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Bounded Rationality and Satisficing (Behavioural Decision-Making Model)

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ABSTRACT:

Two key ideas in behavioral decision-making models that go against the grain of rational decision-making are bounded rationality and satisfaction. We will examine the fundamentals of limited rationality and satisficing in this abstract, illuminating how these ideas have transformed our understanding of how people make decisions. The main characteristics, theoretical foundations, and practical applications of these models in diverse situations will be highlighted in the abstract. It will also go over how satisficing and limited rationality give a truer representation of human decision-making behavior by taking into consideration cognitive restrictions and environmental constraints that people confront in their daily decisions. The importance of limited rationality and satisficing in decision-making theories and its applicability in comprehending the complexity of human behavior will be better understood by readers after reading this abstract.

KEYWORDS:

Behavioral, Decision, Model, Rationality, Satisficing.

I. INTRODUCTION

Long-standing economic theories have made the assumption that people make logical judgements, carefully assessing all of their alternatives, and choosing the one that would maximize their utility or rewards. Human decision-making, however, is often far from being totally logical. Two behavioral decision-making models bounded rationality and satisficing oppose the idea of perfect reason and provide different viewpoints on how people make decisions in the face of complexity and ambiguity. Herbert Simon proposed the idea of bounded rationality, which holds that people have cognitive constraints that prohibit them from analyzing and weighing all the information at their disposal in order to come to the best conclusion. Instead, they use heuristics, generalizations, and simplified mental models to find "good enough" answers given their limitations. Simon created the word "satisficing," which refers to a decision-making process in which people go for the first alternative that satisfies a predetermined bar for acceptability rather than aiming for the optimal result. In other words, they don't actively seek for the greatest option since they are satisfied with a choice that meets their basic requirements[1], [2].

We examine the theoretical underpinnings and practical implications of limited rationality and satisficing in the context of behavioural decision-making in this work. We investigate how these models diverge from conventional rational choice theory and how they provide a more precise depiction of how individuals make choices in actual circumstances. Understanding these models is essential for a variety of disciplines, including as organisational behaviour, marketing, psychology, and economics, since it helps to understand how human decision-making deviates from perfect rationality. In order to demonstrate the importance of limited rationality and satisficing in describing human decision-making behaviour, we shall investigate their essential features throughout this work, relying on empirical data and real-world examples. We'll also look at how these models affect people and organisations, as well as any possible drawbacks and future study directions. By the book's conclusion, readers will comprehend the intricacies of decision-making processes and recognise the contributions that limited

rationality and satisficing make to our knowledge of human behaviour. Bounded rationality and satisficing have come to be widely recognised as crucial elements of the behavioural decision-making paradigm in recent decades. These models have opened up new study and application opportunities in a number of areas by challenging long-held notions that human decision-making is completely rational. The capacity of limited rationality and satisficing to illuminate the psychological and cognitive mechanisms behind decision-making is one of their major achievements. These theories provide a more detailed view of why people often use heuristics and shortcuts when faced with difficult decisions by recognising the limits of human information processing and cognitive capabilities[3], [4].

Additionally, satisficing and constrained rationality have applications in the areas of economics, consumer behaviour, and public policy. Since limited rationality has been acknowledged in economics, behavioural economics, which combines psychological knowledge into economic theories and decision-making models, has emerged. Understanding consumer behaviour, market dynamics, and developing public policies that might influence people to make better decisions are all significantly impacted by this.Adopting the ideas of constrained rationality and satisficing has been advantageous for organisations as well. Organisations may create decision-making procedures that account for cognitive limits and improve results by acknowledging that workers and supervisors might not always make entirely logical judgements. This knowledge affects resource allocation, risk management, and strategic planning because it takes into account how people and organisations make decisions when faced with restricted rationality limitations[5], [6].

