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<https://doi.org/10.19195/1733-5779.34.10>

The anchoring effect in terms of behavioural economics

JEL Classification: D91, E71, G41

Keywords: behavioural economics, cognitive biases and heuristics, anchoring effect, incidental environmental anchors, basic anchoring, self-generated anchors

Słowa kluczowe: ekonomia behawioralna, błędy poznawcze i heurystyki, efekt zakotwiczenia, przypadkowe kotwice środowiskowe, kotwiczenie podstawowe, kotwice generowane przez siebie

Abstract: The assumptions of rational choice or, more generally, standard economic theory have had great success regarding their contributions to economic theory. However, some of their assumptions are systematically inconsistent with some real-world observations and controlled experiments. These observations strongly remark on the existence of cognitive biases and heuristics. It is assumed that anchoring is one of the most robust cognitive bias, since it works implicitly, without an individual's awareness. In this study, the anchoring effect will be discussed and analysed regarding its types and empirical findings. The research aims to distinguish the anchors in terms of their types. As a result, the author discovers five types of anchors: regular informative anchors, self-generated anchors, regular uninformative anchors, basic anchors, and incidental environmental anchors. The author claims that regular informative anchors should not be considered a cognitive bias, since their informativeness levels are sufficient to make rational estimations for unknown values. Moreover, since benefitting from regular informative anchors does not violate the rationality principle, they are not a part of a study of behavioural economics.

Efekt zakotwiczenia w ujęciu ekonomii behawioralnej

Abstrakt: Założenia racjonalnego wyboru lub — bardziej ogólnie — standardowej teorii ekonomicznej odnoszą wielki sukces, jeśli chodzi o ich wkład w teorię ekonomiczną. Niektóre z ich założeń są jednak systematycznie niespójne z niektórymi obserwacjami w świecie rzeczywistym i eksperymentami kontrolowanymi. Te obserwacje zwracają uwagę na istnienie poznawczych uprzedzeń i heurystyk. Zakłada się, że zakotwiczenie jest jednym z najsilniejszych błędów

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poznawczych, ponieważ działa w sposób bezwarunkowy, bez świadomości jednostki. W niniejszym badaniu efekt zakotwiczenia zostanie omówiony i przeanalizowany pod kątem jego typów i ustaleń empirycznych. Analiza ma na celu wyodrębnienie kotwic ze względu na ich typy. W rezultacie autor odkrywa pięć typów kotwic: regularne kotwice informacyjne, kotwice generowane samodzielnie, zwykłe kotwice nieinformacyjne, kotwice podstawowe i przypadkowe kotwice środowiskowe. Badacz twierdzi, że regularne kotwice informacyjne nie powinny być traktowane jako błąd poznawczy, ponieważ ich poziom informatywności jest wystarczający do dokonania racjonalnych szacunków dla nieznanych wartości. Co więcej, ponieważ czerpanie korzyści z regularnych kotwic informacyjnych nie narusza zasady racjonalności, nie są one częścią studiów nad ekonomią behawioralną.

Introduction

The rationality principle in economics has been discussed and questioned in recent decades due to some violation examples of the principle. Standard economics assumptions describe humans as a selfish, rational, and insensitive species. According to this view, since humans are extremely rational about their choices, they do not mix their feelings with their choices. However, the experimental findings and some real-life examples regarding individuals' behaviours demonstrate systematic deviations from rationality. Since real-world observations and controlled experiments contradict rationality, the assumptions of standard economic theory should be questioned. Hence, behavioural economics suggests replacing the rationality term in economic theory with so-called "bounded rationality".

Behavioural economics is a branch of economics that attempts to reunify economics and psychology to explain economic theory more comprehensively. However, it does not consider all the standard economic assumptions as incorrect, while it provides a psychological basis to economic theory. It continues using standard methods in economics while attempting to explain the economic behaviours of individuals from a psychological perspective.

