price has a differentiated impact on perceived quality for these brands, and if the impacts on brand loyalty are moderated by price-related consumer psychographics, such as consumers' price consciousness and price-quality inference. We operationalize this paper with three studies. First, we test the impact of price on brand loyalty according to the brand type, by using actual purchase data on 6 product categories coming from the Danish GfK consumer panel over a period of 6 years (2006 to 2011). We further conduct two experiments with Danish consumers

to further understand the reason behind this impact. We check if price has a different impact on perceived quality for organic brands and PLB. We further check if this impact diverges across types of consumers. The first experiment takes an interest in organic brands and the second one on PLB. We therefore offer new evidence on the impact of brand type (organic brands vs. PLB) on the impact of price on brand loyalty and perceived quality.

In the next section we describe the rationale behind the impact of additional quality cues on price-quality inferences. We then describe our hypothesis about the impact of consumers' psychographics on these relationships. We then describe our data and our methodology. Finally, we present our results as well as some implications and direction for future research.

II. Literature review and hypothesis development

Organic brands are certified by a special process. In general, any business directly involved in food production can be certified, including seed suppliers, farmers, food processors, retailers and restaurants. Requirements vary from country to country and generally involve a set of production standards for growing, storage, processing, packaging and shipping.

Private label brands (PLB) are brands owned by a retailer or a wholesaler (Hyman, Kopf, & Lee, 2008). PLB are available in a wide range of industries from food to cosmetics. They are often positioned as lower-cost alternatives to national brands (NB) (Dekimpe, Gielens, Raju, & Thomas, 2011), although recently some PLB have been positioned as "premium" brands to compete with existing NB (ter Braak, Geyskens, & Dekimpe, 2014; Geyskens, Gielens, & Gijsbrechts, 2010).

From an economics perspective, price is an expression of supply and demand. However, a brand's price goes beyond this reasoning and signals value. Thus, price has a dual role in consumers' evaluation of a product (Marian et al., 2014). First, price represents a cost (i.e. the amount of money consumers spend on a product/service; Lichtenstein et al., 1993). Second, price is a quality cue that creates trust by sending a signal of delivering greater perceived value (Völckner & Hofmann, 2007). Both roles are not necessarily exclusive and can interact at the same time. Apart from price, consumers use other product attributes as quality-inference cues. For example, consumers associate organic brands with greater quality (Yoo et al., 2000). On the other hand, PLB are often positioned as lower-cost alternatives to NB and are often associated with lower quality (Nenycz-Thiel & Romaniuk, 2009). This low-quality claim is also true for premium PLB (Nenycz-Thiel & Romaniuk, 2016). These two quality cues may subsequently change the impact that price has as a quality cue, as product attributes and especially labels are usually assessed in combination and not separately (Purohit & Srivastava, 2001; Janiszewski & Van Osselaer, 2000; Akdeniz, Calantone, & Voorhees, 2013). Thus, the presence of two quality-inference cues in a single product may cause redundancy or create compensatory effects (Larceneux, Benoit-Moreau, & Renaudin, 2012; Park, Jun, & Shocker, 1996). We thus expect that the price moderates perceptions and loyalty toward a brand based on the existence of additional quality cues. Thus, for a brand that carries an attribute that signifies high quality (e.g. organic brands) the impact of price as a quality-inference cue will be lower as compared to a brand that carries an attribute that signifies low quality (e.g. PLB). Thus, prices' negative role as a cost will be predominant for organic brands while the positive role of price as a quality signal will be predominant for PLB. Price will then have a negative impact on brand loyalty for organic brands and a positive impact on brand loyalty for PLB. Thus:

H_{1a}: Price has a negative impact on brand loyalty for organic brands (low price levels lead to higher loyalty)

H_{1b}: Price has a positive impact on brand loyalty for PLB (high price levels lead to higher loyalty)

H_2: Price has a stronger positive impact on perceived quality for PLB than for organic brands.

Price-conscious consumers are consumers that focus exclusively on paying low prices (Lichtenstein et al., 1993). An increase in price will have a negative impact on these consumers' attitudes and behaviors towards a product. Thus, such consumers will react less positively to an increase in price than non-price-conscious consumers. We thus expect that the positive impact of price on brand loyalty for PLB will be lower for price-conscious consumers compared to non-price-conscious consumers. When it comes to organic brands, we expect the negative impact of price on brand loyalty to be stronger for price-conscious consumers than for non-price-conscious consumers. Thus:

H_{3a}: Price has a stronger negative impact on brand loyalty for organic brands for price-conscious consumers than for non-price-conscious consumers.

H_{3b}: Price has a weaker positive impact on brand loyalty for PLB for price-conscious consumers than for non-price-conscious consumers.

Some consumers perceive a higher price as an inference of product quality more than others (Lichtenstein et al., 1993) and will be more likely to use price as an indicator of quality across products (Lichtenstein & Burton, 1989). They may then react more positively to an increase in price for PLB as it will compensate the low-quality claim that comes with PLB.

They may also react more positively to an increase in price for organic brands as this increase will mean product quality increases even if organic brands are already considered of high quality. Hence:

H_{4a}: Price has a weaker negative impact on brand loyalty for organic brands for consumers whose price-quality inference is high.

H_{4b}: Price has a stronger positive impact on brand loyalty for PLB for consumers whose price-quality inference is high.

III. Study 1: A behavioral consumer-based panel approach

The first study was based on purchase data. We tested the impact of price on brand loyalty for organic brands and PLB, which enabled us to test if the differentiated impact of price on brand loyalty depending on the brand type was true at a behavioral level.

III.1. Data

We used consumer panel data from GfK in Denmark. In Denmark the market share of the organic food market is high (8% in 2012; Cottingham, 2014), which makes it an interesting country to study. The panel consisted of about 2,500 households and was geographically and demographically representative of the Danish population (see Table 1). Each panel member recorded its purchases on a daily basis after each shopping trip. The data covered a period of six years ranging from 2006 to 2011. We considered six categories with the highest market share for organic food (milk, pasta, honey, eggs, cereals, butter) allowing greater variability in brand choice.

---Insert Table 1 about here---

III.2. Procedure

We focused on two product attributes: brand type (conventional vs. organic brands and PLB vs. NB) and price levels (low vs. medium vs. high). We grouped brands within the range of ±0.5 standard deviations from the average price of each product category as medium price level, and those with 0.5 standard deviations above (below) the mean as high (low) price level (Marian et al., 2014). To rule out biases due to pack sizes we used the average price per 100 g (100 ml for milk). Further, to avoid bias coming from sales promotions, we excluded products bought on discount.

We approached brand loyalty from a behavioral perspective (Dick & Basu, 1994). Prior literature uses various behavioral brand loyalty measures, such as purchase frequency, share of category requirements or repeat buying rates (Dawes, Meyer-Waarden, & Driesener, 2015; East & Hammond, 1996). However, these measures are confounded with changes in category purchase rates and market share, because market share and loyalty are systematically related (Danaher, Wilson, & Davis, 2003; Fader & Schmittlein, 1993; Pare & Dawes, 2012). In addition, they depend on the time frame of analysis (Sharp, 2010). To control for these confounding factors, we used the polarization index (φ) (Fader & Schmittlein, 1993), which is independent of the time frame, category purchasing and market share (Rungie & Laurent, 2012a).We thus measured loyalty using the polarization index (φ) that was calculated from the switching parameter S of the Dirichlet model (Ehrenberg, Uncles, & Goodhardt, 2004; Fader & Schmittlein, 1993) and that measured heterogeneity in the distribution of brand choice probabilities across the buyer population. The polarization index captured changes in the heterogeneity in consumer choice as purchase incidence changed and was calculated with the following formula:

$$\varphi = 1/(1+S) \qquad (1)$$

The values of φ ranged between zero and one. When values of φ were close to zero, there was pure homogeneity in consumer choice that implied that each consumer had the same propensity to buy a brand and therefore it resulted in lower loyalty. When values of φ were close to one, there was maximum heterogeneity in consumer choice that implied that each consumer bought only his favorite brand and therefore it resulted in higher loyalty (Fader & Schmittlein, 1993). The advantage of φ, compared to other measures of loyalty (e.g. share of category requirements), was that it is not biased by market share (Rungie & Laurent, 2012).

We estimated φ for the following subcategories (conventional vs. organic brands and PLB vs. NB, and each price level within each subcategory of brand type). To avoid bias caused by small brands, we considered only brands with a market share higher than 1%. All other brands were grouped in the analysis as "other brands" (Ehrenberg, 1988).

III.3. Results

Table 2 presents the average polarization index (across the six product categories) and category performance characteristics for each subcategory.

Organic brands have an average market share of 17% and an average penetration of 28%. Looking at the distribution of market share across price levels, organic brands with higher price have the highest market share (8%), whereas conventional brands with lower prices have the highest market share (40%). Organic brands display a higher level of loyalty than conventional brands ($t(250)=-2.31$, $p<.05$). For conventional brands there are no differences in loyalty across price levels ($F(2,123)=0.35$, $p>.1$). On the other hand, for organic brands there are significant differences in loyalty across price levels ($F(2,123)=11.14$, $p<.05$),

with low price levels leading to higher loyalty (see Figure 1). We thus confirm H_{1a}. Hence, we find that price has a negative impact on organic brands loyalty; thus, the higher the price the lower the loyalty for organic brands.

Looking at PLB, we see that their average market share is 39% with an average penetration of 51%. Low-price PLB have the highest market share (25%), while medium-price NB have the highest market share (24%). PLB display a higher level of loyalty than NB ($t(250)=5.89$, $p<.000$). For NB low prices lead to higher loyalty levels ($F(2,123)=32.97$, $p<.000$). For PLB high prices lead to higher loyalty levels ($F(2,123)=5.34$, $p<.01$). We thus confirm H_{1b}: price has a positive impact on brand loyalty for PLB; thus, the higher the price the higher the loyalty.

---Insert Table 2 about here---

---Insert Figure 1 about here---

Looking further at the differences in polarization values across product categories for organic brands (see Figure 2), we see that low-priced brands display higher levels of loyalty across all product categories with a small exception of the cereals category.

---Insert Figure 2 about here---

For PLB, high-priced brands display higher levels of loyalty across all product categories except for butter and eggs (see Figure 3).

---Insert Figure 3 about here---

III.4. Discussion

Our results from the purchase data study show that price has a different impact depending on whether the brand is an organic brand or a PLB. For organic brands, price has a negative impact on loyalty; thus, the higher the price the less loyal consumers are. On the other hand, for PLB, price has a positive impact on loyalty; thus, the higher the price the more loyal consumers are. While price seems to act as a quality cue for PLB, for organic brands the organic label is already the primary quality cue and high price may be perceived mostly as a cost. These findings give further support to previous research that suggests that consumers are not ready to buy organic brands at higher prices (Bezawada & Pauwels, 2013), and thus high prices have a negative impact on consumers' loyalty (Marian et al., 2014). Overall, we find that price has a differentiated impact on brand loyalty depending on brand type (organic brands vs. PLB) and whether it is conveying a product's quality signal. If the brand type signals high product quality (i.e. organic brands) the impact of price is negative. If the brand type signals low product quality (i.e. PLB) the impact of price is positive. Although organic brands display higher loyalty (Marian et al., 2014), we find that this difference varied across price levels and is attributed primarily to the high loyalty that low-price level organic brands exhibit. The same conclusion is valid for PLB where high brand loyalty is associated to high price levels. As the consumer panel data has no explanatory variables to confirm our conclusions we conducted two experimental studies giving us deeper insights.

IV. Studies 2 and 3: An experimental design approach

Following the initial panel data-based study, we conducted two online experiments. The first one dealt with the impact of price for organic brands and the second one with the impact of price for PLB. The goal of these experiments was threefold. The first goal was to

examine the reasons behind the differentiated impact of price. We thus tested the moderating effects of brand type on the impact of price on perceived quality. Second, we aimed to verify study 1 on an experimental level. Finally, we aimed to test if the impact of price differed across consumers. More precisely, we focused on price-related consumer psychographics (i.e. price consciousness, price-quality inference).

IV.1. Methodology

The variables tested for each of the experiments were price and brand type. We conducted the experiments with Danish consumers in the milk product category. We chose this product category as it is a very commonly bought product and in which organic brands and PLB are well spread. Indeed, when we look at our panel data we see that milk is a product category with very high penetration (95%) and very high purchase frequency (102 units per year). Moreover, organic brands' market share is 25% and PLB market share is 36%. This pushed us to choose this product category for our experiments. Both experiments consisted of a 2 (brand type: organic brand vs. conventional brand/or PLB vs. NB) x 2 (price level: low vs. high) x 4 (brand: A vs. B vs. C vs. D) design with brand type and price as between-subjects factors and brand type as within-subjects factor. We used mock-up brands to cancel out any effects resulting from prior knowledge and brand attitudes. To come up with the price levels we estimated the average price of milk of major brands, which was supported by the panel data. The low price was estimated using a price that was 25% below the average and the high price as 25% above the average.

186 Danish consumers took part in the organic experiment. 53.2% of the respondents were male, 51.6% were single/live alone, 21.5% had children at home and the sample mean age was 44. 318 Danish consumers took part in the PLB experiment. 48.7% of the

respondents were male, 48.2% were single/live alone, 21.4% had children at home and the sample mean age was 49.

Participants assessed each stimulus in relation to their loyalty towards the brand (Chaudhuri & Holbrook, 2001) and the perceived quality of the products. We further measured the participants' purchase behavior in relation to organic brands and PLB (i.e. whether they purchase organic brands and PLB when they buy milk). Finally, we measured price consciousness and price-quality using Lichtenstein et al.'s, (1993) scales. During the scale validation process, one item of the price-consciousness scale had to be taken out. The results then offered satisfactory reliability (Cronbach's alpha and Joreskog's rho are higher than 0.7). To check for convergent validity we computed the average variance extracted (AVE) for each of the scales and each of the experiments. Every one of them was equal or above 0.5, which suggests a satisfactory convergence (Fornell & Larcker, 1981, see Table 3). Finally, we assessed discriminant validity by comparing the AVE for each of the scales to the squared correlations between them. In each case, the AVE was higher than the squared correlation showing evidence of discriminant validity (Jiménez & Voss, 2014).

