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## Social-relational classroom climate and its link to primary students' behavioral problems

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### Abstract

According to the BELLA study, 15-20% of all students in primary school age in Germany show mild to manifest mental problems. These children are often involved in bullying, have fewer friends in class, and feel less socially included compared to their classmates. Classroom climate is discussed as an approach to foster the academic achievement, the well-being, and the social-emotional development of these children. Previous research has revealed a link between classroom climate and students' behavioral problems. However, classroom climate is a broad construct for which many different definitions and operationalizations exist and less is known about the nexus between behavioral problems and the social-relational classroom climate. In the present study, we focus on the social-relational classroom climate consisting of the students' feelings of social inclusion, social participation, student-teacher relations, and bullying and address the following research questions: What is the connection between students' behavioral problems and various aspects of social relations on the individual and class levels? Data were collected from 2045 primary school students (51% male; age:  $M = 8.57$  years,  $SD = 1.29$ ) from 87 classes in a cross-sectional design utilizing teacher ratings, student questionnaires, and peer nominations. The results indicated that climate at the class level is not simply a reflection of the classroom climate experienced at the individual level. Differences emerged between behavioral problems related to peer interactions and teacher-student relations, with the latter of particular importance for oppositional/disruptive and academically disorganized behavior. Bullying dimensions were related to higher levels of anxious-depressed, social withdrawal, oppositional/disruptive, and academically disorganized behavior.

*Keywords:* classroom climate, social relations, behavioral problems, primary school

## Soziales Klassenklima und Verhaltensprobleme von Schüler\*innen der Primarstufe

### Zusammenfassung

Gemäß der BELLA-Studie weisen 15-20% aller Grundschüler\*innen in Deutschland Anzeichen für leichte bis schwere psychische Probleme auf. Diese Kinder sind häufig in Mobbingprozesse involviert, haben weniger Freunde in der Klasse und fühlen sich im Vergleich zu ihren Mitschüler\*innen weniger sozial eingebunden. Das Klassenklima wird als ein Ansatz zur Förderung der schulischen Leistungen, des Wohlbefindens und der sozial-emotionalen Entwicklung von Lernenden diskutiert. Studien der vergangenen Jahre deuten auf einen Zusammenhang zwischen dem Klima in der Klasse und dem Auftreten von Verhaltensproblemen hin. Für das weit gefasst Konstrukt Klassenklima gibt es viele verschiedene Definitionen und Operationalisierungen. Bisher ist nur wenig bekannt über den Zusammenhang zwischen Verhaltensproblemen und dem sozialen Klima in der Klasse. Daher untersuchen wir in der vorliegenden Studie das soziale Klassenklima, bestehend aus der gefühlten sozialen Integration der Schüler\*innen, ihrer sozialen Teilhabe, der Schüler\*innen-Lehrkraft-Beziehung sowie Mobbing. Den Fokus bildet die folgende Forschungsfrage: Welcher Zusammenhang besteht zwischen den Verhaltensproblemen von Schüler\*innen und verschiedenen Aspekten sozialer Beziehungen auf individueller Ebene und auf Klassenebene? In einem Querschnittsdesign wurden Daten von 2045 Grundschüler\*innen (51 % männlich; Alter:  $M = 8,57$  Jahre,  $SD = 1,29$ ) aus 87 Klassen unter Verwendung von Lehrkraftbewertungen, Schüler\*innenfragebögen und Peer-Nominierungen erhoben. Die Ergebnisse deuten darauf hin, dass das soziale Klima auf Klassenebene nicht einfach ein Spiegelbild des auf individueller Ebene erlebten sozialen Klassenklimas ist. Es ergaben sich Unterschiede zwischen der Interaktion mit Gleichaltrigen und der Beziehung zwischen Lehrkräften und Schüler\*innen im Zusammenhang mit Verhaltensproblemen. Die Schüler\*innen-Lehrkraft-Beziehung scheint für oppositionelles/störendes Verhalten und Probleme im lernförderlichen Verhalten von besonderer Bedeutung zu sein. Mobbing stand in Zusammenhang mit einem höheren Maß an ängstlich-depressivem Verhalten, sozialem Rückzug, oppositionellem/störendem Verhalten und Problemen im lernförderlichen Verhalten.

*Schlüsselwörter:* Klassenklima, soziale Beziehungen, Verhaltensprobleme, Grundschule

Extensive behavioral and mental health problems are highly prevalent in children and adolescents (Otto et al., 2020). The BELLA study (Klipker et al., 2018; Ravens-Sieberer et al., 2015) estimates that 15-20% of all students between the ages of six and eleven years in Germany show mild to manifest mental problems. These children's behavior is characterized by e.g., aggressiveness, impulsivity, conflicts with peers, inattention, not participating in class, anxiety or depression. They have difficulties maintaining positive peer-relationships, are

more often involved in bullying, have fewer friends compared to other children in class, and feel less well included (Jia & Mikami, 2015; Newcomb et al., 1993; Rytioja et al., 2019). Additionally, these children perceive their teacher-student relationship less positively (Krull et al., 2014; Roorda et al., 2020). This may also be because they receive less positive feedback and instead are more often admonished (especially students with externalizing problems) or overlooked (especially students with internalizing problems) by their teachers (Gresham & Kern,

2004; Rathel et al., 2014). In accordance with the previous considerations, it is relevant to examine how to support students' social-emotional development. In addition to individual factors, contextual factors are also key (Osher et al., 2020). Due to its accessibility to all children and adolescents, schools and in particular the classroom climate, are especially important for the development of mental health (Alansari & Rubie-Davies, 2020; Wang et al., 2020). Accordingly, the objective of this paper is to add further knowledge on this issue.

