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DOI

[10.1016/j.childyouth.2019.05.041](https://doi.org/10.1016/j.childyouth.2019.05.041)

Publication date

2019

Document Version

Final published version

Published in

Children and Youth Services Review

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Citation for published version (APA):

Beld, M. H. M., Van den Heuvel, E. G., van der Helm, G. H. P., Kuiper, C. H. Z., de Swart, J. J. W., Roest, J. J., & Stams, G. J. J. M. (2019). The impact of classroom climate on students' perception of social exclusion in secondary special education. *Children and Youth Services Review*, 103, 127-134. Advance online publication. <https://doi.org/10.1016/j.childyouth.2019.05.041>

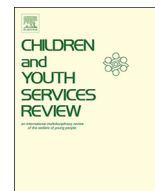
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The impact of classroom climate on students' perception of social exclusion in secondary special education



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ARTICLE INFO

Keywords:

Classroom climate
Externalizing behavior
Social exclusion
Social information processing
Secondary special education

ABSTRACT

The present study examines the relation between classroom climate in schools for secondary special education and students' perceived social exclusion. A total of 401 Dutch adolescents (70.3% males) with conduct problems, attending schools for special education, filled out questionnaires on classroom climate, problems in social information processing, externalizing behavior and perceived social exclusion. Results showed that a positive classroom climate was associated with a reduction of students' externalizing behavior problems and perceived social exclusion, which was associated with improvements in social information processing. However, these relations were only found at the within group level of analysis (between students) and not at the between group level (between classes); thus contextual (class level) effects could not be demonstrated. It can be carefully stated that a positive classroom climate in secondary special education may protect against perceived social exclusion. Future research is required to examine whether our findings can be replicated in other schools for secondary special education or can be generalized to secondary education in general.

1. Introduction

Social exclusion is a situation in which an individual or group is denied access to social rights, opportunities or resources that are normally available to others (Hoff & Vrooman, 2011; Williams, Forgas, & Von Hippel, 2005). It may be considered as one of the most harmful threats to positive youth development during adolescence (Hutchison, Christian, & Abrams, 2007). Although in The Netherlands and other Western countries many community and societal risk and protective factors for social exclusion have been established, and it is well-known that in particular underprivileged groups may be at increased risk for social exclusion, little is known about the ways adolescents become socially excluded in the context of the school, and which school factors can prevent students' social exclusion (Jehoel-Gijsbers & Vrooman, 2007; Sparkes, 1999). One such factor may be classroom climate, which refers to the quality of the students' social learning environment in terms of teacher support, relationships among students, structure, and growth possibilities (Beld, Van der Helm, Kuiper, De Swart, & Stams, 2017). In schools with a positive classroom climate the relationships among students, teachers, and other school staff are positive, there is a

sense of collaboration and participation, while collective norms and goals are pursued (Payne, Gottfredson, & Gottfredson, 2003).

Risk factors for social exclusion may be overrepresented in special education classes for conduct disordered adolescents. These adolescents need additional attention and guidance, because they often struggle with a physical and/or mental disorder, emotional- and behavioral problems, and psychiatric issues, such as ADHD, ODD, CD, and disorders related to autism (Stoutjesdijk & Scholte, 2009). Often these adolescents have social information processing difficulties, which have been found to be connected to externalizing problems (DeLisi et al., 2009; Van der Helm et al., 2013; Young, Justice, & Erdberg, 2004).

Adequate social information processing is necessary for unbiased perception and integration of social information, and facilitates self-regulation in order to solve problems as well as successful goal setting and achievement (Dodge, 1993). Adolescents who inadequately process social information have a distorted image of reality. For example, instead of focusing on neutral information, the adolescent's attention might become focused on threatening information and hostile signals, becoming more inclined to respond with aggression in (negative) contact with peers (Dodge et al., 2003).

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We assume that classroom climate in schools for secondary special education can affect students' perceptions of social exclusion through its effect on externalizing behavior (i.e., aggression and norm trespassing behavior) and inadequate social information processing. First, research shows that a positive classroom climate is associated with less externalizing behavior, whereas a negative classroom climate is related to more externalizing behavior (Barth, Dunlap, Dane, Lochman, & Wells, 2004; Steffgen, Recchia, & Viechtbauer, 2013). Students showing externalizing behaviors may be perceived as difficult by their peers and become 'unwanted', which evokes interpersonal rejection and, subsequently, social exclusion (Killen, Mulvey, & Hitti, 2013; see also: Stenseng, Belsky, Skalicka, & Wichström, 2015).