According to the findings of behavioural economics, some cognitive biases (deviations from rationality) and heuristics (mental shortcuts) do not allow individuals to make rational decisions. The anchoring effect is considered as one of the most robust cognitive bias among the others.¹ It is a type of cognitive bias that forces the human brain to focus on the first available piece of information during the decision-making process of individuals. While some anchors can be considered as informative, some cannot. The author believes that informative anchors have two different types: regular informative anchors and self-generated anchors. Although self-generated anchors are considered as informative, since their informativeness levels are not sufficient to estimate an unknown value without any adjustments, and since adjustments are not sufficient, they will not be considered as rational. However, individuals can make rational estimations in the presence of

¹ A. Furnham, H.C. Boo, "A Literature Review of the Anchoring Effect", *The Journal of Socio-Economics* 40, 2011, no. 1, p. 35.

regular informative anchors for an unknown value without any adjustments due to their high level of informativeness. Therefore, when there is a regular informative anchor, it is not surprising that people consider it as a possible answer and benefitting from them is a rational process.

According to the findings of Wilson et al. (1999) individuals tend to benefit from anchor values, even when the anchors are not informative (regular uninformative anchors). Moreover, individuals might be influenced by an uninformative anchor, even when they are not asked to compare it to the target value (basic anchoring).² The findings of Critcher and Gilovich (2008) under the name of incidental environmental anchors are also consistent with this statement.³

Since it is obvious that there are different types of anchors, the author considers analysing them as crucial. Hence, the goal of this study is to analyse the anchor types to distinguish rational and irrational ones. The author claims that regular informative anchors should be excluded from cognitive biases and heuristics, unlike the other types of anchors, since they do not consist of any irrational process. Moreover, since using a regular informative anchor to estimate an unknown value does not consist of any irrationality, they should not even be considered as a part of a study of behavioural economics.

Before analysing these five types of anchors, it is important to analyse the theoretical background of cognitive biases and heuristics and the reason why the anchoring effect was selected among the others.

Theoretical background of cognitive biases and heuristics

The decision-making process is a challenging and complicated process due to several reasons. During this process, individuals might be influenced by their emotions and limited cognitive abilities. Moreover, time limitations and environmental restrictions might also cause individuals to produce biased behaviours. Hence, these factors mentioned above might create cognitive biases and heuristics thus, irrational behaviours.

When estimating an uncertain value, people might count in some heuristic principles for their estimations. Usually, these heuristics are useful in terms of simplification of the estimation process. However, they may sometimes lead to some systematic errors and thus irrational behaviours.⁴ Cognitive biases are an-

² T.D. Wilson et al., "A new look at anchoring effects: Basic anchoring and its antecedents", *Journal of Experimental Psychology: General* 125, 1996, no. 4, pp. 387–400.

³ C.R. Critcher, T. Gilovich, "Incidental environmental anchors", *Journal of Behavioural Decision Making* 21, 2008, no. 3, pp. 246–248.

⁴ A. Tversky, D. Kahneman, "Judgement under uncertainty: Heuristics and biases", *Science* 185, 1974, no. 4157, p. 1125.

other source of irrational behaviours. In short, it refers to systematic deviation from rationality during the decision-making process of individuals.⁵

In the literature, more than 100 cognitive biases and heuristics are documented.⁶ Some of the most discussed are the anchoring effect, framing effect, loss aversion, mental accounting, and sunk cost fallacy. The anchoring effect is a type of cognitive bias that forces the human brain to focus on the first available piece of information during the decision-making process. This information can be something irrelevant with the estimation question. Moreover, anchors are so influential that individuals might not be aware that they use it as a possible answer in their estimations. The framing effect assumes that decision-makers make their choices depending on how a set of identical choices is presented.⁷ Individuals might act differently to the same things, events or situations when they are presented differently. Framing a glass as “half full” or “half empty” has different meanings and they might evoke different feelings. Loss aversion is a tendency of overweighing some amount of loss much more than similar gains. The ratio of gains and losses is estimated (G/L) over 2:1 in several experiments in one study.⁸ This also means that the pain of loss is approximately twice the pleasure of gain. Mental accounting is a cognitive mental activity that is based on categorization, organization, and evaluation of the financial activities of the human brain.⁹ According to mental accounting, households categorize their income such as food, rent or education. Sunk cost fallacy is also a common irrational behaviour among individuals. “The sunk cost effect is manifested in a greater tendency to continue an endeavour once an investment in money, effort, or time has been made”. Individuals may maintain these kinds of investments or efforts since they heavily weight past costs.¹⁰ A cost can be considered as sunk when it is not possible to recover it. However, from a rational perspective, when a cost is sunk, it does not influence the marginal return of future decisions; thus, it does not have any impact on rational choices.¹¹ The most important common feature of all these cognitive biases and heuristics is that all of them represent an irrational

