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Relationship quality in student-teacher-dyads: Comparing student and teacher determinants in multicultural classrooms[☆]

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ABSTRACT

Teacher-student-relationship quality is associated with academic success and, among ethnic minority adolescents, it can promote positive intergroup relations. However, most research has studied student or teacher reports only and rarely accounted for ethnic classroom heterogeneity. This study investigated teacher-student-agreement on relationship quality in minority and majority student-teacher-dyads and tested predictors of relationship quality in adolescence. The sample comprised 309 minority ($M_{\text{age}} = 12.99$, $SD = 1.30$) and 200 majority adolescents ($M_{\text{age}} = 13.50$, $SD = 1.56$) and their 28 majority teachers ($M_{\text{age}} = 45.82$, $SD = 11.50$). Teachers reported higher relationship quality than students. Correlations in student-teacher-dyads were similar for minority and majority students. A better school climate, teachers' awareness of social heterogeneity and culturally responsive teaching predicted relationship quality in student reports, whereas teaching enjoyment predicted relationship quality in teacher reports. In minority dyads, higher student socioeconomic status (SES) and lower levels of discrimination were additional predictors for relationship quality in both student and teacher reports. Findings suggest different processes in how minority and majority student-teacher-dyads evaluate relationship quality.

Longitudinal, meta-analytic findings have highlighted the importance of positive teacher-student-relationships and showed medium to large effects of relationship quality on students' adaptation: higher levels of relationship quality predicted higher levels of school belonging, school engagement and academic achievement (Engels et al., 2021; Roorda et al., 2011, Roorda et al., 2017). Furthermore, when compared to peer and parental relationships, teacher-student relationships characterized by empathy and support showed the strongest effects on school belonging among secondary-school students (Allen et al., 2018). Especially for ethnic minority students, having a good relationship with their teacher has been found to promote positive intergroup relations (Thijs & Verkuyten, 2012) and to increase school liking (Murray et al., 2008). Consequently, a solid relationship between teachers and students represents a prerequisite not only for academic success, but also for a positive school adaptation overall.

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Due to the many beneficial outcomes, teacher-student relations and particularly the teacher-student-relationship quality has gained a lot of research interest from different theoretical standpoints, such as attachment theory (Verschuere & Koomen, 2012), need fulfillment (Ryan & Deci, 2000) and social learning (Bandura & Walters, 1977). From an attachment perspective, for example, a recent review showed that teachers are considered a secure base and safe haven in promoting emotional security among students (Spilt & Koomen, 2022). From a need fulfillment perspective, scholars investigated teachers' and students' needs for autonomy, competence, and relatedness and showed, for instance, that perceived autonomy was related to better teacher-student relationships (Poulou, 2020) and that positive teacher-student relationships predicted students' need satisfaction one year later (Bakadorova & Raufelder, 2018). Social learning theory posits that children learn from their environment through modelling and tuition. Accordingly, students who reported a positive relationship with their teacher also established higher quality relationships with their classroom peers, probably because they could transfer positive aspects of relationship quality, such as closeness, across social relations (Saxer et al., 2024).

Despite extant research on general processes relating to teacher-student-relationships, a dyadic perspective on teacher-student relationships has rarely been examined (Spilt et al., 2022) and studies focused mainly on children below the age of 13 (Prewett et al., 2019; Zee & Koomen, 2017). This may be problematic because teachers' and students' perspectives are not necessarily in alignment (Kunter & Baumert, 2006) and adolescents show different developmental needs than younger children. In general, teachers' reports were more positive than students' reports in school-related aspects (Conderman et al., 2013), which also include relationship quality (Choi & Dobbs-Oates, 2016; Prewett et al., 2019; Zee & Koomen, 2017). Furthermore, unlike younger children, who rely on their teacher to provide safety and care, adolescents may report other needs, such as perceived support and utilization, due to their autonomy development and the increased importance of peers in their lives. Similarly, the biopsychosocial changes in adolescence have the potential to affect conflict with teachers and/or disaffection with school (Yu et al., 2018). Hence, we need to learn more about both teachers' and students' perspectives on relationship quality, especially among adolescents.

A dyadic approach on the teacher-student relationship quality is even more important when considering the recent developments of the classroom composition. Classrooms today are increasingly culturally diverse: 40 % of all children under 5 years in Germany (tomorrow's adolescents) have a migration background (Statistisches Bundesamt, 2020). As compared to majority groups, minority groups face additional challenges (e.g., discrimination, lower socioeconomic standing, and prejudice based on status and religious orientation; Agirdag et al., 2012), which can negatively affect teacher-student-relationship quality (Civitillo et al., 2024). Concurrently, majority teachers feel less efficacious in teaching minority than majority students (Geerlings et al., 2018). However, research on teacher-student relationships in multicultural classrooms is still rather limited (den Brok & Levy, 2005) or resulted in mixed findings. Some scholars demonstrated that ethnic minority and majority students perceive relationship quality quite similar (Özdemir & Özdemir, 2020), while others showed that ethnic minority students are less likely than majority students to experience positive relationships with their teachers, irrespective of their gender and SES (Fitzpatrick et al., 2015). For instance, minority students experienced less warmth and more conflict in their relationship trajectories with teachers than their majority counterparts (Spilt et al., 2012). Likewise, minority students experienced increasing-negative trajectories in the relationship quality (moderate teacher support and low-increasing rejection), while majority students showed moderate-positive trajectories (moderate support, low rejection) over a period of three years (Baysu et al., 2021).

Due to the vital importance of teacher-student relationships and the recent attention on relationship quality in multicultural classrooms, the present study aimed to investigate factors associated with relationship quality among minority and majority student-teacher-dyads using data from secondary schools in Germany.

