

Associative analysis between mean scores of verbal, perceptual and quantitative cognitive abilities and time spent in various activities by school going and non-school going children of migrant labour families

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■ **ABSTRACT** : This paper studied the gender differences in cognitive abilities (mean scores) among school going and non-school going children of migrant families. Six slum localities were selected from the selected zone and a sample of 120 mother-child dyads including children between 6-8 years of age and mothers working as domestic servants, were purposively selected from each chosen locality through snowball technique. Children were approached to assess their cognitive abilities. Results depicted that school going children of migrant families were superior in all cognitive abilities than their non-school counterparts. Results also revealed that school going females were superior in verbal, quantitative and general cognitive index whereas males possessed higher measures in perceptual, memory and motor abilities. Non-school going males performed significantly better in all cognitive domains as compared to non-school going females except for verbal ability.

■ **KEY WORDS** : Gender differences, Mean scores, Dyads, Cognitive abilities, Migrant families

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Time is an important resource with an individual. The richness of human's development is determined by the way an individual spends his time and the variety and structural complexity of the activities in which he takes part. How young people spend their waking hours defines the fund of developmental experiences in each culture they circumscribe. The absorption of all of child's waking hours in dull and undesirable activity schedule represents severe impoverishment of experience. Time use pattern of children may have significant consequences for their cognitive development thus affecting their educational achievement and social and experiences, with more quality time leading to greater absorption of the cognitive skills and knowledge. Watching a lot of television has been linked to lower cognitive test scores (Timmer *et al.*, 1985). Time spent reading and studying to be linked to verbal achievement and time spent watching television to be associated with poorer verbal scores. Additionally, the types of work activities children perform

differ by gender, with boys performing more market oriented work and girls were performing more domestic labour. Family activities including household work, household conversations and mealtime provide important opportunities for children to participate in household routines. Girls, specifically, appear to assume more of the extra work than boys in dual-earner families (Benin and Edwards, 1990). The relationship between work and schooling differs across country contexts as well as across families and individuals.

Migration is a complex process that can produce profound changes for individuals, families and societies. It is a physical movement by humans from one area to another, sometimes over long distances or in large groups. Ratio of migrant labour against local labour is approximately 80:20 in case of industrial sector and 70:30 in respect of Agricultural Sector (Gill, 2002). The state of Punjab has been demanding labour for various agricultural and industrial activities from other neighbouring states, thus, resulting into an increase in

rate of migration particularly from states like Uttar Pradesh and Bihar. Migration from one place to another place involves lot of adjustment on the part of the migrant families. Moreover, Smita (2008) also investigates the relationship between seasonal distress migration and educational access in India where agricultural labourers migrate for short periods, often several times per year, while migrants to industrial and agro-industrial employment follow a single cycle beginning after the monsoon and lasting for six to eight months until April or June and also identifies a number of ways seasonal distress migration prevents access to education, particularly in the primary age group. Machines replacing men in Punjab seems to have become a reality both in agriculture and industrial sector with the state facing a shortage of labour (Sharma, 2011). The labourers from Bihar used to migrate to Punjab in search of work that too in agriculture as these labourers are well versed with paddy cultivation, scope of employment in rural Bihar and Uttar Pradesh was very limited as a result migration for work took place (Chatterjee, 2012).

Cognitive and non-cognitive abilities are important determinants of schooling and socioeconomic success. In many countries around the world, schooling gaps across ethnic and income groups have more to do with ability deficits than family finances in the school-going years. Parental inputs are relatively more effective in raising non-cognitive skills like motivation, trustworthiness, tenacity and perseverance than cognitive skills, and that critical stages for the development of non-cognitive skills occur until late into childhood, in contrast to critical stages for cognitive skill development which are located in early childhood (Cunha, 2008). Early childhood education attendance is positively associated with a substantial improvement in children's cognitive development (Woldehanna, 2011). The cognitive development was superior in those children who enrolled in pre-school education (Pandey and Devdas, 1991).

■ RESEARCH METHODS

A two group design was employed to conduct the study. One group included 60 school going children and other included 60 non-school going children.

Sample :

The sample for the present study was comprised of 120 children and their mothers' migrant labour class families. The children were selected in the age group between 6 to 8 years and sample was purposively drawn from urban localities of Ludhiana city. Ludhiana Municipal Corporation has divided the city into four zones. One zone was randomly selected from these zones. Six slum localities were selected from the selected zone and 120 children with age range of 6 to 8 years and mothers working as domestic servants, were purposively selected from each chosen locality through snowball

technique.

