
| RESEARCH ARTICLE

Measuring Gender-Biased Classroom Interactions: Development and Validation of the Gendered Classroom Interaction Climate Scale in Moroccan Secondary Schools

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| ABSTRACT

Gender-biased classroom interactions remain a major concern for educational equity; however, limited research has examined students' perceptions of these interactions using validated measurement instruments, particularly in secondary education. This study aimed to validate the Gendered Classroom Interaction Climate Scale and examine Moroccan secondary school students' perceptions of gender-biased classroom interactions involving female and male teachers. Guided by Feminist Theory, Chilly Climate Theory, and Bourdieu's Theory of Social Reproduction, a quantitative cross-sectional design was employed with Moroccan secondary school students. Principal Component Analysis supported the construct validity of the two five-item subscales, yielding unidimensional structures that explained 57.0% and 52.0% of the total variance, respectively. Both subscales demonstrated satisfactory internal consistency (Cronbach's $\alpha = .80$ and $.76$). The findings indicated that students perceived gender-biased classroom interactions involving both female and male teachers. Male students reported slightly higher perceptions of female teachers' preferential interactions toward female students than did female students, whereas perceptions of male teachers' preferential interactions were comparable across student gender. Perceptions of female- and male-teacher gender bias were positively and significantly correlated, although the association was modest ($r = .151$, $p = .007$). Overall, the findings support the reliability and validity of the Gendered Classroom Interaction Climate Scale and provide empirical evidence on gender-biased classroom interactions in Moroccan secondary schools. The study provides a reliable instrument for future research and offers practical insights into how classroom practices can become more equitable and inclusive.

| KEYWORDS

Gendered classroom interactions; biased behavior; chilly climate; inequality reproduction; secondary education; gender differences

| ARTICLE INFORMATION

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1.Introduction

Gender equality in education has become a key concern for international educational initiatives, acknowledging the prominent role of classroom environments in shaping students' academic and social experiences. Although access to education has expanded significantly for students of both genders, inequalities remain embedded in more subtle and implicit forms through everyday classroom practices. Instead of being openly displayed, gender bias might operate through seemingly minor practices that often go unnoticed and are rarely questioned because they have become normalized. Such practices include the unequal distribution of teacher attention, the amount and type of feedback and encouragement provided to students, differential questioning patterns, and disproportionate participation opportunities. The repeated occurrence of these practices can have meaningful implications for the ways students experience and engage with the learning environment. Ultimately, the enduring impact of these interactional patterns necessitates a systematic examination of everyday classroom interactions to gain deeper insight into how gender inequalities persist and continue to be reproduced over time.

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Classroom interactions extend beyond the instructional exchanges of knowledge; they also serve as fundamental arenas in which social norms, expectations, and power relations are established and negotiated. As key participants in classroom interaction, teachers are regarded as social agents who may consciously or unconsciously reproduce and reinforce the prevailing social order through the way they organize and manage classroom activities. In this context, recurring differential patterns of classroom interaction may strengthen stereotypical gender roles and contribute to the perpetuation of unequal educational experiences for male and female students. Therefore, examining how students perceive these interactional patterns is critical to uncover not only the overt form of gender bias but also its covert or hidden aspect that may operate without teachers' conscious awareness.

A large body of research on gender biased classroom interactions has been carried out in Western educational contexts, and there is still limited evidence from North African and Arab countries, especially Morocco, where traditional gender norms persist despite efforts to promote equal educational opportunities for all students regardless of their gender. To address this gap, the current study has two main objectives. It first sought to assess the dimensionality and internal consistency of a questionnaire intended to examine gender-biased classroom interaction. Second, it investigated how Moroccan secondary school students perceive classroom interaction from a gender perspective. The study adds to the literature by providing a psychometrically sound instrument for assessing gendered classroom interaction and empirical data from an understudied educational setting. It is based on feminist theory, the chilly climate construct, and Bourdieu's theory of social reproduction to deepen understanding of gender bias in classroom settings and provide evidence that can guide future research to promote an inclusive and equitable learning environment for students of both genders.

2. The theoretical Framework

To investigate students' perceptions of gendered classroom interaction, particularly regarding male and female teacher behavior, this study is grounded in an integrated theoretical framework that synthesizes feminist theory, the chilly climate construct, and Bourdieu's social reproduction theory. Together, these viewpoints provide a comprehensive understanding of how everyday classroom practices reflect, perpetuate, and uphold larger societal gender hierarchies, despite the fact that each perspective focuses on distinct facets of the educational experience. According to feminist theory, education is considered a gendered social institution whose norms, structures, and practices are shaped by broader power dynamics. Within this framework, feminist scholars contend that educational institutions are driven by gendered assumptions, expectations, and power structures, rather than operating as gender-neutral spaces (Hooks, 1994; Weiler, 1988). Building on this argument, teachers are viewed as important agents in reinforcing and reproducing gender hierarchies through their instructional practices. They may, either intentionally or unintentionally, exhibit gender biased behavior that favors particular students in accordance with prevailing gender norms as their expectations and evaluations are often influenced by gender stereotypes (Carlana, 2019; Muntoni & Retelsdorf, 2018). In this context, gendered patterns of classroom interaction are interpreted as manifestations of embedded structural inequalities rather than isolated instances of individual bias.

