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# Peer integration, teacher-student relationships and the associations with depressive symptoms in secondary school students with and without special needs

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## ABSTRACT

The present study focuses on the association between peer integration and the development of depressive symptoms in secondary school students. A sample of 393 7th grade students (194 boys, 199 girls, mean age = 13.38 years, *sd* = 0.85) was recruited from 25 secondary schools in Austria. Of these students, 34 were diagnosed as having special educational needs. The screening version of the depression questionnaire DTK-II and the subscales “social relationships” and “perceived appreciation by the teacher” from the FEES 3–4 were used for assessment. Structural equation modeling shows that negative teacher-student relationships predict both poor peer integration and depressive symptoms. Teacher-student relationships in schools have an impact on the peer integration as well as on the mental health of students.

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## KEYWORDS

Depression; peer relations; student-teacher relation

## Literature overview

As students spend a major amount of their lifetime in schools, these institutions are forced to not only focus on students' academic but also on their social-emotional development. Nowadays, students' outcomes like emotional problems are getting more in the spotlight. Especially students in secondary grades who are stepping into adolescence might experience emotional problems. They feel generally less happy in school (Schwab 2018a) and along with problems in peer integration there is an increased risk of experiencing depressive symptoms. Depressive symptoms (e.g. negative thoughts such as feeling sad or worthless) have been diagnosed in around 3–5% of students and adolescents (see e.g. Payk 2010; Petermann 2011; Hoffmann et al. 2012), the risk for females are higher compared to the risk for males. Moreover, it can be assumed that depressive symptoms/depressions are less often detected in students compared to adults. Therefore, the real amount of students suffering from depressive symptoms might be even higher. Based on the negative long-term effects of depressions it is important to understand the prevalence and its relating factors more deeply. One gap in the literature is that we know little about depressive symptoms in students with special educational needs (SEN). In this context, problems with peer integration in

schools are of high importance because they have an impact on students' academic, social, emotional and mental health development (Kidger et al. 2012; Låftman and Östberg 2006). Several studies indicated that poor peer integration and poor teacher-student relationships were associated with high levels of depressive symptoms in students (Gooren et al. 2011; Raufelder 2014; Zetterström Dahlqvist, Landstedt, and Gillander Gådin 2012; Zimmer-Gembeck, Hunter, and Pronk 2007). Longitudinal research has identified problems in peer integration and a low quality of teacher-student relationship as predictors of depression (Landstedt, Hammarström, and Winefield 2015; Rudasill et al. 2014; van Lier and Koot 2010).

During the past decades, researchers have studied the social participation of students with SEN as an important factor in inclusive education. Research shows that students with SEN in inclusive settings are at high risk of having difficulties with their peer integration, indicated by having less interactions with peers, having fewer friendships, being less socially accepted, and feeling less socially integrated compared to their non-disabled peers (Bossart et al. 2012, 2013; Koster et al. 2010; Schwab 2018c, 2018b). Regarding the stability of the lower peer integration of students with SEN compared to their classmates without SEN only few studies exist. These show that the stability (retest-reliability) of measures of peer integration over one or two years were relatively similar for students with and without SEN ( $r_{tt} = .40/.50$  for one year and  $.32/.36$  for two years) (Schwab 2014, 2016).

In contrast to peer integration, teacher-student relationships were less focused upon. However, according to the time children spend in school, the teacher-student relationship seems to play a relevant role for students' social, emotional and academic development. Previous studies showed that students with SEN had a poorer teacher-student relationship than their peers. Birch and Ladd (1998) as well as Howes (2000) pointed out that children's social competences and behavior predicted teacher-child relationship quality. Students with behavior problems have less positive teacher-student relationships (e.g. Al-Yagon and Mikulincer 2004; Baker, Grant, and Morlock 2008; Henricsson and Rydell 2004; Meehan, Hughes, and Cavell 2003; Murray and Murray 2004). The only known study concerning the stability of teacher-child relationships of students with SEN is the one by Henricsson and Rydell (2004), which seems to indicate that poor teacher-child relationships tend to be quite stable over time.

### **Research questions**

First, it seems to be unclear if students with SEN (especially regarding learning difficulties) experience a higher level of depressive symptoms compared to students without SEN. Therefore, we firstly examine possible differences in depressive symptoms between these two subgroups.

Research question 1: Are there differences in experiencing depressive symptoms between students with and without SEN?

