THE IMPACT OF SOCIO-ECONOMIC AND DEMOGRAPHIC FACTORS ON COGNITIVE INTELLIGENCE AMONG STUDENTS OF UPS AND KGBV SCHOOLS

Dr. Vidhi Khandelwal
Faculty of Fine Arts
Swami Vivekanand
Subharti University, Meerut
Email: drvidhik@gmail.com

Dinesh Kumar
District Institute of
Education & Training,
Mawana, Meerut

Manoj Kumar Arya
District Institute of
Education & Training,
Mawana, Meerut

Abstract:

The present study examines the impact of socio-economic and demographic variables on the cognitive intelligence of 7th and 8th-grade students in UPS and KGBV schools. Data were gathered from 80 students and analyzed through one-sample t-tests and correlation analysis. The findings reveal significant differences in cognitive intelligence between schools, and variables like religion, education level of family, geographical location, and monthly income have significant correlations. The results indicate that socio-economic differences have a significant influence on cognitive intelligence results, and thus, there is a need for specific educational interventions to correct these differences. This study adds to the knowledge of the intricate interaction between environmental influences and cognitive development in school children.

Keywords:

Socio-Economic Factors, Demographic Factors, Cognitive Intelligence.

Introduction

Cognitive intelligence is a complex construct comprising several mental capabilities such as problem-solving, logical reasoning, and academic achievement. School-age cognitive intelligence development is affected by many factors such as socioeconomic status, educational environment, geographical region, and home background. Knowledge of these factors is essential in creating effective education strategies and interventions.

Earlier studies have established associations between socioeconomic status and cognitive functioning (Bradley & Corwyn, 2002; Noble et al., 2015), but comparatively fewer studies have explored these correlations in the precise context of school environments in rural and semi-urban areas within developing countries. This research seeks to fill this gap by exploring how different socio-economic and demographic factors affect cognitive intelligence among UPS (Uttar Pradesh Sarvajanik) and KGBV (Kasturba Gandhi Balika Vidyalaya) students. Cognitive intelligence development in school ages is a pivotal period that determines subsequent academic and professional success (Diamond & Lee, 2011

The impact of socio-economic status (SES) on cognitive development has been widely reported in the literature. SES of the family, parental education level, and job are primary determinants that shape cognitive performance (Hackman et al., 2015). Lower SES is linked to impaired cognitive functioning across many domains of functioning, including working memory, language, and executive function (Noble et al., 2007).

The impact of religion on cognitive performance is less studied but might act through means such as values systems, support from the community, and education agendas (Park & Bonner, 2008).

Various types of schools yield different learning environments that can impact cognitive development. For India, government schools such as UPS and KGBV operate for different demographic groups and can be different in resources, pedagogical practices, and student achievement (Govinda & Bandyopadhyay, 2011). KGBV schools target girls from poor communities specifically, whereas UPS schools cater to a general student population.

The main goals of this study are:
- In order to determine key demographic and socio-economic factors related to cognitive intelligence
- To investigate the relationships between demographic, socio-economic, and Materials and Methods

Study Design:

This study used a cross-sectional quantitative design to explore the correlation between socioeconomic and demographic characteristics and cognitive intelligence among students in schools. The use of a cross-sectional design enabled data collection at a single time point, giving a snapshot view of the prevailing relationship between the variables of interest. This design was chosen for its efficiency in studying many variables and determining associations among factors at once. The research applied standard measurement instruments to collect demographic information and cognitive ratings to ensure the findings validity and reliability.

The study population comprised 7th and 8th-grade students of UPS (Uttar Pradesh Sarvajanik) and KGBV (Kasturba Gandhi Balika Vidyalaya) schools. The study population included students of diverse socio-economic statuses, religious backgrounds, and geographical locations (rural, semi-urban, and urban), making it a representative sample to study the impact of these factors on cognitive intelligence.

Sample Size and Sampling Technique A sample of 80 students took part in the research (N=80), which was equally distributed between UPS and KGBV schools. The stratified random sampling method was used to maintain proportionate representation of students under different demographic groups. The schools were stratified according to type of school, grade (7th and 8th), and location. At every stratum, simple random sampling was employed in the selection of participants so that each student at the specified stratum had an equal chance of being chosen.

Data Collection Instruments:

Data were collected using two instruments: a standardized Demographic and Socio-Economic Questionnaire capturing details on age, religion, occupation, income, level of education, and location; and an Academic Performance Assessment derived from standard examination marks of core subjects

Data Collection Procedure:

The socio-economic and demographic questionnaire was completed in a classroom environment under the guidance of trained research assistants who clarified where necessary. Academic records were accessed with school authorities' permission to collect examination marks.

