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Developmental Links between Teacher-Child Closeness and Disobedience for Boys Placed in Special Education

Linda D. Breeman^{a,b}, Pol A. C. van Lier^c, Theo Wubbels^a, Frank C. Verhulst^d, Jan van der Ende^d, Athanasios Maras^b, Juliette A. B. Hopman^{b,d}, and Nouchka T. Tick^a

^aUtrecht University; ^bYulius Academy; ^cVU University Amsterdam; ^dErasmus MC-Sophia

ABSTRACT

The aim of this study was to examine developmental links between disobedience and teacher-child closeness in a sample of boys with psychiatric disorders (i.e., emotional and behavioral disorders (EBD) and autism spectrum disorders (ASD)) and special educational needs who are placed in special education. More specifically, this study examined whether developmental links were different between boys with EBD ($n = 150$) versus boys with ASD ($n = 122$). Developmental links between disobedience and teacher-child closeness were investigated by incorporating a multi-informant perspective using teacher, child, and peer ratings and analyzed using autoregressive cross-lagged models across three waves within one school year. Results showed that in general, developmental links between teacher-child closeness and disobedience were stronger for boys with EBD than for boys with ASD. Specifically, boys with EBD experiencing less teacher-child closeness showed more disobedience, which in turn negatively affected their relationship development according to teacher ratings. Surprisingly, for boys with ASD, higher levels of disobedience predicted higher levels of teacher-rated teacher-child closeness during the school year. Our results offer more insight into the differential impact of teacher-child closeness on the behavioral problems for children with EBD and ASD.

Teacher-child closeness plays a central protective role in children's behavioral development (Buyse, Verschueren, Verachtert, & Van Damme, 2009; Cornelius-White, 2007). Children who form a close relationship with their teacher are less likely to exhibit externalizing and aggressive behavior (Baker, 2006; Hughes, Cavell, & Jackson, 1999). However, from a developmental systems perspective (Pianta, Hamre, & Stuhlman, 2003), many dynamic and reciprocal interactions take place between teachers and children that may complicate the development of a close teacher-child relationship. From the teacher's perspective, children's behavioral problems such as disobedience and provoking confrontations represent a major challenge (Hamre, Pianta, Downer, & Mashburn, 2008). Both teachers' perceptions of children's behavior (Dobbs & Arnold, 2009) and children's perceptions of the teacher's behavior (Wubbels & Brekelmans, 2005) impact the development of teacher-child closeness and thereby the development of disobedience. For instance, several studies that examined developmental classroom processes have shown that students' behavioral problems may elicit a negative teacher-child relationship characterized by conflict (De Laet et al., 2014; Doumen, Verschueren, Buyse, Germeijs, & Luyckx, 2008; Roorda, Verschueren, Van Craeyveldt, Van Craeyveldt, & Colpin, 2014; Zhang & Sun, 2011) and lower teacher preference for the child (De Laet et al., 2014; Mercer & DeRosier, 2008), which in turn may negatively impact the development of the child's behavior (Doumen et al., 2008; Mercer & DeRosier, 2008). Although not all these studies found a

CONTACT Linda D. Breeman  l.d.breeman@uu.nl  Department of Youth & Family, Faculty of Social and Behavioral Sciences, Utrecht University, PO Box 80140, 3508 TC Utrecht, The Netherlands.

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developmental impact of behavioral problems on teacher-child closeness (Roorda et al., 2014; Zhang & Sun, 2011), these findings do suggest that children with behavioral problems get caught in a vicious cycle of negative interactions that may prevent them from developing a close relationship with their teacher.

Although previous studies suggest that a close teacher-child relationship may especially protect children who have severe social, emotional, and behavioral problems (Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008; Hamre et al., 2008), empirical evidence on the role of the teacher-child relationship in children's behavioral development is mainly based on typically developing children attending mainstream education. Studies examining the developmental impact of behavioral problems on teacher-child closeness in children with psychiatric disorders such as emotional and behavioral disorders (EBD) and autism spectrum disorders (ASD) and related special educational needs (SEN) are scarce. Most children with EBD and ASD in special education are boys (approximately 80%) with relatively high levels of externalizing problems (Breeman et al. 2005; Stoutjesdijk & Scholte, 2009). Boys exhibiting externalizing behaviors usually have more conflict with their teacher (Hamre et al., 2008) and thus, the teacher-child relationship is usually less close for boys than girls, especially when they show externalizing problems (Hamre et al., 2008; Mashburn, Hamre, Downer, & Pianta, 2006). It is thus uncertain whether findings from mainstream education concerning the reciprocal interactions between teacher-child closeness and behavioral problems generalize to boys with EBD and ASD in self-contained settings for special education. To our knowledge, there is only one study that specifically examined developmental links between externalizing problems and teacher-child closeness in children with ASD (Eisenhower, Blacher, & Hurst Bush, 2015). This study found that higher levels of externalizing behavior were associated with less teacher-child closeness one year later, yet this study had the methodological disadvantage that both the child's behavior and the teacher-child relationship were rated by the teacher, which may have artificially increased the association between these measures. The present study attempts to address the aforementioned knowledge gap by examining the reciprocal interactions between children's disobedience and teacher-child closeness over time in boys with EBD and ASD in self-contained settings for special education using multiple informants.

Boys with EBD and ASD in special education

Children with EBD and ASD and associated SEN are referred to special education when their cognitive, emotional, or behavioral problems hinder them from obtaining education in mainstream schools. Most boys in self-contained settings for Dutch special education fall into the broad category of children with 'severe emotional and behavioral disorders' (EBD). Most of them are diagnosed with attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder (ODD), or conduct disorder (CD). In addition, a distinct second category of boys can be distinguished that are diagnosed with ASD (Stoutjesdijk & Scholte, 2009). When examining classroom processes in special education, it has been argued that differentiating between children with different diagnoses may be necessary to understand which problems—and thereby detrimental reciprocal interactions—are unique to certain clinical groups with SEN (Bossaert, Colpin, Pijl, & Petry, 2015; Whitehouse, Durkin, Jaquet, & Ziatas, 2009).

