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Effect of Cognitive Dissonance on Academic Achievement of Secondary School Students of Bhadrak District

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***Abstract*-- Cognitive dissonance is the mental tension that occurs when someone has conflicting views, feelings or actions. In this study, the effect of cognitive dissonance on the academic achievement of secondary school students of Bhadrak District, Odisha was studied. The differences in academic achievement according to the cognitive dissonance were explored using descriptive survey research method with students from rural and urban students of government and private school. Ten secondary school in Bhadrak District were selected and 100 students were selected by using simple random sampling technique. The data were collected by self-developed and expert-validated questionnaires to measure cognitive dissonance and its association with academic achievement. The data were analysed using statistical techniques like Mean, Standard Deviation, Quartile Deviation, Coefficient of Quartile Deviation and Pearson's Product Moment Correlation. The study revealed that the rural students achieved higher academic achievement scores (M=28.08) than the urban students (M=25.04) and government school students achieved higher academic achievement scores (M=28.06) than private school students (M=25.04). But, the scores of cognitive dissonance did not differ much between groups. The Pearson correlation matrix revealed that cognitive dissonance had very small and statistically insignificant negative correlations with academic achievement with all the students of the urban, rural, private and government schools. The overall correlation (r=-0.0615, p>0.05) showed that there was no significant relationship between cognitive dissonance and academic achievement. The study found that cognitive dissonance affects the psychological experiences of students but not in any measurable way on their way to school success. The results emphasize the need to consider other contextual, socio-economic and institutional determinants of academic outcomes.**

***Keywords*-- Cognitive Dissonance, Academic Performance, Academic Achievement**

I. Introduction

The goal of education is not only to improve students' cognitive skills but also to promote their psychological health which is conducive to good learning. Cognitive dissonance has become a prominent construct among the psychological factors that affect students' academic performance. Festinger (1957) first defined cognitive dissonance as "an aversive state of arousal that occurs when an inconsistency is present between the cognitive elements of an individual's beliefs, attitudes, values, or behaviours.

Cognitive dissonance can happen when students face challenges with their learning and their goals, leading to implications for their motivation, choice of learning, engagement in learning, and achievement. Evidence indicates that they are motivated to eliminate this discomfort by changing their beliefs or behaviour which in turn impact their educational experiences and performance (Festinger, 1957; Harmon-Jones & Mills, 2019).

Students' academic performance is important in determining their learning success; and there are many cognitive, emotional and environmental factors that affect students' academic achievement. Secondary school years are times of greater expectations in school, social pressures and developmental difficulties creating greater susceptibility for cognitive conflicts. These can happen when expectations and aspirations are set too high or too low, when parents and children have different interests, or when they have different attitudes to learning and to how they learn. Research has shown that cognitive dissonance might impact students' concentration, self-regulation and engagement in learning and, consequently, their achievement (Cancino-Montecinos, Björklund & Lindholm, 2017; Deb et al., 2010). Studying the impact of cognitive dissonance on secondary school students' academic performance is therefore crucial for grasping the role of psychological factors in education outcomes and designing educational interventions to optimize learning and academic performance. Research has consistently shown that academic performance is influenced by a variety of factors, including psychological, social, environmental, and cognitive variables (Malik, 2017). Among these, cognitive factors are particularly important because they directly affect students' ability to process information, solve problems, make decisions, and engage effectively in learning activities. Understanding the cognitive processes that influence academic achievement is therefore essential for improving educational outcomes and promoting student success.

II. Review Of Related Literature

The literature review shows that cognitive and psychological factors are important determinants of a person's behaviour, emotional health and educational outcomes. Previous research has pointed out that cognitive dissonance and cognitive conflicts are prevalent factors that affect learning and behaviours.

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Alford (2010) reported that cognitive dissonance had significant impact on the teaching learning process, suggesting a relationship between inconsistencies in beliefs and practices and their impact on the teaching learning process.

Cancino-Montecinos and Björklund (2017; 2018) found had effects of deeper cognitive processing, attitude change, and emotional regulation may also impact behavioural responses so that dissonance can lead to adaptation. There is also a strong connection between cognitive distortions, psychological distress and emotional well-being, which has been established through research. In a study by Maurya and Asthana, (2019), it was observed that cognitive distortions had significant predicting power for stress, anxiety and depression in adolescents, which indicates that maladaptive cognitive processes have negative effects on adolescents.