---Insert Table 3 about here---

IV.2. Results

We first run analyses of covariance with price and brands as independent variables and brand loyalty and perceived quality as dependent variables for both experiments. It first confirms H_{1a}: brand loyalty is significantly higher ($F(1, 267)=26.45$, $p<.000$, see Table 4) for low-priced organic brands (M=4.02, SD=1.80) than for high-priced organic brands (M=2.91, SD=1.58). Furthermore, no significant difference can be found ($F(1, 267)=-0.20$, $p>.1$) in

terms of perceived quality. Respondents thus perceive low-priced organic brands (M=5.20, SD=1.60) having the same quality as high-priced organic brands (M=5.27, SD=1.56).

When it comes to the PLB experiment, we find that consumers are more loyal (F(1, 635)=118.54, p<.000) to low-priced PLB (M=3.74, SD=1.96) than to high-priced PLB (M=2.24, SD=1.46), which contrasts with the results (H_{1b}) of the consumer panel study. There is also no significant difference in perceived quality (F(1, 635)=1.99, p>.1) between high-priced PLB (M=4.31, SD=1.53) and low-priced PLB (M=4.49, SD=1.57). We thus reject H_2, which means that price does not have a stronger positive impact on perceived quality for PLB than for organic brands.

---Insert Table 4 about here---

To test our moderating effects of H_3 and H_4 we apply the Hayes macro PROCESS (Hayes, 2013, see Table 5). This macro enabled us to test the moderating effect of price consciousness and price-quality inference on the impact of price on brand loyalty. Bootstrapping (N=5000 samples) with bias corrected for indirect effects was used. To test the significance of our estimates we checked the bootstrapped 90% confidence interval (CI) of the estimate. If this did not include 0, the effect was significant.

---Insert Table 5 about here---

There is a significant interaction effect between price consciousness and price for organic brands: At low (high) prices brand loyalty is higher (lower) for price-conscious consumers (see Figure 4). We thus confirm H_{3a}: price has a stronger negative impact on brand loyalty for organic brands for price-conscious consumers than for non-price-conscious consumers.

---Insert Figure 4 about here---

We find a significant interaction effect between price-quality inference and price for organic brands. Moreover, we see that at low price brand loyalty for organic brands is higher for consumers with low price-quality inference while it is the opposite when the price is high (see Figure 5). We thus confirm H_{4a}: price has a weaker negative impact on brand loyalty for organic brands for consumers whose price-quality inference is high.

---Insert Figure 5 about here---

There is a significant interaction effect between price consciousness and price for PLB. At low (high) prices brand loyalty is higher (lower) for price-conscious consumers (see Figure 6).We thus reject H_{3b} as price has a negative impact on brand loyalty for PLB.

---Insert Figure 6 about here---

When it comes to PLB, we find a significant interaction effect between price-quality inference and price. Moreover, we see that at low price, brand loyalty for PLB is higher for consumers with low price-quality inference while it is the opposite when the price is high (see Figure 7). We, however, reject H_{4b} as we find a negative impact of price on brand loyalty for PLB. Price thus has a weaker negative impact on brand loyalty for PLB for consumers whose price-quality inference is high.

---Insert Figure 7 about here---

IV.3. Discussion

Our experiments give mixed evidence. Surprisingly, we find that price has no impact on perceived quality for both brand types, organic brands and PLB. Respondents perceived low and high-priced organic brands and PLB as being of similar quality. This means that the

organic label is enough in itself to convey quality (Yoo et al., 2000). Consumers are thus not influenced by price when they judge organic brands in terms of perceived quality. For PLB, this finding is a bit more surprising as it means that PLB-perceived quality is the same across higher and lower price levels. An explanation can be found in (Miyazaki, Grewal, & Goodstein, 2005): if a product displays two inconsistent quality cues, consumers find the negative cue more salient and overweighted it in their evaluations. In the case of PLB, the brand might act as the negative quality cue and price as a quality cue is undervalued. Therefore, price does not have an impact on perceived quality for PLB. We further find that price has a negative impact on brand loyalty for both organic brands and PLB. Unlike the purchase data-based study, we do not find that price has a positive impact on brand loyalty for PLB.

We finally find that the impact of price varies across consumers. In line with literature (Lichtenstein et al., 1993), we show that when consumers are price conscious, price has a stronger negative impact on brand loyalty for organic brands and PLB than when consumers are non-price conscious. We further find that for consumers with high price-quality inference, high prices have a weaker negative impact on brand loyalty for organic brands and PLB compared to those whose price-quality inference is low. The effect of price as a cost is thus weaker for consumers with high price-quality inference and it thus impacts less their purchase behaviors.

V. General discussion

Our results show a differentiated impact of price on brand loyalty depending on the presence of other product-quality cues (e.g. organic brands and PLB). We furthermore show the differentiated, moderating effects of price-related consumer psychographics, such as

consumers' price consciousness and price-quality inference. Our research thus has theoretical and managerial implications.

Our first study aims at understanding the role of price on brand loyalty for brands displaying different quality cues. We do it for brands associated to higher quality (e.g. organic brands) and brands associated to lower quality (e.g. PLB). Our first contribution is to show that price has a different impact whether the brand is organic or PLB. On one hand, price acts more as a cost and impacts negatively brand loyalty if the product conveys a positive signal of quality (e.g. organic brands). On the other hand, price acts as a quality cue and impacts positively brand loyalty if the product conveys a negative signal of quality (e.g. PLB). It is in line with literature that states that high price is an important barrier to organic brands purchase (Bezawada & Pauwels, 2013); Van Doorn & Verhoef, 2015), and that it has a negative impact on consumers' loyalty (Marian et al., 2014). Concerning PLB, it shows that a high price makes up for the low-quality signal conveyed by PLB and enhances brand loyalty.

This has some managerial implications for the positioning and pricing strategies of brands. For low-price brands a quality cue, such as the organic label, is necessary to provide further justification to customers and cancel out the low-quality inferences. However, for high-price brands an organic label may not be necessary. First, because the brand enters a small market, that is not necessarily a niche market, with small performance characteristics (i.e. low penetration and purchase frequencies). Second, because the brand achieves loyalty levels that a conventional brand also might achieve without any label due to its brand capital. Third, assuming that the production costs are higher for organic labels, the profit margin is lower than in the case of conventional brands. An organic label thus may not be attractive if the performance of these brands does not outperform the costs. In summary, the organic label

creates a favorable segment for the low-price level brands. On the other hand, a high price creates a favorable segment for PLB as it re-insures and signals consumers a higher product quality (e.g. high-priced PLB exhibit higher levels of brand loyalty compared to lower-priced PLB). Furthermore, higher price compensates a low quality signal sent by the private label and enables these brands being perceived as high-quality brands. This confirms retailers' strategies that position higher-priced premium PLB to compete with high-quality NB seem to succeed in attracting and retaining customers (ter Braak, Dekimpe, & Geyskens, 2013; ter Braak et al., 2014; Geyskens et al., 2010; Martos-Partal, González-Benito, & Fustinoni-Venturini, 2015). This strategy could thus be extended to more product categories as some retailers have not implemented it to all product categories (ter Braak et al., 2014).

A surprising result is the difference we find on the impact of price on brand loyalty for PLB between the purchase panel-data model and the experiment. A reason for this difference could be methodological and in the way we measure brand loyalty through an online experiment. Respondents might have been unable to reflect themselves in a fictive brand-loyalty situation where they would have to repurchase a brand. They may have overestimated the importance of price in their decision in the online experiment while price had a smaller impact during their actual purchase in the panel data. Moreover, Danish consumers usually have high income making price a small hurdle for them when they purchase.

We find that price has no impact on perceived quality for both brand types, organic brands and PLB. Respondents perceive low and high-priced organic brands and PLB as being of similar quality. It could mean that price is undervalued in consumers' perception of brands and that they rely primarily on the organic label and the PLB when they judge the brand's quality.

Finally, we find that the impact of price differs across consumers. We show that when consumers are price conscious, price has a stronger negative impact on brand loyalty for organic brands and PLB than when consumers are non-price conscious. We further find that for consumers with high price-quality inference price has a weaker negative impact on brand loyalty for organic brands and PLB compared to those whose price-quality inference is low. The effect of price as a cost is thus weaker for consumers with high price-quality inference and it thus impacts less their purchase behaviors. This helps brand managers to better target different types of consumers according to their reactions to price. Price has a stronger negative impact for price-conscious consumers. They react more negatively and are less likely to be loyal to high-priced organic brands and PLB. In terms of positioning, these price-conscious consumers are more likely to purchase and to be loyal to low-priced organic brands. It thus makes the low-price segment a good positioning for organic brands, as these low-priced organic brands could attract all groups of consumers and not only non-price-conscious consumers. On the other hand, high-priced organic brands (due to high production cost for instance) and premium PLB should target primarily non-price-conscious consumers. It means that despite the fact that PLB are favored by price-conscious consumers (Sethuraman & Gielens, 2014), these price-conscious consumers still react more negatively than non-price-conscious consumers to a high price. Finally, the negative impact of price is lower for consumers whose price-quality inference is high. Thus, if an organic brand is positioned with a high price these consumers are more likely to be more favorable and more loyal to them. The same implications are valid for PLB as consumers with a high price-quality inference will be more favorable to a high price than those with a low price-quality inference.

VI. Limitation and future research

Our study is not exempt of limitations. First, our results should be interpreted in the context of a small market, Denmark. Furthermore, we analyse only six product categories. Including data from additional product categories and other countries with different market structure would help in generalizing further the results of our study. Then, the way we operationalize price levels in our experimentation does not necessarily match how consumers perceive them. Finally, this investigation focuses on PLB and organic brands in an isolated manner. An interesting avenue for future research would be to replicate our analyses for organic PLB that combines both organic label and PLB and thus both quality signals (both positive and negative).

Demographic Characteristic	Percentage of Sample
Age[a]	
<25 years	4
25-34 years	14
35-44 years	20
45-54 years	20
55-64 years	20
>64 years	22
Household Gross Income[b]	
<200k	21
200k-400k	36
400k-600k	23
600k-800k	11
>800k	9
Household Size[c]	
1	34
2	39
3	12
>3	16

[a]Age of main shopper in household.

[b]Annual gross income of household in DKK.

[c]Number of people in household.

Table 12: Panelists characteristics.

Subcategories	Polarization (φ)	Market Share (%)	Penetration (%)	Purchase Frequency
Conventional	***0.31***	***83***	***74***	***18.5***
Low price	0.41	40	49	13.3
Medium price	0.43	28	50	8.7
High price	0.42	15	38	4.5
Organic brands	***0.40***	***17***	***28***	***9.7***
Low price	0.84	2	4	2.9
Medium price	0.54	7	17	6.8
High price	0.42	8	18	6.0
NB	***0.45***	***61***	***68***	***14.6***
Low price	0.59	17	31	7.4
Medium price	0.48	24	46	8.4
High price	0.36	20	43	6.2
PLB	***0.60***	***39***	***51***	***11.7***
Low price	0.54	25	37	10.2
Medium price	0.59	11	26	5.1
High price	0.64	3	10	3.3

Table 13: Average brand-performance measures and polarization scores across subcategories.

	Organic brands experiment			PLB experiment		
	Cronbach's alpha	**Joreskog's rho**	**Average variance extracted**	**Cronbach's alpha**	**Joreskog's rho**	**Average variance extracted**
Brand loyalty	0.96	0.96	0.93	0.95	0.8	0.686
Price consciousness	0.81	0.88	0.64	0.81	0.87	0.628
Price-quality inference	0.87	0.82	0.5	0.87	0.83	0.507

Table 14: Reliabilty and convergence indicators for the organic brands and PLB experiments.

Factors	Organic brands experiment	PLB experiment
Brand Loyalty		
Main effects		
Price	26.45***	118.54***
Brands	1.17	1.74
	H_{1a} accepted	H_{1b} rejected[1]
Interaction effects		
Price*Brands	1.93	0.45
Perceived Quality		
Main effects		
Price	0.20	1.99
Brands	2.14	2.64
Interaction effects		
Price*Brands	1.65	2.30
	H_2 rejected	

***p<0.01, **p<0.05, *p<0.1

[1]: The effect of price is opposite to what was originally hypothesized.

Table 15: F-statistics of the effect of the analyses of covariance on brand loyalty and perceived quality.

Price consciousness						
	Organic brands			**PLB**		
	Coefficient	***LB***	***UB***	***Coefficient***	***LB***	***UB***
Price	-0.985***	-1.19	-0.78	-1.370***	-1.53	-1.21
Price consciousness	-0.072	-0.16	0.01	-0.017	-0.07	0.04
Price*Price consciousness	-0.337**	-0.51	-0.17	-0.394***	-0.51	-0.28
	H_{3a} accepted			H_{3b} rejected[1]		
R^2	0.10			0.16		
Price-quality inference						
	Organic brands			**PLB**		
	Coefficient	***LB***	***UB***	***Coefficient***	***LB***	***UB***
Price	-0.985***	-1.19	-0.78	-1.494***	-1.72	-1.27
Price-quality inference	0.091*	0.01	0.17	0.075	-0.01	0.16
Price*Price-quality inference	0.326**	0.16	0.50	0.1785*	0.01	0.34
	H_{4a} accepted			H_{4b} rejected[1]		
R^2	0.10			0.17		

*** p<.01; **p<.05; *p<.1

LB=lower bound; UB=upper bound.

[1]: The effect of price is opposite to what was originally hypothesized.

Table 16: Moderating effect of psychographic variables on brand loyalty across brand types.

