

The Availability Heuristic

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Abstract: Few fields of psychology have undergone such dramatic conceptual changes over the past dozen years as the emerging science of heuristics. Heuristics are effective cognitive processes that consciously or unconsciously ignore part of information. Good heuristics can greatly reduce the time it takes to solve a problem by avoiding some unlikely possibilities, and although heuristic processes tend to find solutions or outcomes that are often valid or correct, they may only be correct, provable, optimal, or accurate sometimes. However, decision making based on heuristics is often sufficient to solve small-scale problems and provide solutions in uncertain situations where complete information is not available. Heuristics rely on shortcuts to provide immediate, efficient and short-term solutions to facilitate timely decision making. People need to understand how cognitive heuristics work in an uncertain world, combined with practical applications or theory, to help analyze the performance and use areas of heuristics, so that they can continue to evolve and improve.

Keywords: heuristics, cognitive processes, rational

1. Introduction

Heuristic is a psychological shortcut that helps people make judgments quickly and effectively[1]. In general, heuristics are effective and useful, but in some cases, it can backfire and lead to cognitive bias. Don't be surprised when your emotions affect all your decisions, no matter how much. Because when you are happy, you are likely to be happy with a lot of things happening and willing to try new things. But when you are sad, you may not be interested in many things. If you bring your intuition with you when faced with a very difficult choice, then a heuristic is influencing your current decision [2].

In the 1950s, Nobel Prize-winning psychologist Herbert Simon proposed the concept of "bounded rationality." He argued that although human beings strive to maximize reason, it is a pity that human reason is always limited by human cognition. In order to save cognitive resources, human beings have developed a set of highly efficient cognitive structures, and this cognitive structure is the heuristic. Then, psychologists Amos Tversky and Daniel Kahneman conducted a systematic study of heuristics and gradually named some heuristics with obvious characteristics. Later, Seymour Epstein developed the famous cognitive experience ego theory based on the study of heuristics [3]. This theory holds that there are two parallel information processing systems in the human cognitive structure, one is the intuitive experience system, and the other is the analytical rationality system. The intuitive experience system has high efficiency, fast reaction speed, and can run at high speed in the unconscious state,

which ensures the order of various daily activities of human beings. The analytical rational system is slow, careful, and often requires concentration to drive, but at the same time it analyzes evidence more thoroughly. Heuristic is an important part of intuitive experience system.

2. Motivation

One of reasons for using heuristic is that people are lazy, there is no doubt that heuristics are more convenient than careful rational analysis. Although the heuristic can make mistakes, it can still maintain good accuracy in most cases. Human cognitive ability is not infinite, heuristics as a kind of cognitive inertia, can help save cognitive resources, so that people can devote their energy to more attention to the problem.

3. Heuristics

A heuristic is a problem-solving or decision-making technique that uses minimal relevant information, past results, and experience to produce a viable and practical solution to a problem in a reasonable amount of time [4]. These strategies focus on delivering fast results with an acceptable range of accuracy, rather than providing near-perfect solutions. Although heuristic processes tend to find solutions or outcomes that are often valid or correct, they may only sometimes be correct, provable, optimal, or accurate. However, decision-making based on heuristics is often sufficient to solve small-scale problems and provide solutions in uncertain situations where complete information is not available. Heuristics rely on shortcuts to provide immediate, efficient, and short-term solutions to facilitate timely decision-making. Analysts in all industries use specific rules of thumb that enable companies to solve problems and make decisions and judgments quickly and efficiently[5]. In the computational world, however, heuristic models serve as empirical methods to speed up and simplify the decision-making process without sufficient time to carefully consider all aspects of the problem.

The common heuristic types are availability heuristic, representational heuristic, affective heuristic and anchoring and adjustment.

4. Availability heuristic

Availability heuristic is a method by which people make judgments based on how easily certain information comes to mind. Information that is easily recalled is perceived as more common than information that is less easily recalled, a cognitive strategy known as availability heuristics [6].

When people are trying to decide, some related event or situation may immediately pop into their mind. As a result, people may judge these events as more likely than others. Some trust this information more and tend to overestimate the probability and likelihood of something similar happening in the future.

