

# Effect of Orientation in Neurocognitive Strategies on the Performance standard of Paniya Tribal Students' School Milieu

**Dr. S. AMUTHA**

*Assistant Professor,*

*Department of Educational Technology, Bharathidasan University,  
Tiruchirappalli – 620 023*

*&*

**TOMY K.O.**

*Research Scholar,*

*Department of Educational Technology, Bharathidasan University,  
Tiruchirappalli – 620 023*

## ABSTRACT

*Child friendly environment is important for Educational performance. The children with behavioral inhibition and the poor educational performance are rightly exemplified in neuroscience research. This study assessed the effect of neurocognitive strategic orientation on the performance standard of Paniya Tribal Students' School Milieu. Grade 8, 9 and 12 from Paniya tribal of Sulthan Bathery Municipality, located in Wayanad district of Kerala were selected as a sample. Stratified random sampling technique was used to select the sample. Results showed that there is a significant difference in the mean scores of Pre-test and Post-test. 21 days residential Orientation in Neurocognitive Strategies was given to the students. Metacognitive Questionnaire was used to collect data.*

**Keywords:** *School milieu, Metacognitive awareness, Child friendly, Behavioral inhibition, Paniya Tribal students, self-esteem, Self-confidence, Neurocognitive Strategies.*

## Introduction

Education is an important input for the personal, social and economic development and helps to live with happiness and prosperity. Poor friendships, social support, disconnections, distance, sense of otherness, rejections and dominance in social relations among tribal students are the important factors considerably shape the school interactional milieu of Paniya tribal students (Kaul (2001); Justin (2016) and Sedwal & Kamat (2008)). Paniya students have developed behavioral inhibition and it is the main reason behind their indifferent attitude towards the formal system of education (Amutha and Tomy, 2019). Behaviorally inhibited children show physiological and behavioral signs of fear and anxiety when introduced to unfamiliar persons and situations, elicit negative reactions to others often develop problems, such as depression, anxiety and low social health (Hornbuckle, Suzanne 2010). Neuroscience research also found that there is greater activity in rejection-related neural regions and mentalizing regions associated with lower state self-confidence (Eisenberger, N. I., Inagaki, T. K., Muscatell, K. A., Byrne Haltom, K. E., & Leary, M. R., 2011).

The implicit bias and prejudiced social behavior affect the normal neurocognitive structural mechanisms (Amodio, D. M., 2008). Social isolation degrades the health and well-being of an individual and it is the result of neural, hormonal, cellular, and genetic processes (Greg J. Norman, Louise C. Hawkey, Steve W. Cole, Gary G. Berntson & John T. Cacioppo, 2012). Neuroscience studies gives insights of the biological system connected with the social behavior of an individual (Cacioppo, Amaral, Blanchard, Cameron, Carter, Crews, Fiske, Heatherton, Johnson, Kozak, Levenson, Lord, Miller, Ochsner, Raichle, Shea, Taylor, Young, and Quinn, 2007). High social reticence in childhood are associated with poverty, discrimination and maltreatment and it develops negative functional connectivity between insula and ventromedial prefrontal cortex and increased amygdala activity (Jarcho, J. M., Davis, M. M., Shechner, T., Degnan, K. A., Henderson, H. A., Stoddard, J., Nelson, E. E. (2016), Shonkoff, J. P., Garner, A. S., Siegel, B. S., Dobbins, M. I., Earls, M. F., Garner, A. S. et. al (2011).

## Back drop of the study

Factors influencing the behavioral inhibition of an individual are different. Early identification is essential for adopting suitable remedial measures. The personal, familial, social, school, peer group and cultural, factors are influencing the Behavioral inhibition of Paniya tribal students (Amutha S., Tomy, 2019). Neuroscience evidence regarding the physiological condition of the brain related to behavioral inhibition shows the abnormal activities in the particular part of the brain. Restructuring the behavioral pattern through behavioral therapy, neurocognitive therapy and neurocognitive enhancement therapy are the present advancement in the treatment of behavioral inhibition but the unique nature of Paniya students required a comprehensive approach for the treatment of their behavioral inhibition and their better performance of their social milieu. Researcher considered all these factors for developing the neurocognitive strategies for orientation to reorganize their experience through the development of metacognitive awareness, mindfulness, interpersonal competence, assertiveness and self-confidence.

## Objectives of the study

- To develop orientation module based on Neurocognitive strategies for Paniya tribal students
- To find out the effect of orientation on the Performance standard of Paniya tribal students' school milieu
- To evolve recommendations on the basis of the findings of the study for future policy and planning for the tribal students' education.