1. Teacher-student-relationship quality in adolescence

For studying teacher-student-relationship quality, the multidimensionality of the construct needs to be taken into account pointing out various facets for its operationalization, such as closeness, empathy, support, conflict or respect. We studied instrumental help and conflict because research has shown that teacher-student-relationships change once students enter the middle school, with increased potential for conflict due to growing autonomy (Ettekal & Shi, 2020; Hughes & Cao, 2018; Jerome et al., 2009) and a need to receive instrumental support while actively pursuing goals (Wentzel, 2004). Moreover, instrumental help and conflict form separate dimensions of the teacher-student-relationship and showed distinct predictive validity with academic success (Ang, 2005). Instrumental help refers to the extent to which the teacher provides additional advice when the student needs it or asks for a helping hand. It reflects the positive experiences in the teacher-student-relationship. The negative experiences are exemplified by teacher-student conflict, which is characterized by mutual frustration and anger.

The Developmental Systems Theory (DST; Pianta et al., 2003) suggests that teacher-student relationships have to be seen as embedded in different contexts, where teachers and students are permanently interconnected. In other words, teacher and student individual characteristics, expectations, and previous reciprocal encounters are related to the perceptions toward one another (Pianta et al., 2003). For this reason, results on teacher-student relationship quality that are based on single-informant reports from either teachers' or students' perspectives (Choi & Dobbs-Oates, 2016; Jellesma et al., 2015; Thijs & Koomen, 2009) missed to capture the similarities and dissimilarities between student and teacher attributes and their perceptions on the teacher-student relationship quality. Research indeed showed differences between teacher and student reports. Students have been found to focus more often on the quality of interactions in the classroom (Prewett et al., 2019; Walker & Graham, 2021) or teaching subject (e.g., teachers of easiest subject and classroom teachers are favored over teachers of the hardest subject; Roorda et al., 2019), while teachers relied on students' personal characteristics, such as students' performance, family context (Ghasemi, 2022; Timmermans et al., 2019) and positive or negative events in the classroom (de Ruiter et al., 2019).

In addition, studies that adopted a double-informant report on relationship quality showed that teachers' perceptions of

relationship quality are associated to students' features (e.g., gender, SES), that students' perceptions of relationship quality are associated to teachers' features (e.g., teaching experience, prosocial behavior in the classroom) and, that there are also common features that predicted both teachers' and students' perspectives, such as externalizing behavior (Prewett et al., 2019; Zee & Koomen, 2017). The great potential of such findings is that they go beyond the threat of common method bias and substantiate the theoretical assumption that teachers' and students' personal features and beliefs interact with one another (Pianta et al., 2003). Following this rationale, our study is unique because it compares student-teacher-dyads based on students' reports about their classroom teacher and on teachers' reports for each student in their classroom. This dyadic perspective is of great interest particularly in multicultural classrooms where culture-related variables become relevant for teacher-student interactions (e.g., teacher diversity norms) (Geerlings et al., 2019). Multiculturalism as a diversity approach in schools has been shown to have beneficial effects for both minority and majority students (e.g., direct relations to students' motivation; Abacioglu et al. 2019) and enhance positive teacher-student relationships among minority youth over time (Baysu et al., 2021). Therefore, this study aims to complement and extend the research on teacher-student dyadic perspectives on relationship quality by including general and migration-related predictors of relationship quality.

2. Determinants of relationship quality in student and teacher reports

We drew on multicultural education theory (Banks, 2009) to investigate individual- and school-related predictors of relationship quality in multicultural classrooms. Multicultural education theory suggests that the integration of cultural and social issues while teaching and an empowering school environment are important assets for establishing positive interactions in diverse settings. This theory can predict teacher-student-relationship quality for student and teacher reports alike.

For students, we considered the perceived interethnic school climate, culturally responsive teaching (CRT) and ethnic discrimination. These factors describe different levels of the school environment (Bronfenbrenner, 1979) and determine how students perceive relationship quality. At the school level, positive interethnic school climate suggests that teachers, school staff, and school management strive to treat all students fairly and encourage interethnic friendships. School climate can either be seen as comprising all individual relations or, as structural characteristics of the school environment that shape the perceptions of different individual relations (Goldsmith, 2004). In this study, we adhere to the latter assumption. Recent research showed that students who perceive their school as an environment which stresses the importance of equality values, also showed better relationship quality over time (Baysu et al., 2021).

At the classroom level, we considered whether and how teachers acknowledge culture while teaching. CRT refers to teachers' engagement with students' culture while teaching (e.g., speaking about contributions that students' cultures have made to a particular subject or helping students know more about other cultures; Gay & Howard, 2000). CRT has been associated with increased teacher support (Dickson et al., 2016), improved academic achievement (Aronson & Laughter, 2016) and was assumed to be beneficial for both minority and majority students (Byrd, 2016).

At the personal level, we investigated ethnic perceived discrimination as one of the major challenges minority students face in the school environment. Research showed that ethnic minority students usually experience ethnically biased treatment in the classroom, for instance, perceiving that they receive poor evaluations or harsher discipline from their teachers due to their ethnic background (Glock et al., 2013; Owens, 2022). Students' feelings of relatedness and belonging are essential for positive school adaptation (Ryan & Deci, 2000) and, perceiving discrimination from teachers (e.g., feeling excluded, being punished more often than others) can be particularly disruptive for building positive, trustworthy relationships because teachers are seen as attachment figures and role models by young people (Benner & Graham, 2013; Byrd & Andrews, 2016). For example, experiencing ethnic discrimination from teachers on a daily basis has been negatively related to same-day cognitive engagement and next-day emotional engagement among minority students (Civitillo et al., 2024).

For teachers, multicultural education theory (Banks, 2009) suggests that in order to successfully teach diverse students and build positive relationships, teachers ought to be interested in their students' social realities and discuss social inequities in the classroom. A mixed-methods study among ninth graders indicated that when teachers acknowledged social status differences in the classroom, relationship quality and students' academic adjustment improved (Gaias et al., 2020). Thus, we considered how teachers' awareness of social status differences affects teacher-student-relationship quality as a first factor. Furthermore, the teachers' professional competence model for teaching in multicultural classrooms (Hachfeld et al., 2012) argues that motivational orientations, such as enjoyment, can improve teachers' behavior while teaching and consequently students' school adjustment. For instance, enjoyment while teaching was a feature of high mastery classes and helped maintain positive teacher-student-relationships (Patrick et al., 2001). Thus, we considered teachers' enjoyment as a second factor in their assessment of relationship quality in diverse classrooms.