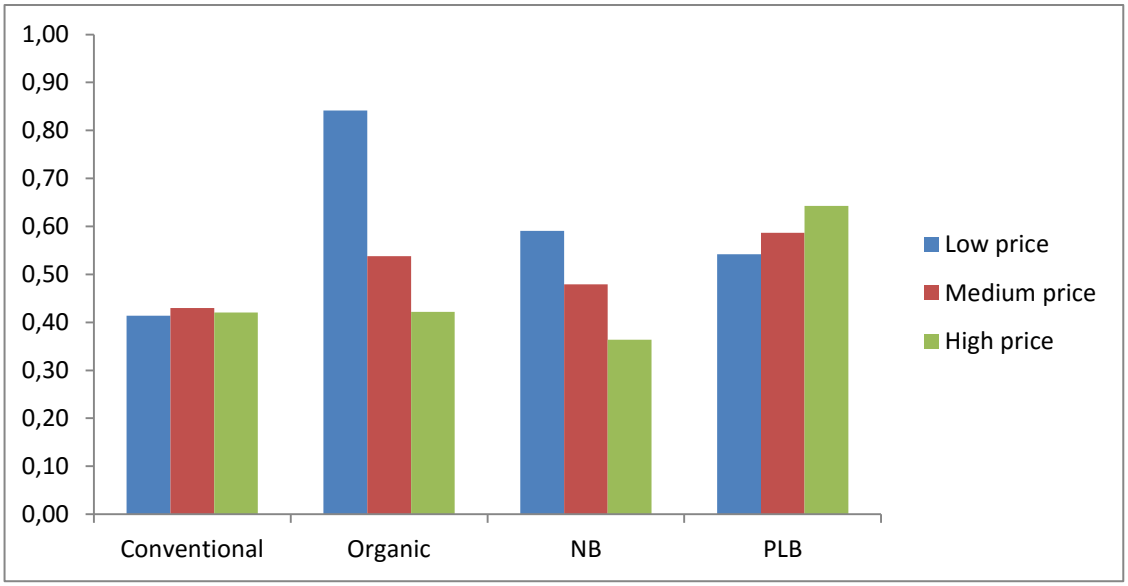

Figure 5: Polarization (φ) for each price level and subcategories.

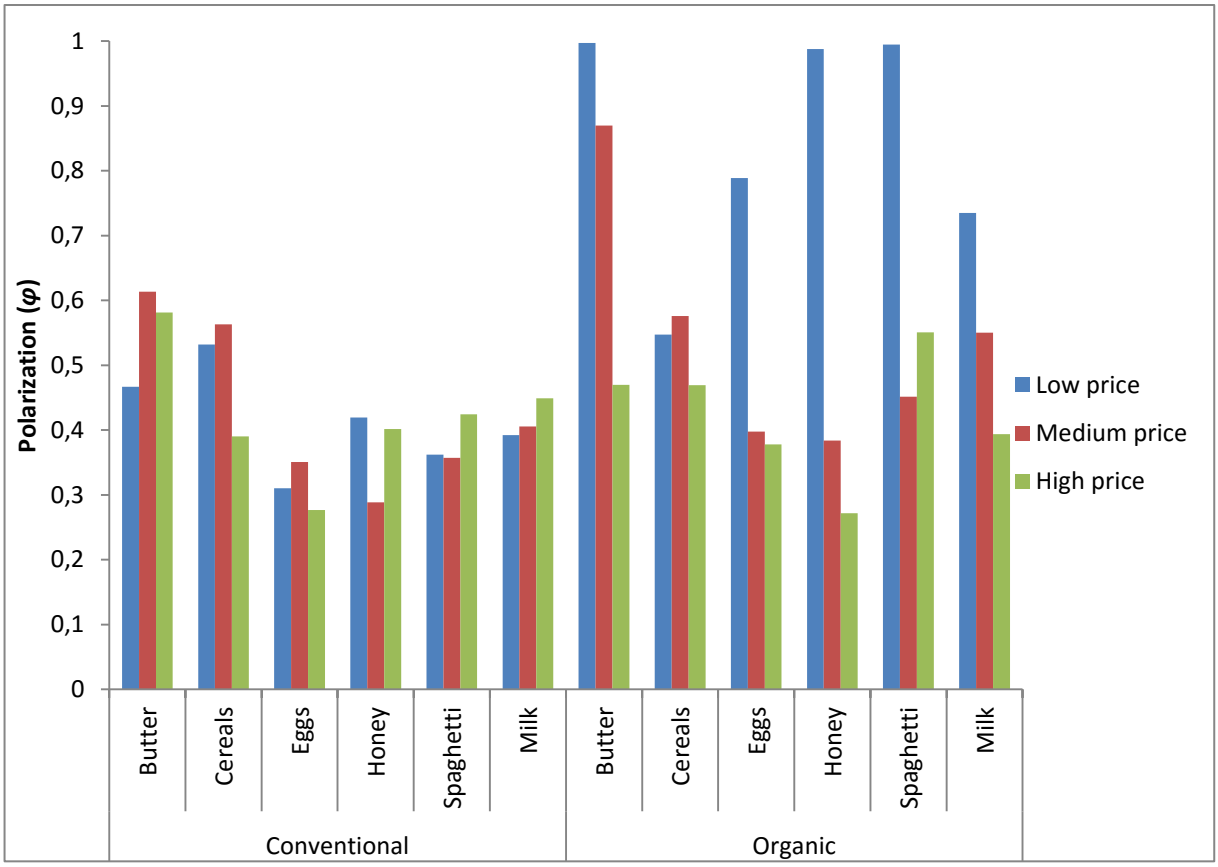

Figure 6: Polarization (φ) across conventional and organic brands for each price level across product categories.

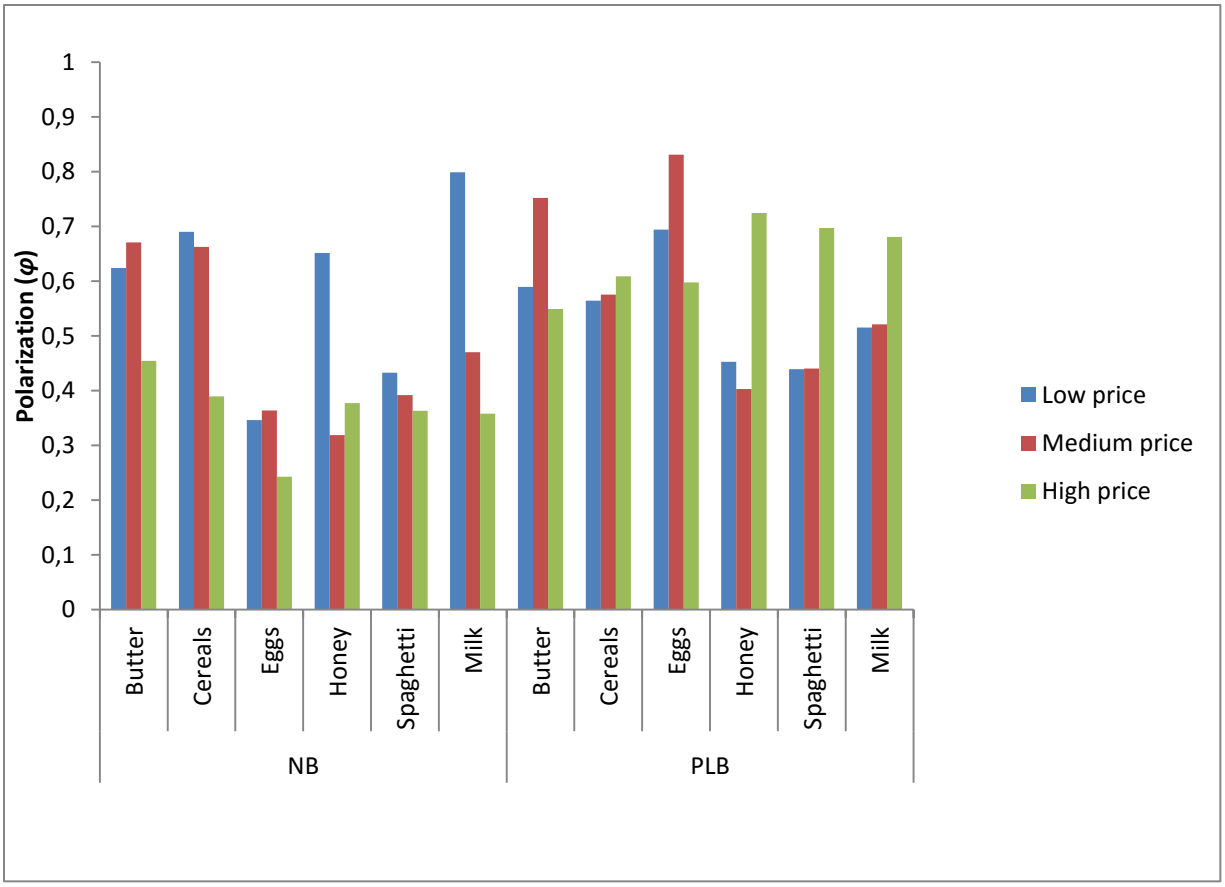

Figure 7: Polarization (φ) across NB and PLB for each price level across product categories.

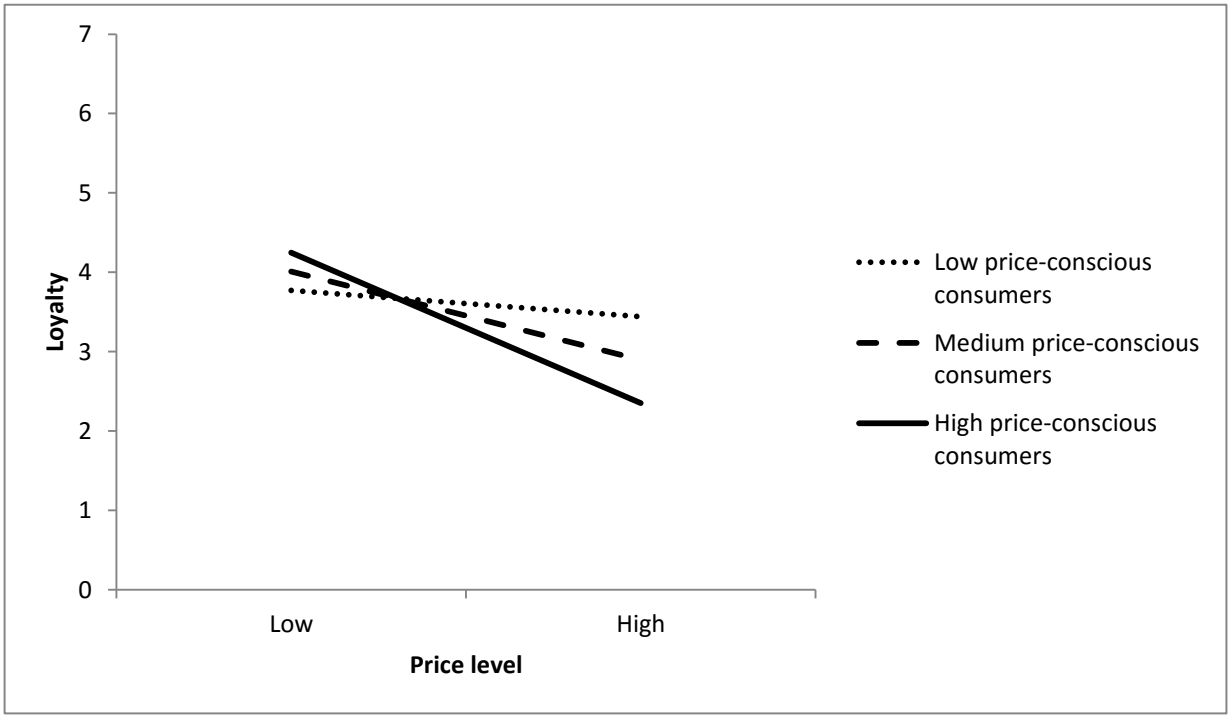

Figure 8: Brand loyalty for organic brands across price and price consciousness levels.

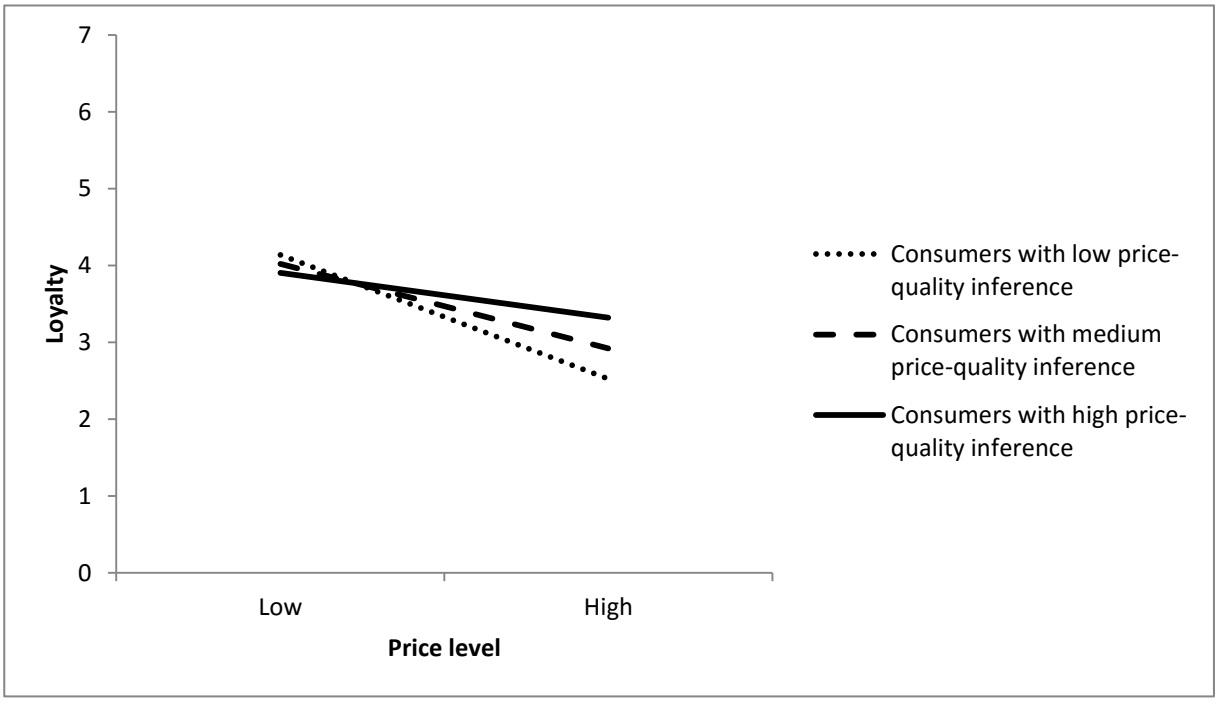

Figure 9: Brand loyalty for organic brands across price and price-quality inference levels.