While feminist theory emphasizes the macro-level social structures that perpetuate gender inequalities in classroom interactions, chilly climate theory shifts the focus to the micro-level processes through which these inequalities are experienced and reproduced in classroom settings. It should be noted that the chilly climate construct was first introduced by Hall and Sandler (1982) to describe how differential treatment, including teacher attention, participation opportunities, praise and criticism, and even eye contact, can create an unwelcoming and less supportive learning environment for students, especially females. According to this theoretical standpoint, small acts of inequities in teachers' behavior towards their students can take subtle shapes and negatively affect female students' confidence, involvement, and academic achievement (Hall & Sandler, 1982, 1984). The body of empirical research that followed has shown that female students tend to perceive the classroom climate as chillier than that of their male counterparts, and these perceptions differ across disciplines and institutional contexts (Janz & Pyke, 2000). Further studies have extended the explanatory scope of chilly climate by emphasizing its educational consequences. Pascarella et al. (1997) investigated the association between female students' perceptions of a chilly campus environment and their cognitive outcomes during the first year of college. The results suggested that the perceived chilly climate may adversely affect the cognitive outcomes of female students. Similarly, Whitt et al. (1999) found that female students who perceived a chillier learning environment exhibited less favorable cognitive development, suggesting that subtle forms of gender bias might undermine female students' academic growth and reinforce educational inequalities. However, some empirical studies reported limited or no evidence of a chilly climate, and attributed the observed difference to contextual and methodological factors rather than gender bias (Cornelius et al., 1988; Drew & Work, 1998). From the perspective of the current investigation, the chilly climate approach serves as a useful framework for understanding how subtle forms of teacher gender bias may shape students' perceptions of a gendered classroom environment, and, consequently, their overall educational experiences.

The third theoretical stand underpinning the present study is Bourdieu's social reproduction theory, which adds an institutional dimension to the framework by considering educational practices as mechanisms through which social inequalities are

transmitted and reproduced over time (Bourdieu & Passeron, 1977; Bourdieu, 1990). This theory highlights how classroom interactions can maintain and reproduce the existing power relations and disparities through gender norms, behaviors, and expectations, although its original theoretical focus extends beyond gender. According to this framework, students develop a gendered habitus, which is a set of deeply ingrained dispositions through which they perceive themselves, engage with others, and internalize socially constructed gender norms and expectations. Similarly, teachers themselves are influenced by a habitus, which they have developed through their own socialization and professional experiences. This system of embodied dispositions informs their expectations of students and their pedagogical practices, thereby contributing to the reproduction of gender inequalities (Bourdieu, 1990; Bourdieu, 2001). Embedded within routine pedagogical practices, these dispositions may operate as symbolic violence, fostering gendered assumptions and legitimizing unequal power relations. In this sense, educational institutions may serve as social fields where gender hierarchies are sustained and reproduced across generations.

Drawing these theoretical perspectives together, the study provides an integrated framework for understanding the complex mechanisms through which gender inequalities are reproduced, experienced, and maintained within educational settings. The feminist theory focuses on the structural dimension of gender inequality, rooted in broader power relations that shape gendered expectations, experiences, and interactions within educational institutions. The chilly climate perspective uncovers the subtle interpersonal dynamics that contribute to the reinforcement and reproduction of gender disparities in everyday classroom interactions. The social reproduction theory, in turn, sheds light on how gendered practices and dispositions are internalized, sustained, and reproduced within schools over time. This multidimensional approach allows for a thorough examination of students' perceptions of teacher-biased behavior, encompassing both explicit forms of differential treatment, such as unequal attention, and more implicit interactional practices, including eye contact and questioning patterns, that may reinforce gendered classroom dynamics. In addition, this triangulated theoretical perspective informs the study's measurement dimensions, in which perceived female teacher bias towards female students and perceived male teacher bias towards male students are viewed as distinct manifestations of broader gendered interactional processes and practices that operate within classroom environments.

3. Literature Review

Although a lot of efforts have been made to promote gender equality in education, recent empirical research consistently documents the persistence of gendered patterns in classroom interactions. For instance, Kolovou et al. (2023), examining patterns of teacher-student interaction in mathematics instruction, found that teachers initially devoted more individual attention to boys as compared to girls and called on boys more frequently during whole-class discussions, with these differences becoming less pronounced in subsequent years. Watson et al., (2022) reported comparable findings, arguing that teachers interacted more frequently with boys than girls in both positive and negative ways, while students perceived teachers as holding gender-stereotypical beliefs about the academic areas in which boys and girls are expected to excel. These findings are consistent with previous studies in this area. In particular, Jones and Dindia (2004) conducted a meta-analysis of teacher-student interactions and found that teachers interacted differently with male and female students, interacting more frequently with boys, especially giving them more discipline-related and cognitively demanding interactions. In the same vein, Beaman et al. (2006) reported that during classroom interactional time, boys received more teacher attention than did girls, which supports the assumption that unequal interaction patterns continue to be part of the regular classroom teaching process. Similarly, the early classroom observational studies conducted by Sadker and Sadker (1994) showed that boys consistently received more attention, longer questioning episodes, and more instructional feedback from their teachers compared to girls, underscoring the persistence of gender inequality in everyday classroom interactions.

