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Perceptions Of Teacher Interpersonal Behaviour

A Study of Gender and Locality Differences in Mathematics Classrooms

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Abstract: Teacher–student interaction is central to the teaching–learning process, and the interpersonal behaviour of teachers plays a decisive role in shaping students' academic and psychological outcomes. This study examined secondary school students' perceptions of their mathematics teachers' interpersonal behaviour using the Questionnaire on Teacher Interaction (QTI). A sample of 820 students (412 males, 408 females; 445 rural, 375 urban) participated in the study. The QTI measured eight dimensions of teacher behaviour: Leadership, Helpful/Friendly, Understanding, Student Freedom, Uncertain, Dissatisfied, Admonishing, and Strict. Data were analysed using independent samples t-tests to identify gender- and locality-based differences. Results indicated that female students perceived their teachers as significantly more understanding, whereas male students reported greater student freedom, uncertainty, and dissatisfaction. Comparisons across locality showed that rural students perceived their teachers as more helpful, understanding, and supportive of freedom, as well as more uncertain, than did urban students. These findings highlight that perceptions of teacher interpersonal behaviour differ across demographic groups, underscoring the importance of fostering equitable, supportive classroom interactions. The study concludes that mathematics teachers should strive to reduce uncertainty and dissatisfaction while strengthening**.**

Index Terms **-** Teacher–Student Interaction, Interpersonal Behaviour, Mathematics Education, Gender Differences, Rural–Urban Differences.

I. INTRODUCTION

The classroom is not merely a site for the transmission of knowledge but also a social environment where interpersonal relationships profoundly influence teaching and learning. Among the many factors that shape students' educational experiences, **teacher–student interaction** stands out as one of the most critical (Pennings et al., 2018). The quality of the interaction is determined not only by instructional strategies or subject expertise but also by the **interpersonal behaviours of teachers**. **Interpersonal behaviour** refers to the patterns of social interaction that teachers display in classrooms, such as leadership, friendliness, understanding, or strictness. These behaviours are very important as it determines the emotional climate of the classroom, affect students' sense of security, and shape their engagement with learning. Positive interpersonal behaviours, such as providing leadership, demonstrating helpfulness, and showing understanding, have been shown to foster student motivation, participation, and achievement (Yi , 2021). They also enhance students' sense of belonging and self-efficacy, encouraging them to take active roles in the learning process (Meeuwisse & Born, 2010). On the other hand, negative interpersonal behaviours, such as dissatisfaction, admonishment, or uncertainty can create anxiety, disengagement, and reduced academic performance (Smart, 2009; Wei, Den Brok, & Zhou, 2009). The role of interpersonal behaviour in teacher-student interaction extends beyond academic achievement; it also influences students' psychological well-

being (Xiao, Tian, & Xu, 2023), social development, and attitudes toward school. A teacher who balances authority with empathy helps to create a classroom culture where students feel both challenged and supported (Traikou, 2024). In contrast, a teacher perceived as overly strict, uncertain, or dissatisfied may unintentionally weaken students' motivation and self-confidence.

Understanding these dynamics is particularly important in subjects like **mathematics**, where students often experience anxiety or disengagement (Luttenberger, Wimmer, & Paechter, 2018). Research suggests that supportive and understanding interpersonal behaviours by mathematics teachers can mitigate negative attitudes and enhance persistence in learning (Goh & Fraser, 1998). Furthermore, students' perceptions of teachers' interpersonal behaviour are not uniform but vary across **demographic variables such as gender and locality** (Koul & Fisher, 2005), making it essential to investigate how different groups of learners experience their teachers. The present study focuses on exploring the **interpersonal behaviour of mathematics teachers** as perceived by secondary school students of West Bengal, India. The primary purpose of the study is to examine whether significant differences exist in students' perceptions based on gender and locality of residence. This inquiry is significant because it provides insights into how teacher behaviours are experienced differently by diverse student groups and offers implications for improving classroom practice, equity, and overall educational quality.

