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Original Research Article

Development of Affective and Cognitive Decision Making Inventory in Indian work Setting

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ABSTRACT

Objective/Aim: The purpose of this study was to construct a decision making inventory to assess the level of decisional ability at work and to validate its psychometric properties respectively. The inventory was designed to measure two core indices i.e. Cognitive, which foresee the logical aspects of decision making and Affective, which foresee the emotional aspects of decision making at workplace. **Method:** Purposive sampling was used to gather data. For standardization of the items the scale was distributed amongst eminent scholars and OB practitioners. 504 working professionals completed the ACDMI. **Result:** Face validity, Content Validity and Construct Validity were found to be significant. ACDMI had good internal consistency. **Conclusion:** ACDMI is a 5 - point likert scale which consists of 28 items, 15 items in cognitive index and 13 items in affective index with positive and reversed scoring.

Keywords: *Cognitive Decision Making, Affective Decision Making, Inventory, Indian Work Setting*

INTRODUCTION

Modern organizations operate in a dynamic, multifaceted and unprecedented environment. To survive and grow in conditions of intense competition, businesses must exhibit characteristics that enable them to swiftly recognize and capitalize on market opportunities and to adapt effectively to changes in their immediate and distant environments(Meredith & Francis, 2000). Therefore, it stands to reason that companies' capacity to adapt to changes in the business environment and, more specifically, their capacity to satisfy the demands of individual clients, is a necessary condition for both survival and, in the long term, competitive advantage. Moreover, to sail in this fierce market organizations should be proactive in enhancing their capabilities and must possess the necessary skills to adapt & adjust.

It is evident through literature that in today's complex and dynamic knowledge-based society, decision-making is one of the most essential competencies for organizational echelons(Bavol'ár & Orosová, 2015; Gehani, 2002). In particular, complicated decision-making with several diverse players and stakeholders frequently occurs in leadership. Based on their beliefs and interests, organizational echelons must recognize and select optimal options.

Making a choice involves selecting from a range of options. The human mind is unquestionably the most intricate structure known, with billions of people indulging in multifaceted decision-making every day (Trafton, 2019). Many of our decisions are prosaic and are the result of habitual behaviour; some are hasty judgments' made quickly and without much thinking, while others—the most imperative ones—are made after thorough consideration of all pertinent information and its implications (Fischhoff & Broomell, 2020; Mellers et al., 1998). It is true that there is a thin line separating a good decision from a bad one, indeed the effectiveness of a decision can only be inferred once the outcome is revealed.

As quoted by the authors of the entitled paper Decision making is defined as an individual and social phenomenon which entails the selection of one behavioral action from among two or more possibilities. It requires deliberate processing of both cognitive and affective component of human functioning to efficiently progress towards desired state of affairs. In other words, the process of Decision-Making is termed as the culmination of deliberation and the initiation of action. It is grounded upon factual and value premises of the decision maker.

Individual and organizational performance & success are contingent on effective and efficient decision-making. If we do not judiciously detect and handle problems, the cost to our time, health, customers, or economic well-being will be indeed very high and counterproductive. At every decisional level decision making is a crucial work competency. To sustain in this cutting-edge environment it is imperative for every organization specially those that are knowledge intensive to provide training and re-training of such skill to their employees.

Paradigms of Decision Making

The Literature offers several perspectives and theories on decision-making. From a managerial perspective, the decision- theory is categorized on three school of thoughts Reductionist, Pluralist, and Contextualist (Tetlock, 1990). Realistic principles underlie the Reductionist school of philosophy. This viewpoint evaluates any variance from rationality; it entails the philosophy of 'the economic-man'. All aberrations are

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viewed as cognitive biases when it comes to making judgments. Reductionist school of thought views a decision through mathematical, laboratory lens(Edward 1954; Edward 1961; Tversky and Kahneman 1974; Kahneman and Tversky 1979; Nisbett & Ross, 1980) Pragmatism is central to the Pluralist philosophical system. The effects of bounded rationality, interpersonal conflict, and executive decision-making at workplaces are studied through pluralist research (March G. & Simon A., 1958). The contextualist paradigm employs phenomenology. The emphasis is not on normative idealism. According to this school of thought subjective views, common ideologies, and cognitive frameworks are much imperative than ex ante decisions. This approach has a process-oriented viewpoint. It indicates that the process of decision-making is more imperative than the result.