In support of this, Deb and Chatterjee (2010) found that secondary school students in India were experiencing high anxiety levels and pinpointed a number of factors that were linked to greater psychological stress. Lian et al., (2022) discovered that adolescents' cognition, attitude and efficacy played a significant role in their health-related decision-making behaviours. Similarly, Schiffer (2021) showed the significance of cognitive processes in behavioral control and psychological intervention effect. Taken together these studies indicate that cognitive mechanisms are important in influencing human behaviour and adjustment, though in different contexts.

Other studies, like those of Long (2013) and Bhatia, Srivastava, and Moond (2020), offer data on the extent to which cognitive and psychological problems occur in various groups. In their study, they highlight the need to comprehend cognitive and emotional influences in developmental and educational outcomes.

III. Rationale Of The Study

Cognitive dissonance occurs when there are inconsistencies or gaps between the cognitive, affective, and behavioral components of a person's beliefs, attitudes, and behaviours, causing a state of psychological discomfort that can lead to negative impacts on cognitive functioning, emotional state, and academic achievement. Cognitive and emotional influences have been therefore a focus of previous research in education. Deb et al. (2010) found secondary school students are commonly suffering from anxiety and psychological distress, which can have negative impacts on learning and engagement in school. In a similar manner, Malik (2017) stated that cognitive problem has a significant impact on students' academic performance, and highlighted the importance of cognitive processes in educational performance.

It has also been found that cognitive dissonance correlates with attitude change, emotional control and behavior change. Cognitive conflict by Cancino-Montecinos and Björklund (2017, 2018) and cognitive distortions by Maurya and Asthana (2019) were found to play a significant role in promoting deeper cognitive processing and behavioural change, and in causing stress, anxiety and depression in adolescents respectively. The psychological problems can have a negative impact on students' academic achievement and growth, which is indirect.

Although much research has been undertaken on cognitive and emotional dimensions, there have been very few studies that have investigated the relationship between cognitive dissonance and academic success among secondary school students specifically with the Indian context. Furthermore, there are few comparative studies based on locality (urban vs rural) and school management (government vs private). This gap in the literature served as motivation to conduct the present study to examine how Cognitive Dissonance influences Secondary students' academic achievement in Bhadrak District of Odisha.

IV. Objectives Of The Study

1. To examine and compare the effect of Cognitive dissonance of secondary school students on their academic achievement with reference to locality (Urban/Rural).
2. To examine and compare the effect of cognitive dissonance of secondary school students on their academic achievement with reference to type of management of school (government/private).

V. Hypotheses

HO_1: There is no significant difference between the academic achievement of rural and urban secondary school students with respect to cognitive dissonance.

HO_2: There is no significant difference between the academic achievement between thegovernment and private secondary school students with respect to Cognitive dissonance.

VI. Methodology

The method of the study used by the researcher was descriptive survey. To collect the data the sample size was 100 secondary school students randomly selected from ten schools in the Bhadrak District. The questionnaires were self-developed and expert-validated and used to collect data. Data collected were analyzed using percentage and comparative statistics

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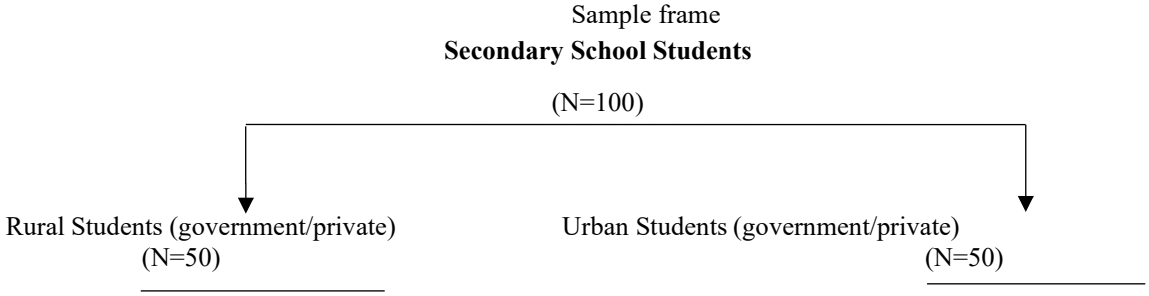

VII. Tool Used

A Self-developed Questionnaire was used to examine the effect of cognitive dissonance of students on their academic achievement and standardized by the experts.

VIII. Statistics Used

The researcher used mean, SD, quartile deviation and Pearson coefficient correlation for analyzing the data.

IX. Analysis And Interpretation

Overall Descriptive Statistics

The table below summarises descriptive statistics for the total sample of 100 students.