⁵ J. Erhlinger, W.O. Readinger, B. Kim, “Decision-making and cognitive bias”, *Encyclopedia of Mental Health* 12, 2016, p. 1.

⁶ Ibidem, p. 3.

⁷ C. Gonzalez et al., “The framing effect and risky decisions: Examining risky decisions with fMRI”, *Journal of Economic Psychology* 26, 2005, nr 1, p. 2.

⁸ A. Tversky, D. Kahneman, “Loss aversion in riskless choice: A reference-dependent model”, *The Quarterly Journal of Economics* 106, 1991, no. 4, pp. 1053–1054.

⁹ R.H. Thaler, “Mental accounting matters”, *Journal of Behavioural Decision Making* 12, 1999, no. 3, p. 183.

¹⁰ H.R. Arkes, C. Blumer, “The psychology of sunk cost”, *Organizational Behaviour and Human Decision Process* 35, 1985, no. 1, p. 124.

¹¹ D. Friedman et al., “Searching For the Sunk Cost Fallacy”, *Experimental Economics* 10, 2007, no. 1, p. 79.

way of thinking. Therefore, to consider an anchoring effect as a cognitive bias, thus a study of behavioural economics, it should consist of some psychological irrational insights. The anchoring effect was selected among the other cognitive biases and heuristics in this study since it is assumed that it is quite influential compared to the others. It is one of the most robust, since it might influence the individuals' decisions implicitly and unintentionally.¹² Furthermore, it is very interesting that individuals might be influenced by the anchor values even when the anchors do not give any valuable information about the estimation question. It is challenging to eliminate the anchoring effect, since it might work automatically and implicitly.¹³ The anchoring effect is essential since it is assumed that it influences even some crucial decisions of individuals without their awareness. Individuals might unconsciously behave irrationally in the presence of the anchoring effect. Therefore, it is believed that it is worthy of analysing the anchoring effect due to its importance on an individuals' life (although they are not aware of it).

After analysing the theoretical background of cognitive biases and heuristics, several anchor types will be analysed in the next section of this study.

The anchoring effect and anchor types

The anchoring effect is a type of cognitive bias that forces the human brain to focus on the first available piece of information or value during the decision-making process. It is one of the most robust cognitive biases that can be seen in many different areas. It can occur even when the anchor values are not informative for estimation questions and people are not asked to compare them with the target values. Moreover, it is challenging to eliminate the anchoring effect since it might influence the decision-making process of individuals implicitly, without an individual's awareness as mentioned above.

In this study, the main aim is to analyse the types of anchor values as mentioned above. The anchoring effect occurs since individuals consider them as possible answers for estimation questions. This can be considered as the first phase of the anchoring effect.¹⁴

Individuals can consider anchors as possible answers for several reasons. First of all, if anchors are informative, individuals would tend to benefit from them, not surprisingly. As mentioned above, informative anchors have two different types: regular informative anchors and self-generated anchors. Since the informativeness levels of regular informative anchors are sufficient to make a rational estimation, individuals do not need to face an adjustment process. Therefore, in the presence of regular informative anchors, the anchoring effect can create rational estima-

¹² A. Furnham, H.C. Boo, *op. cit.*, p. 35.

