

Assessment of Multiple Intelligence among Young Adolescents (12-14 Years)

Gurpreet Kaur* and Sudha Chhikara**

*Department of Human Development and Family Studies, I.C. College of Home Science,
CCSHAU, Hisar 125 004, Haryana, India*

E-mail: gurpreetkaur_24@yahoo.co.in chhikarasudha@rediffmail.com***

KEYWORDS Multiple Intelligence Levels. Standardized Tool. Assessment. Sex Differences. Mean Scores. Above Average Scores

ABSTRACT The present study was conducted with the aim of assessing the multiple intelligence levels among young adolescents and to study the sex differences in the levels. For this, respondents from rural area of Hisar district of Haryana state were selected. The total sample consisted of 200 respondents, in the age group of 12-14 years. The results of the investigation revealed that majority of the respondents were found to be having average levels of intelligence for all the nine components of multiple intelligence. Significant differences were observed in the mean scores of boys and girls for linguistic ($z=2.44$), logical (5.22), musical (4.45) and bodily kinesthetic (3.03) intelligences. It was found that in case of linguistic and musical intelligence girls took slight lead whereas boys were ahead of girls in logical and bodily kinesthetic intelligence.

INTRODUCTION

Intelligence, the concept, a very old one, has been employed in the most varied ways over the centuries. While intelligence was initially perceived as a unitary concept, these days' concepts and practices of enhancing intelligence by leveraging multiple intelligences is one approach around which educators have begun to focus their efforts. Gardner proposed the theory of multiple intelligences and challenged old beliefs about what it means to be smart. Gardner (1999) defined intelligence as; "biopsy-chological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture". Gardner argues that intelligence is not some static reality fixed at birth and measured well by standardized testing. Instead, intelligence is a dynamic, ever-growing reality that can be expanded in one's life through nine intelligences: (1) linguistic (words); (2) logical-mathematical (numbers); (3) spatial (pictures); (4) musical (musical/rhythmic); (5) bodily-kinesthetic (movement); (6) interpersonal (people); (7) intrapersonal (self); (8) naturalistic (flora and fauna); and (9) existential (big picture of existence).

Gardner's verbal/linguistic intelligence consists of the ability to think in words and to use language to express and appreciate complex meanings. Logical/mathematical intelligence

makes it possible to calculate, quantify, consider propositions and hypotheses, and carry out complex mathematical operations. Visual/spatial intelligence includes the ability to perceive the visual world accurately and to perform transformations and applications upon one's own initial perceptions via mental imagery. Musical intelligence is evident in individuals who possess sensitivity to pitch, melody, rhythm, and tone. Bodily-Kinesthetic intelligence highlights the ability to use one's body in a differentiated ways for both expressive (e.g. dance, acting etc.) and goal directed activities (athletics, working with one's hands). Intrapersonal intelligence includes accurate self-appraisal, goal setting, self-monitoring/correcting and self-management and interpersonal provides understanding of other people. Naturalistic intelligence is the eighth intelligence; person strong in natural intelligence displays empathy, recognition, and understanding for living and natural things (plants, animal, geology etc.). Existential intelligence deals with people who are able to capture and ponder the fundamental questions of existence. Those with existential intelligence are most comfortable and productive when they are discussing or writing about themes.

A person learns best when taught in the way he or she can best perceive the things to be learnt. The educational institutions must give attention towards recognizing the dominant Multiple

Intelligence of students before planning the educational activities. When we talk about adolescents, early adolescence is very crucial period of life, whether it is physical, social-emotional, psychological or educational development, all are on the peak during this phase. One other aspect, which is at peak during this time, is the development of professional interest, attitudes and abilities. This is the time when foundations of future professional settlement are laid. A person can be most successful in a profession when the profession is according to his or her abilities and interests. So this is the time when people should recognize their strong multiple intelligence to learn new things in his or her own way and pursue interest and choose future profession which requires that particular intelligence. Considering the importance of assessment and enhancement of intellectual talents during early adolescence, an idea was conceptualized to assess the existing level of multiple intelligence among young adolescents and to see whether there exist any sex differences in the levels of multiple intelligence. The study helped the adolescents to know their area of strength and utilize it up to optimum level in their daily life and to choose their area of future profession.