Boys with EBD may experience social difficulties as a result of being impulsive or easily frustrated and their behavior may involve explosive temperament outbursts, argumentative behavior, or involve a pattern of negativism and hostility (American Psychiatric Association, 2000; Rich, Loo, Yang, Dang, & Smalley, 2009). Many children with EBD thus show poor self-regulation skills and have difficulties in using implicit rules of social communication, making them more likely to pay minimal attention to what their teachers are saying, interrupt their teachers' communication, violate classroom rules, and respond aggressively to the teacher (Abikoff et al., 2002; American Psychiatric Association, 2000). The resulting disobedience of boys with EBD is challenging for teachers as it undermines their teaching efforts (Sutherland, Lewis-Palmer, Stichter, & Morgan, 2008). In addition,

when this behavior is directed at the teacher, teachers may take this kind of behavior personally, hampering the formation and development of a positive teacher-child relationship as experienced by teachers (Greene, Beszterczey, Katzenstein, Park, & Goring, 2002; Stroes, Alberts, & Van der Meere, 2003). Previous research showed that children with EBD experience more dissatisfaction with their teachers (Murray & Greenberg, 2001) and collaborate less with their teachers (Toste, Bloom, & Heath, 2014) than children without disabilities.

The social and behavioral problems of children with ASD are related to different deficiencies than the problems of children with EBD. Children with ASD have impairments in the development of a theory of mind—understanding that other people have different beliefs, emotions, and thoughts (Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997). Children with ASD thus experience problems in perceiving and understanding social behavior and responding with expected and adaptive social behavior (American Psychiatric Association, 2000; Bellini, Peters, Benner, & Hopf, 2007). In the classroom, key problems for these children are failing to understand their teacher or getting troubled and frustrated by their poor social competence which may result in restricted and repetitive behaviors, tantrums, and sometimes property destruction (American Psychiatric Association, 2000; Heflin & Alberto, 2001; Machalicek, O'Reilly, Beretvas, Sigafoos, & Lancioni, 2007; Valenti, Cerbo, Masedu, De Caris, & Sorge, 2010). However, teachers may be less likely to take the resulting disobedience of children with ASD personally as the behavioral difficulties of these children are usually not directed at the teacher, or manipulative to provoke a reaction from the teacher (Klin & Volkmar, 2000).

The present study

The aim of the present study is to contribute to knowledge on developmental links between the teacher-child relationship and disobedience of boys with EBD and ASD in self-contained settings for special education. This study aims to overcome a number of limitations present in previous studies and thereby add to current knowledge on classroom processes in three ways. First, a number of previous studies solely incorporated a teacher perspective on both behavioral problems and the teacher-child relationship (e.g., Eisenhower et al., 2015; Zhang & Sun, 2011), such that developmental links between these constructs partly share the same method variance that may artificially increase the strength of the found relationships. This study will therefore use different informants for each construct, incorporating teacher, peer, and self-ratings of classroom processes. Second, previous studies have mainly focused on developmental links between behavioral problems and teacher-child conflict (e.g., Doumen et al., 2008). Conceptually, while behavioral problems and teacher-child conflict may theoretically be two different constructs, they are highly related. Specifically, it has been shown that these constructs overlap is about 50% (Hamre et al., 2008), which may again result in an artificially increased strength of the found relationship. This indicates that the distinction between behavioral problems such as disobedience and teacher-child conflict is not so clear and may be obscure. The present study will thus focus only on behavioral problems and teacher-child closeness. Third, most studies have focused on classroom processes in mainstream education. This study focuses on boys with SEN in special education. Specifically, the present study compares two clinical groups of children, boys with EBD and ASD, to assess and understand whether detrimental interactions between the teacher-child relationship and behavioral problems may be unique for certain groups.

Based on theoretical and empirical work executed in mainstream education, we have different hypotheses for boys with EBD and ASD. First, we expect that disobedience in boys with EBD will elicit reductions in teacher-child closeness and that lower levels of a positive, protective teacher-child relationship may further increase disobedience and negatively influence the child's perception of the teacher-child relationship. Second, we expect that disobedience in boys with ASD show only weak developmental links to teacher-experienced teacher-child closeness as their behavioral problems are typically not directed at the teacher. Because these boys' behavioral

problems are usually related to stress and frustration coming from environmental demands and changes rather than their caretakers actions or personality, we also expect weak developmental links between child-experienced teacher-child closeness and boys' behavioral problems. Third, with regard to the comparisons between groups, we expect—based on our hypotheses for each group—stronger developmental links between disobedience and teacher-child closeness for boys with EBD than for boys with ASD.

Method

Participants

Participating in the study were 11 special education schools for children with EBD and ASD and related SEN, located throughout the Netherlands. Class size in these special educational schools is smaller than in mainstream education and teachers receive additional training and resources such as the availability of paraprofessionals and school psychologists (Meijer, 2003). The principals of three schools decided that a total of six classes were not able to participate in the study. This was due to problems present in these classes such as teachers resigning or having burnout problems. We initially recruited all boys (87% of the children) in grades 1–6 attending a participating class at the start of the study ($N = 416$). Written informed parental consent for participation was obtained for 87% of these boys ($N = 362$). During the school year, 22 boys (6%) were transferred to other schools. In addition, 68 boys (20%) switched teachers, and as it was our goal to examine the development of the teacher-child relationship in stable teacher-child dyads, these boys were not included in this study. Therefore, our final study sample consisted of 272 boys educated by 42 teachers. Our data thus had a hierarchical structure of students nested within classrooms (i.e., boys nested within teachers). The range of participating boys within each teacher was 1–12 (with one boy coming from a school in which students switched teachers and classrooms every few weeks, except for this student) with a mean number of participating boys in each classroom of 6.48 (2.52). The teachers were mostly female (71%), with a mean age of 38.5 years ($SD = 10.6$; range = 24–61 years). Mean age of the students was 10.2 years ($SD = 1.5$; range = 6–13 years) and their mean IQ was 88.66 ($SD = 15.4$; range = 56–139).