¹³ T.D. Wilson et al., *op. cit.*, pp. 395–396.

¹⁴ *Ibidem*, p. 389.

tions since the adjustment process is not needed. For instance, in one study, the conductor presents information about a local house to the subjects and asks them to estimate its appraised value. The listing price was (from low to high) one of the pieces of information that the experimenters provided to the subjects. According to the results, the listing prices were taken as an anchor by the subjects during their estimation process. When the listing prices were low, estimations were low and vice versa.¹⁵ It is not surprising that the participants considered the listing prices as possible answers when they made their estimations and their actions are considered as rational since the anchors were highly informative and the subjects did not need to make an adjustment for their estimations.

As another example of regular informative anchors, in New York City, it was suggested to taxi drivers to present tip rates as 20%, 30% and 35% to the clients. This method of presentation made clients think that 20% is the lowest tip and presumably they considered this number as an anchor. After this regulation, average tips increased to 22% on average, although it was half of this amount before.¹⁶ Presumably, clients considered these numbers as average tip rates made by previous clients (highly informative), thus they might have felt to tip at least around the lowest one.

Regular informative anchors are common also in negotiations. The first offer might have a huge impact, and negotiations might be towards this value. An experiment was conducted regarding negotiation among 76 (38 dyads) MBA students. In every dyad, there was one seller and one buyer. The negotiation was done in the purchasing of pharmaceutical plants between sellers and buyers. Some general information about the product was given to both sellers and buyers. For instance, the plant was purchased three years ago for \$15 million, and one year later its value increased to \$19 million. Moreover, a similar plant was sold for \$26 million. Such information was given to both sellers and buyers. Later, it was asked for them to negotiate with each other until the purchase occurs. The results showed that in general, the sellers made higher first offers (\$26.6 million on average) than the buyers (\$16.5 million on average). The final purchase prices occurred at \$24.8 million when the first offer was from the sellers and at \$19.7 million when the buyers made the first offer. Furthermore, the first offers had a considerable impact on the final purchase prices. The correlation was very high: 0.93.¹⁷ It is logical to consider these values that are presented by either sellers or buyers as possible

¹⁵ G.B. Northcraft, M.A. Neale, "Experts, amateurs, and real estate: An anchoring-and-adjustment perspective on property pricing decisions", *Organizational Behaviour and Human Decision Process* 39, 1987, no. 1, pp. 84–94.

¹⁶ M. Grynbaum, "In New York, taxi revenue and tips from credit cards rise", *The New York Times* 3, 2009, no. 4.

¹⁷ A.D. Galinsky, T. Mussweiler, "First offers as anchors: The role of perspective-taking and negotiator focus", *Journal of Personality and Social Psychology* 81, 2001, no. 4, pp. 660–662.

answers, since people might think that negotiators are knowledgeable about the market of the products.

Regular informative anchors can be seen in general knowledge estimations too. In one study, informative anchors influenced global warming beliefs of individuals. Since global warming is a topic that is highly discussed by many people these days, there are many predictions and estimations about its severity. Also, there is a high degree of uncertainty about global warming, and the predictions of people are based on their cultural backgrounds and heuristics. An experiment was conducted by a couple of scholars to observe whether the anchoring effect is influential in global warming beliefs. In the study, high and low anchors were presented to the subjects. The conductors hypothesize that participants who are given a higher anchor in terms of increases in outside temperature would estimate a higher level of global warming. The experiment was conducted among 159 participants from marketing undergraduate students. The question was framed in two different ways and then presented to the subjects randomly. The questions that are presented to the subjects are given below:

— “Do you believe the earth’s temperature will rise by exactly 1 degree Fahrenheit over the next 30 years?”

— “Do you believe the earth’s temperature will rise by exactly 10 degrees Fahrenheit over the next 30 years?”