Here's an example of an availability heuristic. When you ask people which is safer to travel by train or by plane, almost all of them will tell you that the train is safer, and the plane has a higher probability of accidents. In fact, the incidence of aircraft accidents is far less than the incidence of train accidents, but once a plane accident, television, radio, newspapers, and other communications have released heavy news, people see and hear a lot of information. When people compare the safety of the two means of transportation, they can easily recall the report about the accident of the plane at once and answer that it is safer to take the train [7]. In this way, people judge how often things happen based on how easily they can recall certain information, which is sexual inspiration.

5. Relevance

For heuristics, there are three points. The first attribute is substitution, where people replace more complex and challenging questions with simpler but related ones. Second, to reduce effort, people use heuristics as a form of cognitive laziness to minimize the mental effort required to make choices and decisions. Third, fast and frugal, people use heuristics because they can be quick and correct in certain situations. Some theories suggest that heuristics are more accurate than biased methods.

For availability heuristic it helps people judge how often things happen, but frequent events are easier to recall because people experience them more. But this heuristic is error prone. Some events have information that is vivid, obvious, impressive, and easy to extract. In contrast, others have information that is more ordinary and familiar, and people turn a blind eye to them, so they think that the former happens more frequently. If something is easily associated with a particular instance and another thing is not easily associated with it, then the former is considered to occur more frequently.

6. Application

6.1. The Bias of Subjective Judgment

In the first experiment, a random word was selected from an English text by a quick comparison. Compare whether words are more likely to start with a "k" or to include the letter "k" in the third position. A total of 78 percent said it was more likely that words would start with a "k", while 22 percent said it was more likely that a "k" would be the third position in a word. So it turns out that most people find it easier to think of words that start with "k." This leads to the conclusion that sampled words are more likely to begin with a "k." In a typical essay, the number of words beginning with "k" in the third place is twice that of words beginning with "k." This application reflects the relevance to economic outcomes. When investing, many people will make subjective judgments, but many times, they cannot make the right choice. Subjective judgment usually has a certain deviation. If such misjudgment occurs in investment, the stock of the enterprise will fall sharply, or the economy will decline, which is more likely to cause the financial crisis of the enterprise.

6.2. The Bias in Estimation Due to Stereotypes

The second experiment selects a mode of transportation through probability evaluation. Option A is the train, and Option B is the plane. The accident rate for trains is known to be 1.0 in 100.00, while the accident rate for planes is 0.8 in 100.00. The results showed that 74% of people chose to take the train, and 26% chose to take the plane. When people compare the accident rate of the train and the plane, they find that the accident rate of the plane is lower than that of the train, but still more people choose the train. Although the incidence of airplane accidents is much lower than that of train accidents, once airplane accidents happen and cause people to panic, when people compare the safety of these two means of transportation, they are easy to immediately recall the airplane accident and answer that it is safer to take the train. The relevance of this application to economic outcomes shows that dramas are more likely to be in the news. For example, a plane crash, a natural disaster, or a terrible crime are all headline news. Because of this, people are often exposed to vivid images or descriptions of events that impress people. As a result, they overestimate their frequency or probability. This will affect the economic development of some enterprises.

6.3. Irrational Thinking in The Stock Market

The third experiment used the stock market. If a stock were crazy in the news, people would choose to buy it or not to buy it. It turns out that 76% of people would choose to buy the stock, and 24%

would not choose to buy it. Most shareholders choose their stock investments based on the news. They buy what other people buy. Examples of people falling into the trap of "availability bias" behavior are also common in the financial sector. When a hot stock, such as the Postal Savings Bank mentioned above, is ready to go public, all the news media will be focused on reporting the event. Many investors, under the bombardment of the media, will unknowingly care about and even buy this stock. This correlation applies to economic outcomes in investment, where people are more influenced by what they see and hear than by statistical thinking.

7. Conclusion

When people make decisions, they usually hope for the best. They want to take everything into account and ensure the best possible outcome. But it's hard to look at it objectively. Personal perceptions can hinder people's decision-making process and affect our judgment. One reason is usability heuristics. This heuristic allows people to make choices quickly but also increases the chances of making the wrong choice. So, people need to avoid using usability heuristics to prevent falling into cognitive bias [8]. For an intelligent investor or financier, it is necessary to think rationally and establish an effective system rather than draw conclusions directly from irrationality or intuition to increase the possibility of winning in the capital market.

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