The respondents in this study were children and their mother, thus the total sample was comprised of 120 mother-child dyads. In the total sample, children were composed of two groups on the basis of their school attendance. One group of children, who were attending school (n=60) and another group was composed of those children who were not attending school (n=60).

The children were selected keeping in view the following criteria:

- Child should belong to the family migrated from Uttar Pradesh.
- Child in the age range of 6-8 years.
- Mother working as domestic servant.

Tool :

McCarthy scales of children's cognitive abilities :

Children's cognitive abilities were assessed by using McCarthy (1972), Scales of Children's Cognitive Abilities MSCA (1972). These scales are useful to record the cognitive outcomes of children between 2.5 to 8.5 years of age. The contents of the tasks are designed to be suitable for both the sexes as well as for children from various ethnic, regional and socio-economic groups. Mean reliability of McCarthy Scale of Children's Cognitive Abilities MSCA ranges from 0.79 to 0.88. The scale systematically measures a variety of cognitive and motor behaviour on six sub scales:

- Verbal
- Perceptual
- Quantitative
- Memory
- Motor
- General cognitive

The test further consisted of 18 sub tests: each of these sub scales is composed of different sets of tests. Time for completion of test on one subject ranges from 30-45 minutes. The scores of three abilities *i.e.* verbal, perceptual, and quantitative are summed up to derive general cognitive index.

Scoring :

Scoring of MSCA was done as per the guidelines given in the manual of MSCA.

Procedure :

For the present study, the investigators personally visited the homes of the children to gather information about socio-personal characteristics of the child and his/her family and cognitive abilities of children. The mothers of the subjects were interviewed individually at their respective homes. Spot observation was also done to avoid any deliberate preparation by the subject for the observer's visit. Cognitive performance of the subjects was assessed by using McCarthy Scales of Children's Cognitive Abilities.

■ RESEARCH FINDINGS AND DISCUSSION

The associative analysis between mean scores of verbal cognitive ability and time spent in various activities by school going and non-school going children of migrant labour families was elaborated in Table 1.

Table 1 presents the differences in verbal ability of children of migrant labour families as per time spent in various activities. The results showed that though the time wise differences in the verbal ability (mean score) for different activities were non-significant yet the mean score across different time categories revealed that school going children spending 4-6 hours in play possessed better verbal ability (MS=43.00) as compared to those who spent lesser time in playing. The mean scored across different time categories showed that children spending 2-4 hours in market related activity scored better verbal ability (MS=39.75) as compared to those who spent less than 2 hours in market work. It came into light that the school going children's mean score of verbal ability was lowest in case of those who were not involved at all in market related activities (MS=35.83). When the data related to different time categories as per the time spent in household chores was scrutinized, it was found that those children who were not involved in household chores were having better verbal ability mean score (MS=43.86) as compared to those who spent less than 2 hours while those who were spending between 2-4 hours had the lowest verbal ability mean score (MS=35.22) and again a non-significant association was observed between the verbal ability mean score and time spent by school going children in household chores.

Similarly, association between verbal ability mean scores of non-school going children as per the different time categories in different activities has also been presented in Table 1. Results indicated that a significant difference (F ratio

=7.49, $p < 0.01$) was observed as children who spent 2-4 hours in play had better verbal with highest mean scores (MS=19.18) as compared to those who spent 4-6 hours in play activities (MS=18.67), while those children who were spending less than 2 hours in play activities were having lowest verbal ability mean scores (MS=16.14). A significant association (F ratio = 6.08, $p < 0.01$) was found in time spent in household chores by the non school going children and their verbal ability mean scores. The children who were not involved in household activities had higher verbal ability mean scores (MS=19.70) as compared to those who were spending less than 2 hours (MS=19.30) whereas those who were spending 2-4 hours possessed lowest verbal mean scores (MS=15.56). The time spent by non-school going children in personal care activities showed a significant association ($t=2.32$, $p < 0.05$) with the verbal ability mean scores as those who were spending less than 2 hours acquired better verbal ability mean score (MS=19.02) as compared to those who spent 2-4 hours (MS=14.00).