Osher et al. (2020) provide an overview of how micro- and macro-level relationships and contexts can interact with individual-level factors to influence human development. A differentiated view that includes both the individual level and the context also proves significant from a methodological perspective (Marsh et al., 2012). At the micro level, schools represent one of the most important contexts because they can be designed and organized to provide support networks that also foster relationships between students and teachers (Crosnoe & Benner, 2015; Osher & Kendziora, 2010). In this regard, the classroom represents the most proximal school environment (Osher et al., 2020). Accordingly, a supportive and safe classroom climate is an important way to counteract student behavior problems and foster social relationships in the classroom (Alansari & Rubie-Davies, 2020; Wang et al., 2020). Positive classroom climate has beneficial effects not only on academic achievement (Givens Rolland, 2012) but also on well-being (Wang & Degol, 2016), social-emotional development (Narvaez, 2010), and motivation and engagement (Wang & Degol, 2014). A recent meta-analysis (Wang et al., 2020) supports these results. By analyzing 61 studies, the authors showed that classroom climate had small-to-medium-sized positive correlations with students' social competences, motivation and engagement, and academic achievement, as well as negative links of small effect sizes with socioemotional dis-

tress and externalizing behaviors. Further studies have also revealed negative associations between a poor classroom climate and anxiety or depressive symptoms among students (Bilz, 2013) or aggressive behavior (Thomas et al., 2011).

With regard to the importance of classroom climate for student behavior, particular attention has been paid to student aggressive behavior and the influence of student interactions and the student-teacher relationship in previous research. The importance of the socio-emotional environment in the classroom was also evident in the study by Thomas et al. (2011), showing that classes with greater peer conflict have higher aggression scores. In addition to student interactions, this also depends on the student-teacher relationship (Lucas-Molina et al., 2015; Wang et al., 2013). Regarding the importance of social-relational classroom climate in its influence on elementary students' behavior problems, the longitudinal study by Rucinski et al. (2018) shows that both the relationship with the teacher and the social climate can have an impact on students' internalizing and externalizing problem behaviors. While positive relationships between teachers and students have a decreasing effect on students' depressive symptoms, lower perceived student conflicts lead to a decrease in aggression in the classroom. This positive effect is even evident when student-teacher relationships are less positive, without compensating for the lack of a positive relationship between students and their teachers.

However, the presented findings should not obscure the fact that classroom climate is a very broad construct and, to date, there is a lack of consensus on the actual definition and operationalization of what constitutes a classroom climate (Pianta & Hamre, 2009; Wang & Degol, 2016). One of the first researchers to use the term were Walberg and Anderson (1968) in the course of assessing children's perception of their school experience.

According to Moos (1979), the relationship dimension comprises both student-student interactions and teacher-student relationships within a class and can in turn be divided into three subdimensions: (1) *involvement*, “[t]he extent to which students are attentive and interested in class activities, participate in discussions, and do additional work on their own” (Raviv et al., 1990, p. 145), (2) *affiliation*, “[t]he level of friendship students feel for each other, as expressed by getting to know each other, helping each other with homework, and enjoying working together” (Raviv et al., 1990, p. 145), and (3) *teacher support*, “[t]he amount of help, friendship, and interest the teacher manifests toward students, how much the teacher talks openly and trusts the students” (Raviv et al., 1990, p. 145).

Research on some of the relationship dimensions of classroom climate refer to it as the social-relational classroom climate (Anderson & Walberg, 1968; Moos, 1979). In this context, recent studies investigating the social-relational classroom climate have revealed a variety of aspects that are addressed here. Some studies focus on the social position of students in the class (Çengel & Türkoğlu, 2016; Zurbriggen et al., 2021), students’ feeling of social inclusion (Zurbriggen et al., 2021), teacher-student interaction (Rucinski et al., 2018; Spilt et al., 2012), or the level of bullying and victimization in the class (Shechtman, 2006; Yoneyama & Rigby, 2006). According to Wang et al. (2020), “the bulk of the research [has] often conceptualized classroom climate as a unidimensional, rather than a multidimensional construct.”

As a common ground based on the above studies, we derive four aspects that appear to be highly relevant for delineating the social-relational climate of a classroom:

1. the social participation and status of all students,
2. students’ feeling of social inclusion,
3. the student-teacher relationship, and
4. the existence and extent of bullying.

Considering the state of research on the relations between these four aspects of a social-relational classroom climate and behavioral problems, it becomes apparent that there is ample evidence on how these aspects correlate on an individual level (e.g., how the social status of an individual is related to that individual’s behavioral problems; see Newcomb et al., 1993). Far fewer studies have investigated the association between the classroom level of these aspects and a) the behavioral problems of individual students and b) the intensity of behavioral problems within the class. We found no empirical evidence on the latter point (b). An overview of the results of the studies regarding the association of the classroom-level social-relational classroom climate with behavioral problems of individual students (a) is given below.

Haynie (2001) found a link between the intensity of *peer relations* in a classroom (network density of friendship nominations) and individual externalizing behavior problems (delinquency). Regarding *self-perceived peer acceptance*, both peer acceptance at the individual and classroom levels were found to correlate negatively with students’ behavioral problems in a study by Steinhausen and Metzke (2001). Similarly, Hendrickx and colleagues (2016) found that the number of teacher-student conflicts within class were related to more aggressive student behavior. This led the authors to conclude that teachers’ negative interactions may pave the way for negative student behavior. Finally, Låftman and Modin (2017) investigated the association between being a victim of bullying along with the *proportion of victims within a classroom* and the extent of a student’s internalizing behavior problems. Both individual- and classroom-level victimization was associated with student’s internalizing problems. From Låftman’s and Modin’s perspective, peer victimization negatively impacts mental health for both victims and non-involved classmates who know of or observe victimization within the classroom.