## Following hypotheses were formulated on the basis of the above mentioned objectives

- Paniya tribal students in control group do not differ significantly in their performance standard in school milieu between pre -test and post test
- Paniya tribal students in experimental group do not differ significantly in their performance standard in school milieu between pre -test and post test
- Paniya tribal students in experimental group and control group do not differ significantly in their performance standard in school milieu in the post -test

## Design of the study

60 Paniya tribal students who were having behavioral inhibition were identified through pilot study. Among the Paniya tribal students researchers selected 8, 9 and 10<sup>th</sup> grade students who were studying in government schools at Sulthan Bathery Municipality, located in Wayanad district of Kerala for investigation. Pre-test was administered for both control group and experimental group to ascertain their entry behaviour. 21 days of neurocognitive based orientation was given to the experimental group and control group were oriented traditionally. Sample selected through stratified random sampling technique. Questionnaire was used as a tool to collect data. This study evaluated the effect of orientation on the school milieu of Paniya tribal students. Questionnaire consisted of 36 items with 5-point scale (Never=1, Occasionally=2, Rarely=2, Indecisive=3, Often=4, Always=5).

## Analysis and interpretations

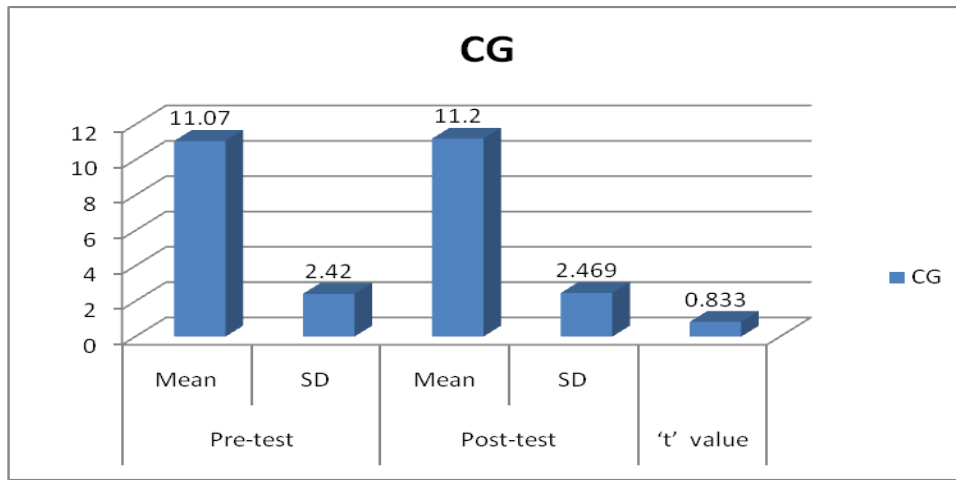
### Hypothesis-1

*Paniya tribal students in control group do not differ significantly in their performance standard in school milieu between pre -test and post test*

### Table-I Descriptive analysis for pre-test and post-test of Control group on their Performance standard in School Milieu

Group	N	Pre-test		Post-test		Df	't' value	sig
		Mean	SD	Mean	SD			
Control group	30	11.07	2.420	11.20	2.469	58	.833	0.01

### Figure-I Descriptive analysis for pre-test and post-test of Control group on their Performance standard in School Milieu



It is inferred from the above table that students of control group without orientation on neurocognitive strategies do not differ significantly in the performance standard scores between the pre-test and post-test at 0.01 level of significance. The mean score of the post-test (M=11.20) and (SD=2.469) are almost same than that of pre-test (M=11.07) and (SD=2.420). So hypothesis is rejected.