Secondly, understanding the nature and influence on depressive symptoms of both peer integration and teacher-student relationships may be particularly important for students with SEN. The present study entirely focuses on students' self-reported

relationships with peers and teachers. To our knowledge, none of the previous studies longitudinally examined self-rated peer integration and self-rated teacher-student relationships in relation to symptoms of depression in students with and without SEN.

In line with previous studies, the hypothesis are formulated as follows:

Hypothesis 1: Students with SEN report poorer peer integration and poorer teacher-student relationships than peers without SEN.

Hypothesis 2: Peer integration and teacher-student relationships are stable over time for both, students with and without SEN.

Hypothesis 3: Peer integration and teacher-student relationships of both samples, students with and without SEN, influence each other.

Hypothesis 4: Poor peer integration and teacher-student relationships are associated with depressive symptoms for both, students with and without SEN.

Thirdly, following the research literature, it can be assumed that peer integration and teacher-student relationships represent qualitatively different aspects of social support. However, there is little evidence that positive teacher-student relationships can compensate negative effects of poor peer integration on mental health or the inverse. What seems to be clear is that both variables influence each other. A positive teacher-student relationship leads to more positive peer integration and vice versa (De Laet et al. 2014). Thus, the following research questions has been developed:

Research question 2: Do teacher-student relationships moderate the effects of peer integration on depressive symptoms and does peer integration moderate the effects of teacher-student relationships on depressive symptoms?

Also this research question will be analyzed for both samples, for students with and without SEN.

## Method

### *Participants*

The sample included 393 7<sup>th</sup> grade students (194 boys, 199 girls, mean age = 13.38 years,  $sd = 0.85$ ) in 25 classes who participated at both T1 (end of grade 7) and T2 (end of grade 8). Of these students, 34 were diagnosed as having SEN (23 boys, 11 girls). Most of the students with SEN were diagnosed as having a learning disability (79.4% had only learning disabilities and about 11.8% had a learning disability combined with social and emotional difficulties). About 8.8% of the students with SEN had emotional or behavioural disorders alone (e.g. hyperactivity disorder). Students with severe intellectual disabilities were excluded from the sample. All students were from Styria, a federal state of Austria, which has one of the highest integration rates of the country: About 80% of students with SEN are educated in mainstream schools. In classes with three or more

students with SEN normally a special needs teacher is present for nearly the whole amount of teaching hours. This teacher is mainly responsible for students with SEN. (see e.g. Anonymous, 2018). In general, students in secondary class have different subject teachers. However, the subject teachers normally stay the same for different grades. Therefore, it can be assumed that students rated the teacher-student relationship to the same teachers at both measurement times. Moreover, in Austrian schools students' classes were not reshuffled across school years.

## **Procedure**

Data for this study were collected at the end of the school year (May/June 2014) in 7th grade and in 8th grade (May/June 2015). The 25 classes were located in rural, urban, and suburban areas of Styria. All schools with students with SEN in grades 7 and 8 were asked to participate. Informed consent was obtained from all parents whose child(ren) participated in the study, and the research was approved by the Styrian Regional School Authority.

Students first had to answer questions about their self-perceived peer integration, followed by items measuring their self-perceived teacher-student relationship. The last scale that was administered concerned the items about depressive symptoms. Filling out the whole questionnaire took approximately 50 minutes. The questionnaires were administered in paper and pencil format. During the assessments, two assistants monitored all students (including those without SEN) and assisted those who had difficulties filling out the questionnaires.

## **Measures**

### ***Special educational needs (SEN)***

In Austria, students with SEN require an official label by the local educational authority in order to be eligible for additional resources (Schwab 2018b). As SEN is officially diagnosed in Austria, teachers were asked to list all children in their class officially labeled as having SEN and to provide information regarding the type of SEN.

### ***Peer integration***

Peer integration was assessed with the subscale "Social Relationships" of the German questionnaire for measuring emotional and social school experiences of primary school students in 3rd and 4th grade (Fragebogen zur Erfassung emotionaler und sozialer Schulerfahrungen von Grundschulkindern dritter und vierter Klassen, FEESS 3–4; Rauer and Schuck 2003). The 4-point Likert scales have anchors 1 = not true at all and 4 = completely true. The original subscale consists of 11 items (example: "I have only few friends in my class") and for 4<sup>th</sup> graders Cronbach's  $\alpha = .84$  (Rauer and Schuck 2003). In the current study, only the best six items of the scale were used to keep the survey as short as possible. The reliability of the scale in the current sample is good ( $\alpha = .81$  at T1;  $\alpha = .83$  at T2).