### Research Questions

Based on the arguments presented above, we assume that the development of behavior problems may not only be linked to a) a student's individual social-relational situation in the classroom (here: *social participation, feelings of social inclusion, student-teacher relationships, and bullying* on an individual level) but also by b) the social-relational classroom climate (here: *social participation, feelings of social inclusion, student-teacher relationships, and bullying* on a class level). Moreover, we assume that c) the extent of behavior problems (here: *social withdrawal, anxious/depressed, academically disorganized, and oppositional/disruptive behavior*) within a class is also related to both the individual social-relational situation in the classroom and the social-relational classroom climate.

All three perspectives seem to be essential in understanding the development of behavioral problems. However, according to our research, so far only little is known about the relevance of these relationships on an individual as well as class level while taking all four aspects of the social-relational classroom climate as well as multiple dimensions of behavior problems into account. Due to the weak theoretical founda-

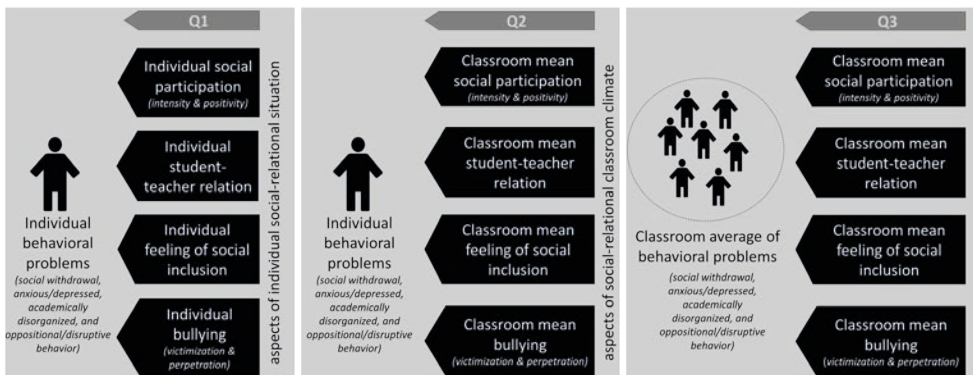
tion and the sparse evidence, we consider this study to be highly explorative. Thus, we state research questions instead of hypotheses. The following research questions address the connection between students' behavioral problems and the four aspects of their social relations (see Figure 1 for the analytical structure of our approach).

Q1: On an individual level: To what extent are students' behavioral problems in a classroom related to the four aspects of their individual social-relational situation in the classroom?

Q2: On a classroom level: To what extent are students' behavioral problems in a classroom related to the four aspects of the social-relational classroom climate in their classroom.

Q3: On a classroom level (aspects of social relations and behavioral problems): To what extent is the intensity of behavioral problems in a classroom associated with the four aspects of social-relational classroom climate?

Behavior problems of primary students are positively correlated to age (Klipker et al., 2018), there is a significant higher prevalence for boys than for girls (Klipker et al., 2018), and migrant students show behavioral problems more often compared to children without a migration background (Bel-



**Figure 1** Students' behavioral problems predicted by individual aspects of social relations (Q1) and classroom means of social relations (Q2); Classroom average of behavioral problems predicted by classroom means of social relations (Q3).

hadj Kouider et al., 2014). Therefore, we will take these characteristics age, gender, and migration background into account.

## Methods

### Participants

Participants were selected from ten inclusive elementary schools in an urban district in the federal state of North Rhine-Westphalia, Germany. The total sample consisted of 2045 students from 87 classes. The classroom class size was  $M = 23.5$  students ( $SD = 3.5$ ). The number of valid ratings per class (i.e. a teacher rating and a matching student rating) ranged between 11 and 32. No classes were excluded from the data analyses (the a priori defined cut-off was less than 10 valid ratings in a class). All students were between six and twelve years old ( $M = 8.57$ ,  $SD = 1.29$ ) and attended grades one to four. 51% were male (49% female). The numbers of students per grade ( $Min = 494$  in grade 4;  $Max = 533$  in grade 3) were approximately evenly distributed. The ratio of children with a migration background was 34% (assessed by a teacher rating; teachers were not provided with definitions of the term 'migration background'). In total, 87 class teachers (92% female) participated in the study. Their median age was between 41 and 50 years (administered as a categorical variable: 20-30, 31-40, 41-50, 51-60, > 60 years). More than half of them had more than ten years of experience working in a school setting (categorical variable: < 1, 1-3, 4-10, > 10 active years).

### Material

This paper has a supplement where you can find a detailed item analysis of all measures and in-depth analyses on the factorial structure (level 1 and level 2) of the social relations measurements applied in this study.

### Social relations

*Students' Social Participation:* To evaluate the students' social participation, a sociometric peer-nomination questionnaire (Moreno, 1996) was applied. All students were asked to write down the names of their classmates (without a limit) whom they liked the most (social acceptance) and whom they liked the least (social rejection). For both measures, indegrees (votes received) were calculated and then divided by the number of valid respondents (minus one) per class. The result was the proportion of students in a class that socially accepted and rejected a particular student. Afterwards, we processed the data by calculating *social participation positivity* (the difference between social acceptance and social rejection) and *social participation intensity* (the sum of social acceptance and social rejection). These two sociometric variables are also known as social preference and social impact (Newcomb & Bukowski, 1983).