Second, a positive classroom climate is assumed to affect students' social information processing in a positive way, because students develop a positive working model of social relationships and better self-regulatory skills through positive interactions with peers and teachers (Ryan & Deci, 2017; Sameroff, 2009; Sutherland, Lewis-Palmer, Stichter, & Morgan, 2008; Van der Ploeg, 2010). In contrast, a negative classroom climate may lead to a negative working model of social relationships and lack of self-regulatory skills, resulting in biased social information processing (Ryan & Deci, 2000; Sameroff, 2009; Sutherland et al., 2008; Van der Ploeg, 2010). Students with inadequate social information processing might isolate themselves through lack of the necessary social skills to build and maintain rewarding social relationships with others. Notably, distorted social information processing may even increase perceptions of social exclusion and interpersonal rejection where no social exclusion actually occurs (Dodge, McClaskey, & Feldman, 1985; Matthys, Cuperus, Maassen, & Van Engeland, 2001).

The present study examined the relation between classroom climate, problems in social information processing, externalizing behavior, and students' perceived social exclusion in secondary special education. Structural equation modeling (SEM) was used to test a path model with multiple mediators, in which problems in social information processing and externalizing behavior were hypothesized to mediate the relation between classroom climate and perceived social exclusion. We hypothesize a positive classroom climate to be associated with lower perceived social exclusion (H1) and less externalizing behavior (H2). We also expect problems in social information processing (SIP) to mediate the relation between classroom climate and social exclusion (H3) and classroom climate and externalizing behavior (H4).

2. Method

2.1. Sample

The present study took place in schools for secondary special education in Amsterdam, The Netherlands, where a culturally diverse group of students with emotional and behavioral disorders (EBD) and learning disabilities receive education. All students were asked to participate in the study. In total, 401 of the 488 students (83% response rate) took part in the study, representing 56 classes with an average cluster size of 7 (range = 1–16 students per class, 1 singleton). A number of students were not present because of illness or other reasons for non-attendance. A total of four students did not want to sign an informed consent form, and six students did not receive permission from their parents to participate in the study. The average age of the students was $M = 15.31$ years old ($Min = 12$ years, $Max = 22$ years, $SD = 1.95$). The sample consisted of 70.3% boys and 28.2% girls. A total of 67.6% of the students had a non-western ethnical background.

2.2. Procedure

Data were obtained in March 2015 in five schools for special education in Amsterdam. Parents of the students were informed about the study beforehand through a letter. Besides information about the goal

of the study, parents were given the possibility to (dis)agree with their child(ren)'s participation in the study at the administration office in the school, depending on age. The questionnaires were filled out by the students, which were completed in around 40 min. In some classes the questionnaires were read out loud by the researchers because students' reading abilities were not sufficient. An informed-consent form was attached to the questionnaires. Students declared that they were willing to participate, after having received information about the goal and proceedings of the study, including anonymous use of the data for scientific purposes. The informed-consent form was archived separately from the questionnaires, and a code was added to the questionnaires indicating to which class the student did belong. Students were asked to fill out the questionnaires individually.

2.3. Materials

Classroom climate was measured with the Special Education Classroom Climate Inventory-Revised (SECCI-R; Beld et al., 2019). The SECCI-R is a student self-report questionnaire and assesses various aspects of classroom climate with 21 items, rated on a 5 point Likert type scale (1 = 'strongly disagree' to 5 = 'strongly agree'), and five scales. Beld et al. found a good fit of a multilevel factor model, supporting construct validity of the classroom climate measure at both the within- and between-group (classroom) level: $\chi^2(314) = 802.63$, $p < .001$; CFI = 0.967, TLI = 0.960, RMSEA = 0.031, SRMR_W = 0.035, SRMR_B = 0.080. Internal consistency of the factors was good for all factors with Cronbach's alpha's above 0.75.

The first scale, 'Positive student affiliation', measures to what extent students experience friendly and amiable behavior in their class. In the present study, this scale had an internal consistency of $\alpha = 0.82$. An example item is "I think my classmates are nice". The second scale, 'Negative peer interactions', measures to what extent students experience disruptive and disorderly behavior in class ($\alpha = 0.83$). An example item is "We call each other names in class". The third scale, 'Teacher support', measures to what extent students experience support and stimulation from their teachers ($\alpha = 0.88$). An example item is "The teachers help with problems". The fourth scale, 'Structured classroom environment', measures to what extent sufficient structure is offered and whether students experience a pleasant atmosphere in class ($\alpha = 0.66$). An example item is "It's chaotic in class". All items of this scale were recoded in that higher scores reflected more structure. The fifth scale, 'Growth possibilities', measures to what extent the students think they learn useful things in school for their future ($\alpha = 0.74$). An example item is "I learn good things here in school".

