



## Exploring relationships between teachers and students with diagnosed disabilities: A multi-informant approach

Marjolein Zee<sup>a,\*</sup>, Elise de Bree<sup>a</sup>, Britt Hakvoort<sup>b</sup>, Helma M.Y. Koomen<sup>a</sup>

<sup>a</sup> Research Institute of Child Development and Education, University of Amsterdam, the Netherlands

<sup>b</sup> Royal Dutch Auris Group, the Netherlands

### ARTICLE INFO

#### Keywords:

ADHD  
ASD  
Dyslexia  
Student–teacher relationship  
Multi-informant approach

### ABSTRACT

This study explored unique associations of student disabilities (ADHD, ASD, dyslexia) with teacher-, student- and peer-perceptions of student–teacher relationship quality. Sixty-three teachers, 510 students, and classmates from 24 Dutch mainstream elementary schools completed questionnaires about the student–teacher relationship quality. Teachers indicated whether students were diagnosed with disabilities. Multilevel models indicated that both teachers and classmates, but not students with ADHD themselves, reported higher levels of conflict in relationships. Additionally, teachers experienced less closeness and more conflict in relationships with children with ASD. The lower levels of closeness were also reported by classmates, but not by students with ASD themselves. Last, students with dyslexia experienced less closeness and conflict with their teacher, whereas their classmates and teachers reported more closeness and less conflict in relationships.

### Introduction

Since the inception of policies for inclusive education, there has been increasing concern about the implications of diagnostic labels for children who manifest learning, behavior, or social-emotional problems in elementary school. Diagnostic labels, including dyslexia, autism spectrum disorder (ASD), and attention deficit hyperactivity disorder (ADHD), are generally meant to communicate information about students' strengths and weaknesses, establish financial support, and yield faster and more effective interventions for children who presumably are at risk for adjustment problems in school (Ysseldyke & Algozzine, 1990). Yet, mounting evidence has supported the view that such labels tend to increase stereotypes among students with disabilities, thereby negatively affecting teachers' emotions, behaviors, and attitudes toward these children (e.g., Harris, Milich, Corbitt, Hoover, & Brady, 1992; Hornstra, Denessen, Bakker, van den Bergh, & Voeten, 2010).

Given the potentially negative impact of diagnostic labels on teachers' expectations, it would not be surprising if such labels have negative implications for teachers' and students' perceptions of their mutual relationship. Indeed, prior studies have repeatedly suggested that teachers generally experience poorer-quality relationships with students with disabilities than with typically developing peers (e.g., Al-Yagon & Mikulincer, 2004; Murray & Greenberg, 2000; Pasta, Mendola, Longobardi, Pino, & Gastaldi, 2013). Most of the evidence supporting

this outcome, however, has been confined to samples of children with behavioral or developmental problems in a broad sense, instead of formally diagnosed disabilities (e.g., Baker, 2006; Murray & Zvoch, 2011). Of the studies that did focus on relationships between teachers and children with a diagnostic label, the majority used composite measures of child disabilities (e.g., Toste, Bloom, & Heath, 2014), or addressed only one particular disorder, such as ADHD or ASD (Baker, 2006; Longobardi, Prino, Pasta, Gastaldi, & Quaglia, 2012). As such, empirical studies in this area unfortunately do not lend themselves to a careful analysis of which particular developmental disabilities are most likely to be associated with poor-quality student–teacher relationships.

In addition, research on students' disabilities and student–teacher relationship quality has mainly relied on teachers' relationship perceptions (but see Frymier & Wanzer, 2003, and Rogers, Bélanger-Lejars, Toste, & Heath, 2015, for exceptions). This is unfortunate, as children with disabilities themselves might be well aware of teachers' potentially negative views of their mutual relationship (e.g., Riddick, 1996). Moreover, as the main socializing agents in class, teachers may have ample opportunity to more or less unconsciously exude their negative relationship views onto those of children's classmates (Hendrickx, Mainhard, Oudman, Boor-Klip, & Brekelmans, 2017). Given that not only teachers', but also students' and classmates' reports of student–teacher relationship quality may contribute to students' adjustment (Hughes, 2011), it seems vital to explore associations of various

\* Corresponding author at: Research Institute of Child Development and Education, University of Amsterdam, P.O. Box 15776, Amsterdam NL-1001 NG, the Netherlands.

E-mail address: [M.Zee@uva.nl](mailto:M.Zee@uva.nl) (M. Zee).

<https://doi.org/10.1016/j.appdev.2019.101101>

Received 6 March 2019; Received in revised form 12 November 2019; Accepted 14 November 2019

Available online 22 November 2019

0193-3973/ © 2019 Elsevier Inc. All rights reserved.

disabilities with the quality of student–teacher relationships from multiple perspectives.

In this study, therefore, we adopted a multi-informant approach to explore unique associations of various diagnosed disabilities (i.e., ADHD, ASD, and dyslexia) with affective student–teacher relationship quality from different perspectives (i.e., teachers, students, and classmates). This information may potentially increase teachers' awareness of how diagnostic labels may subtly bias their expectations of children with diagnosed disabilities and how these expectations, in turn, may influence classmates' views. By deliberately adjusting their daily interactions with diagnosed students, teachers may improve the larger classroom ecology and thereby provide the social–emotional support that helps students with diagnostic labels participate in all aspects of school life.

#### *An attachment perspective on relationships between teachers and students with disabilities*

Empirical research on the role of students' disabilities in the affective quality of student–teacher relationships has been largely inspired by extended attachment theory (Bowlby, 1969; Hamre & Pianta, 2001). The present study also uses this attachment perspective as overarching theoretical framework. This theory is based on the idea that warm and affectionate relationships between children and teachers may foster feelings of emotional security in the child. Specifically, teachers, like responsive parents, have been argued to provide children with a secure base from which they can explore their classroom environment, and a safe haven to which children can maintain proximity in times of stress or need (Hamre & Pianta, 2001; Verschueren & Koomen, 2012). Accordingly, the importance of warm and emotionally secure student–teacher relationships may become particularly acute for children with disabilities in elementary school (Murray & Pianta, 2007). These students generally display significant deficits or participation restrictions in behavioral, social-emotional, or cognitive functioning (APA, 2013), and may frequently seek proximity to teachers when they face challenging situations in class (e.g., Baker, 2006).

In this study, we specifically focused on a combination of the behavior-related developmental disabilities ADHD (i.e., pervasive and impairing symptoms of inattention, hyperactivity, and impulsivity) and ASD (i.e., deficits in social communication, restrictive and repetitive behaviors and interests), and the developmental learning disorder dyslexia (i.e., deficits in printed word recognition in spite of adequate instruction and general cognitive abilities; APA, 2013). Two reasons underlie this decision. First, since the inception of inclusive education, regular elementary school teachers in the Netherlands most frequently have to deal with these three disabilities (cf. Smeets et al., 2013). Estimated prevalence rates range between 1 and 20% for ADHD (Polanczyk, De Lima, Horta, Biederman, & Rohde, 2007), 1 and 2% for ASD (CDC, 2014), and 5 and 10% for dyslexia (Peterson & Pennington, 2015). Second, student–teacher relationship quality could, within this comprehensive spectrum of behavior-related and learning disorders, be affected both by children's academic and behavioral difficulties in the classroom, as well as information about students' labels or categorical association with specific social or diagnostic categories (Ohan, Visser, Strain, & Allen, 2011). Such labeling effects allude to phenomena where teachers' interpretations or judgments of individual students with disabilities are dependent upon the general diagnostic label given to them. Such overtly or covertly expressed judgments may not only affect individual students' self-esteem within the dyad, but also spill over to classmates, who may use their teachers' interactions as vital clues to interpret the behaviors and social relationships of students with disabilities (e.g., Hughes, Im, & Wehrly, 2014; Mikami & Mercer, 2017). The literature points to several mechanisms that can explain the contribution of ADHD, ASD, and dyslexia to affective student–teacher relationship quality (both from inside and outside the dyad), in addition to the overarching attachment framework. The next sections provide

further detail on these mechanisms.

#### *Relationship views from inside the dyad: The role of expectancy-confirmation processes and labeling bias*

Previous studies based on an extended attachment framework suggest that the extent to which teachers provide support and emotional security to children depends on the degree of closeness and conflict in the relationship (Pianta, 1999). These unique relationship dimensions have primarily been measured from inside the dyad, based on the well-known Student Teacher Relationship Scale (STRS; Pianta, 2001). This scale provides a multidimensional view on teachers' relationship experiences, with closeness generally reflecting positive aspects, such as warmth, security, and open communication, and conflict reflecting negative aspects, including the degree of discordance, anger, and negativity between students and teachers (Pianta, 1999; Verschueren & Koomen, 2012).

Compared to teachers' relationship views, students' inside perceptions have been evaluated less frequently (Sabol & Pianta, 2012). When they were included, these perceptions tended to be mainly investigated through unidimensional instruments that only emphasize positive relationship qualities such as closeness (e.g., Mantzicopoulos & Neuharth-Pritchett, 2003; for an exception see Vervoort, Doumen, & Verschueren, 2015). Recently, however, Koomen and Jellesma (2015) introduced a promising multidimensional student measure, the Student Perception of Affective Relationship with Teacher Scale (SPARTS), which focuses both on positive and negative relationship qualities. Similar to the STRS, this scale taps a closeness and a conflict factor, which both have been found to be valid and reliable (Koomen & Jellesma, 2015; Zee & Koomen, 2017).

Despite measuring largely similar constructs (Zee & Koomen, 2017), prior studies have found only moderate convergence across teacher- and student perceptions of their shared relationship (e.g., Hughes, 2011; Koomen & Jellesma, 2015; Vervoort et al., 2015), with correlations ranging between 0.08–0.38 for closeness, and 0.43–0.59 for conflict, respectively. Prior attachment-based research suggests that such different perceptions are likely to be determined by teachers' and students' specific history of relationship experiences as well as personal characteristics (Pianta, Hamre, & Stuhlman, 2003). Possibly, the presence of diagnostic labels may influence these relationship views differently for students and teachers.