As having a psychiatric diagnosis is a prerequisite for placement in these schools for special education, all children were diagnosed by a general health professional—predominantly psychiatrists (48%) or health care psychologists (46%)—not associated with our study. For this study, the ASD group consisted of boys who had an ASD diagnosis ($n = 122$, 45%), regardless of possible comorbid diagnoses. Comorbid diagnoses in this group consisted mainly of ADHD (26%). In addition, few boys were also diagnosed with comorbid anxiety and mood disorders (2%) or behavioral disorders such as ODD/CD (5%). In contrast, the EBD group consisted of boys with predominantly emotional and behavioral problems and who did not have an ASD diagnosis ($n = 150$, 55%). These boys were mainly diagnoses with ODD/CD (51%), ADHD (46%), and/or anxiety and mood disorders (14%). In addition, teacher reports at the beginning of the school year showed that the EBD group had more behavioral problems ($M = 2.72$; $SD = 0.70$) than the ASD group ($M = 2.17$; $SD = 0.70$; $p < 0.001$) as measured with the externalizing behavior scale of the teacher-rated Problem Behavior at School Interview (PBSI; Erasmus Medical Center, 2000).

All data were collected during the execution of a more extensive intervention study—with an intervention and control condition—aimed at improving the wellbeing of children and teachers in special education. The results of that study are reported elsewhere (Breeman et al., 2016). In short, findings showed that the intervention had not affected boys' teacher-child relationships and the intervention only had a small effect (Cohen's $d = 0.14$) on boys' disobedient behavior. Given the limited impact of the intervention, we included all boys in the current study. To correct for a possible effect of the intervention on the developmental links between disobedient behavior and teacher-child closeness, we added study condition as a covariate in the analyses (control group = 0; intervention group = 1). The study was approved by the Dutch Medical Ethics Committee for Mental Health Care.

Measures

Data were collected at the start of the 2010–2011 school year (T_1), halfway through (T_2), and at the end (T_3). To avoid rater bias when examining developmental links across time, each outcome measure was rated by a different informant (i.e., teacher-rated and child-rated teacher-child closeness and peer-rated behavioral problems). Boys in grade 1 participated, yet, given these students' young age with literacy and writing skills still in development, they did not provide data themselves. For these boys, we only collected their classmates' ratings on their disobedience and their teacher's rating on teacher-child closeness. If a child in grade 2 or higher needed help, research assistants conducted a face-to-face interview with the child.

Teacher-rated teacher-child closeness

Teacher reports of teacher-child closeness were collected using the Closeness scale of the Dutch version of the Student Teacher Relationship Scale (STRS; Koomen, Verschueren, & Pianta, 2007; Pianta, 2001). The Closeness scale consisted of 11 items (sample's Cronbach's alpha: $T_1 = 0.89$, $T_2 = 0.89$, $T_3 = 0.89$) such as "*I share an affectionate, warm relationship with this child,*" that were rated by teachers on a 5-point scale ranging from 1 (*definitely does not apply*) to 5 (*definitely applies*). The intraclass correlation coefficient (ICC) of the STRS baseline measurement indicated that 21% of the variance in individual ratings of teacher-child closeness was at the classroom level. The STRS is a frequently used and empirically validated measure of teachers' perceived relationship quality with individual children (Sabol & Pianta, 2012). Previous studies have reported high test-retest reliability coefficients for the original (0.83 within a 4-week interval; Pianta, 2001) and the Dutch version of the STRS (between 0.70 and 0.83 within a 3–4 month interval; Koomen et al., 2007). In addition, teacher reports of teacher-child closeness, as rated by the STRS, are moderately and positively associated with closeness rated from the child's perspective (Doumen et al., 2009).

Child-rated teacher-child closeness

Children's perspectives on teacher-child closeness were assessed using the proximity dimension of the Questionnaire on Teacher Interaction (QTI; Wubbels, Brekelmans, & Hooyman, 1992). Children responded to 32 statements such as "*This teacher is friendly*" using a 4-point scale, ranging from 1 (*never*) to 4 (*always*). A teacher-child proximity dimension score was subsequently calculated (using the formula provided in Wubbels & Brekelmans, 2005) with scores indicating: 0.0–0.5 = moderately positive, 0.5–1.0 = positive, and >1.0 = very positive (Opdenakker, Maulana, & Brok, 2012). The sample's Cronbach's alpha for proximity was good (T_1 EBD = 0.88, T_1 ASD = 0.79; T_2 EBD = 0.91, T_2 ASD = 0.86; T_3 EBD = 0.91, T_3 ASD = 0.89), indicating that children understood the items in the questionnaire and could reliably indicate their perception of teacher-child closeness. The ICC of the baseline measurement indicated that 22% of the variance in individual ratings of teacher-child closeness was at the classroom level. Strong and positive correlations have been found between the proximity dimension of the QTI and student motivation, student confidence, and student effort in children attending mainstream education (Wubbels & Brekelmans, 2005). In addition, the QTI meets the standards of the American Evaluation Association for accuracy, reliability, and validity (Wubbels & Brekelmans, 2005).