Problems in social information processing was measured using the Taxonomy of Problematic Social Situations – Adolescent self-report version (TOPS-A, Van der Helm et al., 2013), a Dutch translation of the TOPS (Dodge et al., 1985; Matthys et al., 2001). This instrument assesses inappropriate responses of adolescents to problematic social situations and distinguishes between four types of social problem situations: Disadvantage, competition, accepting authority, and accepting/giving help. Van der Helm et al. (2013) found evidence for construct validity of the TOPS-A. Using confirmatory factor analysis (CFA), their results showed a good fit to the data: $\chi^2(186) = 209.41$, $p < .001$; CFI = 0.976, TLI = 0.970, and RMSEA = 0.032. Internal consistency of the factors was satisfactory.

The questionnaire consists of twenty-four items, rated on a 5 point Likert type scale (1 = 'strongly disagree' to 5 = 'strongly agree'). The first scale, 'Disadvantage', measures the extent to which an adolescent perceives disadvantage, such as unjust treatment by others, including attribution of hostility (internal consistency is $\alpha = 0.72$). An example item is "When others tell me I wear the wrong clothes, I yell at them". The second scale, 'Competition', measures how children experience playing together and how they cope with winning and losing ($\alpha = 0.70$). An example item is "If I win, I call the other a loser". The third scale, 'Accepting/giving help', measures to what extent adolescents ask for