Table 1: Overall Descriptive Statistics (N = 100)

Measure	Mean	Std Dev	Q1 (25th)	Q3 (75th)	QD
AA Score (Overall)	26.56	5.20	22.00	30.25	4.12
CD Score (Overall)	67.54	5.41	63.00	71.25	4.12

Both AA and CD scores share an identical Quartile Deviation of 4.12, suggesting comparable variability in both measures across the full sample. The mean CD score (67.54) is considerably higher than the mean AA score (26.56), which is expected given the different scales of measurement.

Cognitive Dissonance on Academic Achievement by Locality (Urban vs Rural)

The following table presents the Quartile Deviation statistics for AA and CD scores segmented by locality (Urban vs Rural).

Table 2: Quartile Deviation — AA and CD Scores by Locality

Group	N	Mean	SD	Q1	Q3	QD	Coeff QD
Urban — AA Score	50	25.04	5.04	21.25	29.00	3.88	0.1542
Rural — AA Score	50	28.08	4.38	25.25	31.00	2.88	0.1022
Urban — CD Score	50	67.82	4.94	64.25	71.75	3.75	0.0551
Rural — CD Score	50	67.26	5.05	63.00	71.00	4.00	0.0597

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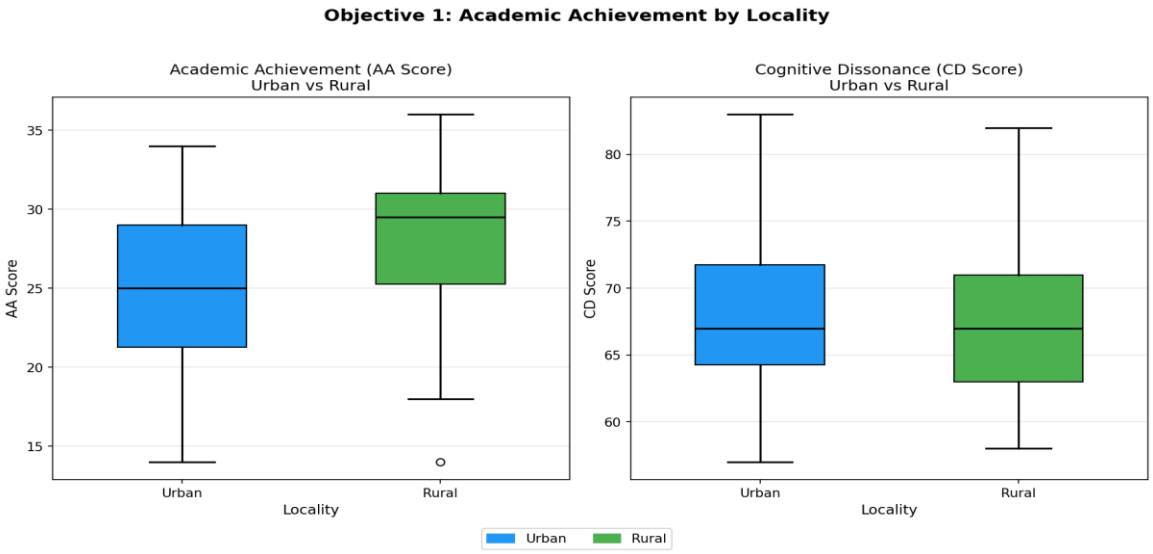

Figure 1: Box Plot — AA and CD Scores by Locality (Urban vs Rural)