Bounded rationality and satisficing have substantial contributions, but they are not without detractors. Some contend that these models might oversimplify decision-making processes or minimise the influence of values and emotions on decision-making. Furthermore, there is still study and discussion to be done about where to draw the line between compromising and satisficing. behavioural decision-making theories such as limited rationality and satisficing have fundamentally changed how we see human decision-making. These models have questioned the established rationality presumptions and offered a more practical and useful framework for understanding and forecasting behavioural patterns in people. Researchers and practitioners may create more precise and effective decision-making techniques, enhancing individual well-being and organisational success, by accepting the limitations of human cognition and embracing the notion of satisficing. We may anticipate further deeper understandings of the complexities of human decision-making and its effects on society and organisations as this field of study continues to grow[7], [8].

II. DISCUSSION

The behavioural choice theory has seen significantly increased attention during the past several decades. While behavioural decision theory has significant practical consequences, it is fundamentally descriptive in nature and aims to understand how people really make choices as opposed to classical decision theory, which is normative or prescriptive and seeks to identify an ideal answer. Behavioural decision theory has come to be seen as a significant and promising area of study and practise after being long dismissed as a niche science and maybe just a bothersome annoyance to those who support "economic decision making." Herbert Simon and Daniel Kahneman, two behavioural choice theorists who are not economists, were awarded the Nobel Prize in Economics for their contributions. Also, Cass Sunstein, a well-known proponent of "paternalistic intervention" to influence decision-making and a key author on behavioural choice theory, was chosen by President Obama to head up the White House Office of Information and Regulatory Affairs. His opinions in that capacity have elicited both support and criticism. These topics have been made more widely known by well-known publications like Thaler and Sunstein's Nudge, Ariely's Predictably Irrational: The Hidden Forces That Shape Our Decisions, and Kahneman's Thinking, Fast and Slow. The use of behavioural choice theory has provided fresh perspectives on a wide range of problems, including numerous management-related ones as well as terrorist futures, traffic rage, whether to punt, bullet selection, divorce, and organ donation. This entry examines (a) the nature of rationality and its bounds, (b) the effects of such bounds on rationality, (c) the functions of automatic information processing, (d) the relative merits of clinical, actuarial, and

clinical synthesis approaches to decision making, (e) disagreements regarding paternalistic intervention, and (f) the prospects of statistical groups and prediction markets[9], [10].

Fundamentals

Herbert Simon argued that decision-making is the core of administration in his 1947 book Administrative Behaviour and that an operational administrative decision is just, effective, and doable to execute using a set of coordinated methods. The behavioural and cognitive processes involved in making logical judgements were the subject of administrative behaviour. This laid the groundwork for much of behavioural choice theory as well as Simon's subsequent work Simon issued the first significant critique of the idea of the rational economic man in his landmark 1955 work, "A Behavioural Model of Rational Choice," which he subsequently referred to as "my chief epistle to the economists." He used this to add depth and realism to standard economic ideas rather than to criticise them outright. According to the conventional "rational economic man" model of decision-making, people are capable of selecting the best choices. That approach is predicated on the idea that the decision-maker has full knowledge of relevant aspects of the environment, including alternatives, relevant events (states of nature), the probabilities of those events, and the outcomes associated with combinations of alternatives and events;

a. Possesses a well-organized and stable set of preferences;
b. Enjoys superb computational abilities capable of optimization;
c. Is capable of “cool” decision making, not swayed by emotions and stress; and
d. Has immediate access to costless information.

In light of the many limitations that face human decision-makers. He discussed his theory of a "new rationality" that substituted "administrative man" for "rational economic man." The following ideas are included in this new rationality:

1. In lieu of the traditional conception of rationality, "bounded rationality" is used, in which the decision-maker looks for workable answers within a variety of cognitive, perceptual, situational, and other limitations.
2. Aspirational levels are crucial and changing Success and failure may alter ambition levels, which might alter what is seen as acceptable or undesirable.
3. Information gathering and processing take time and money. As a result, the issue of the optimal degree of tenacity in achieving a goal entails a trade-off between the possible advantages and disadvantages of search.
4. Preferences may change. For instance, tastes might alter as people age and mature. Consequences may also alter one's payoff function. Additionally, we can just be unaware of our preferences due to inexperience

Simon argued that the idea of human decision makers acting as optimizers is illusory in light of the limits on rationality and accompanying challenges. Simon suggested that human decision-makers should satisfice rather than optimise in its place. Satisficers look for the first acceptable option in the feasible set, whereas optimizers look for the best alternative possible.Satisficing acknowledges that information search and acquisition are expensive, even though it may seem undesirable (because, for example, a better alternative may be available than the first acceptable alternative and because it binds the decision-maker to the order in which alternatives are available). According to Simon, optimising is like finding the sharpest needle in a haystack, which is immeasurably more challenging. Satisficing is like finding a needle in a haystack. Sometimes all you need is a needle, Simon reasoned.

