



Effects of Price image dimensions on consumer buy intention

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Abstract

Purpose – The purpose of this paper is to analyse how five price image dimensions influence shopping intentions for different store formats.

Design/methodology/approach – In total, 306 espondents evaluated three stores from a list of 18 retailers on a multiple-item scale, resulting in 918 price-image measurements. Based on these data, a covariance structure analysis in Mplus analyses the direct and indirect impact of five price image dimensions on shopping intentions. A multiple group analysis identifies differences in the effects between store formats.

Findings – The impact of image dimensions differs substantially between store formats. For discount stores, value for money is by far the most important image dimension. For supermarkets, price level and value are equally important, but price perceptibility and price processibility are also relevant. For organic food stores, value is most important, followed by price processibility and evaluation certainty. For the weekly market, price perceptibility plays a key role in explaining customers' shopping intentions.

Practical implications – The results carry several implications for retail pricing practice, as they indicate that retailers should not focus exclusively on price level competition. Depending on the store format, retailers should attach importance to the price image dimensions in varying degrees.

Originality/value – The study contributes to the literature by: advancing price-image measurement; modelling direct effects on shopping intentions; analysing a number of different indirect effects in an integrated model; and taking the moderating effects of store format into account.

Keywords Retailing, Pricing, Shops, Consumer behaviour

Paper type Research paper

Introduction

Price competition is an important topic for grocery retailers. Empirical studies show that price is an important factor in choosing a retail food store (Tigert, 1983) and price perceptions are an integral part of a retailer's store image (Lindquist, 1974/1975; Zimmer and Golden, 1988). The importance of price is also underlined by current developments in the food retailing sector. Especially in Europe, traditional retail stores are exposed to the rapid expansion of discounters across the continent (Colla, 2003). Customers seem to find discount stores cheaper than traditional retailers (Mitchell and Kiral, 1999; Morschett *et al.*, 2006); however, the latter try to hold their ground, for example by introducing budget-price store brands (Moreau, 2006c, 2007).

In such a situation, it is extremely important for retail managers to measure the price image of their stores. This helps them to identify discrepancies between the aspired price positioning and the customers' subjective perceptions. Price-image measurements are also important to monitor the effects of changes in pricing strategies



and tactics (Downs and Haynes, 1984), for example the effects of introducing a budget-price store brand product line.

However, retailers should not only measure price images. As recent research has underlined the multidimensionality of price images (Zielke, 2006) and price satisfaction (Matzler *et al.*, 2006), retailers have to set priorities as to which image dimensions they should attach the most importance to. Some retailers might be better off paying more attention to the price-level image, while other retailers should improve the perceived value for money. While the price-level image refers to how cheap or expensive customers perceive the store, value for money depends on what customers perceive they get in return for the prices they pay (price-performance ratio). Retailers should also be aware how price perceptibility, price processibility and price evaluation certainty influence behavioural intentions to shop in their store.

The present study answers these questions by analysing the impact of five different price-image dimensions on shopping intentions. Prior studies have already shed some light on the behavioural impact of price-image dimensions (Zielke, 2006), although the item-scales were not fully developed and price attitude was selected as the central dependent variable. Therefore, this study extends this research by advancing price-image measurement and modelling the direct effects of price-image dimensions on shopping intentions.

However, only analysing the direct effects on shopping intentions might produce misleading results as the different image dimensions are related to each other. Price-level perception is, for example, an antecedent of perceived value (e.g. Dodds and Monroe, 1985; Kerin *et al.*, 1992; Baker *et al.*, 2002). This might result in a considerable indirect effect of price-level perception which is partly mediated by value perception. Therefore, knowledge of such indirect effects is required to draw conclusions about the real relevance of an image dimension. This paper analyses these effects. As most previous studies only analysed relations between selected image dimensions, this paper extends this research by analysing a number of different indirect effects in an integrated model.

It is also misleading to analyse these direct and indirect effects without differentiating between store formats. Store formats are diverse in their price and value positioning (Morschett *et al.*, 2006), indicating that the effects of price-image dimensions can differ between store formats. Previous studies neglected the moderating role of store format, although knowledge of these moderating effects is crucial for retail managers. If, for example, value perception is extremely important for shopping intentions in discount stores, managers of these stores should concentrate their efforts on this dimension and not solely on price-level perception. Therefore, this study analyses how store format moderates the impact of price-image dimensions on shopping intentions as an important extension of prior research.

In a nutshell, this paper analyses the direct and indirect effects of five price-image dimensions on shopping intentions for different store formats. It extends prior research by:

- advancing price-image measurement;
- modelling the direct effects of price-image dimensions on shopping intentions;
- analysing a number of different indirect effects in an integrated model; and
- taking the moderating effects of store format into account.

Literature review and theoretical background

Nyström (1970) provided one of the first major works on retail price images. He defined price image as “buyer attitude towards price on the assortment level”. Similarly, most researchers defined and conceptualised price image one-dimensionally as low prices or price-level image (e.g. Nyström, 1970; Nyström *et al.*, 1975; Zeithaml, 1984; Büyükkurt, 1986; Cox and Cox, 1990; Desai and Talukdar, 2002, 2003). Recent research, however, deviates from this view, defining price image as a multidimensional latent variable (Zielke, 2006). According to this view, price image is a multidimensional latent variable that consists of several perceptual dimensions about a retailer’s pricing activities and their consequences. This definition seems to capture the nature of an image better, which is often seen as an “entire array of associations” related to an object (Blackwell *et al.*, 2001).

Different streams in the literature contribute to the understanding of the domain, the antecedents and consequences of retail price images. One stream analyses the impact of different product groups on the overall store price image, defined as the price level of the store (Nyström, 1970; Büyükkurt, 1986; Alba *et al.*, 1994; Desai and Talukdar, 2002, 2003). A second research stream describes what retailers or service companies do when they set prices for their products (Bolton and Shankar, 2003; Ailawadi and Keller, 2004; Avlonitis and Idounas, 2007; Hardesty *et al.*, 2007). These studies are related to price-image research as they describe the antecedents of store price image. A third research stream analyses price-related constructs other than price-level perception, such as value for money (Zeithaml, 1988; Sweeney and Soutar, 2001) or price fairness (e.g. Kahneman *et al.*, 1986; Campbell, 1999; Homburg *et al.*, 2005). A final research stream integrates research from the third stream by conceptualising price perception in general or price images in particular as multidimensional latent variables (Matzler *et al.*, 2006; Zielke, 2006).