### *Teacher-student relationships*

The subjective perception of the teacher-student relationships was measured with the subscale “Feeling Accepted by the Teacher” of the FEESS ( $\alpha = .89$  for 4th graders; Rauer and Schuck 2003). The original scale consists of 13 four-point Likert items (e.g. “My teachers like me”), however we again used only the best six items. Here too, the reliability of the scale is good ( $\alpha = .78$  at T1;  $\alpha = .85$  at T2).

### *Depressive symptoms*

Depressive symptoms were measured at T2 only using the screening version of the German Depression Test for Children (Depressionstest für Kinder – II; Rossmann 2014). This questionnaire consists of 11 items (e.g. “Are you often unhappy?”). In the present study, one item was excluded from the analysis because this item was directly related to peer integration (“Do you often feel lonely?”). All items had to be answered using a dichotomous answering format (no = 0, yes = 1). The internal consistency was good in the norm sample ( $\alpha = .82$ ; Rossmann 2014) and was good in the current sample ( $\alpha = .84$ ).

### *Statistical analyses*

Next to descriptive analyses, t-tests and correlational analyses (hypotheses 1 and 2) were conducted. As the sample of students with SEN is too small to calculate a multi-group model and to compare the path estimates across SEN status, correlation coefficients were calculated separately for students without SEN and students with SEN. Significance of the differences between the correlations of students with and without SEN were calculated using the Fisher *r*-to-*z* transformation.

To study the longitudinal reciprocal relations of teacher-student relationship with peer integration, autoregressive latent cross-lagged modeling with two measurement waves was used. Within this analysis, not the simple correlations are presented. For instance, if one predicts peer integration at T2 from teacher-student relationships peer integration at T1 is constant. Therefore, one actually predicts changes in peer integration (after stability is taken out) from antecedent teacher-student relationships.

To test hypothesis 4, direct effects from sex, peer integration and teacher-student relationships at T1 to depressive symptoms at T2 were added to the second model (i.e., direct influence model). To analyze possible moderation effects we conducted a median split (negative vs. positive peer integration/negative vs. positive teacher-student relationships) and compared the model fit of a model with free estimation of the prediction and a model with fixed estimations for the two groups (for both variables) with the Satorra-Bentler chi-square difference test (Satorra and Bentler 2001).

As the data were based on a hierarchical data structure (clusters of students in classes) we adjusted the standard errors of the estimated path coefficients for clustering (Asparouhov 2005) using the “complex analysis feature” (Williams 2000). The full information maximum likelihood (FIML) algorithm was used to handle missing data and the non-normality of our data was taken into account by using maximum likelihood estimation with robust standard errors (MLR). Mplus version 5 (Muthén and Muthén 2007) was used to estimate the models. To determine the fit of the models we used common fit

indices ( $\chi^2/df \leq 3$ ,  $CFI \geq .95$ ,  $TLI \geq .95$ ,  $RMSEA \leq .08$ ,  $SRMR \leq .08$ ; Hu and Bentler 1999; Weiber and Mülhhaus 2010) and the chi-square-test.

## Results

### *Peer integration, teacher-student relationships and depressive symptoms in students with and without SEN*

Table 1 presents means, standard deviations as well as results of t-tests. In general, students indicated a low level of depressive symptoms. Moreover, students feel a high level of peer integration and rate the teacher-student relationship as rather positive. Results of the t-tests show that students with SEN felt a lower level of peer integration, but experienced a more positive teacher-student relationship at both measurement times, compared to their peers without SEN. Therefore, one part of the hypothesis 1, that students with SEN experience poorer teacher-student relationships compared to students without SEN, can not be confirmed. Moreover, no group differences were found for depressive symptoms.

