The International Journal of Indian Psychology
ISSN 2348-5396 (Online) | ISSN: 2349-3429 (Print)
Volume 11, Issue 1, January- March, 2023
DIP: 18.01.094.20231101, DOI: 10.25215/1101.094
https://www.ijip.in

Review Paper

Cognitive Styles Research: A Review of Theory, Assessments and Applications

Mohammed Rashid ul Ansar[1]*, M.P. Ganesh[2]

ABSTRACT

Often seen as a major step in linking personality to environmental influence, cognitive styles research has come a long way in the study of individual differences in cognition. With a resurgence of interest in individual differences studies due to the rise of personalised educational technology and services, it becomes further important to collate research findings in this field. This review attempts to present a timely comprehensive picture of latest theories, assessments and applications of cognitive styles as a research construct in cognitive psychology, thereby integrating the construct into the mainstream cognitive science research areas of today.

Keywords: *Cognitive Styles, Individual Differences, Cognitive Psychology, Information Processing, Hierarchical Model*

Individual differences are an ever-growing research concern in Psychology. While it is quoted as the major reason theories in social sciences are applicable within specific contexts alone, it is also the source of curiosity as to how complex human societies are formed which are far from being monotonous or easily predictable. One such major difference lies in the processing of information on various levels of cognitive system organization, known as Cognitive Styles (CS). Messick (1976) defined it as stable attitudes, preferences, or habitual strategies that determine individuals' modes of perceiving, remembering, thinking, and problem solving. It is seen as the way in which individuals negotiate with their surroundings and the specific ways they choose to do so.

Cognitive Styles research gained momentum alongside cognitive revolution of the 1950s. It was seen as a major forward step in linking personality to the environment (Witkin, 1954). CS research reached an impasse by the seventies due to the lack of a useful coherent theory and efforts to study its relationship with other psychological constructs (Kozhevnikov, 2007). However, there have been a resurgence lately in the interest on CS largely due to the findings that CS can be a better predictor of many individual successes in many other fields like internal communications (Hayes & Allinson, 1994), organizational behaviour (e.g.,

[1]PhD Scholar in Psychology, Dept. of Liberal Arts, IIT Hyderabad, India
[2]Associate Professor, Dept. of Liberal Arts, IIT Hyderabad, India
*Corresponding Author

Received: February 11, 2023; Revision Received: February 20, 2023; Accepted: February 23, 2023

Streufert & Nogami, 1989; Sadler-Smith & Badger, 1998; Talbot, 1989), and education (e.g., Sternberg & Zhang, 2001).

The search for a testable comprehensive theory has always been at the core of scientific enquiry in the field of information processing even when the results have not been quite robust. Nevertheless, every attempt at it produces insights into the working of the human mind in more concrete terms. The emphasis on the theory being 'concrete' and viable for empirical testing obviously falls in line with the reductionist and positivist conception of the mind. This is not in an attempt to negate the fluidity and the dynamic nature of human information processing but is a part of a larger approach to attain more control over its processes and thereby predict its future course when provided with better inputs. This could be argued against as an attempt to control and colonize human mind on an extreme, but such risks are part of every scientific endeavour; be it splitting of atoms or the radio. The only workable way around it seems to be the optimal use of such theories and inventions to benefit a larger population.

With these clearly stated goals, setting out for a comprehensive theory of cognitive styles is an elaborate exercise aimed, not at finding and labelling subjects into fixed styles but engaging them more with the idea of styles as flexible ways of information processing that can be used variedly depending on the context to optimize their information processing capabilities. Stating this goal is important in that the resulting findings are not reduced into a set of rigid types that run the risk of presenting the subject with a more or less fixed and rigid picture of their cognitive capabilities, thereby seriously minimizing chances of thought flexibility.