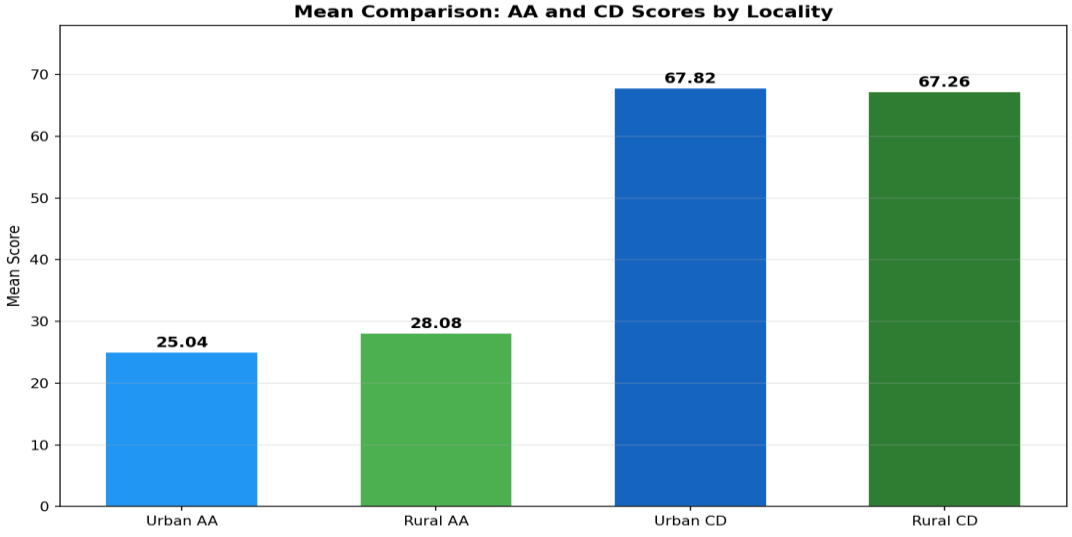

Figure 2: Mean Comparison of AA and CD Scores by Locality

The rural secondary school students achieved higher academic achievement (Mean = 28.08) than that of their urban counterparts (Mean = 25.04), thus, comparatively better academic performance was achieved. The lower Quartile Deviation and the Coefficient of Quartile Deviation of the rural students indicate that there is greater uniformity and homogeneity in the students' academic scores compared to those of the urban students. For the students, cognitive dissonance scores were nearly the same for both groups, suggesting that there was not much difference in the amount of cognitive dissonance that was experienced depending on the locality.

But there were slightly more variations in the cognitive dissonance score of the rural students than the urban students.

Testing Of Hypothesis

HO_1: There is no significant difference between the academic achievement of rural and urbansecondary school students with respect to cognitive dissonance.

The Pearson Coefficient of Correlation was computed between CD and AA scores for each locality group (Urban vs Rural). Results are presented in the table below.

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Table 3: Pearson Correlation for CD vs AA by Locality

Locality Group	N	r (Pearson)	p-value	Significance
Urban Students	50	-0.0509	0.7254	Not Significant (p > 0.05)
Rural Students	50	-0.0457	0.7527	Not Significant (p > 0.05)
Overall (Combined)	100	-0.0615	0.5436	Not Significant (p > 0.05)

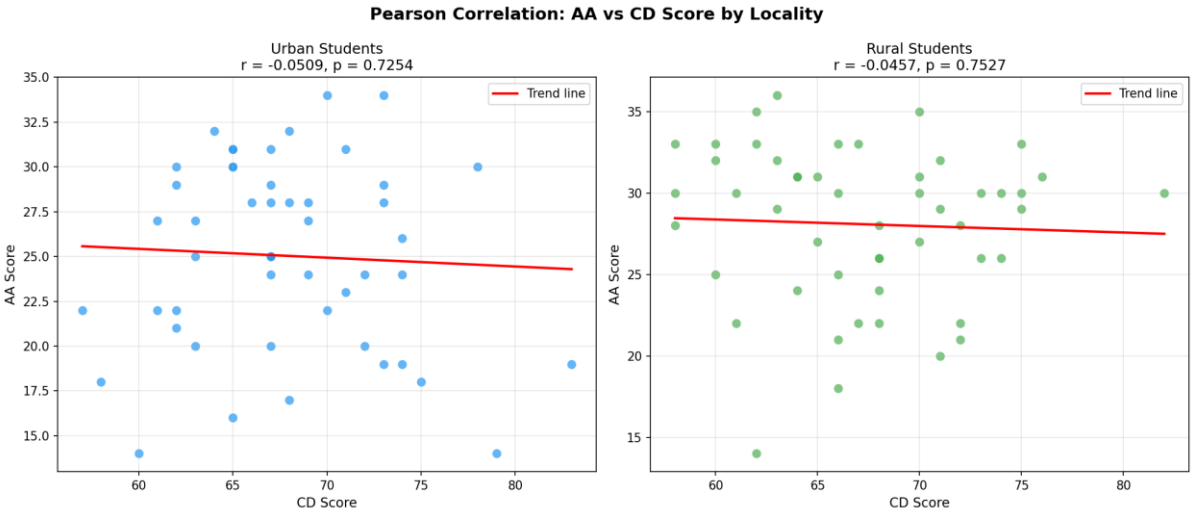

Figure 3: Scatter Plots — Pearson Correlation between CD and AA Scores (Urban and Rural)

Neither the urban nor the rural students showed significant and negative Pearson correlation between Cognitive Dissonance (CD) and Academic Achievement (AA) ($r = -0.0509$, $p > 0.05$ and $r = -0.0457$, $p > 0.05$, respectively). The overall correlation of the total sample was also very low ($r = -0.0615$) and non-significant ($p>0.05$) which means there is no significant influence of cognitive dissonance on academic achievement. The results indicated that, while there were some differences in academic performance between the rural and urban students, the amount of cognitive dissonance students experience is not strongly linked to their academic performance, regardless of location.