Moreover, recent research has further contributed to this area of study by exploring the factors that shape gender-differentiated classroom interactions and their broader implications for education. In this context, Farago et al., (2022) found that teachers who had more traditional gender-role beliefs were more likely to exhibit gendered classroom behavior, including making gender more noticeable during instruction and promoting same-gender interactions among students. The results of the study reveal that subtle gender-related beliefs held by teachers may affect their instructional behavior and contribute to the reproduction of traditional gender norms in the classroom. Such a perspective aligns with the gender schemas theory proposed by Valian (1998). The theory assumes that people develop cognitive associations related to gender that guide the way they perceive and evaluate males and females, often without realizing it. Consistent with this view, the research of Timmermans and Rubie-Davies (2023) has demonstrated that gender-based teacher expectations significantly affect students' self-concept, their task valuations, and their performance, highlighting the potential effect of gender stereotypes on students' experiences and academic performance. Similarly, Gajda et al., (2022) reported that teachers' perceptions of students' gender-stereotypical behavior, along with their responses to such behaviors, may unintentionally reinforce gender stereotypes in classroom interaction. These findings suggest that gendered classroom interactions are shaped by teachers' gender role beliefs, implicit gender schemas, stereotypical

expectations, and responses to students' gender-related behaviors, all of which may contribute to the reproduction of gender inequalities in educational settings.

Within the Moroccan educational context, empirical research examining students' perceptions of gender bias in educational settings remains limited. One of the few studies addressing this issue, Khouch and Benattabou (2020) found that Moroccan EFL students perceived gender-biased treatment from their teachers, suggesting that teacher-student interactions may be experienced differently by male and female learners. Similarly, Mamoun and Nfissi (2023) examined Moroccan secondary school students' perceptions of institutional sexism and distinguished between two dimensions of the construct: sexist perceptions of institutional norms and sexist perceptions of professional behavior. Their findings highlighted that female students were more likely to perceive overt forms of sexism manifested in differential treatment of teachers and the gendered behavior of educational professionals, whereas male students reported greater awareness of subtle sexism embedded in institutional norms. Similarly, Benattabou et al. (2021) revealed that gender imbalances and inequalities remain present in Moroccan EFL classrooms, with subtle forms of bias manifested through teachers' classroom practices, interaction patterns, and teaching approaches despite claims to maintain a fair and neutral learning environment. Overall, these studies suggest that gender stereotypes continue to influence students' educational experiences within Moroccan classrooms.

Although these studies have made important contributions, several gaps remain in the existing literature. International research has mainly examined gender bias through classroom observations, teacher reports, or teacher expectations, whereas Moroccan studies have primarily focused on institutional sexism, teachers' gender-biased treatment, or wider gender inequalities in education. As a result, less attention has been given to how students themselves perceive gender-biased classroom interactions, particularly in the Moroccan secondary school context. In this perspective, there is still limited research on whether students perceive male teachers as favoring male students and female teachers as favoring female students during everyday classroom interactions. This gap is important to address because students' perceptions can shape their sense of fairness, inclusion, and engagement in the classroom, regardless of whether teachers' behaviors are intentional or consciously perceived. Taken together, the present study investigates Moroccan secondary school students' perceptions of gender-biased classroom interactions by examining perceived same-gender favoritism among male and female teachers.

4. Research Objectives and Hypotheses

The present study pursued two overarching objectives. First, it sought to examine the psychometric properties of the Gendered Classroom Interaction Climate Scale by evaluating its factorial validity and internal consistency. Second, it aimed to investigate Moroccan secondary school students' perceptions of gender-biased classroom interactions involving both female and male teachers. Drawing on the empirical literature and the theoretical perspectives of Feminist Theory, Chilly Climate Theory, and Bourdieu's Theory of Social Reproduction, the following hypotheses were formulated.

Research Objectives

1. To examine the construct validity and internal consistency reliability of the Gendered Classroom Interaction Climate Scale.
2. To investigate Moroccan secondary school students' perceptions of gender-biased classroom interactions involving female and male teachers.

Research Hypotheses

H1. Moroccan secondary school students perceive the existence of gender-biased classroom interactions involving both female and male teachers.

H2. Students' perceptions of female teachers' gender-biased classroom interactions differ significantly according to students' gender.

H3. Students' perceptions of male teachers' gender-biased classroom interactions differ significantly according to students' gender.

H4. Students' perceptions of female teachers' and male teachers' gender-biased classroom interactions are positively associated.

The first research objective was addressed through Principal Component Analysis (PCA) and reliability analysis using Cronbach's alpha to evaluate the factorial validity and internal consistency of the instrument. The second research objective and the associated hypotheses were examined using descriptive statistics, independent-samples *t*-tests, and Pearson's correlation analysis.

5. METHOD

5.1 Research Design

This study adopted a cross-sectional quantitative design using a structured questionnaire to examine students' perceptions of gender-biased classroom interaction in Moroccan high schools. Specifically, the study examined whether teacher-student interactions differed based on both teacher and student gender.

5.2 Participants

The initial sample consisted of 376 Moroccan secondary school students from seven public high schools in the Fez region following administrative authorization from the relevant educational authorities. Schools were selected based on accessibility and represented areas with varying levels of urbanization. The sample consisted of 56% female and 44% male students from the Common Core (21.54%), First-Year Baccalaureate (30.59%), and Second-Year Baccalaureate (47.87%). Because some responses were missing, the number of participants varied across analyses, ranging from 329 to 345. Only cases with complete data were retained for each analysis.

5.3 Instrument

Data were collected using the Gendered Classroom Interaction Climate Scale, which consists of 10 items divided into two parallel subscales. The first subscale measured students' perceptions of female teachers' biased behavior towards female students, focusing on attention, encouragement, assistance, frequency of interaction, and questioning patterns. The second subscale assessed perceived male teachers' bias toward male students, including attention, questioning difficulty, eye contact, and encouragement. Items were rated on a six-point Likert scale ranging from 1 (strongly agree) to 6 (strongly disagree), with higher scores reflecting stronger perceptions of gender bias in classroom interaction.