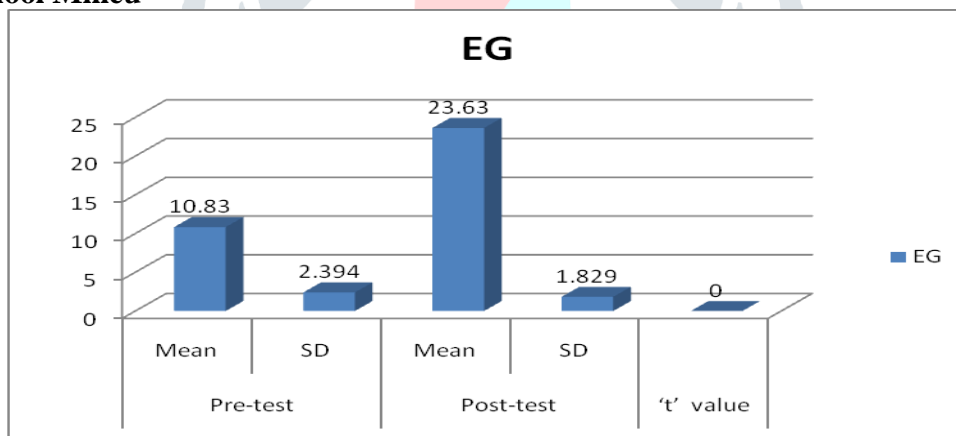
**Hypothesis-2**

*Paniya tribal students in experimental group do not differ significantly in their performance standard in school milieu between pre-test and post test*

**Table-II Descriptive analysis for pre-test and post-test of Experimental group on their Performance standard in School Milieu**

Group	N	Pre-test		Post-test		Df	't' value	sig
		Mean	SD	Mean	SD			
Experimental Group	30	10.83	2.394	23.63	1.829	58	.000	0.01

**Figure-II Descriptive analysis for pre-test and post-test of Experimental group on their Performance standard in School Milieu**



It can be seen from the table 2 that the students of experimental group with orientation on neurocognitive strategies showed significant difference in their social health performance scores between the pre-test and post-test at 0.01 level of significance. The mean score of the post-test (M=23.63) and (SD=1.829) is greater than that of pre-test (M=10.83) and (SD=2.394). It shows that the effect of orientation in neurocognitive strategies on the school milieu of Paniya tribal students. So hypothesis is rejected.

**Hypothesis-3**

*Paniya tribal students in experimental group and control group do not differ significantly in their performance standard in school milieu in the post -test*

**Table-III Descriptive analysis for pre-test and post-test of Control group and Experimental group on their Performance standard in School Milieu**

Group	N	Pre-test		Post-test		Df	't' value	sig
		Mean	SD	Mean	SD			
Control Group	30	11.07	2.420	11.20	2.469	58	.833	0.01
Experimental Group	30	10.83	2.394	23.63	1.829	58	.000	0.01

**Figure-III Descriptive analysis for pre-test and post-test of Control group and Experimental group**

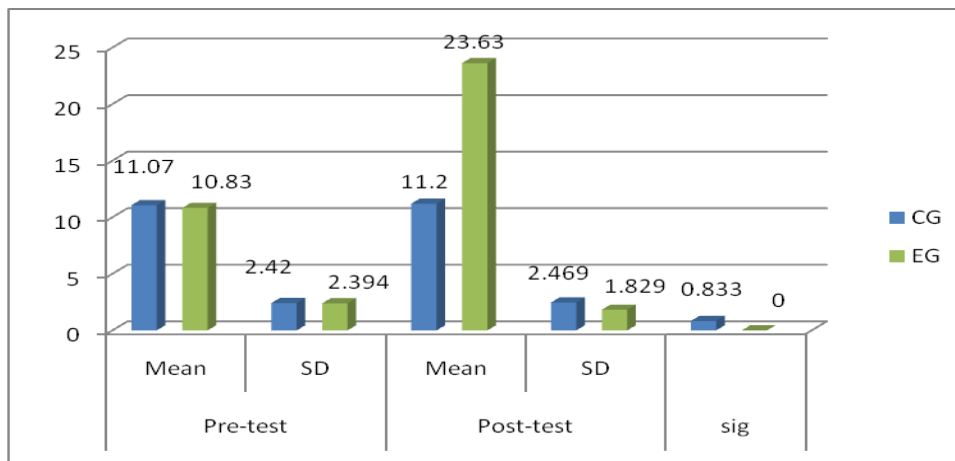


Table-III the mean score of control group in the post-test ( $M=11.20$ ) and ( $SD=2.469$ ) are almost same from the pre-test ( $M=11.07$ ) and ( $SD=2.420$ ) scores. The mean scores and standard deviation of the experimental group in post-test ( $M=23.63$ ) and ( $SD=1.829$ ) is greater than that of pre-test ( $M=10.83$ ) and ( $SD=2.394$ ). This increased mean score of experimental group clearly indicates that there is a significant influence of orientation in Neurocognitive Strategies on the performance standard of Paniya students' school milieu.

