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Behavioural Decision Theory: A Theoretical Foundation

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Abstract

The paper discusses some seminal papers in the field of behavioural decision theory from some of the very eminent researchers.They have played a major role in shaping the concepts related to behavioural decision theory that we study today.The papers that I have discussed here include "Gambling With the House Money and Trying to Break Even: The Effects of Prior Outcomes on Risky Choice" by Thaler and Johnson, "Judgment Under Uncertainty: Heuristics and Biases" by Tversky and Kahneman, "Prospect Theory: An Analysis of Decision Under Risk" by Kahneman and Tversky and "Advances in Prospect Theory: Cumulative Representation of Uncertainty" by Tversky and Kahneman. The papers discuss concepts such as effect of prior outcomes on risky choices, heuristics and biases and a detailed account of prospect theory, including the advances done in it. These concepts are the foundation of the some of the most widely used theories today in the field of management.

Introduction

This paper discusses some seminal papers that have played a major role inshaping the concepts related to behavioural decision theory that we study today. In this paper, I have tried to summarize and review the works of some of the very well-known researchers in the field of management. They include: Thaler, Hohnson, Tversky and Kahneman. I have discussed their seminal works, i.e., the papers that have helped in building the foundation of some of the most widely used theories and are the basis of many behavioural decision theory models used these days.

Gambling With the House Money and Trying to Break Even: The Effects of Prior Outcomes on Risky Choice by Richard H. Thaler and Eric J. Johnson

The paper evaluates if prior gains and losses affect the risk-taking behaviour using a framework based the prospect theory.

The economists concentrate only on the incremental costs, but it is known that the choices made by the decision makers are affected by the decisions that they made in past. People gamble more when they have made prior gains (house-money effect) and they gamble less when they have incurred losses in the past. But when given an opportunity to break-even (if they have incurred a previous loss), then people are more willing to gamble.

As stated earlier, the authors use the prospect theory to explain this phenomenon. Prospect theory leaves flexibility to edit the prospects if the reference point is affected by previous outcomes. The authors have edited these prospects and have referred to these as 'editing rules'.

The editing rules that they have proposed are: 'Prospect Theory with Memory', 'Prospect Theory, No Memory', Concreteness', and 'Hedonic Editing'. The authors evaluate each of these in two versions: two-stage version (where one event is fixed and for the consequent event the people are asked to gamble) and one-stage version.

The authors have conducted several experiments to test these editing rules. While conducting experiments for hedonic editing, they found that people want gains to be spread-out and they want to experience the losses separately. This was further explored and the authors then proposed 'Quasi-Hedonic Editing Hypothesis'. According to this, firstly, people do not segregate the sure gains when presented in the one-stage format. Secondly, people do not integrate subsequent losses with the first loss in two-stage format ('risk-aversion after prior losses').

The authors evaluated these editing rules after conducting several experiments. They inferred that presentation format of the gamble matters. The first four editing rules that the authors had proposed were refuted by the data of the experiments. Prior losses generally cause risk-aversion, especially when subsequent gamble does not guarantee to break-even. The opposite happens in case of prior gains.

The authors also offer some alternative explanations for the results that they arrived at. There are certain studies that suggest that mood also affects the risk-taking behaviour. Losses will land one in a bad mood while gains will result in a good mood. The initial loss may find people thinking that it is not their lucky day ("hot hand" effect) and hence they stop placing bets.

Judgment Under Uncertainty: Heuristics and Biases by Amos Tversky and Daniel Kahneman

The paper talks about the heuristics that are used by people to make judgments under conditions of uncertainty. The paper describes the imperfection in human reasoning. People generally use heuristics in making judgments when predicting probabilities of outcome of complex process. There are three heuristics that are described in the paper. They are 'representativeness', 'availability of instances', and 'adjustment from an anchor'.

Representativeness happens when 'people are asked to judge the probability that an object or event A belongs to class or event B'. This approach to the judgment of probability is susceptible to certain errors. Those errors include: 'insensitivity to prior probability of outcome' (people evaluate probability by representativeness, thereby ignoring previous probabilities; even when worthless evidence is given); 'insensitivity to sample size' (people tend to apply the representative heuristic and ignore the sample size); 'misconceptions of chance' (chance is viewed as a self-correcting concept wherein if the deviation is much larger on one side then on the next chance it is going to correct itself to reach the state to equilibrium); 'insensitivity to predictability' (people tend to disregard predictability and chose on the basis of representativeness); 'illusion of validity' (people have more confidence in redundant input variables even though they decrease accuracy); 'misconceptions of regression' (if an event a is k units from the mean, then most people will predict that the next event will be less than k units from k - ignoring the regression).

Availability occurs when the probability of an event increases because it can be recalled more easily. This leads to certain biases. These include: 'biases due to retrievability of the instances' (this is affected by familiarity, salience, and recent occurrences); 'biases due to the effectiveness of a search set' (people tend to predict the probability of events which are easier to search); 'biases of imaginability' (the probability of the events which are easier to conceive and easily come to the mind is more); 'illusory correlation' (things that have a strong association will be judged to have a greater probability of occurring).