Following Darley and Fazio's (1980) theory on teacher-student expectancy confirmation in social interactions, it is likely that teachers act toward students with disabilities in ways that are in line with their biased expectations about the specific behaviors and actions of these students. In a study of Ohan et al. (2011), for instance, teachers were found to perceive students who were described in a vignette to meet ADHD symptom criteria and to have received the label “ADHD” as more disruptive than students who were described to display similar levels of disruptive behavior without such a label. Other research has shown that students with disabilities, including dyslexia, ASD, and ADHD, are often viewed by their teachers as less intelligent and more difficult to teach (e.g., Greene, Beszterczey, Katzenstein, Park, & Goring, 2002; Stinnett, Crawford, Gillespie, Cruce, & Langford, 2001).

How the presence of a diagnostic label may impact teachers' perception of the affective relationship with the student has hardly been investigated. With respect to ADHD, Rogers et al. (2015) revealed that teacher reports of the affective teacher–student bond were more unfavorable when students had clinically elevated levels of ADHD symptoms. Furthermore, small-scale studies using teacher reports of the student–teacher relationship have indicated that elementary students who show ASD-related symptoms are more likely to have relationships marked by conflict and a lack of closeness than typically developing peers (Blacher, Howell, Lauderdale-Littin, DiGennaro Reed, & Laugeson, 2014; Longobardi et al., 2012; Robertson, Chamberlain, & Kasari, 2003). It may be that teachers' awareness of the presence of the

ADHD and ASD labels in itself impedes their relationship perspectives.

The handful of studies regarding dyslexia are less consistent. For instance, an attachment-based study by [Pasta et al. \(2013\)](#) did not reveal any differences in relational closeness and conflict between children with or without the diagnostic label dyslexia. Yet, there is also evidence that teachers, due to biased attitudes, tend to treat children with dyslexia differently than their typically developing peers. In a sample of 307 second- through sixth-graders and their 30 teachers, [Hornstra et al. \(2010\)](#) found that teachers did not explicitly report to have negative feelings about students with dyslexia when asked about their attitude toward dyslexia in a questionnaire. However, their results from a priming task showed that teachers had more negative connotations toward dyslexia compared to neutral prime words, indicating slightly negative *implicit* attitudes toward these students. Such negative attitudes might reflect a labeling bias. In other words, the diagnosis itself might subtly bias teachers' perceptions of individual students with dyslexia (cf. [Jussim & Harber, 2005](#)), thereby negatively affecting the feelings, beliefs, and expectations of teachers about the relationship with these students. Please note, however, that we do not directly measure teachers' beliefs and potential biases in this study, but rather their perceptions of student–teacher relationship quality.

An alternative option is that it is not the diagnostic label that influences *students'* relationship perceptions, but instead the symptoms and behaviors characterizing the disorder and the related interactions in class. For instance, there is evidence to indicate that students with ADHD are likely to heavily overestimate their own competencies, despite having significant functional problems in multiple domains ([Hoza et al., 2004](#)). This phenomenon of positive illusory bias may lead them to view the quality of the student–teacher relationship as higher than their teacher. Yet, an attachment-based study among a sample of 280 high schoolers did not find support for the idea that students with ADHD experience more favorable or less negative relationships with their teachers than students without ADHD ([Al-Yagon, 2016](#)). Research of [Rogers and Tannock \(2013\)](#) even showed the opposite finding. In their study, based on self-determination theory, elementary students with ADHD reported lower levels of affective relatedness to their teachers and felt that their teachers failed to meet their basic needs. These results held after accounting for students' conduct problems, academic ability, and age.

As far as we know, no study to date has explored the relationship views of children with ASD. When it comes to dyslexia, however, it is possible that students with this disability respond negatively to their teachers as a result of their teachers' biased interactions. For instance, interview data from [Riddick \(1996\)](#) and [Humphrey and Mullins \(2002\)](#) revealed that students with dyslexia frequently experience a lack of emotional support, time, and attention from their teacher, and sometimes feel mistreated by them as a result of their teachers' disbelief that the problems they experience in the classroom could be attributed to dyslexia.

It should be noted that findings from students' perspective are limited and lend mixed support to the contention that their disabilities contribute to the quality of relationships with their teacher. Hence, more research into the association between students' disabilities and the affective student-teacher relationship is needed from multiple perspectives.

#### *Relationship views from outside the dyad: The role of social referencing*

Recently, attachment-based research has started to pay attention to views from *outside* the dyad, including classmates' perspectives of affective student–teacher relationships (e.g., [Hughes, 2011](#)). According to social referencing theory ([Hendrickx, Mainhard, Boor-Klip, & Brekelmans, 2017](#); [Walden & Ogan, 1988](#)), classmates generally base their views of teachers' relationships with children on social cues regarding how their teacher behaves and acts toward individual children in class. It has been established that teachers differ in the extent to

which they feel efficacious in providing emotional support to individual children in class, and those with behavioral difficulties in particular ([Zee, de Jong, & Koomen, 2017](#)). Whereas teachers may provide sufficient emotional support to typically developing children, they are less likely to act as a secure base and safe haven during interactions with behaviorally challenging students. Given that the teacher is the most important socializing agent in class, students can witness their teachers' classroom interactions the whole school day long and develop ideas about the quality of teachers' relationships with classmates with disabilities. This makes it likely that teachers act as social referents for relationship quality, thereby exuding their potentially negative relationship views about individual students with disabilities on their peers in class.

Several empirical studies have used both attachment and social referencing theory to indicate that classmates might indeed be well aware of teachers' differential treatment of individual students in class and use this information to make inferences about these students' social traits and competencies, and teachers' relationship perceptions (e.g., [Hughes et al., 2014](#); [Hughes, Cavell, & Willson, 2001](#); [White & Kistner, 1992](#)). For instance, in a study by [Hughes et al. \(2014\)](#), students were found to be better liked and to be perceived as more academically capable by their classmates when these classmates held a positive view about those students' relationship with the teacher. Moreover, a large-scale study of [Hendrickx, Mainhard, Boor-Klip, and Brekelmans \(2017\)](#) among fifth-grade students indicated that the social cues elementary school teachers provide with respect to their liking of an individual student may positively influence classmates' liking of this student as well. Other longitudinal evidence from these authors ([Hendrickx, Mainhard, Boor-Klip, Cillessen, & Brekelmans, 2016](#)) also points to links between negative teacher behavior and peer perceptions of teachers' disliking for the student in the long run.

The idea that teachers can act as social referents in class has primarily been investigated in relation to teachers' and students' behavior in samples of typically developing students. Yet, it could be assumed that the potential influence of teachers' labeling bias also extends to peers' perception of student–teacher relationships. Classmates may perceive how the teacher's expectations of the disorder may negatively influence the interaction with the student and their perspectives might converge with that of the teacher. These findings and notions imply that classmates' relationship perceptions need to be considered as well.

#### *Present study*

The present study aims to broaden the purview of research on relationships between teachers and children with disabilities in two ways. First, rather than focusing on composite measures of disabilities that have not been formally diagnosed or only one particular disorder, we were explicitly interested in testing the unique contribution of *three* relatively common disabilities to affective student–teacher relationship quality. By focusing on both behavior-related (i.e., ASD, ADHD) and learning disorders (i.e., dyslexia), we were able to explore which particular disabilities are most likely to contribute to the attachment-based dimensions of closeness and conflict. Second, we adopted a multi-informant view in which relationship quality is studied from inside the dyad (i.e., both teacher- and student reports of the relationship), as well as outside the dyad (i.e., classmates' relationship perceptions).

Regarding the unique contributions of ASD, ADHD, and dyslexia to student–teacher relationship quality, we expected the behavior-related disabilities ASD and ADHD to be negatively related to closeness and positively to conflict in the relationship. We could not formulate specific hypotheses with regard to dyslexia, given the relatively limited and mixed evidence in this field ([Hoza et al., 2004](#); [Riddick, 1996](#)).

Additionally, based on the idea of expectancy-confirmation processes as well as prior research ([Darley & Fazio, 1980](#)), we expected that teachers are more likely than students with ASD, ADHD, or dyslexia themselves to experience low levels of closeness and high levels of

conflict in the relationship. This may be particularly true for the behavior-related disabilities. Specifically, ADHD and ASD are likely to produce a range of symptoms that cause challenges with social skills, communication, concentration, and patience (APA, 2013). These challenges are directly observable in class, may be stress-provoking, and—other than dyslexia—usually require immediate attention from teachers (Arbeau & Coplan, 2007; Coplan & Prakash, 2003). The consequences of such challenging behaviors are that teachers may feel more negative about and less efficacious in dealing with children with ADHD or ASD than with dyslexia (cf. Zee et al., 2017). Thus, at least from teachers' perspective, it can be expected that the behavior-related disorders ASD and ADHD will show stronger associations with the relationship dimensions than the learning disorder, dyslexia. Given the limited and generally mixed evidence regarding the relationship views of diagnosed children themselves, we could not formulate specific hypotheses regarding children's relationship perspectives.

Last, based on social-referencing theory and research (Hendrickx, Mainhard, Boor-Klip, & Brekelmans, 2017; Hendrickx, Mainhard, Oudman, et al., 2017), we expected teachers' negative relationship view to spill over to classmates, who use their teachers' daily classroom interactions as vital clues to interpret the behaviors, actions, and social relationships of students with disabilities (e.g., Hughes et al., 2014; Mikami & Mercer, 2017). Additionally, given the moderate degree of convergence across teacher- and student perceptions of their shared relationship in prior studies (e.g., Hughes, 2011; Koomen & Jellesma, 2015), we hypothesized that teachers' and classmates' perceptions of closeness and conflict in relationships between teachers and students with disabilities are more similar to each other than the relationship views of teachers and children with disabilities themselves.

## Method

### Participants

Data were collected as a part of a larger project among 1507 students from 24 mainstream, predominantly white elementary schools across the Netherlands. The schools from which the sample was drawn were recruited via telephone and e-mail, after ethical approval was granted by the Ethics Review Board of the Faculty of Social and Behavioral Sciences, University of Amsterdam (project no. 2013-CDE-3188). Of the 350 schools that were initially invited, 24 (6.9%) from both rural and urban areas in the Netherlands agreed to participate. This sample appeared to represent a relatively balanced cross-section of the larger population of schools in the Netherlands (Zee, Koomen, Jellesma, Geerlings, & de Jong, 2016). Non-participation was mainly due to the school's already full agenda, research fatigue, and lingering teacher shortages.