Primarily, research on decision-making centered on normative models. Such models suggested how individuals should make judgments and projected the effectiveness of those decisions based on whether or not real-world behaviour mirrored laboratory behaviour (Beresford & Sloper, 2008). Recently, naturalistic descriptive models have been created that place equal emphasis on the role of experience and human skill in decision making and the characteristics of the context in which decisions are formed because the ideology behind the earlier theories were too primitive and static to account for the way individuals make choices in the real world. (Cannon-Bowers, Salas, & Pruitt, 1996; Zsambok & Klein Gary, 1997 ; Patel, Kaufman, & Arocha, 2002; Beresford & Sloper, 2008)

1. Rational Decision-making Model This paradigm accommodates logical approaches to decision-making. This is in accordance with Economic Theory and Utilitarianism. It is assumed that a "Economic Man" makes decisions logically and considers the decision's highest utility. For individuals in organizations looking to gain the most, this approach might be regarded as the ideal one. Under the classical model, each alternative is given a numerical value or utility during the "choice" phase. The alternative with the greatest utility (or the greatest subjective predicted utility) is preferred (Turpin & Marais, 2004).

2. Bounded rationality decision-making model Herbert Simon's Bounded Rationality paradigms of decision making (1955) acknowledged the limitations of the rational model. The prevalent misconception that being economical was similar to being reasonable is acknowledged by the decision-making paradigm of bounded rationality. This paradigm is based on the understanding that human knowledge & abilities are constrained and lack in certain important ways. The idea of bounded rationality indicates that decision-makers must be adaptable in their rational approach. According to this approach, individuals consciously restrict their choices to a manageable number and select the first acceptable option without completing a comprehensive search of alternatives. Bounded rationality is characterized by the search and satiation processes. An option is said to "satisfice" and the search is regarded to be finished if it satisfies some implicitly or explicitly given minimal criterion.

3. Intuitive Decision-making Model As an alternative to conventional decision-making models, the intuitive decision-making paradigm has emerged. This approach relates to decisions made without conscious deliberation. 89% of managers who responded to the survey reported employing intuition at least occasionally, and 59% claimed they did it frequently (Plessner, Betsch, & Betsch, 2007).

The intuitive decision-making model posits that in a certain circumstance, decision-makers rely on the surroundings for clues to identify patterns. Once a pattern is identified, they can simulate a potential course of action to its conclusion based on their existing knowledge. From a neuroscience perspective, this paradigm follows to the right brain approach. This approach employs intuitive tactics and frequently prioritizes sentiments over facts. Even when knowledge is insufficient, right-brained decision-makers employ an unstructured and impulsive process to examine the whole rather than its components (Sauter, 1999).

Affective Cognitive Dominance in Decision Making

There have been several attempts to cast light on the link between affect and cognition in managerial decision-making. For instance, Blanchette & Richards, 2009 analyzed a plethora of studies to determine if and how affective systems impact cognitive mechanism. These researchers concluded, in particular, that cognitive biases are mostly associated with anxiety and that (high/low) perception of risk is also impacted by affective states. Furthermore, according to them, affect can impede normatively accurate reasoning, while in other instances they enhance it. In a similar line, Lochner, 2016 inferred that negative and positive emotional states had a substantial influence on reasoning skills. Conversely to the above opinion, another set of researchers asserted that cognitive systems are superior to affective systems. Grecucci et al., 2020 postulated and confirmed that cognitive methods are capable of altering emotional states However, a third group of scholars held the notion that emotions and cognition could not be assessed independently and that the debate over affect and cognition should instead be viewed through the lens of dynamic interaction, with the cognitive and affective

domains being seen as two sides of the same coin. (Gosling et al., 2020)

In an expanding number of contexts, psychological research on decision making has proven that dual process models are more effective at describing behaviour than unitary models (e.g., (Chaiken & Trope, 1999) (Kahneman, 2003) (Sanfey et al., 2006) (Scherbaum et al., 2022) In addition, the neuroscience literature demonstrates a growing number of distinct neuronal systems in the brain that contribute to decision-making and behaviour. Moreover, Economics literature also infers the increasing impact of multi-system approach to decision making (Sanfey et al., 2006, Lee, 2013, Grecucci et al., 2020).

