

Precedence of Debiasing Techniques on Decision Making Process: A RIDIT Approach

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Abstract:

Scope of the Study: Day to day decisions were affected by heuristics and biases. These biases can be eradicated from human thoughts by adopting bias-reducing techniques. Debiasing seeks to remove a bias altogether. This article emphasizes on prioritizing the items of debiasing in order to raise the excellence of decision-making process. Also, debiasing literature is reviewed and analyzed in this study. Real world approaches for eliminating biases in business were suggested in this study. If debiasing is used in the right manner and right situations, it can have a remarkable impact on decision making process.

Purpose: To analyse how decision-making process is affected by cognitive biases. To study the impact of debiasing methods on decision making process.

To prioritize the items of debiasing techniques by obtaining ranks by using RIDIT analysis.

Design/ Methodology/ Approach: Descriptive research method is used for the study. The population consists of employees of manufacturing companies, Bangalore. Primary data was collected by means of a survey. The responses were analyzed to obtain the findings and essential interpretations.

Findings: Cognitive biases lead to poor visions, understandings and conclusions and that are often improper. Cognitive biases are very human and rise from our vital to make sense of a situation before deciding on a course of action. We cannot avoid somewhat such type of biases. These biases sometimes lead us to the wrong conclusions. We should know how to spot them and then apply suitable debiasing method to eliminate them. Only by filtering out the cognitive biases that are sure to arise while decisions are being made we can be confident that, by applying suitable debiasing methods, we can take better decisions which can improve the performance.

Keywords: Cognitive biases, Debiasing, Decision making, Performance

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I. INTRODUCTION

In the highly competitive manufacturing industry, decision making becomes one of the most essential process for gaining competitive advantage in the marketplace. Decision making can be defined as a procedure of determining based on choices made

between two or more challenging activities. It also needs creating certain a choice among two or more alternatives. During this process, the consequences or the outputs can be positive or negative. Researchers such as Arkes HR (1995) and Hammond (1992), established the importance of decision making in everyday life and in society side by side. Four types

of information were recognized by them which are anticipated by the decision maker while creating a decision tree.

Cognitive prejudices are methodical outlines of nonconformity from reasonableness, that arise because of the method that our intellectual structure works. These prejudices interrupt us in an extensive variety of zones. It consists our opinion about other people and the ways of collecting information and making conclusions about them. To reduce the effect of these biases, several debiasing tactics may be utilized. There exist specific debiasing techniques which can be applied for particular biases. Few of the techniques are, evolving consciousness of numerous cognitive biases, reducing the reasoning process, and generating advantageous circumstances for decision making. Particular biases can be reduced or eliminated by some definite effective debiasing tactics. The efficiency of diverse debiasing tactics differs meaningfully among different situations. Still, research demonstrates that even, small debiasing interferences can be very effective in few cases.

Decision-making study is often about nonconformities from what is assumed to be rational choice, whether these are enclosed as deficiencies in reasoning of individuals, or as adaptive strategies. Understanding heuristics and biases is considered as the main thought of decision-making study (Tversky and Kahneman, 1974). Specifically, the domain of decision making arises from studies about the judgement of individuals under circumstances of ambiguity such as common individual calculations of possibilities. Decision study developed in the area of behavioural economics, behavioural finance and behavioural operations and also achieved much political attention because of the broader social consequences of the effects exposed. Analysing and persuading decision-making processes might be a significant component of transformation of behaviour.

According to Plous (1993), intensive study has been done on failures in decision making than on successes. In the view of Thaler and Sunstein (2008), basically cognitive bias is presumed to be an

organized bias in the consequences of the decisions made by individuals. From the application of one or more heuristics rules of thumb those biases were arising. Gigerenzer et al (1999), considered those biases as inference instruments and simple shortcut policies for making conclusions or decisions. If individuals deviate in an organized direction then they are considered as biased.

During assessment, the decision makers are just expected to be correct but are not concerned whether the choice maker is rational inside or not. In the view of Dunwoody (2009), the correspondence idea can also be increased to assess a choice maker's wellbeing as described by using intention accomplishment, gladness, or pleasure. If individuals have the potential in creating proper judgments then the state is called as decision readiness. During the process of improving choices, it is necessary to decide whether to make choice at that situation. Lack of decision readiness will happen because of powerful expressive states, exhaustion, and poor decision-associated skills. There are two wide approaches available for debiasing decisions namely debiasing by altering the choice maker and debiasing by altering the circumstances.

In the light of the above discussion, the present study will attempt to identify various debiasing techniques which have a positive influence on decision making and improves the effectiveness of the decision. The study will try to assess the priority in the strength of influence of these debiasing techniques on decision making, which in turn will help the managers to devise an effective policy for biasing issues across organizations.