Informed consent was obtained from teachers and parents of participating children. In the current study, we only included four boys and four girls from each teacher's classroom. These eight students were randomly selected by the first author from the total pool of signed parental consents and had (near) complete data on the main study variables. The decision to randomly select eight students per classroom was based on guidelines from Snijders and Bosker (1999), who have indicated that relatively high intra-class correlations may decrease the benefits of including whole classes in the sample. Moreover, including more students per class would make the data collection overly burdensome for teachers and would compromise their willingness to participate. Accordingly, a total of 63 teachers and 510 students (grades 3–6) were included for analyses.

Teachers were predominantly female (70.5%), relatively experienced in teaching ( $M = 16.9$  years,  $SD = 12.0$ , range = 1.5 to 44.0 years), and had a mean age of 41.4 ( $SD = 12.3$ , range = 23 to 63 years). The majority of participating teachers had a Bachelor's degree in elementary education (93.3%) and worked 4 days a week or more (64.4%). The students in this sample were divided across grades 3

( $n = 46$ ), 4 ( $n = 158$ ), 5 ( $n = 154$ ), and 6 ( $n = 152$ ), respectively. Their mean age was 10.23 at the start of this study ( $SD = 1.1$ , range = 7 to 13 years), and the gender composition was evenly distributed with 257 girls (50.4%). Based on their parents' country of birth, 85.1% of the students could be considered Dutch. This is comparable to demographic information reported in nationally representative studies (e.g., Zee, Koomen, & van der Veen, 2013). Teachers' reports on students' disabilities indicated that 91 students in this sample (17.8%) had received a diagnosis of ADHD, 28 (5.5%) a diagnosis of ASD, and 73 (14.3%) a diagnosis of dyslexia. Of all children in this sample, 35 (6.9%) had more than one diagnosis. The percentages of students with ASD and dyslexia were slightly higher than the common international prevalence rates of these disorders, ranging between 1 and 20% for ADHD (Polanczyk et al., 2007), 1 and 2% for ASD (CDC, 2014), and 5 and 12% for dyslexia (Peterson & Pennington, 2015).

### Instruments

#### Students' disabilities

Teachers were asked to indicate whether participating students were diagnosed with any disabilities, including ADHD, ASD, and dyslexia. For each disability, teachers could choose among two response options. The first indicated that the child had not been diagnosed with the disability in question. The second option indicated that the child had been formally diagnosed with the specific label.

Please note that formal diagnoses of ADHD, ASD, and dyslexia take place outside of the school curriculum and are based on national guidelines and protocols. The diagnoses are made by certified psychologists and psychiatrists, not by school teachers themselves. However, teachers usually work closely together with internal supervisors and school psychologists, who inform them about students' diagnosed disabilities. In most cases, these diagnostic labels are registered in the school's administration system and form the basis of Individual Education Plans. Hence, even though teachers obviously do not diagnose the children themselves, they are well informed about these diagnoses and as such can relatively reliably report on the prevalence of ADHD, ASD, and dyslexia in their classroom (see Ledoux & Roeleveld, 2010).

#### Teacher-perceived student–teacher relationship quality

We used a short form of the authorized translated Dutch version of the Student–Teacher Relationship Scale (STRS; Koomen, Verschuieren, van Schooten, Jak, & Pianta, 2012) to evaluate teachers' student–teacher relationship perceptions. This short form estimates specific student–teacher relationship patterns of Closeness and Conflict, using a 5-point Likert-type scale (1 = *definitely does not apply*; 5 = *definitely applies*). The Closeness dimension (5 items) evaluates the extent to which teachers perceive the student–teacher relationship to be warm, open, and secure (e.g., “I share an affectionate and warm relationship with this child”). The Conflict dimension generally focuses on negative aspects of the student–teacher relationship, including tension and anger. An example item is “This child and I always seem to be struggling”. In prior research, the psychometric properties of the short form of the Dutch STRS have been demonstrated to be adequate (e.g., Zee et al., 2013; Zee & Koomen, 2017). In the present study, alpha coefficients were 0.86 for Closeness and 0.88 for Conflict.

#### Student-perceived student–teacher relationship quality

Students responded to the Student Perception of Affective Relationship with Teacher Scale (SPARTS; Koomen & Jellesma, 2015). This instrument yields two primary dimensions, paralleling those of the STRS (Zee & Koomen, 2017). The Closeness dimension (8 items) reflects students' positive feelings toward the teacher, as well as their reliance on them in times of need and stress (e.g., “I tell my teacher things that are important to me”). Conflict (10 items) taps students' perception of the degree of negative behavior, anger, and distrust in the relationship

with their teacher (e.g., “I easily have quarrels with my teacher”). The SPARTS employs a 5-point response scale, ranging from 1 (*no, that is not true*), to 5 (*yes, that is true*). Cronbach's alphas were 0.87 for Closeness, and 0.87 for Conflict. These reliabilities are largely consistent with those found in previous research (e.g., Jellesma et al., 2015; Koomen & Jellesma, 2015; Zee & de Bree, 2017). Moreover, Koomen and Jellesma et al. (2015) provided sufficient evidence for the factorial, convergent, and concurrent validity of the SPARTS.

#### *Peer-perceived student–teacher relationship quality*

All children from participating classrooms were asked to complete a sociometric questionnaire on their classmates' relationships with the teacher. We used an unlimited nomination procedure, in which students could name as many peers in their classroom as they wanted for each question (Terry, 2000). We adjusted and extended the sociometric questionnaire of Hughes et al. (2001, 2014), which now contained four items of interest that generally correspond to the teacher-reported relationship dimensions. The dimension of Closeness was evaluated using two items, including “I think these children have a good relationship with the teacher” and “These children really trust the teacher and tell the teacher things that are important to them”. Another two items focused on student–teacher Conflict, including “These children easily have quarrels with the teacher” and “At these children the teacher gets angry very often”. Sociometric scores were computed for each student, by counting the number of nominations of all classmates per question, and standardizing them within classrooms. Subsequently, the sociometric scores for the respective Conflict and Closeness items were summed to represent one score for each relationship dimension. In this study, Cronbach's alphas were 0.82 for Closeness and 0.96 for Conflict.

#### *Procedure*

Data were collected in the second semester of the school year in two waves, with a three-month time interval. Research has previously indicated that the quality of relationships between students and teachers has been sufficiently crystallized during the second half of the school year (Roorda, Verschueren, Vancraeyveldt, Van Craeyveldt, & Colpin, 2014). Although the cross-sectional design of our study prevented us from actually assessing the stability of student–teacher relationship patterns across time, it is likely that the teachers, students, and classmates in our study have had enough time to get to know each other.

During the first wave, in the middle of the school year, teachers completed a survey on their own background characteristics and reported on the disabilities of eight randomly selected students from their classrooms. Teachers who were not present at the time of data collection could return their survey by regular mail or e-mail. During a second, planned school visit at the end of the school year, students completed the sociometric questionnaire, the SPARTS, and some demographic questions (e.g., age, gender, grade level, ethnicity). Teachers were not present in class during this data collection. They were asked to complete the STRS for the eight randomly selected students outside the classroom. A test assistant was present in the classroom to answer students' questions and to ensure that students answered all items in a serious way. All participating teachers completed and returned their questionnaires at wave 1. At wave 2, the teacher response rate was 90.4% and the student response rate 95.3%. Non-participation of students and teachers was due to absences at the time of data collection.

#### *Data analysis*

Given that the data reflected a multilevel structure comprising students nested within teachers, we performed a series of multivariate multilevel analyses in Mplus 7.11 (Muthén & Muthén, 1998–2012). This analytical technique is flexible in that it corrects for nested data structures and avoids aggregation bias and underestimation of standard errors that sometimes compromise the outcomes of Ordinary Least

Squares-analyses of multilevel data (Snijders & Bosker, 1999). Given the slightly skewed nature of the data, we based all parameter estimates in these models on maximum likelihood estimation with robust standard errors and a mean-adjusted chi-square test statistic (MLR; Muthén & Muthén, 1998–2012). This estimator is to be preferred with skewed distributions, as it is robust to non-normality. In addition, missing data (range = 1.6% - 9.6%) were treated using full information maximum likelihood estimation. In this study, *t*-tests and chi-square tests indicated that missing data were not due to teachers' and students' background characteristics (age, gender, teaching experience). Continuous predictors were centered around the grand mean to ease their interpretation.

#### *Modeling procedure*

Based on the methods proposed by Raudenbusch and Bryk (2002), we used a stepwise sequential modeling strategy. First, we estimated three separate unconditional means models for teachers', students', and classmates' perceptions of the student–teacher relationship quality, respectively. These preliminary models were used to estimate the variances in the outcome variables at both the student and teacher level, and test whether there were significant differences between teachers (Snijders & Bosker, 1999). Second, we added students' background characteristics (age and gender) and the presence of each of the diagnosed disabilities (ADHD, ASD, and dyslexia) as student-level covariates and predictors to the three respective models. After these student features were accounted for, we included teacher-level covariates (teaching experience and gender; based on Zee & Koomen, 2017) to the equation to explain variance at the teacher-level.

## **Results**

#### *Descriptive statistics*

Means, standard deviations, and zero-order correlations are displayed in Table 1. Both classmates and teachers, but not students, were likely to report more Conflict in student–teacher relationships involving children with ASD or ADHD, but not Dyslexia. Additionally, teachers reported lower levels of Closeness in relation to children with ASD. This lower degree of Closeness in relationships between children with ASD and their teachers was also reported by classmates. None of the other associations between children's disabilities and relationship quality were statistically significant. The moderate correlations between the student–teacher relationship dimensions across raters were also in the expected direction. Closeness and Conflict were negatively associated with each other, both within and across raters of the student–teacher relationship.

