

## Exploring the Relationship between Cognitive Styles and Problem-Solving Style among Young Adults

Namita Chakraborty,<sup>1\*</sup>, Prof (Dr.) Rita Kumar<sup>2</sup>

### ABSTRACT

Cognitive styles particularly refer to the individual's preference to think and perceive the world whereas problem-solving styles refers to the preference of an individual's method and approaches to solve a particular problem, both of this constitute the basic cognitive processing of human mind. The current study aims to explore the relationship between cognitive styles and problem-solving styles. Data was collected from young adults (n=190) studying social sciences and technical backgrounds. To analyze the data Pearson coefficient correlation was used along with descriptive statistics. The results suggested a statistically significant correlation of systematic cognitive style with sensing problem solving style ( $r = .184, p < 0.05$ ), and feeling problem solving style ( $r = .174, p < 0.05$ ) while a negative correlation was found between systematic cognitive and thinking problem solving style ( $r = -.103$ ). These results propose crucial insights on how human cognition works when confronting a problem.

**Keywords:** *Systematic cognitive styles, Intuitive cognitive style, Sensing problem-solving style, Thinking problem-solving style, Feeling problem solving style, Intuition problem solving style*

Every day, we engage in the cognitive tasks of thinking, perceiving, memorizing etc., without paying attention to the details and complexities it holds in the human mind. **E**Cognition is the core of human mind. The developed cognition of humans is what differentiates us from ordinary mammals. It is a broad term that encompasses various processes along with individual differences present in all cognitive processing humans engage in. Every one of us has a preferred way of perceiving and comprehending the world, this preference in perception is referred to as cognitive style. It majorly develops mostly in the developmental years of an individual's life. Further it depends on the type of exposure in terms of decision making, problem solving an individual experiences throughout their lives shapes their cognitive styles.

### *Cognitive styles*

According to the American psychological association cognitive style is referred to as, “**a person's characteristic mode of perceiving, thinking, and remembering.**”

<sup>1</sup>Student, Amity Institute of Psychology & Allied Sciences, Amity University, Uttar Pradesh.

<sup>2</sup>Professor, Amity Institute of Psychology & Allied Sciences, Amity University, Uttar Pradesh.

\*Corresponding Author

Received: April 18, 2024; Revision Received: May 15, 2024; Accepted: May 18, 2024

## Exploring the Relationship between Cognitive Styles and Problem-Solving Style among Young Adults

Initially in 1978, Ausburn & Ausburn proposed that “*cognitive style was referred to consistencies in an individual’s manner of cognitive functioning, particularly in acquiring and processing information*”

Similarly, Witkin, Moore, Goodenough, and Cox (1977) characterized “*cognitive styles as individual differences in the ways people perceive, think, solve problems, learn, and relate to others.*”

The birth of the concept of cognitive style dates to the 1950s, an enormous body of research emerged regarding individual differences in cognition that are consistent over time and are somewhere or the other related to one's personality. Initially, the research revolved around the individual difference of basic cognitive task and were conducted in early 1940s and 1950s. The concept of cognitive style was introduced by “Klein” and “Schlesinger” who focused on possible interrelation between individual differences in perception and cognitive tasks and termed them as “perceptual attitudes.” Perceptual attitudes are defined as, “special ways distinctive for a person for coming to grips with reality.”

### *The Multidimensional Model of cognitive styles-*

In around the early 1970 Keen, McKenney and Botkin described two elements namely-

- Systematic Style
- Intuitive style

Systematic Style is briefly defined as, “logical, rational, sequential approach of thinking, perceiving, in contrast intuitive style is defined as spontaneous, holistic approach.”

In an attempt to link the brain theory that suggests different tasks of the left and right sides of the brain, psychologist Wonder & Donovan stated that, “Because of our genetic inheritance, our family life and our early training most of us prefer to use one side of the brain over the other.”

The type of behavior associated with left side of the brain is “sequential”, “concrete”, “rational”, whereas the right side of the brain associated with “intuitive”, “spontaneous holistic behaviors”.

The multidimensional model attempts to create an entire spectrum to explain people’s behavior in regard to thinking, perceiving etc. This model was proposed by Martin in 1983.

This model consists of two continua:

- High systematic to low systematic
- High intuitive to low intuitive

### **Problem-solving style**

Problem solving abilities constitutes of a complex cognitive processing task a human can perform. Since our early development we are exposed to daily life problems of the world. Throughout our life span we gather information from our environment, structure the, store them in our memory and these further defines the trajectory while solving a problem.

