



Clerical Ability among Secondary School Students: A Differential Study of Standard, Area, Gender, and Academic Achievement

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Abstract

This study examined clerical ability — the capacity for rapid and accurate performance on routine, detail-oriented perceptual tasks — among secondary school students in Gujarat, India, and its variation across grade level, residential locale, gender, and academic achievement level. A sample of 1,812 students of Standard 9 and 10 (1,016 and 796, respectively; 866 rural and 946 urban; 1,109 boys and 703 girls) was drawn, and clerical ability was measured using the Clerical Ability subtest of a re-standardised Differential Aptitude Test Battery. Descriptive statistics and the Critical Ratio (C.R.) test were used to test six null hypotheses. The distribution of scores was markedly negatively skewed (skewness = -2.26) and leptokurtic (kurtosis = 5.34), with 72.8% of students scoring in the top score band (19–21), indicating a pronounced ceiling effect. No significant difference was found between Standard 9 and 10 students (C.R. = 1.36) or between boys and girls (C.R. = 0.14). Rural students scored significantly higher than urban students (C.R. = 2.29 , $p < .05$), and mean clerical ability scores rose consistently with academic achievement level, with all three pairwise comparisons among low, middle, and high achievers reaching significance at the .01 level. The findings suggest that clerical ability in this population is closely tied to academic achievement but is largely independent of gender and grade, and they carry implications for accuracy- and speed-based instructional design in secondary schools.

Keywords: clerical ability, differential aptitude, secondary school students, rural–urban comparison, academic achievement, gender difference



Introduction

Clerical ability refers to the capacity to perceive, compare, and process routine symbolic material — letters, numbers, names, and codes — quickly and accurately under time pressure. Unlike reasoning or verbal comprehension, it is primarily a measure of perceptual speed and precision rather than problem solving, and it has long occupied a place among the standard dimensions assessed by multiple-aptitude batteries used in educational and vocational guidance.

The Clerical Speed and Accuracy subtest of the Differential Aptitude Tests, developed by Bennett, Seashore, and Wesman (1947), remains one of the most widely used measures of this construct, and comparable clerical-ability subtests continue to be adapted and re-standardised for use in Indian school settings for guidance and placement purposes.

Because clerical ability underlies everyday academic tasks such as copying, checking, tabulating, and proof-reading, understanding how it is distributed across demographic groups — grade level, rural or urban locale, gender, and level of academic achievement — has direct relevance for classroom instruction, remedial planning, and career guidance. The present paper draws on data collected as part of a larger differential-abilities study of secondary school students and reports, in focused detail, the findings pertaining specifically to clerical ability.

Review of Related Literature

Aptitude has been defined as a combination of characteristics reflecting an individual's capacity to acquire specific knowledge or skills through training and practice, distinct from general intelligence in its domain-specific focus (Bennett, Seashore, & Wesman, 1947). Anastasi and Urbina (1997) similarly note that specific aptitude tests, including clerical measures, are intended to predict performance in relatively narrow, well-defined task domains rather than broad intellectual functioning.

A substantial body of research has examined gender differences on clerical speed and accuracy tasks. Schneider and Paterson (1942) were among the first to report a female advantage on clerical aptitude measures, and Majeres (1977) linked this advantage to differences in the perceptual and verbal encoding strategies used during rapid symbol comparison. Reviewing large normative samples, Feingold (1992) reported a fairly consistent female advantage on clerical speed measures across successive test standardisations. More recent reviews have



continued to report that females tend to perform faster on clerical-type processing-speed tasks, although the reported effect sizes are generally modest and vary across cultural and educational contexts.

Locale-based comparisons of aptitude have produced mixed findings. Pujar and Chanda (2017), comparing rural and urban secondary school students on several Differential Aptitude Test dimensions, found that urban students generally scored higher on verbal, numerical, abstract, and mechanical reasoning measures, a pattern they attributed to differential access to educational resources and enrichment opportunities. Such findings have contributed to a general assumption that urban schooling confers a broad aptitude advantage, although researchers have cautioned that the pattern is not uniform across all aptitude domains and may not extend to speeded, perceptual-accuracy tasks such as clerical ability.