### *Stability and reciprocal influence of peer integration and teacher-student relationships and the correlations with depressive symptoms*

Table 2 shows the bivariate correlations between peer integration and teacher-student relationship for students with and without SEN. The correlations between study variables turned out to be as expected. Comparisons of the correlation using Fisher *r*-to-*z* transformation indicate that the stability of peer integration ( $z = 1.20$ , *n.s.*) was similar in both subgroups, but that the teacher-student relationships were less stable in students with

**Table 1.** Means, standard deviations, t-values and degrees of freedom in students with and without SEN.

	Students without SEN		Students with SEN		Group comparison
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i> ( <i>df</i> )
Peer integration T1	21.15	3.01	19.74	3.79	<i>t</i> (37.07) = 2.12*
Teacher-student relationship T1	18.53	3.57	19.82	3.02	<i>t</i> (390) = -2.01*
Peer integration T2	21.14	2.96	19.91	3.57	<i>t</i> (378) = 2.21*
Teacher-student relationship T2	17.91	4.06	19.12	3.53	<i>t</i> (373) = -1.66*
Depressive symptoms T2	1.96	2.51	1.50	1.96	<i>t</i> (384) = 1.05

\* $p < .05$ .

**Table 2.** Bivariate correlations between peer integration and teacher-student relationship. Correlations for students without SEN are reported below the diagonal and correlations for students with SEN above the diagonal.

		1	2	3	4	5
1	Peer integration T1	-	.33	.41*	-.08	-.05
2	Teacher-student relationship T1	.27**	-	.43*	.23	-.05
3	Peer integration T2	.52**	.28**	-	.21	.06
4	Teacher-student relationship T2	.20**	.68**	.36**	-	-.42*
5	Depressive symptoms T2	-.19**	-.18**	-.30**	-.23**	-

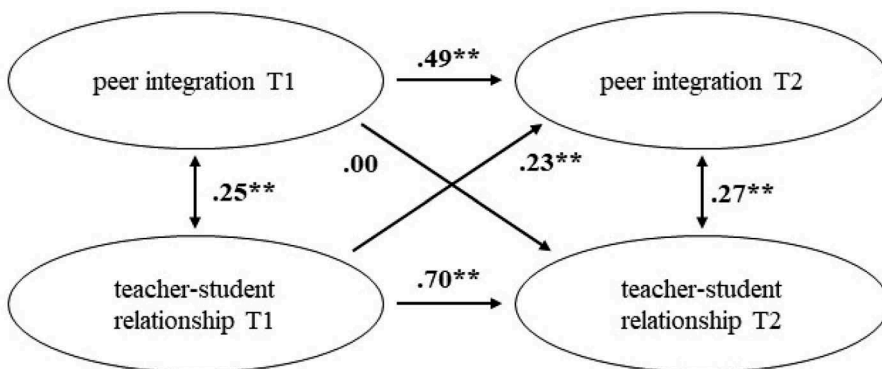
\* $p < .05$ , \*\* $p < .01$ .

SEN ( $z = 3.03, p < .01$ ). Regarding the cross effects from peer integration to teacher-student relationships, the correlations proved not significantly different regarding the effect of peer integration at T1 on teacher-student relationships at T2 ( $z = -0.02, n.s.$ ) and for teacher-student relationships at T1 on peer integration at T2 ( $z = -1.23, n.s.$ ). Regarding the correlations between peer integration in the classroom and depressive symptoms, no differences were found for peer integration at T1 ( $z = -0.78, n.s.$ ) and teacher-student relationships at T1 ( $z = -0.74, n.s.$ ) and T2 ( $z = 1.08, n.s.$ ). The correlation between peer integration at T2 and depressive symptoms (T2) was significantly lower in students with SEN ( $z = -1.90, p < .05$ ).

In addition to the correlation analyses also structural equation modelling has been used to examine the stability and reciprocal influence of peer integration and teacher-student relationships. Hence, longitudinal reciprocal effects among peer integration and teacher-student relationships can be shown, while taking into account the previous levels of each variable (autoregressive effects) and within-time associations between variables (cross-sectional correlations). Figure 1 presents all significant paths of the autoregressive model. The model-fit was relatively good, the CFI and TLI values can be considered as acceptable, the RMSEA and SRMR values indicate good fit ( $\chi^2 = 384.49, df = 238, \chi^2/df = 1.62, TLI = .904, CFI = .917, RMSEA = .044, SRMR = .060$ ). Cross-year stability of teacher-student relationships was high whereas only a moderate correlation was found for peer integration. In accordance with hypothesis 3, teacher-student relationships at Wave 1 predicted peer integration at Wave 2. However, peer integration at Wave 1 did not influence teacher-student relationships at Wave 2.