## Exploring the Relationship between Cognitive Styles and Problem-Solving Style among Young Adults

According to Selby in 2002, problem solving style refer to the “consistent individual differences in the ways people prefer to plan and carry out generating and focusing activities, in order to gain clarity, produce ideas, and prepare for action.”

Further the authors stated that, “An individual’s natural disposition towards change management and problem solving is influenced in part by mindset, willingness to engage in and respond to a situation as presented, and the attitudinal dimensions of one’s personality.” The initial model for problem solving was based on Carl Jung’s theory of cognitive functions which constitute of 4 primary functions namely- **“Sensing”, “Feeling”, “Intuitive” and “Thinking”**.

According to Jung, an individual typically takes in information through two processes that is through sensation and intuition. Sensation refers to an individual’s preference to gather information through the senses, they are comfortable in attending the details. This type is the “realist type.” On the other hand, intuition refers to the opposite of sensation that is these individuals gather information by the means of imagination, taking the gestalt into consideration in any situation. This type is the “idealist type”. They take a “long range view” into consideration.

The feeling and thinking function according to Jung is used for decision making. Individuals tends to develop a preference while decision making. Thinking function refers to the process wherein the conclusion is reached through “analytical modes of reasoning”, these individuals aim to explain things in scientific terms “independent of human needs and concerns.”

Feeling function, conversely approaches any situation through value judgement. By feeling Jung did not emphasize on “emotion”, every type can be emotional, rather Jung stated that these types of individuals are “sensitive to people and individual differences”, they empathize and value human terms and differences.

Overall thinking “generalizes” whereas feeling “individuates”, that is one analyses the incoming data through “logical analysis” and other depends on “subjective and personal process.” The fact is no matter how an individual obtains the information (sensation-intuition) they will reach certain conclusion, Since these dimensions are opposite to each other there are combination made to define four possible personalities. They are- “sensing”, “intuitive”, “thinking”, “feeling”.

### REVIEW OF LITERATURE

Suryalatha (2021) conducted a study on “women teacher’s cognitive styles in terms of different variables”. 350 participants were recruited for this study from Coimbatore district. The data was collected using Cognitive style inventory by Praveen Kumar Jha. The results suggested “significant difference between cognitive style among women teachers due to the type of institution and locality they live in”.

Setiawan et.al (2020) conducted a study to “explore the effects of collaborative problem-solving strategies and cognitive style on students’ problem-solving abilities”. The study recruited 109 students from public junior high school as participants. The data was obtained from Group Embedded Figure Test for cognitive style. The results suggested “a significant

## Exploring the Relationship between Cognitive Styles and Problem-Solving Style among Young Adults

differences on problem-solving abilities between individuals having field-dependent and field independent cognitive style.”

Son et.al (2020) conducted a study on students’ “mathematical problem-solving ability based on teaching models intervention and cognitive style”. The study recruited 145 participants who are learning through CORE RME model of teaching. The data was collected using the MPSA test and the group embedded figure test. The results revealed “important insights on how teaching models impacts an individual’s problem-solving abilities and cognitive styles.”

Nadaf, Nadeem and Basu (2019) conducted a study to on “cognitive style, academic achievement and gender”. Third semester students were recruited from University of Kashmir for this study. The data collection was done using Cognitive style inventory by Praveen Kumar Jha. The results suggested “a positive correlation of academic achievement and cognitive style whereas there was no gender difference for this variable.”

### **METHODOLOGY**

**Aim:** To study the correlation between cognitive styles and problem-solving styles among young adults.

#### **Objectives:**

To examine the relation between different dimensions of cognitive styles and problem-solving styles.

#### **Hypothesis:**

There will be a significant correlation between dimensions of cognitive styles and problem-solving styles

#### **Variables**

The present study uses correlational variables namely cognitive style and problem-solving style. The independent and dependent variables are as follows-

##### **Independent Variable**

- *Systematic Cognitive style*  
Systematic cognitive style refers to the logical, rational style of an individual characterized by step-by-step approach while performing cognitive tasks.
- *Intuitive Cognitive Style*  
Intuitive cognitive style refers to the creative, a more holistic approach an individual engages in while performing cognitive task.

##### **Dependent Variable**

###### *Sensing Problem-solving style*

Sensing problem-solving style relies on facts and evidence while solving a problem. This style relies on well formulated approaches to solve a problem.

###### *Intuitive Problem-solving style*

Intuitive problem-solving style focuses more on hypothetical assumptions rather than actual facts.

## Exploring the Relationship between Cognitive Styles and Problem-Solving Style among Young Adults

### *Feeling Problem-solving style*

Feeling problem-solving style relies on the internal perception and deeper meaning of the situation. This style keeps the human and moral factors into consideration.