METHODS AND MATERIAL

The present study was conducted in Hisar district of Haryana state. Rural area of Hisar district was selected purposively as the tool used was appropriate to assess the multiple intelligence of rural young adolescents. One block was taken randomly. From the selected block a cluster of villages was also taken randomly. From the selected cluster of villages, 2 schools were taken purposively to meet the sample size. Criterion for school selection was age of the respondents. Finally a total of 200 respondents, 100 in the age group of 12-13 and 100 in the age group of 13-14 years was the sample for the present investigation.

A standardized Tool "Multiple Intelligence Assessment Tool" (Kaur and Chhikara, 2006) was used to assess the multiple intelligence levels among young adolescents. The tool consisted of nine subscales namely, linguistic intelligence, logical mathematical intelligence, bodily kinesthetic intelligence, spatial intelligence, interpersonal intelligence, intrapersonal intelligence, naturalistic intelligence and existential intelligence. The tool has high test retest reliability for

all the nine components of multiple intelligence, namely linguistic (.78), logical mathematical (.65), musical (.71), bodily kinesthetic (.86), spatial (.83), interpersonal (.81), intrapersonal (.81), naturalistic (.71) and existential intelligence (.63). The interobserver reliability of tool was also significant for all the aspects of the multiple intelligence-linguistic (.81), logical mathematical (.83), musical (.84), bodily kinesthetic (.85), spatial (.83), interpersonal (.90), intrapersonal (.71), naturalistic (.70), and existential intelligence (.61). All items included in the tool hold significant content validity ratio and it is valid to be used for both age groups and both sex.

After assessing the multiple intelligence levels among young adolescents, the significance of difference between mean scores of boys and girls was tested by the 'z' test.

RESULTS AND DISCUSSION

Levels of Various Components of Multiple Intelligence among Young Adolescents

This part deals with the description of levels, i.e. above average, average and below average, of all the components of multiple intelligence.

Perusal of the results shown in Table 1 suggest that for all the components of multiple intelligence, maximum number of respondents were falling in 'average' category of performance, followed by 'above average' and 'below average' categories. Average performers have particular intelligence up to an average extent, and they might be 'above average' performers in other type of intelligence. Although 'below average' and 'average' categories always need attention but in case of multiple intelligence 'above average' is the category which requires special attention both by parents as well as teachers. As they have more potential in particular aspect, if they are encouraged and motivated, they can be able to recognize their potential and can reach the stage of maximum utility of their talent in particular field. They can become famous people in their field like Dhoni (bodily kinesthetic), Abhijeet Sawant (Musical intelligence), Mandira Bedi (Interpersonal intelligence), Osho (Intrapersonal intelligence), Dalai Lama (Existential intelligence), Vishwanathan Anand (Logical intelligence), M.F. Hussain (Visual spatial intelligence), Ayn Rand (Linguistic intelligence), Dr. Salim Ali (Naturalistic intelligence).

Table 1: Distribution of respondents for various components of multiple intelligence

S. No.	Components	Levels					
		Below Average		Average		Above Average	
		F	%	F	%	F	%
1	Linguistic	46	23.00	114	57.00	40	20.00
2	Logical	41	20.50	114	57.00	45	22.50
3	Musical	37	18.50	103	51.50	60	30.00
4	Bodily-kinesthetic	62	31.00	101	50.50	37	18.50
5	Visual-spatial	37	18.50	123	61.50	40	20.00
6	Interpersonal	22	11.00	114	57.00	64	32.00
7	Intrapersonal	34	17.00	124	62.00	42	21.00
8	Naturalistic	36	18.00	110	55.00	54	27.00
9	Existential	36	18.00	105	52.50	59	29.50

Need is to educate parents and teachers about the multiple intelligence of adolescents. As adolescence is the age when people start utilizing their talent and interest in particular field and start aspiring it as a career/profession. Thus this is the time when parents should identify talent of their children and should start planning for their education in the particular field, so that their adolescents can later enter into that particular career in field of their choice. Educating parents about multiple intelligence can be a key component of school success. It should be started in schools as none of the student's parents are aware of multiple intelligence (Hoerr, 2002). In rural areas, most of the parents are still uneducated thus there is need to help parents to make them understand how different intelligences can be utilized for the success of their children.