Peer-rated disobedience

Disobedience was evaluated by means of unlimited peer nominations (Coie & Dodge, 1988) using the question "*which child disobeys the teacher?*". The mean number of children providing peer nomination data in relation to each classmate was 9.18 ($SD = 2.41$, range = 2–13). To account for variability in classroom size, scores were adjusted by dividing each individual child's total number of nominations by the number of participating children in the class minus one (self-nominations were not allowed). To achieve percentages of disobedience, scores were multiplied by 100. The ICC of the baseline measurement indicated that 21% of the variance in individual ratings of disobedience was at

the classroom level. Peer nominations can be used with children in grade 1 onwards (Coie & Dodge, 1988) and previous studies showed that peer nominations of children's behavioral problems coincide with children's self-reported behavioral problems (Van Lier, Vitaro, Wanner, Vuijk, & Crijnen, 2005). Zakriski and Prinstein (2001) found that peer nominations were meaningful and related to social adaptation and psychological and behavioral adjustment in a clinical population of children with severe emotional and behavioral problems.

Data analysis

We used SPSS 22.0 to produce means and standard deviations of our outcome measures. To provide additional descriptive statistics, ANOVAs and repeated measures ANOVAs were used to supply information about possible baseline differences and the general development of disobedience and teacher-child closeness. To correct for a possible effect of the intervention, we added study condition as a covariate in the analyses (control group = 0; intervention group = 1). In addition, means were likewise adjusted for boy's age and IQ.

To test our hypotheses, models were fitted in Mplus 6.12 (Muthén & Muthén 1998–2010). Coefficients were estimated using maximum likelihood estimation with robust standard errors (MLR). The data has a hierarchical structure of children nested within teachers and the reported ICC values can be considered relatively high (i.e., 0.21–0.22; Raudenbush & Liu, 2000). Yet, these values can be expected as characteristics of the teacher exert a substantial effect on individual teacher-child relationship scores. As large ICC values result in too “liberal” tests of statistical significance (Kenny, Kashy, & Cook, 2006), we used the “type = complex” feature in Mplus to account for this dependency. We used full information maximum likelihood estimation (FIML) to handle missing data. Yet, missing data were minimal because research assistants always checked questionnaires when collecting them from participants (range missing data between waves: STRS: 0%–5%; QTI: 4%–6%; peer nominations: 2%–5%). Fit of the model to the data was tested using the comparative fit index (CFI), the root mean squared error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Fit of the models was considered good for a value of CFI equal or larger than .95, for RMSEA equal or less than .06, and SRMR equal or less than 0.08 (Hu & Bentler, 1999).

Developmental links between disobedience and teacher-child closeness were analyzed using multiple group (EBD vs. ASD) autoregressive cross-lagged models. The autoregressive links represent the stability within each construct by regressing each variable on their immediate prior value. The cross-sectional links represent the correlations between the three variables within each time point. In this study, we focus only on the cross-lagged links (i.e., the developmental links) between disobedience and teacher-child closeness as these links represent the reciprocal relations between these constructs over time. The strength of the pathways were indicated using standardized regression coefficients (β), which represent change in standard deviation units. Standardized regression coefficients with values less than 0.10 indicate small effects, values around 0.30 indicate medium effects, and values around 0.50 indicate large effects (Kline, 2005).

For testing our three hypotheses concerning the developmental links within each group and between the two groups, we used the following model building strategy. First, parameter estimates were controlled for study condition (intervention vs. control), IQ, and age. For model parsimony, only the significant relations between these covariates and the three outcome measures at each assessment wave were retained in the model. Second, we analyzed a baseline multiple group model in which all parameters (i.e., autoregressive links, cross-sectional links, and cross-lagged links) were freely estimated across the two groups (EBD vs. ASD). Third, to examine whether a more parsimonious (i.e., simple) model could be constructed of developmental stability within the school year, we imposed equality constraints on each pair of cross-lagged links and examined whether these constraints resulted in a significant decrease in model fit. As the standard chi-square value cannot be used for comparing nested models, we calculated the Satorra-Bentler scaled chi-square difference test

(TRd; Satorra & Bentler, 2001) to test the decrease in model fit. Fourth, to test our hypothesis on differences in developmental links between the two groups (EBD vs. ASD), we imposed equality constrains on each pair of cross-lagged links and examined whether these constrains resulted in a significant decrease in model fit. These equality constrains between groups were tested by a Wald chi-square test using the “model test” command in Mplus. Data and methods are available for verification from the corresponding author upon request.

Results

Descriptive statistics

As can be seen from Table 1, boys with EBD showed more disobedience than boys with ASD at baseline ($F(1,247) = 6.00, p = 0.015, d = 0.31$), a small difference (Cohen, 1988). Table 1 callout The development of disobedience was the same for both groups ($F(2480) = 1.08, p = 0.341$). There was no difference between boys with EBD and ASD in teacher-rated ($F(1249) = 0.63, p = 0.428$) and child-rated teacher-child ($F(1239) = 0.17, p = 0.678$) closeness at baseline. However, both groups differed in their development of teacher-rated teacher-child closeness ($F(2476) = 7.95, p < 0.001$). Specifically, teacher-rated teacher-child closeness remained stable for boys with EBD ($F(2274) = 0.81, p = 0.446$), while it showed an increase for boys with ASD ($F(2196) = 5.33, p = 0.006$). For child-rated teacher-child closeness, the groups did not differ in development over time ($F(2466) = 1.34, p = 0.262$). Table 2 shows all bivariate correlations between the three constructs for both groups separately. Table 2 callout

Differences in developmental links

The fit of the model that contained all autoregressive, cross-sectional, and cross-lagged links was somewhat below acceptable levels; $\chi^2(50) = 105.668, p < 0.001$; CFI = 0.93; RMSEA = 0.09; SRMR = 0.06. Modification indices recommended including second order stability paths (i.e., direct links between the more distant time

Table 1. Raw means and standard deviations and test of baseline and developmental differences.