The relationship between specific aptitudes and academic achievement has also received attention. Fleishman (1972) argued that perceptual-speed abilities, including clerical-type skills, form a distinct component within the broader taxonomy of human abilities and are meaningfully related to performance on tasks that require sustained attention and accuracy — attributes that plausibly extend to classroom achievement more generally. Guilford and Fruchter (1978) and Garrett (1981) provided the statistical foundations, including the Critical Ratio test for the significance of the difference between means of independent groups, that continue to underlie educational research of this kind.

Taken together, the literature suggests three broad expectations against which the present findings can be read: a possible female advantage in clerical ability, a possible urban advantage reflecting differential resource access, and a positive association between clerical ability and academic achievement. The present study tests these expectations directly in a large Indian secondary-school sample.

Objectives of the Study

The specific objectives of the present study were:

- To study the nature of the distribution of clerical ability scores among secondary school students.
- To compare the mean clerical ability scores of students of Standard 9 and Standard 10.
- To compare the mean clerical ability scores of students of rural and urban areas.



- To compare the mean clerical ability scores of boys and girls.
- To compare the mean clerical ability scores of students with low, middle, and high academic achievement.

Hypotheses

In accordance with the objectives, the following six null hypotheses were formulated and tested:

H01: There is no significant difference between the mean clerical ability scores of students of Standard-9 and Standard-10.

H02: There is no significant difference between the mean clerical ability scores of students of rural and urban areas.

H03: There is no significant difference between the mean clerical ability scores of boys and girls.

H04: There is no significant difference between the mean clerical ability scores of students with low and middle academic achievement.

H05: There is no significant difference between the mean clerical ability scores of students with low and high academic achievement.

H06: There is no significant difference between the mean clerical ability scores of students with middle and high academic achievement.

Method

Design

The study followed a descriptive survey design of the differential (ex post facto) type, comparing pre-existing, naturally occurring groups of students on a standardised measure of clerical ability.

Sample

The sample consisted of 1,812 secondary school students of Standard 9 ($n = 1,016$) and Standard 10 ($n = 796$). Of these, 866 students belonged to rural areas and 946 to urban areas; 1,109 were boys and 703 were girls. For achievement-level comparisons, students were further classified into low ($n = 454$), middle ($n = 905$), and high ($n = 453$) academic achievement groups on the basis of their prior academic performance.



Tool

Clerical ability was measured using the Clerical Ability subtest of a re-standardised Differential Aptitude Test Battery, constructed in the tradition of the Clerical Speed and Accuracy subtest of the Differential Aptitude Tests originally developed by Faculty of Education, which requires the rapid and accurate comparison, checking, or matching of letter and number combinations under timed conditions. Scores on the subtest used in the present study ranged from 0 to 21.

Statistical Technique

Descriptive statistics (mean, median, mode, standard deviation, skewness, and kurtosis) were computed to examine the nature of the score distribution. The significance of the difference between the mean scores of independent groups was tested using the Critical Ratio (C.R.) test, following the procedures outlined by Garrett (1981) and Guilford and Fruchter (1978). A calculated C.R. value at or above 1.96 was treated as significant at the .05 level, and a value at or above 2.58 was treated as significant at the .01 level, for the relevant degrees of freedom.

Results

Nature of the Distribution

Descriptive statistics for clerical ability scores of the full sample (N = 1,812) are presented in Table 1.