Teachers have to play more important role as they are responsible for adolescents education as well as their career/profession and utilization of their potential up to the optimum level as in our society most of the parents are still uneducated. Multiple intelligences theory endorses a group of propositions many teachers have always believed: we are not all the same; we do not have same kind of minds; and education works most effectively if these differences are taken into account rather than denied or ignored. Research shows that students learn best when their preferred learning style is matched by appropriate teaching methods (Hayes and Allinson, 1993). Teachers should identify the students having 'above average' performance caliber in particular field and should motivate him/her. They can plan their educational activities based on multiple methods of stimulation. They should enable their students to apply their talent in real life situations by utilizing different types of strategies, rather than encouraging rote memory

that may foster little connection to material, low motivation and poor performance (Lefebvre et al. 1998). Counseling students according to multiple intelligence is also within the context of school reform it is very important to examine Howard Gardner's theory of multiple intelligences. His work has far reaching implications for curriculum development and classroom implementation.

Sexwise Distribution of the Respondents for Performance on Multiple Intelligence Assessment Tool

Results of the study revealed that both boys and girls faired equally well in almost all the components of multiple intelligence. The significance of difference between mean scores of boys and girls was tested by the 'z' test. Table 2 shows that significant differences were observed in the mean scores of boys and girls for linguistic ($z=2.44$), logical (5.22), musical (4.45) and bodily kinesthetic (3.03) intelligences.

It was found that in case of linguistic and musical intelligence girls took slight lead whereas boys were ahead of girls in logical and bodily kinesthetic intelligence.

Several studies in various fields confirm the results of the present study. Early in development, girls are ahead in language progress. They begin to talk earlier and show faster vocabulary growth. Throughout the school years, girls attain higher scores on reading writing achievement tests (Campbell et al., 2000). Girls' early advantage in language skills may be fostered by their faster rate of physical maturation, believed to promote earlier development of the left hemisphere of the cerebral cortex, where language functions usually are localized. In human beings, the left side of the cerebral cortex is slightly larger and more mature in females than in males (Diamond et al., 1983).

Table 2: Means, standard deviation and z-test by sex for the components of multiple intelligence

S. No.	Components	Boys		Girls		Total		Z-test
		Mean	SD	Mean	SD	Mean	SD	
1	Linguistic	16.47	3.59	17.82	4.18	17.12	3.95	2.44*
2	Logical	8.47	2.22	6.81	2.27	7.64	2.39	5.22*
3	Musical	12.78	4.86	15.92	5.10	14.35	5.21	4.45*
4	Bodily-kinesthetic	10.51	2.67	9.38	2.58	9.95	2.69	3.03*
5	Visual-spatial	13.42	3.29	13.93	3.39	13.68	3.34	1.08
6	Interpersonal	15.10	3.42	15.94	3.47	15.52	3.47	1.72
7	Intrapersonal	11.45	3.47	11.83	3.56	11.64	3.51	0.77
8	Naturalistic	20.79	4.33	21.97	4.22	21.45	4.30	1.93
9	Existential	13.36	3.93	14.03	4.11	13.69	4.02	1.17

* Significant at 0.05

Results depicted in the table showed boys' higher mean scores on logical mathematical intelligence as compared to girls. By adolescents, an overall difference in mathematical abilities of boys and girls exists (Bielinski and Davison, 1998; Linn and Hyde, 1989). Boys generally outscore girls on the mathematical tests (Benbow and Stanley, 1983; Lubinski and Benbow, 1994). The occupations they choose are often consistent with sex differences in mathematical ability. Boys enter engineering, math, physical science and computer science at higher rates than girls who surpass men in entering medicine and health professions (Benbow et al., 2000). Accumulating evidence suggests that sex differences in mathematical ability are rooted in boy's biologically based superior spatial reasoning. Clear sex differences in spatial abilities emerge by middle childhood and persist throughout the lifespan (Kerns and Berenbaum, 1991).