5.4 Procedure

The questionnaire was administered in Arabic during regular class hours to make the items easier to understand. Participation was voluntary, and students were informed about the study's purpose and the confidentiality of their responses. All questionnaires were completed under standardized classroom conditions and checked for missing responses before data entry and analysis.

5.5 Data Analysis

The collected data were analyzed using IBM SPSS Statistics. Means and standard deviations were calculated to describe the study variables. The dimensionality of the Gendered Classroom Interaction Climate Scale was examined using Principal Component Analysis (PCA), conducted separately for each subscale. Because each subscale was designed to represent a single latent construct, only the first principal component was retained, and no rotation was used. Cronbach's alpha coefficients were then used to determine the internal consistency of the subscales.

To examine differences in perceptions based on student gender, independent-samples *t* tests were conducted, and Pearson product-moment correlation analysis was performed to assess the relationship between the two perceived teacher-bias constructs. The normality of the data was evaluated by visually examining the histogram before conducting the inferential analyses.

6. Results

6.1 Psychometric Properties of the Gendered Classroom Interaction Climate Scale

The Gendered Classroom Interaction Climate Scale consisted of two parallel five-item subscales. The first subscale examined students' perceptions of female teachers' biased interaction with female students, whereas the second subscale measured students' perceptions of male teachers' biased interaction with male students. All items were rated on a six-point Likert-type scale ranging from strongly agree (1) to strongly disagree (6). Principal component analysis (PCA) was carried out separately for each subscale to determine whether the items within each subscale measured a single underlying construct, which represents students' perceptions of gender-biased classroom interactions. In addition, internal consistency was evaluated using Cronbach's alpha for each subscale.

6.2 Construct Validity of the Female-Teacher Bias Subscale

As exhibited in **Table 1**, the principal component analysis of the subscale measuring *Perceived Female Teachers' Gender-Biased Classroom Interaction in Favor of Female Students* extracted a single component that explained **57.0%** of the total variance. All five items loaded substantially on the retained component, with standardized factor loadings ranging from **.666** to **.802**, and it was determined that no rotation was necessary. The item about female students receiving more attention and encouragement from female teachers than from male teachers had the strongest loading (**.802**), while the weakest loading (**.666**) was found for the item about female students interacting more often with female teachers than male students. All factor loadings exceeded the commonly accepted threshold of .60, indicating satisfactory convergent representation of the underlying construct.

Table 1. Principal Component Analysis of the Subscale Measuring Perceived Female Teachers' Gender-Biased Classroom Interaction in Favor of Female Students

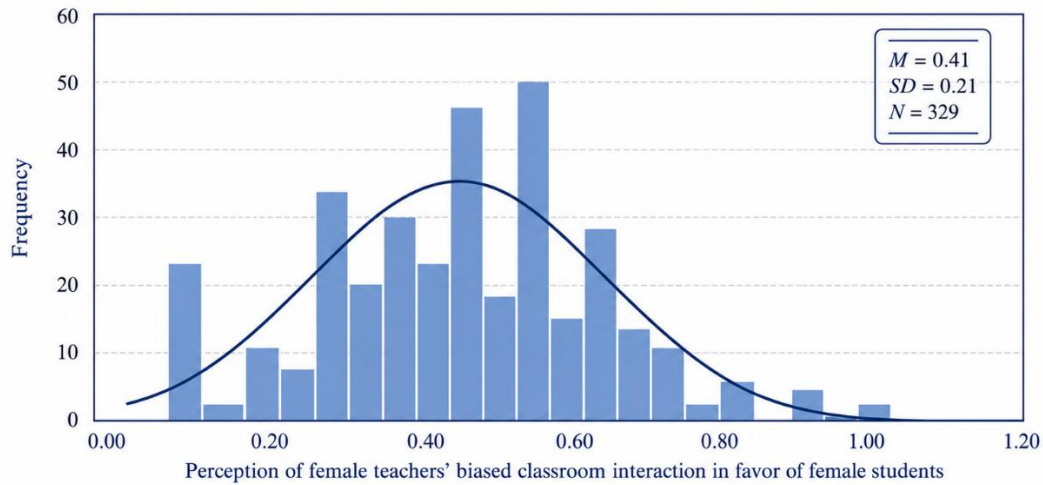
Item	Factor Loading
Female students receive more attention and encouragement from female teachers than from male teachers.	.802
Female students receive more attention and encouragement than male students from female teachers.	.786
Female teachers tend to help female students and devote more classroom time to them at the expense of male students.	.781
Female teachers listen more attentively to high-achieving female students than equally high-achieving male students.	.728
Female students interact more frequently with female teachers than male students.	.666
Variance Explained (%)	57.0
Extraction Method	Principal Component Analysis
Retained Components	1

Note. One principal component was retained. Factor loadings below .40 were suppressed

6.3 Normality of the Female-Teacher Bias Variable

Figure 1 displays the distribution of the perceived female teachers' biased classroom interaction in favor of female students. The histogram suggests that the data are roughly normally distributed, with most scores close to the mean ($M = 0.41$, $SD = 0.21$, $N = 329$). Although there are small differences at the ends of the distribution, no major deviation from normality was observed. Overall, the variable appears to satisfy the normality assumption for subsequent parametric analyses.

Figure 1. *Distribution of Students' Perceptions of Female Teachers' Biased Classroom Interaction in Favor of Female Students*



Note. The solid line represents the normal distribution.

Source. Prepared by the author using SPSS.

