

## MAIN FACTORS THAT INFLUENCE IN THE PRICE MISPERCEPTION

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### ABSTRACT

*Price knowledge is a very important psychological concept for retailers and manufacturers to formulate and develop marketing strategies. In this sense, an analysis of the knowledge that individuals have of prices can help retailers design more efficient price strategies. The purpose of this research is to analyse socio-demographic and environmental determinants (i.e. price range) and consumer price perception error in different types of retail stores. The empirical study is based on a survey that analyses price knowledge using perception error. Considering different socio-demographic and behavioural aspects of consumers in relation to prices, an analysis was carried out to ascertain whether or not there are significant differences in perception error. The results reveal significant differences for the price range and some socio-demographic variables.*

**Keywords:** prices, price knowledge, perception error.

### 1. Introduction

The present situation of the economy has seen product prices take on a very important role in consumer purchase decisions. In this sense, consumers spend more time trying to gain a more accurate knowledge of the price of the products they buy. As a result, price knowledge has become a much more relevant factor.

As a starting point, prices can be considered the monetary effort that consumers must make in order to obtain the right to consume or to use a product or service. A classical economic approach assumes that lower prices of the same product produce more sales than higher prices. However, prices sometimes act as an indication of quality. A product with an excessively low price could be perceived as a low quality product.

Prices, which from a marketing perspective translate the value that a product or service has for a consumer at a certain time, are usually overestimated or underestimated by consumers.

Prices are sometimes considered to regulate supply and demand, as a qualitative property of the product. Consumers have their own price-quality ratios, expensive-cheap, for each product. They assess products considering quality, customer service, information and the brand and company image (Velasco, 1994).

On other occasions, prices fail to adjust sufficiently to the values perceived by the consumer, which leads to an underestimation of prices. When faced with this situation, it is important to remember that the value of a product is considered in subjective and objective terms by possible consumers. Therefore, prices are yet another factor, albeit very important, of the set of satisfactions and sacrifices represented by the supply of the product.

Although prices are one of the costs faced by consumers in a purchase decision, there are others, such as the time of purchase, displacement costs and psychological costs. Nevertheless, prices are among the easiest for consumers to analyse, which is why they play such an important role in consumer purchase decisions. The findings of Agárdi and Bauer (2000) showed that buyers selected at a point of sale to make a purchase considered the price of a product to be the most decisive factor in their purchase decision.

Section 2 of this paper analyses the concept of price knowledge from a theoretical viewpoint, as well as the main indicators used to measure it and the factors that most influence consumer price knowledge. Furthermore, this section presents the hypotheses to be tested in relation to the influence that different factors have on price knowledge. Section 3 conducts an empirical application with everyday consumer products, which makes it possible to test the veracity of the hypotheses considered. The results presented in section 4 reveal that

perception error is lower for products with a higher price; women have better price knowledge than men and that consumers over the age of 55 display greater perception error and therefore less price knowledge. In contrast, the frequency of purchase and the type of establishment have no significant effect. Finally, the discussion section includes the main conclusions and limitations of this study and the future research lines.

## **2. Materials**

### **2.1 Price Knowledge**

Price knowledge is an important psychological concept for retailers and manufacturers to formulate and develop marketing strategies. In this sense, an analysis of consumer price knowledge can help retailers to fix the price of the products they sell much more efficiently.

Price knowledge is frequently considered in definitions as the ability of consumers to store the value of prices in their memory (Aalto-Setälä and Raijas, 2003; McGoldrick and Marks, 1987). Therefore, price awareness is used as a substitute of price knowledge with an almost identical meaning. Price awareness has been defined in three different ways (Monroe and Lee, 1999):

1. The ability of buyers to remember the exact prices of products they have purchased recently, that is to say, to evoke the exact price of the products they have just bought.
2. The ability of buyers to classify different products according to their price.
3. The ability of buyers to recognise the correct price of a product among several price alternatives.

