

A study on verbal and numerical reasoning aptitude of college going students

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■ **ABSTRACT** : Aptitude is a pronounced innate capacity or ability in a given line of endeavor such as a particular art, subject or vocation. The present study was done by using the Differential Aptitude Test (DAT) developed by George *et al.* (1947). The randomly selected sample consisted of 120 boys & girls from all four basic faculties like Arts, Commerce, Science and Home Science in the age range 15 to 25 years. The findings of the study denoted that the verbal reasoning ability of Science students was comparatively higher than all other faculty students. The numerical ability of Commerce students reflected very low in comparison with the Home Science, Arts and Science students. There was a positive and significant correlation between the faculties of the students and their gender in verbal reasoning ability. The numerical ability of the students in the various faculty had significant negative correlation between the gender (-0.240) and family size (-0.205).

■ **KEY WORDS**: Aptitude, Abstract reasoning, Verbal reasoning, Numerical ability, College students

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Aptitude means a natural ability, skills or talent, a natural or acquired disposition or capacity for a particular purpose. In research, aptitude is defined as the 'capability of learning a task'. The word aptitude is derived from the word aptos which means 'fitted for'. Aptitude is the aptness or quickness to succeed in a specific field of activity. It is a present condition or indication of individuals' potentialities for future. Aptitude is a pronounced innate capacity or ability in a given line of endeavor such as a particular art, subject or vocation. Aptitude is thus considered to be a unique or unusual potential or ability of an individual to acquire general knowledge and skill in many fields, to acquire

specific knowledge and skill in new field. High or low aptitude in a given area shows individuals fitness into one job better than into another.

In other words, aptitude is simply a capacity to learn. Academic aptitude refers to the capacity to complete a comprehensive curriculum successfully and is composed of a combination of aptitudes. The clerical aptitude means the capacity to handle office work with speed. Aptitude is the result of the interaction of heredity and environment. An individual is born with certain potentialities and begins to learn from his environment. Thereafter, everything he learns enables him to develop an aptitude which must be developed by practice and

training to make it an ability.

Verbal reasoning ability is aimed at the evaluation of the student's ability to abstract generalizations and to think constructively. It may be expected to predict reasonable accuracy, success in fields where complex verbal relationship and concepts are important. The students ability to work with numbers, to manipulate numerical relationships and to deal intelligently with quantitative materials is known as numerical ability. It is important for prediction in fields as mathematics, physics, chemistry, engineering, and other curricula in which quantitative thinking is essential.

Science News (2011) revealed a study on technical aptitude of women and their interest. It was said that boys do better on tests of technical aptitude. For example, in mechanical aptitude tests and similar gender trend was seen for adults too. Perspectives on Psychological Science described a theory explaining the root cause that boys are more interested in technical things, than girls. As aptitude tests are used to predict how well people will do in school and jobs, these tests focused particular skills or specific aptitude like verbal or technical aptitude.

Siegel, Laurence (2010) conducted a study on differential aptitude tests developed by Bennett *et al.* (1959). The review asserted the development of norms for the combination of verbal reasoning and numerical ability subtest scores to serve as a single measure of scholastic aptitude. Several studies of the validity of this new index of scholastic aptitude are highly supportive of its utility (PsycINFO database record (c) 2010 APA).

Jerome *et al.* (2007) conducted a study on the differential aptitude tests as predictors of achievement test scores on Iowa high school pupil who were given the differential aptitude tests. A year later, DAT subtests showed appreciable correlation with at least one section with the other test series, with 4 co-efficients above 80. In another validation study, Ohio and New Jersey children were given the DAT in grade IX and tested with essential high school content battery. The verbal reasons and sentences of the students showed rather high correlation with most of the achievement test sections indicating the large part played by the language factor in such tests.