If they answer “no” to the first question, as a second question, their predictions about increases in temperature in the next 30 years were asked in each group. The results reveal that, in the first group, 30.7% of the participants replied “yes”, while this rate was 54.9% in the second group. The average estimations of subjects who replied as no were 2.62 in the first group and 4.55 in the second group. The results revealed that a higher anchor leads to higher predictions about global warming.¹⁸ It is logical to consider these anchor values as possible answers for the estimation questions, since subjects might consider experimenters as knowledgeable people about the estimation question. Considering almost one-third of subjects in the first group and more than half of the subjects in the second group accepted the given degree for the estimation question, subjects considered the presented anchors as informative. Benefitting from anchor values that are presented by the experimenters in this example can be considered as rational and thus this is another good example of regular informative anchors.

As another type of informative anchors, self-generated anchors claim that individuals might make their estimations by starting from a point that is not given by experimenters but given by the nature of the estimation question. Although these types of anchors are informative, benefitting from them can not be con-

¹⁸ J. Joireman, H.B. Truelove, B. Duell, “Effect of outdoor temperature, heat primes and anchoring on the belief in global warming”, *Journal of Environmental Psychology* 30, 2010, no. 4, pp. 4–5.

sidered as rational. Because they require some adjustments and since adjustments are not sufficient, insufficient adjustments create biased estimations as mentioned before.¹⁹ Specifically, individuals tend to benefit from a reference point that they already know and adjust it to estimate the target value. This method is called anchoring-and-adjustment.²⁰ Therefore, self-generated anchors can be considered as part of a study of cognitive bias and thus behavioral economics, since benefitting from them consists of irrationality. For instance, when it is asked when George Washington was elected as president, subjects might try to estimate this number from a reference point that they already know: independence date of the U.S (1776). It is a well-known fact that George Washington was the first president of the U.S. and then the subjects might make their estimation towards 1776, which is the independence date of the U.S (Individuals might think that it probably took some time to select the first president after the declaration of independence, so the correct answer for the estimation question should be a few years after 1776).²¹ The anchor in this example can be considered as a self-generated anchor.

Thirdly, anchors might be uninformative and the experimenters would ask the subjects to compare the anchor values with the estimation questions (regular uninformative anchors). More specifically, subjects are explicitly invited to benefit from the anchor value by the experimenters in this type of anchor. For instance, there is a famous “wheel of fortune” example that is presented as follows:

Kahneman and Tversky (1974) ask students to spin a wheel of fortune and write down the number they received from it, that is either 10 or 65, since the wheel of fortune was arranged as tricky. However, the participants did not know that there can be only 10 or 65 in the wheel of fortune. Later, the following questions were asked to all of the subjects:

— Are African nations among UN members higher than the number you just wrote down?

— What is your best guess?

According to the results, participants who received number 10 from the wheel of fortune made smaller estimations for the second question compared to those who received number 65. Participants who received number 10 estimated the value on average at 25%, and participants who received number 65 estimated it on average at 45%. The results demonstrate that a piece of irrelevant and uninformative information easily influenced the estimations of the individuals.²² As can be seen in the example, the anchor values were determined randomly, and experimenters

¹⁹ A. Tversky, D. Kahneman, “Judgement under uncertainty”..., pp. 1124–1131.

²⁰ Ibidem.

²¹ N. Epley, T. Gilovich, “Putting adjustment back in the Anchoring and Adjustment Heuristic: Differential processing of self-generated and experimenter-provided anchors”, *Psychological Science* 12, 2001, no. 5, pp. 391–396.

²² A. Tversky, D. Kahneman, “Judgement under uncertainty”..., pp. 1128–1129.

invited the subjects to use the anchor values. Thus, this example consists of a regular uninformative anchor.