II. THEORETICAL PERSPECTIVE

The study of learning environments is rooted in Lewin's (1936) field theory, which explained human behaviour as a function of personality and environment ($B = f[P, E]$). Later, Murray (1938) emphasized the role of environmental perception through the concepts of *Alpha Press* (non-participative observation) and *Beta Press* (participative observation). Moos (1974) further classified learning environments into three dimensions: **relationship**, **personal development**, and **system maintenance and change**. These perspectives collectively laid the foundation for studying the classroom as a psychosocial environment.

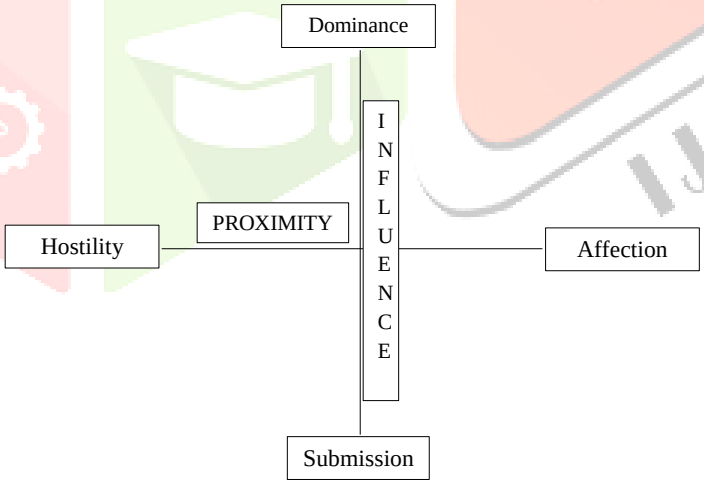

Figure 1: Leary Model of Interpersonal Behaviour here

From the **interpersonal perspective**, Wubbels and Levy (1991, 1993) adapted **Leary's (1957) model of interpersonal behaviour**, which originated in clinical psychology. Leary conceptualized interpersonal behaviour along two orthogonal dimensions: **Influence** (dominance-submission) and **Proximity** (cooperation-opposition). This two-dimensional framework (Fig. 1) allows interpersonal interactions to be mapped within a circular model of human behaviour.

Wubbels and Levy applied Leary's model to the classroom context. They further subdivided the two dimensions of the interpersonal behaviour into eight distinct behavioural sectors: **Leadership, Helping/Friendly, Understanding, Student Freedom, Uncertain, Dissatisfied, Admonishing, and Strict**. This model has become a cornerstone in the study of teacher-student interactions, providing a systematic framework to describe classroom communication patterns.

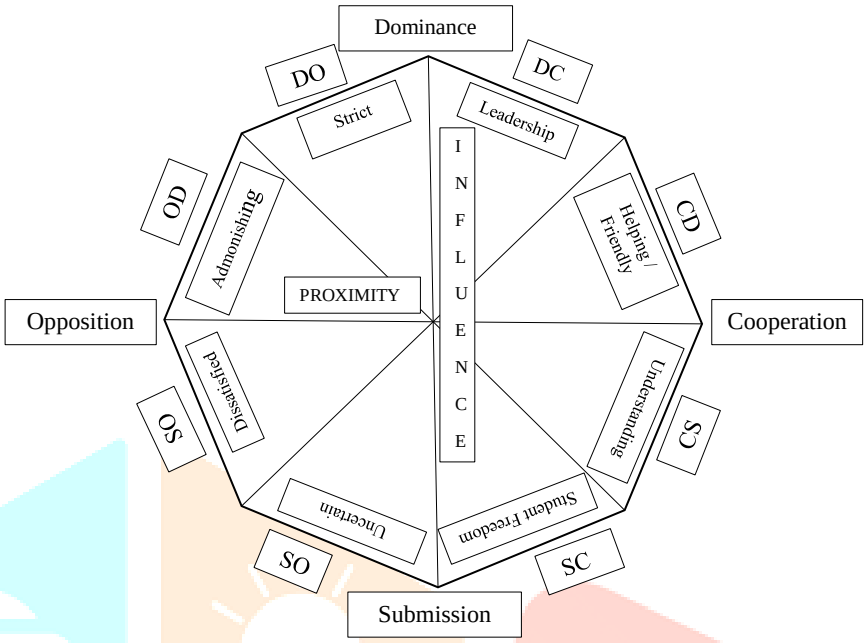

Figure 2: Model of Teacher Interpersonal Behaviour (Wubbels & Levy, 1991)

To measure these behaviours empirically, Wubbels, Créton, and Hooymayers (1985) developed the **Questionnaire on Teacher Interaction (QTI)**. The instrument has been adapted in various cultural contexts like the Dutch (77 items), American (64 items), and Australian short form (48 items). The Australian version has been successfully validated in India (Brok, Fisher, & Koul, 2005) as a reliable and valid tool for assessing students' perceptions of teacher interpersonal behaviour.