Kozhevnikov (2007) conducted a quite comprehensive review of CS research in the past 60 years and concluded that there was still a dearth on basic research in cognitive styles. Most studies focused on defining styles in narrow terms, often as bipolar dimensions. This was due to research being conducted independently in different applied disciplines which led to many researchers coming up with their own versions of CS which often overlapped. Another major conclusion from the review was that hierarchical models of CS that were based on information processing theories are the promising way ahead. For instance, a hierarchical model proposed by Nosal (1990) has four levels named Perception, Concept Formation, Modeling and Program and four methods of information processing from automatic data encoding to conscious allocation of mental resources to which different identified dimensions of CS can be placed. For e.g., the field dependence-independence style is placed in the perception level since it functions as a filter at the very beginning of cognitive processing. One major strength of this model is that it still has empty cells in the matrix where newly identified styles can be accommodated.

Rationale

In this backdrop, the present study tries to comprehensively review the research done post 2007 till present in this field. We aim to look for theoretical advancements in the construct as well as the applied utility of CS construct as a deterministic factor in fields like learning, science education and decision sciences. This will help in identifying the research gap that needs to be addressed and also analyse the recent trends in CS research.

Objectives

The review broadly aims to recount the recent developments in the field of CS research and identify the research gaps. Specific objectives of the review are:

- To analyse the theoretical additions to Cognitive Styles construct after Kozhevnikov (2007)'s review.
- To review the new assessment tools of CS
- To analyse the relevance of CS in applied research.

METHODOLOGY

Google Scholar was chosen as the primary database for conducting online article search, since its results are drawn from a wide range of other established databases and returns a greater number of scholarly articles than databases like PubMed. Gehanno, Rollin & Darmoni (2013) have demonstrated this by showing that Google Scholar returned 100% of studies that were used in systematic reviews published in Cochrane Database of Systematic Reviews or in the Journal of American Medical Association (JAMA) obtained from gold standard database. This ensures the authenticity of google scholar as credible source for conducting systematic reviews. However, it is also recommended to expand the search to other established databases like PubMed or JSTOR. Additionally, Google Scholar also provides increased access to grey literature (Ridley, 2012). The search keyword used was "*cognitive styles*" and the period was set from 2007 to 2021. This was in line with the research objective to cover the studies post the review of CS by Kozhevnikov (2007). The following inclusion/exclusion criteria were set:

- Only journal articles were selected for the review. Book chapters, conference papers and summary reports were excluded.
- Only the articles with the keyword 'cognitive style(s)' in their title were included. This was to ensure that the article discussed CS construct with sufficient importance.
- Articles written in English.
- Articles in the broad context of learning and education were selected. Other myriad of contexts like religiosity, political orientation, etc. were rejected.

RESULTS AND DISCUSSION

The final number of articles that fell within the criteria of the review was twenty-two which includes the review by Kozhevnikov (2007). The articles covered theoretical works, review papers as well as empirical studies. The findings are discussed with an emphasis on CS theory, assessment of the construct and its usage as a predictor of individual success in many other areas.

The Hierarchical Model of Cognitive Styles

From the initial conception of CS as individual differences in performing simple cognitive tasks that can be grouped as Field Dependence and Independence (Witkin, 1962) and Sharpeners or Levelers (Klein, 1951), basic research in CS gained huge interest during the 1950s. Many style dimensions were identified, thanks to a lot of researchers taking up the question independently, leading to a point where 29 styles were identified through review (Allinson & Hayes, 1996). However, such extensive number of styles was a result of lack of coordinated research effort among style researchers and they proved to be of little practical help in constructing a useful theory around cognitive styles. A second wave of research within the style paradigm focused on unifying these styles under one or two categories to arrive at a more comprehensive picture of styles as a psychological construct (Kozhevnikov, 2007). This too, drew its criticism from the fact that most of such organized styles were bipolar in nature or stood out as independent continuum structures which could not be integrated with other cognitive processes. It was thus especially important to integrate cognitive styles into leading edge research on other cognitive processes that were happening

simultaneously to realize the larger role played by styles in the cognitive makeup of a person. The Hierarchical models of cognitive styles were born out of this need, where the theorists tried to place the styles in relation with other cognitive processes at various levels, and how at each level of information processing, cognitive styles played an apparent role in selecting or even avoiding certain information.