As another example of regular uninformative anchors, in one study, judges were influenced by an irrelevant number during their judgment process. In the study, a file that tells a thief story of a woman was presented to 52 judges in Germany. Later, it asked the judges to throw a pair of dice arranged as tricky, since the dice were showing only 3 or 9. As the next step of the study, the judges were asked whether they would like to give the number from the dice as punishment. According to the results, the judges who received number 9 expressed that they would like to give eight months on average as a punishment while those who received number 3 were ready to give five months on average as a punishment.²³

As the fourth type, anchors can be considered as possible answers by individuals even when they are uninformative, completely irrelevant to the estimation question and experimenters do not ask them to compare the anchors with the estimation question. Wilson et al. (1999) call this “basic anchoring” and according to their view, this type of anchoring effect occurs when individuals give sufficient attention to the anchor value. One of their studies demonstrates that when they ask the subjects to examine whether the anchor value has four digits or not, they did not observe any anchoring effect, since the subjects did not give sufficient attention to the anchor value. On the other hand, when the subjects were asked to examine whether the anchor value is higher than 1920, the basic anchoring effect occurred, since the subjects gave sufficient attention to the anchor value to calculate whether it is higher than 1920. When the subjects did not give sufficient attention to the anchor value, the anchoring effect was eliminated. As another example of basic anchoring, some random numbers (participant ID numbers) influenced the estimations of the subjects regarding the number of physicians in a town. Considering these participant numbers are irrelevant for the number of physicians in that town and the subjects were not asked to compare their numbers with the estimation question, the anchor can be considered as a basic anchor.²⁴

As another example of basic anchors, the experimenters asked the subjects to write the last two digits of their social security numbers on paper. In the study, they attempt to analyse whether these anchor values will have any influence on the subjects’ willingness to pay or not. Next, a selection of products (computer accessories, wine bottles, luxury chocolates, and books) was shown to the subjects. Later, they were asked if they would be willing to pay the numbers they wrote down on their paper as a dollar for these products. As a second question, the students were asked how much they would be willing to pay (maximum) for each product. Later, the social security numbers of the students were divided into five categories to analyse the findings. For instance, the highest anchors are from 80 to

²³ D. Kahneman, *Thinking Fast and Slow*, New York 2011, p. 118.

²⁴ T.D. Wilson et al., op. cit., pp. 391–393.

99, and the lowest from 1 to 20. The results revealed that the higher the anchors, the higher the willingness to pay. For instance, students with the lowest-ending social security numbers were willing to pay \$11.73 for a rare wine while students with the highest-ending social security numbers were willing to pay \$37.55. The difference is quite big, and it was evident that anchoring had an impact on the WTP of the subjects. The results were similar in other products. In general, in 5 different categories regarding the anchor values in 6 different products, the authors determined a significant correlation between the anchor values and WTP of the subjects.²⁵

In five different studies Wilson et al. (1999) have some important findings regarding basic anchoring the author finds worth presenting:

- Basic anchoring occurs when subjects pay sufficient attention to the anchor value.

- Knowledgeable people are less likely to be influenced by anchor values compared to unknowledgeable people.

- The anchoring effect occurs unintentionally and without the individual's awareness, thus it is difficult to avoid it.

- Although there were many warnings reminding the subjects that there is an anchor and it influences their decisions, it was not enough to eliminate the effect of the anchor. Anchors might be very powerful, and eliminating them might be highly challenging.²⁶

Finally, Critcher and Gilovich (2008) discover another type of anchor and call them “incidental environmental anchors”. They consider this a new type of “basic anchor” since there is a slight difference between basic anchors and incidental environmental anchors. The difference occurs on the “sufficient attention” part. According to the authors, some “incidental” anchors can influence the decisions of individuals even in the case of a very low level of attention, unlike basic anchors. Therefore, incidental environmental anchors appear to be more robust than regular basic anchors. Otherwise, they both claim that the anchoring effect might occur when the anchors are uninformative and people were not asked to benefit from the anchors to estimate the target value. The authors state that the existence of some “incidental” numbers in the “environment” might be enough to influence the judgments of individuals with a low level of attention. For instance, in one study, subjects were asked to estimate the success of a footballer. While one group of subjects saw the picture of the player with the shirt number 54, the other group of subjects saw the same player with the shirt number 94. According to the results, the subjects who saw shirt 94 estimated the higher success of the player on average than those who received shirt number 54. A random and ir-

²⁵ D. Ariely, G. Loewenstein, D. Prelec, “Coherent arbitrariness: Stable demand curves without stable preferences”, *The Quarterly Journal of Economics* 118, 2003, no. 1, pp. 74–76.