Cognitive Decision-Making (CDM) As quoted by the authors of the entitled paper Cognitive decision-making is a technique in which decisions are drawn on logical algorithm, refraining from influence of sentiments or non-logical factors to arrive at solution. CDM entails comparing several possibilities or alternatives with the aid of objective research, facts, and other data. When making decisions, rational decision-making prioritizes logic over affect. Decision makers who predominantly evaluate a problem through a cognitive lens rely on methods of deductive reasoning.

Affective Decision-Making (ADM) As quoted by the authors of the entitled paper Affective decision-making (ADM) involves making decisions based on instinct, incidental & integral emotions. Affective decision-making is selecting among alternatives without using logic or analysis. It entails making judgments based on emotions or inadvertently recalling a memory. In contrast to CDM, Affective approach expedites decision-making because it eliminates time-consuming algorithmic processes.

Upon analyzing the classical, neoclassical and modern paradigms of decision making and related literature we observed the dearth of measurement instruments in this field in Indian work settings. Despite significant shortcomings in its assessment, numerous scholars believe that decision-making is at an intriguing turning point. In light of the fact that individuals often have very little knowledge about the variables that influence their decisions (Bordley, 2001), it appeared crucial to construct and evaluate a questionnaire to gather data for two purposes: (1) to identify the primary factors that contribute to and inhibit decision making. (2) To assess the individuals predominant approach to decision-making. But because real decisions are complicated and made by people from all walks of life and professions—such as those in healthcare, corporate, education, and government—it is believed that it would be more beneficial to develop a questionnaire that could be used in the Indian workplace, specifically among corporate.

Theoretical Model of ACDMI

Organizations are considered as decision-making systems, with an emphasis on how they choose among possible courses of action. Decision-making and problem-solving are required of by members' at all organizational tiers. These responsibilities are an integral element of a employees' job. Decision making serves to orient human behaviour and commitment toward a future objective. There are two types of decisions made at work: programmed decisions and non-programmed decisions (Fig. 1). Decisions that are programmed are recurrent in nature. These choices address straightforward, typical, and commonly occurring issues that are addressed by established processes. Non-programmed decisions are not certainly routine. They pertain to exceptional circumstances for which no set processes exist. An individual can rationally or emotionally assess programmed and non-programmed decisions depending on the nature of the problem, the circumstance, the time constraints, and the individual's abilities. Through the aforementioned model representation, it is demonstrated that a predominant cognitive approach to decision making is employed when a programmed or non-programmed work decision is based mostly on logical algorithm, refraining from the effect of feelings or non-logical variables to arrive at solution. On the other hand, predominant affective approach to decision-making is utilized when an individual bases their choice on emotion, sentiments, and personal preferences without considering any logical considerations.

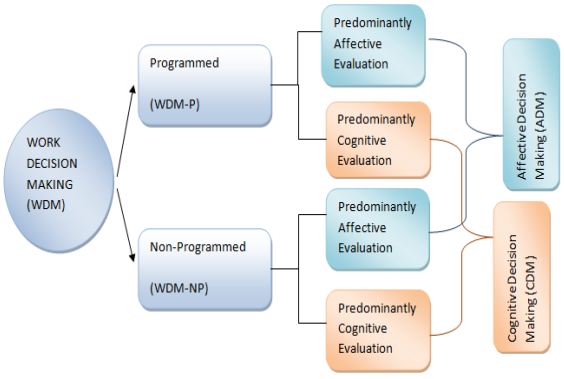

Figure 1: Showing the theoretical model of Affective Cognitive Decision Making Inventory

METHOD

AIM

The present research describes the conceptualization, construction and validation of Affective Cognitive Decision –making.

DESIGN

A mixed method research design, was considered appropriate for a study of this kind, it encompassed both qualitative and quantitative facets. Figure 2 depicts the phases of ACDMI development as a whole. The final ACDMI scale, which has 28 items, was developed by following an integrative version that underwent numerous iterations of improvement.