*Students' Feeling of Social Inclusion:* We administered a shortened version of the original subscale *social inclusion* (items 5, 10, 24, 30, 31, and 33 instead of 11 items) from the *Questionnaire for assessment of emotional and social school experiences* (FEES; Rauer & Schuck, 2003, 2004). The scale measures the extent to which a child feels accepted by peers and considers himself or herself a full member of the group (example items: "My classmates are nice to me." and "Only a few classmates like me."). First and second graders had to assess whether or not they agreed with the statements (0 = "strongly disagree", 1 = "strongly agree"). Students in the third and fourth grades had to answer the statements that applied to them on a four-point Likert scale (0 = "strongly disagree", 1 = "hardly agree", 2 = "quite agree", 3 = "strongly agree"). Due to the different response scales for younger (first- and second-grade) and older (third- and fourth-grade) students, we adapted the scales for third and fourth graders with a linear transformation (sum score



divided by three yielding a sum scale from 0 to 6). Therefore, the sum scales for the younger and the older students were equal.

*Student-Teacher Relation:* The student-teacher relation was operationalized through a shortened version (items 10, 30, 33, 34, 39, 41, 43, and 52 instead of 13 items) of the original “students’ feeling of acceptance by the teacher subscale” of the FEES questionnaire (Rauer & Schuck, 2003, 2004). The scale measures the extent to which a child feels accepted, understood, and supported by his or her teacher (example items: “My teacher likes other children better than me.” and “My teacher takes time for me.”). The scale format and the subsequent handling were identical to the subscale ‘social inclusion’ of the FEES (see above).

*Bullying:* Classroom teachers were asked to assess the bullying involvement of each student in a class on a newly developed scale. This scale consisted of four items addressing *victimization* and four items addressing *perpetration*. For each item, teachers were asked to indicate how often the description applied to a specific student within the last six months (0 = “never”, 1 = “a little”, 2 = “largely” and 3 = “frequently”). For students’ victimization, an example item was: “Her/His personal belongings are explicitly broken by the classmates (e.g., school materials, toys, clothes)”. For students’ perpetration, an example item was: “He/She explicitly breaks personal belongings of certain classmates (e.g., school materials, toys, clothes)”. If a teacher could not assess the behavior, he or she could respond “unknown.”

### **Behavioral Problems**

Four dimensions of behavioral problems were administered through the German version of the *Integrated Teacher Report Form* (ITRF-G; Volpe et al., 2020): *Anxious-depressive behavior* (11 items; example item: “Acts fearful.”), *social withdrawal behavior* (7 items, example item: “Does not

respond to others’ attempts to socialize.”), *oppositional/disruptive behavior* (8 items; example item: “Has conflicts with peers.”), and *academically disorganized behavior* (8 items, example item: “Does not start assignments independently.”). Classroom teachers were asked to rate for each item the degree of concern regarding the described problem behavior (0 = “not a concern”, 1 = “slight concern”, 2 = “moderate concern”, 3 = “strong concern”).

### **Procedure**

The present data come from a four-year longitudinal study in Germany (see Urton et al., 2018). Data collection took place from February to April 2019 during the second school semester. A team of two or three (depending on the school size) trained graduate and undergraduate students collected data adhering to a standardized data collection script. Second to fourth graders filled out all measures within 30 minutes in the classroom (group survey). Due to their low level of literacy skills, all children in the first grade were interviewed in a one-on-one interview (approximately within 20 minutes) in a separate room. During the same period of the student survey, the classroom teachers filled out the respective questionnaires.

The study was approved by the education authority of the district. All participating children had a declaration of consent from their parents or legal guardians. An additional ethical statement was not obtained.

### **Analyzing Strategy**

We conducted a series of multilevel analyses (random intercept models with students nested in classrooms) to address our research questions.

For question 1, we set up models with each of the four behavior problem variables as a criterion and the six social-relational variables as predictors (regression model 1). Additionally, we added migration background, age, and sex as additional predic-

tors. Sex and migration background (dichotomous variables) were contrast coded with -1 and 1 (Helmert contrast).

For question 2, we firstly calculated the means of the six social-relations variables per class and added these variables as level 2 predictors (regression model 2). Additionally, we also included the class means for the variables sex (proportion male students per class), migration background (proportion of migration backgrounds per class), and age (classroom age per class). Finally, all level 1 variables (as for question 2) were included as predictors.

To answer question 3, we set up a means-as-outcome model for each of the four behavioral criteria (regression model 3). A means-as-outcome model only included level 2 predictors, while the criterion was a level 1 variable (here: behavioral problems). As the level 1 criterion was predicted by no other level 1 variable, level 2 effect sizes were related to differences in the classroom means of the criterion variable. As predictors, we included the means of the social-relation variables and (as control variables) the mean age, the proportion of migration backgrounds, and the proportion of male students (as in the models for questions 2).

All estimators were reported in standardized form and all analyses were conducted in R with the nlme package (Pineiro et al., 2021). Regression tables were created with the help of the sjplot package (Lüdtke et al., 2021). The R code for all analyses and data sets for reproducing the results are provided in the supplementary material for this paper.

## Results

### Descriptive Statistics

The means, standard deviations, and correlations of all variables on an individual level and on a classroom aggregated level are displayed in Tables 1 and 2.

### Connection Between Students' Behavior Problems and Social Relations

The results of the multilevel analyses with each of the four behavioral problem variables as a criterion and the six social-relational variables as predictors can be derived from Table 3 (for social withdrawal behavior), Table 4 (for anxious/depressed behavior), Table 5 (for academically disorganized behavior), and Table 6 (for oppositional/disruptive behavior).

#### *Social Relations on the Individual Level and Students' Individual Behavior Problems (Q1, model 1)*

**Social withdrawal behavior.** Students with higher participation intensity ( $\beta = -0.17$ ,  $p < .001$ ) as well as positivity ( $\beta = -0.13$ ,  $p < .01$ ) and who were more engaged in bullying perpetration ( $\beta = -0.09$ ,  $p < .01$ ) displayed less socially withdrawn behavior. Students who experienced more bullying victimization had significantly more social withdrawal behavior problems ( $\beta = 0.24$ ,  $p < .001$ ).

