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# **The impact of arbitrary numbers in product description on consumers' preferences**

## **Summary**

The paper raises the issues regarding ways of formulating judgements when presented with information which is partially or completely meaningless to the consumer. Particular attention has been given to the effect of anchoring when evaluating product utility. The essence and conditions of effectiveness of anchoring heuristic are discussed.

In the second, empirical part of the paper results of research into the phenomenon of anchoring in buyer behaviour are presented. The research aimed to determine the impact of arbitrary numerical values on buyers' preferences. With the use of between subject design experiment, respondents' attitudes to a hypothetical model of a notebook depending on numerical values presented in its description were measured. The research results did not confirm the existence of statistically significant differences between evaluation of the described product using high values (so called: high-anchor values) and low values (low-anchor values). A post-hoc analysis, however, revealed the existence of anchoring effect among men.

## **Introduction**

Consumers reach conclusions about product utility based on available information on its features (e.g. price, brand, guarantee). In publications regarding behaviours it is under discussion to what extent the judgements and consequently buying decisions are systematic and rational, and to what extent they are heuristic (e.g. Bohner, Wanke 2004) and result from habits and factors buyers are not aware of (e.g. Zajonc 2001).

Some of consumers' beliefs may be justified – and could be called rational. It is a common opinion that when purchasing expensive goods a buyer analyses the product features, rationally evaluates the information and then makes a conscious decision. Such logical decisions are also made in the context of new products of which the consumer has scarce experience. When buying products at a cheaper price, with short period of usage, mass, or those the consumer is familiar with, less prudent and more impulsive behaviour is exhibited (Gajewski 1997).

Nonetheless, more and more common are opinions that, generally, consumers very rarely and in exceptional situations rely on rational thinking (Zaltman 2003). Universal are, on

the other hand, intuitive judgements, inter alia, due to the fact that making inferences about product utility is based on beliefs or “naive theories”, e.g. that a high price equals high quality or that only very good products are advertised (Falkowski, Tyszka 2002). According to Broniarczyk and Alba (1994) when making inferences about unknown product features intuitive beliefs may outweigh the actual correlation between features.

The assumption about predominance of intuitive behaviours of buyers poses numerous challenges to marketers. For the success of marketing activities (market research, promotional activities) familiarity with psychological factors in buying behaviours is becoming a key issue. Therefore, it seems worthwhile to try to transfer some terms and experience of psychology onto the ground of marketing. The deliberations in this paper focus on psychological aspects of making judgements and coming to conclusions, and particularly, on the occurrence of anchoring effect when making judgements about product usability.

### **Anchoring and adjustment heuristic**

People, especially when they have little information or lack time or motivation, tend to rely on simplified principles of reasoning – heuristics. The principles facilitate formulating judgements and decision-making in various areas of life, including consumer decisions and scientific reasoning. They do not guarantee optimal output (Tyszka 1999), moreover, they can contribute to severe judgemental biases (Kahneman, Tversky 1973).

Tversky and Kahneman (1974), on the basis of conducted experiments, described three most typical heuristics:

- representativeness – tendency to estimate probability of an event based on the level of similarity to a typical case,
- anchoring and adjustment – tendency to rely on given information even when it is irrelevant to the problem,
- availability – tendency to attach greater probability to events which are easier to recall and which are more emotionally loaded.

Further deliberations in the paper are concerned with the anchoring and adjustment heuristic.

Mussweiler and Starck (2000) in one of their research asked students about the height of Mount Kilimanjaro. First, however, as a “hint” some people were asked whether it is higher or lower than 2,5 metres, and another group - whether it is higher or lower than 4950 metres. Seemingly, these questions are rather insignificant. It is hard to imagine a mountain lower than 2,5 metres. Thus the questions should not have any impact on the estimate of the height of this African mountain. They did, however. Students from the first group (answering

whether it was higher or lower than 2,5m) on average estimated the height at 1493m, while persons from the second group claimed the height was 2459m (Mussweiler, Strack 2000). The initial values, respectively 2,5 or 4950m, acted as anchors in estimating the mountain height. Such process is called anchoring and adjustment.