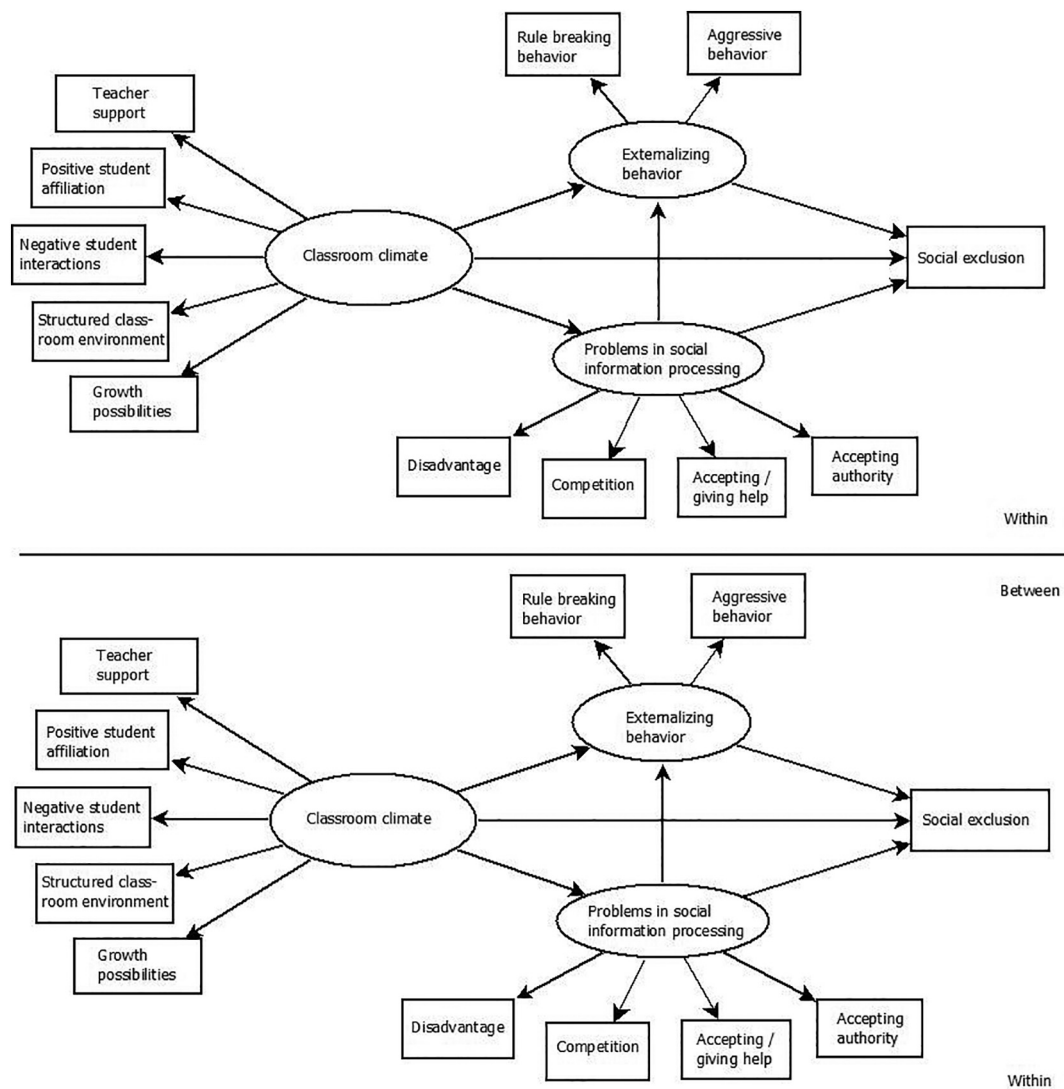


Fig. 1. Hypothesized Model of the Relation Between Classroom Climate, Externalizing Behavior, Problems in Social Information Processing, and Social Exclusion.

help in situations, and to what extent they accept support of peers or offer help to peers ($\alpha = 0.55$). An example item is “When I feel bad and someone asks me what’s wrong, I keep my mouth shut”. The fourth scale, ‘Accepting authority’, measures to what extent adolescents are able to accept the authority of their teacher ($\alpha = 0.72$). An example item is “When the teacher leaves the classroom, I do whatever I want”. A higher score on the scales indicates higher levels of problematic social information processing.

Externalizing behavior was measured with the rule breaking and aggressive behavior subscales of the Youth Self Report (YSR, Achenbach, 1993; Achenbach & Rescorla, 2001; Verhulst, van der Ende, & Koot, 1997). The YSR is designed for use with adolescents between 11 and 18 years and assesses adolescents’ perception of their own emotional and behavioral problems (Verhulst et al., 1997), showing good validity and reliability in several studies both in The Netherlands (De Groot, Koot, & Verhulst, 1996) and in other Western countries (Ivanova et al., 2007). The YSR consists of thirty-two items, rated on a 3 point Likert type scale (0 = ‘Not at all’, 1 = ‘A little or sometimes’, 2 = ‘Clearly or often’), representing nine narrow-band scales (e. g., Attention Problems, Thought problems, and Social problems), and three broad-band scales (Internalizing, Externalizing, and Total Problems). In the present study, the Rule breaking behavior and Aggressive behavior scales were used to assess Externalizing behavior. An example item of the Rule breaking scale is “I lie and cheat”, and an example of the Aggressive

behavior scale is “I fight a lot”. The YSR has been extensively used in research to assess youth’s emotional and behavioral problems. The broadband scales of the Dutch version of the YSR have been found to be reliable with Cronbach’s alpha’s between 0.78 and 0.91. (Verhulst et al., 1997). In the present study, internal consistency reliabilities for rule breaking behavior ($\alpha = 0.76$) and aggressive behavior ($\alpha = 0.86$) were good.

Social exclusion was measured with seven items, which are considered to constitute the concept of perceived social exclusion as outlined by Hutchison et al. (2007), that is, the perception of being ‘excluded, rejected, or marginalized from desired relationships or groups’ (p. 30). The questions each have three answer possibilities (1 = Disagree, 2 = I don’t know, 3 = Agree). An example item of this scale is “I never get what I’m entitled to”. We examined construct validity of the scale by means of confirmatory factor analysis, using Mplus (Muthén & Muthén, 1998–2010). To account for non-normally distributed ordinal data, the means and variance adjusted weighted least squares estimation procedure (WLSMV) was chosen. Results showed a good fit to the data: $\chi^2(14) = 29.65, p = .009$; CFI = 0.977, TLI = 0.966, and RMSEA = 0.054 (90% CI = 0.026, 0.081). Standardized factor loadings ranged from 0.58 to 0.79. The scale was found to be internally consistent ($\alpha = 0.70$), with corrected item-total correlations ranging from 0.33 to 0.51.

Table 1
Classroom climate, externalizing behavior, social information processing, and social exclusion: means, standard deviations, ICCs, and correlations.