The present study builds on the multidimensional research stream, in particular on results from Zielke (2006), who identified a number of image dimensions, such as price-level perception, value for money, price perceptibility, price processability and price evaluation certainty. The present study extends this research by advancing price-image measurement, analysing the direct and indirect effects of price-image dimensions on shopping intentions in an integrated model, and analysing the moderating effects of store format.

Definition of price-image dimensions

Before developing hypotheses about the behavioural impact of price-image dimensions, it is necessary to define these dimensions. Based on the literature review and an empirical pre-study, five image dimensions were selected. The selected dimensions are price-level perception, value for money, price perceptibility, price processability and evaluation certainty. Other dimensions suggested in the literature, e.g. special offer image, price fairness or an emotional factor, were excluded based on the results of a pre-study. The pre-study indicated that these dimensions are not clearly separable from at least one of the five image dimensions, which are defined as follows:

- (1) *Price-level perception* is the perception of prices without taking quality differences into account. On a category, store or retailer level, price-level perception is synonymous with price-level image. For single products, price-level perceptions result from comparisons of product prices with a

standard, often called the reference price (e.g. Winer, 1986; Rajendran and Tellis, 1994). The resulting product price perceptions can be integrated in the overall price-level image of the retail store. Several authors have suggested rules for such an integration (Nyström, 1970; Büyükkurt, 1986; Alba *et al.*, 1994; Desai and Talukdar, 2002, 2003).

- (2) *Value for money* is usually defined as a trade-off between give and get components (Emery, 1969; Dodds and Monroe, 1985; Zeithaml, 1988). In a retail context, value for money is the outcome of a trade-off between sacrifices and utilities derived from product and store attributes. In addition to price, customers might also consider physic, psychic and temporal costs during the purchasing process as sacrifice components (Zeithaml, 1988; Gijbrecchts, 1993; Baker *et al.*, 2002). Although price-level perception and value seem to be related, a retail store can perform very differently on both dimensions. A gourmet might evaluate meat prices in a discount store as very cheap, but surely not as valuable. By the same token, he might perceive his favourite wine store as offering good value for money, but surely not as cheap.
- (3) *Price perceptibility* is the ease with which a customer can find or see products' prices in the store. Previous research has emphasized the importance of price labelling for price perceptibility (Zielke, 2006).
- (4) *Price processibility* refers to the ease of price processing, especially when comparing the prices of alternative products at the point of sale (Zielke, 2006). While price labelling might be an antecedent of price perceptibility, price processibility might depend on the declaration of unit prices or shelf layouts (processibility might increase when national brands are presented close to quality-equivalent private labels). Hence, a store using large red price labels might be perceived as excellent in terms of perceptibility, but not necessarily processibility.
- (5) *Evaluation certainty* describes how easily customers perceive the price-evaluation process (Zielke, 2006). Customers might have difficulties in evaluating single product prices, but also the evaluation of a whole store's price positioning might be a challenging task. Uncertainty in price evaluation is likely to occur in a retail setting, because the customers' price knowledge is limited and the acquisition of exhaustive price information is very difficult (Desai and Talukdar, 2003). Even if perceptibility and processibility are excellent, evaluation certainty might be poor if prices vary between product groups and over time. Therefore, evaluation certainty is a separate dimension of a retailer's price image.

Store formats in grocery retailing

Store formats are defined as competing categories of stores types that provide specific benefits to match the needs of different customer types and shopping situations (González-Benito *et al.*, 2005). In Europe, discount stores and various supermarket formats dominate the grocery retail market. In addition, niche formats, such as organic food stores or the weekly markets, also exist. These formats are described in the following, as the impact of price-image dimensions potentially differs between discount stores, supermarkets, organic food stores and weekly markets.

Discount stores offer a limited assortment of food products at very low prices. Usually, they offer products with a high inventory turnover and in the product categories, only a small number of package sizes and brands are available. Discount stores are not usually larger than 1,500 square meters and do not offer more than 1,500 SKUs. Sometimes, discount stores are also called limited assortment supermarkets. Examples of discount stores are Aldi, Dia, Lidl, and the US-chain Save-a-Lot (Zentes *et al.*, 2007; Levy and Weitz, 2009).

Supermarkets exist in different sub-formats. Conventional supermarkets are self-service stores offering a wide range of food items. The conventional supermarket is 400 to 1,000 square meters in size and offers up to 30,000 SKUs. Superstores and hypermarkets mostly differ from conventional supermarkets in size. Superstores offer between 30,000 and 40,000 SKUs and are between 1,000 and 5,000 square meters in size. Compared to superstores, hypermarkets carry even more SKUs and they are larger. Examples of hypermarkets are Auchan, Carrefour and Metro's format Real (Zentes *et al.*, 2007; Levy and Weitz, 2009). While most textbooks make a clear distinction between supermarkets, superstores and hypermarkets, in practise it is sometimes difficult to categorize a grocery chain in one of these formats. Retailers, such as Edeka, Rewe, Swiss Coop and Tesco for example, use their retail brand name for different supermarket formats. Furthermore, the boundaries between store formats are sometimes blurred and differ between sources (McGoldrick, 2002).

Organic food stores are specialty stores or supermarkets offering an assortment of organic products at a premium price level. Organic products are produced by environmentally friendly processes, and they are free from pesticides and other chemical residues (Chinnici *et al.*, 2002; Tsakiridou *et al.*, 2008). Similar to supermarkets, different variations of organic food stores exist. Traditionally, organic food stores were small specialty stores, owned by independent retailers. Nowadays, however, more and more organic products are produced by industrial farms and sold by organic food store chains (Thompson and Coskuner-Balli, 2007). The German chain Alnatura, for example, carries 6,000 SKUs on an average floor size of 550 square meters. In North America and the UK, Whole Foods sells more than 20,000 SKUs in stores with an average area of over 3,000 square meters. However, the typical organic food stores in Europe are still specialty stores or small supermarkets which exclusively stock organic products.

Public markets are places where small independent vendors sell a variety of goods regularly (Ng, 2003). As these markets are often organized weekly, they are also called weekly markets. At weekly markets, a number of local farmers, regional producers and independent traders sell mostly fresh groceries, such as fruit, vegetables, flowers, meat, fish, eggs, dairy and bakery products. Farmers' markets are a particular sub-format of public or weekly markets, where mostly local farmers periodically sell their fruit and vegetables to the public (Hinrichs, 2000; Ng, 2003; Lapping, 2004). Although the variety of weekly markets is limited to fresh produce, the assortment is deep as the visitors can buy the products from different competing vendors. Prices at weekly markets usually range from low prices offered by independent traders to the premium prices of organic farmers. Depending on the location, the size of public markets differs considerably.

