



UvA-DARE (Digital Academic Repository)

“Draw me a picture”

Student-teacher relationship drawings by children displaying externalizing, internalizing, or prosocial behavior

Zee, M.; Moritz Rudasill, K.; Roorda, D.L.

DOI

[10.1086/708661](https://doi.org/10.1086/708661)

Publication date

2020

Document Version

Final published version

Published in

The Elementary School Journal

License

Article 25fa Dutch Copyright Act (<https://www.openaccess.nl/en/policies/open-access-in-dutch-copyright-law-taverne-amendment>)

[Link to publication](#)

Citation for published version (APA):

Zee, M., Moritz Rudasill, K., & Roorda, D. L. (2020). “Draw me a picture”: Student-teacher relationship drawings by children displaying externalizing, internalizing, or prosocial behavior. *The Elementary School Journal*, 120(4), 636-666. <https://doi.org/10.1086/708661>

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (<https://dare.uva.nl>)

“DRAW ME A PICTURE”

Student-Teacher Relationship Drawings by Children Displaying Externalizing, Internalizing, or Prosocial Behavior

ABSTRACT

This study explored the role of students' externalizing, internalizing, and prosocial behavior and classroom climate in their mental representations of student-teacher relationships. In total, 266 third to sixth graders and 35 teachers participated. Teachers completed questionnaires about students' social-emotional behavior and student-teacher relationships. Relationship perceptions were aggregated to form a classroom climate measure. Students made drawings of themselves with the teacher, which were scored by independent coders on 8 dimensions. Multilevel models indicated that children with externalizing behavior depicted more tension/anger, bizarreness/dissociation, and emotional distance/isolation, and less pride/happiness in their drawings. Internalizing behavior was not associated with their mental relationship representations. Children with prosocial behavior depicted more creativity/vitality and less role reversal and global pathology than less prosocial counterparts. Classroom climate did not moderate linkages between child behavior and mental representations. These findings suggest that overt, rather than covert, behaviors play a role in students' mental relationship representations.

Marjolein Zee

UNIVERSITY OF
AMSTERDAM

Kathleen Moritz
Rudasill

VIRGINIA
COMMONWEALTH
UNIVERSITY

Debora L. Roorda

UNIVERSITY OF
AMSTERDAM

SOCIAL-EMOTIONAL student behaviors have long been associated with the affective quality of student-teacher relationships (Birch & Ladd, 1998; Hamre & Pianta, 2001; Nurmi, 2012; Roorda et al., 2014). Evidence from both empirical and meta-analytical studies has repeatedly indicated that young children with externalizing and/or internalizing problem behavior are likely to be at risk for developing student-teacher relationships that are marked by discordance, anger, and a lack of warmth and affection (e.g., Buyse et al., 2008; Jerome et al., 2009; Murray & Murray, 2004; Nurmi, 2012). In contrast, prosocial behaviors, including helping, sharing, and cooperating (Dunfield & Kuhlmeier, 2013), may allow children to form positive relationships with teachers that are generally warm and conflict-free (Birch & Ladd, 1998; Henricsson & Rydell, 2004; Roorda et al., 2014).

Although prior studies have made great strides in promoting better understanding of the links between social-emotional child behaviors and student-teacher relationships, much of this work has primarily relied on teacher reports of dyadic relationship quality (cf. Koomen & Jellesma, 2015). Thus, our understanding of student-teacher relationships is somewhat limited because teachers' perceptions of relationship quality are affected by their own characteristics, biases, and experiences. Students have unique perspectives of their relationships with teachers, yet relatively little is known about views of students, especially across a range of social-emotional behaviors (Zee & Koomen, 2017). Moreover, empirical studies that have included students' perceptions have primarily employed survey measures of student-teacher relationship quality, whereupon students rate their views of the relationship on a Likert-type scale (Jellesma et al., 2015; Murray & Zvoch, 2011; Zee & Koomen, 2017). Generally, more global measures provide a useful and relatively simple method of obtaining data about relationship quality. At the same time, however, they may be less suitable to capture the feelings, behaviors, and emotions, or mental representations, that underlie students' perceptions (e.g., Harrison et al., 2007; Madigan et al., 2016; Marsh et al., 1991). Because questionnaires and other (non)observational methods, including representational techniques, are usually only weakly correlated, it is likely that mental representations tap different aspects of the relationship from those obtained from questionnaires, thereby providing additional information about the student-teacher relationship (e.g., Harrison et al., 2007; Nosek, 2005, 2007).

In the current study, we aim to extend the current body of work on student-teacher relationships by exploring the unique contributions of a variety of social-emotional child behaviors (internalizing, externalizing, and prosocial behavior) to children's mental representations of relationships with teachers in middle childhood. In addition, given the role of teachers in establishing the emotional climate of the classroom (Farmer et al., 2011), this study includes an examination of the extent to which associations between child social-emotional behaviors and mental representations of relationships are moderated by teachers' perceptions of relationship quality at the classroom level.

An Attachment Perspective on Children's Mental Relationships Representations

Linkages between children's social-emotional behavior and their mental representations of the relationship with their teacher have commonly been rooted in the

central concepts of Bowlby's (1969) attachment theory. This developmental framework accords a central role to mental representational models, or internal working models, that children acquire and develop through repeated interactions with their primary caregiver (Bowlby, 1969; Bretherton & Munholland, 2008; Pianta et al., 2003). These representational models have been theorized to reflect a dynamic set of feelings, beliefs, personal attributes, and behaviors of the self, the significant other, and the mutual relationship (Pianta et al., 1999). Once established, such mental representational models may help children interpret the underlying intentions and trustworthiness of others' behaviors and actions in new situations and contexts, including the classroom (Pianta et al., 2003; Stuhlman & Pianta, 2002).

To date, most empirical research on teacher-child attachment has suggested that teachers, just like parents, may function as ad hoc attachment figures for children. This indicates that teachers may play the role as a safe haven and secure base by being sensitive and responsive to their students' needs and helping them to feel confident exploring the classroom environment (Pianta, 1999, Chapter 5; Pianta et al., 1999). This is not only true in early childhood, but also in early adolescence, where children still may use their teacher as a secure base from which they can try new things, approach learning tasks in a confident way, and pursue their goals (De Laet et al., 2014).

Within the context of the classroom, the quality of children's mental representations of the relationship with their teachers is commonly classified along dimensions of emotional closeness, conflict, and dependency (Pianta et al., 2003; Verschueren & Koomen, 2012). Generally, emotionally close relationship representations can be considered conceptually consistent with secure attachment. In early adolescence, these representations reflect children's views of themselves as competent and worthy of affection, their disclosing behavior, and their confidence in the teacher in times of stress and need (e.g., Koomen & Jellesma, 2015; Pianta et al., 1999). Representations of conflict, in contrast, are consistent with an insecure-avoidant attachment style where children view their teacher as negative, distrustful, or rejecting (Koomen & Jellesma, 2015). Dependency is in line with an insecure-ambivalent attachment representation, reflecting children's intense desire for affection and constant concerns about the teacher's availability, resulting in overly clingy behavior (Pianta, 1999, Chapter 5). These three dimensions of relationship quality are likely to be influenced not only by teachers' sensitivity but also by their attachment history with parents and other teachers (Buyse et al., 2011).

Children's representations of student-teacher relationships in early adolescence are usually captured through survey measures that are filled out by children themselves (e.g., Student Perception of Affection Relationship with Teacher Scale [Koomen & Jellesma, 2015]; Network of Relationships Inventory [Hughes, 2011]; Child-Report Student-Teacher Relationship Scale [Child-STRS; Koepke & Harkins, 2008]). Yet these measures and underlying dimensions tend to be relatively global and are not always reliable (cf. Koomen & Jellesma, 2015). Accordingly, researchers have increasingly argued for more elaborate methodologies that capture children's mental relationship representations in a more nuanced way (e.g., Furrer & Skinner, 2003).

One way to provide deeper insight into children's mental representations of the student-teacher relationship is by using representational techniques such as student-teacher relationship drawings (Harrison et al., 2007). Compared with survey methods,

this nonintrusive, indirect approach can be completed relatively easily and in an enjoyable way (Lewis & Greene, 1983) and disclose relationship information that may be too sensitive or anxiety-provoking on a verbal level. For instance, children may reveal feelings of attachment insecurity in their drawing by distorted or exaggerated body parts, differentiation of size of figures, or unusual or morbid symbols (e.g., sharp teeth, swear words they might not be aware of [Burgess & Hartman, 1993]). As such, children’s drawings may be particularly useful in research on children’s mental relationship representations.

Founded in attachment theory, relationship drawings and the associated coding system were originally developed in the context of parent-child relationships (e.g., Fury et al., 1997; Kaplan & Main, 1986) but later effectively adapted to the school context (Harrison et al., 2007; McGrath et al., 2017). This body of work posits that children’s mental representations of relationships are likely to be reflected in eight primary constructs that tap secure attachment (pride/happiness, creativity/vitality), insecure-avoidant attachment (tension/anger, bizarreness/dissociation, role reversal), insecure-ambivalent attachment (vulnerability, emotional distance), and overall adjustment (global pathology). These attachment styles largely resemble the closeness, conflict, and dependency factors that are usually found in empirical research on student-teacher relationships (e.g., Koomen et al., 2012).

Thus far, only two empirical studies have applied Fury’s drawings and associated coding system to the context of the classroom. Harrison et al. (2007) were the first to examine the validity of the student-teacher relationships drawings in a sample of 123 kindergartners. They found support for one principle dimension (relational negativity), as well as moderate levels of correspondence among this drawing dimension and teachers’ relationships perceptions, as rated on the Student-Teacher Relationship Scale (STRS; Pianta, 1999, Chapter 5). Moreover, this study revealed that children who expressed more negative emotionality in their drawings were likely to be rated by their teachers as more disruptive and less socially competent than those who depicted less relational negativity.

Also focusing on kindergartners and first graders, McGrath and colleagues (2017) aimed to explore whether disruptive children portrayed higher levels of relational negativity in their drawings than well-behaved students. Analyses of variance did not support this assumption, indicating that there were no statistically significant differences in the mental relationship representations of disruptive versus well-behaved students. It should be noted, though, that this study included only a limited number of students ($N = 51$) and used teacher nominations to determine whether participating students were disruptive or well behaved.