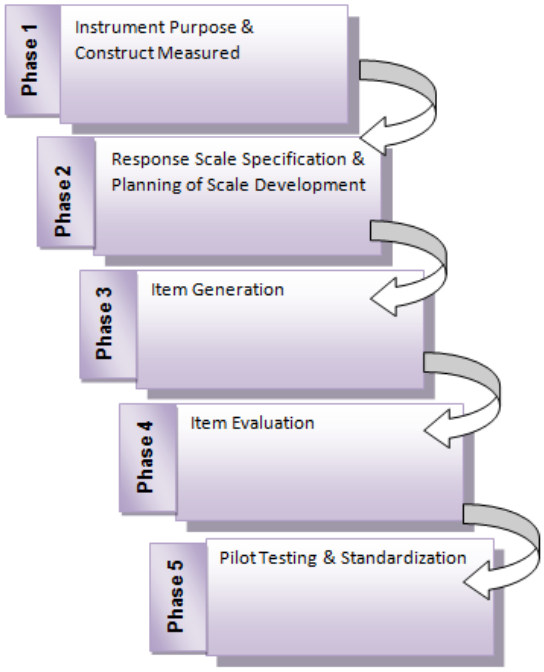

Figure 2: Showing the phase manner development of Affective Cognitive Decision Making Inventory (ACDMI)

SAMPLE

This study aimed to develop a decision making questionnaire to measure the level of decisional competence at work and validate its psychometric features. HR Personnel were the targeted population for this study. Purposive sampling was used to choose the sample. The questionnaire on decision-making was completed by 504 HR managers. The selected sample has at least a bachelor's degree and falls between the ages of 25 and 60. There were no racial, social, or gender-based barriers.

MEASURES

The Affective Cognitive Decision Making Inventory (ACDMI) is a self-report scale that attempts to measure two key indicators, namely cognitive and affective, which predict the logical and emotional components of individual decision-making. It has 28 items that uses a 5-point likert response scale, where 1 represents very infrequently, 2 seldom, 3 neutral, 4 often, 5 very frequently. Out of twenty eight items 9 items are reversed score. Statements like 'while making decision at work I think clearly and precisely at eleventh hour', 'I am governed by my own feelings of right and wrong' are included.

PROCEDURE

The questionnaire was produced over five distinct phases. The goal of the first step was to specify the construct being measured as well as the intent behind the instrument. As a result, a thorough assessment of the scientific literature on the concept of decision making was conducted using the ERIC, Scopus, Pubmed, and Jstor databases. Based on the findings of this analysis, we were able to get a thorough understanding of the variables that have the greatest effect on decisions as well as gained information on the decision-making scales that are now in use. The second phase began with the planning of scale development and the specification of the response scale. Questions about the planning of scale development were addressed after examining the evaluation of relevant material and advice provided by a subject-matter expert. (1) What number of items is required? (2)Which response scale is suitable? (3) The type of statements, such as closed-ended or open-ended inquiries. (4) The method of test administration (eg. Self report scale). The third and fourth phases were item generation and item evaluation. We intended to generate an initial item pool with many more items than the anticipated final scale. This phase allowed us flexibility with regard to the psychometric standard of the components that made it to the final scale. Regarding item generation, the five processes outlined in Handbook of Survey Research were adhered to. Following that, a thorough list of possible indicators of the target construct was created (n=60). The produced items were evaluated for quality and relevance by a panel of experts from the psychology and management fields as well as by upper organizational echelons (HR Managers). The 60 items were reviewed by five experts to eliminate redundancy, identify unclear or awkwardly phrased questions, discover phrases that would be difficult to comprehend and address any general questionnaire issues with regard to presentation, etc. We modified certain phrases, dropped some items, and adjusted the response interval range based on the quantitative and qualitative suggestions made by the experts. These two phases combined to produce a decision-making questionnaire with 28 items that were divided into two indices or subsets: the affective index and the cognitive index. The questionnaire's items are graded on a Likert scale of 1 to 5, with 1 denoting very infrequently and 5 denoting very frequently. The questionnaire has both negative and positive worded statements with different scoring patterns. In the fifth phase, pilot testing and data analysis were used to determine the psychometric

parameters. Samples of 504 working professionals, ranging in age from 25 to 60, were preferred for the pilot test. The information was acquired through a Google form link and by giving out paper forms to HR managers. Three individuals' responses were withheld from the final analysis after data collection. We then determined reliability, means, correlations, and executed a factor analysis. In the result section, the outcome of this statistical study is further explained.