Based on the aforementioned theoretical positions and findings, we expected teachers to report higher levels of relationship quality than students for both minority and majority student-teacher-dyads (H1a). Furthermore, we expected the differences in the mean levels for student- and teacher-reported instrumental help and conflict to be larger in student-teacher-dyads with minority as compared to majority students (H1b). Similarly, because of greater cultural and economic synchrony between majority students and their teachers (e.g., teacher-student ethnic match in schools, similar resources), we expected a higher relationship quality agreement in majority as compared to minority student-teacher-dyads (H2). Moreover, we expected teacher-student-relationship quality to be predicted by a positive student-perceived interethnic school climate and higher levels of student-perceived CRT in students' reports (H3a); and by higher teachers' awareness of social heterogeneity and higher enjoyment in teachers' reports (H3b). We expected these associations in minority and majority student-teacher-dyads, because the mechanisms linking these constructs are assumed to be similar albeit at different levels. Among minority student-teacher-dyads, student perceived discrimination was expected to predict

lower levels of relationship quality in students' reports (H3c).

Besides these predictions, past research indicated that certain variables need to be controlled for to avoid misinterpretations due to hidden heterogeneity affecting associations. Teachers reported higher relationship quality toward girls, students in lower grades and students with a higher SES, while students in lower grades and with a higher SES also reported higher relationship quality (Zee & Koomen, 2017). Boys, who usually show more externalizing behavioral problems than girls (Ogden et al., 2021), were expected to assess relationship quality more negatively. Results on teaching experience are unclear: while some research highlights its importance (Chen & Phillips, 2018), other research found small to no effects on teachers' or students' reports (Choi & Dobbs-Oates, 2016). Thus, we controlled for students' gender, school grade, SES and teaching experience. Additionally, we controlled for generation status in the minority dyads as a migration-specific predictor.

To summarize, according to these empirical findings and the realities in schools today, our study aimed to address three research gaps in the literature on teacher-student relationship quality: examine teacher-student dyads instead of single reports, focus on adolescents instead of elementary school children and address the heterogeneity of experiences in multicultural classrooms. Therefore, we firstly investigated how secondary school students and their classroom teachers perceive relationship quality. Secondly, we examined the contribution of school, classroom and individual characteristics in predictions of teacher and student reports of relationship quality. Thirdly, we compared minority and majority student-teacher-dyads to evidence similarities and/or differences between these groups. The novelty of this multi-informant perspective on relationship quality is that it reveals both similarities and differences between students' and teachers' reports.

3. Method

3.1. Participants

Data were collected in a project on parent-teacher-interactions of ethnic minority and majority adolescents. The research was supported by funds of the "Niedersächsisches Vorab" made available by the Ministry for Science and Culture in Lower Saxony, Germany. Inclusion criteria to participate was students' grade (6th to 10th grade) and school type. We specifically chose to recruit participants from integrated comprehensive schools (*Integrierte Gesamtschule*), because this type of school showed an increase in the percentage of ethnic minority adolescents compared to other school types in Germany (from 13.3 % to 22.4 %) during a ten-year period (Statistisches Bundesamt, 2018), and it includes different school tracks that offer the possibility to achieve all school leaving certificates available in Germany, from vocational to university qualification.

The sample comprised 309 minority and 200 majority student-teacher-dyads from 28 classrooms. Minority students (46 % female) were slightly, but significantly younger than majority students (49 % female) ($M_{ethnic\ minority} = 12.99, SD = 1.30; M_{ethnic\ majority} = 13.50, SD = 1.56, p < .001$). There were no significant differences regarding SES ($M_{ethnic\ minority} = 4.07, SD = 0.84; M_{ethnic\ majority} = 3.95, SD = 0.77, p = .101$). The largest minority groups were of Arab- (12 %), Turkish- (12 %) and Balkan- (6 %) heritage and 23 % of the ethnic minority adolescents were first-generation immigrants ($M = 5.53, SD = 3.38$ length of residence in Germany). Regarding language competence, 86 % of the students in our sample were second-generation minority students, meaning that they already attended kindergarten and primary school and learned the German language accordingly. Moreover, minority students in our sample reported speaking the German language from good to very good: $M = 3.50, SD = 0.48$ (on a scale from 1 to 4, where 1 = *very bad*, 4 = *very good*). Teachers ($N = 28$) were all classroom teachers ($M_{age} = 45.82, SD = 11.50, 80\%$ female) with a teaching experience ranging from 3 to 40 years ($M = 16.78, SD = 11.07$). All teachers had German citizenship, which is common in German schools, where about 99 % of teachers have a German citizenship (Statistisches Bundesamt, 2020). Two teachers were first-generation immigrants (with origins in Ukraine and Iran), resident in Germany for 20 and 23 years, while three other teachers had one parent from Italy, Poland and South Korea.⁶ All teachers were considered to belong to the majority culture because they shared a similar power status, similar educational paths in the German university settings, and similar experience in the German school system. We only divided the student sample into ethnic minority and majority. To match the teacher-student dyads, we created pseudonymized identification codes consisting of letters and numbers based on the first name, surname and date of birth of both teachers and students. Teachers mentioned two letters of the students' surname, while the students mentioned two letters of their homeroom teacher surname, making the matching of the dyads possible.