### Prediction of depressive symptoms via structural equation modeling

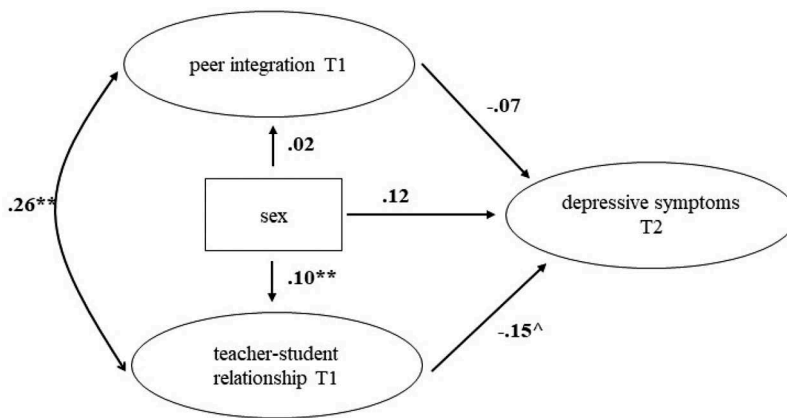
To predict depressive symptoms at T2 on the basis of peer- and teacher-student relations at T1, we tested model 3 (see Figure 2). The fit of this model was acceptable ( $\chi^2 = 332.29, df = 228, \chi^2/df = 1.46, TLI = .936, CFI = .942, RMSEA = .038, SRMR = .050$ ). Results showed that the path coefficient from peer-relations to depressive symptoms was rather low ( $-.07; n.s.$ ). The path coefficient from teacher-student relationships to depressive symptoms was  $-.15$  ( $p < .06$ ). Further, the influence of sex on depressive



**Figure 1.** Autoregressive model.

Note:  $^{**}$  Standardized coefficients significant at  $p < .01$





**Figure 2.** Model 2 predicting depressive symptoms.

Note: Standardized coefficients significant at \*\* $p < .01$  ^ $p < .06$

symptoms was not significant. Thus, negative teacher-student relationships seem to be associated with more depressive symptoms.

### **Moderating effects of peer- and teacher-student relationships**

Next, we tested whether the teacher-student relationships (T1) moderated the effect of peer integration (T1) on depressive symptoms (T2) in a model without any further predictors than peer integration. For the whole sample the regression model showed that depressive symptoms were predicted by peer integration ( $Beta = -.201$ ,  $S.E. = 0.054$ ,  $p < .01$ ;  $\chi^2 = 158.978$ ,  $df = 105$ ,  $\chi^2/df = 1.51$ ,  $TLI = .948$ ,  $CFI = .955$ ,  $RMSEA = .036$ ,  $SRMR = .046$ ). However, for students with low levels of teacher-student relationships (based on the median split), their peer integration was no significant predictor of depressive symptoms ( $Beta = -0.079$ ,  $S.E. = 0.096$ ,  $n.s.$ ), whereas for students with high levels of teacher-student relationships the predictor was significant ( $Beta = -.280$ ,  $S.E. = 0.0078$ ,  $p < .01$ ). According to the Satorra-Bentler chi-square difference test the model with a free estimation of the predictor in the two group ( $\chi^2 = 292.455$ ,  $df = 222$ ,  $\chi^2/df = 1.32$ ,  $TLI = .936$ ,  $CFI = .941$ ,  $RMSEA = .040$ ,  $SRMR = .064$ ) fitted the data better ( $TRd(1) = 2.56$ ,  $p < .01$ ) than the model with fixed parameters ( $\chi^2 = 295.010$ ,  $df = 223$ ,  $\chi^2/df = 1.32$ ,  $TLI = .935$ ,  $CFI = .940$ ,  $RMSEA = .041$ ,  $SRMR = .068$ ). This indicates that the parameters are significantly different in the two groups.

Next, we tested whether peer integration (T1) moderated the effect of teacher-student relationships (T1) on depressive symptoms (T2) in a model without any further predictors than teacher-student relationships. For the whole sample the regression model showed that teacher-student relationships predicted depressive symptoms ( $Beta = -.24$ ,  $S.E. = 0.07$ ,  $p < .01$ ;  $\chi^2 = 203.927$ ,  $df = 105$ ,  $\chi^2/df = 1.94$ ,  $TLI = .913$ ,  $CFI = .923$ ,  $RMSEA = .049$ ,  $SRMR = .054$ ). For students with low levels of peer integration (again based on the median split), the teacher-student relationship was no significant predictor of depressive symptoms ( $Beta = -.197$ ,  $S.E. = 0.121$ ,  $n.s.$ ). For students with high levels of peer integration, it was significant ( $Beta = -.270$ ,  $S.E. = 0.099$ ,  $p < .01$ ). To