#### *Unconditional means models*

We fitted three separate unconditional means models for each informant (students, teachers, and classmates) of the student–teacher relationship quality. These models contained no predictors other than the intercept. Intraclass correlations demonstrated that the between-teacher variance ranged between 0.14 and 0.57 for Closeness, and between 0.03 and 0.13 for Conflict across the three informants. Notably, the between-teacher variance appeared to be highest for peer-nominated Closeness, suggesting that warm and supportive student–teacher relationships in the classroom, at least from classmates' perspective, are more likely to depend on the teacher than on (characteristics of) individual students. Given that the majority of ICCs was  $\geq 0.05$ , the data require models that address the nesting of students within teachers (Snijders & Bosker, 1999).

#### *Predictors of student-perceived student–teacher relationships*

We first added students' background characteristics as control

**Table 1**  
Means, standard deviations, and zero-order correlations.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
Background variables (T1)													
1. Teacher Gender	1.00												
2. Teaching Experience	-0.29***	1.00											
3. Student Gender	0.04	-0.01	1.00										
4. Student Age	-0.24***	0.10*	-0.08	1.00									
Disabilities (T1)													
5. ADHD	-0.03	-0.12**	-0.18***	0.08	1.00								
6. ASD	-0.02	-0.06	-0.14**	-0.07	0.18***	1.00							
7. Dyslexia	-0.07	-0.07	-0.08	0.07	0.16**	0.05	1.00						
Student-perceived STR (T2)													
8. Closeness	0.14**	-0.09*	0.10*	-0.12*	0.03	-0.04	-0.07	1.00					
9. Conflict	-0.09	0.05	-0.18***	0.07	0.08	0.01	0.02	-0.60***	1.00				
Teacher-perceived STR (T2)													
10. Closeness	0.13**	0.13**	0.29***	-0.12*	-0.07	-0.13**	-0.06	0.26***	-0.24***	1.00			
11. Conflict	-0.12*	-0.02	-0.18***	0.06	0.30***	0.27***	0.05	-0.16**	0.34***	-0.39***	1.00		
Peer-nominated STR (T2)													
12. Closeness	0.04	-0.11*	0.22***	-0.02	-0.06	-0.10*	-0.01	0.31***	-0.29***	0.25***	-0.20***	1.00	
13. Conflict	-0.04	-0.01	-0.22***	0.15**	0.27***	0.11*	-0.06	-0.18***	0.44***	-0.20***	0.59***	-0.22***	1.00
Descriptive statistics													
Mean	-	16.87	-	10.23	0.18	0.05	0.14	3.34	1.79	3.99	1.57	0.22	0.09
Standard Deviation	-	12.01	-	1.14	0.38	0.23	0.35	0.92	0.72	0.79	0.86	0.15	0.18

Note. Gender: 0 = boys/male teachers, 1 = girls/female teachers. T1 = Time 1 (Jan. – March); T2 = Time 2 (May – July); STR = student–teacher relationship; ADHD = Attention Deficit Hyperactivity Disorder; ASD = Autism Spectrum Disorder. ADHD, ASD, and Dyslexia: 0 = not diagnosed, 1 = diagnosed.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

variables and their disabilities as predictors to Model 1.<sup>1</sup> Results (see Table 2) indicated that older children tended to experience less Closeness ( $b = -0.08, p < .05$ ) and girls more Closeness ( $b = 0.18, p < .05$ ) and less Conflict ( $b = -0.24, p < .01$ ) in the relationship with their teacher. Regarding students' disabilities, only children with Dyslexia reported lower levels of Closeness ( $b = -0.09, p < .001$ ). This weak association indicates that with each scale point higher on Dyslexia, students' perceptions of Closeness are likely to decrease with a  $-0.09$  scale point.

Next, we added teachers' years of Teaching Experience and their Gender in Model 2. In this model, the negative association between Age and Closeness at the student-level was no longer significant. Yet, in addition to the Closeness effect, students with Dyslexia appeared to report lower levels of Conflict in this model ( $b = -0.04, p < .05$ ). None of the teacher-level covariates reached the significance threshold. Hence, of the three disabilities, only the presence of Dyslexia was associated with students' perceptions of the student–teacher relationship quality. Overall, Model 2 accounted for 3% of the variance in student-perceived Closeness and 4% in Conflict at the student level. Between teachers, the model accounted for 10% and 4% of the variance in the two student–teacher relationship qualities, respectively.

#### Predictors of teacher-perceived student–teacher relationships

The first Model (see Table 3) indicated that teachers experienced higher levels of Closeness ( $b = 0.44, p < .001$ ) and lower levels of

Conflict ( $b = -0.21, p < .01$ ) in relation to girls. Additionally, teachers reported poorer-quality relationships with children with ASD in terms of Closeness ( $b = -0.39, p < .01$ ) and Conflict ( $b = 0.72, p < .001$ ). Thus, with each scale point higher on ASD, teachers' perceptions of Closeness are likely to decrease with a  $-0.39$  scale point and their perceptions of Conflict are likely to increase with a  $0.72$  scale point. Higher levels of teacher-reported Conflict were also noted for students with ADHD ( $b = 0.56, p < .001$ ), whereas lower levels of Conflict were reported for students with Dyslexia ( $b = -0.06, p < .05$ ).

In Model 2, we included teachers' years of Teaching Experience and their Gender as between-level covariates. Compared to the Model 1, we found no significant changes in the variables at the student level. Regarding the covariates at the teacher level, females and teachers with higher levels of Teaching Experience ( $b = 0.25, p < .01$ ) reported higher levels of Closeness in the relationship. Taken together, Model 2 suggests that the presence of all three disabilities contribute to teachers' perceptions of Conflict, with the associations being strongest and negative for the behavior-related disabilities ASD and ADHD, and weakest but positive for the learning disorder Dyslexia. Additionally, teachers also appeared to have the poorest-quality relationships in terms of Closeness with children with ASD. In this model, 12% and 14% of the variance in the respective dimensions of Closeness and Conflict was explained at the student level, and 21% and 8% at the teacher level, respectively.

#### Predictors of peer-nominated student–teacher relationships

Results of the first Model (see Table 4) with students' background characteristics and disabilities suggested statistically significant positive associations between students' Age and peer-reported Conflict ( $b = 0.20, p < .01$ ). Also, peers rated girls to have relationships with their teachers that are higher in Closeness ( $b = 0.61, p < .001$ ) and lower in Conflict ( $b = -0.58, p < .001$ ). Regarding children's behavioral and learning difficulties, classmates rated higher levels of Closeness ( $b = 0.06, p < .001$ ) and lower levels of Conflict ( $b = -0.17,$

<sup>1</sup> To evaluate whether comorbid disorders (6%) would influence the results of our study, we created a new variable in which students with no disability (0), 1 diagnosed disability (1), or > 1 diagnosed disability (2) were included. Additional analyses in which this covariate was included indicated that the strength and direction of the associations did not significantly differ from analyses in which comorbid disorders were not controlled for. Moreover, the coefficients of this covariate in our models were all very small (ranging from 0.00 to 0.006) and non-significant. We therefore reported on the most parsimonious models only.

**Table 2**  
Multilevel results for student-perceived closeness and conflict.

	Closeness (T2)		Conflict (T2)	
	Model 1 <i>b</i> (SE)	Model 2 <i>b</i> (SE)	Model 1 <i>b</i> (SE)	Model 2 <i>b</i> (SE)
<b>Fixed parameters</b>				
Intercept	3.25 (0.07)***	3.19 (0.16)***	1.90 (0.06)***	1.91 (0.14)***
<b>Student-level variables</b>				
Student Gender (T1)	0.18 (0.08)*	0.19 (0.08)*	-0.24 (0.07)**	-0.24 (0.07)**
Student Age (T1)	-0.08 (0.04)*	-0.07 (0.04)	0.04 (0.04)	0.03 (0.03)
ADHD (T1)	0.18 (0.13)	0.13 (0.13)	0.11 (0.10)	0.13 (0.10)
ASD (T1)	-0.23 (0.24)	-0.26 (0.21)	-0.04 (0.15)	-0.02 (0.13)
Dyslexia (T1)	-0.09 (0.03)**	-0.06 (0.03)*	-0.02 (0.02)	-0.04 (0.02)*
<b>Teacher-level variables</b>				
Teacher Gender (T1)		0.19 (0.14)		-0.09 (0.12)
Teaching Experience (T1)		-0.01 (0.01)		0.003 (0.004)
<b>Random parameters</b>				
Teacher-Level Variance		0.10 (0.03)**0		0.06 (0.03)*0
Student-Level Variance	0.77 (0.06)***	.71 (0.05)***	0.47 (0.05)***	.43 (0.05)***
ICC	0.13	0.13	0.13	0.13
<b>R<sup>2</sup> statistics</b>				
R <sup>2</sup> <sub>within</sub>	0.04	0.03	0.04	0.04
R <sup>2</sup> <sub>between</sub>		0.10		0.04

Note. Gender: 0 = boys/male teachers; 1 = girls/female teachers. T1 = Time 1 (Jan. – March); T2 = Time 2 (May – July). ADHD = Attention Deficit Hyperactivity Disorder; ASD = Autism Spectrum Disorder. ADHD, ASD, and Dyslexia: 0 = not diagnosed, 1 = diagnosed.

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

**Table 3**  
Multilevel results for teacher-perceived closeness and conflict.

	Closeness (T2)		Conflict (T2)	
	Model 1 <i>b</i> (SE)	Model 2 <i>b</i> (SE)	Model 1 <i>b</i> (SE)	Model 2 <i>b</i> (SE)
<b>Fixed parameters</b>				
Intercept	3.78 (0.07)***	3.40 (0.14)***	1.56 (0.07)***	1.70 (0.15)***
<b>Student-level variables</b>				
Student Gender (T1)	0.44 (0.07)***	0.44 (0.07)***	-0.21 (0.07)**	-0.21 (0.07)**
Student Age (T1)	-0.03 (0.04)	-0.03 (0.04)	0.06 (0.05)	0.04 (0.04)
ADHD (T1)	0.05 (0.08)	0.07 (0.08)	0.56 (0.11)***	0.55 (0.11)***
ASD (T1)	-0.39 (0.14)**	-0.36 (0.13)**	0.72 (0.17)***	0.72 (0.17)***
Dyslexia (T1)	0.02 (0.02)	0.03 (0.02)	-0.06 (0.02)**	-0.06 (0.02)**
<b>Teacher-level variables</b>				
Teacher Gender (T1)		0.25 (0.12)*		-0.17 (0.12)
Teaching Experience (T1)		0.01 (0.01)*		-0.001 (0.01)
<b>Random parameters</b>				
Teacher-Level Variance		0.12 (0.03)***0		0.08 (0.03)**0
Student-Level Variance	0.43 (0.04)***	.42 (0.04)***	0.56 (0.06)***	.55 (0.06)***
ICC	0.22	0.22	0.11	0.11
<b>R<sup>2</sup> statistics</b>				
R <sup>2</sup> <sub>within</sub>	0.12	0.12	0.14	0.14
R <sup>2</sup> <sub>between</sub>		0.22		0.08

Note. Gender: 0 = boys/male teachers; 1 = girls/female teachers. T1 = Time 1 (Jan. – March); T2 = Time 2 (May – July). ADHD = Attention Deficit Hyperactivity Disorder; ASD = Autism Spectrum Disorder. ADHD, ASD, and Dyslexia: 0 = not diagnosed, 1 = diagnosed.