4. Measures

4.1. Teacher-student-relationship quality

Relationship quality was assessed with the Teacher-Student-Relationship Inventory (Ang, 2005). The items were measured on a 7-point Likert scale from 1 (*almost never true*) to 7 (*almost always true*) and adapted to the respondent (teacher or student). Students reported on their classroom teacher and their classroom teacher reported on each student in their class. The items covered instrumental help (e.g., "If the student has a problem at home, he/she is likely to ask for my help." and "If I have a problem at home, I would ask my teacher for help.;" 4 items) and conflict (e.g., "This student/teacher frustrates me more than most other students/teachers in my class.;"

⁶ To ensure that results were not biased by teacher generation status, we reran the analyses without these teachers. Findings did not change by excluding these five teachers.

4 items). The reliability for the student version was $\alpha = .75$ for instrumental help and $\alpha = .68$ for conflict and for the teacher version was $\alpha = .91$ for instrumental help and $\alpha = .86$ for conflict.

4.2. Student-perceived interethnic school climate

Interethnic school climate was assessed with the School Interracial Climate Scale, which consisted of two subscales: Supportive Norms with six items (e.g., “Teachers at this school like for students of different ethnicities to understand each other.”) and Equal Status with five items (e.g., “Teachers at this school are fair to all students regardless of their ethnic background.”) (Green et al., 1988). We adapted the items to the reality of German schools where ethnic diversity outweighs racial diversity. Eleven items were measured on a 7-point Likert scale from 1 (*completely disagree*) to 7 (*completely agree*). The reliability for the Supportive Norms subscale was $\alpha = .84$, while the reliability for the Equal Status subscale was $\alpha = .78$. The whole scale’s reliability was $\alpha = .87$.

4.3. Student-perceived culturally responsive teaching

CRT was measured with the Cultural Engagement Subscale from the Culturally Responsive Teaching Scale (Dickson et al., 2016). Seven items (e.g., “My teacher helps students learn about other students and their cultures.”) were measured on a scale from 1 (*never*) to 7 (*always*). The scale’s reliability was $\alpha = .86$.

4.4. Student-perceived ethnic discrimination

Ethnic discrimination was assessed with the Perceived Discrimination Scale (Wong et al., 2003). Minority students reported how often they lately experienced negative treatment from their classroom teacher because of their ethnicity. Four items (e.g., “How often do you think that your classroom teacher rates you more harshly because of your ethnicity?”) were measured on a scale from 1 (*never*) to 5 (*every day*). The scale’s reliability was $\alpha = .87$.

4.5. Teachers’ awareness of social heterogeneity

We developed three items to assess teachers’ engagement with students’ social background while teaching. Items were rated (e.g., “I help my students to better understand other students’ life situations.”) on a 7-point Likert scale from 1 (*never*) to 7 (*always*). The scale’s reliability was $\alpha = .70$.

4.6. Teachers’ enjoyment

Teachers’ enjoyment was assessed with the Teacher Emotions Scale (Frenzel et al., 2016). Four items (e.g., “I often have reasons to be happy while I am teaching these students.”) were measured on a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The scale’s reliability was $\alpha = .88$.

4.7. Control variables

We introduced student’s gender, grade, SES and teachers’ experience as control variables in all regression models. Gender and grade were assessed by answering simple questions. SES was measured by asking adolescents about their opinion regarding their family’s financial situation based on 5-response options, from 1 (*very bad*) to 5 (*very good*), while teachers’ experience was measured in years of teaching. Generation status was measured based on whether the students were (*second generation*) or were not born (*first generation*) in Germany.

All scales were in German, the school’s general language of instruction. Higher scores indicate higher levels of the measured construct.

4.8. Procedure

The study was approved by the University’s Ethics Committee, the regional school authority and school directors. Teachers, students, and parents were informed about the study beforehand (i.e., study’s purpose, voluntary participation, and the means of withdrawal at any time without any consequences). After obtaining parental consent, students filled in the questionnaires in the classroom, supervised by trained research staff. Teachers were asked to fill in both a general and an additional questionnaire regarding their relationship quality with every student in their class. Due to the extra workload, teachers were given the opportunity to either fill in the questionnaires in the classroom or send them back by post later on. All teachers and students completed paper-pencil questionnaires between June and October 2019. Students received a 10€ voucher for the participation.

4.9. Data Analysis

To test for H1a and H1b we first established scalar measurement invariance for minority and majority dyads on instrumental help and conflict and then tested for group mean differences. The level of congruence between teacher and student reports was tested by

Table 1
Bivariate Correlations between Study Variables.

	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Student determinants															
1. Female	-	1													
2. Grade	7.74 (1.32)	.02	1												
3. SES	4.02 (.82)	.04	-.11 *	1											
4. Minority group	-	-.03	-.22 **	.08	1										
5. Second generation	-	-.06	-.03	-.00	-.02	1									
6. Perceived interethnic school climate	5.01 (1.18)	.16 **	-.11 *	.19 **	.08	-.02	1								
7. Perceived CRT	3.30 (1.35)	.06	.09	.11 *	-.06	-.06	.36 **	1							
8. Perceived discrimination	1.41 (.80)	-.26 **	-.26 **	.00	.22 **	-.04	-.17 **	.09	1						
Teacher determinants															
9. Teaching experience (in years)	16.78 (11.06)	-.02	.07	-.01	.13 **	-.06	.02	.02	-.04	1					
10. Awareness of social heterogeneity	5.34 (.88)	-.02	-.07	.04	-.01	.02	.04	.02	-.07	-.40 **	1				
11. Enjoyment while teaching	5.84 (.80)	-.03	.17 **	-.10 *	-.18 **	.01	-.08	-.06	-.21 **	.14 **	-.06	1			
Teacher-student relationship quality															
12. Student-reported instrumental help	3.64 (1.53)	.08	-.16 **	.18 **	.02	-.02	.42 **	.35 **	.00	-.18 **	.19 **	-.08	1		
13. Student-reported conflict	2.75 (1.38)	-.11 *	-.08	-.04	.16 **	-.04	-.26 **	-.04	.30 **	.19 **	-.21 **	.00	-.33 **	1	
14. Teacher-reported instrumental help	4.31 (1.35)	.17 **	-.04	.01	-.14 **	.04	-.03	.03	-.03	-.25 **	.13 **	.17 **	.11 *	-.02	1
15. Teacher-reported conflict	1.57 (1.02)	-.16 **	-.22 **	-.07	.16 **	-.01	-.15 **	-.07	.30 **	.24 **	-.30 **	.01	-.12 **	.26 **	-.32 **