Outcome variable	EBD		ASD		Baseline Difference between Groups		Developmental Difference between Groups	
	M	SD	M	SD	F-value	Cohen's d	F-value	η^2
T ₁ Disobedience	0.23	0.19	0.17	0.20	6.00*	0.31	1.08	0.00
T ₂ Disobedience	0.26	0.21	0.18	0.18				
T ₃ Disobedience	0.32	0.25	0.27	0.23				
T ₁ Teacher-child closeness(T)	3.79	0.62	3.72	0.72	0.63	0.10	7.95*	0.03
T ₂ Teacher-child closeness(T)	3.67	0.65	3.73	0.73				
T ₃ Teacher-child closeness(T)	3.64	0.70	3.80	0.67				
T ₁ Teacher-child closeness(C)	0.24	0.19	0.26	0.14	0.17	0.05	1.34	0.01
T ₂ Teacher-child closeness(C)	0.20	0.23	0.24	0.17				
T ₃ Teacher-child closeness(C)	0.18	0.22	0.22	0.19				

Note. T = teacher-rated; C = child-rated; η^2 = partial eta squared; * $p < 0.01$

Table 2. Bivariate correlations between disobedience and teacher-child closeness for both ASD (upper values) and EBD (lower values).

Outcome variable	1	2	3	4	5	6	7	8	9
1. T ₁ Disobedience	1	+0.41**	+0.49**	-0.17	-0.04	+0.06	-0.18	-0.10	-0.14
2. T ₂ Disobedience	+0.59**	1	+0.50**	-0.15	-0.06	+0.03	+0.03	-0.07	-0.08
3. T ₃ Disobedience	+0.51**	+0.50**	1	-0.06	-0.08	-0.02	-0.20*	-0.05	-0.18
4. T ₁ Teacher-child closeness(T)	-0.29**	-0.28**	-0.15	1	+0.75**	+0.67**	+0.01	+0.14	+0.07
5. T ₂ Teacher-child closeness(T)	-0.29**	-0.33**	-0.23**	+0.67**	1	+0.76**	-0.05	+0.23*	+0.13
6. T ₃ Teacher-child closeness(T)	-0.30**	-0.37**	-0.23**	+0.66**	+0.71**	1	-0.03	+0.12	+0.05
7. T ₁ Teacher-child closeness(C)	-0.19*	-0.19*	-0.33**	+0.20*	+0.18*	+0.20*	1	+0.47**	+0.44**
8. T ₂ Teacher-child closeness(C)	-0.21**	-0.27**	-0.35**	+0.21*	+0.32**	+0.35**	+0.65**	1	+0.73**
9. T ₃ Teacher-child closeness(C)	-0.16*	-0.13	-0.30**	+0.11	+0.13	+0.23**	+0.56**	+0.69**	1

Note. T = teacher-rated; C = child-rated; * $p < 0.05$ ** $p < 0.01$.

points T_1 and T_3 in addition to the links between the adjacent time points). When allowing for these second order autoregressive paths the model showed good fit to the data, $\chi^2(44) = 54.353$, $p = 0.136$; CFI = 0.99; RMSEA = 0.04; SRMR = 0.05. We explored whether holding all cross-lagged links equal across time (e.g., disobedience to teacher-child closeness from T_1 to T_2 and from T_2 to T_3) reduced model fit. As this was not the case ($TRd(12) = 12.456$, $p = 0.410$) we used this more parsimonious model. **Figure 1** shows all the estimated autoregressive, cross-sectional, and cross-lagged links in the model. **Figure 1** callout

All the model's parameters are displayed in **Table 3** and **Figure 2** depicts the standardized regression coefficients of the developmental links for boys with EBD (upper part) and ASD (lower part). **Table 3** and **Figure 2** callout Developmental links from teacher-rated teacher-child closeness to boys' disobedience were not significant for both the EBD and ASD groups. In contrast, the developmental links of disobedience to teacher-rated teacher-child closeness differed between boys with EBD and ASD. Higher levels of disobedience in boys with EBD were related to reductions in teacher-rated teacher-child closeness (T_1-T_2 : $\beta = -0.104$, $p = 0.007$; T_2-T_3 : $\beta = -0.109$, $p = 0.007$; i.e., small effect), while higher levels of disobedience in boys with ASD were related to increased teacher-child closeness later in the school year (T_1-T_2 : $\beta = 0.094$, $p = 0.043$; T_2-T_3 : $\beta = 0.089$, $p = 0.043$; i.e., small effect). Results also showed that developmental links from child-rated teacher-child closeness to disobedience differed between boys with EBD and ASD. Higher levels of child-rated teacher-child closeness were related to reduced disobedience in boys with EBD (T_1-T_2 : $\beta = -0.164$, $p < 0.001$; T_2-T_3 : $\beta = -0.175$, $p < 0.001$; i.e., small effect), while child-rated teacher-child closeness was not related to disobedience in boys with ASD. Finally, developmental links from disobedience to child-rated teacher-child closeness were not significant for both the EBD and ASD groups.

Discussion

The goal of the present study was to explore developmental links between disobedience and teacher-child closeness for boys with EBD and ASD. We found that disobedience and teacher-child closeness were related differently over time for boys with EBD and ASD. Among children with EBD, lower levels of closeness between the teacher and child as experienced by the child elicited more disobedience. In turn, increased levels of disobedience affected the relationship as experienced by the teacher, suggesting increasing behavioral and relational difficulties among these children. In contrast, for children who had a diagnosis of ASD, the relationship with their teacher did not affect their