Table 1
Descriptive Statistics for Clerical Ability Scores

Statistic	Value
Mean	18.49
Standard Error	0.09
Median	20
Mode	21
Standard Deviation	3.96
Sample Variance	15.72
Kurtosis	5.34
Skewness	-2.26



Statistic	Value
Range	21
Minimum	0
Maximum	21
Sum	33,510
N	1,812
95% Confidence Interval ($\pm$)	0.18

Table 2
Frequency Distribution of Clerical Ability Scores

Class Interval	Frequency	Percentage
-2-0	11	0.6
1-3	15	0.8
4-6	14	0.8
7-9	42	2.3
10-12	87	4.8
13-15	121	6.7
16-18	203	11.2
19-21	1,319	72.8
22-24	0	0.0

The mean (18.49), median (20), and mode (21) of the distribution, together with pronounced negative skewness (-2.26) and high positive kurtosis (5.34), indicate a strongly left-skewed, sharply peaked (leptokurtic) distribution. Nearly three-quarters of the sample (72.8%) scored within the top score band of 19-21, out of a maximum possible score of 21, pointing to a marked ceiling effect in which the majority of students performed close to the upper limit of the test.



Comparison across Grade, Locale, Gender, and Achievement Level

Table 3

Comparison of Mean Clerical Ability Scores of Students of Standard 9 and Standard 10

Standard	N	M	SD	SEd	C.R.	Remark
9	1,016	18.38	4.11	0.19	1.36	NS
10	796	18.63	3.77			

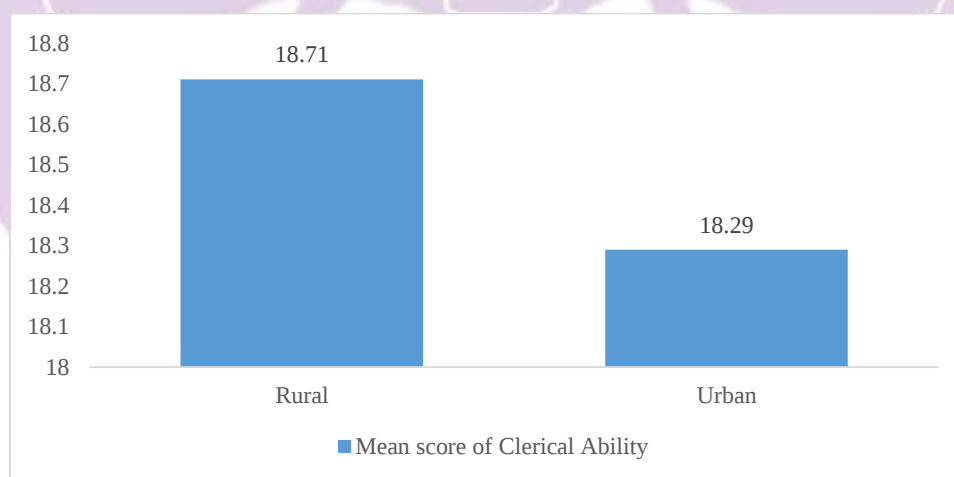
Table 3 shows a calculated C.R. of 1.36 (df = 1,810), which is below the tabulated value of 1.96 required for significance at the .05 level. H01 was therefore not rejected: students of Standard 9 and Standard 10 did not differ significantly in mean clerical ability.

Table 4

Comparison of Mean Clerical Ability Scores of Rural and Urban Students

Area	N	M	SD	SEd	C.R.	Remark
Rural	866	18.71	3.72	0.19	2.29	0.05
Urban	946	18.29	4.17			

Table 4 shows a calculated C.R. of 2.29 (df = 1,810), which exceeds the tabulated value of 1.96 at the .05 level. H02 was therefore rejected: rural students obtained significantly higher mean clerical ability scores than urban students.



Graph No. 1

Comparison of mean scores of Clerical Ability of Students of Rural and Urban Area

Table 5

Comparison of Mean Clerical Ability Scores of Boys and Girls

Gender	N	M	SD	SEd	C.R.	Remark
Boys	1,109	18.48	3.97	0.19	0.14	NS
Girls	703	18.51	3.96			