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. (two-sided) Female = 1, Male = 0. Minority group = 1, Majority group = 0. Second generation = 1, First generation = 0.

strength of the bivariate Pearson correlational associations (H2). Predictors of teacher-student-relationship quality were tested using two-level regression analyses to account for the nested data (Level 1 = students nested in Level 2 = classrooms). To maintain greatest possible parsimony, four individual regressions were conducted for instrumental help as outcome (two per informant per group: minority and majority student-teacher-dyads) and same four regressions for conflict as outcome (H3a, b, c). All analyses were conducted in *Mplus* 8. The few values missing (10 % in perceived discrimination and between 2 % and 7 % for the other scales) were replaced using the full information maximum likelihood procedure (FIML). In the two-level (individual, class) regression analyses, data on two Level 2 predictors were missing: teachers' awareness of social heterogeneity and teachers' enjoyment. Thus, only 26 clusters were included in the analyses. The continuous predictors were grand mean centered and the dummy predictors were left in raw metric (Enders & Tofghi, 2007). Model fit was assessed with the comparative fit index (CFI), Tucker-Lewis-Index (TLI), and root mean square error of approximation (RMSEA). Acceptable fit indices were CFI and TLI \geq 0.90 and RMSEA \leq 0.08 (Schermelleh-Engel et al., 2003). We also report the SRMR index, but we did not use it to inform our decision about model fit. In smaller samples, larger SRMR values occur frequently as there is less certainty in the sample which contributes to larger SRMR values so that models can be considered well-fitting even if the SRMR exceeds 0.80 (Asparouhov & Muthén, 2018).

5. Results

5.1. Mean Differences and Agreement between Minority and Majority Student-Teacher-Dyads (H1a, H1b, H2)

The descriptive statistics and bivariate correlations are depicted in Table 1. In order to test for mean differences between informants and ethnic groups (H1a, b), we conducted measurement invariance models (configural, metric, scalar) for both outcomes (teacher-/student-perceived instrumental help and teacher-/student-perceived conflict) and both groups within a multilevel multi-group CFA. As our data was hierarchically structured (students nested in classrooms), we had to correct for data dependency at Level 2. Therefore, the pseudo maximum likelihood (PML) estimator implemented in *Mplus* (Asparouhov & Muthén, 2005) was used to correct for effects of dependencies of observations within classes. We allowed for a correlation between items 1 and 3 in the instrumental help model, and between items 1 and 4 in the conflict model, as these were very similar in terms of content (asking for teachers' help and being angry with each other). Scalar measurement equivalence was obtained for both outcomes. The final model fit indices for instrumental help were: CFI = .952, TLI = .936, RMSEA = .068 (90 % C.I. = .049–.088), SRMR = .087, χ^2 (42) = 92.04, $p < .001$, while the indices for conflict were: CFI = .943, TLI = .924, RMSEA = .063 (90 % C.I. = .044–.083), SRMR = .106, and χ^2 (42) = 84.77, $p < .001$, indicating an acceptable fit for both dependent variables. The model fit indices for the configural and metric models are in the supplemental material (Appendix A). The mean differences between teacher and students and between majority and minority dyads were all statistically significant ($p < .001$ for all cases). Teachers reported more requests for instrumental help than students and minority students were slightly more likely to ask teachers for help than majority students. Regarding conflict, teachers reported lower levels of conflict than students and, additionally, minority students reported higher levels of conflict than majority students. Hence, H1a was supported because teachers reported better relationship quality than students. H1b was not supported because the mean level differences were larger in the majority than in the minority dyads (see Table 2).

To examine our hypothesis that teacher-student agreement would be higher in majority than in minority dyads (H2), we correlated the dyad scores. Across the whole sample, and against our expectations, we found a small agreement in instrumental help among both majority: $r(200) = .15$, $p = .177$ and minority: $r(309) = .18$, $p = .009$ student-teacher-dyads. Regarding conflict, we found a medium agreement for both ethnic groups, $r(309) = .28$, $p < .001$ for minority and $r(200) = .25$, $p < .001$ for majority student-teacher-dyads. Fischer's Z-tests revealed no significant differences in the strength of associations between minority and majority student-teacher-dyads, $Z_s \leq .35$, $p_s \geq .63$. Thus, H2 had to be rejected.

5.2. Determinants of relationship quality in minority and majority student-teacher-dyads (H3a, b, c)

To predict relationship quality in student-teacher-dyads we conducted eight two-level regression models for (majority and minority) students' and teachers' reports with instrumental help and conflict as outcomes (see Table 3). Model fit was assessed according to the aforementioned criteria. The fit indices for all models can be found in the supplemental material (Appendix B). The intraclass correlation coefficients (ICCs) for the majority student-teacher-dyads were of medium size for instrumental help (0.14) and large size

Table 2
Mean Differences for Relationship Quality.

Outcome	Majority Dyads		Minority Dyads	
	Student	Teacher	Student	Teacher
	<i>M</i> (<i>SD</i>)			
Instrumental Help	1.94 (0.12)***	3.42 (0.36)***	2.02 (0.15)***	3.14 (0.34)***
Conflict	2.91 (0.47)***	1.81 (0.21)***	3.22 (0.41)***	2.10 (0.16)***

Note: * $p < .05$. ** $p < .01$. *** $p < .001$.

Results were obtained by conducting multilevel multi-group CFA models.

Table 3
Two-level Regression Results for Majority and Minority Student-Teacher-Dyads.