This study goes above and beyond existing studies on student-teacher relationship drawings in several ways. First, rather than focusing solely on relational negativity (cf. Harrison et al., 2007), we included all eight drawing dimensions to be able to tap patterns of secure, insecure-avoidant, and insecure-ambivalent attachment, as well as overall adjustment. Second, whereas teachers were asked to nominate two disruptive and two well-behaved students to participate in McGrath et al. (2017), we used a formal behavioral screening questionnaire to gain insight into student’s internalizing, externalizing, and prosocial behavior in class. Last, we conducted this study with children in upper elementary grades, using a somewhat larger sample. Whereas the mental representations of very young children may still be relatively

global in nature, there is increasing evidence that these models become more nuanced and accurate in middle childhood with increases in cognitive functioning (e.g., Cherney et al., 2006; Hughes, 2011; Marsh et al., 1991).

Associations Between Social-Emotional Child Behaviors and Mental Representations

Closeness

Consistent with attachment theory, close and emotionally secure relationships have previously been tied to children's propensity to act prosocially, but only from teachers' perspectives (e.g., Birch & Ladd, 1998; Nurmi, 2012; Roorda et al., 2014). In a cross-lagged longitudinal study from Roorda et al. (2014), for instance, prosocial student behavior was modestly but positively associated with teacher-reported closeness, which, in turn, predicted positive changes in children's prosocial behavior across time. Only Ladd et al. (1999) did not establish a positive association among children's prosocial behavioral styles and teacher-reported closeness.

Externalizing (i.e., undercontrolled and outwardly directed behaviors) and internalizing (i.e., overcontrolled and inwardly directed behaviors) child behaviors have also been linked to emotional closeness, but these patterns of associations are somewhat less consistent. From teachers' perspectives, for instance, cross-sectional studies have revealed a negative association between externalizing behavior and closeness in the student-teacher relationship (Buyse et al., 2008; Thijs et al., 2008). Yet in two cross-lagged panel studies among preschoolers (Mejia & Hoglund, 2016; Roorda et al., 2014), no additional effects of these behaviors on prospective levels of teacher-reported closeness were found after accounting for stability in both constructs. These mixed results are also evident in research in which student perceptions of relationship quality have been used. Whereas Zee and Koomen (2017) found nonsignificant associations between externalizing behavior and student-reported closeness, two other studies noted that children displaying externalizing behavior may report lower levels of trust in relation to their teacher (Koomen & Jellesma, 2015; Murray & Zvoch, 2011).

Evidence suggests that children's internalizing behavior also plays a role in teachers' perceptions of closeness over time, in both positive (Roorda et al., 2014) and negative directions (Arbeau et al., 2010; Valiente et al., 2012). Yet in other longitudinal studies no significant pathways have been found (Henricsson & Rydell, 2004; Jerome et al., 2009; Mejia & Hoglund, 2016). In contrast, using student-rated closeness, Jellesma et al. (2015) found significant negative correlations with internalizing symptoms in a sample of third to sixth graders, whereas Zee and Koomen (2017) did not. Together, these findings indicate that the link between prosocial behavior and emotionally close relationship patterns is probably the most robust, both in direction and magnitude.

Conflict

There is reason to believe that children's externalizing behavior may play a role in the development of avoidant attachment, as children are likely to express their feelings of rejection and refusal in the form of frustration, anger, and distress (Carlson

& Sroufe, 1995; Madigan et al., 2016). The student-teacher relationship literature is consistent with this conceptualization. In studies employing child reports (Koomen & Jellesma, 2015; Murray & Zvoch, 2011) and teacher reports of relationship quality (e.g., Birch & Ladd, 1998; Henricsson & Rydell, 2004; Jerome et al., 2009; Zhang & Sun, 2011), children with externalizing behavior have more conflict with teachers. Cross-lagged longitudinal studies (Crockett et al., 2018; Doumen et al., 2008; Mejia & Hoglund, 2016; Roorda et al., 2014) even found evidence for small reciprocal associations across elementary grades, with students' externalizing behavior predicting teacher-reported conflict and vice versa.

Although it has previously been theorized that internalizing symptoms such as depression and withdrawal can be tied to insecure-avoidant attachment (Carlson & Sroufe, 1995), empirical studies on student-teacher relationship quality are only partially consistent with these propositions. For instance, in several longitudinal studies, teachers have reported higher levels of conflict in relation to students who display internalizing behavior (Jerome et al., 2009; Murray & Murray, 2004; Roorda et al., 2014). At the same time, however, there is also some evidence to indicate that temperamental traits linked to internalizing symptoms, such as shyness, may contribute to lower levels of teacher-reported conflict (Rudasill, 2011). These results are partially substantiated by the results of Zee and Koomen (2017), who found that children's internalizing behavior was related to lower levels of student-reported, but not teacher-reported, conflict in the student-teacher relationship.

To date, only a limited number of studies have examined the potential role that prosocial behavior may play in conflict. Quite counterintuitively, meta-analytical findings from Nurmi (2012) suggest that students' prosocial behavior tendencies may lead to higher levels of (teacher-reported) conflict. Later longitudinal findings from Roorda et al. (2014) counter this, however, with evidence suggesting instead that teacher-reported conflict predicts lower levels of prosocial student behavior, and prosocial student behavior predicts lower levels of conflict across time, after controlling for the stability in these constructs as well as internalizing and externalizing student behavior. Taken together, these results indicate that externalizing student behavior may be the most robust predictor of conflict. Whether internalizing and prosocial behavior are associated with student perceptions of conflict, and in what direction, is yet to be established.

Dependency

Theorists have previously assumed that dependency in student-teacher relationships may be particularly relevant for children with internalizing symptoms, as it may interfere with their capability to master the environment and regulate their thoughts and emotions (cf. Madigan et al., 2016). Indeed, the few empirical studies on student-teacher dependency have revealed that children with internalizing behavior are more likely to be dependent on their teachers than their typically developing peers (Arbeau et al., 2010; Henricsson & Rydell, 2004). Moreover, in a cross-lagged panel study of 175 preschoolers, Roorda et al. (2014) found that teacher-reported dependency led to more internalizing behavior in children, and these internalizing behaviors, in turn, predicted higher levels of dependency.

Also, little is known about associations between children's prosocial behavior and dependency and externalizing behavior and dependency. Whereas Birch and Ladd (1998) and Henricsson and Rydell (2004) noted that higher levels of externalizing behavior predicted higher levels of dependency over time, Roorda et al. (2014) could not replicate this finding in their longitudinal study. In addition, Roorda et al. (2014) found that children's prosocial behaviors predicted less dependency on the teacher over time, but not vice versa. In other empirical research, however, children's tendency to act prosocially was directly associated with lower levels of dependency (Birch & Ladd, 1998; Henricsson & Rydell, 2004).

Thus, we can conclude that internalizing student behavior is associated with higher levels of dependency. Whether externalizing and prosocial behavior are associated with student perceptions of dependency is yet to be determined.

Classroom-Level Student-Teacher Relationship Quality as a Moderator

Student-teacher relationships are formed within a classroom milieu wherein the teacher plays a major role in shaping the global climate and emotional tone (Farmer et al., 2011; Hamre & Pianta, 2005). There is a small body of research supporting a moderating role for classroom-level teacher-student interactions (i.e., classroom quality) when examining teachers' perceptions of student-teacher relationships (Buyse et al., 2008; Rudasill et al., 2016). Buyse et al. (2008) found that children with problem behavior were more likely to have conflict with teachers in classrooms with low levels of emotional support. Somewhat in contrast to that, Rudasill et al. (2016) found that teachers who provided high emotional support reported higher conflict with all students, whereas those providing lower emotional support reported higher conflict only with students who were lower in regulation. In the current study, we view classroom-level teacher perceptions of relationship quality as a measure of the emotional climate of the classroom.

The Purpose of the Study

In this study, we aimed to extend the current body of work on student-teacher relationships by exploring the unique role of social-emotional child behaviors (internalizing, externalizing, and prosocial behavior) in children's mental representations of their relationships with teachers in middle childhood. Although these associations have been explored in the early grades of elementary school, relatively little is known about the relationships that upper elementary students with a variety of social-emotional behaviors experience with their teachers. In addition, the limited body of work that has examined these associations in middle childhood tends to primarily rely on questionnaire measures of relationship quality that may be less well suited to capture the feelings, behaviors, and emotions toward teachers that lie more outside children's conscious awareness. Investigating how child behavior and the broader climate of the classroom as detected by teachers may be associated with these or mental representations may provide a basis for interventions targeted to improving relationship quality and child well-being in upper elementary classrooms.

Based on the body of evidence from teacher reports and child reports of relationship quality, we expected externalizing behavior to be the most robust negative predictor of representational models that tap teacher-child conflict. In addition, we hypothesized that internalizing behavior would be the most robust predictor of representational models that tap dependency and that prosocial behavior would be the most robust predictor of representations that tap emotional closeness. Last, we hypothesized that high levels of classroom-level closeness as reported by teachers may buffer against feelings of attachment insecurity experienced by children with internalizing or externalizing behavior.

Method

Participants

The current study's data were gathered from a sample of 266 children and 35 teachers who were part of a larger investigation of students' internalizing symptoms in middle childhood. These children and their teachers were in 35 classrooms across eight regular Dutch elementary schools located in urban areas in the Netherlands. In this study, eight children from participating a teacher's classroom were randomly selected for inclusion. On average, 7.6 children in each classroom took part (range = 5–8 students).

Participating children (51.1% girls) attended grade 3 ($n = 68$), grade 4 ($n = 70$), grade 5 ($n = 66$), and grade 6 ($n = 62$), and their ages ranged from 8 to 13 years ($M = 9.92$ years, $SD = 1.28$ years). Most of the children (74.8%) identified themselves as native Dutch, with smaller percentages of children reporting Moroccan (7.1%), Turkish (4.1%), Surinamese (1.9%), or other (11.8%) ethnic backgrounds, and 0.4% chose not to report. This proportion of native Dutch students is somewhat consistent with the larger population of elementary school students in the Netherlands (66% Dutch origin; CBS Statline, 2018).

The sampled teachers (75.2% females) had a mean age of 39.77 years ($SD = 11.32$ years, range = 26–64 years), and their professional teaching experience ranged from 1 to 43 years ($M = 13.69$, $SD = 11.24$ years). These demographic characteristics are comparable to those of the larger population of Dutch teachers, who generally have a mean age of 43.3 years (range = 19–67 years) and typically are female (84%; Dienst Uitvoering Onderwijs, 2014).