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

*p* < .001) in relationships between teachers and children with Dyslexia. Additionally, peers rated relationships between teachers and students with ASD as less Close (*b* = -0.37, *p* < .01) and with ADHD as more conflictual (*b* = 1.04, *p* < .001) as compared to children without ASD or ADHD. These associations all remained in Model 2 when teacher-level variables were added. In this second Model, neither

Teaching Experience nor teachers' Gender significantly added to the prediction of classmates' nominations of the student-teacher relationship quality. Overall, the quality of the relationship between teachers and children with Dyslexia were rated by peers as the most positive. Again, the presence of the two behavior-related disabilities both contributed negatively to peer-nominated relationship quality, with

**Table 4**  
Multilevel results for peer-nominated closeness and conflict.

	Closeness (T2)		Conflict (T2)	
	Model 1 <i>b</i> (SE)	Model 2 <i>b</i> (SE)	Model 1 <i>b</i> (SE)	Model 2 <i>b</i> (SE)
<b>Fixed parameters</b>				
Intercept	1.95 (0.16)***	2.21 (0.46)***	1.03 (0.08)***	1.01 (0.23)***
<b>Student-level variables</b>				
Student Gender (T1)	0.61 (0.08)***	0.61 (0.08)***	−0.58 (0.16)***	−0.58 (0.16)***
Student Age (T1)	−0.06 (0.06)	−0.06 (0.06)	0.20 (0.07)**	0.21 (0.08)**
ADHD (T1)	−0.09 (0.10)	−0.10 (0.11)	1.04 (0.25)***	1.05 (0.26)***
ASD (T1)	−0.37 (0.14)**	−0.37 (0.14)**	0.52 (0.39)	0.52 (0.39)
Dyslexia (T1)	0.06 (0.03)*	0.06 (0.03)*	−0.17 (0.07)*	−0.17 (0.06)*
<b>Teacher-level variables</b>				
Teacher Gender (T1)		−0.02 (0.37)		−0.02 (0.20)
Teaching Experience (T1)		−0.02 (0.01)		0.002 (0.01)
<b>Random parameters</b>				
Teacher-Level Variance		1.25 (0.31)***		0.03 (0.08)
Student-Level Variance	0.81 (0.09)***	.80 (0.09)***	2.75 (0.33)***	2.74 (0.33)***
ICC	0.58	0.58	0.01	0.01
<b>R<sup>2</sup> statistics</b>				
R <sup>2</sup> <sub>within</sub>	0.12	0.12	0.11	0.11
R <sup>2</sup> <sub>between</sub>		0.03		0.02

Note. Gender: 0 = boys/male teachers; 1 = girls/female teachers. T1 = Time 1 (Jan. – March); T2 = Time 2 (May – July). ADHD = Attention Deficit Hyperactivity Disorder; ASD = Autism Spectrum Disorder. ADHD, ASD, and Dyslexia: 0 = not diagnosed, 1 = diagnosed.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

positive links between ADHD and Conflict, and negative links between ASD and Closeness. The final model explained 12% and 11% of the student-level variance in peer-nominated Closeness and Conflict, respectively. At the between-teacher level, the predictors accounted for only 3% of the variance in Closeness and 2% in Conflict.

## Discussion

In this study, we adopted a multi-informant approach to explore the extent to which various disabilities of students contributed to the affective quality of dyadic student–teacher relationships. This study is one of the first to provide unique insights into how teachers, students, and classmates take in the quality of relationships between teachers and individual students who display behavior-related or learning disorders. Two main findings emerged from this study. First, the behavioral disorders ASD and ADHD appeared to be more relevant to the affective quality of the student–teacher relationship than the learning disorder dyslexia. Whereas relationships between teachers and students with ASD and ADHD were generally marked by higher levels of conflict and lower levels of closeness compared to students without such disabilities, relationships between teachers and students with dyslexia appeared to be less conflictual across informants. Second, associations between the three disabilities and the quality of student–teacher relationships were generally strongest when teachers and classmates reported about the relationship. Specifically, teachers and peers seemed to converge on their view that the relationships of children with ASD are less warm and relationships of children with ADHD are more conflictual. These views were not shared by children with ASD or ADHD themselves, whose disabilities did not seem to play a role in their relationship views. Notably, all informants agreed upon the lower levels of conflict in relationships between teachers and children with dyslexia, yet these associations were all relatively weak. These disabilities may thus play a differential role in the quality of the student–teacher relationship as experienced by teachers, students, and classmates.

### The role of student disabilities in student–teacher relationships

Both attachment theorists and empirical researchers have previously argued that children with disabilities are likely to have poorer-quality student–relationships, as these children share a heightened risk of experiencing academic and social-emotional problems in class (e.g., Murray & Pianta, 2007; Pasta et al., 2013). Our findings extend this premise by revealing, for the first time, which particular diagnosed disabilities are most likely to be associated with poor-quality student–teacher relationships. Evidence from this study seems to corroborate the hypothesis that students' behavior-related disorders, including ASD and ADHD, may play a stronger role in the student–teacher relationship quality than learning disorders, including dyslexia. Of the two behavioral difficulties under scrutiny, ASD seemed to be the most relevant for these relationships, especially from teachers' perspective. To be specific, teachers experienced the relationship with students with ASD to be less warm and nurturing, and more conflictual. These findings are generally consistent with previous research based on attachment theory, suggesting that students with symptoms of ASD are more likely to have relationships marked by higher levels of conflict and lower levels of closeness than typically developing peers (Blacher et al., 2014; Longobardi et al., 2012; Robertson et al., 2003).

It is possible that the symptoms of children with ASD, including deficits in social communication, restrictive and repetitive behaviors, and comorbid depression and anxiety (APA, 2013; Gadow, Guttman-Steinmetz, Rieffe, & DeVincent, 2012) make it challenging for teachers to reach these children and establish high-quality relationships with them. Furthermore, teachers' responsibility to teach children with ASD and lack of confidence in their ability to effectively deal with them may increase their vulnerability to stress and burnout (e.g., Billingsley, Carlson, & Klein, 2004; Boyer & Gillespie, 2000). Following the lines of social referencing theory (Walden & Ogan, 1988) and our hypotheses, such teacher feelings, beliefs, and actions may also extend to classmates, negatively coloring their view of the relationship between teachers and children with ASD. This may explain why we found a negative association between ASD and peer-nominated closeness as well.

Our finding that ADHD was positively associated with teacher-

reported conflict can also be viewed as largely congruent with our hypothesis as well as prior evidence suggesting that teachers experience poorer-quality relationships with children with ADHD (Rogers et al., 2015; Thijs, Koomen, & van der Leij, 2008) and interact more negatively with them (e.g., Greene et al., 2002). Even though we did not explicitly measure labeling bias, this finding also converges with the theoretical idea that diagnostic labels may have negative implications for children with ADHD, such that they elicit more negative teacher expectations in class (e.g., Harris et al., 1992). In a study of Ohan et al. (2011), for instance, teachers were found to have more negative expectations in the case of an ADHD diagnosis, rated behavior as more disruptive to the classroom and peer relationships, and felt that problems were more serious than without such a diagnosis. Findings of Sayal et al. (2010) even suggested that an early diagnosis could influence teacher expectations and student outcomes over a period of years. This is worrying, as teachers' negative expectations are difficult to change and may hamper the healthy school functioning of children with ADHD in the long run (Sayal et al., 2010; Sherman, Rasmussen, & Baydala, 2008).

Perhaps even more disturbing is the finding that teachers' conflictual relationships with children displaying symptoms of ADHD were also reflected in the perceptions of classmates. This finding was in accordance with our hypothesis and held even after controlling for other disabilities and background characteristics of students and teachers. As such, this important finding suggests that classmates might be well aware of teachers' negative expectations and differential treatment of children with ADHD and may use this information to make inferences about these children's behaviors, competencies, and social relationships in class (e.g., Hughes et al., 2001, 2014). Moreover, this suggestion is generally consistent with a recent study by Hendrickx et al. (2017), indicating that negative teacher comments about a student are likely to add to classmates' negative perception of the student-teacher relationship, possibly resulting in their subsequent disliking of that particular student. Interestingly, though, evidence for a positive social referencing pathway, in which positive teacher behaviors were linked to peer liking, was not found in the study by Hendrickx et al. These prior results, together with those from the current study, seem to suggest that teachers' negative reactions toward children with behavior-related disabilities such as ADHD and ASD spill over to classmates, who may use their teachers' negative reactions as clues to interpret the relationships of their teacher with these children.

After the contributions of students' behavior-related disabilities were accounted for, children with dyslexia were found to experience less closeness and conflict in the relationship with their teacher than children without this learning disorder. In line with our hypotheses, this reduced closeness did not surface in the perception of teachers or classmates. Yet, similar to students' own views, classmates and teachers did report slightly lower levels of conflict and, in the case of peers, higher levels of closeness in relationships between the teacher and children with dyslexia. These findings may be due to these children generally getting more time from their teacher to complete classroom tasks. These contact opportunities may be perceived by peers as an indication of increased emotional support from the teacher.