The present study distinguishes very broadly between four store formats, namely discount stores, supermarkets, organic food stores and weekly markets. Table I summarizes certain characteristics of these formats.

Hypotheses

In the previous section, five dimensions of retail price images were defined (price-level image, value for money, price perceptibility, price processibility, evaluation certainty). Indeed, the different dimensions are not independent from each other. This is not unusual as many other multidimensional constructs have been found to have separate but related dimensions (e.g. Dabholkar *et al.*, 1996; Sweeney and Soutar, 2001). This section discusses these dependencies explicitly by developing hypotheses on the relationships between the different image dimensions.

Based on previous research, it is first assumed that the five dimensions have direct effects on shopping intentions. Price-level image has been proved as an important criterion for store choice (Tigert, 1983), which is currently underlined by the success of price-aggressive discount formats in Europe (Colla, 2003). The literature also provides empirical support for the notion that value for money influences behavioural intentions for retail stores or service providers positively (Cronin *et al.*, 2000; Baker *et al.*, 2002; Zielke, 2006). Price perceptibility and price processibility are related to shopping convenience and physic, psychic and temporal costs in the shopping process. Prior studies support the notion that shopping convenience and such costs influence shopping intentions (Baker *et al.*, 2002; Seiders *et al.*, 2007). *Evaluation certainty* should have an impact on shopping intentions as uncertainty is related to the perceived risk of shopping in the store (Mitchell and McGoldrick, 1996). Customers can reduce this risk by shopping in stores in which they are more certain about prices.

- H1.* Perceptions of (a) price level, (b) value for money, (c) price perceptibility, (d) price processibility and (e) price evaluation certainty have a direct positive impact on shopping intentions.

However, in addition to the direct effects, many indirect effects exist in the process of image formation. Therefore, it seems important to analyse the relationships between the five image dimensions. First, price-level perception should have a positive impact on value for money. Such a relation is consistent with the definition of value and it was found in several previous studies (e.g. Kerin *et al.*, 1992; Baker *et al.*, 2002).

- H2.* Price-level perception has a positive impact on value-for-money perception.

While price level covers financial sacrifices and thus affects value perception, price perceptibility, price processibility and evaluation certainty reduce psychic, physic and temporal sacrifices. These costs are non-monetary price components (Zeithaml, 1988; Gijbrecchts, 1993; Baker *et al.*, 2002) and thus should also have an impact on value

Dimension	Discount	Supermarket*	Organic food store	Weekly market
Price	Lowest	Low-medium	High	Low-high
Assortment depth	Shallow	Medium-deep	Shallow-medium	Medium-deep
Variety	Narrow	Medium-wide	Narrow-medium	Narrow-medium
Size	Small	Medium-large	Small-medium	Small-large

Note: *Covers different supermarket formats, such as conventional supermarkets, superstores and hypermarkets

Table I.
Characterisation of different store formats in grocery retailing

perception. Admittedly, previous studies failed in empirically supporting the relationship between non-monetary price components and value (Baker *et al.*, 2002). However, as Baker *et al.* note, the robustness of their results should be tested in different contexts. They investigated the relations using an experimental design with manipulated videotapes of a card and gift store. Physic, psychic and temporal cost might be less relevant for shopping in such a store compared to grocery shopping, where the utilitarian shopping value (Babin *et al.*, 1994) is potentially more important.

- H3.* Price-perceptibility perception has a positive impact on value-for-money perception.
- H4.* Price-processibility perception has a positive impact on value-for-money perception.
- H5.* Price-evaluation certainty has a positive impact on value-for-money perception.

Furthermore, the different relationships between price perceptibility, price processibility and evaluation certainty should be discussed. First, price perceptibility should have a positive impact on price processibility. This hypothesis is derived from the information processing model, where perception is a precondition of information processing (Jacoby and Olson, 1977; Zeithaml, 1988).

- H6.* Price-perceptibility perception has a positive impact on price-processibility perception.

It is also assumed that price perceptibility and price processibility have an impact on evaluation certainty. If the acquisition and processing of price information is perceived as difficult, this may result in uncertainty about prices. This assumption is also supported in the literature. Zeithaml (1982) proved that item-marking increases the perceived certainty in exact price recall while a structured list of unit prices improves certainty in price comparisons. Also Zielke (2006) observed significant effects of price perceptibility and price processibility on evaluation certainty.

- H7.* Price-perceptibility perception has a positive impact on evaluation certainty.
- H8.* Price-processibility perception has a positive impact on evaluation certainty.

An impact of price-level image on evaluation certainty is also hypothesized. This impact is supported by arguing that cheap prices are easy to evaluate, while more expensive prices have to be justified by superior product and service quality.

- H9.* Price-level perception has a positive impact on evaluation certainty.

The last relationship affects price processibility and price-level perception. Studies analysing the effect on unit prices demonstrated that unit prices lead to a more economic product selection and shift purchases towards cheaper products (Russo *et al.*, 1975; Russo, 1977; Zeithaml, 1982; Miyazaki *et al.*, 2000). Other authors proved that shelf structures have an impact on the choice of low-price products (Simonson *et al.*, 1993; Nowlis and Simonson, 1997; Simonson, 1999). Hence, if cheap store brands and

generics are not hidden on the bottom shelves, they might have a stronger weight when the customer aggregates price perceptions of single products to an overall price-level image.

H10. Price-processibility perception has a positive impact on price-level perception.

The complete structural model resulting from the ten hypotheses is presented in Figure 1. The structural model demonstrates that there should be substantial indirect effects in addition to the direct effects on shopping intentions. Thus, *H1* can be extended by assuming that there are also significant total effects. It is notable that the data might reject *H1* for a specific image dimension, while the total effect is supported.

H11. (a) Price level, (b) value for money, (c) price perceptibility, (d) price processibility and (e) price evaluation certainty have significant direct or indirect (= total) positive impacts on shopping intentions.

So far, the hypotheses assumed several direct and indirect effects of image dimensions on intentions to shop in a retail store. Although previous studies have investigated some of these relations, these studies have not presented an integrated model of all such relations, and they have not analysed how store format moderates these relationships.