### Major Findings of the study

The following are the major findings

- There is no significant difference found between the pre -test and post-test of Paniya tribal students' performance standard in school milieu of control group
- There is significant difference found between the pre -test and post-test of Paniya tribal students' performance standard in school milieu of experimental group
- In the post-test Paniya tribal students' performance in the experimental group regarding the school milieu has improved

### Discussion

Research done by Aerthayil (2008), Paul (2014), Philip, Vijayakumar, K., Indu, P.S., Shrinivasa, Sreelal & Balaji (2015), Justin (2016) et al. found that structural, familial and personal factors considerably shape social interactional milieu within school and isolation, poor friendship, social support, poor school integration, disconnections, distance, sense of otherness, rejections shape the indifferent attitude of Paniya tribal students toward formal education. Present study identified the personal, family, society, school, peer group and cultural factors influence the performance of Paniya tribal students' school milieu.

Cacioppo, Amaral, Blanchard, Cameron, Carter, Crews, Fiske, Heatherton, Johnson, Kozak, Levenson, Lord, Miller, Ochsner, Raichle, Shea, Taylor, Young, and Quinn, (2007), Amodio, D. M., (2008), Greg J. Norman, Louise C. Hawkey, Steve W. Cole, Gary G. Berntson & John T. Cacioppo, (2012) et al says that the neuroscience studies have revealed the unique nature of human brain development influenced by the social relationships of an individual. Present study revealed that the Orientation in Neurocognitive Strategies can improve the performance standard of Paniya tribal students' school milieu; they were suffering from behavioral inhibition.

A number of researchers like Swencionis, J. K., & Fiske, S. T., (2014), Shonkoff, J. P., Garner, A. S., Siegel, B. S., Dobbins, M. I., Earls, M. F., Garner, A. S. (2011), Jarcho, J. M., Davis, M. M., Shechner, T., Degnan, K. A., Henderson, H. A., Stoddard, J., Nelson, E. E., (2016), Falk, E. B., & Bassett, D. S. (2017), (Kotik-Friedgut, B., & Ardila, A., 2019) says that the brain development is affected by the poverty, discrimination, or maltreatment and high social reticence in childhood. Present study also found that the socio-economic backwardness, low self-esteem, poor mental health are the important factors influenced the behavioral inhibition and performance standard of Paniya tribal students' school milieu. Orientation based on Neurocognitive Strategies was effective for improving the performance standard of Paniya tribal students' school milieu.

### Conclusion

Education helps us to lead a good and healthy life. Behaviorally inhibited children show indifferent attitude toward formal education, physiological and behavioral signs of fear and anxiety when introduced to unfamiliar persons and situations. School milieu of Paniya tribal students and their behavioral inhibition of Paniya tribal students are connected. The unique life of Paniya community is a challenge for the educators to provide equal educational opportunity for Paniya tribal students. Insights from neuroscience studies provided the idea for the development of orientation based on Neurocognitive strategies. Orientation in

neurocognitive strategies restructured the behavioral pattern and improved the performance standard of Paniya tribal students' school milieu.