Although teachers did not experience poorer-quality relationships with children with dyslexia than with children without this disorder, it is conceivable that these students themselves, despite getting more time, do experience a lack of recognition or emotional support from their teacher. In studies by Al-Yagon and Mikulincer (2004) and Murray and Greenberg (2000), for instance, children with learning disorders were inclined to view their teachers as less (emotionally) available and less accepting than did typically developing children. Moreover, a priming study from Hornstra et al. (2010) gave the impression that teachers tend to treat children with dyslexia differently than their typically developing peers, but may simply be unaware of their own biased attitudes toward these children. Overall, our findings tie well with the available empirical evidence and our hypotheses, and the

association of dyslexia with relationship perceptions across informants may further advance this line of investigation.

#### *Cross-informant agreement on the role of student disabilities in student-teacher relationships*

Our findings extend prior theory and empirical research on student-teacher relationship quality by illustrating that there may be notable differences in how teachers, students, and classmates take in the quality of relationships between teachers and individual students who display behavior-related or learning disorders. Specifically, associations of students' disabilities with the quality of student-teacher relationships were generally strongest when teachers and, to a lesser extent, classmates reported on the relationship. More specifically, ASD and ADHD were, in a negative way, more relevant to teachers' and peers' perceptions of the relationship than the learning disorder dyslexia.

The assumption that behavior-related disorders would be more relevant to teacher- and peer-perceptions of the student-teacher relationship than dyslexia was based on the challenging and non-negligible behaviors that are associated with such disorders, from the perspective of the teacher (Arbeau & Coplan, 2007). Such negative patterns of student-teacher interactions may be observed by classmates and might be used to interpret the social behaviors and actions of students with ADHD or ASD accordingly (e.g., Hendrickx, Mainhard, Boor-Klip, & Brekelmans, 2017; Hughes et al., 2014). Our results thus correspond well with this social referencing mechanism, in which the teacher may serve as a social referent for students' social status in the classroom (Hughes et al., 2001). This seems especially true for teachers' conflictual relationships with students with ADHD, for whom it is difficult to pay attention, sit still, and curb their impulsivity.

Interestingly, students with symptoms of ADHD or ASD did not seem to reciprocate teachers' (and classmates') negative feelings and beliefs about them. Even though these diagnostic labels are likely to influence teachers' relationship views, individual children with these labels may not necessarily feel or even be disadvantaged by their teachers' negative beliefs and expectations. Based on the idea of positive illusory bias (Hoza et al., 2004), it may be that children with behavioral or developmental disorders, including those with ASD and ADHD, have trouble understanding teachers' (negative) feelings, behaviors, and non-verbal cues, as well as their own. As a result of these poorer social-cognitive skills, they might overestimate their own competencies and misinterpret their teachers' negative feelings and behaviors toward them. As such, the student-teacher relationship experiences of children with ASD and ADHD may be less affected by the daily interactions with their teachers than the experiences of children without such symptoms. Yet, further longitudinal research is needed to investigate these possibilities.

#### *Limitations*

This study has several limitations. First, the design of our study precluded any speculation about the suggested direction of effects. Following both the developmental systems framework of Pianta et al. (2003) and social referencing theory (e.g., Hendrickx, Mainhard, Boor-Klip, & Brekelmans, 2017; Hendrickx, Mainhard, Oudman, et al., 2017; Walden & Ogan, 1988), it is possible that the associations found in this study are reciprocal in nature. Future longitudinal research is needed to advance our understanding of how different disorders and student-teacher relationship dimensions influence one another in a reciprocal way. Cross-lagged panel designs with at least three time intervals, for instance, can be employed to account for the stability in relationship quality and test for reciprocal associations across time.

Second, we did not have permission to check the formal diagnosis of ADHD, ASD, and dyslexia in the official school registers but used the teacher's report on this instead. Nevertheless, teachers are generally well informed about the availability of diagnostic documentation on behavioral or learning disorders, as this documentation does not only

provide information on the presence of the disorder, but also on the way students can be supported in the classroom. Specifically, for children with diagnosed disorders, Individual Education Plans are generally drawn up. It should be reiterated here that diagnoses are not made by school teachers, but by certified psychologists and psychiatrists. With this in mind, it might be important to replicate the present study's findings in future research, using formal diagnoses of children's disabilities.

Third, for this study, we randomly selected four boys and four girls from each teacher's classroom. Although this approach enabled us to generate a relatively representative subset of data, other approaches for recruiting and selecting students with disabilities may be warranted to gain further insight into the relationship between teachers and diagnosed children. In future studies, for instance, researchers might select participating children on the basis of formally diagnosed disabilities, rather than selecting diagnosed disabilities from a larger random dataset.

Fourth, comorbidity between learning disorders and behavioral disorders has been receiving increasing attention (e.g., McGrath et al., 2011). Specifically, comorbidity between dyslexia and ADHD has been reported to be substantial (e.g., Peterson et al., 2017). The interaction between the two might evoke different behaviors and needs of the child, as well as different student-teacher relationships. We did not include any possible interaction effects in our study. This was due to the fact that the groups of students with comorbid disorders (e.g., ADHD and dyslexia or ADHD and ASD) were very small (6%), thereby preventing us from reliably testing such moderation effects. Yet, the weak, positive associations of ADHD with both ASD and Dyslexia (Table 2) suggest that comorbidities in children with ADHD, including ASD and Dyslexia, are fairly common (APA, 2013). In any attempt to replicate the results, it is recommended that future researchers take account of potential comorbidity among disabilities to explain differences in relationship quality.

#### Conclusion and practical implications

In sum, this study goes beyond the available research investigating relationships between teachers and students with disabilities in three ways. First, we combined the central tenets of extended attachment theory with social referencing theory and research about labeling bias. This enabled us to advance insight into the mechanisms explaining the contribution of various disabilities to student-teacher relationship quality, both from inside and outside the dyad. Second, rather than focusing on composite measures of child disabilities, we investigated the unique associations of ADHD, ASD, and dyslexia with student-teacher relationship quality. Thereby, we could support the idea that behavior-related disabilities, more than learning disorders, may be relevant to the affective quality of the student-teacher relationship. Last, as not only teachers', but also students' and classmates' views of student-teacher relationship quality may contribute to students' adjustment (Hughes, 2011), we used a multi-informant approach to investigate relationships between teachers and students with disabilities.

Apart from its theoretical relevance, the results of this study may be relevant to intervention efforts aimed at improving the quality of relationships between teachers and children with ADHD and ASD. There already is a wide variety of programs targeting the challenging behaviors that accompany behavior-related disabilities such as ADHD and ASD. For instance, interventions using social stories, video modeling, exercise, or cue card strategies have been demonstrated to be effective in reducing inappropriate talk, tantrums, shouting, whining and disobedience in the classroom (see Machalicek, O'Reilly, Beretvas, Sigafoos, & Lancioni, 2007, for an overview). Yet, whereas these interventions have mainly targeted children's behaviors, our results seem to suggest that programs focusing on teachers themselves might be especially effective in promoting high-quality student-teacher relationships. One fine example in this respect is My Teaching Partner

(MTP), a one-to-one remote coaching model in which coaches provide teachers with detailed feedback about their daily interactions with students in the domains of emotional support, organizational structure, and instructional support (Pianta, Mashburn, Downer, Hamre, & Justice, 2008). Prior research has indicated that this teacher-focused intervention may be particularly effective in improving teachers' general levels of emotional support in class (Early, Maxwell, Ponder, & Pan, 2017). As such, MTP could help teachers to become more effective in their emotionally supportive interactions with specific students as well, including those with ASD and ADHD.

In addition, educational practitioners may provide insightful information to teachers about how diagnostic labels may subtly bias their expectations and beliefs toward these children, as well as about larger classroom processes in which their own view continuously influences the views of classmates. Furthermore, interventions such as the Dutch coaching program for teachers LLInC (Leerkracht Leerling Interactie Coaching in Dutch, or: Teacher Student Interaction Coaching) may be helpful. This intervention uses relationship-focused reflection (as a means to elicit change in a teacher's relationship representation) and was previously referred to as the "Relationship-Focused Reflection Program" (Spilt, Koomen, Thijs, & Van der Leij, 2012). Given that teachers' in-depth reflection tends to change their relationships with and sensitive behaviors toward children with challenging and/or disruptive behavior (Spilt, Hughes, Wu, & Kwok, 2012), this intervention might also be helpful in changing the quality of relationships between teachers and children with ASD or ADHD.

Moreover, it can be argued that teachers may come to judge students with ADHD or ASD as less disruptive or effortful to teach when they realize these students' symptoms and behaviors are the result of some internal deficit these students cannot control. Hence, intervention efforts that incorporate considerations that the often disruptive behaviors of these children are not intentional may help teachers become more supportive and sensitive in their responses would be promising (cf. Chang & Davis, 2009). Such sensitive responses may not only promote teachers' relationships with behaviorally at-risk students, but also positively influence classmates' perceptions of teachers' relationships with such students.

A last implication for researchers and practitioners in the fields of psychology and education is to evaluate the competence teachers experience (e.g., Sutherland, Kenton Denny, & Gunter, 2005). Teachers who feel more equipped to teach in general and to deal with the challenges that behavioral and learning disorders bring to the classroom might show more favorable interactions and relationships with their students than those who feel less equipped. Consequently, the knowledge base on how to cope with inclusive education could be increased.

In conclusion, our study supports the idea that behavior-related disabilities, more than learning disorders, may be relevant to the affective quality of the student-teacher relationship and generally more so for teachers and classmates than for the students with the diagnosed disorders themselves. Overall, teachers experienced less closeness and more conflict in relation to children with symptoms of ASD, and higher levels of conflict in relationships involving children with ADHD. Moreover, our results suggest that teachers may serve as a social referent in class (Hendrickx, Mainhard, Boor-Klip, & Brekelmans, 2017; Hendrickx, Mainhard, Oudman, et al., 2017), thereby negatively affecting classmates' perceptions of teachers' relationships with students with ASD and ADHD. The findings of this study could be important for educational researchers and practitioners in different ways.

#### Acknowledgements

This research was supported by grant 411-12-036 from the Netherlands Organization for Scientific Research.