RESULT

The Affective Cognitive Decision Making Inventory (ACDMI) which consists of 28 items in its final version was administered on a sample of five hundred (n=504) employees, those who were working on managerial level to collect the responses. Out of sample size of 504, two hundred eighty five represented male and two hundred fifteen represented female gender. All the sample which were included in the study were ensured to be having at least graduation level of education with equal number of representation of age group 25-35, 36-46, 47-60, hence the sample with matched aged and education level from both the gender was included in the study.

To establish the psychometric properties of the Affective Cognitive Decision Making Inventory pertinent reliability and validity measures were applied. Reliability analyses were examined through cronbach alpha for internal consistency. The Alpha Coefficient varies between 0 and 1. Cronbach's Alpha based on standardized items was determined to be 0.81 for the current scale. George , 2003 stated that the coefficient alpha of the scale is rated as inadequate if it is below 0.50, doubtful if it is between 0.50 and 0.60 acceptable if it is greater than 0.70, good if it is greater than 0.80 and extremely reliable if it is greater than 0.90. The reliability of the entire scale is within the good range, according to the aforementioned interpretation.

Table 1: Showing the Cronbach's Alpha Reliability Statistics for ACDMI

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.777	.808	28

Followed by reliability analysis, validity analysis was done by the measure of face and content validity (Expert Judgment) for the data and tool as a whole. As a result of the experts' and respondents' assessment, it was inferred that the scale had good face validity. Both face validity and content validity was analyzed statistically through Fleiss Kappa method. Fleiss Kappa method is utilized in case where there are more than 2 raters. The Kappa value for the scale if less than 0.20 denotes strength of agreement as poor, between 0.21 - 0.40 fair agreement, 0.41 – 0.60 moderate agreement, 0.61 – 0.80 good agreement and 0.81 – 1 is denoted as excellent strength of agreement (Landis and Koch, 1977) . Because Affective Cognitive Decision Making Inventory kappa coefficient value was calculated to be 0.78, it can be concluded that the scale has good strength of agreement among raters.

Furthermore Factor Analysis (FA) was used to reflect upon the construct validity of the scale. FA is a statistical method where items are clustered into common factors on the basis of loadings crossing a certain threshold. To examine the items and details of assumed factor structure principal component analysis method with varimax rotation is carried out.

The Kaiser- Meyer- Olkin (KMO) is used to examine the partial correlation between variables. If KMO value is closer to 1 it indicates strong partial correlation, factor analysis can therefore be justified. In other word KMO and Bartlett's test of sphericity are prerequisite to Factor Analysis. For the present scale KMO was calculated to be 0.887, which is above the threshold limit of 0.6. Bartlett's test of sphericity $X^2 = 5876.230$ is greater than the critical value; hence there is a significant difference in the variance among items. In addition to this the p value is less than 0.05 which too indicates significant difference (shown in table 2).

Table 2: Showing the KMO and Bartlett's Test statistics to measure sampling adequacy of ACDMI

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.887
Bartlett's Test of Sphericity	Approx. Chi-Square	5876.230
	Df	378
	Sig.	.000

The preceding table illustrates enough association between the items/variables to perform a factor analysis. The anti-image correlation matrix also demonstrated that each individual item's measure of sampling adequacy is much more than the threshold value of 0.5, which supports the use of factor analysis for the data. Likewise, it was discovered that communalities had a mean value greater than.6, which is considered to be a sufficient indicator of sample adequacy.

Factor Analysis with varimax rotation was used. The items in the scale were grouped into five factors. The variation explained by that component is taken into consideration by the Eigenvalue, which is actually the sum of the squares of the factor loadings for each factor. The greater the overall variance value, which is the factor's Eigenvalue or characteristics root, the more variance the component explains. In this study, five components with Eigen values over one were retrieved

and arranged in accordance with the maximum variance explained (table 3). Further analyzing the above factor it was observed that items under factor 1 and factor 4 shares same characteristics in nature which is integrated into 1st category i.e. affective component. Similarly factor 2, 3 and 5 possess comparable qualities thus, these factors are merged into 2nd category i.e. cognitive component. In conclusion to the above the items of the scale are divided into two major indices that is affective index and cognitive index.