Effect of Cognitive Dissonance on Academic Achievement by School Management (Private vs Government)

The table below presents the Quartile Deviation statistics for AA scores segmented by type of school management.

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Table 4: Quartile Deviation of AA Scores by School Management Type

Group	N	Mean	SD	Q1	Q3	QD	Coeff QD
Private School (AA)	50	25.04	5.04	21.25	29.00	3.88	0.1542
Government School (AA)	50	28.06	4.85	25.25	31.00	2.88	0.1022

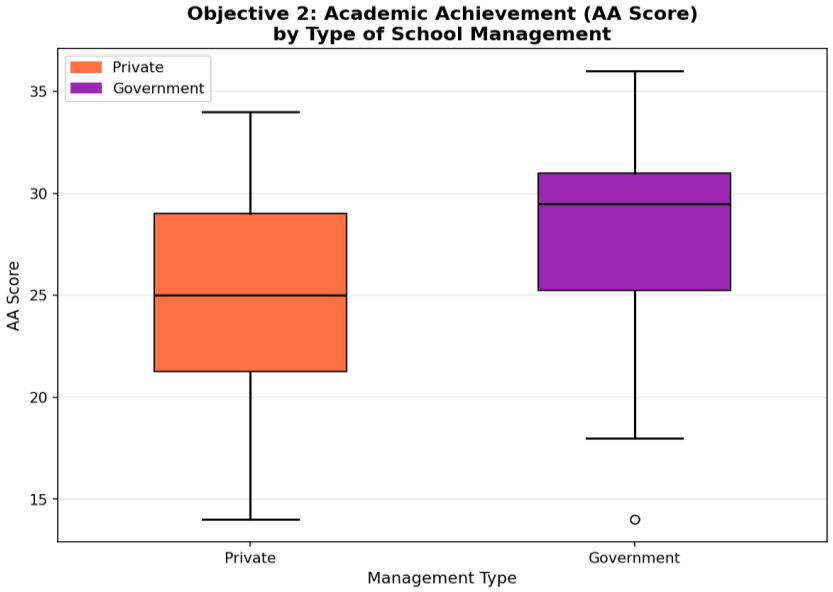

Figure 4: Box Plot — AA Scores by School Management Type (Private vs Government)

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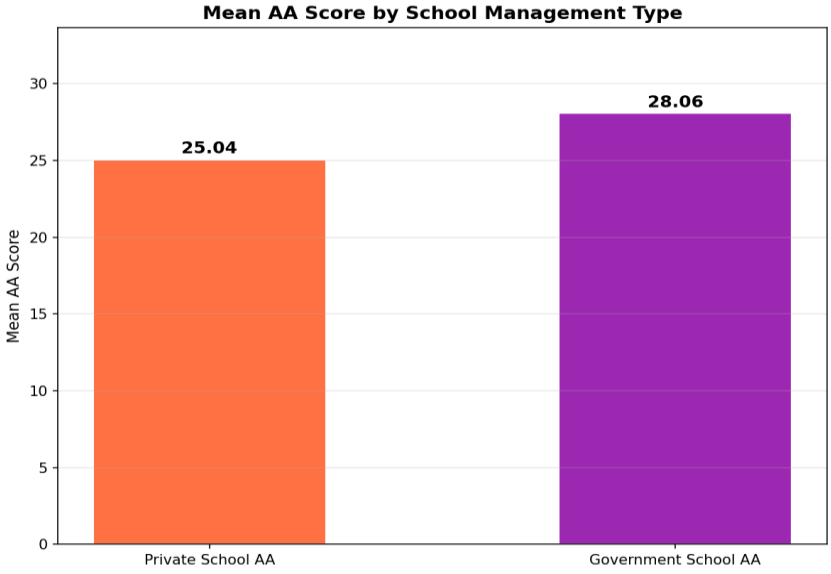

Figure 5: Mean AA Score Comparison — Private vs Government School Students

The academic achievement scores of government school students (Mean = 28.06) were higher than those of the private school students (Mean = 25.04) which shows that government school students' academic achievement scores were comparatively higher. Further, the lower Quartile Deviation and Coefficient of Quartile Deviation of Government school students indicate low level of variation and uniformity in their academic performance. The scores from the students in the private school were more spread out, indicating a wider range of achievement among the students in this category.

Testing Of Hypothesis

HO_2: There is no significant difference between the academic achievement between thegovernment and private secondary school students with respect to Cognitive dissonance.