The first condition of effectiveness of anchoring heuristic is drawing attention to the anchor. This offers an opportunity to compare the anchor with a possible estimate result. This is how anchoring heuristic is usually used in sales and marketing. Cialdini (1996) gives an example of a real estate agent who used this effect when showing real estate to potential customers. The presentation always started with showing two not very attractive but expensive houses (which de facto were not for sale). The estate agent used these examples in order to “anchor” customers. He assumed that after being exposed to such offers, the client would appreciate others.

Drawing attention to anchoring information is not always necessary. It was observed that anchoring effects appear also on the basis of unrelated matters. Persons making estimates using high numerical values tended to overestimate values in answers to questions unrelated to the initial estimates (Chapman, Johnson 2002).

The second condition for occurrence of anchoring is maintaining consistency between the estimate and the anchor. Anchoring effect appears where the anchor information is expressed on the same scale as the sought result. Kahneman and Knetsch conducted an experiment in which they asked inhabitants of Toronto whether they would be willing to pay \$25 (low anchor) or \$200 (high anchor) for cleaning a lake in order to keep up the fish population there, and then checked how much the particular persons were ready to spend on this purpose. Average results for these two groups were respectively \$14 and \$36. The application of the same anchor values but a further question about the percentage of people inclined to pay more than \$100 did not produce statistically significant differences (Chapman, Johnson 2002)<sup>1</sup>.

It appears that maintaining consistency on the scale in the anchor question and actual questions may not be sufficient, either. In the research by Strack and Mussweiler the fundamental question regarded the height and the width of the Brandenburg Gate, and the anchor question referred to one of these values only (either the height or the width). The anchoring effects were the case only for the dimension corresponding with the anchor,

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<sup>1</sup> On the other hand, it would be interesting to know if differences would occur if the question concerned the percentage of people inclined to pay \$20.

although the width and the height were in both cases expressed in metres (Mussweiler i Strack 2001).

The anchoring effect is not hampered by its extremity nor arbitrariness. A good example of such extremity is the above quoted experiment with the height of Kilimanjaro Mount. Even the most extreme anchors retain their strength, e.g. a situation where the price of a textbook was anchored at \$7128 (Hastie, Dawes 2001, p. 103). Similarly to extremity case, in case of arbitrariness anchoring does not vanish despite obvious signs of information inadequacy. Among such arbitrarily created anchors there may be a question about respondents' telephone numbers when specifying the year when Attila was defeated in Europe, or a question about the last digits of one's social insurance number when making judgements about a product price (Chapman, Johnson 1999).

It is implied that most people are not aware of the anchor's impact on their decisions. Moreover, making participants aware of impact potential does not reduce its power (Chapman, Johnson 2002). It is like people saying that advertising is lying, but who still follow its hints. The power of incentives to minimise the impact of anchoring is also limited. It was observed that the impact of prize money for precision of estimates reduced the perceived role of the anchor, it did not, however, affect the value of the very anchoring effect (Chapman, Johnson 2002).

### **Anchoring versus product features**

Relatively extensive psychology literature concerning the anchoring heuristic does not translate into a wealth of studies on buyer behaviour. It is partly a result of quite a demanding procedure of examining the anchoring effect, which is difficult to reproduce in the market context. Modification of such procedure most often leads to the occurrence of priming<sup>2</sup> than standard anchoring.

The effect of anchoring mechanism with regard to the number of purchased products was demonstrated in a field experiment performed by Wansink, Kent and Hoch (1998). They assumed that introducing a promotional price for the purchase of a few items (e.g. 4 cans of beer for €10 promotion) would result in buying a greater number of products than when the introduced price would regard a single product (e.g. a can of beer for €2,50 promotion). The anchor was the suggested number of products at the promotional price, although the buyer could purchase any number of products in both cases. The promotional value of price

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<sup>2</sup> Priming is about earlier stimuli facilitating or accelerating the identification of following stimuli (Strelau 2004, p. 140)

reduction was identical, regardless of the presented form of the price. The research embraced a lot of different products, price reductions of different values, and different anchor values. Generally, in most cases sales results were higher in the case of promotion on multiple products, which may signify the occurrence of anchoring<sup>3</sup>.