An early model by Miller (1987) placed various style dimensions at three levels of cognitive processing like Perception, Memory and Thought, which are then divided into sub levels. At each level, one could find well established cognitive styles, for e.g., analytic/holistic dimension at the pattern recognition sub-level of perception while field independence/ dependence at the attention sub-level. Similarly, at the memory level, analytic-verbal vs visual-analog styles would work at the memory representation sub-level while conceptual complexity style would operate at the organization of memory. Finally, at the thought level, we find styles like serial/holistic at classification, tight/loose style at analogical reasoning, and actuarial/intuitive style at the judgement sublevel, respectively. The flow of information is hierarchical from perception to memory to thought and the placement of distinctive styles at different levels makes sense as it shows how individual differences are actually expressed throughout the cognitive makeup of the person.

Around the same time, Nosal (1990) developed a more elaborate hierarchical model of styles which were presented in the form of a 4x4 contingency table with four levels of information processing and meta dimensions. Nosal's model was unique in that he was the first to propose cognitive styles work at different levels of cognitive complexity as well as on different types of mental processes. For e.g., he suggested that while certain styles worked at a conscious level, where the individual had a control over the selection while other styles were more automatic and worked at more subtly aware levels of processing. This must be read in line with the dual-process theory, which studies the automatic and controlled aspects of cognition. Also, the styles are integrated into information processing theory in that the four levels of perception, concept formation, modeling and program are elaborated. These four levels too, are arranged hierarchically in terms of increasing complexity of processing as well as the level of awareness that the person has over the process, like simple stimulus filtering and for encoding and sifting through information to more complex functions like resource allocation for executive functions. The four meta dimensions of processing can be seen as the level to which conscious control is exerted over the stimuli or the environment to sort and filter the inflow of stimuli. So broadly, while meta dimensions deal with filtering out the chaotic information that is out there, levels of information processing deal with the processing of information that has already made it through.