Pearson Correlation coefficients were computed between CD and AA scores for secondary students from private and government schools respectively. Results are presented below.

Table 5: Pearson Correlation for CD vs AA by School Management Type

Management Group	N	r (Pearson)	p-value	Significance
Private School Students	50	-0.0509	0.7254	Not Significant (p > 0.05)
Government School Students	50	-0.0805	0.5786	Not Significant (p > 0.05)

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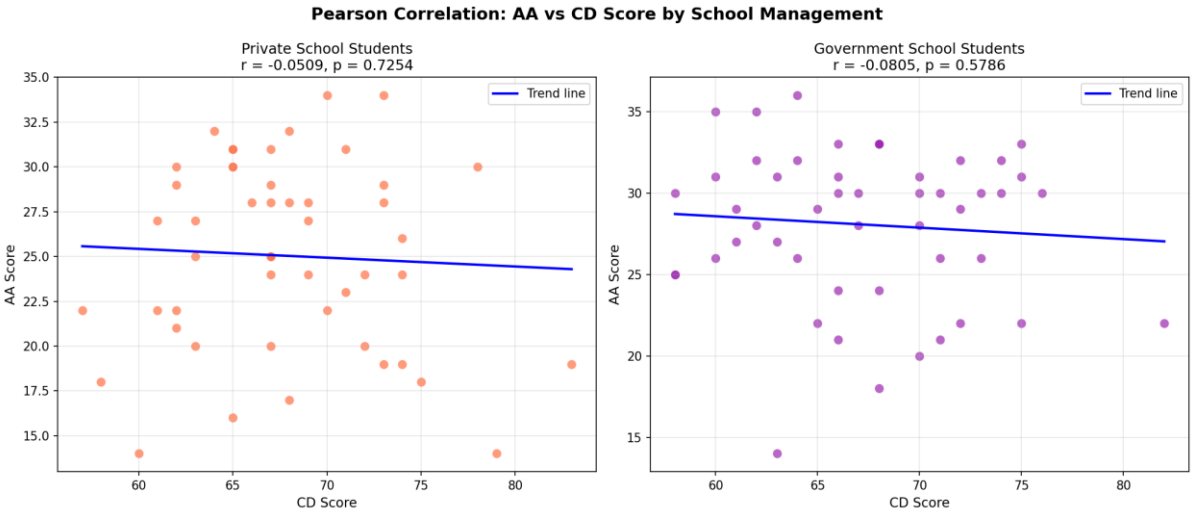

Figure 6: Scatter Plots for Pearson Correlation between CD and AA Scores (Private and Government Schools)

The Pearson correlation analysis revealed negligible and statistically non-significant negative relationships between Cognitive Dissonance (CD) and Academic Achievement (AA) among both private school students ($r = -0.0509$, $p > 0.05$) and government school students ($r = -0.0805$, $p > 0.05$).

Although government school students achieved higher and more consistent academic scores than private school students, cognitive dissonance did not significantly influence academic achievement in either group. The findings indicate that cognitive dissonance is not a reliable predictor of academic performance when students are compared based on school management type.

Table 6: Comprehensive Summary Statistics Across All Groups

Group	N	AA Mean	AA QD	CD Mean	CD QD	r (CD vs AA)	p-value
Urban Students	50	25.04	3.88	67.82	3.75	-0.0509	0.7254
Rural Students	50	28.08	2.88	67.26	4.00	-0.0457	0.7527
Private School Students	50	25.04	3.88	—	—	-0.0509	0.7254
Govt. School Students	50	28.06	2.88	—	—	-0.0805	0.5786
Overall (N=100)	100	26.56	4.12	67.54	4.12	-0.0615	0.5436