Anchoring effects, rather resembling priming, in reference to product bundling were also observed in another experiment. A computer, printer and printer stand were chosen as a set of products. The anchor in the experiment was the first of the listed products – the computer. Depending on the computer's quality, the price of the whole set could be higher or lower. The other two products were the same, their description was not modified during the experiment. The experiment results indicate that, first of all, people exhibited a hierarchical approach depending on the perceived importance of the products when considering its parts. The most important part in the experiment, the computer, acted as an anchor and was decisive in the overall judgement about all the three analysed products (Yadav 1994).

In both above-presented cases there were no questions asked related to anchor values. The very fact of asking questions may not be of such high significance, but still, it makes the information accessible and salient. Abandoning an “anchor question” means reducing accessibility and saliency of anchor information, which may, but as exemplified above, does not necessarily translate into occurrence of anchoring effects.

### **Research hypothesis**

When confronted with partially meaningless information, the buyer has little room for manoeuvre. This may result in the activity of certain stimuli (which one may be not aware of) that in other conditions would be omitted or which would be insignificant. Such stimuli can be numerical values contained in the product description. Some of them are arbitrary values. One can give numerous examples of their existence, e.g. a Webcam 2200 Internet camera (Labtec), electric BQ 2849 grill (Clatronic), Z010 fan (Zelmer). One can ponder whether these arbitrary numerical values can have an effect on the buyer, and if so – in what way. In reference to the described phenomenon of anchoring, one can put forward the following hypothesis:

*H : The product, whose features are described with high (as compared to low) numerical values is evaluated as more appealing.*

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<sup>3</sup> It may also suggest customers' misinterpretation of the promotion and believing they need to purchase the indicated in the promotional price number of products. It does not belittle the application of the very instrument; however, it does change the interpretation of the causes of the effect.

## **Method**

In order to verify the hypothesis a paper and pencil questionnaire was conducted. The group of 80 persons that participated in the research was comprised of full-time University students from the first three years of studies, most of them - (about 54%) men. The respondents were not paid for participation in the research. The participants were examined in groups ranging from 17 to 23 persons. The survey was conducted by a person not aware of the research aim.

Research consists of one-way between-subjects experimental design with anchor as a experimental factor. Two groups were formed differing in the kind of information presented to them. One group, referred to as the “high anchor”, received a product description with data comprised of high numerical values, whereas the other - “low anchor” - group received a product description containing low numerical values. The dependent variable was the attitude to the product. The index of attitude was created on the basis of two questions regarding the product appeal and the respondents' willingness to its purchase.

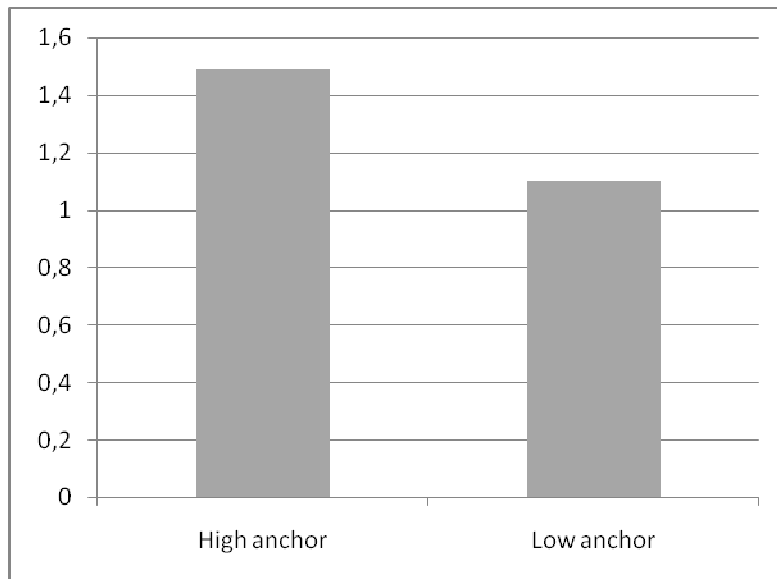
In the research a description of a non-existent Toshiba notebook was used. The reason behind the choice of the product was the fact that mobile computers are among students' interests. The product description included information on 7 features of the computer. Three of them were identical in both groups (the size of the screen, the software provided and the price). The other attributes differed in the numerical values used. The differences regarded the form and not the quality of the very attributes. The computer in the high anchor group had: 1024 MB RAM memory, 4000 mAh battery, T 2310 processor sign, X3100 graphic card; and the computer in the low anchor group: 1GB RAM memory, battery working time of 3,5 hours, processor labelled as 1,6 GHz, and X31 graphic card. The respondents' task was to get familiar with the notebook information and give answers to questions about product appeal and willingness to buy on the scale of -4 to +4.

