

Research on the Heuristic Bias in Behavioral Economics

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Abstract: Behavioral economics is a branch of economics. It studies people's decision-making patterns and behavioral principles when making decisions. Behavioral economics has penetrated into people's lives, and heuristics are everywhere. This paper shows several classifications and experimental investigations of heuristic bias in behavioral economics. It is widely believed that heuristic bias means that when people want to judge a complex, fuzzy, and uncertain event, they often take some shortcut in thinking due to the lack of effective methods, such as relying on past experience, analyzing and processing past experience, getting inspiration, and then making judgments using the inspiration. However, through literature reading and analysis, it can be found that people don't always make such choices when faced with problems, or they stay rational.

Keywords: social, psychological, psychology, choice

1. Introduction

In behavioral economics, heuristic bias is a hot topic. Many experts and scholars have gone to explore it. Behavioral economics is a marginal discipline between psychology and economics. It wants to modify traditional economics with the conclusions of psychology. Because in traditional economics, people think that their behavior is rational and selfish, and that they pursue the maximization of their own utility. And when the conclusion of psychology is integrated into it, it will be found that people are not selfish and single. They also pursue fairness, mutual benefit, social status and other aspects. Therefore, the research questions are, "What is heuristic bias? What is the usage scenario of biased enlightenment?"

2. Heuristic Bias

What is heuristic bias? When people want to judge an event that is both complex and vague and uncertain, because there is no way to use it, they often take some shortcuts in thinking, such as: relying on past experience, analyzing and processing past experience, getting enlightenment, and then using the revelation to make judgments. These thinking shortcuts sometimes help people make accurate judgments quickly, but sometimes lead to deviations in judgments. These judgment deviations caused by shortcuts are called "heuristic biases". Heuristic biases are divided into three types: representative bias, availability bias, and anchoring effect. These three methods can give correct results, but they are not necessarily 100% accurate, and they will still produce some wrong results [1]. Representative heuristics.

When reasoning, we first consider deriving the result based on the event itself or the same kind of event, that is, past experience. This reasoning process is called representational heuristic. In general, representation is a useful heuristic, but in the process of analyzing past examples and looking for the probability distribution of laws or outcomes, serious deviations may occur, resulting in false revelations and leading to errors in judgment. There are two types of biases that may arise from the use of "representative" judgments.

First, representatives cause the sample size to be ignored. When analyzing the characteristics or laws of events, people often cannot correctly understand the significance of the statistical sample size. The results of the overall statistics are the real results. The closer the number of samples is to the real number, the more credible the statistical results. The smaller the sample, the greater the difference with the real number, and the more the statistical results can not reflect the real results. Representative heuristics are statistical analysis of various results that have occurred in the past for similar events, and the probability distribution of the results is obtained to find out the most likely outcome, that is, the most likely outcome. Therefore, it is necessary to look at the population of all similar events or to examine as many similar events as possible (large samples). But people tend to draw conclusions quickly on the basis of very little data [2]. Second, representatives will ignore the difficulty of judgment, even if they are faced with a complex problem that is difficult to judge. They will simply make judgments, or often make judgments based on non-standard and judgment-independent descriptions, or often ignore unfamiliar or incomprehensible information, and only rely on information that they can understand and familiarize themselves with to make judgments, and this ignored information may be critical to the judgment.

For example, in 1913, inside the Casino of Monte Carlo, a black-and-red spinning roulette wheel (with the same probability of appearing black and red) had been stuck in the black area for 10 consecutive times, so that gamblers were determined to bet on red, convinced that it would be almost impossible to appear black after 10 consecutive blacks. However, black kept going, 11 times, 12 times, 13 times... The gamblers' bets were constantly swept away, but the gamblers in front of the roulette table were gathering more and more, and the bets were getting bigger and bigger, and they continued to bet on the red with all their determination [3]. However, the black continued, and it was not until the 27th time that the gamblers were convinced that the red they wanted to wear was late. At this time, a record of 26 consecutive blackouts has already filled the casino. What makes countless gamblers quickly destroy a false belief in their hearts is this: "the law of large numbers" is still strong in small samples, so the probability of events in the random sequence is always related to the previous events, and thus will inevitably run to the "expected probability" under the "law of large numbers". As a result, gamblers are convinced that the expected probability of 50% of the overall red and black in a large sample will also be presented in the current small sample of dozens of times, so that after 10 or even 20 consecutive blacks, the probability of appearing red is almost certain. However, the truth is that no matter how many consecutive blacks are in front of them, the probability of their appearing red is always 50%. This is the "Monte Carlo fallacy," also known as the "gambler's fallacy." Indeed, if a coin is tossed continuously, the probability of 5 consecutive heads-ups is indeed low. That is $50\%*50\%*50\%*50\%*50\%=0.03\%$. Naturally, the probability of 6 consecutive positives is bound to be lower, which is $0.03\%*0.5\%=0.015\%$ [4].

