Investigating the effect of external reference prices on consumer price evaluation and purchase decision: A multi-method approach.

Lilla Lipták
University of Szeged Faculty of Economics and Business Administration
Szabolcs Prónay
University of Szeged Faculty of Economics and Business Administration

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Abstract:

According to the core principle of behavioral economics consumers frequently apply heuristics when deciding which can lead to biased perceptions and decisions. In our research we aimed to investigate one of these phenomena, namely the effect of external reference prices on consumers' price evaluation and decision. In order to this first we applied an online experimental survey which has been filled out by 2158 people. To understand our results more, we also had an eye tracking experiment with an interview among 26 participants. Our results show that external reference prices has influence on consumers, but there are other important factors which play role in the decision making process. All in all we can say that external reference prices has greater influence on more price conscious consumers, although these people fixated on average shorter on the presented prices in our experiment.

Keywords: external reference price, decoy pricing, behavioral economics

Track: Pricing & Promotions

1. Introduction

In the last few decades consumer society outgrow itself causing an unlimited number of products and services on the global market. People are surrounded by so many information and offers that it is impossible to follow. For example, only Amazon, which is the biggest e-commerce company, sells more than 12 million products. In this consumer environment it is very hard to choose the perfect option. In addition to this the appearance and the increasing usage of dynamic pricing make even more difficult for people to compare offers, because those are personalized for them based on their previous online activities and purchases. For this reason when deciding, it is getting more difficult for consumers to rely on their own price knowledge or internal reference prices.

Neoclassical economics consider people as rational decision makers who are provided by all the information about their decision and always choose the best alternative. From our everyday life we know that it is impossible, because we do not even have all the necessary information to decide rationally. It is also proven that the decision-making of people depends on the emotions, traditions, norms and many other factors. In the 1970's behavioral decision making and its research, the new sub-discipline of psychology, had a big influence on economics and led to the appearance of behavioral economics (Anger & Lowenstein, 2012). The most well-known names in behavioral economics are Daniel Kahneman and Amos Tversky. After years of empirical observations and researches they identified several heuristics and connected biases. Based on these they created an alternative model of consumer decision making, called Prospect Theory (Kahneman & Tversky, 1984; Angner & Loewenstein, 2012; Kahneman, 2011). One of the mental shortcuts, so called heuristics they identified, is anchoring and adjusting, which is related to the reference point effect mentioned in Prospect Theory. Anchoring and adjusting means that external stimuli can get stucked into our minds. For this reason people usually make their estimations and decisions based on these initial points. This is mostly an external stimulus which we can recall from our memory. Different initial points can lead to different decisions and they bias the evaluation towards the initial reference point. This phenomenon is called anchoring effect (Tversky & Kahneman, 1974; Thaler & Sunstein, 2008). The above mentioned initial point can also be called reference point. Reference point are essential for people to be able to make comparisons and evaluations (Kahneman, 2011). As Ariely (2008) says, everything is relative and the reason why reference points are so important, because we evaluate the offers and make decisions based on this comparison (Kahneman, 2011).

This phenomenon has been also investigated in case of prices, where we can call this initial point a reference price. Several previous studies proved that reference prices as well as the display of internal reference prices can bias and have an effect on the price perception and price evaluation of people. For this reason in our study we investigated the impact of external price display on consumers' price evaluation and choice.

2. Reference prices

We can identify the reference point effect in case of prices and then we can call it a reference price. It refers to the process when consumers evaluate and compare prices to a "standard" price (Cheng & Monroe 2013). Therefore reference price by definition is the price we compare to the price of other products (Niedrich, Sharma, and Wedell, 2001). It can be a price which we recall from our memory (Kotler, Keller, Brady, Goodman and Hansen 2012) or it can mean all the available prices of other products in the store (Rekettye & Liu, 2018). The former is called internal reference price while the latter is external reference price.

2.1 External reference price and decoy price

External reference prices occur when retailers display both the original and the sale price of an offer (Rekettye & Liu 2018; Cheng & Monroe, 2013). Furthermore, the consumers when buying not only compare the sale price to the original one, but also take the prices of other products within the same product category into consideration (Manning & Sprott, 2009). Therefore, the competing brands provide important reference prices at the place of purchase (Bolton & Shankar, 2003). Decoy prices are special external reference prices. They are attached to products which retailers do not want to sell and only include in the offer to serve as a reference point to which consumers compare the product which wanted to be sold. Decoy product is slightly worse than the one which is wanted to be sold, therefore, it should lead to a higher choice ratio of the other product. The price of the decoy product is called decoy price and it is usually attached to an overpriced item (Weiser, 2016). The prices of the restaurant are good examples for this, because people do not like to purchase the most expensive dish, but they rather buy the second most expensive one (Ariely, 2008).