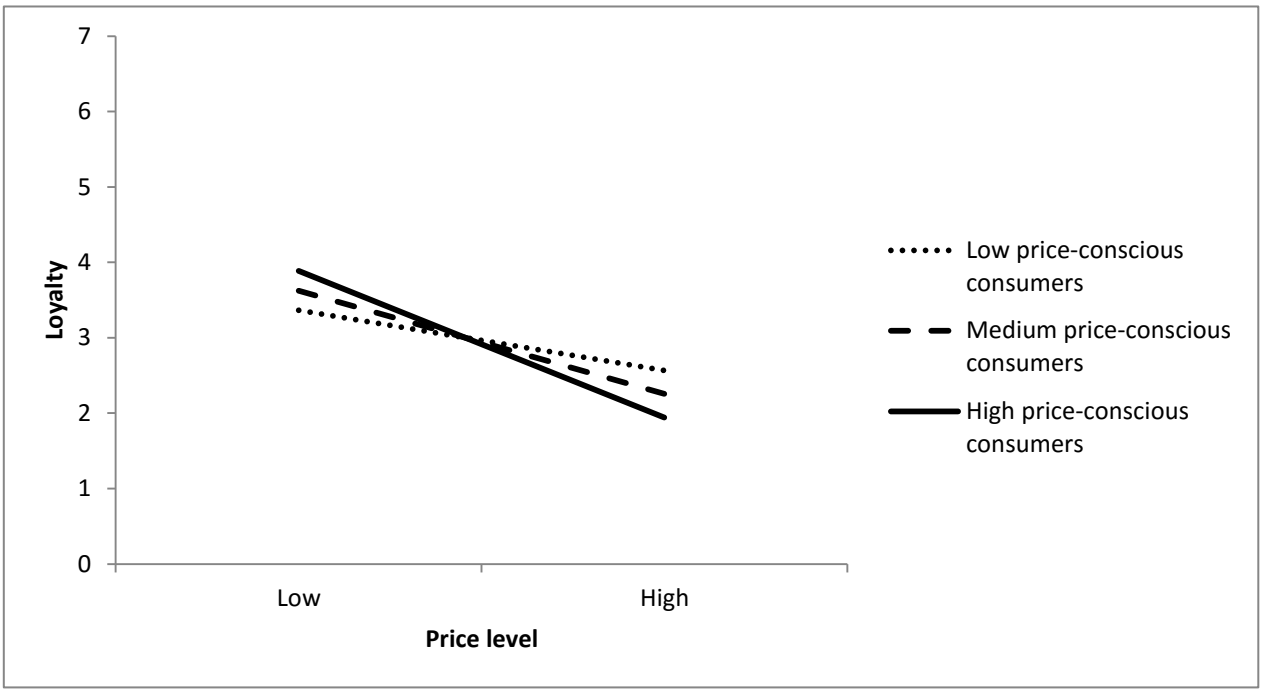

Figure 10: Brand loyalty for PLB across price and price consciousness levels.

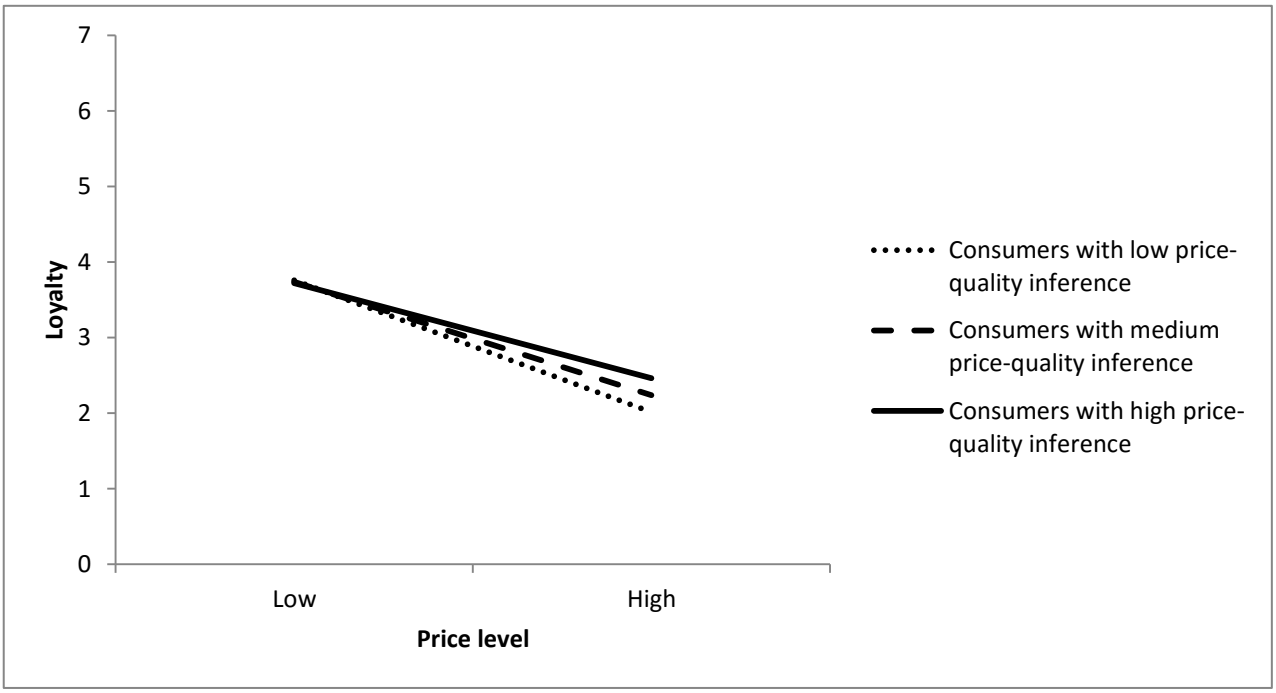

Figure 11: Brand loyalty for PLB across price and price-quality inference levels.

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Summary of the chapter

This paper studies the differentiated impact of price on brand loyalty for organic brands and PLB. It additionally investigates whether the impact on brand loyalty is moderated by price related consumer psychographics, such as consumers' price consciousness and price quality inference. We operationalize this paper with three studies. The first study tests the impact of price on brand loyalty according to the brand type using purchase data for 6 product categories over 6 years. We conducted two experiments with Danish consumers to further understand the reason behind this impact. These experiments enable us to check if price has a different impact on perceived quality for organic brands and PLB and to test the impact of consumers' psychographics. Our results using the purchase data show that price has a negative impact on brand loyalty for organic brands and a positive one for PLB. The effect of price thus diverges whether the brand exhibits a positive or a negative quality cue (i.e. organic brands or PLB). This effect is not replicated in the online experiments. We find that price has a negative impact on brand loyalty for both organic brands and PLB. When it comes to perceived quality, we do not find any effect for both organic brands and PLB. We also find that the effect of price is different across consumers as price conscious consumers react more negatively to an increase in price whereas consumers with high price-quality inference react more positively in terms of brand loyalty. These results are valid for both organic brands and PLB.

This study first provides theoretical contributions. We add to the understanding on the role of price on brand loyalty for brands displaying different quality cues (brands associated with higher quality, e.g. organic brands; and lower quality, e.g. PLB) We show that price has a different impact whether the brand is organic or PLB. We find that price has no impact on

perceived quality for both brand types (organic brands and PLB). Finally, we find that the impact of price differs across consumers. In terms of managerial contributions, these findings help brand managers better set a price that will enhance their brand loyalty and will provide help in the positioning of their brands. Finally, our findings on the role of price-related consumer psychographics help brand managers better target different types of consumers according to their reactions to price.

This study primarily focuses on marketing mix related-antecedents of brand loyalty. It also gives insights on the role of consumer-related characteristics in the formation of brand loyalty. These insights are however very small, they enlighten us solely on the role of price-related characteristics, leaving aside other types of consumers' characteristics. The role of these consumers' characteristics on the formation of brand loyalty is of primary importance. Consumers with different characteristics will have different levels of loyalty and different reactions to antecedents. Further study is necessary to assess the role of these characteristics and how they influence the formation of brand loyalty. Another limitation is that we treat consumer characteristics as a moderating effect and not as an antecedent. We also observe the direct impact of price on brand loyalty leaving aside the mediating effects that could exist. Studying mediating effects would enable us to further understand where brand loyalty comes from. Finally, the study only takes into account organic brands and PLB leaving aside another type of niche brands: organic PLB. These brands are only recent and are becoming more and more important in the market place. More research on them is therefore of great importance.

To fill these gaps, the final study takes an interest in the effect of consumer-related antecedents on the formation of brand loyalty. We investigate the direct and indirect impact of price consciousness, quality consciousness, perceived degree of quality variability in the

category and importance of organic labels on brand loyalty through perceived value for money. It enables us to consider consumers' characteristics that are not necessarily related to price perceptions thus extending further the understanding on consumer-related antecedents of brand loyalty. We also consider the role of perceived value for money which is a vital concept for retailers. Finally, this study investigates the role on consumer characteristics for three types of niche brands: organic brands, PLB and organic PLB.

Chapter 1: Introduction

Chapter 2: A Longitudinal Analysis of Brand Loyalty Evolution and the Impact of Product Category Characteristics

Chapter 3: A longitudinal empirical investigation toward the understanding of product category antecedents of brand loyalty

Chapter 4: The impact of price tiers on brand loyalty and the moderating role of brand quality cues

Chapter 5: The role of consumer characteristics and the mediating role of perceived value for money on the formation of loyalty for organic private label brands

Chapter 6: Conclusion

Chapter 5: The role of consumer characteristics and the mediating role of perceived value for money on the formation of loyalty for organic private label brands

Abstract

Retailers are introducing more and more organic private label (PLB). These brands convey two quality signals both positive and negative. These signals have an impact on consumers' perception and behaviors towards the brands. Understanding what signal prevails for consumers and for what type of consumers is thus of major importance for retailers and marketers. In this study, we investigate the direct and indirect impact of consumers' characteristics (e.g. price consciousness, quality consciousness, perceived quality variability in the category, importance of organic labels) through perceived value for money on brand loyalty for organic PLB. We also test it for organic national brands (NB) and PLB. This way, we provide a benchmark against which we can compare the effect of consumers' characteristics for organic PLB to others types of brands (i.e. PLB and organic NB) to see which signal prevails. We do it through an online experiment. Our results show that price consciousness has a negative impact on brand loyalty for organic NB while no impact for organic PLB and PLB. Quality consciousness has a positive impact on brand loyalty for organic NB and organic PLB and no impact for PLB. Perceived quality variability in the category has a positive impact on brand loyalty for PLB and no impact for the other types of brands. Finally, the importance of organic labels has a positive impact on brand loyalty for organic NB and organic PLB and a negative one for PLB. Theoretical and managerial implications are discussed.

Keyword: *Organic brands, private label brands, online experiment, brand loyalty, perceived value for money.*

I. Introduction.

Following the success of organic national brands (NB) and their growing importance in retail markets (Sahota, 2012), retailers have started to introduce organic brands under their own private label brand (PLB). These brands are on the rise and are exhibiting increasing market shares (Bauer, Heinrich, & Schäfer, 2013). Indeed, in the French retail market, among PLBs, organic PLB showed the strongest increase (+4.7%) in market share in 2015 (Nielsen, 2016). Organic PLB are a great opportunity for retailers as suggested by Bauer et al., (2013) who show that PLB benefit the most from an organic label compared to local, national and global brands.

Research shows that organic NB and PLB are brand types that convey different quality signals compared to regular brands, and these subsequently influence consumers' perception and behavior. First, organic NB are seen as high quality products (Yoo, Donthu, & Lee, 2000) commanding high levels of brand loyalty compared to conventional products (Marian, Chrysochou, Krystallis, & Thøgersen, 2014). Second, PLB are seen as being of lower quality (Nenycz-Thiel & Romaniuk, 2009; Nenycz-Thiel & Romaniuk, 2016) with consumers being more price sensitive to them compared to NB (Bergès, Hassan, & Monier-Dilhan, 2013). This association of low quality with PLB is true for all types of PLB including premium PLB (Nenycz-Thiel & Romaniuk, 2016). The above perceptions and behaviors also differ across consumers. Indeed, not every consumer reacts in the same way to PLB and organic NB compared to more regular brands (i.e. NB and conventional brands). Thus, the role of consumer characteristics, such as their psychographics, on their behavior towards and perception of brands is different across the different types of brands. This is particularly valid for organic NB and PLB. Consumers' perceptions of and behavior towards PLB are different compared to organic NB (Van Doorn & Verhoef, 2015; Sethuraman & Gielens, 2014). This

difference is particularly noticeable when it comes to perceptions of value for money and brand loyalty. For instance, various consumer characteristics such as intolerance for ambiguity, perceived quality variation in the product category and perceived risk of a purchase have been found to influence the perceived value for money of PLB (Richardson, Jain, & Dick, 1996). Perceived value for money and brand loyalty are especially important concepts for retailers as they are central to retail strategy (Richardson et al., 1996; Koschate-Fischer, Cramer, & Hoyer, 2014). However, while the impact of consumer characteristics for both types of brands has been studied, little is known about the effect of consumer characteristics towards organic PLB that convey both positive and negative quality signals. We want to fill this gap in this paper through studying the impact of consumer characteristics on the formation of brand loyalty for organic PLB. In addition to this direct impact, we also study whether this relationship is mediated by perceived value for money. Finally, we study how the formation of brand loyalty differs for organic PLB compared to organic NB and PLB.

We study perceived value for money as a mediator in the consumer characteristics-brand loyalty relationship, as this has been found to be a clear antecedent of consumers' buying behaviors (Richardson et al., 1996; Sweeney, Soutar, & Johnson, 1999). We focus on four consumer characteristics that play an important role on brand perception and consumer behavior: price consciousness (Lichtenstein, Ridgway, & Netemeyer, 1993), quality consciousness (Ailawadi, Neslin, & Gedenk, 2001), perceived quality variability in the product category (Batra & Sinha, 2000) and the importance of organic labels (Beatty & Talpade, 1994). We test the relationships for PLB, organic NB and organic PLB. In this way, we provide a benchmark against which we can compare the effect of consumer characteristics for organic PLB to other brand types (i.e. PLB and organic NB). This helps us to understand whether the positive or negative quality signal (from the organic label or PLB respectively)

has a more powerful effect on brand loyalty for organic PLB according to different consumer profiles. This could help managers to better use organic PLB and better plan their campaigns and target their customers.