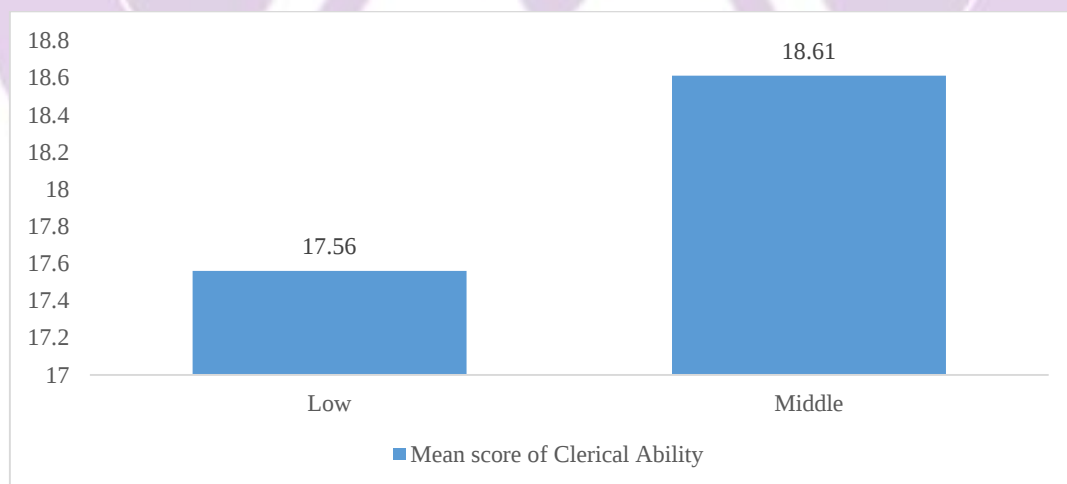
Table 5 shows a calculated C.R. of 0.14 (df = 1,810), well below the tabulated value of 1.96. H03 was therefore not rejected: boys and girls did not differ significantly in mean clerical ability.

Table 6

Comparison of Mean Clerical Ability Scores of Low- and Middle-Achieving Students

Achievement Level	N	M	SD	SEd	C.R.	Remark
Low	454	17.56	4.61	0.25	4.20	0.01
Middle	905	18.61	3.76			

Table 6 shows a calculated C.R. of 4.20 (df = 1,357), exceeding the tabulated value of 2.58 at the .01 level. H04 was therefore rejected: middle-achieving students scored significantly higher than low-achieving students on clerical ability.



Graph No.- 2

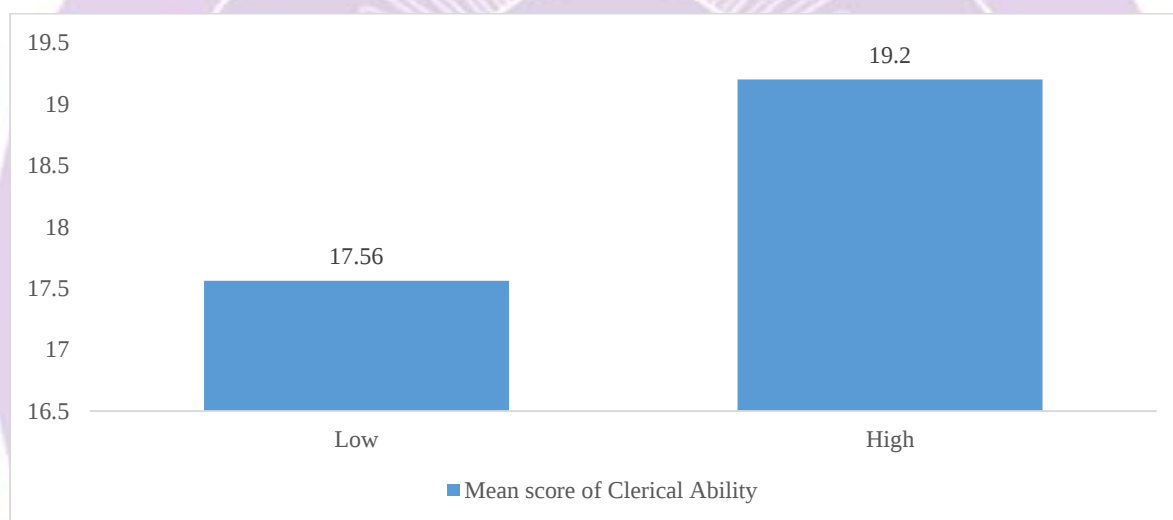
Comparison of mean scores of Clerical Ability of Students having Low and Middle Achievement