**Anxious/depressed behavior.** Students with higher participation intensity ( $\beta = -0.07$ ,  $p < .05$ ) and positivity ( $\beta = -0.06$ ,  $p < .05$ ) were less anxious and depressed. The more a student was involved in bullying victimization, the more the student showed anxious/depressed behavior ( $\beta = 0.27$ ,  $p < .001$ ). Students without a migration background were significantly less anxious/depressed compared to students with a migration background ( $\beta = -0.06$ ,  $p < .05$ ).

**Academically disorganized behavior.** Students with closer relationships to their teachers ( $\beta = -0.10$ ,  $p < .01$ ) and higher



**Table 1**  
Correlation matrix of all individual level variables.

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1 Student-teacher relation	0.76	0.22	-											
2 Feeling of social inclusion	0.75	0.21	.74***	-										
3 Social participation intensity	0.27	0.09	-.05T	.00	-									
4 Social participation positivity	0.55	0.14	.23***	.34***	-.12***	-								
5 Bullying victimization	0.18	0.35	-.14***	-.20***	.13***	-.36***	-							
6 Bullying perpetration	0.27	0.49	-.18***	-.16***	.16***	-.31***	.62***	-						
7 Social withdrawal	0.28	0.48	-.13***	-.16***	-.08**	-.20***	.26***	.17***	-					
8 Anxiety/depression	0.28	0.43	-.12***	-.16***	-.03	-.16***	.33***	.27***	.59***	-				
9 Academically disorganized	0.64	0.72	-.24***	-.24***	.09***	-.38***	.33***	.39***	.41***	.36***	-			
10 Oppositional/disruptive	0.43	0.63	-.21***	-.18***	.16***	-.36***	.52***	.77***	.13***	.28***	.45***	-		
11 Age	8.57	1.29	-.03	.00	.30***	-.01	.06*	.03	.00	.05T	.08**	.01	-	
12 Sex: Male	0.51	0.50	-.12***	-.03	.15***	-.20***	.11***	.18***	.06*	.01	.18***	.23***	.01	-
13 Migration background	0.34	0.47	-.06*	-.08**	-.02	-.10***	.08***	.07**	.06*	.01	.09***	.06*	.04	.01

Note. T<.10; \*p<.05; \*\*p<.01; \*\*\*p<.001

**Table 2**  
Correlation matrix of all classroom level variables.

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1 Classroom student-teacher relation	0.76	0.09	-											
2 Classroom feeling of social inclusion	0.75	0.08	.69***	-										
3 Classroom social participation intensity	0.27	0.07	.03	.06	-									
4 Classroom social participation positivity	0.55	0.05	.32**	.50***	.06	-								
5 Classroom bullying victimization	0.18	0.16	-.14	-.17	.06	-.09	-							
6 Classroom bullying perpetration	0.27	0.27	-.21*	-.18	.01	-.12	.78***	-						
7 Classroom social withdrawal	0.29	0.23	-.05	-.01	.09	.18	.53***	.70***	-					
8 Classroom anxiety/depression	0.29	0.24	-.11	-.18T	.02	.02	.62***	.77***	.82***	-				
9 Classroom academically disorganized	0.64	0.27	-.15	-.10	.13	.09	.52***	.69***	.69***	.64***	-			
10 Classroom oppositional/disruptive	0.43	0.26	-.24*	-.24*	-.10	-.10	.69***	.85***	.63***	.75***	.68***	-		
11 Classroom age	8.60	1.08	-.03	.06	.53***	.08	.15	.04	.05	.13	.20T	.02	-	
12 Proportion male	0.52	0.09	-.16	-.22*	.09	-.14	.24*	.19T	.13	.22*	.21*	.23*	.04	-
13 Proportion migration background	0.36	0.25	-.11	-.16	.01	.09	.02	.09	.13	.24*	.17	.28**	.01	.03

Note. \*p<.05; \*\*p<.01; \*\*\*p<.001

**Table 3**  
Social withdrawal behavior regressed on individual social-relations and social-relational classroom climate.

Predictors	Model 1 (L1)			Model 2 (L1+L2)			Model 3 (means-as-outcome)		
	Beta	SE	p	Beta	SE	p	Beta	SE	p
(Intercept)	0.01	0.04	<.001	-0.00	0.04	.637	-0.00	0.04	.473
Feeling of social inclusion	-0.04	0.04	.363	-0.04	0.04	.367			
Student-teacher relation	-0.06	0.04	.136	-0.07	0.04	.106			
Social participation intensity	-0.17	0.03	<.001	-0.23	0.04	<.001			
Social participation positivity	-0.13	0.03	<.001	-0.16	0.03	<.001			
Bullying victimization	0.24	0.03	<.001	0.23	0.04	<.001			
Bullying perpetration	-0.09	0.03	.008	-0.09	0.03	.007			
Migration background	0.02	0.03	.419	0.00	0.03	.904			
Age	0.02	0.04	.509	-0.00	0.05	.940			
Sex	0.03	0.03	.306	0.03	0.03	.231			
Classroom feeling of social inclusion				0.01	0.06	.804	0.00	0.06	.947
Classroom student-teacher relation				0.04	0.06	.464	-0.02	0.05	.727
Classroom social participation intensity				0.17	0.05	.002	0.03	0.04	.475
Classroom social participation positivity				0.10	0.04	.025	0.08	0.04	.045
Classroom bullying victimization				0.00	0.07	.998	0.11	0.06	.083
Classroom bullying perpetration				0.11	0.07	.103	0.05	0.06	.473
Classroom age				-0.03	0.06	.652	-0.05	0.04	.290
Proportion migration background				0.05	0.04	.275	0.03	0.04	.422
Proportion male				0.01	0.04	.725	0.03	0.04	.507
<b>Random Effects</b>									
$\sigma^2$		0.16			0.16			0.20	
$\tau_{00}$	0.02	<small>id_class_teacher</small>		0.01	<small>id_class_teacher</small>		0.01	<small>id_class_teacher</small>	
ICC	0.09			0.07			0.06		
N	83	<small>id_class_teacher</small>		83	<small>id_class_teacher</small>		83	<small>id_class_teacher</small>	
Observations		1345			1345			1630	
Marginal R <sup>2</sup> / Conditional R <sup>2</sup>		0.112 / 0.194			0.134 / 0.195			0.031 / 0.088	