There are two types of price knowledge: explicit and implicit. Explicit price knowledge assumes the conscious recovery of objective information, whereas implicit price knowledge uses information stored unconsciously, which influences purchase behaviour (Estelami and Lehmann, 2001). Explicit price knowledge is normally considered in terms of the exact price of a product, while implicit knowledge can be assessed by offering a semantic difference as “expensive-cheap”.

One of the aspects analysed in the research on price knowledge is the relationship between price knowledge and consumer purchase decisions. There is normally a direct relationship, that is to say, the consumers who perceive prices more accurately (i.e. those that have greater price knowledge), assign more importance to prices in their purchase decision (McGoldrick and Marks, 1987). This assumption has been corroborated by some studies in which the importance of prices in purchase decisions has been introduced using other variables such as the attention that consumers pay to prices (Dickson and Sawyer, 1990; Monroe and Lee, 1999); price comparison (Monroe and Lee, 1999; Vanhuele and Drèze, 2002) and the use of price information (Dickson and Sawyer, 1986; Mazumdar and Monroe, 1990; Kenesei and Todd, 2003).

Price awareness is often compared to the concept of price knowledge. Kenesei and Todd (2003) contributed with a broader vision of price awareness using three different concepts: price knowledge, price looked for in the establishment and price looked for between establishments. Therefore, price awareness means consumers consciously look for information on prices and memorise it more or less exactly, whereas price memory considers whether or not consumers can memorise the exact price of a product after selection.

Monroe, Powell and Choudhury (1986) establish that recognition is a more appropriate indicator of price knowledge than memory, as price information can be the result of either an active search or learned incidentally by chance while consumers conduct their decision and purchase processes. Price knowledge has three dimensions (Vanhuele and Drèze, 2002):

1. Memorisable price knowledge is the highest level, whereby the processing of price information is deliberated. That is, the consumer carries out an active search for prices for later use. This level is based on the direct storage of the verbal code of the price and the exact value associated to this.
2. The second level considers price recognition. This case deals with memory assisted by keys and information consumers are provided with (Monroe et al., 1986). When consumers observe a product price, they can tell if it is the price they have considered and bear it in mind. This is an intermediate level where consumers process information incidentally.
3. Deal spotting. This form of price knowledge consists of consumers not knowing the exact price, but recognising whether a price falls inside or outside a range of prices they consider normal. In this case, the processing of price information is automatic.

Consumer knowledge of prices in the short term will have to be measured at the time the product is chosen, as information stored in the short term memory vanishes quickly due to its limited capacity (Jacoby and Olson, 1977; Dickson and Sawyer, 1990). On the other hand, the long term memory of consumers when forming benchmark prices and the price information learnt intentionally can be measured before, during and after the visit to the point of sale. According to the latest recommendations in the literature (Monroe and Lee, 1999; Estelami and Lehmann, 2001; Vanhuele and Drèze, 2002), it is important to measure price knowledge in both the short term and the long term. Such indicators measure different forms of numerical memory and different levels of processing.

### **2.2 Perception error**

Most studies in the literature conclude that price knowledge is generally quite limited in the case of almost all consumers (Dickson and Sawyer, 1990). Similarly, Zeithaml (1988) shows how the majority of consumers do not have sufficient price knowledge to give an exact price for many products and, therefore, make mistakes when estimating it.

Many consumers do not know the exact price of many products they buy. They probably do not try to learn or retain that information, although they are very aware of the importance of prices. The point of sale gives all the information about the price that the consumer needs at the time of purchase to choose a product or brand. This reduces the need to retain up-to-date and exact information on prices paid in the past. Therefore, buyers tend to use an external reference frame more than an internal one to assess prices within a specific product category.

Several approaches exist to measure consumers' shortage of price knowledge (Wakefield and Inman, 1993; Zeithaml, 1982; Evanschitzky, Kenning and Vogel, 2004). This paper used the estimation error of prices (perception error) understood as the difference between the price that consumers remember and the real price, in absolute or relative terms. Therefore, we consider a knowledge concept based on the idea of knowledge of a memorable price as in Vanhuele and Drèze (2002) or the first level of knowledge in the planning by Monroe and Lee (1999).