III. REVIEW OF LITERATURE

The study of teacher interpersonal behaviour in classrooms stems from the "Leary Model of Interpersonal Behaviour", which was first applied in educational contexts by Wubbels and Levy (1991). Their comparative study of Dutch and American teachers revealed cultural variations: American teachers exhibited stricter control, while Dutch teachers encouraged greater autonomy. This work laid the groundwork for cross-cultural research in classroom dynamics. A key outcome of these studies was the "development and validation of the Questionnaire on Teacher Interaction (QTI)" as a reliable tool for assessing teacher-student interactions or Interpersonal Teacher Behaviour. Fisher, Fraser, and Cresswell (1995) demonstrated its application in professional development, helping teachers recognize their behavioural strengths and weaknesses. Since then, the QTI has been adapted and validated across multiple cultural contexts including Korea (Kim, Fisher, & Fraser, 2000), Turkey (Telli et al., 2007), and China (Wei, Den Brok, & Zhou, 2009).

A strong line of research has established the connection between teacher behaviour and "student achievement and attitudes". Fisher, Waldrip, and Den Brok (2005) demonstrated that "influence and proximity" predicted both motivation and achievement. Similarly, Koul and Fisher (2005) found in India that "positive perceptions of teacher behaviour" correlated with improved student outcomes. Studies in Brunei (Den Brok, Fisher, & Koul, 2005) confirmed these findings, while Telli (2016) showed that

"cooperative interpersonal styles" universally enhanced student attitudes. Beside the cognitive and attitudinal aspects of learning, teacher interpersonal behaviour is also studied in connection with emotional and affective learning. These studies focus not only on achievement but also on "emotional and motivational factors". Lapointe et al. (2006) found positive associations between teacher behaviour, self-efficacy, and test anxiety. Telli et al. (2007) linked Turkish students' perceptions of teachers' interpersonal styles to their attitudes towards science. Wei, Den Brok, and Zhou (2009) revealed that some aspects of interpersonal behaviour like teacher uncertainty negatively influenced student learning in Chinese classrooms.

Several studies have focused on science and mathematics classrooms to establish links between interpersonal teacher behaviour and student learning. Fisher, Henderson, and Fraser (1995) reported that leadership, helpfulness, and understanding behaviour were strongly associated with positive attitudes toward biology. Goh and Fraser (1998) revealed that in Singaporean mathematics classrooms, interpersonal teacher behaviour consistently predicted both cognitive and affective outcomes in mathematics. Henderson, Fisher, and Fraser (2000) further emphasized that biology teachers' interpersonal behaviours were more strongly linked to student attitudes than to cognitive achievement. NeSmith (2003) confirmed the importance of leadership and understanding for student achievement in U.S. science classrooms. Den Brok, Taconis, and Fisher (2010) highlighted subject-specific differences, noting that "science teachers" were often perceived as "less dominant" than teachers of other subjects.

There are some evidence of cross-cultural research that expanded the field by highlighting how perceptions vary across cultural and gender contexts. Early comparative work in Singapore (Fisher et al., 1996; Rickards, Fisher, & Fraser, 1996) revealed differences influenced by cultural background. Kim, Fisher, and Fraser (2000) identified gender-based differences in Korea, recommending more supportive teaching styles. Further studies across diverse regions supported these insights, The Netherlands and U.S. (Wubbels & Levy, 1991), Singapore (Goh & Fraser, 1998), India (Koul & Fisher, 2005), Brunei (Den Brok, Fisher, & Koul, 2005), Hong Kong (Ming Yu & Zhu, 2011), Macau (Sivan & Chan, 2013), China (Wei, Den Brok, & Zhou, 2009), Nigeria (Ehigbor, 2017). These studies confirmed that cultural context shapes students' preferred teacher behaviours. Overall most of these studies confirmed that leadership, helpfulness, and understanding have a positive impact on students learning.