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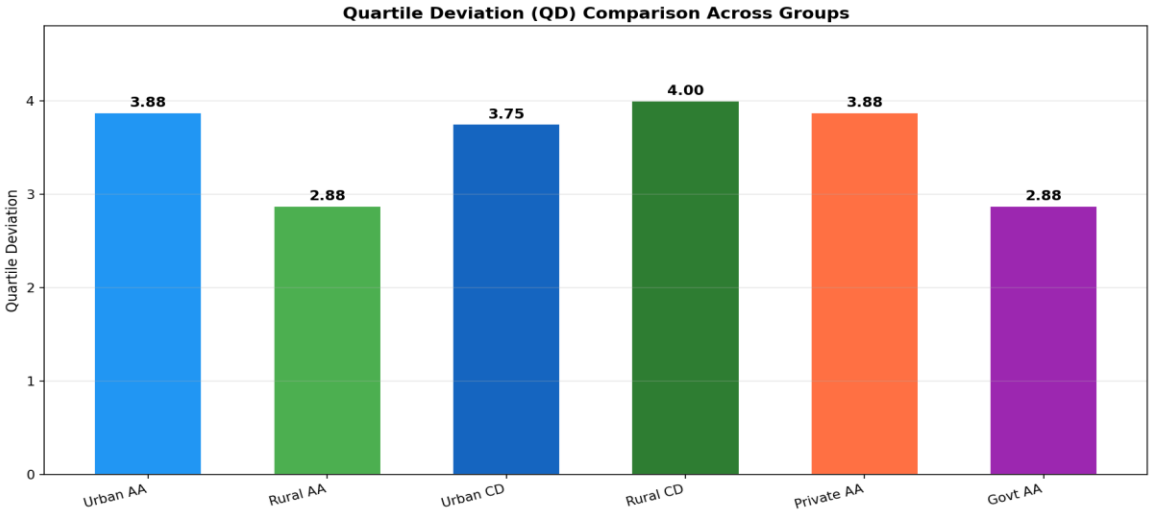

Figure 7: Quartile Deviation Comparison Across All Groups

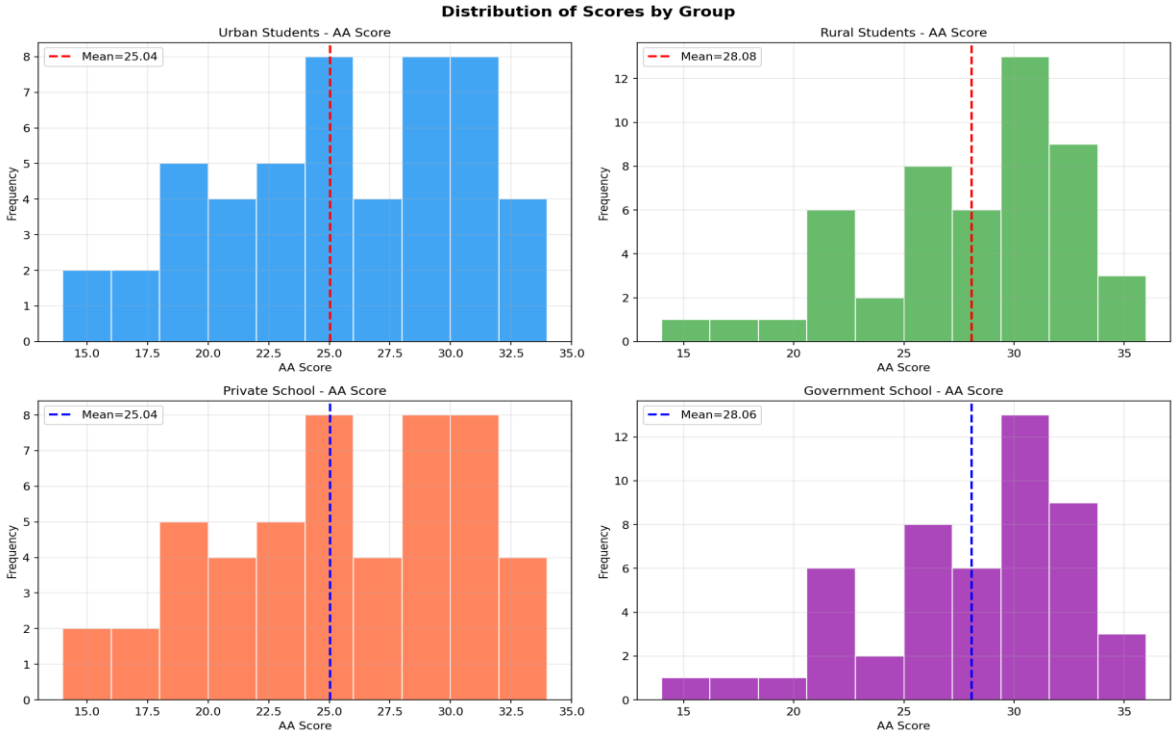

Figure 8: Distribution Histograms — AA Scores by Group

X. Major Findings

1. The overall mean Academic Achievement (AA) score of students was 26.56, while the mean Cognitive Dissonance (CD) score was 67.54.
2. Rural students demonstrated higher academic achievement (Mean=28.08) than urban students (Mean=25.04).
3. Rural students showed more homogeneous academic performance (QD=2.88) than urban students (QD=3.88).