Graham Allison challenged the utility-maximizing rational actor model, which was then prevalent in explaining foreign policy decision-making, via his examination of the Cuban missile crisis. He put out alternate theories that took into account political decisions made by senior leaders, organisational and other limits, and other factors. Other researchers have looked at the types and severity of rationality constraints. For instance, George Miller's essay "The magical number, plus or minus two" demonstrated that humans are only capable of a small and restricted range of about seven, plus or minus two, absolute

judgements of unidimensional stimuli, such as tones, taste intensities, visual position, loudness, and points on scales. As a result, human judgmental ability in one dimension is constrained and remarkably consistent across senses.

Paul Slovic evaluated the data pertaining to the reliability of clinical judgement in an early investigation of the capacity of human decision makers to act as "intuitive statisticians." He came to the conclusion that, in areas like investment analysis, mutual fund performance, Forecasting, money, and medical diagnoses had poor validity, and inter-rater reliabilities were frequently low. In addition, he reached the "quite disappointing" finding that physician experience and training often have little effect on validity but enhance decisional confidence and decrease openness to accept outside inputs.

Daniel Schacter wrote about the "seven sins of memory" and examined memory problems. He assumed that while memory is often accurate, it is also flawed. Three different "sins of omitting," or forgetting, were distinguished by Schacter. These include blockage, transcience, and forgetfulness. Another category is "sins of commission," which are examples of distortion. These are prejudice, suggestibility, and misattribution. The inability to remove bothersome memories is a last "sin". While unpleasant, these "sins," according to Schacter, are by-products of memory's often adaptive characteristics.

Some Consequences of Limits on Rationality

Numerous heuristics and biases are caused by restrictions on reason. Heuristics are simplified generalisations. Satisficing was mentioned as one simplifying heuristic before. Others were suggested by Amos Tversky and Kahneman, including the following: The propensity to calculate an event's likelihood based on how quickly past occurrences of the event may be recalled is known as availability. The propensity to classify something as belonging to the class it seems to represent, or "look like," is known as representativeness. The propensity to utilise an early piece of information as an anchor and then use fresh knowledge to alter that initial anchor is known as anchoring and adjustment. We often give new knowledge too little weight, which leads to inadequate adjustment. Accepting the default that is provided to us, whether it is the default setting when installing computer software or the default that is shown on a form, is known as the default heuristic. As will be shown later, this may be a subtle but effective decision-making factor.

Importance

Many of the early studies on heuristics and biases focused on single-time choices. These choices whether to undergo chemotherapy or surgery, assault an adversary, or decide to wed one's childhood sweetheart are frequent and often important. However, many choices in the real world are made in continuous contexts, which are characterised by frequent input that is often redundant and the ability to make incremental changes.

In certain situations, some heuristics could be less problematic. For instance, information processing conservatism may not be a major difficulty in contexts where there are constant possibilities for revision.

Fast and Frugal Heuristics

Although the risks of heuristics and biases have received the majority of the attention, certain heuristics may be useful if utilised purposefully and sensibly. Gert Gigerenzer, for instance, has advocated for the employment of "fast and frugal heuristics" in a "adaptive toolbox." For instance, he points out that Harry Markowitz, who received the 1990 Nobel Prize in Economics for his research on optimum asset allocation, did not employ his prestigious optimisation method for his own retirement investments. Instead, Markowitz used the 1/N rule, a straightforward heuristic that reads, "Allocate your money equally to each of N funds." The 1/ N heuristic outperformed 12 optimum asset strategies, according to research. The basic heuristic outperformed the optimisation models in terms of past data fitting, but fared worse in terms of future prediction.