**Table 4** Anxious/depressed behavior regressed on individual social-relations and social-relational classroom climate.

Predictors	Model 1 (L1)			Model 2 (L1+L2)			Model 3 (means-as-outcome)		
	Beta	SE	p	Beta	SE	p	Beta	SE	p
(Intercept)	-0.02	0.05	.001	-0.03	0.04	.586	0.00	0.04	.500
Feeling of social inclusion	-0.03	0.04	.396	-0.01	0.04	.719			
Student-teacher relation	-0.06	0.04	.120	-0.07	0.04	.062			
Social participation intensity	-0.07	0.03	.032	-0.07	0.04	.059			
Social participation positivity	-0.06	0.03	.041	-0.08	0.03	.008			
Bullying victimization	0.27	0.03	<.001	0.26	0.03	<.001			
Bullying perpetration	-0.01	0.03	.675	-0.03	0.03	.325			
Migration background	-0.06	0.03	.030	-0.09	0.03	.004			
Age	0.04	0.04	.254	0.05	0.05	.292			
Sex	-0.03	0.03	.226	-0.04	0.03	.164			
Classroom feeling of social inclusion				-0.11	0.06	.075	-0.08	0.06	.169
Classroom student-teacher relation				0.12	0.06	.052	0.06	0.05	.296
Classroom social participation intensity				0.01	0.05	.843	-0.03	0.04	.461
Classroom social participation positivity				0.07	0.05	.138	0.05	0.04	.281
Classroom bullying victimization				0.00	0.07	.952	0.12	0.07	.074
Classroom bullying perpetration				0.15	0.07	.035	0.14	0.07	.037
Classroom age				-0.02	0.06	.759	0.04	0.05	.445
Proportion migration background				0.10	0.04	.032	0.07	0.04	.095
Proportion male				0.06	0.04	.144	0.04	0.04	.262
<b>Random Effects</b>									
$\sigma^2$		0.14			0.14			0.15	
$T_{00}$	0.02			0.01			0.01		
ICC	0.13			0.09			0.08		
N	83			83			83		
Observations		1345			1345			1630	
Marginal R <sup>2</sup> / Conditional R <sup>2</sup>		0.106 / 0.221			0.166 / 0.243			0.080 / 0.150	

**Table 5**  
Academically disorganized behavior regressed on individual social-relations and social-relational classroom climate.

Predictors	Model 1 (L1)			Model 2 (L1+L2)			Model 3 (means-as-outcome)		
	Beta	SE	p	Beta	SE	p	Beta	SE	p
(Intercept)	0.00	0.03	<.001	-0.00	0.03	.291	-0.01	0.03	.468
Feeling of social inclusion	-0.02	0.04	.512	-0.02	0.04	.554			
Student-teacher relation	-0.10	0.04	.006	-0.11	0.04	.003			
Social participation intensity	-0.02	0.03	.470	-0.02	0.04	.588			
Social participation positivity	-0.25	0.03	<.001	-0.27	0.03	<.001			
Bullying victimization	0.09	0.03	.004	0.09	0.03	.008			
Bullying perpetration	0.21	0.03	<.001	0.20	0.03	<.001			
Migration background	0.02	0.03	.464	0.01	0.03	.803			
Age	0.08	0.03	.014	0.06	0.05	.166			
Sex	0.05	0.02	.049	0.04	0.03	.076			
Classroom feeling of social inclusion				-0.01	0.05	.775	-0.02	0.05	.720
Classroom student-teacher relation				0.06	0.05	.192	-0.02	0.04	.700
Classroom social participation intensity				-0.02	0.04	.686	-0.00	0.04	.925
Classroom social participation positivity				0.14	0.04	<.001	0.06	0.03	.095
Classroom bullying victimization				-0.06	0.06	.301	-0.01	0.05	.866
Classroom bullying perpetration				0.08	0.06	.138	0.14	0.05	.012
Classroom age				0.02	0.05	.704	0.06	0.04	.142
Proportion migration background				0.01	0.03	.687	0.03	0.03	.367
Proportion male				0.02	0.03	.556	0.04	0.03	.230
<b>Random Effects</b>									
$\sigma^2$		0.34			0.34			0.47	
$T_{00}$	0.02			0.01			0.01		
ICC	0.06			0.04			0.03		
N	83			83			83		
Observations		1344			1344			1628	
Marginal $R^2$ / Conditional $R^2$		0.246 / 0.290			0.258 / 0.286			0.029 / 0.055	

**Table 6**  
*Oppositional/disruptive behavior regressed on individual social-relations and social-relational classroom climate.*