## **Research results**

The underlying assumption of the experiment was the conviction that numerical values appearing in the description of product features have an effect on its overall evaluation. It was presumed that high numerical values used in the product description (hypothetical model of Toshiba notebook) should lead to a better evaluation of the product (and consequently higher inclination to buy it) than low numerical values.

Based on two questions concerning product evaluation an index of attitude (further referred to as attitude) was formed. Cronbach's alpha coefficient equalled 0,80. The index of attitude served as dependent variable, and the level of anchor as the feature differing the attitude. One-way analysis of variance was used for data analysis. The averages scores of the attitude indexes of both groups are presented in graph 1.

Graph 1. Product evaluation depending on the level of numerical attributes



Source : own work based on the research

The estimation of the product described with high numerical values was higher than the estimation of the product containing low numerical values. The experiment results are thus consistent with the assumptions. However the power of the effect is too weak, which means that the results are not statistically significant ( $F < 1$ ).

From the statistical point of view, this insignificance was connected with a high variance of results. Standard deviation for the group with high and low numerical values was  $SD_{\text{high anchor}} = 1,83$  and  $SD_{\text{low anchor}} = 1,96$ . Part of the respondents evaluated the product positively, and part – negatively, which led to major discrepancies on the evaluation scale and affected the variance level.

The appearance of such effect is justified. When faced with difficult to interpret information about the product, one may categorise the product as good or bad, and only then more thoroughly interpret the information (which would cause the anchoring effect). The natural question remains: What makes some people consider a given product good, and some others – bad?

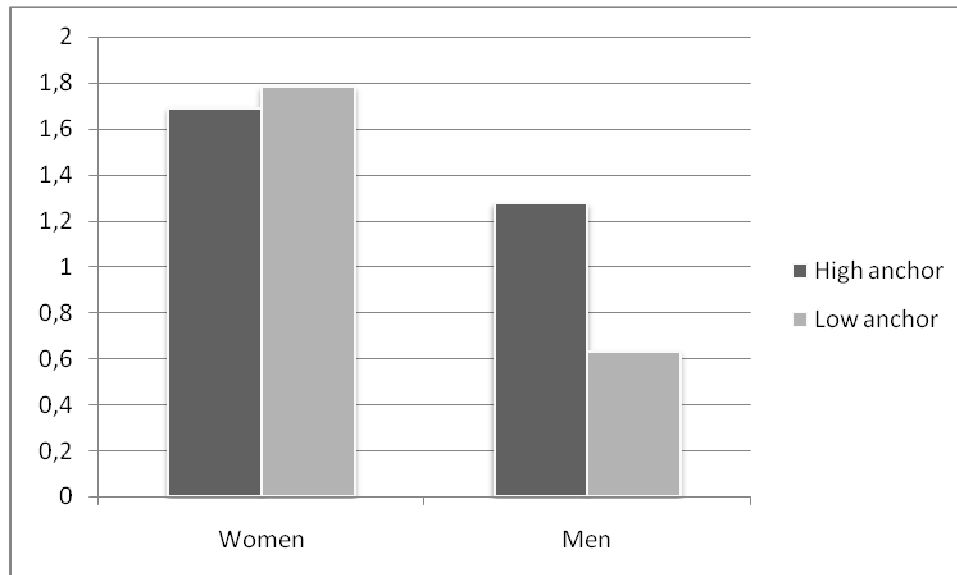


## Post hoc analysis

Gender is one of the variables affecting the results. Women evaluated the product (irrelevant of the way of anchoring) slightly more positively than men ( $M_{\text{women}}=1,73$  whereas the average estimation by men was  $M_{\text{men}}=0,93$ ; Mann-Whitney  $U = 584$ ,  $Z=-2,064$ ;  $p<0,05$ ).

What is more important, one could observe certain differences regarding anchoring dependent on gender. It is related to the fact that the anchoring effect occurred exclusively among men. The comparison of average estimations by women and men is illustrated in graph 2.