Item	<i>M</i>	<i>SD</i>	<i>ICCs</i>	1	2	3	4	5	6	7	8	9	10	11
1. Positive student affiliation	4.01	0.90	0.10	–										
2. Negative peer interactions	3.70	1.03	0.16	–0.22**	–									
3. Teacher support	3.94	1.00	0.25	0.35**	–0.16**	–								
4. Structured classroom environment	3.03	0.95	0.10	0.26**	–0.48**	0.28**	–							
5. Growth possibilities	3.87	1.00	0.18	0.29**	–0.13**	0.59**	0.20**	–						
6. Rule breaking behavior	0.32	0.27	0.05	–0.17**	0.27**	–0.23**	–0.22**	–0.23**	–					
7. Aggressive behavior	0.37	0.33	0.04	–0.13**	0.33**	–0.22**	–0.29**	–0.16**	0.73**	–				
8. Perceived disadvantage	2.26	0.81	0.05	–0.13*	0.37**	–0.19**	–0.25**	–0.20**	0.47**	0.56**	–			
9. Coping with competition	1.78	0.81	0.05	–0.11*	0.23**	0.02	–0.16**	–0.02	0.31**	0.39**	0.49**	–		
10. Accepting/giving help	2.67	1.05	0.08	–0.12*	0.11*	–0.06	–0.17**	–0.09	0.22**	0.19**	0.25**	0.33**	–	
11. Accepting authority and rules	2.03	0.84	0.07	–0.08	0.22**	–0.20**	–0.22**	–0.16**	0.49**	0.53**	0.54**	0.47**	0.28**	–
12. Social exclusion	1.48	0.46	0.05	–0.20**	0.28**	–0.20**	–0.21**	–0.20**	0.37**	0.38**	0.36**	0.26**	0.18**	0.25**

Note: *N* = 401.

** *p* < .01.

* *p* < .05 (two-tailed).

2.4. Analyses

In preliminary analyses we examined the associations between group climate, externalizing behavior problems, problems in social information processing, and social exclusion by means of bivariate correlation analyses (Pearson's *r*). Pearson's correlations of *r* = 0.10–0.30 are seen as small, *r* = 0.30–0.50 are considered as a moderate, and *r* > 0.50 are seen as a large (Cohen, 1988). Subsequently, we tested the study hypotheses through multilevel structural equation modeling (MSEM), using Mplus software version 6.11 (Muthén & Muthén, 1998–2010).

We followed the procedures outlined by Hox (2010). First, intraclass correlation coefficients (ICCs) were calculated to examine the between-group (i.e., between classes) variability and the degree of non-independence in the data (Raudenbush & Bryk, 2002). ICCs greater than zero are indicative of nested data structures, in which case multilevel analysis is necessary in order to account for dependency of observations (Byrne, 2012). Then, the covariance matrix was decomposed into a pooled within- and between-level covariance matrix. The within-level covariance matrix was used to examine the within-level part of the model, and the between-level covariance matrix was used to examine the between-level part of the model. Next, a multilevel structural equation model was fitted to the data in which the within- and between-level models were estimated simultaneously, using the 'type = twolevel' option in Mplus. Maximum likelihood (ML) was used to estimate all models.

We hypothesized a direct effect of classroom climate on social exclusion, and two mediation effects in that the relation between classroom climate and social exclusion would be mediated by externalizing behavior and problems in social information processing. We also hypothesized multiple mediation, with paths from classroom climate to social information processing, from social information processing to externalizing behavior, and from externalizing behavior to social exclusion. The hypothesized model is depicted in Fig. 1.

First, a measurement model was examined using the within-level covariance matrix. In this model, classroom climate was a latent variable, with five indicators: positive student affiliation, negative student interactions, teacher support, structured classroom environment and growth possibilities. Externalizing behavior was a latent variable, with rule breaking behavior and aggressive behavior as indicators. Problems in social information processing was a latent variable, with the following indicators: disadvantage, competition, accepting/giving help, and accepting authority. Social exclusion was used as a composite variable (mean score) in the model.

Second, a structural model was examined using the within-level covariance matrix, in which paths between latent variables were specified as well as paths from the latent variables to the observed

(composite) variable social exclusion. Third, the between-level covariance matrix was used to examine the measurement model and structural model at the between-level part of the model. In the final step, a two-level model was specified, in which the within- and between-level models were estimated simultaneously. Before conducting the two-level model, the variable negative student interactions was recoded such that higher scores indicated less problematic interactions, because research on MSEM has found that reverse scored variables may cause convergence problems in multilevel SEM (Gustafson & Stahl, 2005). In MSEM, negative residual variance at level-2 is a common problem, which can result in non-convergence of the model (Kim, Dedrick, Cao, & Ferron, 2016). Because the residual variance of the structured classroom environment variable at level-2 was close to zero and non-significant, this residual variance was fixed to zero, which is a recommended practice when using multilevel SEM (Hox, 2010).