Automatic Information Processing

Research has also shown that many decisions are made automatically at nonconscious levels, rather than via conscious deliberation. For instance, when we are presented with a choice circumstance frequently, we may construct scripts. Scripts are mental representations of behaviours or event sequences that are suitable for certain contexts, such as the stages of a performance review. When dealing with normal circumstances, scripts may be useful, but they may present issues in unusual scenarios. The advantages and disadvantages of automatic processing, the effects of conflicts between automatic and conscious processing, and the process and effects of switching from one mode (automatic or conscious) to another have all been studied.

Clinical and Actuarial Approaches, Improper Linear Models, and Clinical Synthesis

The clinical-actuarial issue contrasts the accuracy of human (clinical) decision makers with that of actuarial (statistical) models when it comes to making decisions. The idea that actuarial models routinely outperform unassisted clinical judgement is highly supported by research. According to Robyn Dawes, there is no evidence that statistical prediction when both are based on the same codable input factors is superior than clinical judgement. That remains the situation.

Nevertheless, sometimes it is impossible to create a model that best connects predictors to results (this kind of model is known as a suitable model). For example, there can be insufficient observations to support development or no quantifiable criteria at all. In certain circumstances, a non-optimal strategy, such as setting the weights of the predictor variables to equal, may be used to generate an inappropriate linear model. For example, divorce was strongly predicted by dividing the number of fights by the number of passionate encounters, even though neither variable was by itself a significant predictor. The Denver Police Department also chose a better bullet by using unit weighing.

A fascinating example of a flawed linear model is the so-called "model of man," which uses regression analysis to create a linear model of a person's decision-making process. Following that, judgements are made using that model rather than the person this process is known as bootstrapping. The crucial advantage of absolute dependability, which increases validity, is present. Surprisingly, every adequately conducted research that compared the accuracy of human judgements to those of their models of man has revealed that the models are better.

Even among statistically educated psychologists, adoption of proper and improper linear models has been vehemently fought despite the overwhelming evidence in favour of their usage. Dawes has recognised the main reasons for this reluctance and has made an effort to disprove them. For instance, some detractors claim that using a statistical model to choose job applicants rather than, say, an interview or a doctor's expertise to diagnose a condition is unjust and dehumanising. In response, Dawes claims that clinical conclusions might be substantially incorrect and even self-fulfilling.

He observes that some of the worst medical professionals spend a lot of time conversing with their patients, do not read medical publications, order few or no tests, and cry during the funerals. Additionally, because statistical models' accuracy can be evaluated and is often poor (although being greater than that of clinical judges), detractors may raise the issue of their "proven low validities." In the face of such resistance, using actuarial analysis to substitute clinical decision-making. A different approach, known as clinical synthesis, has been suggested in which the output of Actuarial models are made available to people as decision-making input. The clinical synthesis data is unambiguous: Individuals' judgements are improved when they get actuarial model outputs, but they are not as improved as if they had utilised the information directly without any modification. Therefore, one crucial challenge is how to persuade decision-makers to rely more on the advice provided by actuarial models.

Paternalistic Intervention

The effectiveness and acceptability of employing knowledge of human cognitive limits and proclivities to "nudge" individuals towards "desirable" behaviours, a practise known as "paternalistic intervention,"

is the subject of a significant and current debate. The significance of understanding behavioural decision making as well as its contentious ramifications has been underlined by two recent books, Nudge and Predictably Irrational, as well as countless articles. The main points of contention centre on the morality of using subtle prods and who gets to decide what behaviours are "desirable."

For instance, most states and many other nations employ "opt-in" or "explicit consent" forms, which require individuals to perform a specific action, such sending in a form, to indicate that they want to be organ donors. Several European nations adopt a "opt-out" policy, also known as "presumed consent," in which people are assumed to be willing donors until they explicitly state otherwise. According to conventional economic theory, if registering as a donor or nondonor is simple, the alternatives ought to provide comparable outcomes. In contrast, just 12% of people in Germany who use an opt-in system provide their approval, compared to 99% of people in Austria who use an opt-out system. A little adjustment, in this example changing the default heuristic, yields amazing results.