6.4 Construct Validity of the Male-Teacher Bias Subscale

Similarly, the principal component analysis conducted for the subscale measuring *Perceived Male Teachers' Gender-Biased Classroom Interaction in Favor of Male Students* yielded a one-factor solution accounting for **52.0%** of the total variance (Table 2). Factor loadings ranged from **.691** to **.738**, demonstrating that all items contributed meaningfully to the latent construct. The strongest loading (**.738**) corresponded to the item suggesting that male students attempt to attract teachers' attention more than female students, whereas the item stating that male students receive more attention and encouragement from male teachers than female students exhibited the lowest loading (**.691**). As with the first subscale, all factor loadings exceeded recommended minimum criteria, supporting the unidimensional structure of the scale. Overall, the PCA results indicate that both subscales possess satisfactory factorial structure, with each set of items converging on a single latent dimension representing students' perceptions of gender-biased classroom interactions.

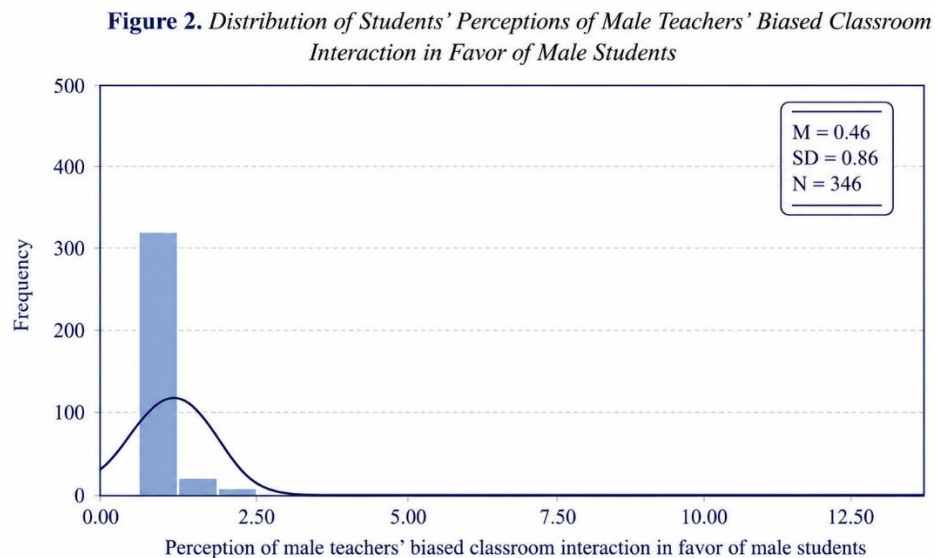
Table 2. Principal Component Analysis of the Subscale Measuring Perceived Male Teachers' Gender-Biased Classroom Interaction in Favor of Male Students

Item	Factor Loading
Male students try to attract teachers' attention more than female students.	.738
Male teachers establish more eye contact with male students than female students.	.727
Female students interact less frequently with male teachers than male students.	.720
Male teachers ask male students more difficult questions than female students.	.706
Male students receive more attention and encouragement from male teachers than female students.	.691
Variance Explained (%)	52.0
Extraction Method	Principal Component Analysis
Retained Components	1

Note. One principal component was retained. Factor loadings below .40 were suppressed.

6.5 Normality of the Male-Teacher Bias Variable

Figure 2 presents the distribution of students' perceptions of male teachers' biased classroom interaction in favor of male students. Most scores are close to the mean ($M = 0.46$, $SD = 0.86$, $N = 346$), suggesting that the data follow a normal distribution. Although the histogram is slightly positively skewed, the distribution does not exhibit any major deviation from normality.



Note. The solid line represents the normal distribution.

Source. Prepared by the author using SPSS.

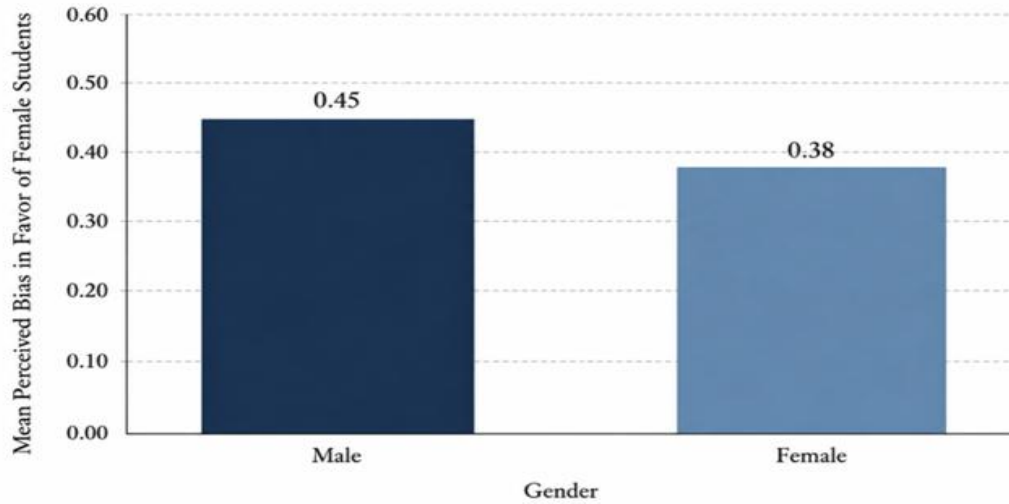
6.6 Reliability of the Two Subscales

Cronbach's alpha was used to evaluate the reliability of the two five-item subscales. For the first subscale, the alpha coefficient reached .80, which suggests good internal consistency. Item-deletion analysis showed that removing any item would not increase the reliability coefficient. As a result, all five items were retained for measuring the intended construct. As for the second subscale, Cronbach's alpha coefficient was .76, indicating an acceptable level of reliability. The analysis also showed that removing any item did not increase the alpha value, confirming that all five items made an adequate contribution to the scale. Taken together, both subscales showed satisfactory internal consistency and were considered reliable for further analyses.