Table 2 interprets the differences in perceptual ability of children of migrant labour families as per time spent in various activities. The results depict that those children who spent 2-4 hours in play activities were having highest perceptual ability (MS=38.06) as compared to those who were involved in play for less than 2 hours with mean scores (MS=35.05) or who were engaged in play for 4-6 hours (MS=31.00). Those school going children who were spending less than 2 hours in personal care activities were having 36.79 perceptual ability mean score as compared to those who spent 2-4 hours in personal care activities with mean score equal to 36.46 and hence the difference came out to be non significant. A significant association was observed ($t=2.66$, $p < 0.01$) between time spent in TV viewing and perceptual ability. The children spending

Table 1: Differences in verbal ability (mean scores) of children of migrant labour families as per time spent in various activities

Activities	Not involved		<2 hours		2-4 hours		4-6 hours		test value	Test
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.		
School going										
Play	-	-	38.82	10.71	35.81	10.59	43.00	12.73	0.46	F-ratio
Market work	35.83	10.00	37.48	10.55	39.75	13.51	-	-	0.50	F-ratio
Household chores	43.86	11.67	36.80	9.88	35.22	11.31	-	-	0.57	F-ratio
Personal care	-	-	37.85	11.24	34.62	8.05	-	-	0.82	t-value
Academic	-	-	37.06	10.37	38.00	14.04	-	-	1.39	t-value
T.V. viewing	-	-	38.14	10.68	35.76	10.66	-	-	0.82	t-value
Family	-	-	35.50	9.61	-	-	-	-	NA	nil
Non-school going										
Play	-	-	16.14	5.95	19.18	8.05	18.67	5.13	7.49***	F-ratio
Market work	12.77	4.23	19.06	8.15	19.00	3.80	-	-	1.76	F-ratio
Household chores	19.70	4.24	19.30	8.95	15.56	5.48	-	-	6.08***	F-ratio
Personal care	-	-	19.02	7.30	14.00	7.74	-	-	2.32**	t-value
Family	-	-	18.39	6.26	16.45	8.23	-	-	0.70	t-value
T.V. viewing	-	-	18.21	7.97	17.04	5.79	-	-	1.15	t-value

** and *** Indicate significance of values at P=0.05 and 0.01, respectively

less than 2 hours were having better perceptual ability (MS=39.89) as compared to those who spent 2-4 hours in TV viewing activities (MS=32.28).

A further glance at the data of Table 2 elaborates on the association between time spent in different activities and perceptual ability of non-school going children. The association was significant (F ratio= 3.94, p<0.05) between perceptual ability and time spent in market work by non school children, as those children who spent 2-4 hours in market related activities scored better in perceptual ability mean scores (18.64) as compared to those who spent less than 2 hours (MS=16.52). The non school going children who spent less than 2 hours with family showed better perceptual ability (MS=16.55) as compare to those who were spending 2-4 hours in family (MS=15.86) but the difference was non significant.

The table further indicates that those children who spent less than 2 hours on Television viewing were having better perceptual ability (MS=16.42) as compared to those children who spent 2-4 hours on TV (MS=16.15) though a non significant difference was observed between time spent in TV viewing and perceptual ability.

Table 3 reveals the differences in quantitative ability of children of migrant labour families as per time spent in various activities. The results showed that a significant difference (F=3.89, p<0.01) was observed between the time spent in play activity and their quantitative ability among school going children. Children who spent 4-6 hours were having best quantitative ability in this data (MS=54.50) as compared to those who spent less than 2 hours in play (MS=32.32). Those who were spending 2-4 hours in play activities were having least quantitative ability

Table 2: Differences in perceptual ability (mean scores) of children of migrant labour families as per time spent in various activities

Activities	Not involved		<2 hours		2-4 hours		4-6 hours		Test-value	Test
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.		
School going										
Play	-	-	35.05	10.78	38.06	12.14	31.00	2.83	0.58	F-ratio
Market work	35.83	8.33	35.59	13.24	43.38	11.65	-	-	1.55	F-ratio
Household chores	31.86	8.07	36.74	12.10	38.56	11.37	-	-	0.86	F-ratio
Personal care	-	-	36.79	10.95	36.46	13.77	-	-	0.08	t-value
Academic	-	-	36.50	11.80	38.67	8.85	-	-	0.54	t-value
T.V. viewing	-	-	39.89	12.72	32.28	7.77	-	-	2.66***	t-value
Family	-	-	37.13	13.15	-	-	-	-	NA	nil
Non-school going										
Play	-	-	15.62	4.92	16.86	5.83	17.67	4.04	0.49	F-ratio
Market work	13.23	4.76	16.52	4.48	18.64	6.44	-	-	3.94**	F-ratio
Household chores	17.10	5.51	15.78	4.56	16.44	5.92	-	-	0.23	F-ratio
Personal care	-	-	16.82	5.31	14.88	5.16	-	-	1.28	t-value
Family	-	-	16.55	4.94	15.86	5.95	-	-	0.46	t-value
T.V. viewing	-	-	16.42	5.63	16.15	4.95	-	-	1.28	t-value