In the next section we provide a literature review and describe our hypotheses. We then present our data and methodology followed by the results. We conclude with some implications and directions for future research.

II. Literature review.

As stated earlier, we study the formation of brand loyalty. Brand loyalty can be defined as a deeply held commitment to rebuy or re-patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts with the potential to cause switching behavior (Oliver, 1999). Brand loyalty is a concept that has been studied extensively in the literature (Dick & Basu, 1994; Chaudhuri & Holbrook, 2001; Pare & Dawes, 2012).

Research shows that organic NB enjoy high brand loyalty levels (Marian et al., 2014) and that consumers are more price sensitive for certain PLB than for NB (Bergès et al., 2013). This in turn, should lead to lower levels of brand loyalty for PLB. Research is scarce when it comes to organic PLB as no study has yet taken an interest in brand loyalty associated to this type of brands. Perceived value for money, namely the value of the product relative to the price (Richardson et al., 1996), is among the antecedents of brand loyalty. It is an important antecedent because a brand with a higher perceived value for money will trigger more loyal behaviors from its consumers. Perceived value for money is an interesting antecedent to take into account as retailers put particular emphasis on perceived value for money in their PLB

strategies (Richardson et al., 1996). A higher level of perceived value for money for their brands will lead to higher levels of PLB purchase and higher levels of brand loyalty. Studying this antecedent is thus essential. Consumers expect to get good value from organic brands despite their high price, whereas not all consumers consider PLB to be good value for money. Indeed, some organic consumers consider PLB to be poor value due to their low price (Richardson et al., 1996). For organic PLB, consumers exhibit the same levels of perceived hedonism, healthiness, environmental friendliness and food safety as for organic NB (Bauer et al., 2013). Perceived value for money is not used in that study but we should expect organic PLB to exhibit the same level of perceived value for money as organic NB.

The consumer characteristics (i.e. price consciousness, quality consciousness, perceived quality variability in the product category and the importance of organic) we study may impact not only brand loyalty but also perceived value for money. As perceived value for money is an antecedent of brand loyalty, we consider it as a mediator of the relation between these consumer characteristics and brand loyalty. Below, we review the hypotheses for each of the consumer characteristics (see Figure 1).

---Insert Figure 1 about here---

II.1. Price consciousness.

Price consciousness is defined as the degree to which a consumer focuses exclusively on paying low prices (Lichtenstein et al., 1993). Price conscious consumers are more likely to focus exclusively on low prices when they purchase products (Lichtenstein et al., 1993) and thus have different reactions to PLB and organic NB. They are further more likely to have positive attitudes and behaviors towards lower priced brands such as PLB and negative attitudes and behaviors towards higher priced organic NB (Van Doorn & Verhoef, 2015;

Sethuraman & Gielens, 2014; van Herpen, van Nierop, & Sloot, 2012). In the case of organic PLB, both product characteristics are present, so these consumers should exhibit an ambivalent reaction. However, Nenycz-Thiel, Sharp, Dawes, & Romaniuk (2010) show that consumers generalize the characteristics of one PLB onto other PLB. In this way, the low price characteristics of PLB are likely to be conveyed to organic PLB. Moreover, Ngobo (2011) shows that price conscious consumers are favorable to organic PLB because of their low price. Therefore, we expect a transfer of the low price positive impact of PLB to organic PLB pushing price conscious consumers to perceive better value for money and higher brand loyalty towards organic PLB, as compared to non-price conscious consumers. Hence:

H1: The direct impact of price consciousness on brand loyalty is (a) positive for PLB, (b) negative for organic NB and (c) positive for organic PLB.

H2: The impact of price consciousness through the mediating effect of perceived value for money on brand loyalty is (a) positive for PLB, (b) negative for organic NB and (c) positive for organic PLB.

II.2. Quality consciousness.

Quality consciousness is defined as the extent to which a consumer prefers to buy high quality products rather than to compromise on quality and buy at low prices (Ailawadi et al., 2001). Quality conscious consumers are more favorable to high quality products. The low quality signal of PLB thus has a negative impact on quality conscious consumers' perception and behaviors (Ailawadi, Pauwels, & Steenkamp, 2008). This opposite effect should be true for organic NB which are better perceived by quality conscious consumers (Van Doorn & Verhoef, 2015). As mentioned above a dual effect is presented by organic PLB as the brand conveys both negative and positive quality signals. There is a spillover effect for PLB in

terms of perceived quality (Szymanowski & Gijsbrechts, 2012), suggesting that consumers generalize the characteristics of one PLB to another (Nenycz-Thiel et al., 2010). Thus, we hypothesize that the association of low quality with PLB will be stronger that the association of high quality with organic NB, and that quality conscious consumers are less favorable to organic PLB than non-quality conscious consumers. Hence:

H3: The direct impact of quality consciousness on brand loyalty is (a) negative for PLB, (b) positive for organic NB and (c) negative for organic PLB.

H4: The impact of quality consciousness through the mediating effect of perceived value for money on brand loyalty is (a) negative for PLB, (b) positive organic NB and (c) negative for organic PLB.

II.3. Perceived quality variability in the category.

Perceived quality variability can be defined as the perceived likelihood of making a mistake by buying a product of low quality (Batra & Sinha, 2000). In product categories with low perceived quality variability, consumers are less afraid of making mistakes by purchasing a PLB (Batra & Sinha, 2000). Indeed, the degree of perceived risk increases with the increase of perceived quality variation across brands in a category (Narasimhan & Wilcox, 1998). Thus, low perceived quality variability in a category pushes consumers to purchase PLB (Batra & Sinha, 2000; Sethuraman & Gielens, 2014). On the other hand, organic NB sales are likely to be negatively impacted by low perceived quality variability in a product category, as their high perceived quality claim is lower. Consumers purchasing organic NB for their quality would thus be more tempted to switch to organic PLB because their perceptions and behaviors would be enhanced by a decrease in the perceived risk of making a mistake by buying these brands. Thus:

H5: The direct impact of low perceived quality variability in the product category on brand loyalty is (a) positive for PLB, (b) negative for organic NB and (c) positive for organic PLB.

H6: The impact of low perceived quality variability in the product category through the mediating effect of perceived value for money on brand loyalty is (a) positive for PLB, (b) negative for organic NB and (c) positive for organic PLB.

II.4. Importance of organic labels for consumers.

Importance of organic labels can be defined as consumers' ongoing sensitivity to organic labels (Beatty & Talpade, 1994). Some consumers are more sensitive to organic NB and attach more importance to their attributes as these NB have a higher intrinsic value than conventional brands (Bezawada & Pauwels, 2013). This higher intrinsic value can be explained by the benefits associated to organic NB such as superior taste, environmental-friendliness, health, food safety and animal welfare (Hughner, McDonagh, Prothero, Shultz, & Stanton, 2007). Consumers' perceptions and behaviors towards organic NB are thus likely to be positive while they are probably negative for PLB that do not convey such benefits. For organic PLB, the benefits conveyed by the organic label may push consumers sensitive to organic brands to consider them as better, compared to the way they are considered by consumers insensitive to organic labels. Thus:

H7: The direct impact on brand loyalty of the importance of organic labels for consumers is (a) negative for PLB, (b) positive for organic NB and (c) positive for organic PLB.

H8: The impact of the importance of organic labels for consumers through the mediating effect of perceived value for money on brand loyalty is (a) negative for PLB, (b) positive for organic NB and (c) positive for organic PLB.

III. Methodology.

III.1. Design.

We conducted an online experiment to test our hypotheses. The experiments were run as follows. Each respondent was exposed to a stimulus: a picture of an egg box presenting a PLB, an organic NB or an organic PLB. One third of our respondents were exposed to PLB, one third to organic NB, and one third to organic PLB. Prior to the experiment, we asked respondents to give an average price for the type of brand they were exposed to. We then used this declared average price for the experiments. We thus avoided biases in price such that each respondent would be considering a product whose price seemed fair. The respondents were French consumers. As stated, the tested product category was eggs since eggs are a common purchase. Eggs are also one of the most frequently purchased organic products in France (Toluna, 2015; IRI, 2015) where organic PLB are well represented.

We then measured perceived value for money and brand loyalty for the product respondents were exposed to as well as the characteristics of these consumers. The measures of consumer characteristics (i.e. price consciousness, quality consciousness, perceived quality variability in product category, importance of organic labels) were our independent variables and are summarized in table 1. Our dependent variables were perceived value for money (Sweeney et al., 1999) and brand loyalty (Chaudhuri & Holbrook, 2001, see Table 1). We focused more specifically on repurchase loyalty (Chaudhuri & Holbrook, 2001) as we are more interested in the act of repurchasing than in the attitudinal side of brand loyalty. On this

specific point, a potential concern with this experimentation was that brand loyalty may prove difficult to measure especially for a fictional brand. However, we placed respondents in a purchasing scenario in which they would find it easy to project themselves. We thus reduced the biases associated with this method and therefore did not believe it to be a source of problems.

---Insert Table 1 about here---

III.2. Data collection and analytical procedures.

641 French consumers took part in the experiment. 215 respondents were exposed to the PLB condition, 214 were exposed to the organic NB condition and 212 were exposed to the organic PLB condition. 56.4% of the respondents were female, 35.3% had children at home and the sample mean age was 34.

During the scale validation process, three items of the price consciousness scale had to be removed. The results then offered satisfactory reliability (Cronbach's alpha and Joreskog rho greater than 0.7). To check for convergent validity, we computed the average variance extracted (AVE) for each of the scales. Each of them was equal to or above 0.5 which suggests a satisfactory convergence (Fornell & Larcker, 1981, see Table 2). Finally, we assessed discriminant validity by comparing the AVE for each scale to the squared correlations between them. In each case, the AVE was greater than the squared correlation showing evidence of discriminant validity (Jiménez & Voss, 2014).

---Insert Table 2 about here---

To test our hypotheses, we considered the three groups of respondents separately (i.e. the PLB group, the organic NB group and the organic PLB group). We then tested the impact

of consumer characteristics one by one for each of the three groups using the Hayes SPSS macro PROCESS (Hayes, 2013). This macro enabled us to test the direct effect of consumer characteristics and the mediating effect of perceived value for money on brand loyalty. Bootstrapping (N=5000 samples) with bias corrected for indirect effects was used. To test the significance of our estimates we checked the bootstrapped 90% confidence interval (CI) of the estimate. If this did not include 0, the effect was significant. We compared confidence intervals to compare the strength of the relationships of two different groups of respondents.

IV. Results.

Table 2 presents the results across groups of respondents. We first test the difference in perceived value for money and brand loyalty across respondents' groups. An analysis of variance shows that perceived value for money is significantly different depending on brand types ($F(2, 637)=6.76$, $p=.001$). Specifically, a Scheffe pairwise comparison test shows that organic PLB (M=3.95, SD=1.49) have higher perceived value for money than conventional PLB (M=3.59, SD=1.52) and organic NB (M=4.12, SD=1.52) also have higher perceived value for money than conventional PLB. We find no significant difference in perceived value for money between organic NB and organic PLB. Then, a second analysis of variance shows that brand loyalty is significantly different depending on brand type ($F(2, 637)=11.38$, $p<.000$). Specifically, a Scheffe pairwise comparison test shows that consumers are more loyal to organic PLB (M=3.84, SD=1.72) than to conventional PLB (M=3.12, SD=1.71) and consumers are also more loyal to organic NB (M=3.75, SD=1.64) than to conventional PLB. Finally, there is no significant difference in brand loyalty between organic NB and organic PLB. Thus, organic PLB display the same level of perceived value for money and brand loyalty as organic NB and a higher level than conventional PLB. Finally, an analysis of variance shows that there is no significant difference in price consciousness, quality

consciousness, perceived quality variability and importance of organic labels across the three groups of respondents.

We then test our hypotheses concerning the consumer characteristics for each of the three groups of respondents using Hayes macro PROCESS. We start with the results for price consciousness. For PLB, the direct effect of price consciousness on brand loyalty is not significant: we reject H1a (see Table 3). The same finding goes for the organic NB and organic PLB groups with no significant effect of price consciousness on brand loyalty which makes us reject H1b and H1c (see Table 4 and Table 5). When it comes to the indirect effect, price consciousness has no significant indirect effect on brand loyalty. We thus reject H2a. For the organic NB group, we find a negative indirect effect for the organic NB group. We thus confirm H2b. Finally, we find no significant indirect effect for organic PLB which makes us reject H2c.

For quality consciousness, we do not find any significant direct effect for PLB: we reject H3a. We do however find a significant positive direct effect for the organic NB group which confirms H3b. Finally, for the organic PLB group we find a positive direct effect of quality consciousness on brand loyalty: H3c is rejected. Coming to the indirect effect, we do find any significance for the PLB group. We therefore reject H4a. Quality consciousness has a positive indirect impact on brand loyalty through a mediating effect of perceived value for money for the organic NB group: we confirm H4b. Finally, we find no significant indirect effect of quality consciousness on brand loyalty for the organic PLB group: we thus reject H4c.

We find a positive direct impact of perceived quality variability in the category on brand loyalty for the PLB group. We thus confirm H5a. We find no significant effect for the

organic NB and the organic PLB groups thus making us reject H5b and H5c. For the PLB group, we find a positive indirect effect of perceived quality variability in the category on brand loyalty through a mediating effect of perceived value for money: we thus confirm H6a. Perceived quality variability in the category has however no significant indirect impact for the organic NB group; we reject H6b. In a similar way, we find no significant indirect effect of perceived quality variability on the category for the organic PLB group: we thus reject H6c.

Finally, for the PLB group we find a negative direct effect of the importance of organic labels on brand loyalty thus confirming H7a. We find no significant effect for the organic NB group. Thus we reject H7b. For the organic PLB group the direct effect is significantly positive which confirms H7c. For the PLB group we have a negative indirect effect of the importance of organic label brand loyalty through a mediating effect of perceived value for money, thus H8a is confirmed. The importance of organic labels has a positive indirect significant effect on brand loyalty for the organic NB group; we thus confirm H8b. Finally, we have the same finding for the organic PLB group with a significant indirect effect on brand loyalty, which confirms H8c.