Graph 2. Product evaluation depending on gender and the kind of anchoring information



Source: own work based on the research

Women evaluated the product alike, regardless of anchoring values ( $t<1$ ). In the case of men, one can observe appearing difference between the high anchor group and the low anchor one. It is important to notice, however, that the differences between high and low anchor groups also here did not produce statistically significant results ( $t(41)=1,04$   $p>0,1$ ). Still there is gender variation in relation to the anchoring value. While in the high anchor group the differences in product estimation by gender groups are statistically insignificant ( $M_{\text{women}}=1,69$ ,  $M_{\text{men}}= 1,28$ ; Mann-Whitney  $U$ ,  $p>0,1$ ), in the low anchor group the situation is different. Women did not revise their opinions, men, however, lowered their estimations of the product ( $M_{\text{women}}=1,78$ ,  $M_{\text{men}}= 0,63$ ; Mann-Whitney  $U =114$ ,  $Z=-2,02$   $p<0,05$ ).

## Conclusions from the research

The experiment results showed that in the analysed case (of hypothetical model of Toshiba notebook) meaningless anchoring information does not have a significant influence on buyers' attitudes, i.e. the evaluation of product appeal and willingness to buy it.

There are a few possible reasons behind the lack of “high” or “low anchor” effects. First of all, it is worth noticing that the conducted experiment is linked with classic anchoring procedure by operating with numerical values, and differs from classic anchoring procedure in lack of direct dependence between the anchor and the answer, as well as low level of saliency of anchoring information. Consequently, it resembles more tasks characteristic of priming. Deciding whether this is priming or anchoring is quite important, since in the case of anchoring one can expect strong effects, which priming does not always produce.<sup>4</sup>

The specificity of the respondent group is also important. In the experiment took part students who had completed a computer course at an advanced level, so they could be regarded as “experts” among buyers of computer equipment. Thus a question arises whether in the case of this group of respondents the description of the notebook's technical attributes could be classified as meaningless information. One can suppose that information on the product features was understood and interpreted consciously.

Another justification for the obtained results may be the fact that it is the price that is one of the most commonly used by consumers cue of the product quality (Rao, Monroe 1989). One can guess that it was an important enough factor affecting the attitudes of the potential notebook buyers, that other information on the product's attributes (i.e. numerical values describing its features) was of marginal importance when making judgements about the analysed product. No occurrence of anchoring effect could have been due to the fact that this “key” attribute in both experiment groups was not different.

The number of presented attributes describing the hypothetical laptop computer could also have had an effect on the results. In economic reality one can observe consumers restricting the amount of information they can take. If the consumer is given too much data on the product, they reduce the information overload and do not analyse all the accessible information (Falkowski, Tyszka 2002). In the analysed case the reduction could have affected the less meaningful numerical values.

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<sup>4</sup> Generally, regardless of the given mechanism, the influence of numbers should represent the same trend – in other words, that high numerical values (compared to low) constituting the description of features will result in more positive estimations of the product.

When analysing the results, one needs to take into consideration limitations of the adopted research method. A probably low level of actual involvement of consumers into obtaining information and making a purchase decision (the experiment was conducted in artificial setting), and the fact of studying the respondents' declarations and not behaviour (a questionnaire, and not for example a "shelf test") also could contribute to other than in natural conditions way of processing information, formulating judgements and, as a result, lack of positive verification of the hypothesis.

The research indicates that men (in comparison to women) were more willing to use meaningless numerical values in product assessment. It is worth noticing that this trend confirms a rather common belief that men are more inclined to attach significance to technical attributes and evaluate utility of higher-class products from this perspective.<sup>5</sup>

### **Further research**

The presented earlier discussion on the conditions of effectiveness of anchoring heuristic, and also lack of positive verification of the hypothesis with the application of experiment, which de facto was on the border between anchoring and priming, are an invitation to further research. It should focus on determining the impact of salience of anchoring information on the anchoring effect. It is also worth seeking an answer to: How much should the attention be focused on this information for the anchoring effects to occur?

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<sup>5</sup> According to results of research commissioned by one of the key producers of household appliances in Poland: when buying such type of products, women tend to rely mainly on the design and number of functions while men mainly pay attention to the price and the technical parameters.

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