## References

- Al-Yagon, M. (2016). Perceived close relationships with parents, teachers, and peers: Predictors of social, emotional, and behavioral features in adolescents with LD or comorbid LD and ADHD. *Journal of Learning Disabilities, 49*, 597–615. <https://doi.org/10.1177/0022219415620569>.
- Al-Yagon, M., & Mikulincer, M. (2004). Socioemotional and academic adjustment among children with learning disorders: The mediational role of attachment-based factors. *Journal of Special Education, 38*, 111–123. <https://doi.org/10.1177/00224669040380020501>.
- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: APA.
- Arbeau, K. A., & Coplan, R. J. (2007). Kindergarten teachers' beliefs and responses to hypothetical prosocial, asocial, and antisocial children. *Merrill-Palmer Quarterly, 53*, 291–318. <https://doi.org/10.1353/mpq.2007.0007>.
- Baker, J. A. (2006). Contributions of teacher-child relationships to positive school adjustment during elementary school. *Journal of School Psychology, 44*, 211–229. <https://doi.org/10.1016/j.jsp.2006.02.002>.
- Billingsley, B., Carlson, E., & Klein, S. (2004). The working conditions and induction support of early career special educators. *Exceptional Children, 70*, 333–347.
- Blacher, J., Howell, E., Lauderdale-Littin, S., DiGennaro Reed, F. D., & Laugeson, E. A. (2014). Autism spectrum disorder and the student teacher relationship: A comparison study with peers with intellectual disability and typical development. *Research in Autism Spectrum Disorders, 8*, 324–333. <https://doi.org/10.1016/j.rasd.2013.12.008>.
- Bowlby, J. (1969). *Attachment and loss: Attachment. V*. New York, NY: Basic Books.
- Boyer, L., & Gillespie, P. (2000). Keeping the committed. *Teaching Exceptional Children, 33*, 10–15.
- CDC (2014). Prevalence of autism spectrum disorder among children aged 8 years—Autism and developmental disabilities monitoring network, 11 sites, United States. *Morbidity and Mortality Weekly Report, 63*, 1–21.
- Chang, M.-L., & Davis, H. A. (2009). Understanding the role of teacher appraisals in shaping the dynamics of their relationships with students: Deconstructing teachers' judgments of disruptive behavior students. *Advances in teacher emotion research* (pp. 95–127). New York, NY: Springer.
- Coplan, R. J., & Prakash, K. (2003). Spending time with teacher: Characteristics of preschoolers who frequently elicit versus initiate interactions with teachers. *Early Childhood Research Quarterly, 18*, 143–158. [https://doi.org/10.1016/S0885-2006\(03\)00009-7](https://doi.org/10.1016/S0885-2006(03)00009-7).
- Darley, J. M., & Fazio, R. H. (1980). Expectancy confirmation processes arising in the social interaction sequence. *American Psychologist, 35*, 867–881. <https://doi.org/10.1037/0003-066X.35.10.867>.
- Early, D. M., Maxwell, K. L., Ponder, B. D., & Pan, Y. (2017). Improving teacher-child interactions: A randomized controlled trial of Making the Most of Classroom Interactions and My Teaching Partner professional development models. *Early Childhood Research Quarterly, 38*, 57–70. <https://doi.org/10.1016/j.ecresq.2016.08.005>.
- Frymier, A. B., & Wanzer, M. B. (2003). Examining differences in perceptions of students' communication with professors: A comparison of students with and without disabilities. *Communication Quarterly, 51*, 174–191. <https://doi.org/10.1080/01463370309370149>.
- Gadow, K. D., Guttman-Steinmetz, S., Rieffe, C., & DeVincent, C. J. (2012). Depression symptoms in boys with autism spectrum disorder and comparison samples. *Journal of Autism and Developmental Disorders, 42*, 1353–1363. <https://doi.org/10.1007/s10803-011-1367-x>.
- Greene, R. W., Beszterczey, S. K., Katzenstein, T., Park, K., & Goring, J. (2002). Are students with ADHD more stressful to teach? Patterns of teacher stress in an elementary school sample. *Journal of Emotional and Behavioral Disorders, 10*, 79–89. <https://doi.org/10.1177/10634266020100020201>.
- Hamre, B. K., & Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development, 72*, 625–638. <https://doi.org/10.1111/1467-8624.00301>.
- Harris, M. J., Milich, R., Corbitt, E. M., Hoover, D. W., & Brady, M. (1992). Self-fulfilling effects of stigmatizing information on children's social interactions. *Journal of Personality and Social Psychology, 63*, 41–50. <https://doi.org/10.1037/0022-3514.63.1.41>.
- Hendrickx, M. M., Mainhard, T., Boor-Klip, H. J., & Brekelmans, M. (2017). Our teacher likes you, so I like you: A social network approach to social referencing. *Journal of School Psychology, 63*, 35–48. <https://doi.org/10.1016/j.jsp.2017.02.004>.
- Hendrickx, M. M., Mainhard, M. T., Boor-Klip, H. J., Cillessen, A. H., & Brekelmans, M. (2016). Social dynamics in the classroom: Teacher support and conflict and the peer ecology. *Teaching and Teacher Education, 53*, 30–40. <https://doi.org/10.1016/j.tate.2015.10.004>.
- Hendrickx, M. M., Mainhard, T., Oudman, S., Boor-Klip, H. J., & Brekelmans, M. (2017). Teacher behavior and peer liking and disliking: The teacher as a social referent for peer status. *Journal of Educational Psychology, 109*, 546–558. <https://doi.org/10.1037/edu0000157>.
- Hornstra, L., Denessen, E., Bakker, J., van den Bergh, L., & Voeten, M. (2010). Teacher attitudes toward dyslexia: Effects on teacher expectations and the academic achievement of students with dyslexia. *Journal of Learning Disabilities, 43*, 515–529. <https://doi.org/10.1177/0022219409355479>.
- Hoza, B., Gerdes, A. C., Hinshaw, S. P., Arnold, L. E., Pelham, W. E., Jr., Molina, B. S., & Wigal, T. (2004). Self-perceptions of competence in children with ADHD and comparison children. *Journal of Consulting and Clinical Psychology, 72*, 382.
- Hughes, J. N. (2011). Longitudinal effects of teacher and student perceptions of teacher-student relationship qualities on academic adjustment. *The Elementary School Journal, 112*, 38–60. <https://doi.org/10.1086/660686>.
- Hughes, J. N., Cavell, T. A., & Willson, V. (2001). Further support for the developmental significance of the quality of the teacher-student relationship. *Journal of School Psychology, 39*, 289–301. [https://doi.org/10.1016/S0022-4405\(01\)00074-7](https://doi.org/10.1016/S0022-4405(01)00074-7).
- Hughes, J. N., Im, M. H., & Wehrly, S. E. (2014). Effect of peer nominations of teacher-student support at individual and classroom levels on social and academic outcomes. *Journal of School Psychology, 52*, 309–322. <https://doi.org/10.1016/j.jsp.2013.12.004>.
- Humphrey, N., & Mullins, P. M. (2002). Self-concept and self-esteem in developmental dyslexia. *Journal of Research in Special Educational Needs, 2*, 1–13. <https://doi.org/10.1111/j.1471-3802.2002.00163.x>.
- Jellesma, F. C., Zee, M., & Koomen, H. M. (2015). Children's perceptions of the relationship with the teacher: Associations with appraisals and internalizing problems in middle childhood. *Journal of Applied Developmental Psychology, 36*, 30–38. <https://doi.org/10.1016/j.appdev.2014.09.002>.
- Jussim, L., & Harber, K. D. (2005). Teacher expectations and self-fulfilling prophecies: Knowns and unknowns, resolved and unresolved controversies. *Personality and Social Psychology Review, 9*, 131–155. [https://doi.org/10.1207/s15327957pspr0902\\_3](https://doi.org/10.1207/s15327957pspr0902_3).
- Koomen, H. M. Y., & Jellesma, F. C. (2015). Can closeness, conflict, and dependency be used to characterize students' perceptions of the affective relationship with their teacher? Testing a new child measure in middle childhood. *British Journal of Educational Psychology, 85*, 479–497. <https://doi.org/10.1111/bjep.12094>.
- Koomen, H. M. Y., Verschuere, K., Van Schooten, E., Jak, S., & Pianta, R. C. (2012). Validating the Student-Teacher Relationship Scale: Testing factor structure and measurement invariance across child gender and age in a Dutch sample. *Journal of School Psychology, 50*, 215–234. <https://doi.org/10.1016/j.jsp.2011.09.001>.
- Ledoux, G., & Roeleveld, J. (2010). *Resultaten van de pilot COOL Speciaal [Results of the pilot COOL Speciaal]*. Nijmegen/Amsterdam, the Netherlands: ITS/Kohnstamm Instituut.
- Longobardi, C., Prino, L. E., Pasta, T., Gastaldi, F. G. M., & Quaglia, R. (2012). Measuring the quality of teacher-child interaction in autistic disorder. *European Journal of Investigation in Health, Psychology and Education, 2*, 103–114.
- Machalicek, W., O'Reilly, M. F., Beretvas, N., Sigafos, J., & Lancioni, G. E. (2007). A review of interventions to reduce challenging behavior in school settings for students with autism spectrum disorders. *Research in Autism Spectrum Disorders, 1*, 229–246. <https://doi.org/10.1016/j.rasd.2006.10.005>.
- Mantzicopoulos, P., & Neuharth-Pritchett, S. (2003). Development and validation of a measure to assess head start children's appraisals of teacher support. *Journal of School Psychology, 41*, 431–451. <https://doi.org/10.1016/j.jsp.2003.08.002>.
- McGrath, L. M., Pennington, B. F., Shanahan, M. A., Santerre-Lemmon, L. E., Barnard, H. D., Willcutt, E. G., ... Olson, R. K. (2011). A multiple deficit model of reading disability and attention-deficit/hyperactivity disorder: Searching for shared cognitive deficits. *Journal of Child Psychology and Psychiatry, 52*, 547–557.
- Mikami, A. Y., & Mercer, S. H. (2017). Teacher behaviors toward children with attention-deficit/hyperactivity disorder predict peers' initial linking and disliking impressions in a summer camp setting. *Journal of Social and Clinical Psychology, 36*, 506–534.
- Murray, C., & Greenberg, M. T. (2000). Children's relationship with teachers and bonds with school an investigation of patterns and correlates in middle childhood. *Journal of School Psychology, 38*, 423–445. [https://doi.org/10.1016/S0022-4405\(00\)00034-0](https://doi.org/10.1016/S0022-4405(00)00034-0).
- Murray, C., & Pianta, R. C. (2007). The importance of teacher-student relationships for adolescents with high incidence disabilities. *Theory Into Practice, 46*, 105–112. <https://doi.org/10.1080/00405840701232943>.
- Murray, C., & Zvoch, K. (2011). Teacher-student relationships among behaviorally at-risk African American youth from low-income backgrounds: Student perceptions, teacher perceptions, and socioemotional adjustment correlates. *Journal of Emotional and Behavioral Disorders, 19*, 41–54. <https://doi.org/10.1177/1063426609353607>.
- Muthén, L. K., & Muthén, B. O. (1998–2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.
- Ohan, J. L., Visser, T. A., Strain, M. C., & Allen, L. (2011). Teachers' and education students' perceptions of and reactions to children with and without the diagnostic label "ADHD". *Journal of School Psychology, 49*, 81–105. <https://doi.org/10.1016/j.jsp.2010.10.001>.
- Pasta, T., Mendola, M., Longobardi, C., Pino, L. E., & Gastaldi, F. G. M. (2013). Attributional style of children with and without Specific Learning Disability. *Electronic Journal of Research in Educational Psychology, 11*, 649–664. <https://doi.org/10.14204/ejrep.31.13064>.
- Peterson, R. L., Boada, R., McGrath, L. M., Willcutt, E. G., Olson, R. K., & Pennington, B. F. (2017). Cognitive prediction of reading, math, and attention: Shared and unique influences. *Journal of Learning Disabilities, 50*, 408–421. <https://doi.org/10.1177/0022219415618500>.
- Peterson, R. L., & Pennington, B. F. (2015). Developmental dyslexia. *Annual Review of Clinical Psychology, 11*, 283–307. <https://doi.org/10.1146/annurev-clinpsy-032814-112842>.
- Pianta, R. C. (1999). Assessing child-teacher relationships. In R. C. Pianta (Ed.). *Enhancing relationships between children and teachers* (pp. 85–104). Washington, DC: American Psychological Association.
- Pianta, R. C. (2001). *STRS: Student-teacher relationship scale: Professional manual*. Lutz, FL: Psychological Assessment Resources.
- Pianta, R. C., Hamre, B., & Stuhlman, M. (2003). Relationships between teachers and children. In W. M. Reynolds, & G. E. Miller (Eds.). *Handbook of psychology: Educational psychology* (pp. 199–234). Hoboken, NJ: Wiley.
- Pianta, R. C., Mashburn, A. J., Downer, J. T., Hamre, B. K., & Justice, L. (2008). Effects of web-mediated professional development resources on teacher-child interactions in pre-kindergarten classrooms. *Early Childhood Research Quarterly, 23*, 431–451. <https://doi.org/10.1016/j.ecresq.2008.02.001>.