Instruments

Children's social-emotional behaviors. Teachers completed the Dutch version of the Strengths and Difficulties Questionnaire (SDQ; van Widenfelt et al., 2003) for the eight randomly selected children from their classrooms. The SDQ is a 25-item screening questionnaire that can be used to evaluate children's psychopathology and adjustment in class. The original scale taps into positive and negative child behaviors that together represent five factors reflecting strengths (prosocial behavior) and difficulties (emotional symptoms, conduct problems, hyperactivity-inattention, and peer problems). In the present study, we used the three broadband factors of internalizing,

externalizing, and prosocial behavior, which are generally preferred over the original SDQ scales in low-risk samples (Goodman et al., 2010).

The externalizing behavior factor (10 items) combines the subscales of hyperactivity-inattention and conduct problems, with items such as “Restless, hyperactive, cannot sit still for long” and “Often has temper tantrums or hot tempers.” The internalizing behavior factor (eight items) reflects all items from the emotional symptoms factor and three items from the peer problems factor (i.e., “Rather solitary, tends to play alone,” “Gets on better with adults than with other children,” and “Picked on or bullied by other children”). Last, the prosocial behavior scale (seven items) comprises all five items from the prosocial scale and two items from the peer problems scale (i.e., “Generally liked by other children” and “Has at least one good friend”).

Teachers responded to the 25 items using a 5-point Likert scale, ranging from 1 (*not true*) to 5 (*certainly true*). In various studies (e.g., Goodman et al., 2010; Van Leeuwen et al., 2006; Zee et al., 2016), the psychometric properties of the three-factor SDQ model have been adequate, with internal consistencies ranging from .70 to .87 and factor loadings $> .41$. In the present study, the three-factor SDQ model yielded factor loadings between .38 and .85 and alpha (α) coefficients of .88 for externalizing behavior, .83 for internalizing behavior, and .86 for prosocial behavior, respectively.

Children’s mental relationship representations. In line with the methods proposed by Fury et al. (1997) and Harrison et al. (2007), children were asked to “draw a picture of yourself and your teacher in the classroom” on a standard white A4 sheet of paper. To make the task as open-ended as possible, children were allowed to make use of all available drawing materials in the classroom (e.g., colored pencils, felt-tip pens, glitter gel pens, ink pens) and were given no further instructions during the drawing task. Consequently, many children chose to add notes, speech bubbles, or thought balloons in their pictures. A research assistant was present to remind children that the drawing should include the teachers. Although no time limits were given, the majority of children finished their drawings within 10–15 min.

Qualitative ratings of the drawings were provided by trained research assistants. These assistants had not been present during the drawing tasks and were trained extensively prior to coding the drawings. In total, eight dimensions of children’s mental relationship representations across four domains (closeness, conflict, dependency, and overall adjustment) were coded. This classification was based on prior empirical research investigating the quality of student-teacher relationships (e.g., Koomen et al., 2012). Relational closeness generally reflects children’s views of themselves as competent and worthy of affection, their disclosing behavior, their confidence in the teacher in times of stress and need, and pleasurable emotions. This relationship domain was captured through the dimensions of vitality/creativity and pride/happiness, which are based on the level of detail, color, and symbols of positive affect and connection in the drawing. Examples of drawing elements are detailed clothes or physical characteristics, color, and moving figures (vitality/creativity), and positive facial expressions, direct open stance, or figures doing an activity together (pride/happiness). Examples of these elements are displayed in Figure 1.

Conflict, which refers to children’s views of their teacher as negative, distrustful, or rejecting, was reflected in the drawing dimensions tension/anger, role reversal, and bizarreness/dissociation. These constructs are related to such drawing elements



Figure 1. Examples of drawings reflecting high levels of closeness. Both drawings are colorful and detailed (e.g., rabbit on the student’s shirt in drawing 1) and engaging to look at (vitality/creativity). The figures look happy and connected, as shown by moving figures (e.g., teacher and child riding horse together in drawing 2) and happy facial expressions (pride/happiness). Both drawings are made by girls (grade 4 and grade 5, respectively). Color version available as an online enhancement.

as scrunched or constricted figures and angry facial expressions (tension/anger), differentiation of size of figures and distorted or exaggerated body parts (role reversal), and fantasy themes or unusual or morbid symbols (e.g., sharp teeth, cannons, dragons, swear words; bizarreness/dissociation). See Figure 2 for examples of drawings reflecting high levels of conflict.

The domain of dependency reflects children’s intense desire for affection and constant concerns about the teacher’s availability. This domain is captured through the dimensions of emotional distance/isolation, with drawing elements such as exaggerated body parts, physical barriers, and distance between the child and the teacher, and vulnerability, with drawing elements such as disproportionate size of the figures (e.g., unusually large teacher, small student), overlapping figures, or figures that are bunched in a corner of the paper (see Figure 3).

Last, the domain of overall adjustment was captured in the global pathology dimension, which taps children’s global rating of students’ feelings about the relationship with the teacher. The scale focuses on global aspects of the drawing as a whole, rather than on specific parts. High ratings reflect a strikingly high degree of disharmony, sadness, or emotional alienation in the relationship, with elements such as complete lack of background, poor integration, or angry facial expressions.

All dimensions were coded on Likert-type 7-point scales, with scores of 1–2 representing the lower end on the scale (*no or little evidence for the construct*), 3–5 reflecting the midrange (*mixed evidence for the construct*), and 6–7 tapping the higher end of the scale (*ample evidence for the construct*). Codes were based on Fury’s (1996) original child-family scoring manual, which was translated and adapted to the Dutch

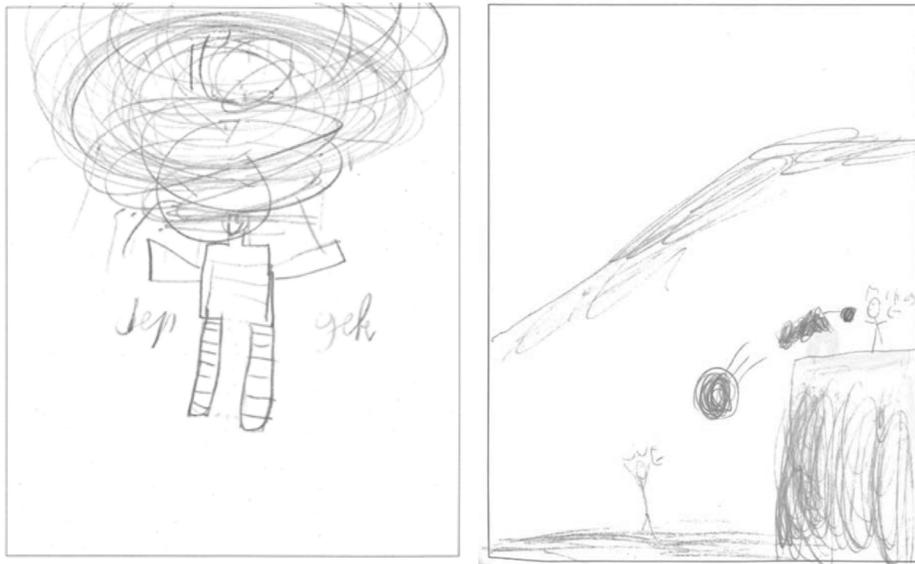


Figure 2. Examples of drawings reflecting high levels of conflict. High scores on tension/anger are attributable to negativity in the way of drawing (e.g., scribbling, false starts; drawing 1) or the impression that the child wants to hurt the teacher (e.g., firing a cannon, drawing 2). Role reversal is reflected in power distance (e.g., the child standing on a cliff above the teacher; drawing 2) and bizarreness/dissociation is reflected in unusual or morbid symbols (e.g., a cannon, dark clouds; drawing 2). Pictures are drawn by boys (grade 4). Color version available as an online enhancement.

school context by Zee and Roorda (2017). This manual provided detailed and comprehensive examples of each of the dimensions that were reflected in drawings.

All drawings were independently rated by two coders, and scores were based on the coders' average scores. Overall, differences ≥ 2 scale points across dimensions were found in only 0.8–2.8% of the cases. For four drawings, however, large differences (≥ 3 scale points) on more than three dimensions were found. These drawings were therefore excluded from analyses. Intraclass correlations (ICCs), based on the average ratings of the coders, were calculated for each of the dimensions to evaluate the degree of agreement between coders. Adequate interrater agreement was found for all constructs, with ICCs ranging from .72 (tension/anger) to .86 (emotional distance/isolation). Hence, the drawings, as used in the present study, can be considered reliable.

Classroom-level teacher perceptions of student-teacher relationship. The emotional climate of the classroom was measured using the short form of the authorized translated Dutch version of the STRS (Koomen et al., 2012). This 15-item instrument estimates student-teacher relationship quality on the three dimensions of closeness (e.g., “I share an affectionate and warm relationship with this child”), conflict (e.g., “This child and I always seem to be struggling”), and dependency (e.g., “This child reacts strongly to separation from me”). All dimensions consisted of five items each; these items were answered by teachers on a 5-point Likert-type scale (1 = *definitely does not apply*; 5 = *definitely applies*).