Although biology may contribute to superior performance, experience also seems to be important. In our society, particularly in rural areas gender stereotyping of activities and occupations is well established. During middle childhood and adolescence, knowledge of stereotypes increases in the less obvious areas of personality traits and achievement (Signorella et al., 1993). Often reading, spelling, art, and music are regarded as more for girls and mathematics, athletics and mechanical skills as more for boys (Eccles et al., 1990; Jacobs and Weisz, 1994). These stereotypes influence children's preference for and sense of competence at certain subjects. For example, boys feel more competent than girls at math and science, whereas girls feel more competent than boys at reading and spelling even when children of equal skill level are compared (Andre et al. 1999; Freedman-Doan et al., 2000). Girls are usually found to be more interested in music than boys

and are seen discussing about music in their free time with their friends. In our society music and dance are considered more to be feminist traits, although girls are also not encouraged to take it as a profession.

Furthermore girls seem to adopt a more general stereotype of males as smarter than females and compared with them, they discounted their talent (Stetsenko et al., 2000). Parents encourage a diverse array of gender appropriate play activities and behaviors. They actively reinforce independence in boys and closeness and dependence in girls. Parents gender typed judgments, in turn, influence children's self-perceptions of ability and the effort they devote to mastering a particular skill and their later performance (Eccles et al., 2000). Fathers often tend to be engaged in more physically stimulating play with their sons than daughters. Sex differences in gross motor development are present as early as the preschool years, increase during middle childhood and are large at adolescence. During adolescence, girls' gains in gross motor performance are modest, leveling off by age 14. In contrast, boys show a dramatic spurt in strength, speed and endurance that continues through the teenage years. Consequently the gender gap widens. By mid adolescence, very few girls perform as well as the average boy in running speed broad jump and throwing distance (Malina and Bouchard, 1991). From a very early age children absorb these social messages that parents hold higher expectations for boys' athletic performance. They view sports as much more important for boys. Girls see themselves as having less talent at sports and devote less time to athletics than did their male classmates (Eccles et al., 1990; Eccles and Harold, 1991).

These research studies support the results of present study indicating that in case of linguistic

and musical intelligence girls were slight ahead of boys who were ahead of girls in logical and kinesthetic intelligence.

CONCLUSION

From the present study it can be concluded that greater attention towards the Multiple intelligence of 'above average' scorers is required so that their unusual talent is not wasted. Sex differences play role in the development of some of the intelligences whereas others are independent of sex differences. So similar interventions can be planned for both sexes. Adolescence being a starting stage of career development becomes very crucial for identification and encouragement of particular intelligence. Parents and teachers should collaborate for identification and motivation strategies for maximum utilization of adolescent's talent. Schools can also organize workshops, fairs and campaigns etc. to make the parents aware about multiple intelligences as even educated parents do not have knowledge about this concept and they still believe in IQ and 3Rs (Reading, wRiting, and aRithmetic) and give importance to mark sheets and judge their child's performance through these.

