

SYNTHESIZING THE THEORIES AND MODELS OF COGNITIVE STYLE: REVIEWING THE LITERATURE

Yasir Hayat Mughal¹, Abdul Halim Busari¹, Farheen Qasim², Qasim Nizamani²
Shahid Rasool³, Farhan Jalil³, Zeeshan Ahmed³

¹Faculty of Cognitive Science and Human Development, Universiti Malaysia Sarawak

Department of Media & Communication Studies, University of Sindh², Pakistan

³Faculty of Economics and Business³

hbl_rulz@yahoo.com, Cell # +60142972838, bhalim@fcs.unimas.my, Cell # +60133151580

: farheen2882@yahoo.com cell # +60-109742324, qasimnizamani80@yahoo.com², Cell # +60-109742324

shahid.rasool24@gmail.com³, Cell # +60145845122, : mfarhanmba@gmail.com³ zeeshan4282@gmail.com³.

ABSTRACT: Purpose – The aim of this paper is to explain the unique role of cognitive style by digging knowledge taken from different theories and models given by the different authors and the measurement of different indicators. To understand the cognitive style seems to be fragmented and tangled in many disciplines. To construct meaningful understanding of cognitive style various disciplines were reviewed and synthesized and models of cognitive styles were discussed. The aim of this paper is to give the deeper understanding of underlying theories of cognitive styles and models. **Methodology** The dimension of cognition centered approach is an evolving approach so that first, the literature that helps conceptualize the cognitive style decision making, second, the foundational pieces of literature that composite the theory, and third, the most emerging literature in the cognitive style are selected to explain the cognitive style. Based on a thorough review of literature new conceptual paper has been introduced. **Findings** – In both the literature and organizational literature, the existing cognitive style models can be evaluated to fully capture the distinctive aspects of the cognitive style various theories of cognitive style are encompassed. **Research limitations/implications** – This extended literature requires empirical testing to identify the dimensions of the cognitive style decision making. **Practical implications** – The extended literature of cognitive style will be useful to bring changes in the decision making of the employees. **Originality/value** – This conceptual literature integrates many theories and models. The foundational theories identified in this study also open up new research ideas for scholars using mix methods approaches.

Keywords: cognitive styles, Intuition, Analysis, decision making, Theories, Models

INTRODUCTION

Cognitive style is defined as how the individual perceives knowledge and process information. Cognitive styles and mental behaviours are related to each other because the individuals apply them when they try to solve problems. Before 1950s and 1960s, psychologists were worried about the abilities measured by the intelligence tests. [46] introduced a model which differentiated the number of cognitive operations is called model of structure of intellect it includes convergent and divergent thinking. Up till now there are 19 ways of cognitive style have been identified all of which are bi-polar distinction [15]. The word cognitive style was introduced by [39] to describe that individuals have their own styles and preference in which they organize the meaning for themselves out of their experiences. Cognitive style includes various variables like global-holistic vs focused-detailed and field dependent vs. field-independent and the field-dependent vs. field-independent are most cited one in cognitive style.

The author of the study [39], developed group embedded figures test (GEFT) for examining field dependence and independence. GEFT having graphical figures are embedded in more complex backgrounds. Also identified that those persons who rely on external cues are less able to identify embedded figures and are considered field dependent and those who rely on internal cues are considered as field independent. The scope of FD-FI was very broad as time passes, but it encompasses the cognitive style metacognitive style and socio effective side of the learner. A limited version of FD-FI dichotomy was developed for special education and has significance on individual learning strategies is [31]

distinction between serialist and holist style of learning. Serialists and holist are able to notice the differences, but they are not able to notice the similarities. The author of the study [24], developed and introduced a theory KAI theory commonly known as a Kirton adaptation innovation theory. This theory was developed to solve problems. In this theory [24] tells that every person has ability to solve problem but some people are adaptors try to solve problem in old traditional methods in a better way and innovators are those who try new methods to solve problem differently. This theory attracts the attention of manager's leaders and academicians for many decades. [24] has also established the KAI inventory to measure cognitive style of adaptors and innovators [8].

Background and Hypothesis

Cognitive style refers to psychological directions representing consistencies in an individual manner of cognitive functioning [2]. Cognitive style is term used in cognitive psychology for describing the way of thinking, perceiving, remembering and processing information by individuals. Cognitive style has been defined by [1] preferred ways of processing information and experiences of individual's. Cognitive style and personality type are considered similar and believed to be stable. It is also defined as the way of collecting, processing and evaluating information by individuals.