Estelami (1998) used a deviation percentage in absolute terms and indicated that when there is great price dispersion in the market, this can result in consumers having little knowledge of prices. Evanschitzky et al. (2004) observed that consumer price knowledge is quite low and tends to overestimate prices, reaching the conclusion that almost eighty percent of consumers overestimate prices.

### **2.3. Factors that influence price knowledge**

Consumer price knowledge can be influenced by several factors, which can be related both to the personal characteristics of the consumer and also to the category of the product (Estelami, 1998).

The socio-demographic characteristics of consumers can affect the knowledge they have of prices. Thus, variables such as gender, age or level of income could affect consumers' interest in products and their ability to know prices. Consumers will probably be indifferent towards the price of products that do not belong in their shopping basket. Shoppers could be familiarised with the prices of products they often buy. Therefore repeated contact with specific prices could lead to a better knowledge of them.

In general terms, the variables that affect consumer price knowledge can be classified in five groups (Jensen, 2004):

1. Cognitive variables, including purchase frequency, brand loyalty, planned behaviour, experience or involvement with prices and the change of establishment.
2. Variables related to the establishment. The type of establishment where the study is conducted could affect consumer price knowledge.
3. Variables related to the product. Generally, we can accept that promotions can increase the attention of consumers. In this sense, Jensen (2001) established that the purchase of a brand in promotion seems to influence consumer price knowledge. Consequently, four aspects could earmark as potentially affecting price knowledge: size of the product category; promotion frequency; purchase frequency; and the relative level of prices within the product category.
4. Demographic variables. This group of variables includes age, gender, the size of family and income.
5. Finally, some situational variables, such as time pressure and purchasing with children entail less time and cognitive capacity to process price information, leading to less knowledge of prices.

Considering the above classification, this paper analysed the effects of two types of factors. First of all, the primary target was to cancel out the impact that the range of product prices has on knowledge. Therefore, this aspect is related to the product. In this sense, the study included products purchased in different price ranges. Secondly, the study assessed socio-demographic features, such as shopper age and gender, also considering aspects related to purchase frequency. Finally, the possible differences in knowledge stemming from the type of establishment where products were purchased was analysed..

#### **2.4. Hypotheses**

Consumer price knowledge is affected by different factors. Bearing this in mind, this study analysed the impact that different factors have on price knowledge, measured using perception error.

Among the factors related to the product, it is worth highlighting their range of prices. In this sense, this research assessed whether or not the perception error committed changes depending on the price range of the product. Price ranges were considered as consecutive intervals of lower to higher prices.

If the product belongs to a higher interval of prices (i.e. the product is more expensive), an active search will involve greater implication and a greater possibility of saving, which should result in a greater knowledge of prices. Furthermore, if the product falls in a lower price interval, the perception of differences will be also smaller. Thus, consumers will perceive greater similarity, less possibility of saving and, therefore, will have less knowledge of prices. Considering these arguments, the following hypothesis could be considered:

*H1: Perception error will be greater for products with a smaller range of prices.*

In relation to the influence of age on price knowledge, the results obtained by Zeithaml (1982) reveal that older shoppers register higher perception errors. One possible cause could be that these shoppers are less capable of memorising and making mental calculations, as well as their frequently low level of education. Therefore, the following hypothesis could be established:

*H2: Price knowledge will be inversely related to consumer age.*

Concerning gender, women display a more precise knowledge of prices than men (Estelami and Lehmann, 2001; Rosa, 2004). This higher knowledge must be due to the fact that women are still in charge of shopping for the household and, therefore, have more purchase experience. In this sense, the following hypothesis can be established:

*H3: Women will have more price knowledge.*

In the case of purchase frequency, we can initially assume that purchase frequency results in greater experience and greater price knowledge, because consumers have gained the information more recently. Notwithstanding, Dickson and Sawyer (1990) concluded that the most frequent consumers in a product category did not generally have a greater knowledge of prices than less frequent consumers. Thus, the following hypothesis can be established:

*H4: Consumer price knowledge will be affected by purchase frequency.*

Another important aspect that can affect consumer price knowledge is the type of establishment where consumers make their purchases. In this sense, McGoldrick et al. (1999) observed that the consumers interviewed in a discount store were significantly more aware of prices than the consumers interviewed in supermarkets. There are several reasons for this. On the one hand, discount store shoppers are more involved or concerned about securing a low price, considering price to be an important factor in the purchase decision. On the other hand, this establishment has less variety of brands and products and, therefore, less information on prices easier to retain. In addition, this type of establishments make less changes in prices due to promotions, or at least not as many as hypermarkets or supermarkets that employ a high-low pricing strategy. For this reason, the following hypothesis can be considered:

*H5: Discount store shoppers will have a greater knowledge of prices.*

### **3. Methods**

After considering the theoretical aspects and hypotheses, the paper now analyses the features of the study that will define the data obtained, as well as the tool and the procedure used in the empirical application.

The information for the study was obtained from personal surveys conducted when shoppers were leaving various types of commercial establishments: two hypermarkets, twenty-nine supermarkets and six discount

stores. The location of these establishments has been selected in order to cover a middle-sized city (175,000 inhabitants). The questionnaires were completed by the person who is normally responsible for purchasing. A total of 180 questionnaires were considered valid. The sample distribution for the different kinds of establishments can be seen in Table 1.

**Table 1. Sample distribution by establishment**

Type of establishment	Sample distribution (%)
Hypermarkets	24.1
Supermarkets	62.1
Discount stores	13.8
<b>Total</b>	<b>100.0</b>

Source: own elaboration

Immediately after shoppers choose their products and pay for them, the interviewer asks them for their receipt. Next, three products were selected on the basis of their price range: one of under a euro, another of between one and three euro and, finally, one of more than three euro. Considering the real price for each product reflected in the receipt, shoppers were asked for different information regarding price knowledge, as well as for their opinion of prices (reasonable, maximum and minimum) for each selected product. Besides the specific information on selected products, the survey also gathered information regarding another series of issues related to purchase habits and behaviour in relation to price.

Price knowledge was initially measured using a generic subjective estimation by the consumer of their general knowledge on a scale of 0 (no knowledge) to 10 (exact knowledge). In addition, objective indicators have also been considered, such as, the perception error committed when considering the price remembered at the time the survey was completed and the real price of the product. Furthermore, consumer behaviour in relation to price and the importance of prices in their purchase decisions was contemplated by way of an array of questions on a likert scale of 0 to 10 points (e.g. the price is important in the purchase; I usually compare prices a lot, etc.).

Perception error is defined as the difference between the remembered price and the real price, corrected by the real price and expressed in absolute or relative terms.

$$\text{Perception error} = \frac{\text{Remembered price} - \text{Real price}}{\text{Real price}}$$

It is important to emphasize that a relative error is used on the real price, because this is the only way to ensure different types of products are comparable. Perception error can take different values and can be interpreted as in Table 2:

**Table 2. Perception error interpretation**

Perception error	Interpretation
E.P. > 0	Remembered price > real price Price over-estimation
E.P = 0	Remembered price = real price Knowledge of the exact price
E.P < 0	Remembered Price < real price Price under-estimation

Source: own elaboration

These error measures were calculated for each of the three product categories considered in this paper: product A, which includes products with a market price lower than €1, product B, which refers to products with a price range of between €1 and €3 and product C, which includes products that cost more than €3.

#### 4. Results

Considering perception error, the characteristics of the data obtained from the survey and the objective of this paper, a univariate analysis of variance (ANOVA) was employed to ascertain the differences in the error committed for different situations. This analysis is a highly versatile and powerful method of analysis in these cases and can be applied in different situations and with different objectives (Novak, 1995).

First of all, considering product price ranges, the results demonstrated that the committed error is significantly different depending on the price range of the product considered (see Table 3). Furthermore, Table 4 displays the average perception errors for each of the product categories considered.

**Table 3. Analysis of variance**

Factor	F	Sig.
Type of product	4.606	0.010

Source: own elaboration

**Table 4. Average perception errors**

	Error A	Error B	Error C	Errors A and B	Errors B and C	Errors A and C
<b>Average</b>	0.124	0.109	0.081	0.015	0.028	0.043

Note: Errors A, B and C are the average perception errors for products A, B and C, respectively. Errors A and B show the differences between the average perception errors for products A and B.