---Insert Table 3 about here---

---Insert Table 4 about here---

---Insert Table 5 about here---

As we find the same type of effect (i.e. positive) for the importance of organic labels for the organic NB and the organic PLB group of respondents, we test whether these effects are stronger for any of the brand types. To do this, we look at confidence intervals. When it comes to the effect of the on the importance of organic labels perceived value for money, the

confidence interval for organic NB is [0.08; 0.21] while it is [0.01; 0.17] for organic PLB. The confidence intervals overlap meaning that both these effects have the same strength.

V. Discussion.

Overall, our results shed light on the impact on consumer characteristics of the formation of brand loyalty through perceived value for money for different brand types. More specifically, it adds to the existing theory by testing consumers' perceived value for money and brand loyalty toward a product conveying two opposite quality signals (i.e. PLB, organic NB/ organic PLB). It contributes to existing theory (Bauer et al., 2013) by testing how different groups of consumers react to this type of brand and if consumer behavior towards organic PLB is closer to their behavior towards PLB or to their behavior towards organic NB. This study offers theoretical and managerial implications.

Our first finding is that price consciousness had no significant effect on value for money and brand loyalty for organic PLB. Thus, price conscious consumers would not be more favorable to organic PLB than non-price sensitive consumer. The same result also applies to PLB for which price consciousness had no effect on value for money and brand loyalty. This result contrasts with existing literature where price conscious consumers are more favorable to PLB (Sethuraman & Gielens, 2014). A possible explanation could be linked to the development of premium tier PLB whose price is on the same level as NB (ter Braak, Geyskens, & Dekimpe, 2014). The high price of these premium tier PLB could have helped close the perceived gap in price between PLB and NB and thus reduce the favorable opinion price conscious consumers have of PLB. We find however, a negative effect of price consciousness on value for money and brand loyalty for organic NB. This suggests that adding an organic label a brand does not convey the low price signal associated with PLB but

rather creates a brand that attracts both price and non-price conscious consumers. This is an interesting result as it enables retailers to widen their potential customer base in the process.

Quality consciousness has a positive direct impact on brand loyalty for organic PLB. Consumers who care about quality when they purchase have better attitudes and perceptions towards organic PLB than those who are not quality-conscious. This effect is also positive for organic NB, in line with the existing literature (Van Doorn & Verhoef, 2015). There is nevertheless a difference since quality consciousness only has a direct positive impact on brand loyalty for organic PLB with no mediating impact of perceived value for money, whereas perceived value for money does have a mediating effect for organic NB. For PLB we do not find any significant effects of quality consciousness on either value for money or brand loyalty; this is not in line with the literature that holds that quality conscious consumers usually perceive PLB in a more negative light (Sethuraman & Gielens, 2014). A possible explanation for this is the fact that PLB are seen as good quality products in France and that the perceived quality gap between PLB and NB is getting smaller and smaller (Nenycz-Thiel & Romaniuk, 2016). In terms of implications, it shows that adding an organic label to PLB helps retailers to improve the brand image and attract quality conscious consumers who are not attracted to regular PLB. The assertion of high quality associated with organic labels is transmitted to organic PLB and appears to overcome the low quality signaled by PLB.

Perceived quality variability in product category has no influence on organic PLB value for money and brand loyalty. This result is the same for organic NB. However, for PLB, perceived quality variability does have a positive impact on value for money and brand loyalty. While the result for PLB is in line with the literature (Batra & Sinha, 2000) Sethuraman & Gielens, 2014) it shows that adding an organic label might also have negative

repercussions on a product by cancelling out some of the beneficial effect associated with PLB. This means that selling organic PLB in product categories with low perceived differences in quality among brands, may not be as beneficial as selling such products in product categories with high perceived differences in quality.

Finally, as expected, the importance consumers attribute to organic labels positively impacts value for money and brand loyalty for organic PLB. This effect is positive on value for money for organic NB and negative on value for money and brand loyalty for PLB. Thus, the values of organic labels that attract organic-conscious consumers are transmitted to organic PLB. This is good news for retailers as it shows that even core buyers of organic brands will have a more positive perception of organic PLB and will thus be more loyal to them.

If we look at the strengths of the effects that are similar for organic PLB and organic NB (i.e. the effects of the importance consumers attribute to organic labels) we find that these effects are of the same magnitude for both these brand types. This is in line with the literature that finds that adding an organic label enhances PLB perception to the same level as organic NB (Bauer et al., 2013). Our study takes this conclusion further by showing that it is also true when we consider the impact of consumer characteristics on the formation of brand loyalty. Overall, the literature shows that adding an organic label may be strategic for PLB because it allows PLB to reach organic levels in terms of brand perception and behavioral purchase intention (Bauer et al., 2013). When considering different groups of consumers to see which is most receptive to this effect, we see that it also a good strategy to combine the beneficial effects derived from both label types. This is not in line with the existing literature that holds

that PLB characteristics are transferred to organic PLB and instead, we find that organic NB characteristics predominate (Nenycz-Thiel et al., 2010).

Our findings give insights for retailers as to the pertinence of introducing organic PLB in their stores. Organic PLB display levels of value for money and brand loyalty similar to those of organic NB. Moreover, the positive impact of certain consumer characteristics on PLB (such as perceived variability in the category) is not transferred onto organic PLB. This means that certain consumers see organic PLB more as NB than as PLB. However, this may not fit with every retailer‘s image and positioning, especially in the case of retailers focusing on low price and savings. Ngobo (2011) shows that retailers' private label strategy has to take into account whether the store attracts more small PLB buyers or big PLB buyers. This implies that for stores with more big PLB buyers (who are attracted to low prices; Sethuraman & Gielens, 2014), introducing organic PLB may not be a good idea as it will impact the retailer's image and positioning and push these consumers to shop elsewhere. On the other hand, it would be a good idea to introduce organic PLB in stores with more small PLB buyers who would consider buying organic PLB more easily. Organic PLB also provides retailers with another way of attracting new consumers by selling alternative high-end products. This provides an alternative to conventional premium PLB and enables retailers to attract consumers who wish to purchase organic products.

Finally, our findings give insights for retailers wishing to sell organic PLB on how to improve their promotion. They can now better identify the consumers who will be the most receptive to organic PLB such as quality-conscious consumers and consumers who value organic produce. A good promotion campaign should focus on these consumers. Moreover, the indirect effect of consumers' sensitivity to organic through value for money means that in

their strategy to promote organic PLB, retailers should focus on the high value for money of organic PLB. They should focus on the benefits of buying organic products and show that they sell organic PLB at reasonable prices. This will enable them to increase brand loyalty of such products.

VI. Limitations and future research.

Our study is not exempt from limitations that define avenues for future research. The declarative nature of our data may be a problem. Indeed, the gap between declarative data and actual behaviors could cause some bias. This is especially true since we measure repurchase behaviors. A follow-up study could test this using actual purchase data even though organic PLB are not sufficiently widespread and obtaining enough data may prove troublesome. This study could also be replicated in other countries to see if our results can be generalized. Indeed, this would enable us to establish sound generalizations of our findings.

Scale	Items*
Brand loyalty (Chadhuri & Holbrook, 2001)	I will buy this brand the next time I buy eggs. I intend to keep purchasing this brand.
Perceived value for money (Sweeney et al., 1999)	This merchandise represents good value for money At the price shown, this merchandise is economical These products are a good buy
Price consciousness (Lichtenstien et al. 1993)	I am not willing to go to extra effort to find low prices (r) I will shop at more than one store to take advantage of low price The money saved by finding low prices is usually not worth the time and effort. (r) I would never shop at more than one store to find low prices (r) The time it takes to find low prices is usually not worth the effort (r) I typically seek out cheap retail outlets to buy products for the house
Quality consciousness (Ailawadi et al., 2008)	I always strive for the best quality Sometimes, I save money on groceries by buying products of lower quality (r) Quality is decisive for me while buying a product
Perceived quality variability in the category (Batar & Sinha, 2000)	All brands of eggs are basically the same in quality. I don't think that there are any significant differences among different brands of eggs Egg brands do not vary a lot in terms of quality. There are only minor variations among brands of eggs in terms of quality.

Importance of organic labels (adapted from Beatty & Talpade, 1994)	Overall, I am very interested in organic food
	Organic food is very important to me
	Organic food means a lot to me
	Organic food is relevant to me

Table 17: Scales details.

*All items are measured on a 7-likert scale with 1: strongly disagree and 7: strongly agree

Factors	Mean (SD)					
	PLB	**Organic NB**	**Organic PLB**	**Cronbach's alpha**	**Joreskog's Rho**	**Average variance extracted**
Brand loyalty	3.12 (1.71)	3.75 (1.64)	3.84 (1.72)	0.95	0.95	0.89
Perceived value for money	3.59 (1.52)	4.12 (1.52)	3.95 (1.49)	0.88	0.88	0.76
Price consciousness	3.47 (1.24)	3.62 (1.18)	3.63 (1.26)	0.73	0.75	0.52
Quality consciousness	5.07 (1.41)	5.18 (1.36)	5.09 (1.39)	0.70	0.75	0.52
Perceived quality variability in the category	3.50 (1.79)	3.34 (1.77)	3.46 (1.83)	0.94	0.94	0.79
Importance of organic labels	3.69 (1.62)	3.82 (1.77)	3.99 (1.82)	0.95	0.95	0.83

Table 18: Descriptive statistics and reliability and convergence indicators for each scale.

Effect	Point estimates[1]	90% CI SE	LB	UB
Price consciousness				
Direct effect on brand loyalty	0.00	0.07	-0.12	0.12
Direct effect on value for money	0.05	0.07	-0.07	0.17
Indirect effect on brand loyalty through value for money	0.04	0.05	-0.05	0.13
Quality consciousness				
Direct effect on brand loyalty	-0.10	0.06	-0.20	0.01
Direct effect on value for money	-0.04	0.07	-0.16	0.08
Indirect effect on brand loyalty through value for money	-0.03	0.06	-0.14	0.06
Perceived quality variability in the category				
Direct effect on brand loyalty	0.10*	0.05	0.02	0.19
Direct effect on value for money	0.18*	0.06	0.09	0.28
Indirect effect on brand loyalty through value for money	0.13*	0.04	0.06	0.20
Importance of organic labels				
Direct effect on brand loyalty	-0.15*	0.05	-0.24	-0.06
Direct effect on value for money	-0.16*	0.06	-0.27	-0.06
Indirect effect on brand loyalty through value for money	-0.12*	0.05	-0.20	-0.04

Table 19: Bootstrap estimates for the direct and indirect effects of consumers' characteristics on brand loyalty for PLB.

CI=confidence interval; LB=lower bound; UB=upper bound.

* p<.1

[1]The point estimates are unstandardized estimates.

Effect	Point estimates[1]	90% CI SE	LB	UB
Price consciousness				
Direct effect on brand loyalty	-0.07	0.06	-0.17	0.03
Direct effect on value for money	-0.16*	0.08	-0.29	-0.03
Indirect effect on brand loyalty through value for money	-0.10*	0.05	-0.19	-0.02
Quality consciousness				
Direct effect on brand loyalty	0.13*	0.07	0.03	0.24
Direct effect on value for money	0.15*	0.08	0.02	0.28
Indirect effect on brand loyalty through value for money	0.10*	0.05	0.02	0.18
Perceived quality variability in the category				
Direct effect on brand loyalty	0.01	0.05	-0.08	0.09
Direct effect on PVFM value for money	-0.02	0.06	-0.12	0.08
Indirect effect on brand loyalty through PVFM	-0.01	0.04	-0.08	0.06
Importance of organic labels				
Direct effect on brand loyalty	0.09	0.06	-0.01	0.18
Direct effect on value for money	0.22*	0.06	0.12	0.32
Indirect effect on brand loyalty through value for money	0.14*	0.04	0.08	0.21

Table 20: Bootstrap estimates for the direct and indirect effects of consumers' characteristics on brand loyalty for organic NB.

CI=confidence interval; LB=lower bound; UB=upper bound.

* p<.1

[1]The point estimates are unstandardized estimates.

Effect	Point estimates[1]	90% CI SE	LB	UB
Price consciousness				
Direct effect on brand loyalty	-0.02	0.05	-0.11	0.07
Direct effect on value for money	0.04	0.07	-0.08	0.16
Indirect effect on brand loyalty through value for money	0.03	0.06	-0.07	0.13
Quality consciousness				
Direct effect on brand loyalty	0.10*	0.06	0.01	0.20
Direct effect on value for money	0.09	0.07	-0.03	0.21
Indirect effect on brand loyalty through value for money	0.07	0.06	-0.03	0.18
Perceived quality variability in the category				
Direct effect on brand loyalty	-0.02	0.05	-0.09	0.06
Direct effect on value for money	-0.03	0.06	-0.12	0.06
Indirect effect on brand loyalty through value for money	-0.02	0.05	-0.10	0.06
Importance of organic labels				
Direct effect on brand loyalty	0.14*	0.05	0.05	0.22
Direct effect on value for money	0.11*	0.06	0.01	0.22
Indirect effect on brand loyalty through value for money	0.09*	0.05	0.01	0.17

Table 21: Bootstrap estimates for the direct and indirect effects of consumers' characteristics on brand loyalty for organic PLB.

CI=confidence interval; LB=lower bound; UB=upper bound.

* p<.1

[1]The point estimates are unstandardized estimates.