II. LITERATURE REVIEW

According to the opinion of Tversky and Kahneman (1974), the initial explanations of a standard-expressive break in decision of human and choosing best possible option have brought about a fruitful research ground. Lack of rational, reasonable, numerical and normative principles of human reasoning was explained by those researches. According to Gilovich et al (2002), people have a

habit of showing methodical biases in judgment and policymaking tasks. In the view of Perkins et al., (1993), people lose the acceptable contextual information for firm decision problems.

Perkins et al., (1993) and Kahneman (2011), discussed about the belief of people choose on simple method of learning which involves discovery and problem-solving, using reasoning and approaches that need little mental struggle. Lunn (2013), Fischhoff and Parker (2005) expressed that life of people can be affected to a great extent by these biases and fallacies. Fischhoff (1981), analyzed about the early debiasing tactics offered distrustful results signifying a strength of decision biases of human. Larrick et al., (1993) and Stanovich and West (1998), said that if general capacity associates positively with normative retorts then one can be confident about debiasing. In the view of Lehman and Nisbett (1990), Fennema and Perkins (2008), possibility of making decision biases will be less if people expertise in Statistics or Economics. Conjectures were tracked by intrusion methods in most of the debiasing researches. Previous studies found that games and instructional videos about how to avoid biases had a substantial debiasing outcome after the intrusion. (Fiske, S. T. et al., 2015). Kagel and Levin, 1986 said that a clear conjecture for enlightening decision making could be knowledge and understanding since individuals can avoid worst results by experience.

Quality of decision making can be improved by vast experience within a field. But only with experience, judgments and results cannot be debiased. According to Hogarth (2001), because of undependable learning atmospheres, individuals frequently use criticism where as Mezulis et al., (2004), opinioned that due to bias, people tend to ignore requests and remember the feelings of self-interest. In the view of Baron and Hershey (1988), choices are assessed by individuals through the outcomes of the choices and not the way they were made. Excellent decisions were made by people those who are proficient in quantitative techniques.

To test the above, an extensive research was originated by Nisbett et al. (1983) as well as Fong et al. (1986). It was identified by them that by the use of definite intellectual aspects and learning, the use of algebraic rules may be smoothed within a certain area. Fong and Nisbett, (1991), suggested that the transference of this learning to new areas is relatively intangible. In the view of Baron (2000), cognitive biases can be mitigated by logical and intellectual thinking

According to Ennis (1991), prejudiced and inaccurate reasoning can be evaded by logical and intellectual thinking.

Educating logical and intellectual thinking is not just a thought-provoking task (Willingham, 2008), however but the degree of its average consequence is amazingly small (Niu et al., 2013).

According to Fischhoff (1981), generation of bias consciousness is a meta-strategy for debiasing. In the view of Babcock and Loewenstein (1997), identifying about the presence of the bias should diminish its outcome. However, according to Mowen and Gaeth (1992), identifying about the bias alone is not adequate; knowing the essential choice instruments has an additional straight debiasing consequence. Slovic et al., (1980), said that in several early debiasing studies, it was shown that basic information about the biases without satisfactory managing skills may be deficient of applicability.

Individual prejudices, such as overconfidence and sunk cost fallacy were minimized or eliminated by developing and evaluating specific guidelines which were mentioned in many debiasing studies (Renner and Renner, 2001 and Soman, 2001). So, the field of debiasing study became extremely separated. Debiasing procedures were classified by Arkes (1991), into three comprehensive groups of biases namely strategy-based mistakes, association-based mistakes, and psychophysically based mistakes. He claims that some general reasons are responsible for these prejudices. and for this reason, they need comparable remedies. Strategy-based mistakes, in which people use substandard approaches, should be

reduced by increasing the responsibility of the choice maker.

III. RESEARCH AIM

Current research paper reviews about the various types of debiasing techniques and their impact on decision making process. Following are the objectives of the present study.

To review and understand the relation between the factors of debiasing techniques and decision-making process

To rank the items of debiasing techniques with respect to their impact on decision making process by using RIDIT analysis.

To prioritize the items of debiasing techniques.

IV. METHOD

To analyse and find out the solutions of the above research objectives, samples were taken using convenience sampling method from the list of employees of manufacturing sector, Bangalore. ‘Decision-Making questionnaire’, comprising 40 items, clustered into 10 subfactors or scales: ambiguity, time burden, money burden, task difficulty, amount of data, several goals, values of the choice, inspiration, self-instruction, reasoning, sentiment, understanding, social burden, burden from other people, and burden from work guidelines. ‘Debiasing techniques questionnaire’, comprising 14 items, develop awareness of cognitive biases, improve the way of your present information, favor simple explanations over complex ones, slow down the reasoning process, use nudges, change incentives, increase involvement in the decision-making process, increase personal accountability, elicit feedback from others, standardize the decision-making process, create favourable conditions for decision making reduce our dependence on personal memory, consider substitute consequences to earlier actions and create emotional detachment. 7-point Likert scale was used to rate the items of the survey. Using convenience sampling, samples were collected which is suitable for this type of study (Koerber, McMichael, 2008). Employees of manufacturing sector were considered as the respondents.

