

A Study on Judgment of the Impact of Usability Heuristic on Life

Yiman Wang

Griffith College, Dublin, D08 V04N, Ireland

Abstract. This paper mainly discusses the availability heuristic in behavioral economics. This article mainly introduces the definition and significance of Availability heuristic, as well as three examples of its impact on the economic sphere of everyday life from different aspects. These are real estate, transportation, and stocks. Because availability heuristic is one of the ways the human brain works, it's hard for any of us to avoid making wrong choices because of it. It will appear in all aspects of our lives, affecting not only personal development, but also economic life from various angles. Therefore, the research purpose of this paper is to let more people know availability heuristic in rational thinking and learn to use it to make more rationally and correct choices.

Keywords: Availability heuristic; Real estate; Transportation; Stocks.

1. Introduction

We are more likely to be influenced by what we see or hear than to think in terms of statistics. Availability heuristic affects every aspect of our lives, extending from academic psychology to economics, law, medicine and political science. It has serious consequences in most professional areas and in many aspects of everyday life. People make countless individual decisions every day, and factors such as media comfort, emotional reactions and vivid images are more influential than the perfectly rational calculations of the human brain. Being aware of our inherent biases can prevent wrong judgements, unintentional discrimination, or costly mistakes in investment and business decisions.

Behavioral economics revises the settings of economic models based on the findings of psychology, aiming to better understand people's decisions in real environments and their effects on the economy. In fact, normalized, axiomatized models of decision making didn't exist until the 1940s. Economists have been aware of irrationality for some time. In 2003, Frieder L. mentioned a point in his Working paper that stock traders seek to buy following large positive earnings surprises and to sell following large negative earnings surprises. It shows that high-profile events can always influence people's judgment.

In the first application, taking Alibaba stock as an example, the stock often gets the public's attention when it is listed in IPO. At this time, people will also be more optimistic about this stock under the influence of availability heuristic. But the fact is that the returns from investing in companies which listed in IPO are lower than they would have been if they had invested in other public companies of similar size over the same period. In the second application, it is found that people's judgment is influenced by the length of time the information is sampled and the visual stimulus. It is difficult for people to make a completely rational risk analysis and judgment on whether to buy property under the influence of availability heuristic. The third application is about traffic accidents. The data prove that people have overestimated the likelihood of a plane accident as a result of recent news coverage. Which in turn caused huge losses for the airline.

The elaboration of availability heuristic in different fields such as psychology, economics, law and political science has deepened the research connotation of behavioral economics. It also has great significance in the field of public health, social system and welfare, and really brings into play the social value of behavioral economics. In the meantime, since behavioral economics is becoming an increasingly popular subject in the world, Availability heuristic has also made great contributions to understanding the impact of human behavior in different countries and different ethnic groups, making analysis and interpretation.

The following sections is arranged as such: Section 2 shows the literature review. Section 3 includes three applications and section 4 is conclusion.

2. Literature review

In 1959, Herbert Simon proposed that recent years have seen important new explorations along the boundaries between economics and psychology. However, it was not until the 1960s that explicit references to behavioral economics, as the efforts to incorporate psychological insights into economics began appearing. Tversky and Kahneman put forward the definition of availability heuristic in 1973, availability is a judgemental heuristic in which a person evaluates the frequency of classes or the probability of events by availability, i.e. by the ease with which relevant instances come to mind.

Since then, more and more scholars have put forward some conclusions and proofs about availability heuristic. Frieder L. wrote that stock traders seek to buy following large positive earnings surprises and to sell following large negative earnings surprises. In addition, Shiller, R. J. also noticed how availability heuristic influence the stock market. He present that investors' attention to investment categories (e.g., stocks vs. bonds or real estate) may be affected by alternating waves of public attention or inattention. And Russell Eisenman cited a 1984 study by Tyler and Cook¹⁰ which concluded that constant media coverage of certain topics like drug use can distort perceptions of how often those events occur in the real world. An increasing number of scholars have found that availability heuristic affects our judgment in many ways. The conclusion that the availability heuristic influences our brain's judgment has been continuously confirmed by subsequent studies. For example, a study by Hayibor and Wasieleski found that the availability of others who believe that a particular act is morally acceptable is positively related to others' perceptions of the morality of that act. And A study done by Craig R. Fox provides an example of how availability heuristics can work in the classroom.