6.7 Gender Differences in Perceived Female-Teacher Bias

Figure 3 shows mean scores for perceptions of female teachers' biased classroom interaction in favor of female students by student gender. Male students had a mean score of 0.45, while female students had a mean score of 0.38. This means that male students perceived slightly more preferential treatment toward female students by female teachers. However, the difference between the two groups was modest, only 0.07, indicating limited variation in perceptions.

Figure 3. *Mean Perceived Female Teachers' Biased Classroom Interaction in Favor of Female Students by Gender*

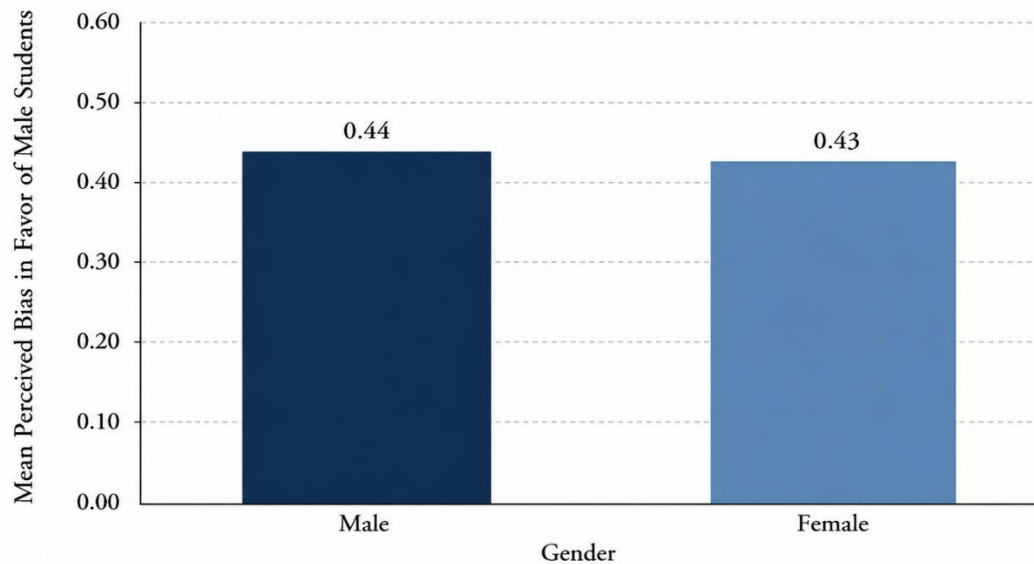


Source: Prepared by the author using SPSS.

6.8 Gender Differences in Perceived Male-Teacher Bias

Figure 4 displays mean scores for perceptions of male teachers' biased classroom interaction in favor of male students by participant gender. The mean scores for male and female students were 0.44 and 0.43, respectively. The scores were relatively very close, differing by only 0.01 points. This suggests that both groups held highly similar perceptions of preferential treatment toward male students by male teachers.

Figure 4. *Mean Perceived Male Teachers' Biased Classroom Interaction in Favor of Male Students by Gender*



Source: Prepared by the author using SPSS.

6.9 Correlation Between Female- and Male-Teacher Bias Perceptions

Table 3 shows the relationship between students' perceptions of female teachers' classroom interactions favoring female students and male teachers' classroom interactions favoring male students. The results indicate that the two constructs were positively related. Pearson's correlation was statistically significant ($r = .151$, $p = 0.007$). However, the correlation was small, which suggests that students' perceptions of gender-biased interactions by male and female teachers were related, but only to a limited extent.

Table 3. *Correlation Between Perceptions of Female and Male Teachers' Biased Classroom Interaction in Favor of Students of the Same Gender*

Variables		Pearson Correlation	
		1	2
1. Perceived female teachers' biased classroom interaction in favor of female students	Pearson correlation	1	.151**
	Sig. (2-tailed)		.007
	N	329	316
2. Perceived male teachers' biased classroom interaction in favor of male students	Pearson correlation	.151**	1
	Sig. (2-tailed)	.007	
	N	316	346

Note. ** Correlation is significant at the 0.01 level (2-tailed).

Source: Prepared by the author using SPSS.

7. Discussion

The present study examined the measurement properties of the Gendered Classroom Interaction Climate Scale and explored students' perceptions of gender-biased classroom interactions by female and male teachers. The results show that both subscales, focusing on gender-biased interactions of female teachers directed toward female students and of male teachers directed toward male students, demonstrated satisfactory construct validity and internal consistency. This suggests that the instrument provides a reliable tool to measure gendered interactions in an educational context. The findings also indicate that students perceive gender bias in the classroom practices of both female and male teachers, although the correlation between the two types of perceived bias was weak. Overall, the findings highlight that the gendered classroom climate scale represents a distinct and measurable dimension of students' experiences within the educational environment.

The emergence of a single component for each subscale indicates that perceptions of gendered classroom interaction are based on coherent latent variables. In other words, the different items within each subscale capture a common aspect of students' perceptions rather than representing multiple unrelated dimensions. In addition, the reliability coefficient indicates that the two subscales have acceptable to good internal consistency, supporting their use for subsequent analyses intended to measure students' perceptions of gendered classroom interactions.

