

Bounded rationality theory and its application to the study of tourists' decision-making behavior

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ABSTRACT

Simon's "Bounded rationality" theory is an important research result of the decision-making process analysis theory, which has important reference value for the study of tourist behavior in the context of risk. On the basis of reviewing relevant decision-making theories and models, this study explores the application value of Simon's decision-making theory in the study of tourists' risk perception and the study of consumption decision-making from the perspective of tourism crisis management research in the hope of providing certain theoretical references to the study of tourism behavior in the context of risk and enriching the study of tourism crisis management at the micro level.

KEYWORDS

Bounded rationality; Risk; Decision-making; Tourist behavior

1 Introduction

In recent years, risks and various disturbances from the social, economic and political levels have been superimposed, causing immeasurable negative impacts on all aspects of human socio-economic life. Tourism is most obviously affected by risks due to its comprehensive characteristics and high sensitivity and dependence on the external environment. Tourists' consumption behaviors have shown sharp fluctuations, and the tourism consumption market as a whole has been in the doldrums, impeding the high-quality development of the tourism industry. On the basis of systematically sorting out the foundation, guidelines and influencing factors of Simon's bounded rationality theory, this study analyzes the application and value of Simon's decision-making theory in the study of tourists' risk perception and consumption decision-making from the perspective of crisis management, hoping to provide certain theoretical references to the study of tourists' behaviors in the context of risk and to enrich the theoretical study of tourism crisis management on the micro level.

2 Simon's theory of decision making

2.1 The basis of managerial decision-making - bounded rationality

In the 1940s, Simon critiqued the assumption of economic man in classical economics from a psychological perspective and proposed the assumption of bounded rationality (Simon, 1955). According to Simon, human rationality is a bounded rationality under specific circumstances. It is called "bounded rationality" because Simon believes that most actors have "biological and psychological limits of their own". There is a limit to the amount of information the average person can process at one time, and attention and information acquisition vary from person to person. A bounded rational decision maker has the following characteristics. Firstly, it is impossible to exhaust all knowledge and information; secondly, ordinary people cannot have the sophisticated computing and information processing capabilities of a mega-computer, nor can they foresee the possible consequences and probability of each scenario. Therefore, "perfect rationality" hardly exists in reality, and "bounded rationality" is widely practiced.

2.2 Guidelines for decision making - most satisfactory

According to the assumption of "economic man", people always choose an optimal solution by comparing and calculating the advantages and disadvantages of each solution when making decisions, following the "principle of optimization" of decision-making. However, in Simon's view, subjective and objective conditions, it is almost impossible to seek the optimal solution within the limited decision-making time, and it is more reasonable to "seek satisfactory decision-making". There are two reasons for this: first, the environment is always changing, and the current foreseeable situation will not be completely consistent with the future changes; second, actors cannot exhaust all the alternatives, and the results are not known (Deng, 2004). In real life, the human decision-making process fits the "most satisfactory" criterion better and is therefore more practicable.

2.3 Influences of bounded rationality in decision making

2.3.1 Information overload

While the information society brings convenience to human life, it also makes people gradually realize that human beings are facing the crisis of “information explosion” and “information overload”, which triggers various information processing problems (Fang et al., 2024). Humans are tired of dealing with overloaded information from various unknown sources every day, and it is difficult for them to concentrate on searching for effective information and making rational decisions, which not only creates opportunities for rumor spreading, but also provides the basis for individual cognitive bias. Understanding the problem of information overload in modern society is an important prerequisite for human beings to think effectively and solve problems. It further reveals to human beings that the way of pursuing the optimal solution does not have the optimal effect.