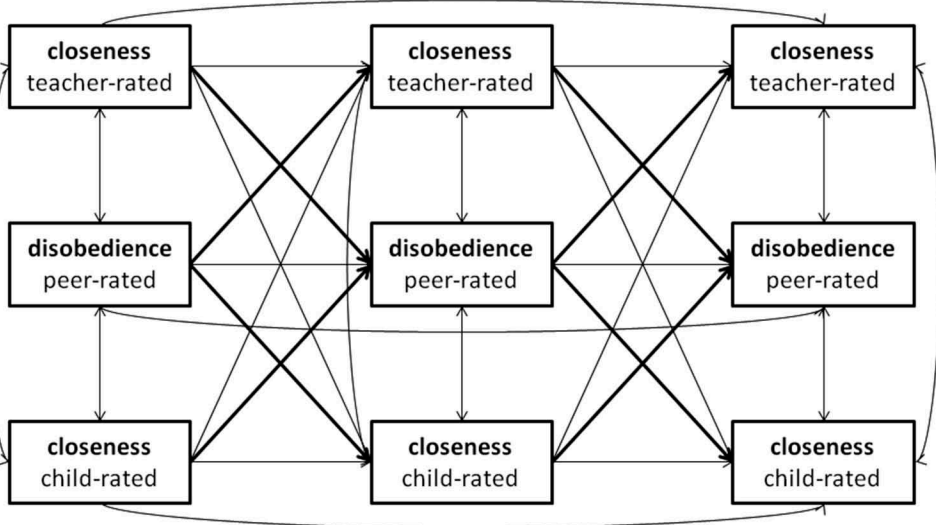


Figure 1. Final autoregressive cross-lagged model with all estimated pathways.

Table 3. Standardized and unstandardized estimates of the autoregressive cross-lagged model.

Parameter	EBD				ASD				Wald
	<i>b</i>	<i>SE</i>	<i>p</i>	β	<i>b</i>	<i>SE</i>	<i>p</i>	β	<i>p</i>
<i>Autoregressive links</i>									
T ₁ close(T)—T ₂ close(T)	0.630	0.078	<0.001	0.617	0.732	0.069	<0.001	0.752	—
T ₂ close(T)—T ₃ close(T)	0.462	0.093	<0.001	0.436	0.520	0.086	<0.001	0.547	—
T ₁ close(T)—T ₃ close(T)	0.353	0.086	<0.001	0.326	0.266	0.083	0.001	0.287	—
T ₁ behavior—T ₂ behavior	0.588	0.083	<0.001	0.534	0.378	0.139	0.006	0.419	—
T ₂ behavior—T ₃ behavior	0.322	0.118	0.007	0.277	0.485	0.109	<0.001	0.368	—
T ₁ behavior—T ₃ behavior	0.431	0.091	<0.001	0.337	0.390	0.106	<0.001	0.329	—
T ₁ close(C)—T ₂ close(C)	0.812	0.114	<0.001	0.656	0.593	0.094	<0.001	0.494	—
T ₂ close(C)—T ₃ close(C)	0.519	0.142	<0.001	0.557	0.791	0.125	<0.001	0.702	—
T ₁ close(C)—T ₃ close(C)	0.212	0.161	0.186	0.184	0.082	0.169	0.630	0.060	—
<i>Cross-sectional links</i>									
T ₁ close(T)—T ₁ behavior	-0.032	0.012	0.011	-0.269	-0.027	0.011	0.013	-0.193	—
T ₁ behavior—T ₁ close(C)	-0.003	0.004	0.526	-0.077	-0.004	0.002	0.024	-0.158	—
T ₁ close(C)—T ₁ close(T)	0.018	0.007	0.013	0.164	-0.001	0.011	0.929	-0.009	—
T ₂ close(T)—T ₂ behavior	-0.012	0.008	0.138	-0.148	0.001	0.006	0.904	0.010	—
T ₂ behavior—T ₂ close(C)	-0.004	0.003	0.134	-0.143	-0.002	0.002	0.268	-0.093	—
T ₂ close(C)—T ₂ close(T)	0.021	0.007	0.004	0.254	0.015	0.008	0.071	0.215	—
T ₃ close(T)—T ₃ behavior	0.004	0.009	0.626	0.049	-0.006	0.005	0.286	-0.070	—
T ₃ behavior—T ₃ close(C)	0.002	0.003	0.622	-0.057	-0.005	0.003	0.063	-0.199	—
T ₃ close(C)—T ₃ close(T)	0.007	0.006	0.246	0.099	-0.001	0.005	0.881	-0.014	—
<i>Developmental links</i>									
T ₁ close(T)—T ₂ behavior	-0.014	0.019	0.449	-0.043	-0.023	0.016	0.137	-0.095	0.712
T ₂ close(T)—T ₃ behavior	-0.014	0.019	0.449	-0.037	-0.023	0.016	0.137	-0.070	—
T ₁ behavior—T ₂ close(T)	-0.353	0.131	0.007	-0.104	0.334	0.165	0.043	0.094	0.002
T ₂ behavior—T ₃ close(T)	-0.353	0.131	0.007	-0.109	0.334	0.165	0.043	0.089	—
T ₁ close(C)—T ₂ behavior	-0.188	0.053	<0.001	-0.164	0.080	0.079	0.311	0.065	0.003
T ₂ close(C)—T ₃ behavior	-0.188	0.053	<0.001	-0.175	0.080	0.079	0.311	0.059	—
T ₁ behavior—T ₂ close(C)	-0.027	0.035	0.455	-0.022	-0.035	0.053	0.510	-0.040	0.897
T ₂ behavior—T ₃ close(C)	-0.027	0.035	0.455	-0.026	-0.035	0.053	0.510	-0.032	—
T ₁ close(T)—T ₂ close(C)	-0.001	0.015	0.941	-0.003	0.010	0.027	0.717	0.042	0.726
T ₂ close(T)—T ₃ close(C)	-0.001	0.015	0.941	-0.003	0.010	0.027	0.717	0.036	—
T ₁ close(C)—T ₂ close(T)	0.290	0.169	0.087	0.082	-0.105	0.155	0.498	-0.021	0.090
T ₂ close(C)—T ₃ close(T)	0.290	0.169	0.087	0.096	-0.105	0.155	0.498	-0.027	—

Note. T = teacher-rated; C = child-rated; *b* = unstandardized estimate; *SE* = standard error; *p* = *p*-value; β = standardized estimate; Wald = Wald test, i.e., test of differences in developmental links between groups.

disobedience and higher levels of disobedience in these children were found to even positively affect their teacher-child relationship.