However, it seems plausible that the relevance of image dimensions differs between store formats such as discounters, supermarkets, organic food stores and the weekly market. As the hypothesized model contains a number of hypotheses, it is not possible to discuss how each hypothesized effect differs between the four formats. Therefore, the following paragraphs only present some general thoughts about moderating effects.

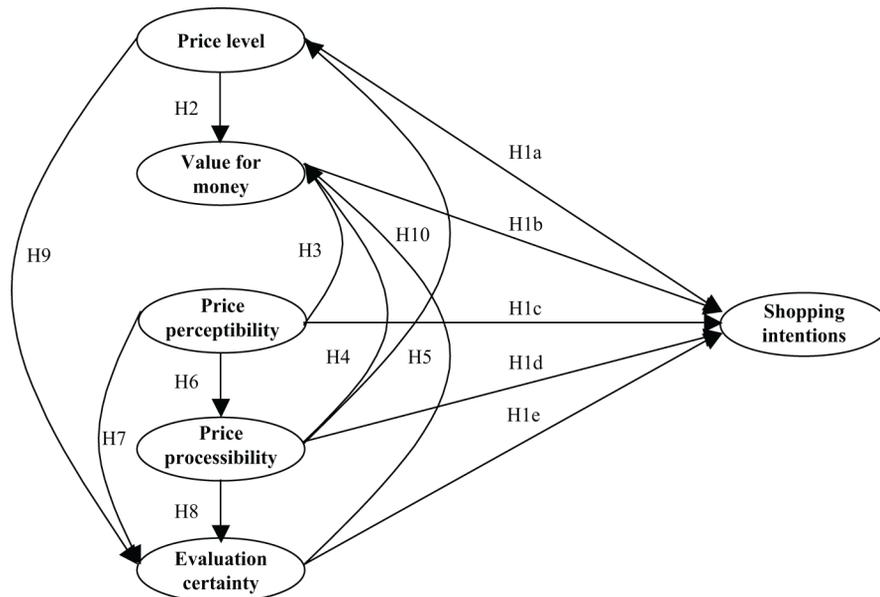


Figure 1.
Hypothesized structural model

For discount stores, the total impact of price-level perception might be smaller compared to other store formats. As cheap prices are the central positioning criterion of discount stores, customers and non-customers should perceive these stores to be cheap, but not necessarily as offering value. Similarly, there should be not much variation in the price-level perception for organic food stores. Presumably all respondents perceive prices in organic food stores to be higher compared to other store formats, irrespective of whether they intend to shop in these stores. For supermarkets, the situation is much different, as supermarkets differ in their price-level positioning and pricing tactics. The same holds for traders at weekly markets. Therefore, the price-level perception should be more important for supermarkets and the weekly market compared to discounters and organic food stores.

Value for money might be especially important for discount stores, as some customers infer negative relations between cheap prices and quality, resulting in poor value perception (Dodds and Monroe, 1985; Lichtenstein *et al.*, 1993; Smith and Natesan, 1999), while others make no such inferences. Price perceptibility and price processibility should be especially important for supermarkets as these stores usually offer a larger number of items compared to other store formats. Thus, buying in supermarkets should be more time-consuming and the problem of identifying and comparing prices is more relevant. Price perceptibility and price processibility should also be important for the weekly market as price-labelling here is often unclear and customers might wish to compare the prices of different traders. Differences in the relevance of evaluation certainty are difficult to predict. Therefore, these effects have to be explored.

Because the number of potential moderator effects is very large, the hypothesis regarding these effects is very general.

- H12.* The behavioural impact of perceived (a) price level, (b) value for money, (c) price perceptibility, (d) price processibility and (e) price evaluation certainty differs between store formats.

Scale construction

Previous research provides item-scales for the five image dimensions (Zielke, 2006). However, these scales measure some dimensions reflectively, while others are operationalized with formative indicators. This is somewhat problematic as reflective and formative measures require different treatments in the data analysis (Diamantopoulos and Winklhofer, 2001; Jarvis *et al.*, 2003). Therefore, the decision was made to advance the existing scales by constructing clear reflective measures. An initial scale was developed based on the definitions of the image dimensions and previous research. In a first pre-test, experts and test-respondents checked whether all items were clear and understandable. A second pre-test was conducted with 75 university students. As a result of this pre-test, some items were adapted, substituted or eliminated. In the final scale, three to five items measure each dimension on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). Example items are “the prices are generally very low here” (price-level image), “the prices here are appropriate in relation to what I get for my money” (value for money), “the prices are easily discernable in this store” (price perceptibility), “comparing the prices of different products requires a lot of effort in this store” (price processibility), and “I can assess this store very well regarding the prices” (evaluation certainty). The complete item scale is presented in Table II.

Price-level image	The prices are generally very low here The price level is very high here You can buy cheap groceries here The prices are cheaper here than in other stores This store is more expensive than other stores
Value for money	The prices here are appropriate in relation to what I get for my money The prices here are excessive in relation to what I get for my money I get good value for money here Compared with other stores, the price-performance ratio is very good here The ratio between price and performance is considerably worse here than in other stores
Price perceptibility	The prices are easily discernible in this store You can easily discern how much a particular product costs here The prices are harder to discern here compared with other stores
Price processibility	Comparing the prices of different products requires a lot of effort in this store It takes a long time to find the most reasonably-priced product within a product group here Price comparisons within a product group reveal that products are costlier here than in other stores
Evaluation certainty	I can assess this store very well regarding the prices I cannot assess this store at all regarding the prices I find it difficult to assess the prices in this shopping establishment
Shopping intentions	I should shop at this store as often as possible I should shop at this store as seldom as possible I should consider this store for my shopping I should disregard this store for my shopping

Table II.
Item scale

Research design and sample

The hypotheses were tested based on a paper-and-pencil survey. The data was collected by students from a European university. They were advised to contact people buying groceries regularly and instructed to cover different levels of age, gender, household size and income. If the respondents agreed to take part in the survey, they usually completed the questionnaire at home without any assistance. The students collected the questionnaires some days later or the respondents sent the completed questionnaires to the research team by post. This procedure was designed to ensure that the respondents had enough time to complete the questionnaire without rushing it.

Each respondent was asked to select three from a list of eighteen retailers. They were advised to select retailers, which they perceive very differently in terms of prices. Then, the respondents rated these retailers on the developed item scale. Items were mixed and rotated in the questionnaire to avoid order effects and guarantee that the respondents were not able to identify the hypothesized dimensionality.

