

## **Do Buyers Really Know Prices? An International Perspective on Price Knowledge**

by

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*Abstract.* Price knowledge is a complex mental process that involves implicit and explicit memory, conducting to special representation of price information. The present paper outlines the coordinates of mental processing of price, as numerical stimulus, necessary to understand buying behaviour. According to this process, there were designed several research methods that investigate the way in which price knowledge is operationalized. There were also identified the main factors that influence price knowledge, factors related to characteristics of buyer, of product category, of store type or to other specific situations. In the paper, there are analysed some studies conducted in several countries that report different results concerning price knowledge. These differences might be caused by the methodology used, by product category, by buyer's personal characteristics or by other factors, specific to each buying context. The main idea of these studies is buyers have a low level of price knowledge, irrespective of country they belong, even when they were exposed to price information very short time before the research interview. These findings are opposite to general belief that shoppers know well prices and do buying decisions dominated by rationality. There are some managerial implications of price knowledge research, related to price format, to the ways used to communicate price changes or to the manner in which it is suitable to set price ranges within product category.

*Key words:* long-term memory, price knowledge, price recall, short-term memory.

JEL classification: M31, M20.

### **1 Introduction**

Price knowledge represents a topic approached quite intensively in the last 30 years in marketing literature, being an area with important implications for decision makers. Many producers and retailers believe that customers have a high level of price knowledge, but the studies affirm the contrary. In order to understand the price knowledge process, it is necessary to analyse how people memorize price information.

Monroe and Lee (1999) made the distinction between explicit memory, that is conscious recollection of information referring to an event by associating it with the context in which such an event happened, and implicit memory that doesn't involve a conscious retrieval of information related to a previously exposed event, but deducing it basing on some cues related to such an event. These authors stated that when price information is processed consciously, the consumer pays attention to the price, encodes the price information and makes a judgment regarding the product's value, being

more likely to recall price level. By contrast, when price information is processed at nonconscious level, the buyer does not pay attention to the price, not being able to recall it, but he may make a judgment on product's value such as: "bargain", "reasonably priced" or "too expensive" (Monroe and Lee, 1999).

The implicit price knowledge, even if doesn't lead to price recall, it might influence the buying behaviour (Coulter, 2003).

According to explicit and implicit memory, it might be made a clear distinction between *price remembering* that involves consciously retrieving information stored in memory, making customer able to recall the price paid and *price knowing*, that is based on a certain familiarity with the context in which price information was presented, reflecting the result of an automatic or non-conscious information processing (Monroe and Lee, 1999; Monroe, 2003). In conformity with this distinction, at the exposure to a price promotion advertisement, price remembering means that an individual remembers he saw a price promotion in the advertisement, that may determine him to check

it in the store, while price knowing means that the individual confirms the existence of the price promotion, not remembering the source which transmitted such an information (billboard, newspaper, radio, TV, banner) (Monroe, 2003).

## 2 Mental processing of price as numerical stimulus

In order to understand the mechanism used to memorize price, it is necessary to analyse the process of representation for numerical stimuli. The price processing as numerical stimulus is complex. Dehaene (1992) proposed a triple-code model for explaining the human number-processing architecture: auditory verbal code that uses word sequences (e.g. six, eighteen), a visual arabic number code (numbers are represented in arabic format "6", "18") and a magnitude code that evaluates the distance between numbers, using numerical quantities ("6" is lower than "18").

Customers might memorise prices in numerical or verbal expression, according to the initial encoding of this information. Price knowledge research takes into consideration all three ways of price representation. Thus, by verbal recall is accessed auditory verbal code, by price recognition from a list is activated the visual arabic number code and by researching the attractiveness of a price or estimating the normal price range is considered the magnitude code (Vanhuele and Drezé, 2002)

Monroe and Lee (1999) have demonstrated that the conscious processing of price involves comparing it with a reference level. During this process, the actual price might be transferred in long-term memory, allowing recall it. The unconscious processing of price does not lead to price recall, but to remembering some product's associations related to price (Coulter, 2003).