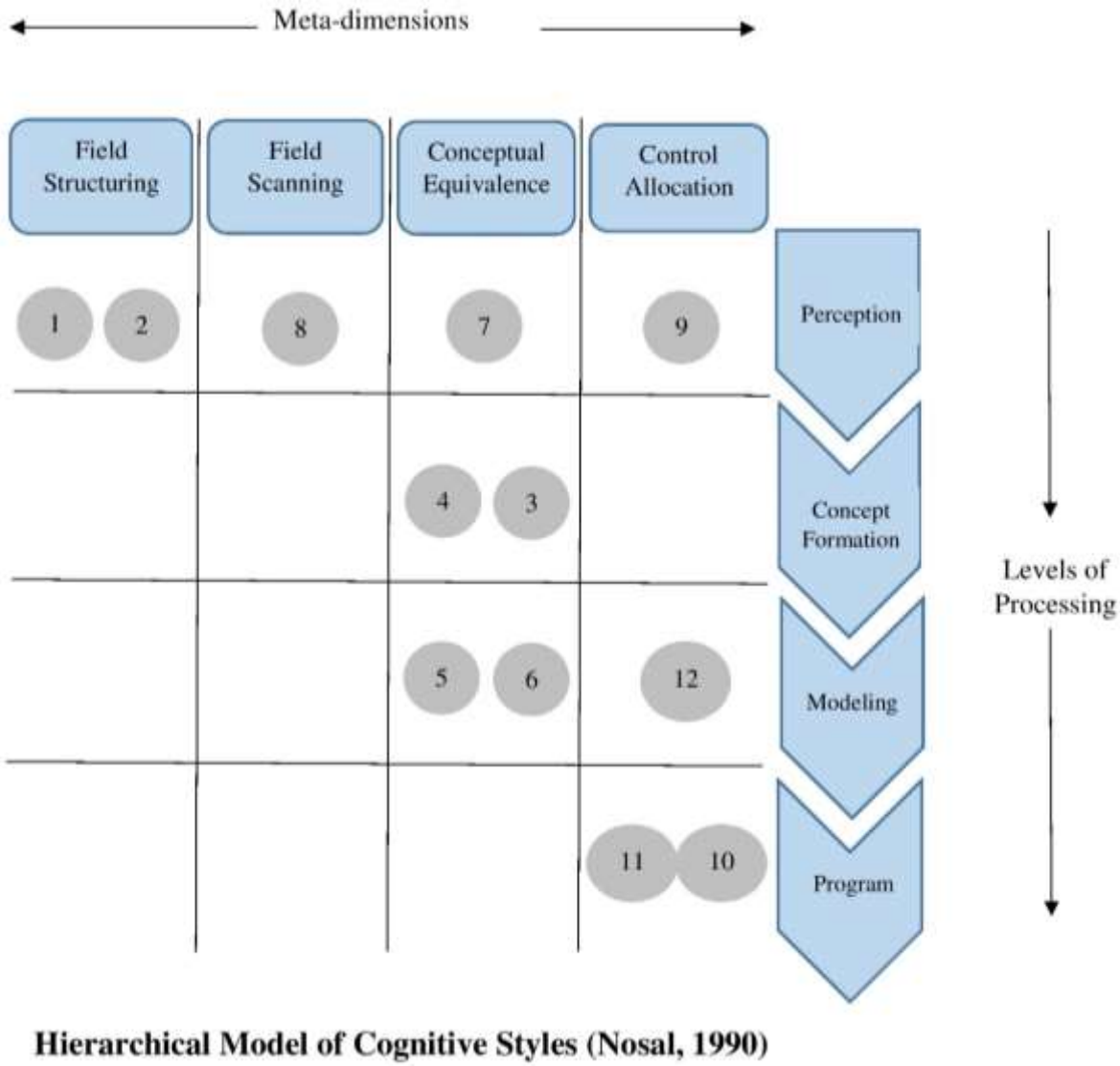

Figure 1. The Hierarchical Model of Cognitive Styles according to Nosal's theory depicting meta-dimensions and levels of processing.

The various styles included are 1= Field Independence- Field Dependence; 2= field articulation (element vs form); 3= breadth of conceptualization; 4= range of equivalence; 5= articulation of conceptual structure; 6= tolerance for unrealistic experience; 7= leveling-sharpening; 8= range of scanning; 9= reflectivity-impulsivity; 10= rigidity-flexibility; 11= locus of control; 12= time orientation

Nosal's model has been touted as the way forward in the field of cognitive styles for several reasons. First, it provides a comprehensive picture of styles in the larger context of other cognitive psychological processes rather than seeing it as a distinct cognitive function. Second, it is helpful in meaningfully integrating the already discovered style dimensions thereby not having to start fresh saving a lot of time and research efforts. Third, the model also has empty spaces for the styles that are yet to identified, which makes it easier for future researchers. However, the tenacity of the model can be established thoroughly only after series of empirical experimentation. However, the model remains a conceptual framework till date and none of the newer style researchers have taken up the huge task of experimenting based on this model. Nosal (2010) has made conceptual additions to the model later. His new model also acknowledges the role played by situational factors in

deciding the cognitive styles as well as the regulative role of cognitive styles. The fundamental argument is that for all styles there is one common mechanism of forming and scanning the perceptual and memory field induced by the situation, and by the differences in the manner of conducting the processes of field scanning codes interfering depend on the range of conceptual equivalency and cognitive control of behaviour (Nosal, 2010).

To be rightly considered as the go-to theory in cognitive styles, Nosal's theory must go through rigorous experimentation. Unfortunately, there has hardly been any attempt to devise a research method to put the theory to test. The hierarchical structure with each level being positioned in an order of processing stage and complexity of metacognition makes it even more difficult so. Nevertheless, a proper methodological exercise outlining the empirical testing of the theory is very much the way ahead. The key problem in empirically testing Nosal's theory is that it is a hierarchical theory arranged in a progressive temporal order of processing and complexity of the information processing involved. The evidence therefore must depict this temporality and order of the theory in the right sequence. Quantitatively, this is a challenge in terms of experimentation/test construction and its validation.