Theories and Models of Cognitive Style

Behavioural Decision Theory

The author [38] has discussed this theory incorporates rational and non-rational process in decision making. This theory recognizes biases and subjective weights given in decision matrices. This theory includes bias means past

experience is good predictor for future. And this also includes irrational commitment to decision regardless of costs. The probability for future outcomes are results can be calculated through computational decision models. When people are under pressure or psychological problems they do not believe on computational results and under these conditions they switch to heuristic reasoning and made wrong decisions.

Classic Dual Process Theory of Human Cognition

This theory tells us the difference between conscious and unconscious processing of information started with feature finding and pattern identification. Confidential information relevant to current mental operations transferred for analysis to working memory and cognition is applied consciously at this stage. Then perceptual information and information from long term memory combined together and processed while actively rehearsed via working memory. Analysis based on stimulus input a response is generated and memory trace is encoded into long term memory for future reference [49] With this model the unconscious is considered as early retentive perceptual process and remained unattended, unrehearsed and displaced from working memory as before encoded in long term memory.

Cognitive Continuum Theory

In cognitive continuum theory decision making is considered as adaptive process and is reflection of decision situation faced. This theory tells us that decision making includes three stages a) task continuum b) cognitive continuum c) surface depth continuum. These three continua have placed analysis and intuition on their opposing ends. The positions on these continua help in making effective decisions [48].

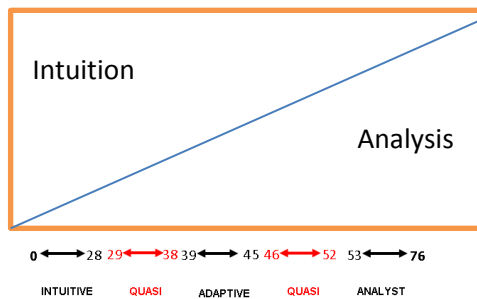


Figure 1 : Adopted from Allinson and Hayes, 2012

Kirton Adaptation Innovation Theory

Author of [24] developed and introduced a theory KAI theory commonly known as a kirton adaptation innovation theory. This theory was developed to solve problems. In this theory [24] tells that every person has ability to solve problem but some people are adaptors try to solve problem in old traditional methods in a better way and innovators are those who try new methods to solve problems differently. This theory attracts the attention of managers’ leaders and academicians for many decades. Kirton has also established the KAI inventory to measure cognitive style of adaptors and innovators [8].

Prospect Theory

Researcher of study [22] developed this theory. The main purpose of that theory was to explain the outcomes of experiments with decision problems stated in term of monetary results and objective probabilities. The main

features of this theory are relevant to decision making in general. There are several other theories on decision making but prospect theory is different from those by being “unabashedly descriptive” and has no normative claim. Another feature of prospect theory is that it differentiates between two stages in decision process. One stage is editing phase so as to make evaluation and choice easy [22]. The second phase is evaluation phase. In prospect theory evaluation occurs when decision is made on two scales by decision maker one of them replace monetary outcomes and the other replace the objective probabilities.

Adaptive Control of Thought Model

In this model one cognition unit spreads activation to other unit along associative contacts while activating other nodes to network. The stimulus being currently processed the amount of conceptual activation being followed by conscious awareness includes unconscious processing under any context unconscious processing is not available to introspection [14].

Parallel Distributed Processing Model

This model gives us the theoretical framework for the vibrant interface of dual process and tells that conscious awareness is result of slow and serial processing and unconscious is result of fast parallel processing. Conscious processing represents rational mode and unconscious represents intuitive mode [23].

Rational Decision Making Model

This model tells us that decision maker has complete and full information about problem and decision situation. Decision maker has relevant criteria and has list of all alternatives and must know the penalty of all alternatives. In this model criteria and alternatives are ranked and weighted to reflect their importance. Decision criteria are constant and weights assign to them are constant over time. And there is no cost and time constraints so full information about criteria and alternative can be obtained. So rational decision maker must choose that alternative which has highest value [44]. Sometimes human beings behave like they are not a realistic being. They choose that alternative which has less cost and based on intuition. While at the time of decision of choosing an alternative depends on mood. This model is considered very good theoretically but very difficult to apply in practical [37].

Cognitive Style Decision Making

A large number of cognitive styles dimensions have been identified by the different researchers like adaptors and innovators are given by the [25] holistic and serialist dimension the wholist-analytical/verbaliser-imager dimension is identified by the [28], and intuition-analysis is given by the [1]. Among those studies they tried to find the relationship between the cognitive style and performance and effectiveness (individual, team and organization).

In present stud cognitive style is presented by intuition and analysis dimensions of style which represents different types of thinking that differentiate right brain thinking and left brain thinking [1]. Theoretical model was based on [27] information processing model, which sorted out the overlapping in style dimension and to integrate many concepts of cognitive style.