Previous studies did not find developmental links from teacher-child closeness to behavioral problems for children in mainstream education with typical levels of behavioral problems (Roorda et al., 2014; Zhang & Sun, 2011). Yet, the present study showed that for boys with EBD in special education who cope with high levels of behavioral problems, teacher-child closeness as experienced by the child (but not the teacher) is developmentally related to their disobedience levels in class. Perceiving their relationship with the teacher as close may thus protect these vulnerable children from further developing adverse outcomes. These results can be considered important as our findings also showed that disobedience was most profound in boys with EBD, stressing the importance of identifying relevant protective factors specifically for these children.

The absence of developmental links from teacher-child closeness to disobedience in boys with ASD is in line with previous research in mainstream education among typically developing children (Roorda et al., 2014; Zhang & Sun, 2011) and research with children with ASD specifically (Eisenhower et al., 2015). This indicates that disobedience in boys with ASD is not spurred by their perception of teacher closeness. It is important to note that not only these developmental links between teacher-child closeness and disobedience were weak for boys with ASD, also many of these cross-sectional correlations (i.e., the relationships between teacher-child closeness and disobedience within each time point) were small. This result provides further proof that behavioral problems of

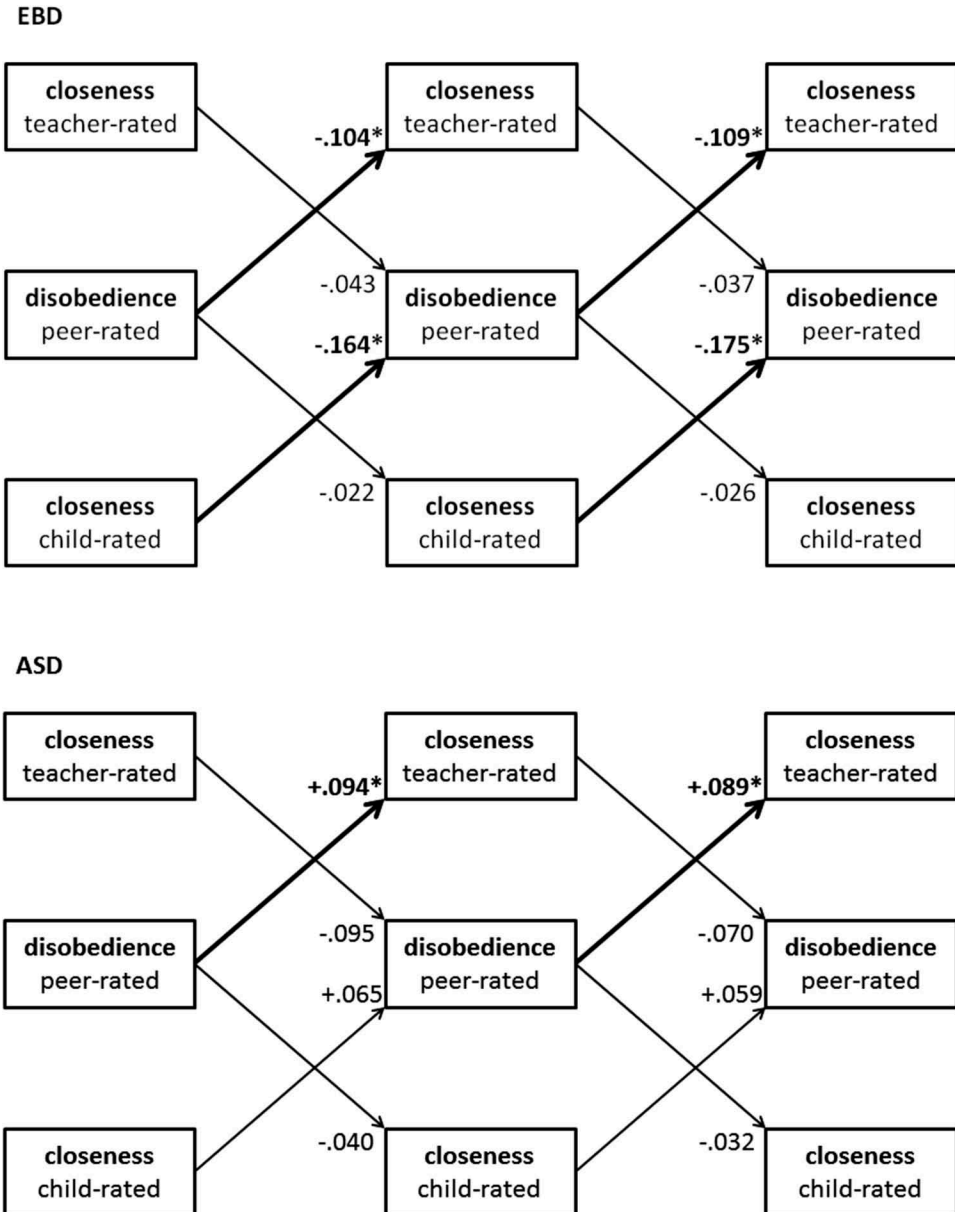


Figure 2. Developmental links between disobedience and teacher-child closeness for boys with EBD (upper part) and ASD (lower part).