Exact model fit was calculated with a Chi-squared test. Because the Chi-squared test is sensitive to sample size, fit measures that are less sensitive to sample size were also used (Cheung & Rensvold, 2002): The Tucker-Lewis Index (TLI), the comparative fit index (CFI), the root mean square error of approximation (RMSEA), and the standardized

root mean square residual (SRMR). The SRMR at the within-group level (SRMR_w) and between-group-level (SRMR_b) were examined to examine model fit of the two-level model. A non-significant Chi-square value is considered to indicate an exact fit to the data, while the following fit values indicate a close fit to the data: TLI > 0.95; CFI > 0.90; RMSEA ≤ 0.08; SRMR ≤ 0.08 (Cheung & Rensvold, 2002). Modification indices, giving the expected drop in chi-square if the parameter in question is freely estimated, were used to improve model fit.

3. Results

3.1. Preliminary analyses

There was a very small proportion of missing values, ranging from 0 to 1.5% per variable. Little's MCAR test ($\chi^2(65) = 79.32, p = .109$) was non-significant, indicating that missing values were missing completely at random. Missing values were imputed by means of expectation maximization. Table 1 shows the means, standard deviations, and ICCs of the five indicators of classroom climate, the two indicators of externalizing behavior, the four indicators of problems I, social information processing and perception of social exclusion as well as the correlations among these variables.

In general, small to moderate correlations were found. Aspects of classroom climate were negatively and significantly correlated with perceived social exclusion (range *r* = –0.20 – –0.21), except for negative peer interactions (*r* = 0.28). Notably, no significant correlations

were found between positive student affiliation and accepting authority and rules, between teacher support and coping with competition and accepting/giving help, and between growth possibilities and coping with competition and accepting/giving help. Further, externalizing behavior (rule breaking and aggressive behavior) was significantly and positively associated with problems in social information processing (range $r = 0.22$ – 0.56) and perceived social exclusion ($r = 0.38$), showing small to moderate correlations. Also, problems in social information processing was positively associated with perceived social exclusion (range $r = 0.18$ – 0.36). The results indicate that a more positive classroom climate was associated with lower levels of social exclusion, whereas more externalizing behavior problems and inadequate social information processing were associated with higher levels of social exclusion.

3.2. Structural equation modeling

First, a measurement model was examined using the within-level covariance matrix in which classroom climate, problems in social information processing, and externalizing behavior were specified as latent variables. The model showed a mediocre fit to the data: $\chi^2(41) = 186.84$, $p < .001$, CFI = 0.885, TLI = 0.845, RMSEA = 0.094, SRMR = 0.073. Model fit was improved by allowing correlations between residual variances of the factors growth and teacher support and between structured classroom environment and negative student interactions. This modification of the model resulted in acceptable fit: $\chi^2(39) = 106.38$, $p < .001$, CFI = 0.947, TLI = 0.925, RMSEA = 0.066, SRMR = 0.052.

Second, the structural model was specified, which showed a good fit to the data: $\chi^2(47) = 121.24$, $p < .001$, CFI = 0.945, TLI = 0.923, RMSEA = 0.063, SRMR = 0.051. Next, the between-level covariance matrix was used to replicate the measurement model. Model fit was unacceptable: $\chi^2(41) = 1009.39$, $p < .001$, CFI = 0.191, TLI = 0.086, RMSEA = 0.649, SRMR = 0.192. Further examination of the between-covariance matrix indicated that a model with externalizing behavior and problems in social information processing represented by latent variables could not be fitted at the between-level. Therefore, a model with only one latent variable classroom climate was specified, which showed a good fit to the data: $\chi^2(4) = 5.70$, $p = .223$, CFI = 0.993, TLI = 0.982, RMSEA = 0.087, SRMR = 0.061. The structural model at the between-level in which the relation between classroom climate and social exclusion was examined resulted in a worse fitting model: $\chi^2(8) = 32.01$, $p < .001$, CFI = 0.908, TLI = 0.827, RMSEA = 0.231, SRMR = 0.114. Subsequently, a two-level model (Fig. 2) was fitted, in which the within- and between-level models were examined simultaneously. In this model, problems in information processing and externalizing behavior were declared as within-level variables and not modeled at the between-level. This model showed a good fit to the data: $\chi^2(52) = 93.54$, $p < .001$, CFI = 0.970, TLI = 0.953, RMSEA = 0.045, SRMR_w = 0.043, SRMR_b = 0.055.