Variable	Majority Group				Minority Group			
	Instrumental Help		Conflict		Instrumental Help		Conflict	
	Student-Report B (SE)	Teacher-Report B (SE)						
Level 1								
Female	.11 (.06)	.20 (.08)* *	-.07 (.08)	-.16 (.09)	.04 (.07)	.26 (.09)* *	-.03 (.08)	-.11 (.09)
SES	.04 (.05)	-.08 (.05)	-.03 (.08)	-.15 (.06)*	.14 (.05)* *	.17 (.08)*	.04 (.07)	-.11 (.08)
Second generation					-.04 (.05)	.00 (.06)	-.04 (.06)	.01 (.06)
Student-perceived school climate	.40 (.06)* **	-.04 (.09)	-.37 (.08)* **	-.24 (.06)* **	.26 (.07)* **	-.06 (.07)	-.25 (.07)* *	-.05 (.07)
Student-perceived CRT	.25 (.06)* **	.17 (.11)	.12 (.09)	.03 (.06)	.27 (.07)* **	.05 (.08)	.06 (.08)	-.01 (.08)
Student-perceived discrimination					-.02 (.06)	.07 (.10)	.24 (.08)* *	.23 (.10)*
Level 2								
Students' grade	-.46 (.22)*	-.14 (.19)	-.16 (.20)	-.56 (.11)* **	-.58 (.26)*	-.05 (.20)	-.06 (.29)	-.24 (.17)
Teaching experience (in years)	-.04 (.19)	-.19 (.21)	.21 (.20)	.02 (.16)	-.72 (.34)*	-.34 (.20)	.60 (.16)* **	.37 (.16)* **
Teachers' awareness of social heterogeneity	.60 (.14)* **	.33 (.19)	-.31 (.17)	-.41 (.13)* **	.03 (.27)	.07 (.18)	-.51 (.25)*	-.42 (.14)* **
Teachers' enjoyment while teaching	.33 (.20)	.48 (.22)*	-.27 (.23)	-.17 (.23)	.20 (.32)	.38 (.21)	.32 (.24)	.02 (.22)
R ² – Level 1	.34 * **	.07	.13 *	.13 * *	.25 * **	.09	.15 **	.11 *
R ² – Level 2	.63 * *	.38 *	.28	.55 * **	.83 *	.22	.99 **	.46 **

Note. **p* < .05. ***p* < .01. ****p* < .001. Female = 1, Male = 0. Second generation = 1, First generation = 0.

for conflict (0.24) in students' reports, indicating that 14 % and 24 % of variance, respectively, was between-classrooms. The ICCs for teachers' reports were large for instrumental help (0.41) and conflict (0.52), indicating 41 % and 52 % between-classroom variance.

The models for *instrumental help in majority student-teacher-dyads* showed a good model fit. A more positive school climate, higher levels of student-perceived CRT and teachers' awareness of social heterogeneity predicted more student-reported instrumental help. Moreover, attending a lower grade was associated with a higher likelihood of asking teachers for help. In teachers' reports, more enjoyment while teaching exclusively predicted higher levels of instrumental help. The models for *conflict in majority student-teacher-dyads* also showed a good fit. Lower levels of SES, students' lower grade and less awareness of the social heterogeneity in the classroom were associated with more teacher-perceived conflict. A negative school climate was a common predictor in students' and teachers' reports of conflict. Hence, in majority dyads, H3a was fully confirmed for school climate and partially confirmed for student-perceived CRT (only for instrumental help). H3b was partially confirmed for both teachers' awareness and enjoyment.

The ICCs for the minority student-teacher-dyads were small for instrumental help (0.05) and conflict (0.07) in students' reports, indicating that 5 % and 7 % of variance was between-classrooms. The ICCs for teachers' reports were large for instrumental help (0.47) and conflict (0.22), indicating 47 % and 22 % between-classroom variance.

The models for *instrumental help in minority student-teacher-dyads* showed a good fit. Having a higher SES predicted higher levels of instrumental help in both students' and teachers' reports. Conversely, a positive school climate, higher levels of CRT, attending a lower grade and less teaching experience predicted more instrumental help in students' reports. Teachers reported that girls were more likely to ask for help than boys. The models for *conflict in minority student-teacher-dyads* showed an acceptable fit for students' reports and a good fit for teachers' reports. A positive school climate predicted lower levels of conflict only in students' reports. Common predictors for higher levels of conflict were higher levels of student-perceived discrimination, more years of teaching experience and lower levels of teachers' awareness of social heterogeneity. Thus, in minority dyads, H3a was fully supported for school climate and partially supported for CRT. H3b was partially supported for teachers' awareness and enjoyment, while H3c was partially supported for perceived discrimination.

6. Discussion

Our study revealed only little to no congruence in the relationship quality of minority and majority student-teacher-dyads, similar to previous research (Gregoriadis et al., 2022; Poulou, 2017; Zee & Koomen, 2017). Based on the Developmental Systems Theory, this difference in perceptions may be driven by teachers' and students' own experiences, appraisals and expectations related to the other within the dyad (Pianta et al., 2003), which was supported by our regression findings. However, despite the lack of agreement, this multi-informant study fills various research gaps by comparatively investigating dyadic data (students' and teachers' perspectives) in ethnic minority and majority student-teacher-dyads during adolescence.