Note. * = Significant group differences in developmental links. Significant pathways are depicted bold. Depicted values reflect standardized regression coefficients (β). Auto-regressive and cross-sectional correlations were also estimated but values are not depicted for readability.

boys with ASD are not related to their perspective on teacher closeness. Nevertheless, although the amount of closeness that teachers report towards these students is not developmentally related to these boys' behavior, the general importance of the teacher should not be dismissed for this group of students. For example, students with ASD most benefit from education in a predictable classroom

environment with clear classroom rules and routines (Carnahan, Hume, Clarke, & Borders, 2009), and the responsibility for a good classroom environment is with the teacher.

Similar differences between boys with EBD and boys with ASD were seen regarding the developmental links from disobedience to teacher-child closeness. Our results showed that higher levels of disobedience were developmentally related to teacher-child closeness experienced by teachers for boys with EBD, but not for boys with ASD. This finding suggests that the persistent behavioral problems of boys with EBD may indeed, as proposed by Sutherland and colleagues (2008), overwhelm a teacher's attempts to provide the necessary care and education and therefore produce a more negative teacher attitude towards these students (Klin & Volkmar, 2000). A deteriorating teacher-child relationship, spurred by these children's specific behavioral problems, may also explain why we found a more negative development of teacher-child closeness across the school year in boys with EBD than in boys with ASD.

For children with ASD, our results showed that higher levels of disobedience may even positively affect later teacher-child closeness as experienced by teachers. This result was unexpected and differs from the findings by Eisenhower and associates (2015). We are therefore careful to over interpret these findings and are curious to find out whether this finding will be replicated in future studies. This being said, there is a possible explanation for these results. It could be that the behavioral problems of children with ASD are not only taken less personal by teachers, but may signal teachers to invest more in the child. For instance, when teachers interpret behavioral problems of children with ASD as a stress reaction (Heflin & Alberto, 2001; Valenti et al., 2010), it might be possible that this interpretation evokes feelings of protection within the teacher (Ladd & Burgess, 1999) and by helping and investing in the child, might increase their perception of closeness.

This study contributed to improved knowledge on the experienced teacher-child relationship and its relation to the development of behavioral problems in a vulnerable population of boys with EBD and ASD in special educational settings. The results of this study are theoretically important and may guide future research and educational practice. Regarding future research, we consider it necessary to establish why developmental links between teacher-child closeness and behavioral problems differ between children with EBD and ASD. We propose that future research may be guided by Weiner's (1979) attributional theory of motivation which assumes that a teacher's perception of, and reaction to, behavioral problems depend on their underlying beliefs about locus of control, stability, and control over behavior. Especially the dimension of control centers upon teachers' beliefs about responsibility and how this influences the teacher-child relationship and teachers' helping behavior towards students. It is possible that children with EBD with high levels of behavioral problems more easily get caught in a vicious cycle of negative interactions because teachers believe their behavior to originate from motivational problems such as a child being lazy or looking for attention (Dobbs & Arnold, 2009; Lovejoy, 1996). Likewise, it is possible that teachers feel less negative about disobedience of children with ASD—compared to children with EBD—because they believe this behavior to originate from a lack of communications skills or physical issues such as lack of inhibition. Thus, next to considering underlying teacher beliefs, future research should take into account quantitative and qualitative differences in children's behavioral problems, to better understand differences between clinical groups of children. More in-depth knowledge on this topic can be used in teacher training curricula to help improve existing programs for teachers dealing with students with EBD and ASD by increasing teacher awareness and target teacher beliefs toward different children.

Strengths and limitations

This study has a range of strengths, the most important being the inclusion of a relatively large sample of a children with a psychiatric diagnosis and special educational needs, the multiple measurements during one school year, and the multi-informant perspective on examining developmental links. There are also limitations. First, diagnoses obtained from school medical files

reflect the clinical judgment of psychiatric professionals, but more reliable data would have been obtained by using the same diagnostic interview in all children. In addition, because the majority of children in special education have complex and comorbid disorders, we classified children into two main categories: Boys with an ASD diagnosis and a broad category of other boys with severe EBD. Therefore, future studies may want to replicate our research using standardized diagnostic assessments which would also allow for differentiation between children with a single diagnoses and those with comorbid diagnoses. Second, future studies may also want to replicate our findings in girls, which was not possible in this study because too few girls are placed in Dutch self-contained settings for special education for a comparable statistical analysis. Third, it is unclear to what extent our results can be generalized to special educational settings in other countries as special education policies vary between countries, even in Europe (European Agency for Development in Special Needs Education, 2010; Meijer, 2003). Fourth, teacher-child relationship quality was measured from multiple perspectives, yet we did not use the same questionnaire for teachers and students. Although both questionnaires were able to measure a construct of teacher-child closeness, the QTI measures children's perceptions of the teacher towards the entire classroom (e.g., "This teacher is friendly") based on interpersonal theory, whereas the STRS focuses on teachers' relationships with individual children (e.g., "I share an affectionate, warm relationship with this child") based on attachment theory. There are thus methodological and conceptual differences between both measures of relationship quality that may have impacted the strength of the cross-lagged links. Fifth, we found larger discrepancies between the teacher and child perspectives of teacher-child closeness for boys with ASD than for boys with EBD. This could be a validity problem when boys with ASD have more difficulty to report on the relationship with their teacher as understanding other people is part of their impairment. Yet, teacher-child closeness ratings by children with ASD were shown reliable and consistent over time. Sixth, behavioral problems were evaluated by peers using one behavioral aspect; disobedience. Disobedience covers a wide range of classroom behavioral problems and by using peer nominations, many classmates independently rate a child yielding a reliable picture of the child's overt behavioral problems. Peers were chosen to report on the child's behavior instead of teachers to reduce the possibility of rater bias by using three different informants (teachers, children, and their peers) to report on the three outcomes of interest. Future research should examine a wider range of behavioral problems including direct observations as this may yield a more complete understanding of the relationship between teacher-child closeness and behavioral problems in special education settings.

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