Assessment of Cognitive Styles

One of the major criticisms of this field was that majority of research were carried out using self-report measures rather than direct objective observation of the style related behaviour. While the strengths of self-report measures are well established, its weaknesses are often overlooked for matters of convenience. Experimental data on cognitive styles would throw light on the structural and functional underpinnings of CS in the brain. The way forward is to adopt study designs that use multiple methods, which will allay some of the limitations associated with self-report measures.

Some promising studies using multiple methods in the field of cognitive neuroscience has showed that cognitive style is linked to brain functions and behaviour (Bendall, 2016). The evidence provided by such studies would be helpful in linking specific neural patterns of neural activity to self-report measures and would support the validity of such psychometric assessments.

Kraemer et. Al. (2009) was one of the first to find evidence that preferences for visual or verbal cognitive styles were correlated with activity in anatomically and functionally distinct brain regions associated with encoding pictorial (fusiform gyrus) and phonological (supramarginal gyrus; SMG) stimuli, respectively. They suggest that people with a preference for visual style engage in mental imagery of word-based stimuli and those with preference for verbal style show a tendency to verbally encode stimuli even when presented with pictorial information. This suggests that modality specific cortical activity underlies processing in visual & verbal cognitive styles.

Shin and Kim (2015) modified the classic Stroop Task to investigate whether differences in cognitive styles, through differential responding to distracting information, increases in neural conflict adaptation in brain regions associated with cognitive control. The results showed that the greater the preference for verbal style, the greater the conflict adaptation effect. This finding was further strengthened by fMRI studies which showed increased neural conflict adaptation effects in task relevant brain networks as preference for verbal style increased, which suggests that flexible cognitive control is associated with an individual's preference for cognitive style (Shin and Kim, 2015).

Eye tracking is another modern research technique that could provide deeper insight into how cognitive style may relate to which information is prioritized during a visual task and how it influences moment-by-moment process of task completion. Tsianos et. al. (2009) provided a good example of this when he demonstrated that visualizer looked more at images while verbalizer focused more on the text. Mawad et. al (2009) found that subjects' score on field dependent and field independent cognitive style scores were related to which details they prioritized while inspecting food labels. Such studies provide useful validation for different models of cognitive styles in relation to attentional focus (Bendall, 2016).

Whilst these tech-heavy methods like eye-tracking are praised for being more precise and objective observation tools, they also faced the criticism of being low on ecological validity. This means that testing conditions tend to resemble actual daily life scenario very less. Fortunately, wearable lightweight eye-tracking devices and portable unobtrusive devices like fNIRS are useful in conducting more "in the field" experiments.

The first-choice self-report questionnaire used in most of the studies is the Cognitive Style Index by Alinson and Hayes (1996) This could be due to the well-established psychometric properties of the scale (Bendall, 2016). Other frequently used tools are Rational and Experiential Information processing(REI) by Pacini and Epstein (1999), the time tested Group Embedded Figures Test (GEFT) and Cognitive Style Analysis (Riding, 1991).As discussed earlier, while these self-report questionnaires are of good value in terms of range of domains they cover and the participant's subjective understanding of how cognitive style works, combining them with more objective assessment techniques like eye-tracking and psychometric tests is the necessary step to obtain a more holistic understanding of styles.

Cognitive Styles in Applied Research

While the field of cognitive styles was hitting a low during the 1990s, what opened up a renewed interest in the field was that in several other fields like learning and education, organizational management, counselling, career guidance, conflict management etc., it was proving to be an important predictor of individual success, more so than general intelligence or situational factors (Kozhevnikov, 2007). This trend was observed in this review as well with studies using cognitive style to explain individual behaviour in varied fields like e-learning, motivation learn science, organizational success, working memory and mental rotation.