At the within-level part of the model, classroom climate was negatively related to externalizing behavior ($\beta = -0.252$, $p < .001$), problems in social information processing ($\beta = -0.501$, $p < .001$), and perceived social exclusion ($\beta = -0.300$, $p < .001$). This means that a positive classroom climate was predictive of less externalizing behavior, less problems in social information processing, and less perceived social exclusion. Externalizing behavior was positively related to social exclusion ($\beta = 0.209$, $p = .021$). Social information processing was not significantly associated with social exclusion. At the between-level part of the model, classroom climate was not significantly associated with social exclusion. The relation between classroom climate and social exclusion proved to be significantly mediated by externalizing behavior (indirect effect, $\beta = -0.053$, $p = .042$). The relation between problems in social information processing and social exclusion was also significantly mediated by externalizing behavior (indirect effect, $\beta = 0.125$, $p = .027$). Multiple mediation was tested, in which both

social information processing problems and externalizing behavior mediated the relation between classroom climate and social exclusion. Results were significant (indirect effect, $\beta = -0.063$, $p = .028$).

4. Discussion

The current study examined whether classroom climate in secondary schools for special education was related to the perception of social exclusion in adolescents with emotional and behavioral problems. A positive classroom climate proved to be associated with a reduction of both perceived exclusion (H1 confirmed) and externalizing behavior problems (H2 confirmed). We found evidence for multiple mediation, which indicated that the relation between classroom climate and externalizing behavior was partly mediated by problems in social information processing (H3 partly confirmed), while the relation between problems in social information processing and social exclusion was fully mediated by externalizing behavior problems (H4 confirmed). However, these relations were only found at the within-level of analysis (between students), and no relations between classroom climate, externalizing behavior, and social exclusion were found at the between-level (between classes). We therefore conclude that students' individual perception of a positive classroom climate was negatively associated with self-reported externalizing behavior, problems in social information processing, and social exclusion, while contextual (class level) effects could not be demonstrated.

Unexpectedly, problems in social information processing were not directly associated with social exclusion. A plausible explanation would be that externalizing behavior put students at risk for actual (real) social exclusion by their classmates and teachers, whereas social exclusion is not affected by biased social information processing, which in our study proved to be a strong predictor of externalizing behavior problems. In other words, social exclusion may turn out to be a real-life phenomenon related to externalizing behavior of students attending special education rather than a subjective experience.

The relation between classroom climate was not fully mediated by social information processing and externalizing behavior problems, which indicates that more factors may explain the relation between classroom climate and social exclusion. For instance, students can also exclude themselves from social situations due to internalizing behavior problems (Birmaher, Bridge, & Williamson, 2004; Chorpita & Southam-Gerow, 2006). Further research should focus on both externalizing and internalizing antecedents of social exclusion, since two profiles of social exclusion were distinguished on the basis of internalizing and externalizing behavior by Killen et al. (2013), accounting for problems in social information processing that are associated with both internalizing and externalizing behavioral tendencies (see Hoogsteder, Wissink, Stams, Van Horn, & Hendriks, 2014).

Externalizing behavior could be a cause of social exclusion (Dodge et al., 2003; Killen et al., 2013), especially if externalizing behavior is expressed as an angry reaction to insults or frustration (Card & Little, 2006); yet it can also be the result of social exclusion (MacDonald & Leary, 2005; Twenge, Baumeister, Tice, & Stucke, 2001). In both directions, there is empirical evidence showing that hostile cognitive biases (i.e., problems in social information processing) may underlie the association between externalizing behavior and social exclusion (DeWall, Twenge, Gitter, & Baumeister, 2009). Janssens et al. (2017) described bidirectional effects: experiencing peer rejection reinforces aggressive and rule-breaking behavior, while adolescents who display aggressive and rule-breaking behaviors are more likely to be rejected by peers. Further longitudinal research might test this bidirectional model explaining social exclusion.

Secondary schools are often faced with complex social issues, such as intergroup social exclusion (Mathieson et al., 2008), which often results in discrimination among students (Van den Bos et al., 2009; Van der Valk & Wagenaar, 2010). Since students in secondary special education are youngsters who become more and more influenced by their