Table 7

Comparison of Mean Clerical Ability Scores of Low- and High-Achieving Students

Achievement Level	N	M	SD	SEd	C.R.	Remark
Low	454	17.56	4.61	0.27	6.05	0.01
High	453	19.20	3.48			

Table 7 shows a calculated C.R. of 6.05 (df = 905), exceeding the tabulated value of 2.58 at the .01 level. H₀₅ was therefore rejected: high-achieving students scored significantly higher than low-achieving students on clerical ability.



Graph No.- 3

Comparison of mean scores of Clerical Ability of Students having Low and High Achievement

Table 8

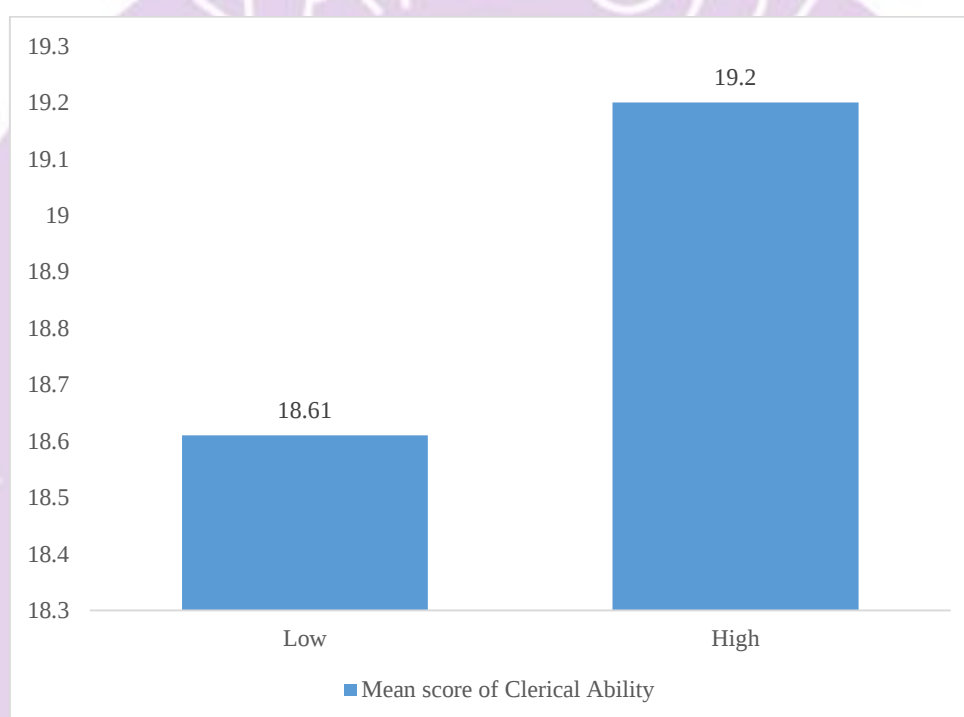
Comparison of Mean Clerical Ability Scores of Middle- and High-Achieving Students

Achievement Level	N	M	SD	SEd	C.R.	Remark
Middle	905	18.61	3.76	0.21	2.87	0.01
High	453	19.20	3.48			



Table 8 shows a calculated C.R. of 2.87 ($df = 1,356$), exceeding the tabulated value of 2.58 at the .01 level. H06 was therefore rejected: high-achieving students scored significantly higher than middle-achieving students on clerical ability.

Considered together, Tables 6–8 show a consistent, monotonically increasing pattern of mean clerical ability scores across the three achievement groups (Low $M = 17.56 < \text{Middle } M = 18.61 < \text{High } M = 19.20$), with every pairwise comparison statistically significant at the .01 level.