REFERENCES

- Andre, T., Whigham, M., Hendrickson, A. and Chambers, S.: Competence beliefs, positive effects and gender stereotypes of elementary students and their parents about science verses other school subjects. *Journal of Research in Science Teaching*, **36**: 719-747 (1999).
- Benbow, C.P. and Stanley, J.C.: Sex differences in mathematical reasoning: More facts. *Science*, **222**: 1029-1031 (1983).
- Benbow, C.P., Lubinski, D., Shea, D.L. and Eftekhara-Sanjani, H.: Sex differences in mathematical reasoning ability at age 13: their status 20 years later. *Psychological Science*, **11**: 474-480 (2000).
- Bielinski, J. and Davison M.L.: Gender differences by item difficulty interactions in multiple choice mathematics items. *American Educational Research Journal*, **35**: 455-476 (1998).
- Campbell, J.R., Hombo, C.M. and Mazzeo, J.: NAEP 1999: Trends in Academic Progress. U.S. Department of Education, Washington, DC: (2000).
- Diamond, M., Jhonson, R., Young, D. and Singh, S.: Age related morphologic differences in the rat cerebral cortex and hippocampus: Male- Female; right-left. *Experimental Neurology*, **81**: 1-13 (1983).
- Eccles, J.S. and Harold, R.D.: Gender differences in sport involvement: Applying the Eccles' expectancy-value model. *Journal of Applied Sport Psychology*, **3**: 7-35 (1991).
- Eccles, J.S., Freedman-Doan, C., Frome, P., Jacobs, J., and Yoon, K.S.: Gender -role socialization in the family: A longitudinal approach. pp. 333-360. In: *The Developmental Social Psychology of Gender*. T. Eckes and H.M. Trautner (Eds.). Erlbaum, Mahwah, NJ: (2000).
- Eccles, J.S., Jacobs, J.E. and Harold, R.D.: Gender-role stereotypes, expectancy effects, parents' role in the socialization of gender differences in self perceptions and skill acquisition. *Journal of Social Issues*, **46**: 183- 201 (1990).
- Freedman-Doan, C., Wigfield, A., Eccles, J.S., Blumenfeld, P., Arbretton, A. and Harold, R.D.: What am I best at? Grade and gender differences in children's beliefs about ability improvement. *Journal of Applied Developmental Psychology*, **21**: 379- 402 (2000).
- Gardner, H.: *Intelligence Reframed: Multiple Intelligence for the 21st Century*. Basic Books, New York (1999).
- Hayes, J. and Allinson, C.W.: Matching learning style and instructional strategy: An application of the person-environment interaction paradigm. *Perceptual and Motor Skills*, **76**:63-79 (1993).
- Hoerr, T.: *Applying MI in Schools*. New Horizons for Learning, Seattle WA 98103. USA (2002).
- Jacobs, J.E. and Weisz, V.: Gender stereotypes: Implications for gifted education. *Roeper Review*, **16**: 152-155 (1994).
- Kaur, G. and Chhikara, S.: *Intervention Package to Enhance Multiple Intelligence Among Young Adolescents*. M.S. Thesis (Unpublished). CCSHAU, Hisar, Haryana (2006).
- Kerns, K.A., and Bernbaum, S.A.: Sex differences in special ability in children. *Behaviour Genetics*, **21**: 383-396 (1991).
- Lefebvre, D.R.; Siefer, N. and Pollack, T. M.: What if they learn differently: applying multiple intelligences theory in the community college. *Leadership*, **60** (4): 197-201 (1998).
- Linn, M.C. and Hyde, J.S.: Gender, mathematics and science. *Educational Researcher*, **18**: 17-27 (1989).
- Lubinski, D. and Benbow, C.P.: The study of mathematically precocious youth: The first three decades of a planned fifty years study of intellectual talent. pp. 25-281. In: *Beyond Terman: Contemporary Longitudinal Studies of Giftedness and Talent*. R.F. Subotink and K.D. Arnold (Eds.). Ablex, Norwood, NJ: (1994).
- Malina, R.M. and Bouchard, C.: *Growth, Maturation and Physical Activity*. Human Kinetics, Champaign, I.L (1991).
- Signorella, M.L., Bigler, R.S. and Liben, L.S.: Developmental differences in children's gender schemata about others: A meta-analytic review. *Developmental Review*, **13**: 147-183 (1993).
- Stetsenko, A., Little, T.D., Gordeeva, T., Grasso, M. and Oettingen, G.: Gender effects in children's beliefs about school performance: A cross-cultural study. *Child Development*, **71**: 517-527 (2000).