2.2 Range Theory for external reference prices

Volkmann's (1951) Range Theory states that the range of stimuli we are exposed to determines the perceived value of any stimulus within that range and influences our decisions. Implementing this into behavioral pricing means that people consider not only one price but the scale of recalled reference prices when making a comparison and evaluate the price of the product they want to buy based on its place within the range (Janiszewski & Lichtenstein, 1999). Therefore, reference price can be determined as not only a certain price but the range

of several reference prices (Niedrich et al., 2001). The theory says that the end prices have huge influence on the price evaluation because they act like anchors, therefore, inner prices have no or small influence on the consumers' decision making. Hence, changing the end prices has the main influence on price evaluation (Janiszewski & Lichtenstein, 1999).

In previous studies Biswas and Blair (1991) pointed out that consumers' purchase intentions are sensitive to the highest and lowest prices in the market. Moreover, Rajendran and Tellis (1994) also found that the purchase decision is influenced by the prices that were present in the store at the time of purchase. Janiszewski and Lichtenstein (1999) in their research found that changing the end prices of an external price range while keeping the internal reference price consistent, has an effect on how favorable the consumers consider an offer.

3. Primary research

Our research was based on the theory of external reference prices, decoy prices and Range Theory. We aimed to investigate the influence of the range of reference prices. Therefore, our research question was the following: Does the change of the range's end prices have an influence of consumers' price perception and decision? Besides these we also investigated the effect of using decoy products and prices on consumers' choice. In our research we used mostly FMCG products (with one exception: hairdryer), because we assumed that people have knowledge and experience, and therefore, probably a more reliable internal reference price in case of these products. Our aim was to test the effect of external reference prices in case of products which are well-known among the consumers.

3.1 Methodology

In our research we used a multi-method approach. First, we made an online experimental survey, where we used discretionary and snowball sampling technique, we had a sample of 2158 people. Due to this we only used descriptive statistics during the analysis. In the survey the participants received pictures of different offer with the range of products and their prices. They either had to estimate the average price of the product category or choose the product they wanted to buy. With the former we wanted to investigate the influence of changing the end point a price range, and with the latter we aimed to identify the effect of using decoy prices. The participants were divided into two random groups at the beginning of the survey, so they received slightly different offers. The offers only differed in the prices, so we could compare the results of the two groups according to the price. We analyzed the data with Microsoft Excel and IBM SPSS softwares. In order to further investigate the phenomena and provide a better insight into our main findings, we conducted an eye tracking experiment

with 26 participants. We collected the data with Tobii Pro X2-30 fixed eye camera and its software and analyzed the data in Excel, based on the outputs made by the software. The software also created heat maps of the eye movements of the participants. The participants were also divided into two groups and received the same pictures as in the online survey, therefore, the offers again only differed in the prices. During the eye tracking, participants had to make the same decisions as in the survey. They had to estimate mean prices or choose which product they would buy. In the analysis we calculated the sum of the fixations' durations and fixations' frequencies in case of the AOIs. Fixation occurs when the eye stop moving and the participants gaze at certain points of the picture (Feng, 2011). It is during fixations that the actual information is absorbed, which triggers the cognitive processing of stimuli (Korpás & Szabó, 2019). AOIs are defined as the "Areas of Interest" on the image, which can be determined by the software before the experiment. In case of our research these AOIs were the prices and the products on the stimuli images. The eye tracking was followed by a short interview, where we had a chance to further investigate the reasons behind the participant's decisions. At the end of the experiment they also had to fill out a short questionnaire which contained attitudinal questions of their price consciousness as well as demographical information.

4. Results

The results of the different methods are presented in a thematic order below. The prices of the products are given in Hungarian currency. Around our research 1€ was equal to 350-360 Forints.