2.3.2 Cognitive capacity limitations and cognitive biases

Simon (1955) believes that individual rationality is a bounded rationality between perfect rationality and irrationality. On the one hand, limited by objective physiological and psychological conditions, individuals have limited resources that can be called upon in a limited time. On the other hand, the decision-making environment in the risk society is extremely complex, and in most cases, the limited objective conditions of individuals also determine that it is difficult for them to accurately judge and predict the consequences of decision-making, and cognitive bias arises as a result (Lu et al., 2025). Cognitive bias is a kind of distortion of perception results, which is generally affected by individual physiological factors and mental ability (Zhou, 2008). Physiological factors mainly stem from the limited call of the human brain to perceive and analyze massive information, which leads to bias in the cost calculation by individuals (Luo et al., 2023). Psychological ability, on the other hand, mostly points to the individual's lack of control over all kinds of emotions in the decision-making process, leading to irrational bias in the screening and processing of real information (Thyagaraj et al., 2025). Cognitive ability limitations and cognitive bias are important reasons for bounded rationality.

3 Application of Simon's Decision Theory to the Study of Tourist Behavior

3.1 Research on Travelers' Risk Perception

3.1.1 Dual-processing models in travel decision-making

Simon believes that most decisions are the most satisfactory rather than the optimal decisions made by the actors under the “physiological and psychological limits of the organisms themselves” (Simon et al., 1955). In the past few decades, scholars have proposed a valuable information processing model based on the theory of bounded rationality, i.e., the dual systems model of decision making (Kahneman, 2003). The model is valuable in understanding why tourists are prone to irrational consumption behavior under the impact of crisis events.

The theory suggests that humans enable two mechanisms to process and handle information. The two mechanisms interact with each other and decide together (Evans, 2013). One mechanism relies on intuitive judgment, information is processed quickly, processing generally takes up no or very little mental resources, and decision makers are easily influenced by their own background factors, which cognitive psychology calls the heuristic process (Stanovich et al., 2000). The other mechanism is based primarily on deliberate reasoning. Information is processed slowly, takes up more mental resources for processing, and is often influenced by rules, which researchers call analytical processes (Tversky et al., 1974). The dual-systems model suggests that both mechanisms work together to influence cognitive decision-making. When the two systems are oriented in the same direction, reasoning results respect both intuition and rationality, whereas when the two systems are in conflict, the heuristic system has a high probability of dominating the outcome of an individual's behavior (Sun et al., 2007). Dual systems theory can well explain the reasons for the generation of irrational bias in the decision-making process of tourism consumption, and explain the psychological roots of the generation of vulnerability of tourist consumption. In 2020, public health emergencies of international concern are spreading rapidly across the globe, and travelers are forced to receive a large amount of negative public information at a high frequency and repetitively, including the number of casualties, spreading trends of epidemics, and lack of supplies, which leads to frequent arousal of their negative emotions and an excessive depletion of their psychological resources. In the process of competing with the heuristic system, the analytical system is stuck, the rational reasoning and processing process gives way to intuition and habit, the heuristic system dominates, and the tourists make bounded rationality decisions, such as suppressing the willingness to go on a trip, changing the consumption habit, and following the crowd to avoid the risk and other behaviors. Analyzing the sensitivity and vulnerability of tourist consumption from the perspective of bounded rationality by using the dual system theory can effectively explain the psychological roots of the fluctuation of tourist

consumption behavior, which has important theoretical and practical value.

3.1.2 Cognitive Limitations of Tourists and the Dunning-kruger effect

For most ordinary people, individuals are vulnerable in coping with risk. The gap between the overload of risk information and the limited cognitive capacity of crisis decision makers leads to limited access to partial information, which further exacerbates the degree of cognitive bias of decision makers. In a tourism crisis, if we continue to observe the response of tourists to risky events, we will find that ordinary tourists, when faced with a major sudden sexual event, the degree of access to key resources is not comparable to that of professionals, which makes the knowledge and ability gap between different types of groups and individuals, a fact that directly leads to the significant differences in the interpretation of the same event and the way of coping between different tourists (Rubinstein, 1993). In addition, under the problem of insufficient access to information, there exists the cognitive bias phenomenon of overconfidence in one's own ability and knowledge, known as the "Dunning-kruger effect" (Kruger et al., 1999), which has been demonstrated by Simon and his subsequent researchers to be prevalent among low-knowledge groups. For example, outdoor sports enthusiasts forcibly crossing the desert in danger is the best evidence. They are guided by their background knowledge and erroneous beliefs, mistakenly believing that they can conquer the danger with their a priori knowledge and beliefs alone. In the fact, they misjudge the risks, resulting in irreversible consequences.