Anton Aluja and Angel Blanch (2004) revealed a study on, socialized personality, scholastic aptitude, study habits and academic achievement. This study analyzed the relationships among cattellian personality factors, scholastic aptitudes, study habits and academic

achievement. A total of 887 volunteer students from primary education (453 males and 434 females) enrolled from 29 public schools participated in this research. It was found that the scholastic aptitude as the most predictive variable of achievement, while the personality traits had a low direct contribution to academic achievement, although the students with higher scores on socialized personality traits showed better study habits than those students with lower scores on personality socialization traits. The relationship between personality and academic achievement seems to be mediated by study habits. Moreover, female students showed a more socialized personality pattern and better study habits.

Richard (2002) studied an aptitude, instruction and individual development programme. The concept of aptitude was revised to represent individual differences in person, situation, interaction in learning and development. Research on cognitive and motivational aptitudes in relation to instruction was also reviewed.

The present study is an endeavor to explore the differential aptitudes of college going students according to their personal characteristics. Hence, the research study was taken up with objective to know the personal and socio-economic characteristics and verbal, numerical aptitude of college going students.

■ RESEARCH METHODS

The sample consisted of 120 students from Arts (25), Science (43), Commerce (42) and Home Science (10) faculties ranging in 15 to 25 years age. The study was conducted by using the Differential Aptitude Test (DAT) developed by George *et al.* (1947). The data was collected through the questionnaire by simple random sampling method with the help of interview schedule. The results were drawn by implementing an exploratory research design & testing method. The data was pooled, tabulated and statistically analyzed.

■ RESEARCH FINDINGS AND DISCUSSION

Table1 reveals the background variables of the college-going students. It was found that majority of the boys (58%) as well as girls (49%) were hailed from the age group 19-22 yrs, followed by 15-18 yrs ranging in between 30-33 % while remaining meager percentages were found in 23-25 yrs age group.

Nearly seventy three per cent of the boys were pursuing their undergraduate degree while nearly only

Table 1 : Distribution of college going students according to their background variables				(n=120)
Background variables	Distribution of college going students (120)			Z values a Vs b
	Girls (65) (a)	Boys (55) (b)	Total (120)	
Age				
15-18	33.85(22)	30.91(17)	32.5(39)	0.35 ^{NS}
19-22	49.23(32)	58.18(32)	53.33(64)	0.98 ^{NS}
23-25	16.92(11)	10.91(06)	14.17(17)	0.98 ^{NS}
Education				
H.S.C	35.38(23)	27.27(15)	31.66(38)	0.95 ^{NS}
UG	49.23(32)	72.72(40)	60(72)	2.65**
PG	15.38(10)	–	8.33(10)	3.38**
Faculty				
Arts	18.46(12)	23.64(13)	20.83(25)	0.68 ^{NS}
Commerce	32.30(21)	38.18(21)	35.00(42)	0.67 ^{NS}
Science	33.84(22)	38.18(21)	35.83(43)	0.57 ^{NS}
Home Science	15.38(10)	–	08.34(10)	3.38**
Annual family income				
Up to 1 lakhs	7.69(05)	7.27(04)	7.5(09)	0
1 lakh to 5 lakhs	89.24(58)	87.28(48)	88.34(106)	0.33 ^{NS}
5 lakh and above	3.07(02)	5.45(03)	4.16(05)	2.26*
Family type				
Nuclear	76.93(50)	85.45(47)	80.83(97)	1.25 ^{NS}
Joint	23.07(15)	14.55(08)	19.17(23)	1.28 ^{NS}
Family size				
Small (<4)	29.23(19)	50.90(28)	39.16(47)	2.39*
Medium (4-6)	63.07(41)	36.36(20)	50.83(61)	3.06**
Large (>6)	7.69(05)	12.72(07)	10 (12)	0.92 ^{NS}
Father's education				
Non literate	3.08(2)	1.82(1)	2.5(3)	2.86**
H.S.C	23.07(15)	12.72(7)	18.33(22)	1.61 ^{NS}
Graduates	73.84(48)	85.45(47)	79.16(95)	1.64 ^{NS}
Mother's education				
Non literate	9.23(6)	5.46(3)	7.5(9)	5.19**
H.S.C	66.15(43)	43.63(24)	55.83(67)	2.58**
Graduates	24.61(16)	50.90(28)	36.67(44)	3.03**
Father's occupation				
Labor	7.69(05)	5.46(03)	6.66(08)	2.26*
Private job	41.54(27)	30.90(17)	36.66(44)	1.26 ^{NS}
Cooperative sector	7.69(05)	9.09(05)	8.34(10)	2.86**
Government service	20(13)	14.56(08)	17.6(21)	0.87 ^{NS}
Businessman	10.76(07)	16.36(09)	13.34(16)	0.96 ^{NS}
Professional	--	3.64(02)	1.66(02)	4.85**
Others	12.30(8)	20.00(11)	15.83(19)	1.18 ^{NS}
Mothers occupation				
Labour	6.15(04)	3.63(02)	5(6)	3.4**
Private job	1.53(01)	5.45(03)	3.33(04)	5.19**
Teacher	6.15(04)	9.09(05)	7.6(09)	4.10**
Professional	--	1.81(01)	0.83(01)	2.47*
Others	86.15(56)	80(44)	83.33(100)	0.86 ^{NS}