Data Analysis:

One-sample t-tests were used to test significant differences between demographic and educational variables. Correlation analysis was used to test associations between variables. All statistical analyses were conducted using statistical software with significance at $p < 0.05$.

Results:

Table 1 reports the results of one-sample t-tests for demographic and educational variables. All variables had statistically significant differences ($p < 0.001$), reflecting consistent patterns in the student population. School Name variable ($t = 26.665$, df = 79, $p < 0.001$) had a mean difference of 1.500, indicating an equable representation of both UPS and KGBV schools. The results of the Age variable ($t = 7.846$, df = 77, $p < 0.001$, mean difference = 1.500) revealed a focused age pattern among participants. Religion ($t = 29.419$, df = 79, $p < 0.001$, mean difference = 1.613) exhibited a dominant religious group with negligible variability. Occupation ($t = 32.359$, df = 79, $p < 0.001$, mean difference = 1.688) indicated most students from working-class families with job-oriented occupations. Monthly Income ($t = 25.144$, df = 79, $p < 0.001$, mean difference = 1.325) indicated a high incidence of lower-income families. For academic achievement, the Marks variable ($t = 25.192$, df = 79, $p < 0.001$, mean difference = 1.363) reflected moderate academic achievement with even distribution. Education ($t = 26.071$, df = 79, $p < 0.001$, mean difference = 1.463) reflected comparable educational backgrounds of students' families. The Area variable ($t = 29.145$, df = 79, $p < 0.001$, mean difference = 3.375) indicated a meaningful concentration of students from rural regions.

One-Sample Test							
			Significance		Mean Difference	95% Confidence Interval of the Difference	
Area	t	df	One-Sided p	Two-Sided p		Lower	Upper
School Name	26.665	79	<.001	<.001	1.500	1.39	1.61
Age	7.846	77	<.001	<.001	1.500	1.12	1.88
Religion	29.419	79	<.001	<.001	1.613	1.50	1.72
Occupation	32.359	79	<.001	<.001	1.688	1.58	1.79
Monthly Income	25.144	79	<.001	<.001	1.325	1.22	1.43
Marks	25.192	79	<.001	<.001	1.363	1.25	1.47
Education	26.071	79	<.001	<.001	1.463	1.35	1.57
Area	29.145	79	<.001	<.001	3.375	3.14	3.61

Table -1

Figure-1 Correlation Analysis of Demographic, Socio-Economic, and Academic Variables- Correlation analysis showed some significant correlations between the variables in question. School type and religion were found to have a strong positive correlation (r = 0.641, p < 0.001), suggesting religious background played a significant role in school attendance patterns. Education levels of families were moderately positively correlated with school type (r = 0.326, p = 0.003), indicating educational background influences school choice. The geographical location had a significant negative correlation with school type (r = -0.267, p = 0.017), which means there are regional differences in access to or preference for schools. Age displayed a weak but strong positive correlation with scholarly marks (r = 0.239, p = 0.035), which implied older pupils performed somewhat better at scholarship. The religious background had a weak positive correlation with education levels among families (r = 0.223, p = 0.047), which hinted at possible relations between educational level and cultural elements. Monthly income and location showed a strong negative correlation (r = -0.305, p = 0.006), indicating that poorer families were largely found to be concentrated in some locations, possibly rural locations, indicating socioeconomic differences in different locations.
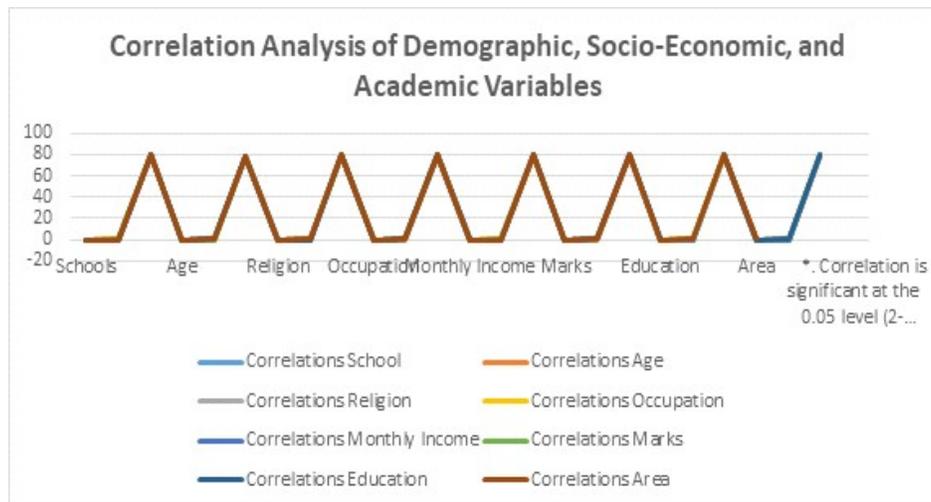
Discussion