As for now, according to Snorre Sylvester Frid-Nielsen presented, a researcher at the University of Roskilde's School of Social Sciences and Business in Denmark, the field of behavioral economics is currently dominated by economists and psychologists, and the questions they study focus on economics.

Behavioral economics has received much attention mainly because it provides a framework for explaining when and how people make mistakes. In fact, the systematic errors and biases that humans make are predictable in certain situations. Conventional economics, Fried-Nelson proposed that assumes that rational people will correctly weigh costs and benefits and calculate the best option for themselves. And according to Altman, the theory of behavioral economics has many positive effects on human beings and society. Therefore intervention by creating a better external environment can help people make more informed decisions and lead healthier lives.

3. Applications

3.1 Ease of recall

For human brains, categories whose examples are easy to extract will be more important than those with the same frequency but whose examples are harder to think of. The degree of familiarity and significance will affect the extractability of examples. What happened recently may be more accessible than what happened before. For example, the subjective probability of a traffic accident rises temporarily after you see a car roll over on the side of the road. Another example is that people buy insurance for themselves just after an accident, but insurance is supposed to anticipate and protect against risks, not after the event.

3.2 Retrievability

Suppose you take a random word which with three or more letters from an English text. Is it easier to find a word that starts with an R or to have an R as the third letter? When people answer this question, they usually recall words that start with an R (like road) and words that start with an R (like car), and then rate their relative frequencies by how easily they think of those two words. Because in more cases, the time people used to search for the first letter of a word in memory is less than it is to search for the third letter, that's why most people think that there are more words that begin with a consonant than words whose third letter is that consonant. But in fact, consonants like R or K are more familiar in the third letter than they are in the beginning.

3.3 Deviation of imagination

When we evaluate the frequency of certain events, examples of these events are not stored in our brains, but we can use our brains to build examples. You typically build multiple examples and assess their frequency or probability by how easy they are to build. For instance, risk can be assessed by imagining contingencies that cannot be handled during an expedition. If someone thinks of many such vivid contingencies, this expedition seems particularly dangerous, though the ease with which such catastrophes are thought of does not reflect the likelihood of them actually occurring. On the contrary, if you fail to think of certain possible dangers, the risks to be taken will be underestimated. Another interesting example is sharks and swimmers. The deaths off San Diego show that, on average, for every swimmer killed by a shark, it saves 10 lives. Every time a swimmer dies, the number of drowning deaths also drops for a few years before returning to normal levels. But people only notice the death from a shark attack because it's more graphic.

3.4 Availability heuristic in stock market

Examples of people falling into the behavioral trap of "availability heuristic" are also common in finance. When a popular stock is ready to go public, the press will focus on this event. And many investors in the media's deepening memory, will fall into the cognitive trap, unknowingly bullish on this stock, or even buy it.