Predictors	Model 1 (L1)			Model 2 (L1+L2)			Model 3 (means-as-outcome)		
	Beta	SE	p	Beta	SE	p	Beta	SE	p
(Intercept)	-0.00	0.03	<.001	-0.01	0.02	.297	0.00	0.02	.505
Feeling of social inclusion	0.02	0.03	.489	0.03	0.03	.340			
Student-teacher relation	-0.06	0.03	<b>.028</b>	-0.06	0.03	<b>.021</b>			
Social participation intensity	0.06	0.02	<b>.004</b>	0.10	0.03	< <b>.001</b>			
Social participation positivity	-0.10	0.02	< <b>.001</b>	-0.10	0.02	< <b>.001</b>			
Bullying victimization	0.06	0.02	<b>.013</b>	0.06	0.02	<b>.007</b>			
Bullying perpetration	0.67	0.02	< <b>.001</b>	0.66	0.02	< <b>.001</b>			
Migration background	-0.01	0.02	.547	-0.03	0.02	.097			
Age	-0.01	0.02	.681	0.02	0.03	.555			
Sex	0.05	0.02	<b>.003</b>	0.05	0.02	<b>.006</b>			
Classroom feeling of social inclusion				-0.04	0.04	.341	-0.03	0.04	.402
Classroom student-teacher relation				0.03	0.04	.423	0.01	0.03	.798
Classroom social participation intensity				-0.11	0.03	<b>.002</b>	-0.05	0.03	.110
Classroom social participation positivity				0.03	0.03	.321	0.00	0.03	.927
Classroom bullying victimization				-0.05	0.04	.265	-0.03	0.04	.490
Classroom bullying perpetration				0.04	0.04	.355	0.30	0.04	< <b>.001</b>
Classroom age				0.00	0.04	.978	0.02	0.03	.467
Proportion migration background				0.08	0.03	<b>.004</b>	0.06	0.02	<b>.015</b>
Proportion male				0.00	0.03	.986	0.03	0.02	.305
<b>Random Effects</b>									
$\sigma^2$		0.14			0.14			0.35	
$\tau_{00}$	0.01			0.01				0.00	
ICC	0.08			0.06				0.00	
N	83			83				83	
Observations		1344			1344			1628	
Marginal R <sup>2</sup> / Conditional R <sup>2</sup>		0.604 / 0.635			0.614 / 0.638			0.093 / 0.093	



social participation positivity ( $\beta = -0.25, p < .001$ ) were less disorganized. The more a student was involved in bullying victimization ( $\beta = 0.09, p < .01$ ) and perpetration ( $\beta = 0.21, p < .001$ ), the more the student was academically disorganized. Students who were older ( $\beta = 0.08, p < .05$ ) and students who were boys ( $\beta = 0.05, p < .05$ ) had significantly more academically disorganized behavior problems.

**Oppositional/disruptive behavior.** The more positive the student-teacher relation ( $\beta = -0.06, p = .05$ ) and the higher the students' social participation positivity ( $\beta = -0.10, p < .001$ ), the less the students' behavior was oppositional/disruptive. Students with high participation intensity ( $\beta = 0.06, p < .01$ ), who were more involved in bullying victimization ( $\beta = 0.06, p < .05$ ) and more engaged in bullying perpetration exhibited ( $\beta = 0.67, p < .001$ ) significantly more oppositional/disruptive behavior. Boys showed significantly more oppositional/disruptive behavior ( $\beta = 0.05, p = .01$ ).

### *Social Relations on the Class Level and Students' Individual Behavior Problems (Q2, model 2)*

For these analyses, we added the classroom means of the six social-relation variables as level 2 predictors to the four regression models. In the following description, we will focus on these level 2 variables.

**Social withdrawal behavior.** The higher the classroom level of participation intensity ( $\beta = 0.17, p < .01$ ) and positivity ( $\beta = 0.10, p < .05$ ), the stronger the withdrawn behavior of the individual students.

**Anxious/depressed behavior.** The more the students in a class were involved in bullying perpetration ( $\beta = 0.15, p < .05$ ), the more an individual student showed anxious/depressed behavior. The higher the proportion of children with a migration background in class, the more individual students exhibited anxious/depressive behavior ( $\beta = 0.10, p < .05$ ).

**Academically disorganized behavior.** The more the students in a class participated positively, the more an individual student showed academically disorganized behavior problems ( $\beta = 0.14, p < .001$ ).

**Oppositional/disruptive behavior.** The less individual oppositional/disruptive behavior the students showed, the stronger the classroom level of participation intensity was ( $\beta = -0.11, p < .01$ ). A higher proportion of children with a migration background in a classroom was associated with more oppositional/disruptive behavior on the part of individual students ( $\beta = 0.08, p < .01$ ).

### *Social Relations on the Class Level and Classroom Behavior Problems (Q3, model 3)*

The next series of analyses describes the intensity of class-level behavior problems by means of class-level social-relation variables.

**Classroom social withdrawal behavior.** The higher the classroom level of positivity, the stronger the classroom level of withdrawal behavior ( $\beta = 0.08, p < .05$ ).

**Classroom anxious/depressed behavior.** The higher the classroom level of bullying perpetration, the stronger the classroom level of anxious/depressive behavior ( $\beta = 0.14, p < .05$ ).

**Classroom academically disorganized behavior.** The higher the classroom level of bullying perpetration, the stronger the classroom level of disorganized behavior ( $\beta = 0.14, p < .05$ ).

**Classroom oppositional/disruptive behavior.** The higher the classroom level of bullying perpetration, the stronger the classroom level of oppositional/disruptive behavior ( $\beta = 0.30, p < .001$ ). A higher proportion of children with a migration background in class was significantly associated with more oppositional/disruptive behavior in class ( $\beta = 0.06, p < .01$ ).