The respondents were deliberately *not* asked to only select stores for which they have detailed price knowledge and shopping experience. This should be closer to

authentic shopping situations where customers make choices from a set of alternative stores they have had different experiences with. For example, if a customer regularly shops at a discounter, he will have a detailed price image for this store. However, before he decides to shop there, he will compare this store with other shopping alternatives, for example a supermarket. To come to a decision, the customer has to make assumptions about store attributes which are important to him, irrespective of prior experience of the supermarket. Even if the customer has never shopped there, he will have some beliefs about the supermarket's prices, which form his subjective price image for the store.

Altogether, 306 questionnaires were collected, resulting in 918 price-image measurements (because each respondent evaluated three stores). In 21.7 percent of all cases, the respondents rated their preferred store, in 27.6 percent they rated a store where they shop occasionally and in 50.7 percent they rated stores where they do not usually shop. Questions on buying frequency and food expenditures, as well as self-reported knowledge of food-prices, indicated that the sample was qualified to answer the image questionnaire. The mean age of the respondents was 36, 62 percent were female and 61 percent lived in a household with two or more people. The monthly income was measured in intervals, the median ranging between 1,500-2,000 Euros.

Results

Descriptive statistics

Table III presents the means and standard deviations of the five price-image dimensions and shopping intentions. The descriptive statistics demonstrate that the perception of price-image dimensions differs substantially between store formats. Interestingly, discount stores yield the best perceptions for all image dimensions. The other formats are perceived similarly with certain strengths and weaknesses. Supermarkets, for example, are perceived as less expensive than the weekly market and organic food stores. However, the value perception of the three formats is almost identical. For price perceptibility and processibility, the weekly market receives lower ratings than any other store format. The perception of evaluation certainty for the weekly market is similar to organic food stores, but lower compared to discounters and supermarkets.

Dimension	Total <i>n</i> = 918		Discount <i>n</i> = 339		Supermarket <i>n</i> = 364		Organic <i>n</i> = 143		Weekly market <i>n</i> = 72	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Price-level image	4.28	1.95*	6.29	0.78	3.61	1.26	1.95	0.89	2.78	1.22
Value for money	5.01	1.32	5.94	0.90	4.47	1.22	4.42	1.29	4.57	1.04
Price perceptibility	5.23	1.29	5.53	1.28	5.30	1.16	4.89	1.30	4.20	1.36
Price processibility	4.84	1.53	5.76	1.14	4.41	1.41	4.36	1.43	3.69	1.67
Evaluation certainty	5.14	1.43	5.86	1.05	5.05	1.24	4.17	1.62	4.13	1.57
Shopping intentions	4.98	1.72	6.01	1.25	4.53	1.63	3.89	1.83	4.50	1.27

Table III.
Descriptive statistics for price-image dimensions and shopping intentions

Notes: *Mean (standard deviation); means and standard deviations were calculated based on sum-scores; 7-point scale

Convergent and discriminant validity

In the first step, convergent validity was checked by calculating Cronbach's (1951) alpha for each image dimension and shopping intentions. All values exceeded 0.7, according to Nunnally and Bernstein's (1994) recommendation, namely 0.97 for price level (PL), 0.89 for value (VAL), 0.82 for price perceptibility (PPC), 0.86 for price processibility (PPR), 0.84 for evaluation certainty (EC) and 0.92 for shopping intentions (SI). In addition, a confirmatory factor analysis tested the discriminant validity between the five price-image dimensions. The analysis was conducted in Mplus, using the MLR estimator (Muthén and Muthén, 2007). The fit indexes are acceptable according to the recommendations in the literature (e.g. Kline, 1998; Hu and Bentler, 1999) and discriminant validity is sufficient according to Fornell and Larcker's (1981) criterion. Table IV demonstrates that for each image dimension, the variance explained is larger than any squared correlation with another image dimension.

Behavioural relevance of image dimensions

The behavioural impact of image dimensions was first tested without considering store format as a moderator. Some outlier cases were eliminated before conducting the analysis. The results are presented in the left column of Table V. The values of the fit indexes are very satisfying (CFI: 0.971; RMSEA: 0.047; SRMR: 0.027; χ^2/df : 628/253). Furthermore, all measurement models proved to be convergent (factor loadings of the measurement models ranged from 0.74 to 0.94). The latent variable *R*-square for shopping intentions is 0.70. By interpreting the path coefficients, significant positive direct effects exist on a 5 percent level for value 0.70 ($p \leq 0.000$), price-level image 0.11 ($p = 0.030$) and evaluation certainty 0.10 ($p = 0.031$). Thus, *H1a*, *H1b* and *H1e* are supported while *H1c* and *H1d* are rejected. However, it will be demonstrated later that there are substantial indirect effects of perceptibility and processibility on shopping intentions. The second hypothesis assumed the positive impact of price level on value perception. This relationship is quite strong. The standardized path coefficient between both constructs is 0.55 ($p \leq 0.000$), supporting *H2*. Furthermore, *H3* to *H5* assumed an impact of price perceptibility, price processibility and evaluation certainty on value perception. The respective coefficients are 0.11 ($p = 0.003$), 0.16 ($p = 0.002$) and 0.13 ($p = 0.006$). Thus, *H3*, *H4* and *H5* are supported. There is also a positive impact of 0.59 ($p \leq 0.000$) of perceptibility on processibility, supporting *H6*. In addition, the impacts of perceptibility and processibility on evaluation certainty are also positive and significant. They are 0.22 ($p \leq 0.000$) and 0.25 ($p \leq 0.000$), supporting *H7* and *H8*. A positive relationship between price-level perception and evaluation certainty is also apparent. The coefficient is 0.34 ($p \leq 0.000$) and supports

Dimension		PL	VAL	PPC	PPR	EC
Price-level image	PL	84.5				
Value for money	VAL	56.7	63.1			
Price perceptibility	PPC	11.1	22.4	60.6		
Price processibility	PPR	32.8	39.3	35.2	67.4	
Evaluation certainty	EC	31.1	33.9	22.2	32.6	64.3

Notes: CFI 0.957; RMSEA 0.058; SRMR 0.034; χ^2 576; df 142

Table IV.
Discriminant validity
(variance explained and
squared correlations)