4. The level of cognitive dissonance was almost identical among rural (Mean=67.26) and urban students (Mean=67.82).
5. The correlation between cognitive dissonance and academic achievement was negligible and non-significant among urban students (r=-0.0509, p>0.05).
6. The correlation between cognitive dissonance and academic achievement was negligible and non-significant among rural students (r=-0.0457, p>0.05).
7. Government school students achieved higher academic scores (Mean=28.06) than private school students (Mean=25.04).
8. Government school students exhibited lower variability in achievement than private school students.
9. The relationship between cognitive dissonance and academic achievement was non-significant among private school students (r=-0.0509, p>0.05).
10. The relationship between cognitive dissonance and academic achievement was non-significant among government school students (r=-0.0805, p>0.05).
11. The overall correlation between cognitive dissonance and academic achievement was negligible and statistically non-significant (r=-0.0615, p>0.05).
12. Both hypotheses were retained as no significant relationship was found between cognitive dissonance and academic achievement across locality and school management categories.

XI. Discussion

It was found in the study that the academic performance of the rural students was better than the students in urban areas. The result of this study implies that, besides locality, factors like learning environment, teacher support, parents' monitoring and student motivation can play a significant role in academic achievement. The discovery goes against general perceptions that urban pupils have an academic edge because they have access to more educational opportunities.

The level of cognitive dissonance was found to be almost similar among rural and urban students. It means that all adolescents, regardless of where they live, have similar internal conflicts, uncertainties and cognitive tensions throughout adolescence.

The most critical finding of the study is that there is no significant relationship found between cognitive dissonance and academic achievement. The correlations were negative, but very small and not significant which contradicts the studies of Deb, Deb and Chatterjee (2010) who found out that the negative effect of anxiety and emotional stress on learning and achievement of students. Likewise, Malik (2017) stated that cognitive issues may hinder performance of students in their academic pursuits.

The present study implies that cognitive dissonance does not seem to be sufficient to directly impact academic performance. The results also contradict with the research conducted by Maurya and Asthana (2019) that cognitive distortions make significant contribution to stress, anxiety and depression. Both cognitive distortions and cognitive dissonance have conceptual similarities, but the current findings suggest that cognitive dissonance is not necessarily directly linked to decrease in academic performance among Secondary School students.

The findings could be understood within the framework of the ideas of Cancino-Montecinos and Björklund (2017; 2018), who claimed that cognitive conflict can engage deeper cognitive processing, and attitude change. So it is possible that the cognitive dissonance process does not always lead to negative consequences; sometimes it can be used as a catalyst for reflection, adaptation and better decision-making without necessarily impacting grades.

The academic performance of government school students was seen to be better than the students of private school. This finding can be explained by contextual factors, like examination orientation, teacher commitment, student composition or institutional practices. The differences in achievement seem to be influenced by factors other than cognitive dissonance, since there was no significant relationship of cognitive dissonance to achievement for either of the two management categories.

XII. Conclusion

The study ends that there is no statistically significant effect of cognitive dissonance on the academic achievement of secondary school students in Bhadrak district. While slight negative correlations were seen between cognitive dissonance and academic achievement for the locality and school management categories, those correlations were not significant. The academic achievement of the rural school students was relatively higher than the achievement of the urban school students; achievement of the government school students was relatively higher than the achievement of the private school students. Thus, the context (educational and socio-environmental) seems to have a greater influence on academic achievement than cognitive dissonance. However, psychological well-being of students is still a concern here as the cognitive dissonance can also have an indirect impact on the motivation, self-concept, emotional adjustment and learning behaviour. Larger sample sizes and other psychological factors could be used in future research to gain a better understanding of the factors influencing academic success.

XIII. Educational Implications

1. While cognitive dissonance did not emerge as a statistically significant predictor of academic achievement in this study, this does not rule out its qualitative or indirect influence.
2. Educators and school counsellors should continue to attend to students' psychological well-being and internal conflict resolution, as persistent cognitive dissonance may manifest through pathways not captured by linear correlation such as motivation, attendance, or test anxiety.
3. The performance gap between rural and urban students, and between government and private school students, warrants further investigation into socio-economic, infrastructural, and pedagogical factors.

Acknowledgement

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Abbreviation

AA-Academic Achievement, CD-Cognitive Dissonance, QD- Quartile Deviation, SD-Standard Deviation

Conflict of Interest

The authors declare there is no conflict of interest.

Declaration of AI Assistance

AI (ChatGPT) was used only for language editing and formatting.

Ethical Approval

This study was conducted based on the ethical standards with approval and consent from all individual participants incorporated in the study ensuing understanding of the research's aim and procedure.

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