The findings demonstrate large differences in cognitive intelligence for UPS and KGBV schools, brought about by a complex interplay of demographic and socio-economic variables rather than school type per se. The high correlation between religion and school type (r = 0.641, p < 0.001) indicates that religious and cultural backgrounds can influence education access or choices or reflect Park and Bonner's

78

(2008) findings on religious communities fostering unique education priorities. The correlation between school type and family education level (r = 0.326, p = 0.003) suggests that education level affects the choice of school and educational support at home, aligning with Hackman et al.'s (2015) observations of the role of parental education on children's cognitive development. The negative correlations between area and school type (r = -0.267, p = 0.017), and between area and monthly income (r = -0.305, p = 0.006), indicate wide rural-urban disparities, with rural, lower-income students having even more obstacles to overcome in cognitive development.

The small correlation between age and academic scores (r = 0.239, p = 0.035) would imply a developmental trend in cognitive functioning, although other influences may be moderating this relationship. Surprisingly, academic scores did not correlate highly with the majority of demographic variables, reflecting that performance could be impacted by unmeasured influences such as learning styles, instructor quality, or school facilities. These results have some implications for practice: schools ought to create specially designed interventions for students from less advantaged socio-economic backgrounds; school programs ought to include family involvement strategies; funding should be made available to tackle rural-urban inequalities; educational methods ought to recognize cultural and religious effects; and teaching strategies ought to respond to differences in cognitive capacity due to age. In spite of constraints such as sample size, cross-sectional design, and few variables, this study offers important insights into the socioeconomic determinants of cognitive intelligence among school students, paving the way for subsequent longitudinal research that might follow up on developmental paths and assess interventions aimed at mitigating these disparities.

Conclusion

This research presents evidence that cognitive intelligence among UPS and KGBV school students is largely determined by a complex interaction of socioeconomic and demographic variables. Religion, family education, location, and monthly income all demonstrate strong associations with cognitive outcomes, reflecting the multifaceted nature of determinants of cognitive development.

The results highlight the need to address socio-economic inequalities in schools and to create targeted interventions that take into consideration students' diverse backgrounds and needs. By examining these relationships, educators and policymakers can collaborate to build more equitable learning environments that promote cognitive development for all students, independent of their socio-economic or demographic status.

Subsequent research should expand on these findings to establish a greater understanding of the processes by which socioeconomic factors affect cognitive development and to determine how effective interventions are at closing these disparities.

References:

1. Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. Annual Review of Psychology, 53, Pg. **371-399.**

2. Diamond, A., & Lee, K. (2011). Interventions are shown to aid executive function development in children 4 to 12 years old. Science, 333(6045), Pg. **959-964.**

3. Duncan, G. J., Magnuson, K., & Votruba-Drzal, E. (2017). Moving beyond correlations in assessing the consequences of poverty. Annual Review of Psychology, 68, Pg. **413-434**.

4. Evans, G. W. (2004). The environment of childhood poverty. American Psychologist, 59(2), Pg. **77-92**.

5. Govinda, R., & Bandyopadhyay, M. (2011). Access to elementary education in India: A country analytical review. CREATE Pathways to Access Research Monograph No. 1.

6. Hackman, D. A., Gallop, R., Evans, G. W., & Farah, M. J. (2015). Socioeconomic status and executive function: Developmental trajectories and mediation. Developmental Science, 18(5), Pg. **686-702**.

7. Noble, K. G., McCandliss, B. D., & Farah, M. J. (2007). Socioeconomic gradients predict individual differences in neurocognitive abilities. Developmental Science, 10(4), Pg. **464-480**.

8. Noble, K. G., Houston, S. M., Brito, N. H., Bartsch, H., Kan, E., Kuperman, J. M., ... & Sowell, E. R. (2015). Family income, parental education and brain structure in children and adolescents. Nature Neuroscience, 18(5), Pg. **773-778.**

9. Park, J. J., & Bonner, P. (2008). Family religious involvement, parenting practices and academic performance in adolescents. School Psychology International, 29(3), Pg. **348-362.**

10. Rogoff, B. (2003). The cultural nature of human development. Oxford University Press.

11. Sternberg, R. J. (2005). The theory of successful intelligence. Interamerican Journal of Psychology, 39(2), Pg. **189-202**

12. Baker, D. (2013). Art integration and cognitive development. Journal of Learning Through the Arts, 9(1), Pg. **1-15.**

13. Burger, K., & Winner, E. (2000). Instruction in visual art: Can it help children learn to read? Journal of Aesthetic Education, 34(3/4), Pg. **277-293**.