	Total		Discount		Supermarket		Organic food store		Weekly market	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
<i>Direct effects</i>										
<i>H1a</i> : PL → SI	<i>0.11</i>	0.030	-0.24	0.071	0.12	0.115	0.13	0.066	<i>0.34</i>	0.001
<i>H1b</i> : VAL → SI	<i>0.70</i>	0.000	<i>0.99</i>	0.000	<i>0.69</i>	0.000	<i>0.60</i>	0.000	0.27	0.052
<i>H1c</i> : PPC → SI	-0.03	0.440	-0.20	0.019	0.05	0.464	-0.12	0.209	<i>0.38</i>	0.025
<i>H1d</i> : PPR → SI	0.00	0.953	0.02	0.860	0.03	0.668	0.05	0.692	0.18	0.288
<i>H1e</i> : EC → SI	<i>0.10</i>	0.031	-0.05	0.677	0.06	0.288	0.15	0.147	-0.03	0.866
<i>H2</i> : PL → VAL	<i>0.55</i>	0.000	<i>0.52</i>	0.000	<i>0.71</i>	0.000	0.13	0.191	0.27	0.051
<i>H3</i> : PPC → VAL	<i>0.11</i>	0.003	<i>0.19</i>	0.002	<i>0.26</i>	0.000	0.09	0.342	-0.06	0.804
<i>H4</i> : PPR → VAL	<i>0.16</i>	0.002	0.01	0.917	0.03	0.653	0.19	0.176	0.18	0.339
<i>H5</i> : EC → VAL	<i>0.13</i>	0.006	<i>0.35</i>	0.005	0.03	0.527	<i>0.32</i>	0.007	0.39	0.130
<i>H6</i> : PPC → PPR	<i>0.59</i>	0.000	<i>0.64</i>	0.000	<i>0.61</i>	0.000	<i>0.32</i>	0.019	<i>0.62</i>	0.000
<i>H7</i> : PPC → EC	<i>0.22</i>	0.000	<i>0.17</i>	0.031	<i>0.31</i>	0.004	0.14	0.229	<i>0.40</i>	0.015
<i>H8</i> : PPR → EC	<i>0.25</i>	0.000	<i>0.27</i>	0.006	<i>0.21</i>	0.030	<i>0.34</i>	0.011	0.28	0.099
<i>H9</i> : PL → EC	<i>0.34</i>	0.000	<i>0.39</i>	0.000	0.09	0.193	0.11	0.244	<i>0.22</i>	0.041
<i>H10</i> : PPR → PL	<i>0.59</i>	0.000	<i>0.47</i>	0.000	<i>0.45</i>	0.000	<i>0.28</i>	0.005	<i>0.39</i>	0.011
<i>Total effects</i>										
<i>H11a</i> : PL → SI	<i>0.56</i>	0.000	<i>0.39</i>	0.000	<i>0.62</i>	0.000	<i>0.25</i>	0.006	<i>0.43</i>	0.000
<i>H11b</i> : VAL → SI	<i>0.70</i>	0.000	<i>0.99</i>	0.000	<i>0.69</i>	0.000	<i>0.60</i>	0.000	0.27	0.052
<i>H11c</i> : PPC → SI	<i>0.38</i>	0.000	<i>0.22</i>	0.001	<i>0.47</i>	0.000	0.09	0.391	<i>0.65</i>	0.000
<i>H11d</i> : PPR → SI	<i>0.49</i>	0.000	<i>0.29</i>	0.001	<i>0.34</i>	0.000	<i>0.35</i>	0.006	<i>0.41</i>	0.009
<i>H11e</i> : EC → SI	<i>0.19</i>	0.000	<i>0.30</i>	0.034	0.08	0.175	<i>0.34</i>	0.004	0.07	0.690

Notes: Italic beta coefficients are significant at a 0.05-level; PL = price-level perception; VAL = value-for-money perception; PPC = price-perceptibility perception; PPR = price-processibility perception; EC = evaluation certainty; SI = shopping intentions. Fit indices: Total – CFI 0.971; RMSEA 0.047; SRMR 0.027; χ^2 628.36; df 253. Multiple group – CFI 0.928; RMSEA 0.060; SRMR 0.078; χ^2 1705.26; df 966

Table V.
Results from the path model

H9. Finally, the effect of processibility on price-level perception was assumed. This effect is surprisingly large with a coefficient of 0.59 ($p \leq 0.000$). Thus, *H10* is also supported. To investigate *H11*, the total effects of the five image dimensions have to be examined. Value has the largest impact (0.70, $p \leq 0.000$), followed by price-level perception (0.56, $p \leq 0.000$), price processibility (0.49, $p \leq 0.000$), price perceptibility (0.38, $p \leq 0.000$) and evaluation certainty (0.19, $p \leq 0.000$). Thus, *H11a* to *H11e*, assuming significant total effects, are supported.

The moderating effect of store format

H12 assumed very generally that the impact of the five image dimensions differs between store formats. This was tested with a multiple group analysis, distinguishing between discount stores, supermarkets, organic food stores and the weekly market. The fit indexes of this analysis are somewhat weaker compared to the total sample (CFI: 0.928; RMSEA: 0.060; SRMR: 0.078; χ^2 /df: 1705/966). This is easy to understand because variance caused by differences in store formats was eliminated from the model. The latent variable *R*-square for shopping intentions is 0.50 for discount stores, 0.74 for supermarkets, 0.53 for organic food stores and 0.73 for the weekly market. To

test *H12*, a restricted multiple group model was compared with an unrestricted model. In the restricted model, all coefficients from the structure model were identical between store formats while these parameters were estimated separately in the unrestricted model. Both models were compared with a chi-square difference test according to the methodology suggested by Satorra and Bentler (2001). The results show that the scaled chi-square difference between the restricted and the unrestricted model was positive and significant ($\Delta\chi^2 = 103.27 > 58.12$, $\Delta df = 42$, $p = 0.05$). Thus, *H12* is supported because the unrestricted model is significantly superior compared with the restricted one. After proving differences between store formats in general, the pattern of coefficients for the three store formats are explored.