3.2 Analysis of tourists' risky consumption decision-making behavior

Tourists' risky consumption decision-making behavior has complexity, and tourist behavior in risky environments is more vulnerable and sensitive. In the early days of tourism decision-making research, influenced by the idea of perfect rationality, tourism decision-making was considered to be the result of tourists' precise assessment of the costs and benefits of decision-making under the condition of perfect rationality (Wahab et al., 1976), and it was a rational purchasing behavior that had been carefully planned and excluded all the fluctuating factors. However, putting aside the analysis of the sensitivity perception of the environment, the tourism decision-making behavior is in fact obviously subjective. This is because in reality, no decision-making individual can have a full and complete understanding of the outcome of each choice. Uncertainty is always present, both before the purchase and during the travel process, which makes the travel decision maker's understanding of the consequences of the choice always fragmented, iterative and subjective to empirical judgment, and it is difficult for the decision maker to reach a level of complete understanding of each candidate option. The high demand for information and the high dependence on the safety environment in tourism decision-making behavior make the reasoning process of tourism decision-making even more difficult under the perturbation of sudden events. We found that even in a safe environment, tourists seldom evaluate alternative destinations based on calculation results and then form travel preferences, but first use a priori knowledge and consumption habits to establish a rule identification system, and then match the rule system with the scenario to form a plan identification. This process can help travelers reduce the confusion caused by information overload, simplify decision-making and relieve decision-making pressure and tension. This shows the complexity of the decision-making process of tourism consumption. In Susan Horner and John Swarbrooke's study, the complexity of tourist behavior is demonstrated in the consumer's interaction with the following seven factors. (1) a high degree of involvement in the purchase decision; (2) susceptibility to the influence of others; (3) a long decision time; (4) a large number of emotional factors mixed into the purchase process; (5) the provider of the tourism product; (6) a high degree of information-seeking needs and (7) a high degree of uncertainty linked to intangibility (Susan et al., 2020).

4 Conclusion and discussion

In tourism decision-making research, the research oriented to the normative decision-making theory of perfect rationality aims to improve the efficiency of decision-making. However, under the risk society, this mode of analysis and theoretical orientation can bring obvious negative impacts on tourism crisis research and analysis of tourists' decision-making behavior under risk factors. For example, focusing too much on logically deducing the decision-making sequence of tourists and the pre-decision game mechanism by normative methods will lead to one-sided research, which will lead people to fall into the quagmire of purely deducing the decision-making process instead of predicting and controlling the decision-making.

Inspired by Simon's idea of bounded rationality, the analysis of tourist behavior in the context of risk should focus more attention on the tourist decision-making process aimed at decision prediction and control, including the identification of tourism risk-perceived factors, the impact of risk information on tourist psychology, the measurement of tourist risk tolerance thresholds, the types of tourist responses to risky environments, as well as the prediction of tourist

behaviors and the control of insecure behaviors etc. The environment in which tourists live is characterized by ambiguity, and the stimulus response process of tourism decision-making behavior is also affected by ambiguity factors. Reality is not unique and causality is complex and variable. Researchers should regard the tourism decision-making process as a multi-stage, nested occurrence process under bounded rationality, pay attention to the analysis of the psychological variables of tourists, and emphasize the core position of tourists' prior experience and the degree of consumption involvement in the decision-making process. This is an important revelation of Simon's theory of finite rationality to the study of tourism consumption.

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