Price knowledge research uses several methods of measurement, as follows (Eberhardt *et al.*, 2009):

- *methods for measuring price recall*, which ask subjects to mention the price of a product to whom he was exposed before;
- *methods for measuring price recognition* that involves presenting the subjects several prices

and asking them to choose the correct one or to judge each of them as right or wrong;

- *methods for measuring price ranking* that ask subjects to rank the presented products, according to price magnitude;
- *methods for measuring price intuition (deal spotting)* are based on the belief customers have a intuition for the normal price, being able to categorize it as low or high;
- *methods for measuring self-assessment* which include questions often used in marketing research.

These research methods take into consideration the operationalization of price awareness process: buyers' ability to recall the price paid, buyers' ability to recall the relative price rank of a product comparing to others in their choice set, buyers' ability to recognize the price paid from a prices list (Monroe and Lee, 1999).

In price knowledge research, asking subjects to recognize a price is easier than recalling it from memory, the task to choose a price from a list is desirable than mentioning it spontaneously (Kenning *et al.*, 2011).

For measuring price recall accuracy, one of the most used formula is to determine the percentage deviation of the recalled price from the objective price (Dickson and Sawyer, 1990):

$$\text{price recall accuracy} = \left| \frac{\text{objective price-recalled price}}{\text{objective price}} \right|$$

In price knowledge research, interviewing shoppers at store entrance evaluates better the price registered in long-term memory, while interviewing at store exit is oriented to identify prices stored in short-term memory (Evanschitzky *et al.*, 2004).

Bahl *et al.* (2011) define price knowledge by four dimensions: accuracy, confidence, usability and specificity. By accuracy they understand the difference between the perceived price and the correct price, while confidence is defined by the trust buyer has in his estimations of price level. Usability depends on the first two dimensions and represents the extent to which the shopper has the right information about price and has confidence in his own judgments about it. Specificity refers to the extent in which the

shopper identifies more clearly the presentation of a price, for example, instead of 10 Euro he states 9.95 Euro. Someone's price knowledge might dispose of accuracy, but not of specificity.

### 3 Factors that influence price knowledge

Searching price information behavior influences price knowledge. According to Dickson and Sawyer (1990), buyers who stated they checked the price during the buying process had a higher price knowledge (70.7%) than those who didn't check it (17.3%). When shoppers do a high in-store price-comparison, both temporal (across time) and spatial (with the prices of other stores), their price knowledge increases (Olavarrieta *et al.*, 2012).

Another category of factors that influence price knowledge is the brand image and its market share. Evanschitzky *et al.* (2004) reported that price knowledge for strong brands (that possess high market shares) is relatively higher than for those with a reduced market share. The explanation offered by them was these brands are bought frequently and have a familiar image, buyers learning their prices easier.

Buying frequency influences also price knowledge, frequent buyers having a higher knowledge of prices and are more prone to compare prices with those applied by other stores than infrequent buyers (Dickson and Sawyer, 1990).

Offering frequent price reductions increases the knowledge of initial price, because buyers pay more attention on it in order to estimate the value of promotion (Vanhuele and Drèze, 2002).

The product category characteristics influence price knowledge. Consumers have higher price knowledge for goods than for services, in terms of accuracy, confidence, usability or specificity (Bahl *et al.*, 2011).

An increased wide of assortment diminishes the awareness of prices. For heterogeneous products with a greater diversity of product range, price recall is lower than for homogenous ones (Vanhuele and Drèze, 2002).

Consumers also have a lower level of price knowledge when they buy bundle products than

unbundled, because in the first case they focus more on value, and in the second one they focus on price (Olavarrieta *et al.*, 2012).

Price dispersion within the product category influences price knowledge. The greater the distance between the minimum and maximum price of the category the weaker is price knowledge degree (Vanhuele and Drèze, 2002).