4.1 The effect of changing the endings of a price range

In this study the six different 1 liter of milks with 2.8% fat content (Figure 1) were shown to the participants with their prices below. The offer of the two groups only differed from the price of the most expensive item: in case of group X it was 453 Ft, while in group Y only 365 Ft. The number and the brand of the products were the same. Our aim was to investigate whether changing the high-end of the price range has any influence on the price perception of our participants. This analysis was based on the statements of Range Theory (Volkmann, 1951 in Niedrich et al, 2001). According to the literature we assumed that the group (X) with the higher end price will estimate the mean price of 1 liter of milk higher. The results proved this, since the participants in group X estimated the mean price 276,4 Ft and the median price to 280 Ft, while both of these indicators were estimated lower by the other group (mean=269,5 Ft; median=270 Ft). So, changing the higher-end price of the milks had an effect on the price evaluation.

Figure 1. The range of milks and their prices in case of the two groups

Source: own editing

The eye-tracking heat map results showed that the price of the most expensive product received the lowest attention while participants fixated mostly on the products and prices in the middle of the range. However, during the interview nobody mentioned the brand names of the products in the middle. Furthermore, those people who got higher scores in the price consciousness attitude scale, looked at the prices for a shorter time and less frequently in average. We can assume that the more price conscious consumers do not need to look at the prices so long, because they already have knowledge about them. We also found, that those participants who looked longer at the highest price, evaluated the mean price of the milk higher than the ones who did not looked at it for so long. In the interview we asked the participants about which product they would choose and why. We found that those who decided based on the price of the product, were fixating at the prices of all products for a longer time and more frequently.

In our other example we changed the lower-end of the range of prices in case of mineral water. The stimuli picture displayed different brands of mineral waters and their prices (Figure 2). The two setting only differed in the price of the cheapest product.

Figure 2. The range of mineral waters and their prices in case of the two groups

Source: own editing

We assumed that the group which had the stimuli picture with the lower price end of the range (group Y) will estimate the price of 1.5 liter of mineral water lower than the other group. The results of our experimental survey supported our assumption. Group X, which had the cheapest item priced relatively higher, estimated the mean price of the mineral water 108.4 Ft with a 110 Ft median price. The estimated mean price was 105.5 Ft while the median price was 105 Ft in case of the other group. However, for the first time this does not seem like a big

difference, but we should consider that the whole range was very narrow, therefore, this difference is significant. Based on these, we can say, that changing the lower-end price has also effect on the price evaluation of consumers.

The eye tracking experiment showed that the group with the lower-end price estimated the price of the mineral water about 11 Ft cheaper than the other group. This difference was four times higher than in the online survey. Once again it was proved here also that those who were more price conscious observed the prices for shorter time than those who were less price conscious. In the interview we asked the participants about the basis of their purchase decisions and categorized them into price-based decision makers and brand-based decision makers. Price-based decisions makers looked longer and more frequently on the prices compared to the brand-based decision makers. The heat maps showed here also, that people fixated less on the end points of the products scales while they mostly on the items in the middle of the offer.

We can conclude these results as follows: the display of prices and the end points of a price range have an effect on consumers' evaluation, and those consumers who consider themselves as price-based decision makers spend more time fixating on the price, while the more price conscious consumers tend to fixate on the price less.

4.2 The examination of the effect of decoy pricing

We have also investigated the effect of decoy prices also with two different stimuli pictures. In the first one the participants saw offers of different hairdryers of the same brand, but with different sizes, quality, accessories and prices. As it can be seen on the Figure 3 below, the offers of the two groups only differed in the price of the second product. In group X we used the original prices of hairdryers, while in group Y we increased the price of this item, to be closer to the third one.

Figure 3. The offer of hairdryers in case of the two groups

Source: own editing

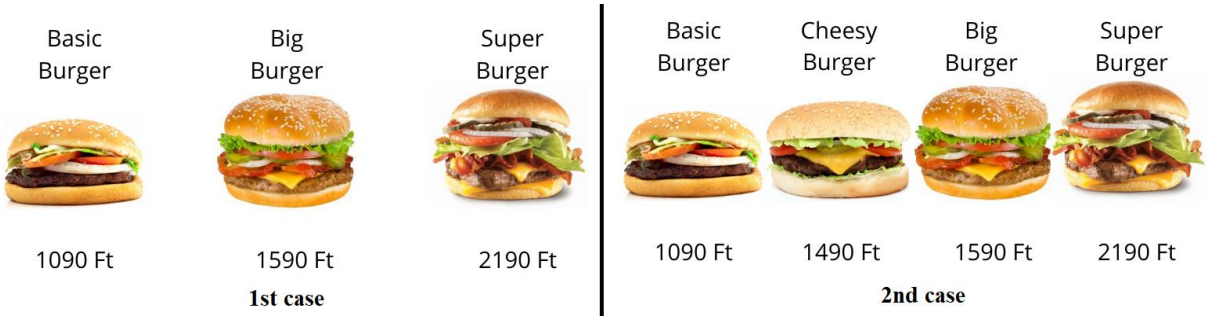
Our assumption was, that in group Y, the ratio of people who will choose the more expensive third item as a gift to a female relative will be higher. So, in case of this example the price of