Table 3: Showing the total extracted factors and variance explained by each factor

Extraction Sum of Square Loadings			
Components	**Total**	**% of Variance**	**Cumulative %**
1	7.311	26.112	26.112
2	4.732	16.901	43.014
3	1.276	4.559	47.573
4	1.192	4.256	51.828
5	1.069	3.819	55.647

DISCUSSION

The present paper describes the conceptualization, development and validation of a relatively new instrument intended to measure affective and cognitive decision making at managerial level in Indian work setting. This questionnaire was developed considering the theoretical definitions of both the indices and after an intensive literature review in this field (Epstein, 1994; Turpin & Marais, 2004). Decision making is defined as an individual and social phenomenon which entails the selection of one behavioral action from among two or more possibilities (Bruch & Feinberg, 2017). It requires deliberate processing of both cognitive and affective component of human functioning to efficiently progress towards desired state of affairs. The questionnaire was developed and its validity and reliability were analyzed.

The study aimed to test the internal consistency, content validity and construct validity for the items of affective cognitive decision making inventory. The reliability of the entire scale was found to be within the good range through cronbach's alpha statistics. The validity analysis was asessed by the measure of face and content validity (Expert Judgment) for the data and tool as a whole. As a result of the experts' and respondents' assessment, it was inferred that the scale had good face validity. Both face validity and content validity was analyzed statistically through Fleiss Kappa method. It was inferred that the scale has good strength of agreement among raters. The result obtained using kappa suggested that modifying some statements in the scale would enhance the validity. Furthermore, construct validity was assessed through factor analysis. The questionnaire's structure was well defined by the exploratory factor analyses, which also supported the findings of other writers (Gomez et al., 2022; Rattray et al., 2007). Following that, and in the sequence of their occurrence in the questionnaire framework, we shall discuss two key factors of the questionnaire that is, the affective component and cognitive component. If an individual's work decisions are predominantly cognitive then it means that the decisions are drawn on logical algorithm, refraining from influence of sentiments or non-logical factors to arrive at solution. Alternatively, individuals whose decisions are predominantly affective in nature usually involve making decisions based on instinct, incidental & integral emotions. Affective decision-making is selecting among alternatives without using logic or analysis.

In an expanding number of contexts, psychological research on decision making has proven that dual process models are more effective at describing behaviour than unitary models (e.g., Chaiken & Trope, 1999, Kahneman, 2003, Sanfey et al., 2006, Scherbaum et al., 2022) In addition, the neuroscience literature demonstrates a growing number of distinct neuronal systems in the brain that contribute to decision-making and behaviour. Moreover, Economics literature also infers the increasing impact of multi-system approach to decision making (Sanfey et al., 2006, Lee, 2013, Grecucci et al., 2020).

After analyzing the psychometric properties of the scale and extensive literature review the final version of the scale consist of 28 items that were divided into two indices or subsets: the affective index and the cognitive index. The questionnaire's items are graded on a 5 point rating scale where 1 denotes very infrequently and 5 very frequently. The questionnaire has both negative and positive worded statements with different scoring patterns.

The Affective Cognitive Decision Making Inventory has its application in Indian work setting and for research purpose at academic and professional level. The scale can be used to simply measure the level of decisional competency of HR managers; it can be used as one of the entry level assessment of managers; it can be used as a learning tool to train decision makers about various factors affecting decision making. It can used to determine the aspects that professionals in positions of responsibility give weight to and are continually making judgments upon. It can be used to assess the predominant factors of decision making for different types of business and work sectors.

CONCLUSION

According to the empirical data it is inferred that ACDMI has demonstrated itself to be a relatively valid and reliable instrument to examine the aspects connected to decision making. Despite this, new data must be obtained to demonstrate its technical features using larger criteria. For instance, the questionnaire's predictive validity, concurrent and divergent validity should be examined using actual decisions, along with comparisons to other existing instruments that assess related or unrelated attributes. The questionnaire also has certain constraints generated from the samples, such as the number of respondents, selection procedure, etc. Therefore, further research in this area should attempt to replicate the findings of this study using samples from different contexts. Similarly, a thorough examination of the age and sex disparities in decision-making in particular fields would be intriguing. Furthermore, the scale only evaluates managers' decision-making skills at this time. Future versions of the scale should evaluate the decision-making skills of all organizational echelons (lower, medium, and upper).

Conflict of Interest: The authors of this study state that there are no conflicts of interest that might possibly hinder the research process or the interpretation of its findings. Furthermore, we have not accepted any financing, grants, or other types of assistance from institutions or people that may have an impact on the impartiality or integrity of the study.

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