Tailoring the e-learning platform based on student's cognitive style has been found to improve student learning. Mampadi et. al (2011) demonstrated this by developing an adaptive hypermedia learning (AHML) platform for UG&PG students. They used Pask's Holist-Serialist dimension of CS and found that not only did students show an improvement in learning when their styles were matched, but they showed more positive perception towards such learning systems. Kageyama and Sugiura (2017) conducted a first-of-its-kind cross cultural study of cognitive styles among higher level employees in UK and Japan. As opposed to the prevailing notion favouring intuitive style among higher level jobs, their study found quite the opposite in Japanese culture; where rational styles were more prevalent as levels went higher. This shows that the development of preference for a cognitive style also has a cultural dimension to it.

Zeyer (2010) found that cognitive science was a significant predictor of motivation to learn science. Their study used the empathizing- systemizing dimension of CS by Baron-Cohen et. al. (2005) and found that systemizing ability had an impact on motivation to learn

science. When it comes to learning success, it is often attributed to the cognitive ability of the pupil, namely intelligence, spatial ability etc. While this, might be true on instances of learning where the learning task and the ability task share a lot in common, like logical reasoning and spatial abilities, Dedic, Rosenfield and Jungert (2011) found through a large study (n=980) student that Cognitive Styles held a better predictive power of influencing choice of a science career or the gender gap in science studies. They also concluded that Cognitive Ability and cognitive Styles are independent of each other. Fletcher, Marks, and Hine (2011) found that in a decision-making scenario, the higher Working Memory Capacity (WMC) mediates between preference for rationality (systematic style) and decision making, while there was no relation between WMC and preference for experientiality (intuitive style).

These studies underline the significant role played by CS in determining the individual success in many areas. Also, recent approaches in cognitive styles aim at making students aware of the different styles so that they can adopt multiple strategies depending on the situational need (Kozhevnikov, 2014). Different learning scenarios can demand the student to adopt different strategies and hence it is important to put them in control of the styles in which they process information. This presents the case for style flexibility, where the awareness of different cognitive styles given the subject the choice to shift between the styles so that it fits the kind of information that needs to be processed. It is a major shift from conceptions of style as rigid and exclusive bipolar dimensions. The notion of flexibility gives the subject a greater control over the process rather than making them passive agents whose information processing abilities are determined by a fixed style.

Table 1: A summary of the studies reviewed with key findings.

SR	Author(s) & Year	Type of paper	Key Findings
1	Kozhevnikov (2007)	Review	Lack of coherent theory a hindering factor of growth in CS research, hierarchical theories are the way ahead
2	Nosal (2010)	Theoretical	Hierarchical theory of styles, one common mechanism of forming and scanning the perceptual and memory field induced by the situation
3	Bendall et. al. (2016)	Review	Limitations of self-report measures, possibilities in cognitive neuroscience studies
4	Kageyama, T., & Sugiura, M. (2017)	Empirical	Cultural differences in CS, importance of tacit knowledge
5	Cuneo, Antonietti & Mohr (2018)	Review	CSA more valid than CSI since it is multifaceted in theory and measurement, problem of overlapping with key personality traits
6	Allinson and Hayes (2012)	User Manual	38 item measure, intermediate states between Intuitive Analytical dimension
7	Fletcher, Marks and Hine (2011)	Empirical	Preference for rationality mediated the relation between WM and decision making, WMC unrelated to preference for experiential learning
8	Pazzaglia and Moè (2013)	Empirical	Object-Spatial Visualizer sub dimension exists, spatial visualizers were better at learning maps with spatial content and vice versa.