the second hairdryer was the decoy price. However, the results of our online survey showed different results. In group X 5% chose the first, 35.6% the second, 44% the third and 15.4% the fourth item, while in group Y 10.6% chose the first, 27,3% the second, 47,7% the third and 14.4% the fourth product. As it can be seen, decoy price changed the ratio of the chosen products, however, in a different way than we had assumed. The ratio of those, who chose the third hairdryer was higher in group Y, but this ratio is only 3.7 percentage points higher than in group X and if we aggregate the distribution of those who chose the third and fourth products, the difference is even smaller in case of the groups (2.7 percentage points). In contrast, we can see that in group Y, where the decoy price was placed and the price of the second item was higher, people rather chose the cheapest product, and 27.3% of the people would have still chosen the overpriced item, which result was unexpected.
During the eye tracking experiment and the interviews we wanted to find the reason behind this result. According to the interviews the choice were influenced and biased by the accessories displayed next to the hairdryers. Also, many people mentioned, that in case of electronics they would choose from the more expensive products, because they assume that the quality and durability of these will be better. We also found, that those, who looked at the prices longer were from the less price conscious group, however, they were those who could recall the price of the second product with a smaller error. From the results of the heat maps it can be seen that the participants of group Y looked longer at the prices and pictures of the second and third item, probably because their comparison was more complex due to the small price difference.

In the other example, people got two offers of hamburgers and had to choose which one they would buy. This time the stimuli pictures did not differ in case of group X and Y so they both had the same tasks. In the first round an offer of three hamburgers where shown while in the next picture. Second time the offer contained one more hamburger, therefore, participants had to choose from four burgers. As it can be seen on Figure 4, in the second case the additional Cheesy Burger was an overpriced decoy product. We assumed that the placement of this product will make more people to choose the Big Burger, which cost only 100 Ft (0.30€) more but contained a lot more ingredients. However, the results showed something different again. In the first case most of the participants (57.9%) have chosen Big Burger, while 31.3% would have bought Basic and 10.8% Super Burger. In the second case, more than one quarter of the participants (26.2%) have chosen the new, overpriced hamburger. The ratio of those who chose Super Burger in the first case did not change significantly. However,

37% of the previously Basic Burger buyers and 24% of the previously Big Burger buyers have chosen the Cheesy Burger in the second setting.

Figure 4. Hamburger offers in the first and second case



Source: own editing

During the interviews our aim was to find the reason behind these results. From the 26 participants 20 chose the Big Burger in the first case, because they taught that that was the best offer for its price. We realized that this burger was not overpriced enough in the first round. Only those chose Basic burger, who did not want to spend more money on a hamburger. However, when the Cheesy Burger was added all the people who chose the Basic Burger and some, who picked Big Burger switched to it. Everybody, who choose the decoy product said, that the reason was the cheese, the fact they love cheese burger and they did not care about its price. We also got to know that the pictures influenced the decision-making process of the participants the most.

5. Summary

We can conclude that consumers compare the prices of the products not only to their internal reference price, but also to external reference prices, but this comparison is far from a easily predictable one.

In our research we proved that changing the lower or the higher end of the price range has an influence on people's price evaluation, especially in case of those who make their decisions based on the price. Furthermore, we found that applying decoy products and prices in our offer, changes the choice of consumers, however, not always in the way that we could expect, since previous studies found that the application if these prices motivate people to buy another product which is a better offer, but in our study we found different patterns. The data of the eye tracking showed that more price conscious people fixated on the prices shorter and less frequently. Furthermore, from the interview we found that the visual representations of the offers have significant effect of the participants' choices – and it can lead to unexpected results. Our study had several limitations. For example, in the online survey we did not ask people about their preferences or involvement, or in case of price scales they did not have to

choose from the products. During the eye tracking we could not ask enough people, however, the interview were very useful, because we could identify the weaknesses of our experimental survey. Based on these results and experiences right now we are working on an extended and improved version of our online experimental survey to be able to measure better and more precisely the effect of external reference prices on different kind of clusters of our future participants.

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