However, this does not mean that the probability of a positive after 5 consecutive heads is 0.015%. Because the coin has no memory, each coin toss is an unrelated independent event, not affected by the previous positive or negative, so the probability of positive or negative at this time is still 50%.

3. Availability Inspiration

When using heuristics for judgment, people tend to rely on their first thoughts of experience and information, and assume that these easily perceptible or recalled will appear more often as a basis for judgment, which is called the availability heuristics. People are usually most likely to think of frequent past events or recent unusual events, but this information may also be unimportant or insufficient to make judgments, which naturally leads to biased judgments. Therefore, when using the availability heuristic, we should pay attention to judging the nature of the existing information, and mining more information to make a comprehensive judgment. [5]

For example, in Thinking, Fast and Slow, there's a question that goes something like, What if someone were to ask you whether Gandhi died before the age of 144 or after the age of 144? Most people's reactions must have been before the age of 144, because as we all know, very few people can live to the age of 144. But have you ever wondered why we're talking around the number of 144 because we're limited by the problem? So we don't wonder how old Gandhi died, but whether he died at 144. In example, if someone asks you if you have more letters at the beginning of A, or more letters than the second letter of A? Our first reaction must have been more than the first letter of A, because we may not be able to remember so much at once. This is the availability inspiration.

4. Anchoring Effect

Tvenky and Kahneman first defined the "deterministic effect," i.e., an estimate from an initial value to an inadequate adjustment thereafter, resulting in a final answer, which is oriented towards the initial value of information [6]. After Tvenky Kahneman proposed the "certainty effect," it was extensively studied and confirmed in many cities. These studies include critical mass assessments, credit assessments of risk and uncertainty, white self-efficacy, common-sense question answering, and more. Among others, anchoring effects have also been proposed, such as shifts in preferences, likelihood assessment, trait inference, production and understanding of language, self-bias, and explanatory mechanisms for various phenomena, such as daydreaming.

For example, two shops that sell porridge have about the same flow of customers in a day. When going in to buy porridge, the clerk of store A will ask the customer, "Do you want an egg?" and the clerk of store B will ask the customer, "Would you like one or two eggs?" At this time, the sales of store A are high or the sales of store B are high? Or is there little difference in sales between the two stores? The answer is that the sales of store B will be significantly higher than those of store A. The reason for this is that, despite the fact that neither store's waiters said anything, the options for customers differ [7]. The choice given by store A is to add or not to add. At this time, this anchor point is not to be added. Customers can choose to add or not add on the basis of not adding. But the choice given by store B is "plus one" or "plus two." At this time, the anchor point of this is "plus," which is just a question of whether to add more or less. Although customers can also choose not to add eggs, because of this anchor point, the customer's subconscious will push the option of not adding eggs to the back. The probability of choosing not to add will be reduced accordingly, and the anchor point of "adding eggs" will take effect. Of course, there's a difference between asking "with or without eggs" and asking nothing, because at least this question gives the customer an anchor point. If you don't ask, only customers who really need it will take the initiative to ask for a purchase. In order to achieve your goal, set anchor points for the other party to reach the goal, thereby increasing the probability of your own reaching the goal. At the same time, merchants will use people's experience to make the volume cheaper and cheaper.

Second, there is a common business case. There will be a display on the merchandise display rack: a 550-gram bag of chips sells for \$7, and a 750-gram bag for \$9.90. Which one will the

customer choose? The answer is that most customers will choose to buy the \$9.90 model, although that's a bit more expensive than the \$7 one [8].

In fact, merchants also used the anchor effect at this time. By displaying the weight of the item and its price, a double anchor point is set for the consumer [9]. When there are double anchors, it is the inner anchor, that is, the user's own anchor experience, which has a greater impact on the results. This setting will bring more profit to the merchant.

Third, consumers do not want to take advantage, but have the feeling of taking advantage. If we look closely, we may see that several dishes on the same page of a restaurant's menu have similar dishes but very different prices. Similarly, luxury stores will put some "high-priced" products, but if consumers look carefully, they may find that there are not many "high-priced" products, and they are likely to be scattered on various counters [10]. After consumers see these "high-priced" products, and then buy the products next to it, do you think the prices of these products that are not sky-high are reasonable? Therefore, merchants use this anchor point effect to set up a comparison of high and low price points, so that consumers feel that "the goods are very cheap".

5. Conclusion

This paper explores heuristic bias in behavioral economics and its application scenarios and concludes that heuristic bias application scenarios are applicable to all aspects of our lives, such as choice, geography, sociology, psychology, etc. It is known that it has an important impact on our judgement or decision-making. But it also has disadvantages. He is very limited. It can lead to errors in one's basic judgement. The disadvantage of this study is its small scope and limited sample. It is hoped that future studies can expand the scope of the study and increase the sample size, so that the results will be more accurate.

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