- Polanczyk, G., De Lima, M. S., Horta, B. L., Biederman, J., & Rohde, L. A. (2007). The worldwide prevalence of ADHD: A systematic review and meta-regression analysis. *American Journal of Psychiatry*, *43*, 434–442. <https://doi.org/10.1093/aje/dyt261>.
- Raudenbusch, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Newbury Park: Sage.
- Riddick, B. (1996). *Living with dyslexia*. London, UK: Routledge.
- Robertson, K., Chamberlain, B., & Kasari, C. (2003). General education teachers' relationships with included students with autism. *Journal of Autism and Developmental Disorders*, *3*, 123–130. <https://doi.org/10.1023/A:1022979108096>.
- Rogers, M., Bélanger-Lejars, V., Toste, J. R., & Heath, N. L. (2015). Mismatched: ADHD symptomatology and the teacher–student relationship. *Emotional and Behavioural Difficulties*, *20*, 333–348. <https://doi.org/10.1080/13632752.2014.972039>.
- Rogers, M., & Tannock, R. (2013). Are classrooms meeting the basic psychological needs of children with ADHD symptoms? A self-determination theory perspective. *Journal of Attention Disorders*, *20*, 1–7.
- Roorda, D. L., Verschueren, K., Vancraeyveldt, C., Van Craeyveldt, S., & Colpin, H. (2014). Teacher–child relationships and behavioral adjustment: Transactional links for pre-school boys at risk. *Journal of School Psychology*, *52*, 495–510. <https://doi.org/10.1016/j.jsp.2014.06.004>.
- Sabol, T. J., & Pianta, R. C. (2012). Recent trends in research on teacher–child relationships. *Attachment & Human Development*, *14*, 213–231. <https://doi.org/10.1080/14616734.2012.672262>.
- Sayal, K., Owen, V., White, K., Merrell, C., Tymms, P., & Taylor, E. (2010). Impact of early school-based screening and intervention programs for ADHD on children's outcomes and access to services. Follow-up of a school-based trial at age 10 years. *Archives of Pediatrics and Adolescent Medicine*, *164*, 462–469.
- Sherman, J., Rasmussen, C., & Baydala, L. (2008). The impact of teacher factors on achievement and behavioural outcomes of children with attention-deficit/hyperactivity disorder (ADHD): A review of the literature. *Educational Research*, *50*, 347–360. <https://doi.org/10.1080/00131880802499803>.
- Smeets, E., Ledoux, G., Blok, H., Felix, C., Heurter, A., Van Kuijk, J., & Vergeer, M. (2013). *Op de drempel van passend onderwijs: Beleid en aanbod rond specifieke onderwijsbehoeften in zes samenwerkingsverbanden. [On the threshold of inclusive education: Policy and supply of specific educational needs in six school collaborations]*. Nijmegen: ITS.
- Snijders, T. A. B., & Bosker, R. J. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. London, UK: Sage Publishers.
- Spilt, J. L., Hughes, J. N., Wu, J. Y., & Kwok, O. M. (2012). Dynamics of teacher–student relationships: Stability and change across elementary school and the influence on children's academic success. *Child Development*, *83*, 1180–1195. <https://doi.org/10.1111/j.1467-8624.2012.01761.x>.
- Spilt, J. L., Koomen, H. M., Thijs, J. T., & van der Leij, A. (2012). Supporting teachers' relationships with disruptive children: The potential of relationship-focused reflection. *Attachment & Human Development*, *14*, 305–318. <https://doi.org/10.1080/14616734.2012.672286>.
- Stinnett, T. A., Crawford, S. A., Gillespie, M. D., Cruce, M. K., & Langford, C. A. (2001). Factors affecting treatment acceptability for psychostimulant medication versus psychoeducational intervention. *Psychology in the Schools*, *38*, 585–591.
- Sutherland, K., Kenton Denny, R., & Gunter, P. L. (2005). Teachers of students with emotional and behavioral disorders reported professional development needs: Differences between fully licensed and emergency-licensed teachers. *Preventing School Failure*, *49*, 41–46. <https://doi.org/10.3200/PSFL.49.2.41-46>.
- Terry, R. (2000). Recent advances in measurement theory and the use of sociometric techniques. In A. H. N. Gillessen, & W. M. Bukowski (Eds.). *Recent advances in the measurement of acceptance and rejection in the peer system*. San Francisco, CA: Jossey-Bass.
- Thijs, J. T., Koomen, H. M., & van der Leij, A. (2008). Teacher-child relationships and pedagogical practices: Considering the teacher's perspective. *School Psychology Review*, *37*, 244–260.
- Toste, J. R., Bloom, E. L., & Heath, N. L. (2014). The differential role of classroom working alliance in predicting school-related outcomes for students with and without high-incidence disabilities. *The Journal of Special Education*, *48*, 135–148. <https://doi.org/10.1177/0022466912458156>.
- Verschueren, K., & Koomen, H. M. (2012). Teacher–child relationships from an attachment perspective. *Attachment & Human Development*, *14*, 205–211. <https://doi.org/10.1080/14616734.2012.672260>.
- Vervoort, E., Doumen, S., & Verschueren, K. (2015). Children's appraisal of their relationship with the teacher: Preliminary evidence for construct validity. *The European Journal of Developmental Psychology*, *12*, 243–260. <https://doi.org/10.1080/17405629.2014.989984>.
- Walden, T., & Ogan, T. (1988). The development of social referencing. *Child Development*, *59*, 1230–1240. <https://doi.org/10.2307/1130486>.
- White, K. J., & Kistner, J. (1992). The influence of teacher feedback on young children's peer preferences and perceptions. *Developmental Psychology*, *28*, 933–940.
- Ysseldyke, J., & Algozzine, B. (1990). *Introduction to special education*. Boston: Houghton Mifflin Company.
- Zee, M., & de Bree, E. H. (2017). Students' self-regulation and achievement in basic reading and math skills: The role of student–teacher relationships in middle childhood. *European Journal of Developmental Psychology*, *14*, 265–280. <https://doi.org/10.1080/17405629.2016.1196587>.
- Zee, M., de Jong, P. F., & Koomen, H. M. (2017). From externalizing student behavior to student-specific teacher self-efficacy: The role of teacher-perceived conflict and closeness in the student–teacher relationship. *Contemporary Educational Psychology*, *51*, 37–50. <https://doi.org/10.1016/j.cedpsych.2017.06.009>.
- Zee, M., & Koomen, H. M. Y. (2017). Similarities and dissimilarities between teachers' and students' relationship views in upper elementary school: The role of personal teacher and student attributes. *Journal of School Psychology*, *64*, 43–60. <https://doi.org/10.1016/j.jsp.2017.04.007>.
- Zee, M., Koomen, H. M. Y., Jellesma, F. C., Geerlings, J., & de Jong, P. F. (2016). Inter- and intra-individual differences in teachers' self-efficacy: A multilevel factor exploration. *Journal of School Psychology*, *55*, 39–56. <https://doi.org/10.1016/j.jsp.2015.12.003>.
- Zee, M., Koomen, H. M. Y., & van der Veen, I. (2013). Student–teacher relationship quality and academic adjustment in upper elementary school: The role of student personality. *Journal of School Psychology*, *51*, 517–533. <https://doi.org/10.1016/j.jsp.2013.05.003>.