Figures in parenthesis indicate frequencies, * and ** indicate significance of values at P=0.05 and 0.01, respectively NS = Non-significant

50 per cent of the girls were completing their degree programme. Irrespective of their gender, 27-35 per cent students were completing their Higher Secondary College education. Only 15 per cent girls were found to be completing the PG programme and interesting to note that none of the boy was found completing the post graduation education. Significant differences were noted among these girls and boys percentages who were completing graduation and postgraduation.

It was seen that Commerce and Science stream students were nearly distributed among both the gender groups (boys 38% and girls 32-33%) followed by Arts faculty (boys 23% and girls 18%) and few students were observed to be admitted in Home Science (15% only girls).

It is reiterated from the table that the 87-89 per cent of the selected students were having annual family income between 1-5 lakhs and meager percentages were seen to be distributed in other two remaining categories as below 1 lakh and above 5 lakhs.

Majority *i.e.* seventy seven to 85 per cent students were belonging to nuclear families irrespective of their gender. Most of the girls were belonging to medium size of family (63%) while fifty per cent boys were noted

from small family. With regard to family type of college going students, it was seen that a very high majority (77-85%) of the girls as well as boys were belonging to nuclear type of families.

The educational profile of parents indicated very clearly that majority of fathers (74-85%) were graduates while their mothers were scattered in two groups of higher secondary educated and attained graduation, with notable statistical significance. In case of fathers occupation, it was seen that 16-20 per cent of them were involved in business and government jobs while 12-20 percent of them were also seen doing other jobs like agriculture, agricultural labourer, watchmen, etc irrespective of gender of the respondents.

Very high percentage (80-86%) of the college going girls' and boys' mothers were found to be home makers or involved in small petty jobs. Though highly significant differences are noted in mothers involved in labour work, private jobs, teaching profession, in professions like doctor, advocate etc. but it is very negligible.

Table 2 details on verbal reasoning ability scores of college going students. Among college going girls and boys in the four streams selected for study, irrespective of gender, majority (80%) of the students were having

Table 2 : Distribution of college going students according to their verbal reasoning ability (n=120)

Verbal reasoning ability	Girls (n=65)					Boys (n=55)					Z values				
	Arts (a) (12)	Commerce (b) (21)	Science (c) (22)	Home Sci (d) (10)	Total (e) (65)	Art (f) (13)	Commerce (g) (21)	Science (h) (21)	Home Sci (i) (00)	Total (j) (55)	a Vs f	b Vs g	c Vs h	d Vs i	e Vs j
-17 to 3 (Low)	--	3.07 (02)	--	1.53 (01)	4.61 (3)	1.81 (01)	36.36 (20)	--	--	38.18 (21)	0.74 ^{NS}	4.84 ^{**}	--	0.81 ^{NS}	4.86 [*]
4 to 25 (Medium)	18.46 (12)	29.23 (19)	26.15 (17)	13.84 (09)	87.69 (57)	21.81 (12)	1.81 (01)	21.81 (12)	--	45.45 (25)	0.41 ^{NS}	1.43 ^{NS}	0.64 ^{NS}	3.11 ^{**}	5.31 [*]
26 to 46 (High)	--	--	07.69 (05)	--	7.69 (5)	--	--	16.36 (09)	--	16.36 (9)	--	--	1.53 ^{NS}	--	1.53 ^{NS}