### *Thinking Problem-solving style*

Thinking problem-solving style approaches a problem and make decisions based on analytical reasoning.

### **Research Design:**

The present study, as indicated earlier aims to find out the relationship of cognitive style with problem-solving style. The study therefore uses a correlational research design to assess this relationship with cognitive style as the independent variable and problem-solving style as the dependent variable.

### **Sampling Design**

The sample for the study includes 190 participants aged between 18-26 encompassing the age group of young adults. Snowball and convenience sampling were employed. Consent was taken from the participants before the conduction of the study. The sample mostly contains women participants while the percentage of men is low. Participants included in the study are various university students in Delhi, NCR region. For better analysis homogeneity of the sample is kept.

**Table 1: Demographic Details of the sample**

Demographic Category	Frequency	Percentage
Gender		
Female	150	78.94%
Male	40	21.05%
N(Total) =190		
Educational Qualification		
Social Sciences	160	84.21%
Technical Studies	30	15.78%
N(Total)=190		

### **Tools**

The primary measures for the current study are cognitive style and problem-solving style. The tools for the respective variables are as follows-

- **Cognitive style Inventory:** Cognitive style was measured using Cognitive style inventory (CSI) by Praveen Kumar Jha (Jha,). It has 40 items divided into the dimensions of systematic and intuitive styles. This is a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The reliability of the test is measured in two ways that is the internal consistency of scores which came out to be 0.70 and 0.67 respectively for both the dimensions. Lastly test-rest method was also employed, and the scores came out be 0.58 and 0.56 respectively for both the dimensions of the inventory. The validity of the test is ensured and examined in three ways that is judge's validity, concurrent validity and internal validity
- **Problem solving style Questionnaire:** Problem solving style was measured using Problem solving style questionnaire (PSSQ) by Thomas Cassidy and Christopher Long (Cassidy, Long,1993). It has 20 items divided into the dimensions of sensing,

## Exploring the Relationship between Cognitive Styles and Problem-Solving Style among Young Adults

intuitive, feeling and thinking styles. This is a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The PSSQ is reported to have an overall adequate reliability and strong internal consistencies ranging from 0.83 to 0.96. PSSQ is reported to be a highly valid test and has been used in numerous studies regarding academic performances.

### Statistics

To analyze the data Pearson's coefficient of correlation along with descriptive statistics were administered using Statistical Package for social sciences (SPSS) version 29.0. For better understanding of the results scatter graphs and normal probability curve was used.

## RESULTS

The aim of this research is to study the correlation between cognitive styles and problem-solving style among young adults. Out of 200 participants who were a part of the study, about 10 participants were excluded due to neutral response bias of the data.

Descriptive statistics were used to identify the key characteristics of the data. Mean is a measure of central tendency around which the data revolves. It is also known as the average whereas, standard deviation depicts the amount of variation the data has from the mean, that is higher the standard deviation higher represents that the data is widely spread whereas a lower standard deviation suggests that the data is closely plotted near the mean.

*Table 2 Description of research data*

Dimensions	N	Mean	SD	Skewness
Systematic Cognitive Style	190	74.77	7.282	-0.086
Intuitive Cognitive Style	190	76.09	6.396	0.191
Sensing Problem-Solving Style	190	17.15	2.950	-0.011
Intuitive Problem-Solving Style	190	13.41	2.355	-0.094
Feeling Problem-Solving Style	190	17.50	2.922	0.201
Thinking Problem-Solving Style	190	17.27	4.876	5.680

Through the given skewness, it possible to interpret that, systematic cognitive style and intuitive problem-solving style is slightly negatively skewed meaning majority of the data set lies on the right side of the distribution. This typically means mean is less than the median and mode implying minimal no. of low values. Intuitive Cognitive style and feeling problem solving style is slightly positively skewed meaning the data sets lies on the left side of the distribution. In this the mean is greater than the median mode hence the is a presence of high values. Sensing problem-solving style depicts approximately symmetric data set which implies that the data is evenly distributed around the mean. Lastly, thinking problem-solving style depicts significant positive skewed distribution suggesting extreme values pulling the mean towards the right.

## Exploring the Relationship between Cognitive Styles and Problem-Solving Style among Young Adults

**Table 3: Matrix depicting correlation between cognitive styles and problem-solving styles.**

Variables	S	I	Sensing PSS	Feeling PSS	Intuitive PSS	Thinking PSS
S	1	0.692	0.184*	0.174*	0.020	-0.103
I		1	0.217**	0.071	0.038	-0.067
Sensing PSS			1	0.549	0.217	0.230
Feeling PSS				1	0.508	0.226
Intuitive PSS					1	0.194
Thinking PSS						1

Note: N=190, S=Systematic Cognitive style, I=Intuitive Cognitive Style, PSS= Problem-Solving style.