Overall, research demonstrates that "teacher interpersonal behaviour has a profound impact" on student cognitive, affective, and motivational outcomes. Across cultural contexts, three recurring positive dimensions—"leadership, helpfulness, and understanding"—emerge as essential in promoting learning. In contrast, teacher "uncertainty and dissatisfaction" often hinder student engagement and performance.

IV. OBJECTIVES OF THE STUDY

The study was conducted based on two objectives.

1. To identify whether there are significant differences in perceptions based on **gender**.
2. To investigate whether students' locality of residence (**rural vs. urban**) influences their perceptions of mathematics teachers' interpersonal behaviour.

V. METHODOLOGY

The present study adopted a **descriptive survey research design** to investigate students' perceptions of mathematics teachers' interpersonal behaviour. A quantitative approach was employed to examine differences across gender and locality of residence using statistical analysis.

The population of the study comprised **secondary school students studying mathematics** in various schools. From this population, a sample of **820 students** was selected using stratified random sampling to

ensure adequate representation of both gender and locality groups. Among them, **412 were male students** and **408 were female students**, while **445 were from rural schools** and **375 from urban schools**.

The data were collected using the Australian short version (48 items) of **Questionnaire on Teacher Interaction (QTI)**, originally developed by Wubbels and Levy (1991) and subsequently validated Indian cultural and educational contexts by Koul (2003). The QTI is designed to measure students' perceptions of their teachers' interpersonal behaviour in classrooms. The QTI employs a **circumplex model of interpersonal behaviour**, consisting of two dimensions: **Influence** (dominance - submission), and **Proximity** (cooperation – opposition).

Together, these dimensions produce eight distinct scales representing different teacher behaviours:

1. **Leadership** – the extent to which the teacher provides direction, organises learning activities, and sets clear expectations.
2. **Helpful/Friendly** – the extent of supportive, approachable, and encouraging behaviours.
3. **Understanding** – the degree of empathy, patience, and responsiveness to students' needs.
4. **Student Freedom** – the extent to which students are given independence and autonomy in learning.
5. **Uncertain** – perceptions of teachers as indecisive or lacking confidence.
6. **Dissatisfied** – the extent to which teachers are seen as critical, impatient, or dissatisfied with students.
7. **Admonishing** – the degree of corrective behaviour involving scolding, strictness, or reprimand.
8. **Strict** – perceptions of teachers as rule-focused and demanding discipline.

The instrument used a **five-point Likert scale** ranging from *Strongly Disagree (1)* to *Strongly Agree (5)* to capture students' perceptions on each scale.

VI. DATA ANALYSIS

Objective 1: To identify whether there are significant differences in perceptions based on **gender**.

The associations between the students' perceptions of teacher interpersonal behaviour and the gender of the students were analysed. The gender differences in students' perceptions of classroom learning environment were examined by splitting the total number into male (412) and female (408) students involved in the study.

Table 1: Result of t-test for each eight scales of Interpersonal Teacher Behaviour based on Sex of the students

Scales	Sex	N	Mean	Std. Deviation	t	Sig. (2-tailed)
Leadership	Male	412	22.81	4.799	-1.426	0.154
	Female	408	23.27	4.308		
Helpful/Friendly	Male	412	20.55	5.208	0.216	0.829
	Female	408	20.47	4.968		
Understanding	Male	412	22.55	5.465	-3.877	0.000
	Female	408	23.90	4.422		
Student freedom	Male	412	17.31	4.489	2.768	0.006
	Female	408	16.41	4.736		
Uncertain	Male	412	16.64	4.775	3.437	0.001
	Female	408	15.45	5.100		
Dissatisfied	Male	412	17.26	5.008	3.011	0.003
	Female	408	16.16	5.360		
Admonishing	Male	412	17.44	4.651	-0.215	0.829

	Female	408	17.51	4.891		
Strict	Male	412	21.03	4.939	1.242	0.215
	Female	408	20.60	4.995		