The validity and reliability of scores from the STRS have been found to be adequate in prior empirical research (Zee et al., 2013; Zee & Koomen, 2017). A validation

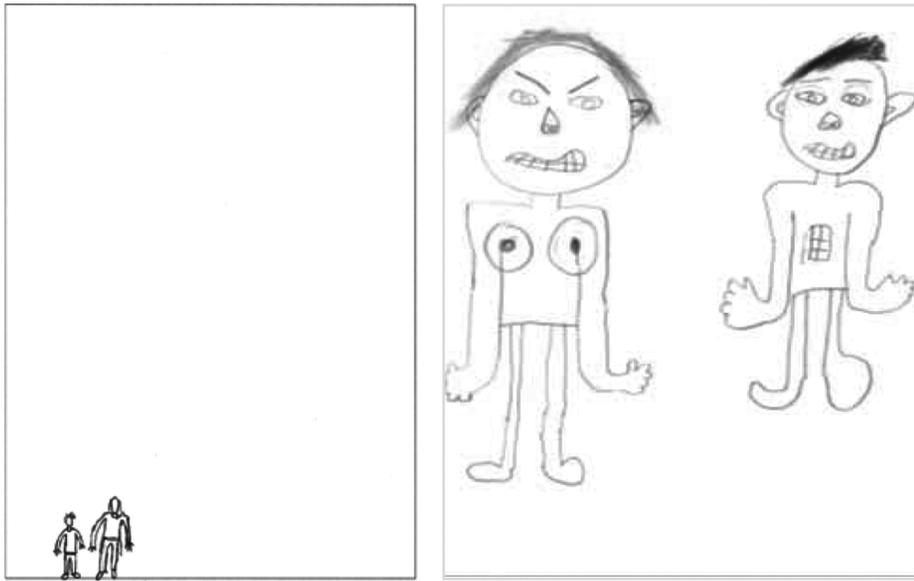


Figure 3. Examples of drawings reflecting high levels of dependency. High scores on emotional distance/isolation are due to exaggerated body parts (e.g., large hands and teacher’s breasts in drawing 2), lack of color, and angry/ambivalent facial expressions. High scores on vulnerability are attributable to disproportionate size of the figures and figures that are bunched in the corner of the page (drawing 1). Pictures are drawn by a girl (grade 5) and boy (grade 4), respectively. Color version available as an online enhancement.

study of Koomen et al. (2012), for instance, provided evidence for the construct validity of the three dimensions of the STRS and for metric invariance across gender and age. In addition, the moderate to strong correlations of the STRS subscales with teacher- and parent-reported problem and prosocial behaviors (SDQ) seemed to indicate sufficient concurrent validity as well. Scores based on teachers’ responses on the three subscales have also been found to be reliable, with Cronbach’s α s ranging between .88 and .93 for closeness, .88 and .91 for conflict, and .77 and .82 for dependency, respectively (e.g., Zee et al., 2013; Zee & Koomen, 2017).

Teachers’ scores on the three relationship dimensions in the present study had acceptable reliability, with .86 for closeness, .89 for conflict, and .82 for dependency, respectively. Furthermore, we found weak to moderate levels of correspondence between teachers’ relationship perceptions and dimensions of student-teacher relationship drawings. Specifically, closeness was positively associated with vitality/creativity ($r = .25, p < .001$) and conflict was positively associated with both tension/anger ($r = .23, p < .001$) and bizarreness/dissociation ($r = .27, p < .001$). Furthermore, these relationship dimensions were associated in the expected direction with global pathology ($r = -.20$ and $.22, p < .001$, respectively). Dependency, however, was not associated with drawing dimensions related to this domain. All correlations are displayed in the Appendix.

To get an indication of the average relationship quality experienced by teachers in the classroom, we aggregated the teacher-reported relationship dimensions to the classroom level of analysis. In prior studies (e.g., Zee et al., 2018), aggregation of

eight students per classroom has been shown to be sufficient to generate reliable aggregate variables.

Procedure

Prior research (Roorda et al., 2014) has suggested that student-teacher relationship patterns have yet to be crystalized in the first couple of months of the school year. Therefore, we chose to collect data between February and March 2017, when children's relationship representations are likely to be more stable. Prior to data collection, we contacted approximately 200 schools in both rural and urban areas across the Netherlands by email and telephone. These schools were randomly selected from a website with all schools in the Netherlands. In addition, we placed messages on social media (e.g., LinkedIn, Facebook), in which we invited teachers and children from their classrooms to take part in this research. Of all schools that were contacted, eight ultimately agreed to participate. Nonparticipation was mainly due to already full agendas or involvement in other research studies. After schools agreed to participate, either school principals or participating teachers distributed information letters and consent forms to children's parents. From all consents received (95%), we randomly selected eight children from participating teachers' classrooms and subsequently let these teachers know which eight children to report on.

During a planned school visit, children in teachers' classrooms were asked to provide information about their background characteristics and make a drawing of themselves with their teacher. To ensure that children could draw freely and individually, their desks were set apart and their teachers were asked to leave the classroom. In addition, to reduce systematic error in children's output, a research assistant was present in the classroom to explain the procedure, answer children's questions, and ensure that the children did not look at each other's drawings. Overall, children were finished in approximately 30 min. Completed student-reported questionnaires and coded drawings were available for 96% of the sample. Nonparticipation was mainly due to absence or illness at the time of data collection (3%). Less than 1% of the children who were present during data collection did not complete their drawing, either due to time constraints or unwillingness to draw.

Teachers were asked to complete several items about their relationship with individual students from their classrooms (STRS) as well as some questions about their background characteristics. These questionnaires were collected via a digital survey link that was emailed around the same time as the school visit. Teachers were asked to complete the digital questionnaire within 2 weeks. The total survey took approximately 40 min to complete. Complete teacher-reported data were available for 99% of the students. Using Little's Missing Completely at Random Test, no systematic patterns of missingness were identified, $\chi^2(439) = 456.54, p = .272$.

Data Analysis

Using Mplus version 7.11 (Muthén & Muthén, 1998–2012), we fitted a series of multivariate hierarchical linear models to evaluate the unique contribution of children's social-emotional behaviors to their mental representation of the student-teacher relationship. This technique takes the clustering of students within teachers

into account by partitioning the variation in the student-teacher relationship quality between and within teachers (Snijders & Bosker, 1999). Thereby, it allows for the calculation of unbiased estimates of the standard errors associated with the regression coefficients and for the inclusion of both teacher and student factors in models with outcomes at the student level. Maximum likelihood estimation with robust standard errors and a scaled test statistic (MLR) was chosen as the estimation method, and missing data (<5.0%) were treated using full information maximum likelihood estimation (Muthén & Muthén, 1998–2012).

In line with the methods proposed by Raudenbush and Bryk (2002), we adopted a stepwise sequential modeling strategy, reflecting an increasing complexity with each successive model. To avoid model complexity and ease the interpretation of results, we fitted separate models for drawing dimensions within the domains of closeness, conflict, and dependency. First, we fitted an unconditional means model without adding predictors and covariates to the data. This model was estimated to partition the variance across the two levels. Second, we included students' gender, age, and ethnicity as covariates to the model, as well as their internalizing, externalizing, and prosocial behavior. For ease of interpretation, predictors were centered on the grand mean. Third, we added teachers' gender and teaching experience, and average classroom relationship quality (closeness, conflict, and dependency) to explain variance at the between-teacher level. Last, to examine the existence of cross-level interactions, we allowed potential random slopes to vary across teachers. If a particular association between students' social-emotional behaviors and drawing dimensions significantly varied across classrooms, cross-level interactions were added.

Results

Descriptive Statistics

Table 1 presents descriptive statistics, including zero-order correlations, means, standard deviations, and ranges of the variables. In line with expectations, weak to moderate positive correlations were found between externalizing behavior and drawing dimensions associated with conflict and dependency (r s between .17 and .33, $p < .01$), and weak to moderate negative correlations were noted between externalizing behavior and drawing dimensions associated with closeness (r s between $-.19$ and $-.21$, $p < .01$). In addition, similar but reverse correlation patterns were found for prosocial behavior, which was positively correlated with drawing dimensions aligned with closeness (r s between .15 and .30, $p < .01$) and negatively correlated with drawing dimensions aligned with conflict and dependency (r s between $-.12$ and $-.27$, $p < .01$), respectively. Of note, neither was children's internalizing behavior correlated with any of the coded drawing dimensions, nor were average levels of classroom-level teacher perceptions of student-teacher relationships. Only the association between classroom-level closeness and emotional distance/isolation was statistically significant ($r = .12$, $p < .01$). The correlations among the drawing dimensions were all in the expected directions, with positive correlations between negative drawing dimensions aligned with conflict and dependency, and positive correlations between positive drawing dimensions aligned with closeness.

Table 1. Means, Standard Deviations, and Zero-Order Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1. Teacher gender	—																		
2. Teaching experience	.06	—																	
3. Child gender	-.01	-.02	—																
4. Child age	-.29**	.03	.03	—															
5. Child ethnicity	.12	-.04	.05	.04	—														
6. Externalizing behavior	.08	-.11	-.33**	-.06	-.10	—													
7. Internalizing behavior	.06	-.29**	-.04	.01	-.07	.37**	—												
8. Prosocial behavior	-.03	.26**	.32**	.05	.11	-.51**	-.40**	—											
9. Average closeness	.30**	.47**	.02	-.14*	-.04	-.16**	-.29**	.41**	—										
10. Average conflict	.15*	-.29**	-.01	-.03	-.03	.28**	.32**	-.26**	-.43**	—									
11. Average dependency	.05	-.30**	.02	-.09	.04	.29**	.35**	-.20**	-.28**	.71**	—								
12. Creativity/vitality	-.04	.02	.45**	-.06	.19**	-.19**	-.10	.30**	.09	-.11	.04	—							
13. Pride/happiness	-.02	-.14*	.32**	-.13*	.01	-.21**	.01	.15*	-.04	.01	.10	.48**	—						
14. Vulnerability	-.02	.09	-.35**	.08	-.12	.26**	.08	-.22**	.05	.01	-.06	-.46**	-.65**	—					
15. Emotional distance/ isolation	.04	.18**	-.19**	.13*	-.01	.17**	-.05	-.12	.12*	-.02	-.10	-.31**	-.69**	.74**	—				
16. Tension/anger	.07	.09	-.39**	.06	-.06	.27**	.02	-.24**	-.02	.11	-.04	-.56**	-.79**	.58**	.52**	—			
17. Role reversal	.07	.01	-.31**	-.05	-.07	.17**	.05	-.24**	-.01	-.01	-.04	-.48**	-.31**	.37**	.32**	.38**	—		
18. Bizarreness/dissociation	.08	.09	-.42**	-.02	-.13*	.33**	-.02	-.27**	.02	.01	-.08	-.54**	-.72**	.59**	.49**	.81**	.37**	—	
19. Global pathology	.07	.05	-.41**	.07	-.12	.27**	.06	-.29**	-.02	.05	-.09	-.73**	-.73**	.72**	.61**	.77**	.51**	.76**	—
Mean	—	13.69	—	9.92	—	1.88	1.83	4.15	3.95	1.66	1.90	3.98	4.75	3.51	3.41	2.99	2.93	2.69	3.89
Standard deviation	—	11.24	—	1.28	—	.77	.74	.69	.46	.46	.47	1.13	.97	1.39	1.30	.92	.92	.99	1.13
Range	—	1-43	—	8-13	—	1-5	1-5	1-5	1-5	1-5	1-5	1-7	1-7	1-7	1-7	1-7	1-7	1-7	1-7

Note.—Gender: 0 = boys/male teachers, 1 = girls/female teachers; ethnicity: 0 = migrant background, 1 = native Dutch.