Figures in parenthesis indicate frequencies * and ** indicate significance of values at P=0.05 and 0.01, respectively NS= Non-significant

Table 3 : Distribution of college going students according to their numerical ability (n=120)

Numerical ability	Girls (n=65)					Boys (n=55)					Z values				
	Art (a) (12)	Commerce (b) (21)	Science (c) (22)	Home Sci (d) (10)	Total (e) (65)	Art (f) (13)	Commerce (g) (21)	Science (h) (21)	Home Sci (i) (00)	Total (j) (55)	a Vs f	b Vs g	c Vs h	d Vs i	e Vs j
-25 to 15 (Low)	10.76 (07)	24.61 (16)	10.76 (07)	09.23 (06)	55.36 (36)	5.45 (03)	23.63 (13)	03.63 (02)	--	32.72 (18)	1.05 ^{NS}	0.12 ^{NS}	1.60 ^{NS}	2.53 [*]	6.09 ^{**}
16 to 25 (Medium)	07.69 (05)	07.69 (05)	18.46 (12)	06.15 (04)	39.99 (26)	18.18 (10)	14.54 (08)	16.36 (09)	--	49.09 (27)	1.81 ^{NS}	1.23 ^{NS}	0.29 ^{NS}	2.03 [*]	6.44 ^{**}
26 to 46 (High)	--	--	4.61 (03)	--	4.61 (03)	--	--	18.18 (10)	--	18.18 (10)	--	--	2.44 [*]	--	2.44 [*]

Figures in parenthesis indicate frequencies * and ** indicate significance of values at P=0.05 and 0.01, respectively NS= Non-significant

medium (4-25 score) reasoning ability. While boys were distributed in all the three categories as high (16%) low (38%) and medium (45%) verbal reasoning ability. The stream wise study among girls and boys indicate Commerce (29%) and Science (26%) followed by Arts (18%) girl students are better while among boys, Science and Arts (22% each) students are better than Commerce students. None of the boy student was found to be admitted in Home Science course.

It is inferred that irrespective of gender, majority (87%) of the students were having medium (4-25 score) on verbal reasoning ability. Among selected girls, Commerce students indicated higher percentages (29.23%) while it was found true with Science and Arts boy students (21.81%) too.

When these results were statistically analyzed it was seen that highly significant differences were noted among commerce girls and boys students having at par values in medium range of verbal reasoning ability. Similar trend was seen with the students with medium reasoning ability irrespective of their streams to which they belong. It is to be noted that percentage ability of boys are significantly at low level with respect to verbal reasoning ability.

Table 3 indicate the numerical ability scores obtained by college going students. over all it can be said that irrespective of gender except Science stream (4-18%), the students are distributed at large in low (3-24%) and followed by medium (6-18%) score groups from Commerce, Arts, Science or Home Science faculties.

It is reiterated that boys are better (14-18%) with medium score in numerical ability than girls hailed from Commerce and Arts faculties and similar trend was seen high score (18%) numerical ability in comparison with other group. The statistical analysis indicate at par significant difference in boys having medium score of numerical ability.

Conclusion :

Hence, it is concluded that the selected majority of the college going students were completing their graduation, having annual family income between-5 lakhs, nuclear and medium family size. Their fathers were undergraduates while mothers were H.Sc qualified. The majority of the fathers were involved in private jobs and mothers were home makers. Irrespective of gender, Majority (87%) of the students were having medium

verbal reasoning ability. There are differences in numerical ability according to faculties of students Commerce Student's numerical ability was found to be very low comparative with Arts (18%) and Science (18%) faculty students. Commerce faculty girls are better than boys in verbal reasoning ability.

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