Graph No.- 4

Comparison of mean scores of Clerical Ability of Students having Middle and High Achievement

Discussion

The absence of a significant difference between Standard 9 and Standard 10 students on clerical ability (H01) is consistent with the view that clerical ability, as a perceptual-speed skill rather than a content-based competency, is less directly shaped by a single additional year of subject-matter instruction than abilities such as numerical or verbal reasoning. Because both grades share a broadly similar curriculum and testing culture, a two-year interval may be insufficient to produce a detectable shift in this particular skill.



The finding that rural students scored significantly higher than urban students (H02) runs counter to the more common pattern reported in the aptitude literature, where urban students have generally been found to outperform rural students on several Differential Aptitude Test dimensions, including verbal, numerical, and reasoning measures (Pujar & Chanda, 2017). One plausible explanation is that clerical ability, unlike reasoning-based aptitudes, depends less on exposure to enriched academic resources and more on sustained, focused practice with routine, repetitive tasks — a mode of engagement that may be less disrupted by the greater availability of digital distractions typically reported among urban students. This divergence from the general urban-advantage pattern underlines the importance of examining aptitude domains separately rather than assuming a uniform locale effect across all abilities.

The absence of a significant gender difference on clerical ability (H03) is noteworthy in light of a long research tradition reporting a female advantage on clerical speed and accuracy tasks (Feingold, 1992; Majeres, 1977; Schneider & Paterson, 1942). Several factors may account for this divergence in the present sample. First, the pronounced ceiling effect evident in Table 1 and Table 2 — with nearly three-quarters of students scoring at or near the maximum — substantially restricts the variance available for any group difference, gender included, to emerge as statistically significant. Second, co-educational schooling with a common curriculum and shared test-preparation practices may narrow gender gaps that have historically been observed in less standardised settings. The present finding should therefore be interpreted with the ceiling effect in mind rather than as a straightforward contradiction of the wider literature.

The clearest and most consistent pattern in the present results is the positive, graded relationship between clerical ability and academic achievement level (H04–H06). This is in line with Fleishman's (1972) argument that perceptual-speed abilities are related to performance on tasks demanding sustained attention and accuracy — qualities that plausibly transfer to broader academic work such as note-taking, revision, and examination performance. The consistency of this pattern across all three pairwise achievement comparisons, each significant at the .01 level, suggests that clerical ability may be a useful low-stakes indicator of students' general work habits and attentional discipline, even though it is not itself a measure of subject-matter knowledge.



The strongly negatively skewed and leptokurtic distribution of scores (Table 1) is itself an important finding. A ceiling effect of this magnitude suggests that the test, as administered to this sample, may not have been sufficiently difficult or sufficiently timed to differentiate meaningfully among the majority of students clustered at the top of the range. This has direct implications for the interpretation of the non-significant findings (H01 and H03) reported above, and it suggests that future administrations of the tool in similar populations may benefit from stricter time limits or more demanding item content to restore discriminating power across the full range of ability.

Educational Implications

- Accuracy- and speed-based classroom tasks — timed proof-reading, tabulation, and data-checking exercises — can be used routinely to develop and reinforce clerical ability alongside subject-matter instruction.
- Given the strong positive association between clerical ability and academic achievement, structured practice in sustained-attention and accuracy tasks may be a useful, low-cost component of remedial support for low-achieving students.
- Because clerical ability showed a rural advantage rather than the more commonly reported urban advantage, curriculum planners should avoid assuming a uniform locale-based aptitude gap and should assess each aptitude domain independently when designing locale-specific interventions.
- The pronounced ceiling effect observed here suggests a need for periodic review and re-calibration of clerical ability tools used at the secondary level, so that they retain sufficient discriminating power across the full range of student performance.

Conclusion

Clerical ability among the secondary school students studied here was high overall and strongly skewed toward the upper end of the score range. Grade level and gender were not significant sources of variation, whereas residential locale and, most strongly and consistently, academic achievement level were significantly related to clerical ability, with rural and higher-achieving students scoring higher on average. These findings extend the differential-aptitude literature by showing that, within this population, clerical ability tracks more closely with academic achievement than with the demographic variables of grade and gender that are more commonly



examined, and they point to clerical ability as a domain worth attending to in both classroom instruction and future aptitude research.

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