Among personal factors, Rosa-Diaz (2004) demonstrated that buyers who have greater confidence in their own judgment on price level know prices better.

Eisenhauer and Principe (2009) have found a significant relationship between price elasticity of demand and accuracy of price knowledge, consumers with a greater price knowledge having higher elasticity of demand.

Among the situational factors, Dickson and Sawyer (1990) found that in store availability of price information (as communicating special offers in stores' catalogues) doesn't reduce searching time concerning prices and other product characteristics.

The presence of in-store price signs (on the floor, on the shelf, hanging from ceiling) or out-store price signs (at the store entrances) increases attention and predisposes to more active processing of information relating to price, raising its awareness (Olavarrieta *et al.*, 2012).

The importance of price in buying decision making process influences price knowledge. The more important the price is in the purchasing decision, the higher is the price knowledge (Rosa-Diaz, 2004).

Chandrashekar and Suri (2012) showed that price knowledge influences perceived value depending on the channel type, so buyers with a low price knowledge consider an offer having a higher value when is presented in the off-line environment than when it is sold in traditional stores.

Concerning the influence of socio-demographic variables on price knowledge, the opinions are divergent. Bahl *et al.* (2011) found that price knowledge for goods and services is not influenced by socio-demographic variables (age, sex, level of education). Other studies (Estelami and Lehmann, 2001; Rosa-Diaz, 2004) show that women have a greater ability to

recall exact price compared to men. Also, Estelami and Lehmann (2001) found that price recall accuracy is negatively related to income, higher income buyers having lower price recall accuracy.

Gaston-Breton and Raghubir (2013) showed that price awareness is higher for younger buyers with a higher income and belonging to higher social classes. Rosa-Diaz (2004) states that age and marital status did not influence the price knowledge, except for when this variable was operationalized as how to rank three brands according to their price.

The channel type and gender influences price and value perceptions. Women appreciate more favourable an offer when is presented in traditional stores compared to its promotion in online environment, while for men the opposite is true (Chandrashekar and Suri, 2012).

#### 4 Price knowledge in international context

Dickson and Sawyer (1990) have evaluated the price knowledge in US, asking subjects to recall the price of the item they just chose and place it in the shopping card (in an interval of 30 seconds after picking the product). In this way, it was intended to measure price information buyers were exposed at very recently. According to the results, 47.1% of American buyers have recalled the correct price, 55.6% of them recalled within 5% deviation, but 21.1% weren't able to do any estimation of it. Also, less than a half were conscious they bought a special-priced item.

Concerning Romania, Vranceanu (2005) conducted a survey on price knowledge for mineral water, subjects being interviewed at the exit from a hypermarket. The methodology used was according to Vanhuele and Drèze (2002) for testing short-term memory. Romanians' price knowledge is low, only 16.4% of subjects being able to recall the exact price, 58.9% within 5% deviation and 19.2% weren't able to do any price estimation. Concerning the extreme prices, price recall was higher for maximum price of product category (11%), than for minimum price (2.7%), almost 35% couldn't do any estimation on extreme prices.

In the same study, it was analysed the Romanians price behaviour. Many of them (62.8%) use to search for information about prices before buying from a certain store, and a half (50%) know the stores from their area that offer the most convenient prices. In price searching behaviour, 30.9% of buyers use marketing sources (catalogues, advertisements, TV commercials), the interpersonal sources being less used, only 23.4% asking friends/acquaintances about prices offered by different stores. Concerning the price behaviour for mineral water, Romanian buyers base more on external reference price (22.3% compare in-store prices for different containers, 23.4% look for special offers) than on internal reference price (20.2% analyse prices paid before for mineral water).

This study might be compared with one conducted by Vanhuele and Drèze (2002) for testing short term price memory for mineral water. According to it, among French hypermarket buyers, 10% recalled exact price, 37% within 5% and 34% weren't able to do any estimation on price. Comparing the results for these two studies, it results that Romanian buyers have a higher degree of price knowledge for mineral water than French buyers (Table 1).