Anchoring happens when 'different starting points yield different estimates, which are biased towards the initial values'. So because of this, certain biases occur. These include: 'insufficient adjustment' (when people base their results based on some incomplete computation), 'biases in the evaluation of conjunctive and disjunctive events' (the overall probability is overestimated in case of conjunctive events and underestimated for disjunctive events because of anchoring); 'anchoring in the assessment of subjective probability distributions' (people give very narrow confidence intervals which reflects more certainty than they know based on their knowledge base).

This article makes us aware of the biases that can happen under conditions of uncertainty so that while taking a decision in the future, we are conscious of these biases and try to avoid them.

Prospect Theory: An Analysis of Decision Under Risk by Daniel Kahneman and Amos Tversky

In this paper, the authors propose that the utility theory is not an adequate model for decisions taken under risk and have proposed a new theory - Prospect Theory - for such situations.

There are certain phenomenons that the authors have discussed that cannot be expressed by utility theory. Firstly, they have discussed the certainty effect. This refers to situations where people avoid risks in situations which have sure gains and they tend to take risks in choices that have sure losses. Then they have discussed the reflection effect, wherein, the people tend to avoid risks in the positive domain and are risk seeking in the negative domain. Another effect that the authors have discussed is probabilistic insurance which is a protective measure that people take in order to avoid the probability of an undesirable event occurring. They have also discussed the isolation effect. Here, when making a choice, people mostly disregard the components that the alternatives share and focus on the factors that stand them apart.

Then the authors have proposed their own theory, the prospect theory, which helps in understanding the above mentioned phenomenon that the utility theory is unable to explain. It segregates the two stages, editing and evaluation, while making a choice. People do certain operations in the editing phase, which include coding, combination, segregation, cancellation, simplification, and detection of dominance. After this follows the evaluation phase wherein the people evaluate each of the edited prospects and choose the prospect that has the highest value. They evaluate the value in terms of two scales, π (associates a decision weight with each probability) and ν (reflects the subjective value of an outcome). Value is assigned to gains and losses rather than final assets. The value function is 'defined on deviations from the reference point and normally concave for gains, commonly convex for losses, and is generally steeper for losses than for gains'. Decision weights are generally lower than the corresponding probabilities, except in cases of low probabilities.

Advances in Prospect Theory: Cumulative Representation of Uncertainty by Amos Tversky and Daniel Kahneman

In this paper, the authors have modified the prospect theory 'that incorporates the cumulative functional and extends the theory to uncertain as well as risky prospects with any number of outcomes'.

The authors have listed five phenomena of choice that violate the original prospect theory. These include: framing effects, nonlinear preferences, source dependence, risk seeking, and loss aversion. The authors have indicated that the earlier model of the prospect theory does not satisfy stochastic dominance and is not applicable for prospects with numerous outcomes. They have tried to address these issues with the new prospect theory. The new proposed theory also allows different decision weights for gains and losses.

The authors conducted experiments to test this new theory and observed the 'fourfold pattern of risk attitudes', which is risk-averse behaviour when gains have moderate probabilities or losses have small probabilities, and risk-seeking behaviour when losses have moderate probabilities or gains have small probabilities. The new proposed theory has introduced a two-part cumulative functional to aptly represent the decision weights.

Future Scope

The paper titled 'Gambling with the House Money and Trying to Break Even: The Effects of Prior Outcomes on Risky Choice' by Thaler and Johnson is very interesting and leaves a lot be desired. In this paper the authors have talked about how your prior experience influences your risk-taking behaviour. They have tried to explain it through the prospect theory by editing various rules. They conducted several experiments and then presented their results.

Towards the end, they have also given certain alternative explanations about the results that they arrived at. One of these alternative explanations greatly intrigued me. In that, they have tried to explain the result by taking the mood of the person in account. It would be interesting to study and see if the mood of the person really does affect his risk taking behaviour? And if it does, then how? Does good mood lead to positive risk-taking behaviour for both gains and losses? Thaler and Johnson say that prior losses generally cause risk-aversion, especially when subsequent gamble does not guarantee to break-even. Does mood affect this? Will an individual in good mood be willing to take risks even in case of prior losses when the subsequent gamble does not guarantee break-even or gains?

In fact, not just mood. How does the psychological state of the person affect the risk-taking behaviour will be good to study?

I think studying this across age-groups (children, young adults, middle-aged, and older adults), genders (male and female), and economic status (poor, middle-class, rich) will be interesting.

Conclusion

In this paper, I have tried to include some of the pivotal and ground-breaking researches in the field of behavioural decision theory. Every student, researcher and all the people working in academia should be very well acquainted with these authors and their influential works. This was an attempt to familiarize the budding academia community in the field of economics and management with some of the journal papers that were the source of the basic fundamental theories that they use in all their research work. I have also commented on how some of these papers and theories can be extended and use to explain some of the current trends in the field.

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