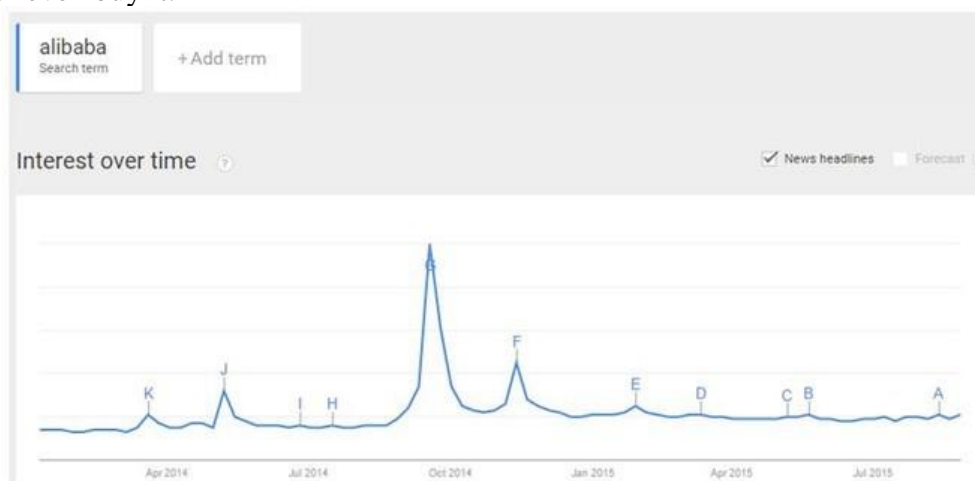


Figure 1. Shows the number of searches for "Alibaba" in Google. We can see that the search volume on Alibaba peaked around September 2014, which was right around the time Alibaba went public in the U.S.

But the reality is that buying an IPO isn't necessarily a good deal for investors. For example, Professor Ritter of the United States studied and analyzed the return of investment in IPO of listed companies from 1970 to 2010 in the United States, which is summarized in the above chart. We can see that whether after the first six months, second six months, two years or even five years, the returns of investing in IPO companies are lower than the returns of investing in other public companies of similar size over the same period.

Table 1. Percentage returns on IPOs from 1970-2010 during the first five years after issuing

	First six months	Second six months	First year	Second year	Third year	Fourth year	Fifth year	Geometric Mean years 1-5
IPO firms	6.0%	0.4%	6.8%	5.2%	10.7%	18.7%	12.6%	10.7%
Size-matched	5.4%	5.6%	11.5%	13.3%	14.2%	16.9%	14.2%	14.0%
Difference	0.6%	-5.2%	-4.8%	-8.1%	-3.6%	1.8%	-1.6%	-3.3%
No of IPOs	8,386	8,360	8,386	8,419	7,754	6,948	6,049	
IPO firms	6.5%	0.8%	7.5%	7.0%	11.6%	18.3%	11.2%	11.1%
Size & BM-Matched	4.0%	4.6%	9.0%	12.6%	11.5%	18.3%	13.2%	12.9%
Difference	2.5%	-3.9%	-1.4%	-5.6%	0.2%	0.0%	-2.0%	-1.8%
No of IPOs	8,200	8,174	8,200	8,036	7,359	6,555	5,679	

Note: Source Ritter. J Returns on IPOs during the five years after issuing for IPOs from 1970-2010

3.5 Availability heuristic in real estate

The first application was a study involving students from University of Zürich. There are 92 students participated in the study in total (52 women, 40 men). The experiment asked all participants to imagine that they were going to buy a house in a certain location, and they got some information from the staff about the probability of flooding in the area. The scenario highlights that 'The severe damage caused by this flood is only partially covered by insurance'. Participants in the experimental group have two photographs depicting homes that had been damaged during a flood. And participants in the control group were had the information of two photos depicting intact homes, with no mention of how the homes would look after being affected by flooding. In addition, half of the participants had the information of the flood disaster risk based on one year, and the other half of the participants had the information over a period of thirty years. Ever participants were tested individually, and they were randomly allocated to one out of the four groups.

Table 2. Time period

Condition	Time Period	
	1 Year	30 Years
Experimental group	2.95(1.21)n=22	3.83(1.07)n=23
Control group	2.22(1.09)n=23	3.38(1.44)n=24

Note: Ratings made on a six-point scale: 1 = not risky at all and 6 = very risky. Standard deviations are given in parantheses.

Judging from the time period factor, the expected effect was confirmed. A message which has a longer period increased perceived risk in both the experimental and control groups. In addition, another hypothesis of the experiment was also confirmed. The availability of images about the impact of a flood event increases the perceived risk. Based on this experiment, we can conclude that these images trigger negative emotions and the time period will influence people to perceive risk.