** and *** 0.05 and 0.01, respectively

Table 3 : Differences in quantitative ability (mean scores) of children of migrant labour families as per time spent in various activities

Activities	Not involved		<2 hours		2-4 hours		4-6 hours		Test value	Test
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.		
School going										
Play	-	-	32.32	13.68	31.06	9.81	54.50	10.61	3.89**	F-ratio
Market Work	30.59	12.26	31.50	11.80	34.74	12.08	-	-	0.67	F-ratio
Household chores	29.00	15.10	33.97	11.83	30.33	11.07	-	-	0.72	F-ratio
Personal care	-	-	32.06	11.98	33.15	12.37	-	-	0.23	t-value
Academic	-	-	31.78	11.10	37.00	18.85	-	-	0.64	t-value
T.V. viewing	-	-	32.20	11.47	32.44	12.87	-	-	0.23	t-value
Family	-	-	32.13	10.71	-	-	-	-	NA	Nil
Non-school going										
Play	-	-	15.90	6.16	18.68	8.25	20.67	5.03	1.38	F-ratio
Market Work	13.31	6.50	17.88	7.73	20.21	5.12	-	-	3.47***	F-ratio
Household chores	19.00	7.64	18.39	8.75	16.04	5.50	-	-	0.94	F-ratio
Personal care	-	-	18.50	6.73	14.50	7.99	-	-	1.79	t-value
Family	-	-	17.47	7.35	17.36	7.22	-	-	0.06	t-value
T.V. viewing	-	-	17.48	6.95	17.37	7.72	-	-	1.84	t-value

** and ***Indicate significance of values at p=0.05 and 0.01, respectively

mean scores (31.06) and hence, they were having lowest quantitative ability in the sample. Those children who spent less than 2 hours in household chores were having better quantitative ability (MS=33.97) where as those school going children who were spending 2-4 hours in household chores had lower quantitative mean scores (30.33). Although non-significant difference was found between time spent in TV viewing and quantitative ability, but those who spent 2-4 hours in TV viewing possessed better quantitative ability (MS=32.44) as compared to those who spent less than 2 hours (MS=32.20). Table also gives difference between time spent in different activities and quantitative ability among non-school going children. It shows that non-significant difference was observed between time spent by non-school going children in various activities and their quantitative ability except for time spent in market work. The difference in quantitative ability mean scores across various categories of time spent by non-school going children in market work and their quantitative ability, was significant (F-ratio=3.47, $p < 0.01$). Those children who spent 2-4 hours in market related activities were having better quantitative ability mean score (20.21) where as those children who spent less than 2 hours were having lower quantitative ability (MS=17.88), while, those who were not involved in market work were having the lowest quantitative mean ability (MS= 13.31). Similarly when the data related to time spent with family and their quantitative ability was further observed, it was found that a non-significant difference ($t=0.06$) was observed as those children who spent less than 2 hours with family were having nearly equal quantitative ability mean score (17.47) as compared to those who were spending 2-4 hours (MS=17.36). Similarly non-significant difference was observed between different categories of time spent by non-school going children in TV viewing. Those who spent less than 2 hours were having slightly better quantitative ability mean score (17.48) as compared to their counterparts who were spending 2-4 hours in TV viewing (MS=17.37).

Conclusion :

The observations clearly indicated that a significant difference was observed as children who spent 2-4 hours in play had better verbal with highest mean scores as compared to those who spent 4-6 hours in play activities, while those children who were spending less than 2 hours in play activities were having lowest verbal ability mean scores. A significant association was found in time spent in household chores by the non-school going children and their verbal ability mean scores. Again, significant association was observed between time spent in TV viewing and perceptual ability. The children spending less than 2 hours were having better perceptual ability as compared to those who spent 2-4 hours in TV viewing activities. Though a non significant difference was observed between time spent in TV viewing and perceptual ability but result further indicates that those children who spent less than 2 hours on Television viewing were having better perceptual ability as compared to

those children who spent 2-4 hours on TV.

Significant association was found between the time spent in play activity and their quantitative ability among school going children. Although non-significant difference was found between times spent in TV viewing and quantitative ability, but those who spent 2-4 hours in TV viewing possessed better quantitative ability as compared to those who spent less than 2 hours. It was found that a non-significant difference was observed as those children who spent less than 2 hours with family were having nearly equal quantitative ability mean score. Similarly non-significant difference was observed between different categories of time spent by non-school going children in TV viewing.

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