V. ANALYSIS, RESULTS AND DISCUSSION

Table 1 Mean and Standard Deviation of the items of Debiasing Techniques

Variables	Mean	SD	Ranks
DBT01	5.275362	1.144763	12
DBT02	5.268116	1.258779	13
DBT03	5.23913	1.223578	14
DBT04	5.73913	1.013085	5
DBT05	5.768116	0.906504	4
DBT06	5.695652	1.168995	6
DBT07	5.876812	1.056457	2
DBT08	5.811594	1.014858	3
DBT09	6.021739	1.192846	1
DBT10	5.681159	1.113851	7
DBT11	5.528986	1.302395	10
DBT12	5.652174	1.098454	8
DBT13	5.347826	1.276698	11
DBT14	5.608696	1.13623	9

From table 1, we find that mean of the factor, DBT09 - ‘Slow down the reasoning process’ (6.021739) is maximum followed by the mean of DBT07 - ‘Favour simple explanations over complex ones’ (5.876812), DBT08 - ‘Increase involvement in the decision-making process’ (5.811594) and DBT05 – ‘Improving the way of present information’ (5.768116). During decision making biases can be avoided if we think deeply about the available information and we should not come to a conclusion in urgency. Because of this deep thinking, one can achieve the benefit of identifying many other alternatives which can be helpful to get rid of biased perceptions. Beginning with explicit procedures and etiquettes, we can guarantee that, we slow down when it is required. Processing the information is depending upon the way of presentation. If the information is presented in different ways the outcome also will be different. Hence if we need to reduce the impact of various biases, then we need to modify the way of presenting the information to others.

RIDIT Analysis for prioritizing the items of debiasing techniques

RIDIT analysis was familiarized by I. Bross. Several practical areas of business management and behaviour studies used RIDIT analysis to rank the

factors of the variables under study. RIDIT scores can be obtained by applying effective mathematical methods. Ordinal data can be converted into probability scale using RIDIT method. Wilcoxon rank sum test is directly related to RIDIT analysis. Fleiss et al describe how chi square statistic can be used for testing the hypothesis that there is no significant difference in the mean RIDITS across all

groups. Items of debiasing techniques were taken as reference data set. The frequencies of the responses are shown in Table 2. The RIDIT values of the reference data set for each item were shown in the last row of reference dataset on Table 2. Weights that are summed to derive RIDIT values and the priority rankings associated with those RIDIT scores are shown in Table 3.

Table 2 RIDIT values for the reference dataset

	1	2	3	4	5	6	7	
DBT01	0	1	5	38	22	55	17	138
DBT02	0	1	10	35	21	47	24	138
DBT03	0	1	7	40	23	44	23	138
DBT04	1	0	3	15	15	81	23	138
DBT05	0	0	2	15	19	79	23	138
DBT06	1	0	3	24	16	58	36	138
DBT07	1	0	2	16	11	71	37	138
DBT08	0	1	3	14	16	73	31	138
DBT09	1	0	2	19	12	40	64	138
DBT10	1	0	2	22	21	60	32	138
DBT11	2	0	13	10	26	57	30	138
DBT12	0	1	6	14	27	61	29	138
DBT13	1	0	13	20	33	44	27	138
DBT14	0	0	7	18	30	50	33	138
Freq	8	5	78	300	292	820	429	1932
1/2 Freq	4	2.5	39	150	146	410	214.5	
ri	4	10.5	52	241	537	1093	1717.5	
Ri	0.00207	0.005435	0.026915	0.124741	0.27795	0.565735	0.888975	

RIDIT values are derived by summing the weights. Priority rankings connected with the RIDIT scores are provided in the following table

Table 3: Calculation of the RIDIT values for the comparison datasets and prioritization