* $p < .05$.

** $p < .01$.

With regard to teacher and child demographics, children experienced higher levels of emotional distance ($r = .18, p < .01$) and lower levels of pride/happiness ($r = -.14, p < .05$) in relation to their more experienced teachers. Also, girls were consistently rated higher on drawing dimensions related to closeness (r s between .32 and .45, $p < .01$) and lower on drawing dimensions related to conflict and dependency (r s between $-.19$ and $-.41, p < .01$) than boys. Older children’s drawings displayed less pride/happiness ($r = -.13, p < .05$) and more emotional distance/isolation ($r = .13, p < .05$) than younger children’s drawings, and Dutch children’s drawings appeared to display higher levels of creativity and vitality ($r = .19, p < .01$), and lower levels of bizarreness/dissociation ($r = -.13, p < .05$), than children with migrant backgrounds.

Last, means ranging between 2.69 (bizarreness/dissociation) and 4.75 (pride/happiness) indicated that children depicted moderate levels of relational positivity in their drawings. This is largely in line with overall levels of classroom-average closeness ($M = 3.95, SD = 0.46$), conflict ($M = 1.66, SD = 0.46$), and dependency ($M = 1.90, SD = 0.47$). Furthermore, according to their teachers, children in this sample displayed relatively high levels of prosocial behavior ($M = 4.15, SD = 0.69$) and relatively low levels of internalizing ($M = 1.83, SD = 0.74$) and externalizing behavior ($M = 1.88, SD = 0.77$), respectively. These overall levels of social-emotional behavior are consistent with prior studies using nonrisk samples (Zee et al., 2016).

Multilevel Models of Children’s Mental Representational Models

Closeness. ICC coefficients for the model containing pride/happiness and creativity/vitality as outcome variables indicated that between 3.2% and 4.5% of the two drawing dimensions occurred between classrooms. Accordingly, fixed effects of children’s background characteristics and social-emotional behaviors were entered in Model 1, and teachers’ background features and classroom-level perceptions of student-teacher relationship variables were entered in Model 2. Results of these models are displayed in Table 2.

Model 1 revealed statistically significant positive associations of children’s gender with both vitality/creativity and pride/happiness, indicating that these positive dimensions were more indicative of girl’s drawings than boy’s drawings. These associations remained in Model 2 when classroom-level variables were added ($\gamma = .40$ for pride/happiness; $\gamma = .86$ for creativity/vitality, $p < .001$). In addition, native Dutch children appeared to be more creative in their drawings than children from minority backgrounds, after accounting for classroom-level variables ($\gamma = .46, p < .001$), and older children depicted less pride/happiness in their drawings than did their younger counterparts ($\gamma = -.11, p < .05$). Yet this association only became statistically significant in Model 2.

With respect to children’s social-emotional behaviors, only externalizing behavior was negatively associated with pride/happiness, after accounting for classroom-level variables ($\gamma = -.20, p < .01$). This indicates that with each scale point higher on children’s externalizing behavior, the degree of pride/happiness in their drawings is expected to decrease by $-.20$ scale points (Hox, 2002). Last, children displayed more creativity in their drawings when their teachers rated them as more prosocial ($\gamma = .38,$

Table 2. Multilevel Results for Drawing Dimensions Related to Closeness

	Pride/Happiness		Creativity/Vitality	
	Model 1 γ (SE)	Model 2 γ (SE)	Model 1 γ (SE)	Model 2 γ (SE)
Fixed parameters:				
Intercept	4.75 (.06)***	4.97 (.20)***	3.98 (.06)***	4.22 (.15)***
Child-level variables:				
Child gender	.43 (.12)***	.40 (.12)***	.86 (.14)***	.86 (.14)***
Child age	-.09 (.05)	-.11 (.05)*	-.07 (.04)	-.07 (.04)
Child ethnicity	.04 (.13)	.04 (.13)	.44 (.12)***	.46 (.13)***
Externalizing behavior	-.21 (.07)**	-.20 (.07)**	.05 (.09)	.06 (.09)
Internalizing behavior	.08 (.09)	.07 (.09)	.02 (.09)	.04 (.10)
Prosocial behavior	.08 (.11)	.14 (.13)	.36 (.13)***	.38 (.13)***
Classroom-level variables:				
Teacher gender		-.06 (.19)		-.29 (.17)
Teaching experience		-.01 (.01)*		-.001 (.01)
Average closeness		-.27 (.44)		.26 (.38)
Average conflict		-.11 (.47)		-.61 (.21)**
Average dependency		.23 (.47)		.66 (.30)*
Random parameters:				
Classroom-level variance		.04 (.04)		.003 (.05)
Child-level variance	.80 (.10)***	.79 (.10)***	.93 (.08)***	.90 (.07)***
Intraclass correlation		.05		.03
R^2	.13	.14	.27	.29

Note.—Gender: 0 = boys/male teachers, 1 = girls/female teachers; ethnicity: 0 = migrant background, 1 = native Dutch.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

$p < .001$). Note, however, that the proportion of variance explained by children's social-emotional behavior is very low (see Table 2).

Next to these child-level variables, Model 2 also revealed a significant negative association between teaching experience and pride/happiness ($\gamma = -.01$, $p < .05$). Also, the paths from the average of classroom conflict ($\gamma = -.61$, $p < .01$) and dependency ($\gamma = .66$, $p < .05$) to creativity/vitality were significantly different from zero, suggesting that children in classrooms with lower levels of teacher-perceived conflict and higher levels of dependency made drawings with more creativity.

Conflict. Multilevel model estimates for tension/anger, bizarreness/dissociation, and role reversal are displayed in Table 3. Assessment of unstandardized coefficients indicated that children's gender was the most robust predictor of drawing dimensions related to conflict, with girls depicting lower levels of tension/anger ($\gamma = -.60$, $p < .001$), role reversal ($\gamma = -.48$, $p < .001$), and bizarreness/dissociation ($\gamma = -.64$, $p < .001$) than boys, both in Models 1 and 2. In addition, children with a native Dutch background depicted significantly less bizarreness/dissociation in their drawings than children with other backgrounds ($\gamma = -.30$, $p < .05$), but only after accounting for teacher and classroom factors at the classroom level.

Of children's social-emotional behaviors, externalizing behavior was significantly and positively associated with both tension/anger ($\gamma = .19$, $p < .01$) and bizarreness/dissociation ($\gamma = .27$, $p < .01$), even when classroom-level variables were accounted for. Also, there was less indication of role reversal in drawings of children who were

Table 3. Multilevel Results for Drawing Dimensions Related to Conflict

	Tension/Anger		Role Reversal		Bizarreness/Dissociation	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	γ (SE)	γ (SE)				
Fixed parameters:						
Intercept	2.97 (.06)***	3.44 (1.17)**	2.92 (.06)***	3.39 (2.26)	2.71 (.06)***	5.20 (1.70)**
Child-level variables:						
Child gender	-.60 (.10)***	-.60 (.10)***	-.49 (.09)***	-.48 (.08)***	-.65 (.10)***	-.64 (.10)***
Child age	.04 (.04)	.04 (.04)	-.03 (.04)	-.02 (.04)	.00 (.04)	.00 (.05)
Child ethnicity	-.10 (.13)	-.12 (.13)	-.12 (.12)	-.14 (.14)	-.26 (.15)	-.30 (.13)*
Externalizing behavior	.21 (.08)**	.19 (.08)**	.04 (.09)	.05 (.08)	.29 (.09)**	.27 (.09)**
Internalizing behavior	-.14 (.08)	-.13 (.08)	-.07 (.05)	-.09 (.06)	-.13 (.10)	-.11 (.09)
Prosocial behavior	-.11 (.07)	-.16 (.09)	-.20 (.08)**	-.21 (.09)**	-.13 (.09)	-.17 (.09)
Classroom-level variables:						
Teacher gender		.51 (.38)		.34 (.74)		.87 (.44)
Teaching experience		.53 (.33)		.07 (.37)		.67 (.23)**
Average closeness		-.37 (.47)		.11 (.88)		-.79 (.54)
Average conflict		.63 (.54)		.22 (.56)		-.06 (.36)
Average dependency		-.26 (.43)		-.86 (.64)		-.11 (.30)
Random parameters:						
Classroom-level variance		.14 (.87)		.21 (.82)		.12 (.58)
Child-level variance	.70 (.09)***	.86 (.06)***	.71 (.07)***	.74 (.05)***	.75 (.10)***	.74 (.05)***
Intraclass correlation		.04		.03		.04
R^2	.20	.21	.14	.14	.25	.26

Note.—Gender: 0 = boys/male teachers, 1 = girls/female teachers; ethnicity: 0 = migrant background, 1 = native Dutch.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

rated by their teachers as prosocial, both in Model 1 and final Model 2 ($\gamma = -.21, p < .01$). At the classroom level, only teachers’ years of experience were significantly and positively associated with bizarreness/dissociation ($\gamma = .67, p < .01$). Again, only a small proportion of the variance in tension/anger (21%), bizarreness/dissociation (26%), and role reversal (14%) was explained in this model.