Cognitive theory tells us that there is difference in the people of perceiving things and making judgments [17]. Most of the

researchers claimed that these differences help to differentiate or identify the left brain and right brain thinking, most of the researchers especially [1] used it as 'intuitive' and 'Analytic'. This research will focus on the Allinson and Hayes dimensions of analytic and intuitive.

[18] identified cognitive style in the literature with three different names, cognition centered approach, personality-centered approach, and activity centered approach or learning centered approach. However in this [35] relate three models of cognitive style surrounded under the cognition centered approach, that is fit for this research, which has been used in the organizational settings and is accepted all over the world. This study is not focusing on the learning but the literature will focus on the cognition centered approach. This cognition centered approach consist of the three models, these are comprised of the wholist-analytic, verbal-imagery, and the integrated of the wholist-analytic and verbal-imagery. These three dimension got importance are known by the names as [25] adaption-innovation, [29] verbaliser-imager, dimension and [1] Intuition-Analysis dimension. Therefore the remaining explanation will focus on these three dimensions.

Kirton Adaptation Innovation Theory

[24] Carried out study on consumer innovativeness and persistent in managers. Evidence had been collected from these studies that people personalities influence or effect the progress on initiatives in which one is either adaptive or innovative [13]. The author of study [24] founded this theory on the basic time idea. Researcher of study [36] claimed that the theory of the kirton is only focused on the cognitive style and tells us that how people solve their problems. [24] Argued that the difference between the adaptors is that they do the things better while the innovators they do the things differently. He also proposed that these two dimensions make a continuous sequence on which each person can be classified or differentiated. In the kirton work the main focus was cognitive style that how different people approach or find the different types of the ways for problem solving and decision making.

Riding Wholist-Analytic/Verbaliser-Imager Theory

Author of [28] has introduced two different families of cognitive styles one is wholist-analytic and other is verbal-imagery. These two families also belongs to the cognition centered approach. Among the most introduced dimensions of the cognitive style categories wholist-analytic models are most featured dimensions among the models. [28] has also mentioned that number of theories have been working with different concepts of the cognitive styles. But there is no effort made to bring these concepts together especially the superordinate dimension of cognitive style [27].

Allinson & Hayes Intuition Analysis Dimension

This model was introduced by the [1], this topic will discuss this intuition and analysis dimension in detail in this section so the readers can easily understand and come to know about this dimension of the cognitive style. The author of this model has also developed the cognitive style index also which is also mentioned below in further section.

Intuition and analysis are the two different names of the two different dimensions in order to represent the left brain and right brain these two dimensions have been introduced by [1]. According to the [1] intuition represents the right brain

which means that immediate judgments or experience judgments which are based on the feelings and holistic approach. In the context of the organizations the intuitivist's people prefer to make decision and like to solve problem by using the open minded approach, they try to explore new methods, they remember spatial images most easily and like to work more with ideas which need overall assessments [1].

On the other side the analysis refers to the left brain people which directs to the logical mental reasoning based on the details. In the context of the organizations the analyst people prefer structured approach, to solve problem and making decision, and they use systematic methods of the investigation. And they feel easy with ideas which require step by step analysis [4].

Cognitive Style Index Allinson & Hayes 1996

There was shortage of valid and reliable instrument which can easily measure the cognitive style so [1] developed CSI cognitive style index. It is a self-report test and it was developed with the idea that it will measure single continuum cognitive style means that it is uni dimensional in nature to measure the whole/part processing dimension of cognitive style which is intuition and analysis.

This questionnaire consists of 38 items with trichotomous scale of true/uncertain/false. There are 21 items for analysis and 17 items for intuition. If the person is intuitive it means that he/she made decisions on the basis of the feelings on the basis of the holistic approach. While analytical people need mental reasoning and logical reasoning they believe on the step by step process. The CSI has score of the 76 . higher the score tells us that person is analytical while lower score tells us that person is intuitive.

CSI Selection for this Study

This section will tells us that background of the CSI, theoretical basis, the reliability and validity of the questionnaire, and its conclusion will leads us to the selection of the psychometrical sound instrument for the measurement of the cognitive style in organizational settings [1].

The research on the cognitive style has caught the eyes of the most of the researchers in the field of business and management and psychology and education [41]. The use of CSI has been commented upon the [3, 26, 6]. Author of study [12] highlighted that researchers not only give attention to choose the right instrument but also should know how to use that instrument appropriately. [1] Has claimed many times that the internal reliability and temporal stability is good. [33] cognitive styles are able to be hammed , in line with [1] gives an opinion that cognitive style can be changed by experience and culture.