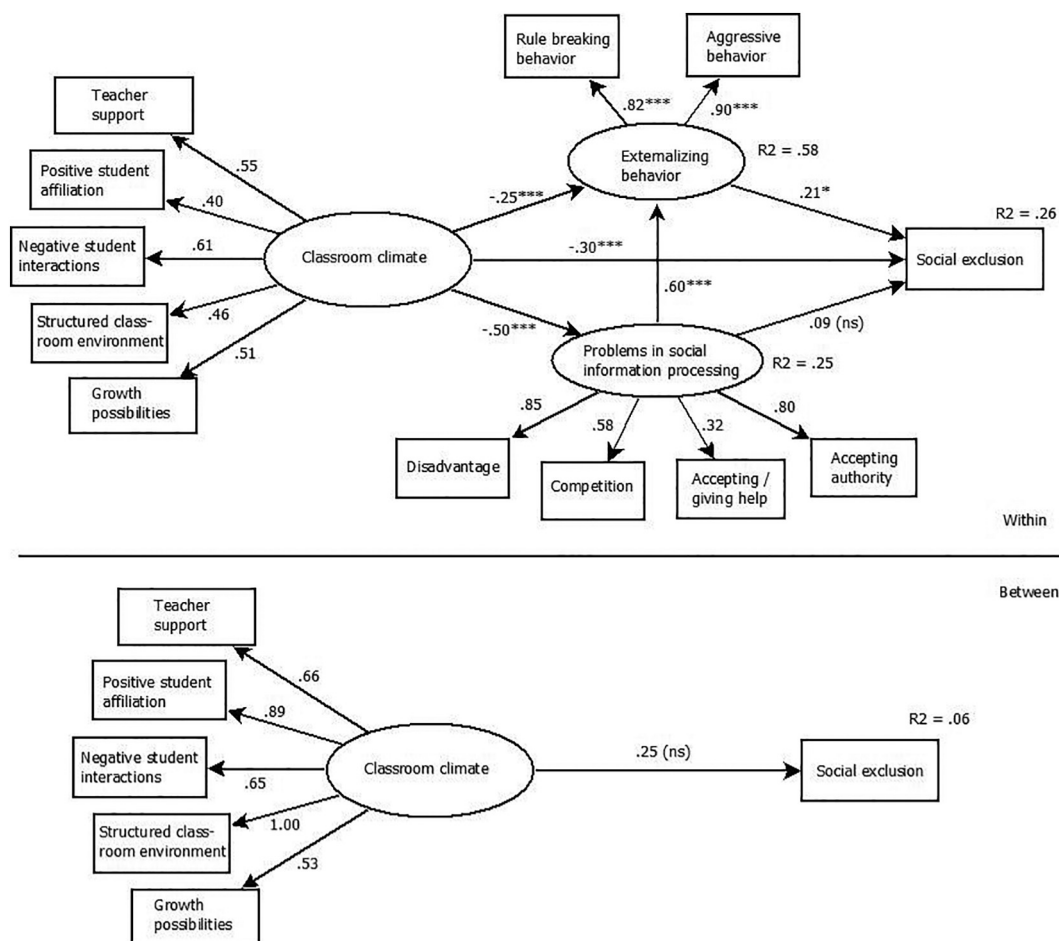


Fig. 2. Two-level Structural Equation Model of the Relation Between Classroom Climate, Externalizing Behavior, Problems in Social Information Processing, and Social Exclusion.

peers and are less influenced by parental supervision (De Jong, 2015; Sentse, 2010), school may have an important role in the prevention of these problems. It can be carefully stated that a positive classroom climate in secondary special education may at least contribute to lowering the risk for social exclusion of their students.

The current study has some limitations. A first limitation is that social exclusion was measured as a one-dimensional construct instead of a multi-dimensional construct (Hoff & Vrooman, 2011), which prohibits a more fine-grained analysis of the relation between classroom climate and the perception of social exclusion. Future studies on the relation between classroom climate in special education schools should assess the multiple dimensions of social exclusion, including limited social participation, lack of normative integration, inadequate access to basic social rights, and material deprivation (Hoff & Vrooman, 2011). A second limitation is that results were based on student self-report questionnaires only. Teacher-report and observations could be a valuable addition to student self-report. A third limitation is that data gathering has been completed in a Dutch metropolitan environment, where youth who attend special education are raised in disadvantaged neighborhoods, which limits the generalizability of our findings. Finally, the design of the study was cross-sectional instead of longitudinal, which sets limits to the causal interpretation of our results.

The current study showed that there are clear indications for an association between perceived classroom climate and social exclusion, which is explained by the effect of classroom climate on students' biased social information processing and, subsequently, their externalizing behavior problems. Further research should focus on both internalizing and externalizing antecedents of social exclusion as a risk factor for lack

of school commitment and social connectedness in general. In addition, experimental research is needed to examine whether improvement of classroom climate can affect social exclusion in a causal way. Finally, research on social exclusion should be extended from special education schools in disadvantaged neighborhoods to special education schools in non-risk urban and rural areas and to schools for regular (secondary) education in order to test the generalizability of our findings. If our results can be generalized, it might become possible to prevent social exclusion in both risk and non-risk contexts by improving classroom climate. We tend to believe that Nelson Mandela was right when he stated “education is the most powerful weapon which you can use to change the world”.

Declarations of interest

None.

Acknowledgements

This work is part of the research programme 'Scholarship for teachers' with project number 023.003.158, which is (partly) financed by the Netherlands Organisation for Scientific Research (NWO).

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