Table 4 reveals that perception error is lower for products with a higher price (product C). In relation to the difference between the perception errors for the different types of products, it is possible to observe that the difference between these errors is smaller for products with similar prices, products with lower prices recording the smallest difference. These results confirm the first hypothesis.

If the average perception error for all three types of products is considered, the results indicate that there are significant differences between different age groups (see Table 5). Shoppers over the age of 55 register a higher perception error and, therefore display less knowledge of prices. In contrast, shoppers under the age of 34 have a better knowledge of prices. Table 6 shows the results that confirm the second hypothesis.

**Table 5. Analysis of variance**

Factor	F	Sig.
Age	3.399	0.036
Gender	3.251	0.073
Purchase frequency	0.227	0.797
Type of establishment	1.086	0.844

Source: own elaboration

**Table 6. Average perception error by age group**

Age	Average
Under 34	0.006
Between 35 and 54	-0.022
Over 55	0.038

Source: own elaboration

As regards gender, the results in Table 5 show that there are significant differences between the average perception error of men and women. Indeed, the average perception error for men is 0.023, while for women it is -0.011. These results confirm that women have a better knowledge of prices than men, thereby corroborating the third hypothesis.

On the other hand, the results in Table 5 also reveal that there are no significant differences in terms of the average perception error based on the frequency of purchase. That is, buying once a week, twice a week or any more does not have a significant effect on the average perception error of prices. This result rejects the

hypothesis that purchase frequency has a positive effect on price knowledge and confirms the findings of Dickson and Sawyer (1990).

Finally, in reference to the type of establishment, the results showed that there is no difference in the price knowledge of the shoppers who buy their products in different types of establishments. These results reject the fifth hypothesis that discount store shoppers have a greater knowledge of prices.

## **5. Conclusions**

The results obtained in this paper provide an overview of some of the factors that influence consumer perception error of prices.

First of all, the price range a product falls in determines the error committed. In this sense, the more expensive a product is, the smaller the relative error a shopper commits.

Secondly, the socio-demographic factors represented by age and gender display negative effects. The first supports the hypothesis of greater difficulty in the memory is a possible positive effect of the greater age. In the second case, it seems that role of women as a habitual household shopper determines their greater knowledge of prices. In spite of this, the relationship could be further clarified if other aspects such as disposable income were considered.

This paper cannot confirm the hypothesis that frequent shopping has a positive effect on price knowledge. Therefore, the argument that greater shopping frequency results in greater exposition to prices and greater experience does not appear to hold in this case. In any case, considering shopping frequency in large blocks (i.e. once a week, twice a week, others...) homogenises consumers and makes it difficult to detect differences.

Finally, the type of establishment does not condition price perception error as initially expected, but rather is independent of the place of purchase. This criterion can therefore either be assumed to be irrelevant, or due to there being less shoppers in discount stores than in other types of establishments.

The results and conclusions of this paper generally corroborate the hypotheses initially considered. However, some limitations of the approach and method may have also affected these results.

First of all, the final measurement of some variables may have conditioned the results. As regards price ranges, greater intervals could be used, although the types of product consider make the ranges used in this research reasonable. Other concepts, such as the frequency of purchase could have been associated directly to the product rather than in general terms as a more adapted proxy of experience in the purchase of products. Furthermore, the data gathering process and situational conditions may have affected the quality of questionnaire responses. Although the questionnaire was not long, the pressure of time and haste could have led to less responsible answers.

Finally, in relation to future avenues of research, it would be interesting to analyse consumer knowledge of prices not only in physical establishments, but also on Internet. It would also be worth obtaining information not only after a purchase has been made, but also before, that is, to conduct a survey at home before shoppers enter a shop or supermarket, or while shopping. Researchers could also consider not only everyday consumer goods, which have a limited price range, but also lasting products, such as household appliances. Finally, it would also be interesting to analyse how perception error influences consumer behaviour (e.g. loyalty, satisfaction, perception of service quality,...).

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