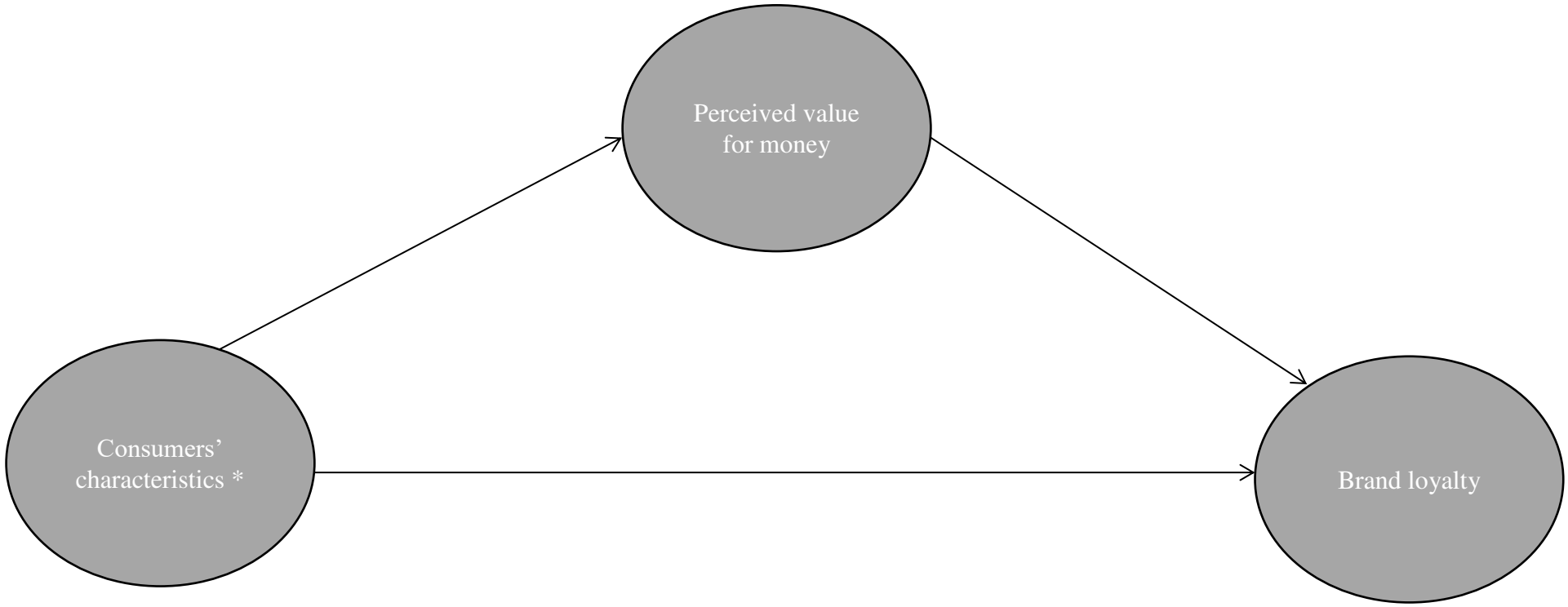

Figure 12: Conceptual framework tested for every brand type.

*e.g. Price consciousness, quality consciousness, perceived quality variability in the category and importance of organic labels.

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Chapter 1: Introduction

Chapter 2: A Longitudinal Analysis of Brand Loyalty Evolution and the Impact of Product Category Characteristics

Chapter 3: A longitudinal empirical investigation toward the understanding of product category antecedents of brand loyalty

Chapter 4: The impact of price tiers on brand loyalty and the moderating role of brand quality cues

Chapter 5: The role of consumer characteristics and the mediating role of perceived value for money on the formation of loyalty for organic private label brands

Chapter 6: Conclusion

Chapter 6: Conclusion

The problematic we examined in this Ph.D. study was as follows: the long-term impact of product category, marketing mix and customer-related antecedents of brand loyalty in light of the proliferation of niche brands. This Ph.D. research therefore takes an interest in the antecedents of brand loyalty. We contribute in the following ways:

We primarily look at the proliferation and moderating effect of two types of niche brands: PLB and organic brands. We further check whether brand loyalty evolves at an aggregate level. This research enables us to close gaps in the literature and contributes to the global knowledge on brand loyalty antecedents. Specifically, we assess the impact of the level and of the evolution trends of number of SKUs, the category purchase frequency, the category penetration, the repertoire size and the share of PLB on brand loyalty evolution (study 1). We also test the direct impact of the number of SKUs, the category purchase frequency and the category penetration on brand loyalty in a product category. We furthermore test the effect of the share of PLB and its moderating effect on brand loyalty as well as the interaction effect between category penetration and category purchase frequency (study 2). We then assess the moderating effect of these niche brands on the effect of price on brand loyalty (study 3). Finally, we test the effect of consumers' characteristics on the formation on brand loyalty depending on the type of niche brand (i.e. PLB, organic brands and organic PLB; study 4). This gives us three types of contributions: theoretical, methodological and managerial. We present them in detail hereafter.

I. Contributions of the Ph.D. research.

I.1. Theoretical contributions.

I.1.1. The impact of product category–related antecedents on brand loyalty.

The first theoretical contribution concerns the impact of product category–related antecedents. We assess two different aspects: the effect of the level of product category–related antecedents on brand loyalty evolution and their direct impact on brand loyalty.

I.1.1.1. The effect of their level and trend on brand loyalty evolution.

Product categories displaying different levels of product category–related antecedents do not exhibit similar brand loyalty evolution trends. More specifically, if a product category displays high levels of category purchase frequency, category penetration and repertoire size brand loyalty will decrease. Conversely, if a product category displays low levels of category purchase frequency, category penetration and repertoire size brand loyalty will increase. The effect of category purchase frequency is in line with Ehrenberg's (1988) findings that show that the more frequently consumers purchase in a product category, the more likely they are to switch products. The effect of category penetration is also in line with the literature as Narasimhan et al. (1996) showed that in product categories with a larger pool of consumers there is likely a higher number of brand switchers that will decrease brand loyalty. Finally, the findings on repertoire size agree with previous findings (Dawes et al., 2015). Thus, in product categories with increasing brand loyalty, consumers exhibit less variety-seeking behavior. We find no effect of SKUs on brand loyalty evolution trends. This is not in line with previous literature (Bawa et al., 1989; Dawes et al., 2015). Product categories with increasing and decreasing brand loyalty evolution thus display the same level of SKUs. We also investigate the evolution of product category–related antecedents across product categories with different

brand loyalty evolution trends. We find that product categories that exhibit increasing loyalty have stronger decreased rates of repertoire size and category penetration than product categories with decreasing loyalty. This is not the case for SKUs for which the rates are the same. Finally, the decreased rate of category purchase frequency is stronger for product categories with decreasing loyalty.

I.1.1.2. The direct effect on brand loyalty.

First, unlike what we found in a previous study, the number of SKUs has a negative impact on brand loyalty. This is in line with previous literature (Bawa et al., 1989; Dawes et al., 2015) that shows that the more consumers' choices increase the less loyal consumers are. This finding indicates variety-seeking behavior (Chintagunta, 1998). As stated, this effect is different compared to the one we find regarding the effect of the level of SKUs on brand loyalty evolution. One possible explanation is the following: Consumers are used to the level of SKUs in a specific product category and thus have adapted their buying habits to it. The actual level of product category antecedents then may not trigger any change in buying behaviors and, in turn, will not trigger any changes in brand loyalty. However, when the number of SKUs increases or decreases in a product category, this variation creates a shock to which consumers react. They thus will modify their buying behaviors, which, in turn, will impact brand loyalty.

Second, we show that category penetration has a negative impact on brand loyalty. This finding is in line with previous research (Narasimhan et al., 1996). The more consumers buy from a product category, the higher the probability that these consumers are variety seekers and opportunists and thus are less loyal. The brand loyalty of these consumers in the product category will decrease.

Third, we find that category purchase frequency has a positive impact on brand loyalty. As previous research showed, higher purchase frequencies in the category decrease variety-seeking behavior and increase repeat purchases (Van Tripj, Hoyer, & Inman, 1996). Consumers are also less likely to purchase unplanned products in frequently purchased categories (Inman et al., 2009). This result contrasts with the finding that the level of category purchase frequency has a negative impact on brand loyalty evolution. A possible explanation for this ambiguous result is that in a product category with a high level of category purchase frequency consumers have more possibilities to switch when they purchase thus decreasing overall brand loyalty (Ehrenberg, 1988). This may explain the findings we get when we study the effect of the level of category purchase frequency. When it comes to the effect of an increase in purchase frequency, the literature shows that when consumers start buying more frequently in a product category they establish more habitual processes (Ji & Wood, 2007). This makes consumers stick more to products and brands they appreciate and that better match their tastes and needs. Thus, an increase in category purchase frequency has a positive effect on brand loyalty.

We finally find a negative interaction effect between category penetration and category purchase frequency. This means that in a product category with a higher category penetration the positive effect of category purchase frequency on brand loyalty is lower. In product categories with high penetration, consumers' tastes are more varied, and thus, an increase in consumers' purchase frequency makes them purchase more various products than in a product category where penetration is lower and consumers' tastes are less varied. Thus, higher category penetration means more consumers are variety seekers and opportunists and thus are less loyal, which, in turn, decreases the positive effect of category purchase frequency on brand loyalty (Narasimhan et al., 1996).

I.1.2. The effect of PLB proliferation on brand loyalty.

The first two studies also provide findings for the effect of the proliferation of PLB on markets. First, the level of the share of PLB has no impact on brand loyalty evolution. We find that product categories whose brand loyalty decreases have the same share of PLB compared to product categories whose brand loyalty increases. However, we find that product categories with increasing loyalty display a stronger positive rate of growth of share of PLB than product categories with decreasing loyalty.

We also find a direct impact of the share of PLB on brand loyalty in a product category. An increase in PLB share has a U-shaped impact on brand loyalty. Thus, at first the higher the PLB share in a category, the lower the brand loyalty. After a certain level, the opposite happens: the higher the PLB share in a category, the higher the brand loyalty. One possible explanation behind this result is that, at first, when PLB are introduced consumers' preferences might switch from the brand to price, and thus, consumers become less loyal to the brands in the product category. After a certain point, however, PLB monopolize the product category, and consumers may become more loyal due to this concentration. Our study thus confirms a never empirically tested supposition in previous research stating that PLB might be a possible reason for brand loyalty decline (Dekimpe, Steenkamp, Mellens, & Vanden Abeele, 1997; Dawes et al., 2015). We further contribute to the literature by showing the U-shape of this effect. We assess the moderating effect of the share of PLB on the effect of product category–related antecedents of brand loyalty. In categories with a higher share of PLB, the negative effect of SKUs is enhanced, and the positive effect of category purchase frequency is decreased. Consumers of categories with a high PLB share may be more likely to buy based on a deal as their price loyalty is higher than in markets with a low share of PLB (Mela et al., 1998).

The difference in effect between a change in the PLB share and the effect of the level could be explained by the same reasons as for SKUs. Consumers may have established habit processes for the level of PLB in a product category meaning that the actual level of the PLB share does not trigger any changes in brand loyalty. However, an increase or decrease in the PLB share will make consumers react and modify their buying behaviors which will ultimately impact brand loyalty in a product category.

I.1.3. The effect of PLB and organic brands' signals on the effect of price on brand loyalty.

For the effect of niche brands, we find that price has a different effect on brand loyalty depending on the type of niche brand. Price is a very complex marketing mix antecedent as it has a dual effect on consumers' perception and behaviors as a cost (Lichtenstein, Ridgway, & Netemeyer, 1993) and as a quality cue (Yoo, Donthu, & Lee, 2000). Thus, depending on other quality cues associated with the product, one of the effects may dominate. We show that for PLB that display a negative quality cue the positive signal of price is the most important, and thus, price has a positive impact on brand loyalty. In the case of a product that display positive quality cues (i.e., an organic brand), the negative effect of price is predominant, and thus, price has a negative impact on brand loyalty. This further adds knowledge to the existing theory of price and helps better understand its effect for these two increasingly important types of brands.

However, this effect is not the same across consumers. When consumers are price conscious, price has a stronger negative effect on brand loyalty for organic brands and PLB than when consumers are non-price conscious. This finding is in line with literature showing that for price-conscious consumers paying more constitutes a burden (Lichtenstein et al., 1993). We further find that for consumers whose price-quality inference is high price has a

weaker negative effect on brand loyalty for organic brands and PLB compared to the effect for consumers whose price-quality inference is low. The effect of price as a cost is weaker for consumers with high price-quality inference, and this effect thus impacts their behaviors less.

I.1.4. The effect of consumers' characteristics on brand loyalty.

We study the role of consumers' characteristics in the formation of brand loyalty. We examine their direct effect and their mediating effect through perceived value for money for several types of brands: PLB, organic NB and organic PLB. This leads to several theoretical findings for customer-related antecedents of brand loyalty. It also adds to the existing literature by studying organic PLB, as well as studying the mediating role of perceived value for money. This type of brand is on the rise, and consumers' perception of and behaviors toward this type of brand has been scarcely studied thus far in the literature. Organic PLB also combines two opposite signals of quality (positive and negative) meaning that there is an ambivalent effect for consumers. We help better understand how consumers react to it. Finally, we help understand whether the effect associated with organic PLB comes closer to PLB or organic NB by comparing the effect to the effects on these brands. This helps refine the knowledge of consumers' perception when they confronted by several ambivalent quality signals.

We find that price consciousness has no significant effect on brand loyalty for organic PLB. Thus, price-conscious consumers would not have a more favorable reaction in terms of brand loyalty to organic PLB than consumers who are not price conscious. The same result also applies to PLB for which price consciousness has no effect on brand loyalty. This result contrasts with existing literature that finds price-conscious consumers have a more favorable reaction to PLB (Sethuraman & Gielens, 2014). However, we find a negative effect of price

consciousness for organic brands. This finding suggests that with organic PLB the low price claim associated with PLB is not conveyed which makes it a product that attracts indifferent price- and non-price-conscious consumers. Quality consciousness has a positive direct impact on brand loyalty for organic PLB. Consumers who care about quality when they purchase have better attitudes toward and perceptions of organic PLB than others. This effect is positive for organic NB as well, which is in line with the literature (Van Doorn & Verhoef, 2015). For PLB, we do not find any significant effect. This is not in line with the literature as quality-conscious consumers usually view PLB badly (Sethuraman & Gielens, 2014). Perceived quality variability in the category does not have any influence on brand loyalty for organic PLB. This result is the same as for organic NB. Perceived quality variability has a positive impact for PLB. Although the result for PLB is in line with the literature (Batra & Sinha, 2000; Sethuraman & Gielens, 2014), the result shows an organic label might also have negative repercussions on organic PLB as the label can cancel out some beneficial effect associated with conventional PLB. Finally, as expected, the importance consumers attribute to organic labels has a direct positive impact on brand loyalty for organic PLB, as well as an indirect impact. This indirect effect is positive as well for organic NB and is negative for PLB. Thus, the values of organic labeling that attract consumers interested in organic products are transmitted to organic PLB. We further find that the positive effects of the importance of organic on organic PLB and organic NB are of the same magnitude.

I.2. Methodological contributions.

I.2.1. Use of the polarization index as a measure of brand loyalty.