From a theoretical standpoint, the one-component structure of the two subscales is consistent with the conceptual framework adopted in the present study. Through a feminist lens, the internal consistency of the subscales suggests that gender bias in classroom interactions can be interpreted as a manifestation of broader gendered power relations that shape educational practices, rather than occurring as separate or isolated incidents of teacher behavior. Bourdieu's theory of social reproduction adds another dimension by showing how everyday educational practices can contribute to the reproduction of gendered dispositions, leading students to perceive consistent patterns of behavior identified within each subscale. The chilly climate theory offers a complementary explanation by proposing that the repeated and subtle forms of gender-biased practices shape students' educational experiences, making these behaviors appear as unified constructs of teachers' conduct. Accordingly, the

distinction between the perceived female and male teacher- biased classroom interaction subscales further supports their independent examination in subsequent analyses.

Beyond the psychometric evaluation of the instrument, the present study yielded several substantive findings. The first of these concerns gender differences in students' perceptions of female teachers' biased classroom interactions in favor of female students. Contrary to the expectations of the chilly climate framework, male students reported significantly higher perceptions of female teachers' biased classroom interaction in favor of female students than did female students. This finding contrasts with previous research indicating that female students are generally more likely to perceive gender bias and less inclusive classroom climates (Canada & Pringle, 1995; Janz & Pyke, 2000; Allan & Madden, 2006). Drawing on feminist theory, this pattern may reflect the persistence of patriarchal power relations in the classroom. In other words, practices that are meant to support female students may be perceived by some male students as preferential treatment, rather than an effort to promote equal opportunities. Such perceptions may represent subtle resistance to changes in traditional gender roles and power relations (Crocker & Major, 1989; Cameron, 2001). In addition, Bourdieu's theory of social reproduction (1990, 2001) posits that students' perceptions are influenced by gendered dispositions acquired and developed through socialization, which leads male students to evaluate female teachers' practices in light of those pre-existing gender norms and expectations, rather than assessing their actual instructional behavior.

The second analysis focused on whether male and female students would differ in their perceptions of male teachers' biased behavior in favor of male students within classroom interactions. Unlike the first analysis, the results did not reveal a statistically significant difference between the two groups. This means that both male and female students tended to perceive male teachers as relatively less biased in their classroom interactions with male students. While this particular finding does not fully support the expectations of the chilly climate construct, it is consistent with earlier research suggesting that male teachers are often evaluated more positively by students and that gender stereotypes may shape perceptions of teaching effectiveness (Boring, 2017; MacNell et al., 2015; Mitchell & Martin, 2018). In the same vein, Martinez and Gil (2019) reported that female students generally maintain positive attitudes toward their teachers, regardless of their gender. This finding can also be interpreted from a feminist perspective, particularly in terms of how patriarchal gender schemas may shape students' interpretation of teachers' behavior, with behaviors associated with men being perceived as more acceptable while similar behaviors by women may be subject to greater criticism (Miller and Chamberlin, 2000; Sandler et al., 1996; Valian, 1998). This may explain why male teachers' behavior was viewed as less sexist as it aligns with common expectations about men, whereas female teachers' behavior was judged more critically, especially by male students in this study.

This finding can further be explained through Bourdieu's theory of social reproduction (Bourdieu & Passeron, 1977; Bourdieu, 1990, 2001), which suggests that schools may reinforce existing social relations by passing on habitus, or internalized ways of thinking that influence how individuals perceive and evaluate the world around them. Extending this approach to gender, Bourdieu proposes in *Masculine Domination* (2001) that symbolic power operates through gendered habitus, influencing the way people perceive male authority as natural and legitimate. Subsequent research has also demonstrated that gendered dispositions or ways of thinking can be reproduced in educational settings, shaping students' perceptions of male teachers' behaviors as more legitimate and rendering gender stereotypes as natural rather than socially constructed (Edgerton et al., 2014; Hernández Méndez, 2013). As a result, students in this study may have viewed male teachers more positively and female teachers more critically, even without consciously being aware of the effect of these gendered dispositions. This means that their habitus, shaped by gender norms, may have influenced their understanding of what constitutes appropriate behavior. Overall, the findings suggest that students' perceptions may reflect the way gendered power relations are reinforced and reproduced in the classroom, rather than reflecting differences in teachers' actual interactions with students.

The third analysis examined the extent to which students' perceptions of female teachers' classroom interactions favoring female students were related to their perceptions of male teachers' classroom interactions favoring male students. The correlation analysis revealed a significant positive relationship between the two constructs. Although the association was relatively modest, it suggests that students who perceived gender-biased interactions among one group of teachers tended to perceive similar behaviors among the other group as well, showing that these perceptions are closely related rather than formed independently. This implies that students may interpret teachers' classroom interactions within a broader gendered educational environment rather than seeing these behaviors as isolated actions of individual teachers. This interpretation is consistent with the findings of Farago et al. (2022), who found that teachers holding more traditional views about gender roles were more likely to engage in gendered practices in the classroom, highlighting that these practices are shaped by common beliefs about gender rather than by teachers' gender alone. In this sense, the significant positive correlation observed in this study may indicate that students who are sensitive to gendered classroom interactions tend to recognize similar patterns across both female and male teachers since

these practices reflect common institutional norms and expectations and are not limited to the characteristics of individual teachers. Along similar lines, Ouabou et al. (2025) found that Moroccan teacher trainees generally supported equal treatment of male and female students, but they encountered difficulties implementing these practices because of persistent sociocultural gender norms. As a result, these gendered norms shape the pedagogical practices of both female and male teachers, leading students to perceive similar forms of gender-bias across both groups, which might account for the positive correlation between the two constructs observed in this study.