\*Correlation is significant at 0.05 level

\*\*Correlation is significant at 0.01 level

Correlation was computed to determine whether there is a significant relation between the given variables. Pearson's correlation was chosen to assess the data. The results imply interesting findings.

There is a significant positive correlation between systematic cognitive style and sensing problem solving style ( $r=0.184$ ) and feeling problem-solving style ( $r=0.174$ ) at 0.01 level of significance ( $p<0.01$ ).

Secondly a positive significant correlation was also established between intuitive cognitive style and sensing problem solving style ( $r=0.217$ ) at 0.05 level of significance ( $p<0.05$ ).

### DISCUSSION

The aim of the present paper is to explore the relationship between cognitive style and problem-solving style. Cognitive style refers to individual differences. Overall, a sample of 190 was recruited which majorly consisted of social science and technical background students. Pearson's correlation and multiple regression was administered using SPSS. The results suggested a significant positive correlation between systematic cognitive style and sensing and feeling problem-solving style, intuitive cognitive style and sensing problem-solving style.

As depicted in table 2, it is found out that there is significant correlation between different dimensions of cognitive styles and problem-solving style. But interestingly all the dimensions are not correlated suggesting that it might be possible that these two cognitive functions function separately in human minds. Specifically, a correlation is established between systematic CS with sensing PSS and feeling PSS suggesting that an individual with a systematic CS tends to solve problems based on facts that is things that can be verified through their senses. An individual with sensation problem solving style are realist in nature, that is they keep facts into consideration while solving a problem, on the other hand an individual with systematic cognitive style works in step by step manner therefore, they too prefer factual basis of perceiving information. A correlation between systematic CS and feeling PSS was an interesting finding of the research. This suggests that an individual with systematic, logical and factual basis of information processing still tends to keep the human factor into consideration, hence rejecting the myth that logical individuals don't let feeling come into their decision making. Lastly, a correlation was established between intuitive cognitive style and sensing problem-solving style, suggesting that an individual who keeps

## Exploring the Relationship between Cognitive Styles and Problem-Solving Style among Young Adults

facts as a basis to solve problems might have intuitive ways of processing information. Although, there is a correlation established it is not strong enough to generalize it for a larger population. Hence the hypothesis is partially accepted.

### CONCLUSION

Cognition comprises of an individual's complex abilities to tackle daily life issues with ease. The aim of this study is to study the correlation between cognitive style and problem-solving style. A sample of 190 was recruited from Delhi, NCR. The results suggested interesting findings as a positive correlation was found between systematic cognitive style, sensing problem solving style and feeling problem solving style, and intuitive cognitive style with sensing problem. Overall, a significant relationship was established between few cognitive style and problem-solving styles. One of the major limitations of the concerned variable is that these variables are heavily dependent on individual difference hence it is tough to generalize the findings over a large population. Secondly, both of these variables are measured using self-report questionnaire making it tough to measure the subjective aspects of the same. Longitudinal studies, qualitative analysis, diverse statistical measure may help to understand this phenomenon more effectively.

### REFERENCES

- Nadaf, Z. A., Nadeem, N. A., & Basu, N. (2019). Cognitive Styles, Academic Achievement and Gender: A Study of Higher Education. *Think India Journal*, 22(14), 10377-10395.
- Suryalatha, A. (2021). Relationship of cognitive style with academic achievement among student teachers. *Information technology in industry*, 9(2), 1259-1263.
- Setiawan, A. (2020). The effect of cognitive styles on reasoning and problem-solving ability. *Journal for the Mathematics Education and Teaching Practices*, 1(2), 87-93.
- Son, A. L., & Fatimah, S. (2020). Students' Mathematical Problem-Solving Ability Based on Teaching Models Intervention and Cognitive Style. *Journal on Mathematics Education*, 11(2), 209-222.
- Ulya, H., Kartono, A. R., & Retroningsih, A. (2014). Analysis of mathematics problem solving ability of junior high school students viewed from students' cognitive style. *Journal of Education and Practice*, 2(10), 577-582.

### Acknowledgment

The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

### Conflict of Interest

The author(s) declared no conflict of interest.

**How to cite this article:** Chakraborty, N. & Kumar, R. (2024). Exploring the Relationship between Cognitive Styles and Problem-Solving Style among Young Adults. *International Journal of Social Impact*, 9(2), 111-118. DIP: 18.02.015/20240902, DOI: 10.25215/2455/0902015