The first methodological contribution is the use of the polarization index from the NBD-Dirichlet model as a measure of brand loyalty. It proves to be an adequate tool for

investigating the repeat consumers' purchase behavior. The index measures brand loyalty at an aggregate level. It is a reliable measure independent of market shares and other correlated measures indexes unlike other widely used estimators of brand loyalty (such as share of category requirements). This makes the index very useful for describing behavioral loyalty (Corsi et al., 2011). This Ph.D. research provides further insights into this estimator and could be used for future research.

I.2.2. Use of the NBD-Dirichlet model.

We used the NBD-Dirichlet model for our first three studies. This model has been used extensively in the literature to provide benchmarks for markets and to better understand markets. We thus advance knowledge of the model by showing how it can be used to investigate antecedents of brand loyalty and how the model can be used to measure loyalty for specific types of brands (e.g., PLB and organic brands).

Furthermore, we advance knowledge of how to operationalize the model. The traditional use of this model is with an Excel macro. The Excel macro is easy and fast to use, but it runs the model for only one category and one year at the time. Furthermore, the macro does not allow automatization of other statistical treatments, such as calculating the number of brands that display excess loyalty based on a difference of 10% between the theoretical Dirichlet values and the observed ones (Pare & Dawes, 2012). This is easily coded on R. After the appropriate code is written, the analyses of the data are easier and faster. This is what we do in this Ph.D. research. We use the R Dirichlet code and automatize the statistical analyses. This way, using R instead of Excel enables us to adapt our methodology and to gain valuable time.

I.3. Managerial contributions.

Finally, this Ph.D. research offers managerial contributions. These contributions can be divided between those for category managers and those for product managers. We start by describing managerial contributions for category managers.

I.3.1. Managerial contributions for category managers and retailers.

Category managers can now better predict the evolution of brand loyalty at an aggregate level based on the findings. Category managers can expect a decrease if the levels of category penetration, category purchase frequency and repertoire size are high. Otherwise, if these levels are low, category managers can expect brand loyalty to increase. This also helps them better understand the trends and the results in terms of the brand loyalty the brands in a product category exhibit.

This Ph.D. research also shows category managers what to do and what marketing actions they should undertake if they want to increase brand loyalty in the product category. On one hand, if category managers want to enhance brand loyalty, they can launch marketing actions designed to increase purchase frequency such as finding new product applications. On the other hand, if category managers increase the number of SKUs and category penetration with actions such as sales promotions, category managers will decrease brand loyalty in the product category. The finding that the number of SKUs negatively impacts brand loyalty contrasts with Dhar, Hoch, & Kumar (2001) who find that a broader assortment size increases retailer performance (measured as the volume and the retailer sales levels for the whole market). The findings suggest that marketing actions aiming at increasing the number of SKUs in the market and increasing penetration jeopardize brand loyalty in the category in the long term as they make consumers more opportunist and thus prone to brand switching, as

well as being less profitable for brands. On the other hand, marketing actions that aim at increasing category purchase frequency (e.g., by finding new product uses) should have a double beneficial effect as they increase the performance of the brands and thus brand loyalty.

The moderating effect of the share of PLB on the effect of the number of SKUs is also an important insight as it can help category managers make more precise decisions. Category managers are now able to incorporate the share of PLB as a variable that impacts their actions. In product categories with a high share of PLB, increasing the number of SKUs has a stronger negative impact than in product categories with a low share of PLB, for instance.

Finally, we also show that in "niche" categories with low penetration the positive effect of an increase in purchase frequency is stronger than in product categories with high penetration. This finding suggests that consumers in markets with high penetration are more versatile, are variety seeking and thus are less loyal. This finding is in line with Narasimhan et al. (1996) who show that in product categories with a high category penetration, the pool of consumers who are brand switchers is larger. This finding also helps retailers and category managers better predict the results of their actions.

This Ph.D. research also provides insights for retailers as it first shows the U-shape of the share of PLB on brand loyalty. Introducing PLB in a product category first makes brand loyalty decrease, but after a point, it increases back. This finding can help retailers predict the effect the introduction of their brand has on a market.

I.3.2. Managerial contributions for product managers.

Product managers benefit from this research as well. It has practical implications for positioning and pricing strategies for organic brands. For low-price brands, a quality cue, such as the organic label, is necessary to provide further justification to customers and cancel out

the low-quality inferences consumers may make. However, for high-price brands, an organic label may not necessarily be a good strategy. Thus, the organic label creates a favorable segment for low-price brands. In contrast, a high price creates a favorable segment for PLB as the high price assures consumers about the product quality. When it comes to PLB, this finding shows that high-price PLB exhibit a higher level of brand loyalty compared to lower-priced PLB. Premium PLB that have been introduced by retailers to compete with high-quality NB succeed in attracting and keeping consumers (ter Braak et al., 2014; Geyskens et al., 2010). This type of PLB is higher priced than other types of PLB. This higher price makes up for the bad quality signal sent by PLB and helps them be seen as good-quality brands. This finding gives credit to this strategy that is becoming central for retailers (ter Braak et al., 2013; Martos-Partal et al., 2015) and shows that the efforts deployed are worthwhile.

For the effect of price on brand loyalty, we find that it differs among consumers. The effect helps brand managers know what type of consumers would be more likely to react positively to certain price levels. Price has a stronger negative effect for price-conscious consumers. Thus, they react more negatively and are less likely to be loyal to high-priced organic brands and PLB. This finding is in line with literature that shows price is one of the main barriers to organic purchases (Van Doorn & Verhoef, 2015; Bezawada & Pauwels, 2013). In terms of positioning, this finding means that these price-conscious consumers would be likely to purchase and be loyal to low-priced organic brands. These low-priced brands could then attract all groups of consumers and not only non-price-conscious consumers. The low priced segment is makes a good positioning for organic brands. However, if an organic brand is high priced (due to high production costs, for instance), product managers should focus primarily on non-price-conscious consumers. We get the same findings for PLB. This means that although PLB are favored by price-conscious consumers (Sethuraman & Gielens,

2014), these consumers still react more negatively than non-price-conscious consumers to a high price. In terms of positioning and targeting, this finding shows that if PLB are premium and high priced, they have to target non-price-conscious consumers. For the effect of the price–quality inference, we find that the negative effect of price is weaker for consumers with a high price–quality inference. This result is valid for organic brands and PLB. Thus, if an organic brand or a PLB are priced high, consumers with high price-quality inference have a more favorable reaction to organic PLB and more loyal to the brand. In terms of positioning, targeting these consumers would be fruitful if the brand is priced high.

Finally, this research provides insights for targeting consumers for organic PLB. This type of brand is on the rise, and research and managerial insights are missing. On one hand, we show that quality-conscious consumers and consumers who see organic as important have a more favorable reaction to organic PLB. On the other hand, price consciousness and perceived quality variability in the category have no impact on brand loyalty for organic PLB. These results are interesting as they enable retailers and product managers to target consumers they would not have targeted before and widen the potential customer base in the process. More specifically, this result shows that selling organic PLB helps retailers attract quality-conscious consumers who usually are not attracted to regular PLB. The good-quality claim associated with an organic label is transmitted to organic PLB and overtakes the low-quality claim of PLB. The importance consumers attribute to organic labels has a positive impact on brand loyalty for organic PLB. This is good news for retailers as it shows that even core buyers of organic products and quality-conscious consumers perceive organic PLB as better and are likely to be more loyal to them. Conversely, price-conscious consumers would not have a more favorable reaction to organic PLB than non-price-conscious consumers. Retailers can thus target all types of consumers with these brands. In product categories with a small

perceived difference in terms of quality between brands, selling organic PLB may not be as interesting as in product categories with high perceived difference in quality. On another side, this result also means that retailers can expect organic PLB to perform equally well in terms of brand loyalty. Finally, the result provides insights for retailers into whether introducing organic PLB in their stores is interesting. Retailers that usually attract many big PLB buyers may not benefit from this introduction as it sends mixed signals in terms of the retailer's positioning (Ngobo, 2011). This introduction may "push" away big PLB buyers to go shop elsewhere. On the other hand, retailers with many small buyers of PLB may benefit as these consumers may be more willing to buy PLB that are of superior quality. These consumers will more easily consider buying these products and may buy more of the retailer's PLB.

II. Limitations and future research.

This Ph.D. research is not exempt from limitations that define avenues for future research. We review them here.

II.1. External validity of the data.

The first limitation is about the external validity of the findings. The panel data we use originated in Denmark. Denmark is a country with specificities when it comes to PLB and organic brands. The PLB market share of PLB differs across countries (Sethuraman & Gielens, 2014; Hyman et al., 2008). PLB are more developed in some countries than in others. This difference could mean that consumers' perception and awareness could differ from country to country. Danish consumers then would have different reactions to PLB compared to consumers in other countries. This limitation makes our results hard to generalize. Differences also exist for organic brands. Denmark is a country where organic brands are the most popular brands and where their market share is the highest. In 2013, the market share of

organic food was about 8% (Willer & Lernoud, 2015). The high average income in Denmark enables consumers to purchase organic brands despite their high price. However, this high market share may mean that organic brands are no longer niche brands and that they may fail to have the niche brand characteristics they would have in countries where the organic market share is low. Thus, although this high market share is a chance for our studies as it allows for greater variability in brand choice, the high market share also poses a problem as it differs from that in other countries. These differences make generalization of these findings complicated. Future research should try to test our hypotheses in different countries to see whether the hypotheses hold true or not.

II.2. PLB as a unique group of brands.

In these studies, we do not differentiate between the different types of PLB. PLB can be positioned as low-quality economy products, standard-quality products or high-end products. Consumers' reactions differ among these types of PLB although research shows that consumers tend to consider PLB a homogenous group. Follow-up studies could differentiate between the types of PLB and see whether the findings differ among the types.

II.3. The difficulty of measuring brand loyalty through experiments.

We measured brand loyalty with experiments. Measuring brand loyalty with an experiment and not in real purchase condition could be seen as a flaw of these studies. Consumers had to answer questions about rebuying a product when they did not buy it in the first place. This way, brand loyalty is stated and not revealed from actual purchases.

The use of mock-ups is also a flaw as consumers would have difficulty imagining rebuying products that do not exist. To cope with both problems, a follow-up study conducted

in the real purchase condition would be fruitful and would enable us to overcome these limitations.

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Appendix

The fourth paper of the Ph.D. was written in collaboration with Thomas Ruspil, a doctoral student at the IAE Toulouse. Each of us worked on different parts of the paper. Our work was split as follows.

First of all, the general ideas, objectives and contributions of the paper were thought over by me. Following that, Thomas Ruspil and I re-thought some parts of the paper until we had a very clear picture of what the objectives and contributions article would be. Once it was done, the literature review and the justifications of the hypotheses were done by me. After this literature review, the design of experiment (i.e. what kind of experiment it would be, what scales were going to be used and what would be the different steps) were done by me. We then had a talk with Thomas Ruspil to see if everything was fine for the both of us regarding the experiment and following that I created the stimuli used in the experiment. The data collection then started and was conducted equally by the both of us. Following the data collection, the formatting of the data set as well as the analyses were conducted by me. Finally, the first draft was written by me before being sent to Thomas Ruspil. We then exchanged feed backs and comments back and forth until we had a paper that we judged was good.

Appendix 2: Work repartition of the fourth article.

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Abstract

Firms invest heavily in building and maintaining relationships with their customers. This is due to loyal customers being among the most profitable ones for firms. It is thus essential for managers and researchers to understand what drives customers to become loyal. Researchers have investigated brand loyalty antecedents at great length. These antecedents can be divided in three classes: product category, marketing mix and customer-related ones. Despite the large body of research on these antecedents, an update is necessary as markets have been changing in the last decades. One of the major changes has been the apparition and proliferation of niche brands (such as organic and private label brands) that are positioned to serve segments of consumers with specific needs. The aim of this Ph.D. research is to fill these gaps and get a better understanding of what influences brand loyalty in the light of niche brands' development. We specifically focus on two types of niche brands: organic and private label brands. This Ph.D. research is comprised of four studies, each one investigating one class of antecedents. Our results first enable us to reassess the effect of certain antecedents of brand loyalty using recent panel purchase data. It also gives us some insights on the role of niche brands. It shows that the proliferation of niche brands and more specifically the proliferation of private label brands has an effect on brand loyalty at an aggregate level. In the same way, niche brands have a moderating effect on the impact of some antecedents of brand loyalty. Theoretical, methodological and managerial implications of these findings are discussed.

Keywords: Brand loyalty, niche brands, product category-related antecedents, marketing mix-related antecedents, customer-related antecedents, panel data, experimentations.

Résumé

Les entreprises investissent de larges sommes dans la fidélisation de leur clientèle. La raison en est simple : les clients fidèles font partie des plus profitables pour les entreprises. Il est donc essentiel de comprendre ce qui amène les consommateurs à être fidèles. La recherche a ainsi considérablement étudié les antécédents de la fidélité à la marque. Ceux-ci peuvent être divisés en trois classes : les antécédents liés à la catégorie de produit, ceux liés au marketing mix du produit et ceux liés au consommateur. Cependant, et malgré l'intérêt des chercheurs pour ces questions, une étude plus approfondie est nécessaire du fait de la mutation des marchés ces dernières décennies. Un des changements les plus marquants est le développement des marques de niche. Le but de cette thèse est ainsi de mieux comprendre ce qui amène les consommateurs à être fidèle à la lumière de ces marques de niche. Nous étudions plus particulièrement les marques bio et de distributeur. Cette thèse comporte quatre études, chacune s'intéressant à une classe particulière d'antécédents. Nos résultats nous permettent, tout d'abord, de réexaminer l'effet de certains antécédents grâce à des données de panel récentes. Ils nous donnent ensuite des indications sur les effets des marques de niche sur la fidélité à la marque. Plus précisément, ils démontrent que le développement des marques de niche a un effet sur la fidélité à un niveau agrégé. De la même façon, on observe un effet modérateur du type de marques de niche sur l'effet de certains antécédents. Nous discutons les implications théoriques, méthodologiques et managériales de ces résultats.

Mots-clés : Fidélité à la marque, marque de niche, antécédent lié à la catégorie de produit, antécédent lié au marketing mix, antécédent lié au consommateur, données de panel, expérimentations.