Statistical Groups and Prediction Markets

Although there is strong evidence that statistical models of decision makers that is, models of men perform better than actual decision makers, these models reach performance levels that are comparable to those attained by averaging judges' inputs. This is due to the fact that averaging over multiple judges significantly lowers unreliability, which is one major advantage of models of man. This shows that using statistical groups i.e., averaging the opinions of group members might be helpful. Francis Galton investigated a competition where participants tried to estimate the weight of a fat bull at a local fair in England as a typical example. The ox weighed 1,198 pounds, according to the 787 participants' average prediction of 1,197 pounds. More recently, the Society for American Baseball Research invited its members to choose the champions of the 2004 baseball postseason.

The expert group's preferred pick won every round of the playoffs with a perfect score. Utilising prediction markets, which pool individual opinions to estimate event probability, is a natural extension of statistical groups. In these markets, participants place bids on contracts that pay out a particular sum if a certain event happens. For instance, if a given company's sales exceed a specified threshold, a contract may pay $1. The market "believes" that sales have a 60% probability of achieving that amount if the market price for the contract is $.60. Internally, companies like Google, Hewlett-Packard, IBM, and others utilise these marketplaces.The Iowa Electronic Markets and InTrade are two examples of prediction markets that have had remarkable success in forecasting events like Oscar and election winners. The most contentious of these markets which was rejected after a vehement backlash was one that sought to forecast terrorist activity. The concept was derided as "incredibly stupid" and "a futures market in death" by critics. However, after Umar Farouk Abdulmutallab, the "pants bomber," attempted to detonate plastic explosives on a Northwest Airlines flight, security professionals familiar with the incident claimed a prediction market, with its capacity to integrate disparate information, could have stopped him from boarding the flight. In conclusion, behavioural decision making has significantly increased in acceptability, influence, and the depth of its insights. It emphasises important variables, such as persistent departures from the "rational economic man" model of decision making, that affect the character and effectiveness of human choices. Despite its intrinsic descriptiveness, it raises significant and sometimes contentious policy implications for a range of disciplines, including management, finance, medicine, and foreign policy.

III. CONCLUSION

Our understanding of and research into human decision-making has been completely transformed by bounded rationality and satisficing. A more accurate and realistic depiction of how individuals make decisions in the actual world has been made possible by these behavioural decision-making models, which have challenged the conventional notion of humans as entirely rational agents.Herbert Simon's formulation of the idea of limited rationality draws attention to the cognitive constraints people encounter while analysing data and coming to judgements. It recognises that it is not always possible for humans to compile and evaluate all relevant data in order to make the best decision. Instead, they use heuristics and mental evasions to make decision-making easier.On the other hand, satisfying proposes

that people often strive to find satisfied solutions that fit their minimal requirements rather than looking for the greatest possible conclusion, which complements restricted rationality. This strategy considers the real restrictions people face while making decisions, such as time and effort restrictions.Combining bounded rationality with satisficing offers a more thorough explanation of why humans do not always make totally rational decisions and useful insights into the intricacies of decision-making. These models have been used in a variety of domains, including as organisational behaviour, marketing, psychology, and organisational economics, improving our capacity to understand and predict human behaviour in many settings.Additionally, the acceptance of limited rationality and satisficing cleared the door for the growth of behavioural economics and had an impact on organisational tactics as well as public policy. Researchers and policymakers may create more effective treatments that support improved decision-making and wellbeing by adding psychological insights into economic models.Though they have greatly improved our knowledge of decision-making, limited rationality and satisficing have several drawbacks. Further research is needed to determine the limits between satisficing and compromise, as well as the significance of emotions and values in making choices.As a result, the behavioural decision-making model now includes bounded rationality and satisficing as essential elements, giving a more precise and complex picture of how people make decisions. Researchers and practitioners may create more practical and successful ways to decision-making processes, improving results in many areas of life, by acknowledging and appreciating the cognitive restrictions and practical constraints that affect decision-making. We may anticipate further deeper understandings of the complexities of human decision-making and its effects on people, organisations, and society at large as this area of study continues to advance.

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