Dependency and overall adjustment. Multilevel model estimates for drawing dimensions related to dependency and children’s overall adjustment are displayed in Table 4. In Model 1, including children’s background characteristics and social-emotional behaviors, children’s age ($\gamma = .13, p < .05$), gender ($\gamma = -.74, p < .001$), and externalizing behavior ($\gamma = .25, p < .05$) were significantly associated with vulnerability. Of these, only the unique contributions of age and gender remained in Model 2 when classroom-level factors were added, such that boys and older children depicted more vulnerable details in their drawings. In addition, emotional distance/isolation was positively predicted by children’s age ($\gamma = .15, p < .05$) and externalizing behavior ($\gamma = .28, p < .01$), and negatively predicted by their internalizing behavior ($\gamma = -.26, p < .01$). After controlling for teachers and classroom factors at the classroom level, however, only the coefficient for age reached the significance threshold. Focusing on children’s overall adjustment, results indicated statistically significant negative associations for children’s gender ($\gamma = -.62, p < .001$), internalizing behavior ($\gamma = -.28, p < .05$), and prosocial behavior ($\gamma = -.29, p < .01$) with global pathology in Model 1. Age was significantly and positively associated with global pathology in this model ($\gamma = .10, p < .05$). Yet in Model 2, when the

Table 4. Multilevel Results for Drawing Dimensions Related to Dependency and Overall Adjustment

	Vulnerability		Emotional Distance/ Isolation		Global Pathology	
	Model 1 γ (SE)	Model 2 γ (SE)	Model 1 γ (SE)	Model 2 γ (SE)	Model 1 γ (SE)	Model 2 γ (SE)
Fixed parameters:						
Intercept	3.54 (.07)***	3.56 (.28)***	3.40 (.09)***	3.31 (.26)***	3.87 (.07)***	3.76 (.19)***
Child-level variables:						
Child gender	-.74 (.17)***	-.70 (.17)***	-.32 (.16)	-.27 (.16)	-.62 (.14)***	-.61 (.14)***
Child age	.13 (.06)*	.15 (.07)*	.15 (.06)*	.18 (.05)**	.10 (.04)*	.13 (.05)*
Child ethnicity	-.23 (.16)	-.18 (.15)	-.01 (.20)	.05 (.18)	-.18 (.15)	-.19 (.16)
Externalizing behavior	.25 (.12)*	.24 (.20)	.28 (.10)**	.26 (.14)	.18 (.10)	.17 (.13)
Internalizing behavior	-.04 (.13)	-.02 (.31)	-.26 (.10)**	-.22 (.18)	-.28 (.12)*	-.29 (.21)
Prosocial behavior	-.07 (.11)	-.15 (.17)	-.09 (.10)	-.19 (.13)	-.29 (.11)**	-.22 (.13)*
Classroom-level variables:						
Teacher gender		-.20 (.23)		-.14 (.24)		.16 (.18)
Teaching experience		.01 (.01)		.01 (.01)		.00 (.01)
Average closeness		.82 (.69)		.96 (.62)		.39 (.49)
Average conflict		.55 (.52)		.63 (.45)		.53 (.41)
Average dependency		-.54 (.71)		-.75 (.55)		-.61 (.51)
Random parameters:						
Classroom-level variance		.003 (.58)		.08 (.28)		.01(.19)
Child-level variance	1.70 (.20)***	1.65 (.20)***	1.54 (.21)***	1.47 (.19)***	1.10 (.10)***	1.07 (.08)***
Intraclass correlations		.03		.06		.02
R^2	.14	.15	.08	.10	.19	.20

Note. Gender: 0 = boys/male teachers, 1 = girls/female teachers; ethnicity: 0 = migrant background, 1 = native Dutch.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

classroom-level covariates were added, internalizing behavior was no longer statistically significant. At the classroom level, none of the teacher or classroom climate variables differed significantly from zero. Together, the variables explained only 15%, 10%, and 20% of the child-level variance in vulnerability, emotional distance/isolation, and global pathology, respectively.

Cross-level interactions. To explore whether classroom-level teacher perceptions of student-teacher relationship quality moderated the associations among children's social-emotional behavior and their mental representations of the student-teacher relationship, we first allowed the slopes for these associations to vary across classrooms. Yet none of the random slope coefficients reached the significance threshold, indicating that none of the parameters varied across classrooms. This is perhaps not surprising, given the relatively low ICCs reported in Tables 2–4. Given this lack of random slope variation, no cross-level interactions could be included.

Discussion

In this study, we explored the unique role of a range of social-emotional child behaviors in children's mental representations of student-teacher relationships in middle childhood. In addition, we explored whether classroom-level teacher perceptions of student-teacher relationship quality may buffer or exacerbate associations between children's social-emotional behaviors and their mental relationship representations.

Three primary findings emerged from the current study. First, although the findings are modest, children’s externalizing problems and prosocial tendencies, but not their internalizing behavior, appeared to be relevant for their mental representations of the student-teacher relationship. Second, girls consistently depicted higher levels of attachment security (closeness) and lower levels of attachment insecurity (conflict and dependency) in their relationship drawings than boys. There were also indications of age- and ethnicity-related differences. Finally, dimensions of children’s mental relationship representations tended to vary more across children than across classrooms, explaining why emotional classroom climate did not moderate linkages between child behavior and relationship quality. Together, these findings may provide a basis for interventions targeted to improving relationship quality and child well-being in upper elementary classrooms.

Associations Between Social-Emotional Child Behaviors and Mental Representations

Initial evidence from this study corroborates the hypothesis that externalizing behavior may be the most robustly linked to child representational models that tap insecure-avoidant attachment. Specifically, children who were rated by their teachers as hyperactive and disruptive to others were likely to depict higher levels of tension and anger, lower levels of belongingness and happiness, and more underlying disorganization by bizarre signs in their drawings. These findings are generally consistent with research based on Bowlby’s (1969) theoretical contentions, suggesting that children with externalizing behavior tend to express their feelings of rejection and insecure attachment in the form of frustration, anger, and distress (Carlson & Sroufe, 1995; Madigan et al., 2016). Moreover, studies using questionnaire measures of student-teacher relationship quality (e.g., Birch & Ladd, 1998; Crockett et al., 2018; Hamre et al., 2008; Henricsson & Rydell, 2004) have shown that teachers’ reports of problem behaviors may explain as much as 53% of the variance in conflictual student-teacher relationships. In contrast to those studies, though, we used a multi-informant approach to evaluate linkages between child behavior and student-teacher relationships. Thus, instead of commonly using teacher reports of both social-emotional student behavior and relationship quality, which may result in an overestimation of associations, we evaluated students’ behavior through a teacher-reported survey and relationship quality through children’s relationship drawings. In doing so, we might have canceled out any influences that teachers’ feelings and beliefs about the child may have on their ratings of relationship quality and overcome potential shared source variance. This is relevant, as the distinction between externalizing behavior and student-teacher conflict, which also partly highlights children’s behavior in the relationship, may not always be clear (Hamre et al., 2008; Konold & Pianta, 2007).

Attachment theorists have previously postulated that children with internalizing behavior may also be prone to developing mental representations reflecting ambivalent and/or avoidant attachment, as they are more likely to experience psychological unavailability of their teacher (cf. Carlson & Sroufe, 1995). Yet evidence from our study largely suggests some contradictions with these assumptions, both in terms of direction and magnitude. Specifically, children who were rated by their teachers as displaying internalizing problems drew pictures with lower levels of emotional

distance and disconnection between themselves and their teachers and had fewer adjustment problems than children without such behavior. This is inconsistent with previous empirical research, in which children with internalizing behavior were more dependent on their teachers than their typically developing peers (Arbeau et al., 2010; Henricsson & Rydell, 2004; Roorda et al., 2014).

We can only make a well-educated guess about these inconsistent and generally nonsignificant associations. In our study, for instance, teachers were the source of information in the identification of internalizing behavior. Although teachers have the unique opportunity to observe the behavior and subtle cues of children with internalizing behavior, previous studies suggest that teachers may vary considerably in their perceptions and interpretations of children's behaviors (e.g., Achenbach et al., 1987; Keiley et al., 2003). Moreover, teacher reports have also been shown to differ considerably from children's own reports of their internalizing symptoms (Achenbach et al., 1987; Madigan et al., 2016). One common explanation for this lack of agreement is that children with internalizing symptoms, by virtue of their passively compliant attitude, do not often disturb teachers' lessons, challenge their authority, or evoke frustration in them (Coplan & Prakash, 2003; Rubin & Coplan, 2004). Accordingly, these children may not only be less visible but also less likely to attract the attention of their typically harried teacher than children with more overt externalizing or prosocial behavior (Achenbach et al., 1987; Tandon et al., 2009). This may increase the likelihood of teachers underreporting internalizing symptoms (Sointu et al., 2012).

In a similar vein, recent meta-analytical evidence from Madigan and colleagues (2016) has demonstrated that effect sizes of the links between attachment patterns and internalizing behavior are consistently stronger when children report on their own internalizing behavior than when their teachers or parents report on these emotional problems. These findings remained even after controlling for child age, attachment methodology (questionnaires, relationship drawings), and type of internalizing behavior. Hence, it is possible that the modest associations found in this study might have been stronger when more valid child reports of internalizing behavior were used or when reciprocal associations were evaluated.

After accounting for child features and classroom and teacher characteristics, we found modest evidence for the idea that children with prosocial behavior in the classroom were more likely to invest emotionally in their drawings than their less prosocial counterparts. That is, their drawings were coded as showing more creativity and vibrancy via the use of color, shape, and line. Furthermore, these children were less inclined to draw a role-reversal kind of relationship with their teacher (i.e., depicting their feelings or needs as more important than their teachers') and showed lower levels of overall maladjustment. As such, this study contributes to the small body of evidence supporting the idea that prosocial acts, such as helping, sharing, and cooperating (Dunfield & Kuhlmeier, 2013), and the quality of student-teacher relationships are positively linked to one another (e.g., Birch & Ladd, 1998; Nurmi, 2012; Roorda et al., 2014).

Quite surprisingly, though, we only found a statistically significant association between prosocial behavior and the positive drawing dimension of creativity/vitality, but not for pride/happiness. Generally, this was inconsistent with our expectation that prosocial children may have a higher sense of teacher pride and

belongingness and generally feel more comfortable with their teacher than less well-behaved children. There are some indications, however, that teachers spend less time with children displaying prosocial behavior and may even fail to give these children credit for their behavior (e.g., Arbeau & Coplan, 2007; Nesdale & Pickering, 2006). This may be especially true in the upper elementary grades, where children are likely to struggle with heavy curricular demands and growing independence from their teachers (Ang et al., 2008; Lynch & Cicchetti, 1997). Conceivably, this lack of teacher praise and support in the upper elementary grades may be reflected in children’s drawings as well, explaining why we only found associations between prosocial behavior and vitality/creativity, and not pride/happiness. Not only does the creativity/vitality dimension capture children’s emotional investment in completing the task, which is line with their tendency to share and cooperate (Dunfield & Kuhlmeier, 2013), it also does not necessarily reflect children’s emotional closeness to the teacher. Indeed, children can express their emotional investment and creativity in either positive or disturbing and complex ways (Fury et al., 1997). Hence, further research on the linkages between prosocial child behavior and mental representational models in middle childhood is needed.