²⁶ T.D. Wilson et al., op. cit., pp. 388–400.

relevant number easily influenced the predictions of the subjects.²⁷ The subjects were not explicitly invited to benefit from the anchor value, and the numbers were just on the jersey of the players as the nature of the game since all players have their numbers. However, it cannot be logical to correlate these numbers with their successes.

In the other two similar studies, Critcher and Gilovich (2008) discovered incidental environmental anchors by creating some fake names (consisting of numbers, too) to some products and services. For instance, in one of the studies, participants' willingness to pay at the Bistro 97 restaurant was more than the restaurant at Bistro 17. In a similar study, the subjects estimated that the P97 model mobile phone is sold more than the P17 model across Europe. Presumably, 97 and 17 were taken as anchor values by the subjects although these numbers cannot be informative in both cases and the subjects were not invited to benefit from the anchor values. The numbers are just the name of the products or services (as a natural part of random events) that cannot be correlated with their successes.²⁸

To sum up, the author observed five important anchor types, and only one of them cannot be considered as a type of cognitive bias, since it does not consist of any irrationality: regular informative anchors. Moreover, since they do not consist of any psychological insights and they satisfy one of the important assumptions of standard economic theory which is rationality, they do not constitute research of behavioural economics as well.

Conclusion

According to the latest findings, standard economics assumptions are violated by some controlled experiments and real-world observations. Hence, behavioural economists renamed the rationality principle in economic theory with a new term: bounded rationality. As a result of bounded rationality, cognitive limitations of individuals remark many cognitive biases and heuristics that individuals display during their decision-making process. It is possible to find more than 100 cognitive biases and heuristics in the literature. It is assumed that anchoring is one of the most robust, since it works implicitly without the individual's awareness.

Most of the studies regarding the anchoring effect documented either informative or uninformative anchors, with calling individuals to benefit from it. However, the results from several studies strongly suggest that the anchoring effect is influential even when the anchors are not informative and the subjects are not asked to compare the anchors with the target value. Moreover, these types of uninformative anchors are not observable in only one area. They exist in many areas, such as willingness to pay (WTP) decisions, negotiations, and predictions about

²⁷ C.R. Critcher, T. Gilovich, *op. cit.*, pp. 243–245.

²⁸ *Ibidem*, pp. 245–248.

unknown values, such as global warming. It is quite reasonable to benefit from an informative anchor during the estimation process of an unknown value. However, from a rational perspective, uninformative anchors should not influence the decision-making process of individuals, because it is not reasonable to benefit from a random number that is completely irrelevant to the estimation question. However, as discussed above, in several studies subjects were influenced by the anchors even when they were not informative and unrelated to the estimation questions.

To determine which types of anchors can be considered as a study of behavioural economics and which cannot, the author analysed several types of anchors. He strongly claims that it is quite reasonable to benefit from regular informative anchors during the decision-making process for an unknown value, since their informativeness levels are sufficient to make a rational estimation. Therefore, regular informative anchors do not consist of any irrational parts. However, although self-generated anchors are considered as informative, since their informativeness levels are not sufficient to estimate an unknown value without any adjustments, and since adjustments are not sufficient, they cannot be considered as rational. Hence, it is claimed in this study that only regular informative anchors among all the anchor types cannot be considered as a type of cognitive biases and heuristics. Moreover, since benefitting from regular informative anchors does not violate the rationality principle, they are not part of a study of behavioural economics.

The author hopes that this study can make some contribution to the anchoring effect, cognitive biases and heuristics and behavioural economics literature regarding anchor types. He believes that more empirical research is needed to highlight the topic more comprehensively.

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