In particular, our study can offer a clearer understanding of students' and teachers' perspectives. First, as found in earlier studies, teachers and students perceived relationship quality differently with teachers rating the relationship more positively. In this case, the

social desirability bias might be much stronger for teachers: first, because as teachers, they are trained and required to handle all types of students; and second, because as adults, the willingness to admit conflicts or negative encounters on a questionnaire may be reduced. Differentiating between minority and majority students adds to these findings, because conflicts between teachers and students are more pronounced in minority student-teacher-dyads (both teacher and student reports) and because teachers report more requests for instrumental help from majority students. The strength of associations between teacher and student reports, however, did not differ significantly between minority and majority dyads which may also be the result of the rather limited agreement overall. Second, we were able to provide an insight into why the perceptions of students and teachers differ from one another. Besides common predictors (e.g., teachers' awareness of social heterogeneity predicted teachers' and students' reports of relationship quality in both groups), students' perception of the teacher-student-relationship quality was associated to global assessments of social relations in school (e.g., school climate), whereas teachers' perspective was associated to their own teaching experiences (e.g., enjoyment while teaching). Third, we found differences in the predictions between minority and majority reports (e.g., SES played a more important role for minority dyads), which is an indication of group-specific processes at play.

As expected from our application of multicultural education theory (Banks, 2009), all students reported benefits from interethnic and culturally sensitive environments. A positive interethnic climate predicted higher levels of instrumental help and lower levels of conflict in both ethnic minority and majority dyads. That is, students who perceived that their teachers and school staff treated everyone equally and encouraged forming friendships showed high levels of relationship quality. This finding adds to previous research: Together with results showing that relationship quality predicts numerous positive academic outcomes (e.g., Engels et al., 2021; Roorda et al., 2017), our findings suggest that relationship quality could be a potential mediator in the empirically established association between a supportive and fair school climate in multicultural schools and higher achievement, academic self-concept and life satisfaction (Schachner et al., 2018). Similarly, students' perceptions of CRT related to their perceptions of instrumental help for both minority and majority dyads. This finding highlights the importance of teacher readiness to incorporate culture as a factor in their teaching and complements previous research (e.g., Dickson et al., 2016) in two ways. First, it confirms the validity of this measure for individual teachers' behavior (here, the classroom teacher), whereas other studies focused on the whole team of teachers. Secondly, it shows a clear association between CRT and instrumental help (instead of teacher support in general), which suggests that perceived CRT may have outcome-specific effects. The result also extends the generalizability of some US research to the German context where research in this area is still at the beginning and where the school environment is substantially different from the US school environment (Civitillo & Juang, 2020). As expected, our data also show that perceiving ethnic discrimination from teachers relates to higher levels of conflict among minority student-teacher-dyads in both reports, while there was no association to instrumental help. Compared to family or peer relationships, the teacher-student-relationship is characterized by an imbalance in power in that the teacher has the authority and is a relevant figure in students' school adjustment. Therefore, it might be that when students feel that their teachers grade them unfairly or punish them more harshly because they belong to a minority group, they feel helplessness, frustration and anger, a finding previously confirmed (van Bergen et al., 2021).

Finally, though we found no differences in the strength of associations between teachers' and minority or majority students' perceptions of relationship quality, students' and teachers' perspectives on predictors of relationship quality did differ for minority and majority student-teacher-dyads. For minority students, teachers' experience played a significant role, but not in majority dyads. This finding was counterintuitive: more teaching experience was associated with lower levels of instrumental help and higher levels of conflict in both teacher and student reports. One interpretation is that teachers who are new in the job are more enthusiastic and motivated to try innovative teaching methods and improve themselves and their students' learning, while more experienced teachers already chose their strategies to which they hold. Additionally, a recent study associating teachers' experience and teaching quality showed that more experience does not necessarily equate more competence and beginning teachers can be as competent as experienced teachers (Graham et al., 2020). Therefore, an alternative interpretation might be that younger cohorts of teachers are better prepared for dealing with diverse classrooms – through own experience or better university curricula. This explanation is supported by the fact that teachers' awareness of social heterogeneity (which was negatively correlated with teaching experience) related to lower levels of conflict in both minority and majority dyads and predicted higher levels of instrumental help in majority student reports. Future studies should address effects of teacher experience and teacher cohort in more detail in order to identify points for improvement in teacher training.

Among teacher characteristics, experiencing positive emotions while teaching also played a crucial role in teacher reports on instrumental help, but only for majority dyads. Hence, our results show that enthusiastic teachers, who are enjoying their work, inspire students to ask for help and, therefore, confirm and extend recent research on the benefits of teachers' positive emotions on building fruitful relationships and improving students' adjustment (Frenzel et al., 2021). However, more research is needed to clarify why this finding only applied to majority student-teacher-dyads, or whether the finding for minority student-teacher-dyads in this study was sample-specific (it just missed significance, $p = .06$).

More research also seems advisable with regard to the role of students' SES in teachers' reports. In minority dyads, teachers reported more requests for instrumental help from students with a higher SES, while in majority dyads higher levels of SES led to lower levels of conflict in teachers' reports. These findings are in alignment with a German report on the teaching profession showing that most of the teachers believe that the social class strongly relates to school performance (Vodafone Stiftung Deutschland, 2012). Our results show that teachers treat students differently depending on their social standing. Future research should address these differences, for example by investigating whether teachers perceive high SES minority children as more similar to themselves, or whether the effect of less teacher-reported instrumental help from low SES minority adolescents is the double penalty through the intersection of two kinds of low social status (minority and low SES) in these adolescents (Murray & Zvoch, 2011). Finally, another interesting result merits comment. We found smaller ICCs in students' reports in the minority group than in the majority group, which indicates

that minority students' perceptions of relationship quality vary more on the individual level and less across classrooms than the perceptions of majority youth. This result has at least two explanations: first, students from ethnic minority groups may show different needs and ability levels, which leads teachers to offer individual and adapted levels of support and second, as recent research on teaching-related intercultural efficacy shows (Ulbricht et al., 2022), teachers in equality and inclusion-oriented schools may be more inclined to adjust their lessons and teaching behaviour to the socio-cultural background of minority students.

7. Limitations and future directions

Besides strengths (e.g. same relationship quality scale for both informants, measurement invariance established, group comparisons), some limitations have to be considered. First, based on our theoretical assumptions (e.g., Baysu et al., 2021), we assumed that interethnic school climate is associated to relationship quality. However, relationship quality may also shape the school climate or, school climate and individual relationships may bidirectionally associate. Our cross-sectional study cannot draw a clear line of causation between the concepts tested and we advise future studies to investigate reciprocity. Moreover, given that relationship quality is said to change over time (Ettekal & Shi, 2020), longitudinal studies are needed to investigate how teacher-student agreement and its determinants change across secondary school years.