Last, there is evidence suggesting that linkages between social-emotional child behavior and attachment (in)security may vary as a function of children’s age. For instance, meta-regression results from Madigan et al. (2016) showed that the association between children’s attachment and their internalizing behavior became weaker as children matured. This moderating role of age may provide an explanation for why our results departed from previous research (Arbeau et al., 2010; Henricsson & Rydell, 2004; Roorda et al., 2014), which generally used samples of young children. Here, instead, we used a sample of children between 9 and 12 years old.

Associations Between Child Characteristics and Mental Representations

Across all dimensions but emotional distance/isolation, girls expressed consistently more attachment security in their drawing than did boys, even after children’s social-emotional behaviors were controlled. This relatively robust finding echoes previous research using relationship drawings, showing that girls generally express less relational negativity and a healthier balance of power in their drawings than boys (Harrison et al., 2007; McGrath et al., 2017). Such gender differences may be due to girls having more sophisticated and controlled drawing techniques and better developed fine motor skills than boys (e.g., Cherney et al., 2006; Pianta & McCoy, 1997), potentially confounding the mental representations that children depict in their drawings. At the same time, however, Golomb’s (2004) research suggests that such skills may not necessarily be needed to create mental relationship representations via drawings. This may explain why gender differences were not only evident in the dimension of vitality/creativity, but in other drawing dimensions as well.

Our findings regarding gender differences also reflect similarities with theory and research indicating that girls are likely to experience higher-quality relationships with their teachers than boys (Hamre & Pianta, 2001; Hughes, 2011; Jellesma et al., 2015; Spilt et al., 2012). Conceivably, the more self-regulated behaviors typical of girls are a better match for the school environment than the more assertive and energetic behaviors of boys (e.g., Ewing & Taylor, 2009) and, as such, might have colored teachers’ views of the social-emotional behaviors of and interactions with boys in

a less favorable way. This might have resulted in differences in the mental representations between girls and boys.

Another noteworthy finding of the current study is that children from minority backgrounds tended to express less emotional investment in their drawings and more underlying disorganization depicted by unusual signs or symbols. There is some research to suggest that children's drawings may not only reflect their social environment but also mirror their understanding of their own cultural background (e.g., La Voy et al., 2001). Such cultural differences are usually revealed in facial expressions (smiles), details (clothing, hair), and the way the child identifies with the ethnic majority group (size of the figures or disorganization in the drawings (La Voy et al., 2001). It is possible that children with ethnic minority backgrounds express the way they feel about themselves and being part of a minority group by subtle signs of abandonment and betrayal, including angry facial expressions, black clouds, or irritated scribbling.

The finding that ethnic minority children depict less emotional investment and more dissociation in their mental representations of the student-teacher relationship may be relevant. Specifically, various empirical Dutch studies have indicated that ethnic minority children are more likely to be victims of racist name-calling and social exclusion than native Dutch children (e.g., Verkuyten & Thijs, 2010). Such negative experiences based on ethnicity may negatively influence children's ethnic self-esteem and global self-worth (Verkuyten, 1998; Verkuyten & Thijs, 2006), especially when there is a lack of trust and emotional closeness between teachers and minority children (e.g., McGrath & Van Bergen, 2015; Verkuyten & Thijs, 2004). Given that teachers may play a role in fostering ethnic minority children's representations of self and significant others, it seems relevant to provide them with the cultural competencies and interpersonal skills necessary to deal with children from diverse ethnic backgrounds.

Last, there were some modest age-related differences in the way in which children portrayed themselves with their teachers. Specifically, older children expressed a lower sense of belonging and happiness in their drawings and higher levels of emotional distance and global pathology than younger children. This finding is consistent with prior theory and empirical research on student-teacher relationships in the upper elementary grades, suggesting that classmates and friends may gradually begin to replace older children's teachers as sources of social support (e.g., Ang et al., 2008). As such, older students are likely to gradually become less emotionally connected to and experience less pride and happiness in relationships with their teachers when they transition to middle school (Ang et al., 2008; Hargreaves, 2000; Jerome et al., 2009; Lynch & Cicchetti, 1997).

The Role of Classroom-Level Student-Teacher Relationship Quality

In the present study, ICCs indicated that all dimensions of children's mental relationship representations tended to vary more across children than across classrooms. This is inconsistent with empirical research using questionnaire measures of relationship quality, in which up to one third of the variance in teacher- and child-reported student-teacher relationship quality is attributed to mean differences between classrooms or teachers (e.g., Mashburn et al., 2006; Zee & Koomen, 2017).

One explanation for this notable lack of variance in children’s drawings across classrooms is that children’s explicit judgments of relationship quality may be less objective than their more implicit feelings and beliefs. Researchers have suggested, for instance, that informants’ (subjective) views may be heavily dependent on their conscious knowledge, motivation, mental state, or particular context in which they make their judgments (e.g., Konold & Pianta, 2007; Kraemer et al., 2003). Explicit judgments may thus reveal as much about the child as about features of the classroom context, including emotional climate, peer pressure, or teacher style (e.g., Doumen et al., 2008). Representational measures, in contrast, are more likely to lie outside children’s awareness and do not necessarily involve children knowing that their relationship views are being assessed (Hahn et al., 2014). Accordingly, children’s mental representations of student-teacher relationships are more likely to be the residue of their own relationship history and personal characteristics, stored in memory, than the context of the classroom. This idea is in line with attachment-based notions that children’s inner feelings are primarily dependent upon factors and processes intrinsic to the child and may also explain why classroom-level student-teacher relationships did not moderate linkages between children’s behavior and relationship representations.

Limitations and Future Directions

In interpreting the present study’s results, we acknowledge six potential limitations. A first limitation pertains to the correlational and cross-sectional nature of the data, which precludes any speculation about the direction of effects. Various studies using questionnaire measures of relationship quality have indicated that the association between social-emotional child behavior and student-teacher relationship quality may be in the opposite direction (e.g., Birch & Ladd, 1998; Buyse et al., 2008) or even reciprocal in nature (Mejia & Hoglund, 2016; Roorda et al., 2014). More importantly, this design also prevented us from drawing causal conclusions. Future studies with at least three measurement occasions or with experimental designs may advance our understanding of the direction and magnitude of linkages between children’s social-emotional behavior and their mental representations of student-teacher relationships in the classroom.

Second, to get an indication of the average relationship quality experienced by teachers in the classroom, we aggregated the teacher-reported relationship dimensions of closeness, conflict, and dependency to the classroom level of analysis. This might have led to biased results, as classroom-average levels of relationship quality may be influenced by teachers’ interpretation of the individual behaviors and characteristics of individual students from their classroom. Future studies may overcome this issue by including third-party assessments of relationship quality through direct observation in the classroom.

Third, some caution is warranted when generalizing the results of this study to other populations and settings. Specifically, this study relied on a relatively small sample of primarily experienced female teachers and their students who were relatively homogeneous in terms of their background features, such as their ethnicity. Moreover, teachers from only 8 of 200 schools (4%) participated in this study, which might have resulted in sampling bias. It is possible that participating teachers, by virtue of their experience and interest in this particular study, may have taught in

classrooms where the relationship quality is relatively high. Including larger samples of teachers and children from a wider range of backgrounds may result in more reliable and generalizable results.

Fourth, it should be noted that teachers in this study rated children's social-emotional behaviors in the classroom. Although teachers have the unique opportunity to observe such behaviors across the school day, overt behavior such as externalizing and prosocial behavior in particular, they have been shown to be less accurate in identifying such less salient behaviors as internalizing problems (e.g., Achenbach et al., 1987; Kraemer et al., 2003). Accordingly, child behavior ratings from other observers, including parents and children themselves, might give a richer picture of the associations among social-emotional child behavior and mental representations of student-teacher relationships. Also, efforts to conduct psychometric research to ensure the reliability and validity of scores from all measures are essential in future research.

Fifth, attachment theory suggests that children's mental representations are not only influenced by their own characteristics and teachers' backgrounds but also by their attachment history with their parents and other teachers (e.g., Pianta et al., 2003). Although several teacher and child characteristics were controlled for in this study, we did not have any information about children's attachment history. Future studies could account for such prior attachment experiences by letting children draw a picture of themselves with their parents (see Pianta et al., 1999) or use other methodologies that provide a nuanced picture of their attachment history.

A last limitation pertains to the limited amount of variance at the classroom level. It is possible that the random selection of eight children per participating classroom might have reduced the variance between classrooms. At the same time, however, there is evidence to suggest that the inclusion of eight students per classroom is sufficient to obtain enough variation at the student and teacher levels (Snijders & Bosker, 1999; Zee et al., 2018). Still, to strengthen the implications of the current findings across classrooms, future research could investigate the association among social-emotional child behavior and relationship quality in a larger sample of children from intact classrooms.

Conclusion

Despite these limitations, this study may present some implications for research and practice. Using children's drawings, this study is one of the first to provide gentle evidence that overt, but not covert, child behaviors may play a role in the mental representations that middle schoolers hold about the relationship with their teachers. Whereas prosocial child behavior may be associated with positive relationship representations, externalizing conduct may function as an obstacle to warm feelings and beliefs about the student-teacher relationship. This is notable, as teachers are likely to provide more instructional and emotional support to well-behaved children and children who show no signs of behavioral problems in class (e.g., Nurmi et al., 2012; Stipek & Miles, 2008). Without such supports, children may become easily frustrated or demotivated with their schoolwork, thereby increasing the risk of academic maladjustment. This may be especially true in the upper elementary grades, where teachers may serve as vital sources of support who can help children stay

engaged and handle increased cognitive and emotional demands (cf. Roorda et al., 2014). Therefore, teacher training should include emphasis on the importance of teacher support as well as the social-emotional behaviors that may bias teachers’ beliefs, behaviors, and actions toward individual children in class. This may create positive changes in the mental relationship representations of children at risk of behavioral problems.

In addition, both educational researchers and practitioners alike may effectively use children’s drawings in the context of intervention efforts. Such drawings may provide a window into the representational world of children, and particularly those who suffer from internalizing symptoms (cf. Cherney et al., 2006; Zee et al., 2018). These children may fly easily under teachers’ radar and thereby frequently miss out on the supports they need to participate in all aspects of school life (e.g., Rubin & Coplan, 2004). Possibly, children’s relationship drawings may increase teachers’ knowledge of individual children’s specific emotional needs in the classroom. For instance, the drawing dimensions emotional distance/isolation and vulnerability may provide insight into various internalizing symptoms, such as (social) anxiety, emotional insecurity, and loneliness, which are reflected in clear barriers between teacher and child, downward eye contact, and exaggeration of body parts or the size of the figures in the drawing. By identifying such features in children’s drawings, teachers may become more aware of children who display internalizing behavior in their classroom and develop strategies to get through to these children. As such, further steps can be made in improving the social-emotional development and relationship experiences of middle schoolers in class.