9	Alloway, Banner and Smith (2010)	Empirical	WM linked to attainment but not to cognitive styles, CS didn't predict attainment.
10	Shi (2011)	Empirical	Learning styles help teachers to tailor teaching while CS help students to learn better, Theoretical aspects not addressed.
11	Koć-Januchta et. al. (2017)	Empirical	Only few studies using sophisticated tools, visualizers spent more time on images and verbalizers on text.
12	Bouvet, Valdois and Donnadieu (2011)	Empirical	Positive correlation between reaction time for global vison identification and global melody identification, similar cognitive styles across modalities
13	Mampadi, Chen, Ghinea and Chen (2011)	Empirical	Experimental design involving AHLS and OHLS- 3 components: direct guidance/ no guidance, embedded links/no links and serial structure vs conceptual map structure, post test scores higher for AHLS than Ordinary HLS for both holists and serialists.
14	Jena (2014)	Empirical	No gender differences in problem solving ability and cognitive styles, slight correlation b/w problem solving and systematic style
15	Mishra, Kanoujiya and Yadav (2017)	Review	Culture as the soul of a collectivistic society. Cultures with tight structure tend to be Field Independent and vice versa.
16	Thomas and McKay (2010)	Empirical	Object visual scale scores showed a significant though weak negative correlation with verbal scale scores. distinction between spatial and object visual styles, learning outcomes improve when instructional material is matched to students' cognitive styles
17	Pektaş (2014)	Empirical	Design performance positively correlated with being at the Imager side of the cognitive styles continuum. The Wholist-Analytic dimension was found to be independent from performance.
18	Chrysostomou, Tsingi, Cleanthous and Pitta-Pantazi (2011)	Empirical	Spatial imagery, as opposed to the object imagery and verbal cognitive styles, is related to the achievement in algebraic reasoning and number sense. As spatial imagery style score increases, the use of conceptual strategies in solving the tasks also increases.
19	Zamzuri, Kassim and Shahrom (2010)	Empirical	No influence of cognitive styles towards user's perceived importance on e-learning interface.
20	Stamovlasis, Tsitsipis and Papageorgiou (2010)	Empirical	Cognitive style was a significant predictor of understanding the three physical states of matter. Pupils with divergent style favored understanding particulate nature of matter
21	Zeyer (2010)	Empirical	Strong correlation between motivation to learn science and systemizing style, and no

			correlation with empathizing style. No gender difference in motivation to learn science
22	Dedic, Rosenfield and Jungert (2010)	Empirical	Cognitive style, and not cognitive ability is the significant predictor of STEM performance as well as the gender gap in it.

CONCLUSION

The review showed that the field of cognitive styles is still held back by the absence of a strong theoretical foundation. While Nosal's (1990; 2010) hierarchical model has been very promising, it is yet to be empirically validated fully. Combining self-report questionnaires with objective techniques like eye-tracking and psychometric tests will help to build an integrated testing procedure, which is also the demand of a hierarchical theory. The developments in the fields like cognitive neuroscience in terms of assessment have been promising and this should be the right time for cognitive style researchers to make use of them to advance the field. This will help in properly situating the cognitive styles construct in mainstream cognitive science research with regard to information processing and underlying neural networks of behaviour. The increasing usage of the construct in other fields as a predictor of other behaviour only points out to the significant role played by cognitive styles in determining the path and outcome of information processing. All of this suggests that the field of styles still has a lot to offer in the understanding of brain and behaviour and for that, rigorous empirical research based on hierarchical theories is the first way ahead for its practitioners.

REFERENCES

Allinson, C., & Hayes, J. (2012). The cognitive style index: Technical manual and user guide. *Retrieved on August 13*, 2020.

Alloway, T. P., Banner, G. E., & Smith, P. (2010). Working memory and cognitive styles in adolescents' attainment. *British Journal of Educational Psychology*, 80(4), 567-581.

Bendall, R. C., Galpin, A., Marrow, L. P., & Cassidy, S. (2016). Cognitive style: Time to experiment. *Frontiers in psychology*, 7, 1786.

Bouvet, L., Rousset, S., Valdois, S., & Donnadieu, S. (2011). Global precedence effect in audition and vision: Evidence for similar cognitive styles across modalities. *Acta psychologica*, 138(2), 329-335.