To examine the gender differences in students' perceptions of teacher interpersonal behaviour in mathematics classes, the within-class gender subgroup mean was chosen as the unit of analysis which aims to eliminate the effect of class differences due to males and females being unevenly distributed in the sample. In the data analysis, male and female students' mean scores for each class were computed, and the significance of gender differences in students' perceptions of teacher interpersonal behaviour and mathematics classroom were analysed using an independent *t*-test. Table 1 shows the scale item means, male and female differences, standard deviations, and t-values. The purpose of this analysis was to establish whether there are significant differences in perceptions of students according to their gender. As can be seen in the Table 5.3, out of eight scales of the QTI, the gender differences in the perceptions of males and females were found to be statistically significantly different on four scales. According to the results, female students perceived more positively the understanding displayed by their teachers. On the other hand, male students perceived that their teachers displayed more students freedom, uncertain, and dissatisfied behaviours. The gender differences found in this study are quite similar to the results reported by Fisher & Rickards (1998) and Khine Fisher (2001). Fisher and Rickards (1998) reported on Australian students, and found that seven scales of the QTI had significant differences in the perceptions of students of different enders. Khine & Fisher (2001), in a study in Brunei found that six scales of the QTI had significant differences.

2. Objective 2: To investigate whether students' locality of residence (**rural vs. urban**) influences their perceptions of mathematics teachers' interpersonal behaviour.

The associations between the students' perceptions of teacher interpersonal behaviour and the locality or residence of the students were analysed. The differences in students' perceptions of classroom learning environment based on locality or residence of the students were examined by splitting the total number into Rural (445) and Urban (375) students involved in the study.

Table 1: Result of *t*-test for eight scales of Interpersonal Teacher Behaviour based on locality of the students

Group Statistics						
Scales	Locality	N	Mean	Std. Deviation	*t*	Sig. (2-tailed)
Leadership	Urban	375	23.15	4.679	0.677	0.499
	Rural	445	22.93	4.472		
Helpful/Friendly	Urban	375	19.61	5.610	-4.680	0.000
	Rural	445	21.26	4.471		
Understanding	Urban	375	22.87	5.565	-1.852	0.064
	Rural	445	23.52	4.481		
Student freedom	Urban	375	15.64	4.543	-7.059	0.000
	Rural	445	17.87	4.473		
Uncertain	Urban	375	15.00	4.776	-5.617	0.000
	Rural	445	16.92	4.966		
Dissatisfied	Urban	375	16.46	5.209	-1.216	0.224
	Rural	445	16.90	5.226		
Admonishing	Urban	375	17.60	4.763	0.707	0.480
	Rural	445	17.37	4.772		
Strict	Urban	375	21.23	4.888	2.252	0.025
	Rural	445	20.45	5.021		

In the data analysis, rural and urbans students' mean scores for each class were computed, and the significance of locality differences in students' perceptions of teacher interpersonal behaviour in mathematics classroom were analysed using an independent t-test. Table 2 shows the scale item means, rural and urban differences, standard deviations, and t-values. The purpose of this analysis was to establish whether there are significant differences in perceptions of students according to their gender. As can be seen in the Table 5.3, out of eight scales of the QTI, the differences for locality in the perceptions of students

were found to be statistically significantly different on four scales (Helpful/friendly, Understanding, Students freedom and uncertain). According to the results, rural students perceived more positively the Helpful/friendly, Understanding, Students freedom and uncertain in their Mathematics teachers' interpersonal behaviour.

VII. CONCLUSION

This study highlights the importance of teacher interpersonal behaviour in shaping students' perceptions of mathematics classrooms. The findings suggest that significant gender difference exists in perception of teacher interpersonal behaviour. Female students perceive mathematics teachers as more understanding, while male students report more freedom but also higher levels of uncertainty and dissatisfaction. A significant different also found between rural and urban students in their perception interpersonal teacher behaviour. Rural students tend to view teachers more positively in terms of helpfulness, understanding, and freedom, possibly reflecting closer teacher-student relationships in less urbanised settings.

The results underscore the need for teachers to balance interpersonal behaviours to cater to diverse student needs. Professional development programs should encourage teachers to reduce uncertainty and dissatisfaction while enhancing supportive, understanding, and friendly behaviours. Future research should integrate longitudinal and qualitative approaches to explore how these perceptions develop over time and how they influence long-term academic outcomes.

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