Author [7] founded that cognitive style reliability is good in CSI. The same results have been founded by [5] for cross culture studies. In other researches authors founded more good reliability of cognitive style with other variables like sex, learning [34]

The [1] developed that CSI scale in order to measure that whether the person is analytical left brain or intuitive right brain. However the research by [20] said that scoring process and wording problems lead to the unsatisfactory results and need to be revised. Therefore they have suggested the two factors and for that they have given the strong support for that model. In which the two dimensions intuition and analysis

were seen as separate. There are some other researchers they have found problems in the intuition and analysis reliability and factor analysis results [42] Then [21] wrote a paper in order to give response to these researchers.

CSI was chosen as according to the [1] the cognitive style index was psychometrically sound instrument for this study and sound for measurement for cognitive style in organizational settings, that's why this CSI was chosen to be used in the Pakistani context higher education institutions.

Unique Role of Cognitive Style

Uptill now number of researchers gave us the number of concepts and direction of cognition and cognitive styles [23: 30]. Also [30] gave two modes of understanding one is rational and second is intuitive. Later on these modes are named intuition and analyst by [5]. Also [1] report the development and validation of cognitive style index. The theoretical study of [43] identify the most common cited directions of cognitive style. The theoretical study of [43] identifies the most common cited directions of cognitive style. [45] presented critique of styles but he confused the terms cognitive style and learning style. In reply [32] give a compelling argument that learning style may suffer due to over usage and weak theoretical base, there is growing empirical and psychological evidence and he suggested that cognitive style is valid concept cannot be ignored. Since the last two decades the numbers of instruments have been reported by number of authors and researchers showing the reliability and validity of instruments. The latest one instrument has been reported by [1] called CSI and Rational Experiential Inventory [14]. Cognitive style indicator has been given by [10] these are at their early stages of use and development. The cognitive style index measured the individual intuitive-analyst dimension of cognitive style.

[14] gave the cognitive experiential self-theory and reported that people think in two parallel systems rational and experiential. The rational system works at conscious stage at primary stage and is intentional, analytic and affect free. The experiential system is automatic affected and preconscious. Due to this dual process theory new self-report measure of individual difference in intuitive experiential and analytic rational thinking a new theory was given by Epstein rational experiential inventory.

Author [9] developed cognitive style indicator this instrument assesses three dimensions labelled knowing style, planning style and creating style. Individual with knowing style they try to know the data, they want know things exactly and want to retain details and facts. Individual with planning style first they prepare and plan to control and organize in highly structured environment. People having creative style like uncertain things and problems and considered these as opportunities.

METHOD

For this paper literature was reviewed, to conceptualize the cognitive style to build the concept about the cognitive style by reviewing the foundational theories and critiques the previous models and theories. The specific method used in this paper was used is described below.

Numerous articles and thesis were reviewed which were related to this topic by searching by keywords or key words

combinations such as intuition, analysis, cognitive style decision making, In short the total 40 articles were reviewed along with thesis done by researchers, the literature was divided in to different types. One type was that literature that helps in making basis on theories about cognitive style. The existing models were analyzed in this paper in order to identify the key components then foundational literature was used about the specific cognitive style, thus in spirit of theory building this paper aims to presents extended cognitive style based on deep understanding of models and theories underlying.

DISCUSSION

Role of theory is to provide mean of classifying significant and pertinent knowledge [40]. Several theories and models are available all have some strengths and weaknesses as well as critics. All theories and models are not perfect but contribute some knowledge and helps in understanding the cognitive process. New models are emerging to integrate the existing approaches. Since the publication of CSI it has been used in business and management institutes in 300 studies reported to its authors data base. CSI, KAI and Mayers briggs type indicator are most cited instruments [47].

Cognitive style helps us to explain why managers have similar capabilities and make decision different. Many researchers has ben attracted since last 20 years to do research on cognitive style of decision making and problem solving . areas researched by researchers are strategic decision making, decision support system design , and general managerial decision making.

CONCLUSION

There is common saying that theories are neither right nor wrong rather different views of reality [11] A lot of attention has been given to cognitive style in last two decades and this attention leads to number of development of theories on cognitive style. Cognitive style got importance in management literature in last decade. Number of researchers have pointed out the three main issues to make advance the field of cognitive style these are a) theories of cognitive style b) measurement of cognitive style c) practical relevance of cognitive style [9]. The concept of cognitive style is now as a great source of information science research and has crossed line of psychology and educational theory [16] . This paper explains the knowledge taken from past few theories for better understanding for users.

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