Chrysostomou, M., Tsingi, C., Cleanthous, E., & Pitta-Pantazi, D. (2011). Cognitive styles and their relation to number sense and algebraic reasoning. In Proceedings of the Seventh Congress of the European Society for Research in Mathematics Education (pp. 387-396)

Cuneo, F., Antonietti, J. P., & Mohr, C. (2018). Unkept promises of cognitive styles: A new look at old measurements. *PloS one*, 13(8), e0203115.

Dedic, H., Jungert, T., & Rosenfield, S. (2010). Model of how cognitive style impacts differentially by gender on achievement and perseverance in SMET studies. *In American Educational Research Association Conference, April*.

Fletcher, J. M., Marks, A. D., & Hine, D. W. (2011). Working memory capacity and cognitive styles in decision-making. *Personality and Individual Differences*, 50(7), 1136-1141.

Jena, P. C. (2014), Cognitive Styles and Problem-Solving Ability of Undergraduate Students. *International Journal of Education and Psychological Research (IJEPR)*. Volume 3, Issue 2, June 2014

Kageyama, T., & Sugiura, M. (2017). Relationship of Cognitive Style and Job Level: First Demonstration of Cultural Differences. *Frontiers in psychology*, 8, 1279.

Koć-Januchta, M., Höffler, T., Thoma, G. B., Prechtl, H., & Leutner, D. (2017). Visualizers versus verbalizers: Effects of cognitive style on learning with texts and pictures–An eye-tracking study. *Computers in Human Behavior*, 68, 170-179.

Kozhevnikov, M. (2007). Cognitive styles in the context of modern psychology: toward an integrated framework of cognitive style. *Psychological Bulletin*, *133*(3), 464.

Mampadi, F., Chen, S. Y., Ghinea, G., & Chen, M. P. (2011). Design of adaptive hypermedia learning systems: A cognitive style approach. *Computers & Education*, 56(4), 1003-1011.

Mishra A, Kanoujiya J & Yadav S (2017). Systematic Review of Cognitive Style, Its Approaches and Cultural Research. *International Journal of Indian Psychology*. July-September 2017.

Nosal, C. (2010). The structure and regulative function of the cognitive styles: a new theory. *Polish Psychological Bulletin*, *41*(3), 122-126.

Pazzaglia, F., & Moè, A. (2013). Cognitive styles and mental rotation ability in map learning. *Cognitive Processing*, 14(4), 391-399.

Pektaş, Ş. T. (2014). Correlations between the visualizer/imager cognitive style and achievement in digital modelling tasks. *Procedia-Social and Behavioral Sciences*, 116, 5053-5057.

Stamovlasis, D., Tsitsipis, G., & Papageorgiou, G. (2010). The effect of logical thinking and two cognitive styles on understanding the structure of matter: an analysis with the random walk method. *Chemistry Education Research and Practice*, 11(3), 173-181.

Shi, C. (2011). A Study of the Relationship between Cognitive Styles and Learning Strategies. *Higher Education Studies*, 1(1), 20-26.

Thomas, P. R., & McKay, J. B. (2010). Cognitive styles and instructional design in university learning. *Learning and Individual Differences*, 20(3), 197-202.

Zeyer, A. (2010). Motivation to learn science and cognitive style. *Eurasia Journal of Mathematics, Science & Technology Education*, 6(2), 121-128.

Zamzuri, N. H., Kassim, E. S., & Shahrom, M. (2010, January). The role of cognitive styles in investigating E-learning usability. In e-Education, e-Business, e-Management, and e-Learning, 2010. IC4E'10. International Conference on (pp. 3-6). IEEE.

Acknowledgement

The authors appreciate Dr. Priyanka Srivastava for her valuable input during the review drafting phase.

Conflict of Interest

We have no known conflict of interest to disclose.

How to cite this article: Ansar, M.R.U., & Ganesh, M. P. (2023). Cognitive Styles Research: A Review of Theory, Assessments and Applications. *International Journal of Indian Psychology*, *11(1),* 924-934. DIP:18.01.094.20231101, DOI:10.25215/1101.094