Second, we investigated only minority and majority dyads. However, certain minority groups are more or less stigmatized by the majority population (e.g., Muslim vs. non-Muslim in Germany, recent vs. established groups; Schwarzenthal et al., 2022), which could impact the relationship quality between teachers and students due to teachers' implicit and explicit biases (Steketee et al., 2021). Therefore, future research can profit from intensive (also qualitative) studies to investigate certain ethnic minority groups among students, but also among teachers in greater detail and to see whether or not results for relationship quality are in alignment with our findings. Furthermore, future research should extend the findings on relationship quality to other school contexts where the teacher-student ethnic ratio is more balanced and further investigate the cultural and socio-economic synchrony between teachers and students. Recent findings already showed that the teacher-student ethnic match associates with higher motivation and student engagement (Rasheed et al., 2020).

Third, our sample included only one single school type. Future studies should examine other types of schools (e.g., as Level 3 factor) in other countries in order to generalize results to other school settings, especially because school characteristics were found to affect student outcomes significantly (Brenick et al., 2012; Goldsmith, 2004). This would help to explain and contextualize differences in the appraisals within minority and majority student-teacher-dyads. Fourth, we used instrumental help and conflict to measure relationship quality, which captured only two aspects of the complexity of interpersonal relationships between teachers and students during adolescence. It might be interesting for future studies to investigate other constructs, such as trust, empathy or respect. Finally, our study included a small number of teachers ($N = 28$) and, regarding the multilevel models, data for two classrooms was missing. Thus, the regression results for teachers' enjoyment and teachers' awareness of social heterogeneity are based on a moderate sample. Further investigations with larger numbers of teachers and students (allowing to test multiple indicators in one single SEM framework) should be considered.

8. Implications for research and practice

Despite these limitations, this study improves our understanding of teacher-student-relationship quality in multicultural classrooms and yields valuable implications for research and practice. As regards research, future studies should develop new instruments, and use new approaches to measure relationship quality and obtain additional information on the dyadic processes. For example, including other sources (e.g., peers, parents) or using different methods (e.g., observations, daily diaries) when investigating dyadic relations could help extend and validate findings. As regards practice, our results emphasize the benefits of integrating multicultural education trainings in schools and during the teacher preparation years. Such trainings should raise awareness about the effects of teacher beliefs, expectancy stereotypes (e.g. SES) and perceived discrimination on students' psychosocial outcomes. Moreover, intervention programs designed to encourage classroom discussions about cultural and social differences can positively shape adolescents' development (e.g. positive interethnic relations), and teachers' professional competence (e.g. improve school to home communication) in modern multicultural schools.

9. Conclusion

Given that a positive relationship between teachers and students is a prerequisite for academic success, understanding which factors contribute to improving this relationship especially in increasingly diverse schools is of high priority. Our study showed that, besides similarities, students' perceptions of relationship quality were associated to global assessments of social relations in school (e.g., positive interethnic climate), while teachers' perceptions of relationship quality were associated to their own personal experiences (e.g., enjoyment while teaching). We hope that our findings will encourage school practitioners to promote intercultural relations and build welcoming environments that incorporate and recognize students' and teachers' heritage.

Declarations of interest

none.

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CRedit authorship contribution statement

Peter F. Titzmann: Writing – review & editing, Supervision, Project administration, Methodology, Funding acquisition, Conceptualization. **Alison E. F. Benbow:** Writing – review & editing, Project administration, Methodology, Investigation, Conceptualization. **Mădălina A. Paizan:** Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Conceptualization.

Appendix A

Model Indices for Measurement Invariance on Relationship Quality for Minority and Majority Groups.

Invariance types	χ^2 (df)	RMSEA (90% CI)	CFI/TLI	SRMR
Instrumental help				
1. Configural	63.75 (28)* **	.071 (.048-.094)	.966/.931	.054
2. Metric	77.81 (36)* **	.068 (.047-.088)	.960/.937	.082
3. Scalar	92.04 (42)* **	.068 (.049-.088)	.952/.936	.087
Conflict				
1. Configural	47.36 (28)*	.052 (.024-.077)	.974/.948	.048
2. Metric	64.85 (36)* **	.056 (.033-.078)	.962/.940	.104
3. Scalar	84.77 (42)* **	.063 (.044-.083)	.943/.924	.106

Note. CFI = comparative fit index, TLI = Tucker-Lewis-Index, RMSEA = root mean square error of approximation, SRMR = standardized root mean square residual.

Appendix B

Model Fit Indices for the Two-level Regression Models (students nested in classrooms).

Model	χ^2	df	CFI	TLI	RMSEA	SRMR _{within}	SRMR _{between}
Majority student-teacher-dyads							
Teacher-reported instrumental help	17.93 *	8	1.00	1.00	.000	.000	.000
Student-reported instrumental help	77.35 * **	8	1.00	1.00	.000	.000	.002
Teacher-reported conflict	34.85 * **	8	1.00	1.00	.000	.000	.000
Student-reported conflict	26.32 * **	8	1.00	1.00	.000	.000	.001
Minority student-teacher-dyads							
Teacher-reported instrumental help	22.02 *	10	1.00	1.00	.000	.000	.000
Student-reported instrumental help	82.43 * **	10	1.00	1.00	.000	.001	.025
Teacher-reported conflict	28.65 * *	10	1.00	1.00	.000	.000	.001
Student-reported conflict	53.56 * **	10	.948	1.00	.000	.036	.038

Note. CFI = comparative fit index, TLI = Tucker-Lewis-Index, RMSEA = root mean square error of approximation, SRMR = standardized root mean square residual.

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