For discount stores, a large direct effect of value on shopping intentions dominates the pattern of path coefficients (0.99, $p \leq 0.000$). Interestingly, price level has a non-significant negative direct effect (-0.24 , $p = 0.071$), although the total effect is significant and positive (0.39, $p \leq 0.000$). This observation becomes understandable by looking at the large impact of price level on value (0.52, $p \leq 0.000$). Thus, the effect of price level on shopping intentions is mediated by value. This means that price-level perception alone does not explain discount buying. Customers relate prices to what they get in return and the outcome out of this relation attracts people to discount stores. Compared to the other store formats, price level has a large impact on evaluation certainty (0.39, $p \leq 0.000$). This underlines the assumption that low prices in discount stores in particular make customers more certain in their price evaluation. Furthermore, evaluation certainty is an important value driver (0.35, $p \leq 0.005$) and has a substantial total effect on shopping intentions (0.30, $p \leq 0.034$). Thus, evaluation certainty plays an important role for discount stores' price images. Somewhat surprising is the negative direct effect of perceptibility on shopping intentions (-0.20 , $p = 0.019$), while the total effect is positive (0.22, $p = 0.001$). It is only possible to speculate about this outcome. Probably the answer is similar to the explanation for price-level effects. Large price labels in the store alone have no effect on the customers' intentions. They only have an effect via value, processibility and evaluation certainty. From the total effects, value is most important (0.99, $p \leq 0.000$), followed by price level (0.39, $p \leq 0.000$), evaluation certainty (0.30, $p = 0.034$), processibility (0.29, $p = 0.001$) and perceptibility (0.22, $p = 0.001$).

The pattern for supermarkets is very different from discount stores. Here, value has a smaller direct impact (0.69, $p \leq 0.000$), while price level has positive but still insignificant direct impact (0.12, $p = 0.115$). A glance at the total effects illustrates that the total effect of price level (0.62, $p \leq 0.000$) is quite similar to the effect of value (0.69, $p \leq 0.000$). Similar to discount stores, value is a mediator of price-level perception. The impact of price level on value perception is quite strong (0.71, $p \leq 0.000$). In contrast to the discounters, evaluation certainty has no or little relevance. The direct effect is insignificant (0.06, $p = 0.288$), as is the impact on value (0.03, $p = 0.527$). The total effect is also insignificant (0.08, $p = 0.175$). However, the total effects of perceptibility (0.47, $p \leq 0.000$) and partly processibility (0.34, $p \leq 0.000$) are strong. Perceptibility has a considerable impact on value (0.26, $p \leq 0.000$) while processibility influences the price-level perception (0.45, $p \leq 0.000$) substantially. The large impact of these image dimensions is comprehensible as super- and hypermarkets offer the largest variety of goods and extensive assortments. Thus, problems in price perception and price processing are especially relevant. Considering the relative importance of the five

image dimensions, value perception is the most important (0.69, $p \leq 0.000$), directly followed by price-level perception (0.62, $p \leq 0.000$), perceptibility (0.47, $p \leq 0.000$), processibility (0.34, $p \leq 0.000$) and evaluation certainty (0.08, $p = 0.175$).

For organic food stores, the direct effects of price level and value are similar to supermarkets (price level: 0.13, $p = 0.066$; value: 0.60, $p \leq 0.000$). However, the total effects are quite different. The total effect of value (0.60, $p \leq 0.000$) is much stronger compared with price-level perception (0.25, $p = 0.006$). This observation is triggered by the insignificant relationship between price-level perception and value (0.13, $p = 0.191$) and the insignificant impact of price level on evaluation certainty (0.11, $p = 0.244$). Obviously, the respondents weight the price component very weak when they evaluate the value for money in organic food stores. Although evaluation certainty is not influenced by price-level perception and the direct effect is insignificant, a considerable total effect exists (0.34, $p = 0.004$). This effect results from a significant path from certainty to value (0.32, $p = 0.007$). Finally, the pattern for organic food stores is characterized by an insignificant total relevance of perceptibility (0.09, $p = 0.391$), while the effect of processibility is significant (0.35, $p = 0.006$) and similar to supermarkets (0.34, $p \leq 0.000$). The small and flat assortment of organic stores can explain this. Here, perceptibility is not a problem, whereas processibility is difficult as customers cannot compare the prices of organic products with those of (non-organic) national brands. To sum up, value is the most important (0.60, $p \leq 0.000$), followed by processibility (0.35, $p = 0.006$), evaluation certainty (0.34, $p = 0.004$), the price level (0.25, $p \leq 0.006$) and perceptibility (0.09, $p = 0.391$).

For the weekly market, price-level perception (0.34, $p = 0.001$) and price perceptibility (0.38, $p = 0.025$) have a significant direct effect on shopping intentions. The effect of value is smaller and not significant (0.27, $p = 0.052$) as is the influence of price-level perception on value (0.27, $p = 0.051$). However, both effects would be significant on a ten-percent level. Perceptibility plays a key role in the results for the weekly market as perceptibility significantly influences processibility (0.62, $p \leq 0.000$), which improves price-level perception (0.39, $p = 0.011$). Consequently, perceptibility has the largest total effect on shopping intentions (0.65, $p \leq 0.000$), followed by price-level perception (0.43, $p \leq 0.000$), price processibility (0.41, $p = 0.009$), value (0.27, $p = 0.052$) and evaluation certainty (0.07, $p = 0.690$).

Discussion and implications

The results supported most of the hypothesized effects for the total model. Only direct effects from perceptibility and processibility were not identified. However, the results underline the fact that it would be wrong to ignore the importance of these image dimensions. Perceptibility and processibility influence shopping intentions indirectly, resulting in substantial total effects. Including store format as a moderator sheds additional light on the importance of both dimensions especially for supermarkets and traders at the weekly markets.

In summary, the multiple group analysis identified a number of differences in direct, indirect and total effects between store formats. As it is not possible to discuss each of these effects in detail, only the most important differences should be highlighted:

- For *discount stores*, value is by far the most important image dimension. Interestingly, price-level perception influences evaluation certainty stronger than

in any other store format and evaluation certainty has a substantial total effect on shopping intentions.

- For *supermarkets*, the total effects of price level and value perception are quite similar and price level influences value more significantly than in any other store format. Perceptibility and processibility have a considerable relevance.
- For *organic food stores*, the total impact of value is substantially larger than the effect of price-level perception. Price-level perception is not related to the value perception of organic food stores, and the total effect of price-level perception is weaker compared to price processibility and evaluation certainty.
- The results for the *weekly market* are very different from other store formats as price perceptibility plays a key role in explaining shopping intentions. The weekly market is the only store format where price-level perception has stronger direct and total effects than value.