Further supporting these findings, Glock et al. (2024) found that students' perceptions of teacher interpersonal behavior are influenced by broader classroom dynamics rather than simply by whether the teacher and the student are of the same gender. This suggests that students develop generalized perceptions of classroom relationships that extend across different teachers. Similarly, Mamnoun and Nfissi (2023), through their comprehensive review of gendered classroom interactions, identified differences in how teacher allocate attention and provide opportunities for student participation as consistent patterns across diverse educational settings, reflecting systemic patterns of gender bias beyond individual teacher practices.

These findings lend further evidence to the feminist theoretical framework by showing that gender inequalities are embedded within everyday educational practices and may contribute to the reproduction of broader gendered social structures through schooling. The positive but modest correlation between the two subscales is theoretically meaningful because it reflects students' perceptions of gendered classroom dynamics as differentiated yet interconnected dimensions of the classroom climate. It is differentiated because students' perceptions of bias among male and female teachers are not identical, and it is interconnected because both perceptions may reflect a broader awareness of gender as a socially meaningful dimension of classroom interaction. This interpretation is consistent with feminist theory, chilly climate theory, and Bourdieu's social reproduction perspective, which emphasize that gender inequality may be embedded in routine educational practices, rather than occurring solely through explicit acts of discrimination.

8. Limitations and directions for future research

The study has several limitations that should be acknowledged. It relies on students' perceptions, which provide valuable insight into the mechanisms of classroom interactions but cannot serve as direct evidence of teachers' actual classroom behaviors and gender-biased practices. Since these perceptions may be affected by individual characteristics, prior educational experiences, and sociocultural norms concerning gender roles, future research needs to use diverse methodologies, including both perceptual measures and objective observations of classroom dynamics as well as teachers' perceptions to have a comprehensive understanding of how gender dynamics are experienced and interpreted in everyday classroom interaction.

Another limitation of the study is its cross-sectional nature, which restricts the causal interpretation and prevents the examination of students' perceptions of gender-biased classroom interactions over time. Although the principal component analysis and reliability tests yielded promising results, future research should verify the factor structure of the scale using confirmatory factor analysis, assess the factorial invariance of the measure across key demographic groups, and conduct longitudinal designs to examine the development and long-term impact of gendered classroom interactions.

9. Implications for Educational Practice

The findings of this study have several important implications for educational policy, teacher training, and classroom practice. First, teacher education should focus on gender-sensitive teaching practices, particularly in areas such as attention, participation, eye contact, encouragement, and questioning to foster fair and inclusive learning environments. Second, teacher education should address subtle forms of gender bias in classroom interactions because minor or unintentional behaviors may go unnoticed while still contributing to the reproduction and perpetuation of gender hierarchies. Third, educational authorities should implement systematic mechanisms, including regular teacher training, classroom observations, and constructive feedback to identify and address patterns of differential treatment based on gender. Finally, curriculum developers and educational policymakers should rigorously examine the representation of gender across instructional materials and classroom resources to challenge and reduce the perpetuation of gendered stereotypes and ensure that instructional materials do not promote unequal conceptions of gender roles and social expectations.

10. Contributions

This study makes several contributions to the existing literature on gender and education by examining how gendered patterns of classroom interactions are perceived and interpreted in educational settings. In terms of methodology, the study develops and validates a psychometrically reliable instrument for measuring students' perceptions of teacher-biased interaction through a gender lens, thereby offering researchers a standardized tool for future research on gender dynamics across diverse educational

settings. With regard to its empirical contribution, the study adds to existing knowledge by presenting empirical evidence from the Moroccan secondary school context, which is still underexplored in research on gender bias in education. The findings further contribute to the expanding body of research by showing that students' perceptions of gender-biased classroom interactions extend beyond individual behavior and are embedded within broader sociocultural context, highlighting the influence of gender norms, social expectations, and gendered power relations on classroom interactions. On a theoretical level, the study provides a multidimensional lens for interpreting how gendered interactional practices are perceived, maintained, and reproduced in classroom settings by drawing on feminist theory, chilly climate framework, and Bourdieu's theory of social reproduction.

11. Conclusion

The present study investigated students' perceptions of classroom interactions from a gender perspective, alongside the development and validation of a measurement instrument designed to capture these perceptions. The findings support the scale's reliability and validity, and therefore its potential use in research on classroom gendered dynamics. The findings also reveal that students' perceptions are neither uniform nor reduced to a single form of gender disadvantage. Differences in perceptions between female and male teachers' interactions as well as differences observed at the level of student gender emphasize the complex nature of gender dynamics in educational settings, which suggests that such perceptions need to be understood within wider sociocultural structures related to gender norms, socially constructed expectations, and gender power relations that shape educational experiences. Accordingly, the study highlights the importance of examining gender bias in education from a broader, context-sensitive approach that considers classroom relationships and broader sociocultural influences.

Taken together, the study proposes that addressing gender bias in education requires consideration of both observable classroom practices and the social meanings and expectations that inform their interpretations. Acknowledging and addressing these interconnected dimensions can promote equitable classroom environments in which students' experiences, participation, and opportunities are not restricted by gender. In this respect, the study provides a foundation for further research on gendered patterns underlying classroom interactions by combining measurement validation with theory-informed interpretation.

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