examine whether the differences between the two samples were significant, a model with free estimation of this parameter ( $\chi^2 = 335.286$ ,  $df = 222$ ,  $\chi^2/df = 1.51$ ,  $TLI = .906$ ,  $CFI = .913$ ,  $RMSEA = .051$ ,  $SRMR = .065$ ) was compared with a model with fixed parameters ( $\chi^2 = 334.464$ ,  $df = 223$ ,  $\chi^2/df = 1.50$ ,  $TLI = .908$ ,  $CFI = .915$ ,  $RMSEA = .050$ ,  $SRMR = .065$ ). Results of the chi-square difference test following Satorra-Bentler indicated that the second model (with the fixed parameter) did not fit the data better ( $TRd(1) = 0.03$ , *n.s.*), indicating that the parameters are not significantly different.

## Discussion

Despite the fact that social relations are central for the students' social and emotional outcomes (e.g. Kidger et al. 2012), there is limited research on whether and how peer integration and teacher-student impact one another over time and which of these two variables most influences students' mental health (e.g. depressive symptoms). The present study examined the stability of peer integration and teacher-student relationships in students with and without special needs in the association with symptoms of depression in secondary school students.

In line with our first hypothesis and consistent with other studies (e.g. Bossaert et al. 2012; Anonymous 2018c) we found that students with SEN reported poorer peer integration than their peers without SEN (at both measurement times). As such, the existence of problems in peer integration of students with SEN in inclusive education could (and should) emanate a broader scientific discussion on the role teachers can play in improving peer integration. Nevertheless, it should be reminded, that even if the judicial framework (e.g. the UN convention on the rights of persons with disabilities) subscribes that students with SEN are included in regular classes, peer integration cannot be prescribed by any law as it is based on the principle of voluntary engagement of students which each other. Contrary to our expectation, the teacher-student relationship was rated more positively by students with SEN compared to students without SEN (at both measurement points), whereas in previous research, the inverse had been shown (e.g. Al-Yagon and Mikulincer 2004). Perhaps, the more positive ratings of the students with SEN in our sample are related to the specifics of the Austrian school system and the available resources. In many of our inclusive classes, at least two teachers are present and the second one, the special needs teacher, often feels responsible for the students with SEN only. As the special needs teacher usually spends much time in small groups with the students with SEN, s/he has the possibility to develop a closer relationship with the students with SEN than with the other students. Furthermore, the results might reflect the fact that teachers are more sensitive to the individual needs of students with SEN, by giving them less difficult assignments and being more indulgent with them, which in turn might be considered unfair by students without SEN who would wish that the teachers treated all students alike. This would imply that teachers have to find a balance in their sensitivity to the individual needs of students with SEN and those of all other students.

Regarding the second hypothesis, the correlational analyses and the structural equation modelling confirmed that peer integration and teacher-student relationships were relatively stable over the period of one year. A more fine-grained analysis executed separately for students with and without SEN showed that the stability of peer

integration was similar in both subgroups, but that the teacher-student relationships were less stable for students with SEN. A possible explanation could be that students with SEN have more problems with learning depending on the particular tasks they have to solve and that the tasks they are currently working on influence their estimations of the teacher-student relationships. This idea might be further investigated using intensive longitudinal methods, such as the Experience Sampling Method (e.g. Venetz and Zurbriggen 2015), in which students are repeatedly asked to give a short self-evaluation of peer integration and a short report of what they are doing at that particular moment and with whom.

To analyse the reciprocal influences of peer- and teacher-student relationships and allowing valid interpretations of causality (hypothesis 3), we considered an autoregressive model. The analysis showed that teacher-student relationships had an influence on peer integration, but that the inverse was not true. This result is interesting from a methodological point of view, because ordinary correlations showed that all variables correlated significantly with each other. The findings strongly imply that more research with cross-lagged-panel design studies is needed to clearly determine cause and effect. A practical implication of the results would be that teachers should be aware of the impact of their interactions with students. Earlier studies based on the social referencing theory (Feinman 1992) demonstrated that positive teacher feedback lead to a more positive peer integration of students with and without SEN, while negative feedback had a strong negative influence on students' social acceptance (see e.g. Huber, Gebhardt, and Schwab 2015). The fact that no influence of peer integration on teacher-student relationships was found partly contrasts with De Laet et al. (2014) who underlined that peer integration influence students-teacher relationships and vice versa. However, these authors used sociometric popularity as an indicator of peer integration instead of the self-perception of peer integration, which was our focus of interest. The different results might be related to the operationalization of different subthemes of peer integration. Furthermore, De Laet et al. (2014) investigated a younger sample. In Austrian secondary education, there is no small and steady teacher team as in primary schools, but the teams consist of a number of teachers, each teaching specific subjects.