Table 1 Price recall for mineral water in Romania and France

Accuracy level	Cumulative percents	
	Romania	France
Correct	16.4%	10%
Within 5%	58.9%	27%
Within 10%	71.2%	48%
Within 20%	80.8%	66%
Don't know	19.2%	34%
Total	100.0%	100.0%

Source: Adapted from Vranceanu (2005); Vanhuele and Drèze (2002)

Vanhuele and Drèze (2002) presented the results of another study that evaluated French buyers' short-term and long-term memory for prices. The interviews were performed at store entrance, before exposure to current prices. According to the results, 2.1% of subjects were able to recall exact price, 21.3% recalled within 5%, 39.7% having any idea of prices. Thus, French buyers have very low price knowledge.

Evanschitzky *et al.* (2004) conducted a research on German buyers, asking them to indicate, for certain products, the normal, the low and the high price. The interview was applied at store entrance, thus being explored the long term memory. The results show that price knowledge among Germans is low, less than 50% of subjects being able to do an estimation of it. Also, they have underestimated prices, the deviation of recalled price to the normal price being negative.

Olavarrieta *et al.* (2012) applied in Chile the same methodology as Dickson and Sawyer (1990), price information being asked just after buyer chose the product. The results show that 67.5% of subjects did a price recall within 5% and 28.7% remembered the exact price. This situation shows a medium to low price knowledge for Chilean customers.

Rosa-Diaz (2004), in a survey conducted in Spain, has established that 25.5% of subjects made a correct assessment of the price level, 61.5% had a deviation up to 5%, while 21.7% could not make any price estimation.

Making a comparison between five studies conducted in different countries (Table 2) it might be observed that American buyers have the highest degree of price knowledge and French buyers the lowest, while Spanish buyers are very likely with Chileans.

Table 2 Comparative analysis of price knowledge in several countries

Country	Authors	Corect price	Within 5%
USA	Dickson and Sawyer (1990)	47.1%	55.6%
Chile	Olavarrieta <i>et al.</i> (2012)	28.7%	67.5%
Spain	Rosa-Diaz (2004)	25.5%	61.5%
Romania	Vrânceanu (2005)	16.4%	58.9%
France	Vanhuele and Drèze (2002)	10%	27%

Concerning the influence of price knowledge on buying behaviour, it is more likely that information stored in long-term memory influences the buying decision than that stored in short-term memory (Evanschitzky *et al.*, 2004). Awareness of price reductions' presence

enhances the price image of a brand and of a store (Dickson and Sawyer, 1990).

Concerning the variation of price knowledge, this is very wide, Monroe (2003) appreciating that buyers who recall prices exactly vary between 8% - 61.3%.

## 5 Conclusions

In general, buyers have a low price knowledge degree, paying little attention to prices during buying process. The studies conducted just after picking the product show that less than 50% of shoppers can remember the exact price, the percent being much lower when is evaluated price long-term memory.

Processing the price as numerical stimulus is a complex activity, during which is activated explicit or implicit memory. According to the way in which price is represented in memory, there were designed several research methods.

Price knowledge might be influenced by product category, assortment variety, frequency of purchase, brand image, degree of fidelity, importance of price in buying decision, buyer's trust in his estimates of price, socio-demographic variables.

The results of price knowledge studies in international context are heterogenous, caused by the differences in research methods (focused on short-term memory or on long-term memory) or by cultural factors. In order to obtain comparable results at international level, it is necessary to implement a multinational study, with a standardized methodology.

The managerial implications of price knowledge studies concern necessity to intensify the promotional efforts in order to communicate different price offers or to choose promotional means with high potential to attract attention to a special offer. In designing the assortment, the suppliers have to assess the wide of assortment and the price range. Also, the decision makers might do a segmentation of their markets according to price knowledge.

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