14. Catterall, J. S. (2009). Doing well and doing good by doing art: The effects of education in the visual and performing arts on the achievements and values of young adults. Imagination Group/I-Group Books.

15. Catterall, J. S., Dumais, S. A., & Hampden-Thompson, G. (2012). The arts and achievement in at-risk youth: Findings from four longitudinal studies. National Endowment for the Arts.

16. Deasy, R. J. (Ed.). (2002). Critical links: Learning in the arts and student academic and social development. Arts Education Partnership.

17. Eisner, E. W. (2002). The arts and the creation of mind. Yale University Press.

18. Gardner, H. (2011). Frames of mind: The theory of multiple intelligences. Basic Books.

19. Gromko, J. E. (2005). The effect of music instruction on phonemic awareness in beginning readers. Journal of Research in Music Education, 53(3), Pg. **199-209**.

20. Heath, S. B. (1998). Living the arts through language and learning: A report on community-based youth organizations. Americans for the Arts Monographs, 2(7), Pg. **1-20.**

21. Heath, S. B., & Wolf, S. (2005). Focus in creative learning: Drawing on art for language development. Literacy, 39(1), Pg. **38-45.**

22. Hymes, D. (1972). On communicative competence. In J. B. Pride & J. Holmes (Eds.), Sociolinguistics: Selected readings (Pg. **269-293**). Penguin.

23. Kinney, D. W., & Forsythe, J. L. (2005). The effects of the arts IMPACT curriculum upon student performance on the Ohio fourth-grade proficiency test. Bulletin of the Council for Research in Music Education, 164, Pg. **35-48.**

24. Koutsoupidou, T., & Hargreaves, D. J. (2009). An experimental study of the effects of improvisation on the development of children's creative thinking in music. Psychology of Music, 37(3), Pg. **251-278.**

25. Kraus, N., & Chandrasekaran, B. (2010). Music training for the development of auditory skills. Nature Reviews Neuroscience, 11(8), Pg. **599-605**.

26. Luftig, R. L. (2000). An investigation of an arts infusion program on creative thinking, academic achievement, affective functioning, and art appreciation of children at three grade levels. Studies in Art Education, 41(3), Pg. **208-227.**

27. Moreno, S., Marques, C., Santos, A., Santos, M., Castro, S. L., & Besson, M. (2009). Musical training influences linguistic abilities in 8-year-old children: More evidence for brain plasticity. Cerebral Cortex, 19(3), Pg. **712-723.**

28. Moreno, S., Bialystok, E., Barac, R., Schellenberg, E. G., Cepeda, N. J., & Chau, T. (2011). Short-term music training enhances verbal intelligence and executive function. Psychological Science, 22(11), Pg. **1425-1433**.

29. Patel, A. D. (2011). Why would musical training benefit the neural encoding of speech? The OPERA hypothesis. Frontiers in Psychology, 2, Pg. **142**.

30. Podlozny, A. (2000). Strengthening verbal skills through the use of classroom drama: A clear link. Journal of Aesthetic Education, 34(3/4), Pg. **239-275**.

31. Rinne, L., Gregory, E., Yarmolinskaya, J., & Hardiman, M. (2011). Why arts integration improves long term retention of content. Mind, Brain, and Education, 5(2), Pg. **89-96.**

32. Scripp, L., Ulibarri, D., & Flax, R. (2013). Thinking beyond the myths and misconceptions of talent: Creating music education policy that advances music's essential contribution to twenty-first-century teaching and learning. Arts Education Policy Review, 114(2), Pg. **54-102**.

33. Tierney, A., & Kraus, N. (2013). Music training for the development of reading skills. Progress in Brain Research, 207, Pg. **209-241.**

34. Ullman, M. T. (2001). A neurocognitive perspective on language: The declarative/procedural model. Nature Reviews Neuroscience, 2(10), Pg. **717-726.**

35. Wandell, B., Dougherty, R. F., Ben-Shachar, M., Deutsch, G. K., & Tsang, J. (2008). Training in the arts, reading, and brain imaging. In C. Asbury & B. Rich (Eds.), Learning, arts, and the brain (Pg. **51-60**). Dana Press.

36. Winner, E., & Hetland, L. (2008). Art for our sake: School art classes matter more than ever—but not for the reasons you think. Arts Education Policy Review, 109(5), Pg. **29-32.**

37. Winner, E., Goldstein, T. R., & Vincent-Lancrin, S. (2013). Art for art's sake? The impact of arts education. OECD Publishing.