The fourth hypothesis can only be partly confirmed. In the sample of students without SEN, peer integration and teacher-student relationships (at both measurement times) were negatively correlated with depressive symptoms at T2. In the sample of students with SEN only teacher-student relationships at T2 correlated with depressive symptoms at T2. The structural equation model in the entire sample, however, indicated that only teacher-student relationships predict depressive symptoms ( $p < .06$ ). Both peer integration and teacher-student relationships appear to have an effect on depressive symptoms, but when controlling one for the other the teacher-student relationships seem to be the stronger indicator. Another important finding concerns the strong gender effect that was found in the correlational analysis, indicating that girls showed more depressive symptoms than boys, which is in line with previous research using the Depression Test for Children (Rossmann 2014). However, in the structural equation model, which can be considered as a stronger type of analysis as it takes all variables into account simultaneously, this relation failed to reach significance.

The last research question focused on the moderating effects of peer- and teacher-student relationships. Even if this is the first study that explicitly analyzed these effects,

we expected bidirectional moderation effects, indicating buffer effects of both variables. For students with low levels of teacher-student relationships, the peer integration did not predict depressive symptoms, but it did for students with high levels of teacher-student relationships. No moderation effect was found for peer integration. The results imply that if students have a low level of teacher-student relationship they have a higher risk of showing depressive symptoms. Good peer integration cannot buffer this negative peer integration with the teacher. In the case of high levels of teacher-student relationships, peer integration have an impact on depressive symptoms. In this connection, it should be kept in mind, that the teacher student relationships were found to be much more stable over time than the peer integration. It seems that if the more important and stable factor, the teacher-student relationship, is too low, than the risk of showing depressive symptoms is high. Only if this factor is high enough, the next factor that will influence depressive symptoms is the peer integration.

### ***Limitations and future directions***

Despite this study's strengths, some limitations should be taken into account when interpreting the results. First of all, the sample size of students with SEN was very limited, so the results should rather be interpreted as a first indicator. More research is needed with larger samples. Additionally, findings and conclusions about students with SEN could prove to be more differentiated when different groups of SEN (e.g. learning difficulties, emotional disorders) are compared, which was not possible in this study. Furthermore, the peer integration were solely based on students' self-reports. It should be kept in mind that other research has shown a rather low correspondence between peer-reports and self-reports of peer integration (e.g. Schwab 2016). The same is true for teacher- and student-reports of teacher-student relationships (Hughes 2011). Thus, results might differ if social relations were assessed from different viewpoints. It should also be reminded that the current study investigated only one dimension of social participation, namely self-rated peer integration (compare Bossaert et al. 2013). The fact, that the study focuses entirely on students' self-reported relationships with teachers and peers and the target variable – depressive symptoms, are based on self-reports – leads to smaller independent contributions of the relationships between the variables. All these three variables have common measurement variance. Therefore, it would be important to examine if the results stay stable using different measurement methods and not solely focusing on students' self-ratings. A further important limitation of the present study is that depressive symptoms were only assessed at the last measurement point. This implies that the interpretation of causality is restricted. Studying peer integration and depressive symptoms in combination with a cross-lagged-panel-design could yield further important insights about causality. Finally, the present results are limited to secondary grade students. Research covering different age ranges is needed.

### ***Conclusions and practical implications***

Summarising, it can be concluded that the teacher-student relationships in schools are highly important and future research should focus on both peer integration and teacher-student relationships to gain better insight in the effects of students' social relations in

schools. When focusing on peer integration, it is recommended that interventions should not only concentrate on students' individual competences (e.g. social competences), but rather on aspects that show an influence on class level (e.g. considering the role of the teacher). The findings of the present study underline once more the importance of the teacher not only as a manager of social relations in class but also as an attachment figure which represents an important part of the developmental context for his or her students.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Notes on contributors

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