3.6 Availability heuristic in transportation

Here is another example of availability heuristic. It's related to airplane accidents. The news media often report on horrific plane accidents that lead to multiple deaths, and the Availability heuristic makes people's brains feel that flying is a very dangerous thing to do. For example, U.S. carrier Southwest Airlines experienced a mid-air engine explosion in 2019 that resulted in the death of a passenger. Even though the probability of such an accident is very low, the company's ticket sales fell sharply afterward due to the media coverage, and the company lost between \$50 million and \$100 million in sales. Consumers inflate expectations of similar events far beyond the possibility that they

will actually occur. It is for this reason that, after the 9-11 events in the United States, many Americans have a fear of flying and prefer driving to avoid flying. Gerd Gigerenzer, a German professor, calculates that in the year after 9/11, 1,595 Americans died because they chose to travel in cars to avoid flying.

4. Conclusion

The example in the previous section proved that availability heuristic can be found everywhere in our economic life from three different aspects: real estate, transportation, and stock. Because of its existence, it makes it difficult for us to make completely rational judgments.

Availability heuristics are used in a great number of professional areas and also in many aspects of our usual lives. People make countless individual decisions every day, and factors such as media comfort, emotional reactions and colorful images are more influential than the perfectly rational calculations of our brains. To be aware of inherent biases can prevent fallacious reasoning and costly mistakes in investment and business decisions. We, as human beings, are subject to innately irrational habits of behavior. If you want to be a smart investor, you need to know your enemies and yourself. First, you need to fully understand your human weaknesses. Then you can build a rational system in your brain and insist on independent thinking to boycott your weaknesses.

References

- [1] Ashraf, N., Camerer, C. and Loewenstein, G., 2005. Adam Smith, Behavioral Economist. *Journal of Economic Perspectives*, 19(3), pp.131-145.
- [2] Frieder, L., 2003. Evidence on Behavioral Biases in Trading Activity. *SSRN Electronic Journal*,
- [3] SENT, E., 2004. Behavioral economics: how psychology made its (limited) way back into economics. p.740.
- [4] Tversky, A. and Kahneman, D., 1973. Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, 5(2), pp.207-232.
- [5] Shiller, R., 1999. Human behavior and the efficiency of the financial system.
- [6] Eisenman, R., Sawyer, K., Piechowski, M., Eisenman, R., Mumford, M., Supinski, E., Sternberg, R. and Eisenman, R., 1993. Book review. *Creativity Research Journal*, 6(4), pp.457-484.
- [7] Hayibor, S. and Wasieleski, D., 2008. Effects of the Use of the Availability Heuristic on Ethical Decision-Making in Organizations. *Journal of Business Ethics*, 84(S1), pp.151-165.
- [8] Judgment and Decision Making, 2006. The availability heuristic in the classroom: How soliciting more criticism can boost your course ratings. pp.86-90.
- [9] Frid-Nielsen, S. and Jensen, M., 2020. Maps of Behavioural Economics: Evidence from the Field. *Journal of Interdisciplinary Economics*, p.026010792092567
- [10] Altman, M., 2013. What Behavioural Economics Has to Say about Financial Literacy. *Applied Finance Letters*, 2(1), p.12.
- [11] Tversky, A. and Kahneman, D., 1973. Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, 5(2), pp.207-232.
- [12] Keller, C., Siegrist, M. and Gutscher, H., 2006. The Role of the Affect and Availability Heuristics in Risk Communication. *Risk Analysis*, 26(3), pp.631-639.
- [13] Gaissmaier, W. and Gigerenzer, G., 2012. 9/11, Act II. *Psychological Science*, 23(12), pp.1449-1454.
- [14] Ritter, J., Gao, X. and Zhu, Z., 2012. Where Have All the IPOs Gone?. *SSRN Electronic Journal*,