## References

1. Aerthayil, M. (2008). Impact of globalization on Tribals in the context of Kerala. *Indian Social Institute, RAWAT Publications*: New Delhi.
2. Amodio, D. M. (2008). The social neuroscience of intergroup relations. *European Review of Social Psychology*, 19(1), 1–54.
3. Amutha S., Tomy K O (2017). Innovative educational practices of Bo-Dhi and TUDI in bringing educational advancement of Paniya community. *International Journal of Academic Research and Development*.2 (5), 346-347
4. Amutha S., Tomy K O (2019). Behavioral Inhibition of Paniya Tribal Students (In press)
5. Cacioppo, J. T., & Decety, J. (2011). Social neuroscience: challenges and opportunities in the study of complex behavior. *Annals of the New York Academy of Sciences*, 1224(1), 162–173.
6. Cikara, Mina, and Jay J. Van Bavel. 2014. The Neuroscience of Intergroup Relations. *Perspectives on Psychological Science* 9 (3) (May): 245–274.
7. Cushman, F., & Greene, J. D. (2012). Finding faults: How moral dilemmas illuminate cognitive structure. *Social Neuroscience*, 7(3), 269–279.
8. Eisenberger, N. I., Inagaki, T. K., Muscatell, K. A., Byrne Haltom, K. E., & Leary, M. R. (2011). The Neural Sociometer: Brain Mechanisms Underlying State Self-esteem. *Journal of Cognitive Neuroscience*, 23(11), 3448–3455.
9. Elliot M. Tucker-Drob, Daniel A. Briley, K. Paige Harden (2013). Genetic and Environmental Influences on Cognition Across Development and Context. Retrieved from <http://journals.sagepub.com/doi/pdf/10.1177/0963721413485087>
10. Fishback (1999). Neurobiological Insight on Learning. Retrieved from <http://newprairiepress.org/cgi/viewcontent.cgi?article=2689&context=aerc>
11. Hulshoff Pol et al. (2006). Genetic Contributions to Human Brain Morphology and Intelligence. Retrieved from <https://sci-hub.tw/10.1523/JNEUROSCI.1312-06.2006>.
12. Hulshoff Pol et al. (2006). Differences in Genetic and Environmental Influences on the Human Cerebral Cortex Associated With Development During Childhood and Adolescence. Retrieved from: <https://sci-hub.tw/10.1002/hbm.20494>.
13. Jensen, (2000). Moving with the brain. Retrieved from: <https://www.nemours.org/content/dam/nemours/www/filebox/service/preventive/nhps/pep/braininmind.pdf>.
14. John T. Cacioppo, David G. Amaral, Jack J. Blanchard, Judy L. Cameron, C. Sue Carter, David Crews, Susan Fiske, Todd Heatherton, Marcia K. Johnson, Michael J. Kozak, Robert W. Levenson, Catherine Lord, Earl K. Miller, Kevin Ochsner, Marcus E. Raichle, M. Tracie Shea, Shelley E. Taylor, Larry J. Young, and Kevin J. Quinn (2007). Social Neuroscience Progress and Implications for Mental Health. *Association for Psychological Science*. 2 (2).
15. Justin P. Jose (2016). The Lives of Tribal Children at School Milieu in Kerala: A Phenomenological Study. *Research Report Submitted to Rabindranath Tagore Centre for Human Development Studies* Retrieved from: <https://www.researchgate.net/publication/309668143>
16. Kimberly G. Noble, Laura E. Engelhardt, Natalie H. Brito, Luke J. Mack, Elizabeth J. Nail, Jyoti Angal, Rachel Barr, William P. Fifer, Amy J. Elliott. (2016). Socioeconomic Disparities in Neurocognitive Development in the First Two Years of Life. Retrieved from [http://elp.georgetown.edu/wp-content/uploads/2016/12/Noble\\_et\\_al-2015-Developmental\\_Psychobiology.pdf](http://elp.georgetown.edu/wp-content/uploads/2016/12/Noble_et_al-2015-Developmental_Psychobiology.pdf).
17. Klackl, J., Jonas, E., & Kronbichler, M. (2013). Existential neuroscience: self-esteem moderates neuronal responses to mortality-related stimuli. *Social Cognitive and Affective Neuroscience*, 9(11), 1754–1761.
18. Lenroot, R. K., & Giedd, J. N. (2006). Brain development in children and adolescents: Insights from anatomical magnetic resonance imaging. *Neuroscience & Biobehavioral Reviews*, 30(6), 718–729.
19. Li, H., Zeigler-Hill, V., Luo, J., Yang, J., & Zhang, Q. (2012). Self-esteem modulates attentional responses to rejection: Evidence from event-related brain potentials. *Journal of Research in Personality*, 46(5), 459–464.

20. McGregor, I., Nash, K. A., & Inzlicht, M. (2009). Threat, high self-esteem, and reactive approach-motivation: Electroencephalographic evidence. *Journal of Experimental Social Psychology, 45*(4), 1003–1007.
21. National Scientific Council on the Developing Child (2004). Young children develop in an environment of relationships. Working Paper No. 1. Retrieved from <http://www.developingchild.net>
22. Naomi Popeskil, Katarina Dedovicl, Michael Meaney Jens Pruessner. Self-Esteem and Parental Bonding as Indicators of Hippocampal Volume 9 Carole Scherlingl. Retrieved from [http://thesciencenetwork.org/docs/BrainsRUs/NBR\\_2006\\_Giedd.pdf](http://thesciencenetwork.org/docs/BrainsRUs/NBR_2006_Giedd.pdf)
23. Paul. J. V. (2014). Socio-Political Analysis of the School Dropouts among ‘Paniya’ Students in Wayanad. *International Interdisciplinary Research Journal, 4*(1), 256-260.
24. Philip, R.R., Vijayakumar, K., Indu, P.S., Shrinivasa, B. M., Sreelal , T. P., & Balaji, J. (2015). Prevalence of undernutrition among tribal preschool children in Wayanad district of Kerala. *International Journal of Advanced Medical Health Research, 2*, 33-8
25. Will, G.-J., Rutledge, R. B., Moutoussis, M., & Dolan, R. J. (2017). Neural and computational processes underlying dynamic changes in self-esteem. *eLife, 6*.