## Discussion

The relevance of enhancing students' social-emotional development in schools is reflected in a high prevalence of behavioral and mental health problems among school-aged children (Otto et al., 2020). The *classroom climate* has been suggested as one potentially relevant aspect to explain the emergence of students' behavioral problems (Alansari & Rubie-Davies, 2020; Wang et al., 2020). The present study investigated this aspect and took a closer look at the individual social-relational situation in the classroom and the social-relational classroom climate in terms of their effects on four dimensions of behavioral problems displayed by students in inclusive elementary schools.

We started by investigating the association between the social-relational classroom climate and students' behavior problems (research questions 1 and 2). At the *individual level* of analysis (question 1), we found that all four dimensions of problem behavior we investigated were associated with reduced *positive social participation*, which is in line with previous research (e.g., Krull et al., 2014, 2018; Schürer, 2020). However, while students with a higher degree of social withdrawal and those with more anxious/depressed behavior showed a lower level of *social participation intensity*, those with oppositional/disruptive behavior revealed a higher intensity. Meaning, students with higher levels of oppositional/disruptive behavior have fewer positive social interactions, but receive a lot of attention in the classroom - both in being socially accepted and rejected. Regarding the student-teacher relationship, we showed that a more negative relationship went along with higher degrees of academically disorganized and oppositional-disruptive behavior. The importance of teachers for students' social-emotional development was also indicated in the study by Roorda and Koomen (2021), which revealed that students' positive social experiences with teachers con-

tributed to more positive behavior. Similarly, there may also be a correlation between teacher and exacerbating students' behavior problems, as increased teacher-student conflicts were related to more aggressive student behavior (Hendrickx et al., 2016). With respect to *bullying*, we found that students who were involved in bullying exhibited higher levels of problem behaviors in all investigated dimensions. This is similar to the results of other studies (e.g. Bilz, 2013; Låftman & Modin, 2017; Thomas et al., 2011). Students who are victims of bullying are more likely to exhibit social withdrawal, anxious/depressive, academic disorganization, and oppositional/disruptive behavior. Students who are perpetrators of bullying showed a lower level of social withdrawal but a distinctively higher level of oppositional/disruptive behavior.

When we added the dimensions of social-relational classroom climate as additional predictors of individual behavioral problems (research question 2), some of the effects were reversed: higher levels of *positive social participations* in the classroom were associated with more *social withdrawal* and *academically disorganized behavior*. Moreover, more *intensive social participation* in a classroom was associated with more *social withdrawal* but less *oppositional/disruptive behavior*.

It is important to bear in mind that these classroom effects depict associations above those found on an individual level. We think that these inverted effects can be explained by the fact that social participation is less important as an absolute characteristic and more as a relative amount compared to that of other members of the social group (here, the classroom). That is, when a classroom has a high level of positive social participation, an individual needs more positive personal participation to feel positive about his or her social situation than in a classroom with a low level of positive social participation. In other words, students feel positive about their social situation not only when their status is high, but also when their so-

cial status is above that of their peers and vice versa. Furthermore, students who generally perceive a high level of social participation in their class and do not experience this for themselves may be more emotionally burdened. According to Dijkstra and colleagues (2008), frequent upward social comparisons can enhance negative affect and lower positive self-evaluations.

With respect to differences in behavioral problems in classrooms (research question 3), we found the prevalence of bullying to be the strongest correlate: The total degree of anxious/depressed, academically disorganized, and oppositional/disruptive behavior in a classroom was higher the more bullying occurred in a class. Thus, in line with Låftman and Modin (2017), it seems that not only do personal bullying experiences affect students' social-emotional development, but also observing or knowing about bullying seems to affect students' social-emotional development as well (Låftman & Modin, 2017).

We included students' gender and migration background as control variables in the analyses and found the expected positive correlations with male students having more negative and intense social participation, higher scores as perpetrators and victims of bullying, and higher scores for disorganized and oppositional behavior. For migration background we found a quite similar pattern but less strongly pronounced. This is in line with Klipker et al. (2018) who also found higher rates of externalizing behavior problems among male students, and Belhadj Kouider et al. (2014) also found higher rates among immigrant students. Similarly, social participation studies report higher rates of social rejection among male and immigrant students (Krull et al., 2018).

### Limitations

The results of this study should be interpreted in the light of some caveats. Although different aspects of social-relational classroom climate were surveyed in terms

of student-student interactions and teacher-student relationships, some dimensions that were investigated in other studies were excluded here, such as *involvement* (Moos, 1979) and *friendship networks*.

It is also important to point out that the study had a cross-sectional design not allowing for causal interpretations. Furthermore, the assessment of the extent of *bullying perpetration* and *victimization* as well as students' behavioral problems were all based on teacher ratings, whose diagnostic competence regarding the assessment of social processes within classes are low to moderate (Wilbert et al., 2020). Moreover, it has been shown that the accuracy of teachers' ratings of bullying processes in class may be influenced by students' behavioral problems (Liau et al., 2004; Wienke Totura et al., 2009). Thus, the particularly strong association between bullying and behavior problems may be partially explained by the fact that teachers assessed both characteristics.

### Implications and further research

Consistent with previous research (Alansari & Rubie-Davies, 2020; Wang et al., 2020), our study shows that the classroom climate is related to students' social-emotional well-being. This highlights the importance of fostering positive social relationships in classes. Since the presence of bullying is clearly related to behavior problems, it is not enough to solely focus on positive interactions in the classroom, but also to counteract bullying consistently and intensively (Menesini & Salmivalli, 2017).

To draw conclusions about the interaction between the development of the classroom climate and the students' social-emotional situation, longitudinal studies would be important.

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JK, KU, JW conceived and designed the study; JK, KU, PRK, JW wrote the paper; JW performed the analyses; JW curated the data; JK, KU organized and supervised the data collection; TH, JK administrated the project; TH raised the funding.

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