	1	2	3	4	5	6	7	Sum	UB	LB	Priority Ranking
DBT01	0.0000	0.0000	0.0010	0.0343	0.0443	0.2255	0.1095	0.4147	0.3667	0.4626	13
DBT02	0.0000	0.0000	0.0020	0.0316	0.0423	0.1927	0.1546	0.4232	0.3771	0.4693	12
DBT03	0.0000	0.0000	0.0014	0.0362	0.0463	0.1804	0.1482	0.4124	0.3692	0.4557	14
DBT04	0.0000	0.0000	0.0006	0.0136	0.0302	0.3321	0.1482	0.5246	0.4523	0.5969	4
DBT05	0.0000	0.0000	0.0004	0.0136	0.0383	0.3239	0.1482	0.5242	0.4538	0.5947	5
DBT06	0.0000	0.0000	0.0006	0.0217	0.0322	0.2378	0.2319	0.5242	0.4607	0.5877	6
DBT07	0.0000	0.0000	0.0004	0.0145	0.0222	0.2911	0.2383	0.5664	0.4933	0.6396	2
DBT08	0.0000	0.0000	0.0006	0.0127	0.0322	0.2993	0.1997	0.5445	0.4744	0.6145	3
DBT09	0.0000	0.0000	0.0004	0.0172	0.0242	0.1640	0.4123	0.6180	0.5288	0.7072	1
DBT10	0.0000	0.0000	0.0004	0.0199	0.0423	0.2460	0.2061	0.5147	0.4535	0.5759	7
DBT11	0.0000	0.0000	0.0025	0.0090	0.0524	0.2337	0.1933	0.4909	0.4330	0.5488	10
DBT12	0.0000	0.0000	0.0012	0.0127	0.0544	0.2501	0.1868	0.5051	0.4455	0.5648	8
DBT13	0.0000	0.0000	0.0025	0.0181	0.0665	0.1804	0.1739	0.4414	0.3944	0.4884	11
DBT14	0.0000	0.0000	0.0014	0.0163	0.0604	0.2050	0.2126	0.4956	0.4398	0.5514	9

Taking the first row in Table 3 which has the variable DBT01, the value of 0.0000 is derived from Table 2 by multiplying the frequency of 0 (from the row marked DBT01 in Table 2) by the reference group RIDIT values of 0.00207 (found in the bottom row of Table 2) and then dividing by the n of 138 (from the last column of Table 2). The weights from the seven columns are then summed to get RIDIT scores. Mathematically the average RIDIT value will be 0.5. Those items with relatively more response of 7 and 6 will tend to have a RIDIT value of greater than 0.5. Those items with relatively more responses of 2 and 1 will have a RIDIT value of less than 0.5. Consequently, the higher the RIDIT value is, the higher priority the sample places on the item will be. We allocate priority rankings to the items with the maximum priority going to the uppermost RIDIT value. The Kruskal-Wallis W was calculated to be 236.7804. Because the W (77.37268) is significantly greater than $\chi^2(14-1) = 19.6751$, it can be inferred that the opinions about the scale items among the respondents are statistically different. This test is a rank-based nonparametric test that can be used to check if there are statistically significant differences between two or more groups of an independent variable. It does not need the data to be normal, but instead uses the rank of the data values for the investigation.

From the RIDIT ranking analysis (Table 3), it was found that out of all the items of debiasing techniques, the item, DBT09 - 'Slow down the reasoning process' are given utmost priority by the respondents followed by the item, DBT07 - 'Favour simple explanations over complex one of jumping to conclusion bias, whereas the least priority was assigned to the item, DBT03 - 'Create psychological distance'. The results of the RIDIT priority index shows that slowing down the reasoning process is the most significant item among the debiasing techniques proposed in the present study. Many reasoning biases can be alleviated by making our self to slow down and think through the data that we are trying to develop. The advantage of doing this is that it permits us to reproduce on our intellectual process, and to think through another viewpoints. Moreover, it also encourages us to evade trusting on biased perceptions. The other dimensions and their relative ranking are also found to be more or less symmetrical. This means the rankings of the items being done by using mean, justifies their rankings

being done by RIDIT analysis. The overall ranking of the items of debiasing techniques was shown in Table 3.

VI. CONCLUSION

Debiasing is one of the utmost significant skills that we can acquire, if we need to be able to reason undoubtedly and take intelligible conclusions. Most of logical biases can be managed with the help of common debiasing strategies. Also, it is vital to retain in attention that various debiasing policies will differ in their efficiency, and will take a diverse effect in diverse situations. Therefore, when applying these policies, they may vary and it is questionable that we will be talented to debias our self or others totally. Hence, the organizations need to understand the strength of influence of the individual debiasing techniques on certain situation having biasness as issue at its core.

The present study tried to identify the existing debiasing techniques which have a significant impact on decision-making process. The study concentrated on selected manufacturing units of Bangalore for data analysis and relevant conclusions. While it was discussed and inferred in the literature review that debiasing techniques have a significant influence on the decision-making process at all levels of the organization, it has been empirically accepted in the present study also. The study, in fact, extends the purview of the debiasing techniques and discuss in details about the individual items constituting the debiasing dimensions. The previous studies have discussed the debiasing techniques as a dimension and not much efforts have been seen in analysing the influence of the individual items on decision making in organizations.

The relevant findings of the study shall be of utmost importance to the managers in taking decisive resolutions on the biased issues and problems within the organizations. The priority of the debiasing technique items will enhance the efficiency of the managers in taking right decision at the right available time. The study recommends top-level managers to concentrate on the rankings of various de-biasing techniques to remove biases during

decision making which in turn will increase organizational performance.

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