Management implications

The results of this study carry several implications for retail-pricing practice. They indicate that retailers should not only focus on price-level competition. Value perception, price perceptibility, price processibility and evaluation certainty also have significant direct or indirect effects on shopping intentions. Therefore, retailers are well-advised to measure the customer perceptions of these price-image dimensions continuously. Such measurements are important to control the companies' price positioning from the customers' perspective. They are necessary to identify discrepancies between the intended price positioning and the customers' subjective perceptions. In addition, price-image measurements are also important to monitor the effects of changes in pricing strategies and tactics (Downs and Haynes, 1984). The present paper suggests an item-scale that retailers can use to measure the different image dimensions.

The results from the structural model also shed light on the relationships between image dimensions, which are important from a management perspective. The results indicate that price-level perception is an important value driver, although price perceptibility, price processibility and evaluation certainty also have significant direct effects on value. Furthermore, price processibility has an indirect effect on value perception via the price-level image. Hence, retailers can increase the customers' price level and value perceptions considerably without actually reducing prices. They simply have to make the perception and processing of price information easier for their customers. They can achieve this through price labelling, structured lists of unit prices and shelf-layouts that support price comparisons within a product category.

Another implication arises from the determinants of evaluation certainty. Although price perceptibility and price processibility directly or indirectly influence the evaluation certainty, price-level perception has the strongest direct effect on this image dimension. This underlines the fact that stores with a strictly low price level have an additional competitive advantage, as their prices are easy to evaluate for customers. Retailers with a medium or high price level should try to reduce this effect, for example through price guarantees for budget-price store brand lines or by actively justifying price premiums through information about superior product quality.

In addition to these general recommendations, retailers should be aware that the relevance of image dimensions and the relationships between them differ between store formats. Therefore, they should set different priorities in their price-image management:

- *Discount retailers* should concentrate their efforts on improving value perception, as this is by far the most important image dimension for this store format. Apparently, only offering cheap products is not sufficient. In reality, a lot of discounters have recently encouraged their efforts to improve value by offering more premium food products, such as organic product lines (Moreau, 2006b). It should be also noted that the small effect of the price-level image does not imply that discounters should raise their prices. Price level might be a so-called basic requirement for discount stores. Such a basic requirement is irrelevant as long as it is perceived as fulfilled, but becomes extremely relevant if it is perceived as not fulfilled (Kano *et al.*, 1984; Matzler *et al.*, 1996; Zielke, 2008). Hence, discount retailers do not have to improve their price-level image, but have to fulfil customer expectations for prices in discounters.
- For *supermarkets*, price-level image and value perception are both important. Retailers in the UK were very successful in the competition amongst discount stores by introducing “budget-price” store brands and generics (Moreau, 2006a). In addition, supermarkets should also pay attention to the performance dimension of value, for example by introducing value-added store brands which are innovative and offer equal or even higher quality than national brands (Burt, 2000). This becomes more important as discounters try to improve their value perception. In addition, supermarkets should not neglect the effects of perceptibility and processibility. Hiding low-priced store brands on the bottom shelves will apparently neutralize their efforts to develop a competitive price-level image.
- For *organic food stores*, perceived value is the most important driver of shopping intentions. However, as processibility and evaluation certainty perceptions are also important, these retailers should consider improving their price communication. They might actively communicate and justify price differences to conventional national brands, and they should emphasize the added value of their products.
- Finally, as price perceptibility is the most important price-image dimension for *weekly markets*, traders should attach special importance to price communication, especially price labelling. Furthermore, as price-level perception seems more important than value perception, traders at the weekly markets should try to improve their price-level image.

Implications for theory and future research

This paper extends prior research in a number of aspects. The study advances price-image measurement by suggesting a clear reflective scale, and it sheds more light on the behavioural impact of five price-image dimensions by analysing indirect and moderating effects. The results demonstrate that ignoring these indirect and moderating effects leads to insufficient and misleading insights. Nevertheless, the study leaves room for future studies, which can build on the results presented here. First, future studies should investigate the different drivers of price-image dimensions to improve our understanding of price-image formation (Gijbrecchts, 1993). Second,

future research should investigate more mediators and moderators for the impact of price-image dimensions on shopping intentions. Satisfaction might be such a mediator (Varki and Colgate, 2001), while price consciousness (Lichtenstein *et al.*, 1988) and food product involvement (Drichoutis *et al.*, 2007) might be moderators. Third, future research should discuss the generalisability of the results, e.g. by replicating the analysis in different geographical markets or by using different data collection methods. Fourth, future research might replicate the findings of this study using an experimental design and actual shopping data.

Limitations

Finally, some limitations should be mentioned. First, as the present approach is attribute-based, it is susceptible to halo-effects (Wu and Petroschius, 1987), which can produce a common method bias in the results. The existence of such a bias was tested by comparing the model presented in Figure 1 with a one-factor model. However, the results for the one-factor model produced poor fit indices (CFI: 0.646; RMSEA: 0.159; SRMR: 0.105; χ^2/df : 5246/230), supporting the assumption that different price-image dimensions explain behavioural intentions to shop in a retail store much better than a common factor.

Second, the attribute-based approach neglects the “gestalt” of the image, as an image might be more than the sum of its parts (Oxenfeldt, 1974; Dichter, 1985; Zimmer and Golden, 1988) and as the process of image formation might be category-based (Keaveney and Hunt, 1992). If the latter is true, the observed variance in the data might simply result from different store-format schemata. However, this concern is weakened by introducing store-format as a moderator variable. This analysis rules out variance produced by differences between store formats and the results show that variance in price images within store formats exists.

Third, the study is based on a convenience sample. However, as the students were instructed to contact respondents of different age, gender, household size and income, the sample is quite representative for the local area where the study was conducted. Nevertheless, it is not a strict quota sample.

Fourth, the respondents were deliberately not asked to evaluate only stores for which they have regular and recent experience. It was argued that this is similar to real-world shopping situations, where customers make choices for alternative stores. Furthermore, this method generated variance in shopping intentions. At the same time, this procedure might be also a limitation. If respondents are forced to infer their price images for stores they have little experience with, their perceptions might be far away from the objective price positioning of these stores. This should especially hold for the dimensions price perceptibility and price processibility which are difficult to evaluate without any experience with a store. On the other hand, this is what happens in actual shopping situations. Although some traders at the weekly markets offer cheap fruit and vegetables, several customers have apparently the impression that the weekly market is expensive, resulting in smaller shopping intentions for this store format.

Another research design limitation concerns the number of ratings made by each respondent. This procedure has the advantage that respondents rate the stores relatively to each other and this should also approximate actual shopping situations. Furthermore, as the respondents usually rated stores from different formats, the ratings within one store format are mostly independent.

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