Appendix

Congruence Between Teachers’ and Children’s Views of the Relationship

	Closeness	Conflict	Dependency
STRS dimensions:			
Closeness	1.00	–	–
Conflict	–.35**	1.00	–
Dependency	.02	.55**	1.00
Drawing dimensions related to closeness:			
Vitality/creativity	.25**	–.18**	.06
Pride/happiness	.07	–.18**	.08
Drawing dimensions related to conflict:			
Anger/tension	–.14*	.23**	–.03
Role reversal	–.16**	.12	–.07
Bizarreness/dissociation	–.19**	.27**	–.00
Drawing dimensions related to dependency:			
Vulnerability	–.16*	.24**	.01
Emotional distance/isolation	–.05	.16*	–.04
Overall adjustment:			
Global pathology	–.20**	.22**	–.05

Note.—STRS = Student-Teacher Relationship Scale.

* $p < .05$.

** $p < .01$.

Note

Marjolein Zee is assistant professor of developmental disorders and special education at the Research Institute of Child Development and Education at the University of Amsterdam; Kathleen Moritz Rudasill is professor and associate dean for research and faculty development in the School of Education at Virginia Commonwealth University; Debora L. Roorda is assistant professor of developmental disorders and special education at the Research Institute of Child Development and Education at the University of Amsterdam. Correspondence may be sent to Marjolein Zee at m.zee@uva.nl.

References

- Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin*, *101*, 213–232. <https://doi.org/10.1037/0033-2909.101.2.213>
- Ang, R. P., Chong, W. H., Huan, V. S., Quek, C. L., & Yeo, L. S. (2008). Teacher-student relationship inventory: Testing for invariance across upper elementary and junior high samples. *Journal of Psychoeducational Assessment*, *26*, 339–349. <https://doi.org/10.1177/0734282908315132>
- 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.
- Arbeau, K. A., Coplan, R. J., & Weeks, M. (2010). Shyness, teacher-child relationships, and socio-emotional adjustment in grade 1. *International Journal of Behavioral Development*, *34*, 259–269. <https://doi.org/10.1177/0165025409350959>
- Birch, S. H., & Ladd, G. W. (1998). Children's interpersonal behaviors and the teacher-child relationship. *Developmental Psychology*, *34*, 934–946. <https://doi.org/10.1037/0012-1649.34.5.934>
- Bowlby, J. (1969). *Attachment and loss: Attachment* (Vol. 5). Basic.
- Bretherton, I., & Munholland, K. A. (2008). Internal working models in attachment relationships: Elaborating a central construct in attachment theory. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 102–127). Guilford.
- Burgess, A. W., & Hartman, C. R. (1993). Children's drawings. *Child Abuse and Neglect*, *17*, 161–168. [https://doi.org/10.1016/0145-2134\(93\)90015-W](https://doi.org/10.1016/0145-2134(93)90015-W)
- Buysse, E., Verschuere, K., Doumen, S., Van Damme, J., & Maes, F. (2008). Classroom problem behavior and teacher-child relationships in kindergarten: The moderating role of classroom climate. *Journal of School Psychology*, *46*, 367–391. <https://doi.org/10.1016/j.jsp.2007.06.009>
- Buysse, E., Verschuere, K., & Doumen, S. (2011). Preschoolers' attachment to mother and risk for adjustment problems in kindergarten: Can teachers make a difference? *Social Development*, *20*, 33–50. <https://doi.org/10.1111/j.1467-9507.2009.00555.x>
- Carlson, E. A., & Sroufe, L. A. (1995). A developmental investigation of inattentiveness and hyperactivity. *Child Development*, *66*, 37–54. <https://doi.org/10.1111/j.1467-8624.1995.tb00854.x>
- CBS Statline. (2018). *Leerlingen in (speciaal) basisonderwijs; migratieachtergrond, woonregio* [Students in (special) primary education; migration background, living area]. Retrieved from <https://opendata.cbs.nl/statline/#/CBS/nl/dataset/83295NED/table>
- Cherney, I. D., Seiwert, C. S., Dickey, T. M., & Flichtbeil, J. D. (2006). Children's drawings: A mirror to their minds. *Educational Psychology*, *26*, 127–142. <https://doi.org/10.1080/01443410500344167>
- 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)
- Crockett, L. J., Wasserman, A. M., Rudasill, K. M., Hoffman, L., & Kalutskaya, I. (2018). Temperamental anger and effortful control, teacher-child conflict, and externalizing behavior across the elementary school years. *Child Development*. Advance online publication. <https://doi.org/10.1111/cdev.12910>
- De Laet, S., Doumen, S., Vervoort, E., Colpin, H., Van Leeuwen, K., Goossens, L., & Verschuere, K. (2014). Transactional links between teacher-child relationship quality and perceived versus

- sociometric popularity: A three-wave longitudinal study. *Child Development*, **85**, 1647–1662. <https://doi.org/10.1111/cdev.12216>
- Dienst Uitvoering Onderwijs. (2014). *Leeftijd van personeel in het primair onderwijs* [Age of employees in primary education]. https://duo.nl/open_onderwijsdata/databestanden/po/onderwijspersoneel/po-personeel1.jsp
- Doumen, S., Verschueren, K., Buyse, E., Germeijs, V., Luyckx, K., & Soenens, B. (2008). Reciprocal relations between teacher–child conflict and aggressive behavior in kindergarten: A three-wave longitudinal study. *Journal of Clinical Child and Adolescent Psychology*, **37**, 588–599. <https://doi.org/10.1080/15374410802148079>
- Dunfield, K. A., & Kuhlmeier, V. A. (2013). Classifying prosocial behavior: Children’s responses to instrumental need, emotional distress, and material desire. *Child Development*, **84**, 1766–1776. <https://doi.org/10.1111/cdev.12075>
- Ewing, A. R., & Taylor, A. R. (2009). The role of child gender and ethnicity in teacher–child relationship quality and children’s behavioral adjustment in preschool. *Early Childhood Research Quarterly*, **24**, 92–105. <https://doi.org/10.1016/j.ecresq.2008.09.002>
- Farmer, T. W., Lines, M. M., & Hamm, J. V. (2011). Revealing the invisible hand: The role of teachers in children’s peer experiences. *Journal of Applied Developmental Psychology*, **32**, 247–256. <https://doi.org/10.1016/j.appdev.2011.04.006>
- Furrer, C., & Skinner, E. (2003). Sense of relatedness as a factor in children’s academic engagement and performance. *Journal of Educational Psychology*, **95**, 148–162. <https://doi.org/10.1037/0022-0663.95.1.148>
- Fury, G. (1996). *The relation between infant attachment history and representations of relationships in school-aged family drawings* [Unpublished doctoral dissertation]. University of Minnesota, Minneapolis.
- Fury, G., Carlson, E. A., & Sroufe, L. A. (1997). Children’s representations of attachment relationships in family drawings. *Child Development*, **68**, 1154–1164. <https://doi.org/10.2307/1132298>
- Golomb, C. (2004) *The child’s creation of a pictorial world*. Erlbaum.
- Goodman, A., Lamping, D. L., & Ploubidis, G. B. (2010). When to use broader internalising and externalising subscales instead of the hypothesized five subscales on the Strengths and Difficulties Questionnaire (SDQ): Data from British parents, teachers and children. *Journal of Abnormal Child Psychology*, **38**, 1179–1191. <https://doi.org/10.1007/s10802-010-9434-x>
- Hahn, A., Judd, C. M., Hirsh, H. K., & Blair, I. V. (2014). Awareness of implicit attitudes. *Journal of Experimental Psychology: General*, **143**, 1369–1392. <https://doi.org/10.1037/a0035028>
- 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>
- Hamre, B. K., & Pianta, R. C. (2005). Can instructional and emotional support in the first-grade classroom make a difference for children at risk of school failure? *Child Development*, **76**, 949–967. <https://doi.org/10.1111/j.1467-8624.2005.00889.x>
- Hamre, B. K., Pianta, R. C., Downer, J. T., & Mashburn, A. J. (2008). Teachers’ perceptions of conflict with young students: Looking beyond problem behaviors. *Social Development*, **17**, 115–136. <https://doi.org/10.1111/j.1467-9507.2007.00418.x>
- Hargreaves, A. (2000). Mixed emotions: Teachers’ perceptions of their interactions with students. *Teaching and Teacher Education*, **16**, 811–826. [https://doi.org/10.1016/S0742-051X\(00\)00028-7](https://doi.org/10.1016/S0742-051X(00)00028-7)
- Harrison, L. J., Clarke, L., & Ungerer, J. A. (2007). Children’s drawings provide a new perspective on teacher–child relationship quality and school adjustment. *Early Childhood Research Quarterly*, **22**, 55–71. <https://doi.org/10.1016/j.ecresq.2006.10.003>
- Henricsson, L., & Rydell, A. M. (2004). Elementary school children with behavior problems: Teacher–child relations and self-perception. A prospective study. *Merrill-Palmer Quarterly*, **50**, 111–138. <https://doi.org/10.1353/mpq.2004.0012>
- Hox, J. J. (2002). *Multilevel analysis: Techniques and applications*. Erlbaum.
- Hughes, J. N. (2011). Longitudinal effects of teacher and student perceptions of teacher–student relationship qualities on academic adjustment. *Elementary School Journal*, **112**, 38–60. <https://doi.org/10.1086/660686>

- 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>
- Jerome, E. M., Hamre, B. K., & Pianta, R. C. (2009). Teacher–child relationships from kindergarten to sixth grade: Early childhood predictors of teacher-perceived conflict and closeness. *Social Development*, *18*, 915–945. <https://doi.org/10.1111/j.1467-9507.2008.00508.x>
- Kaplan, N., & Main, M. (1986). *A system for the analysis of children's drawings in terms of attachment* [Unpublished manuscript]. Department of Psychology, University of California, Berkeley.
- Keiley, M. K., Lofthouse, N., Bates, J. E., Dodge, K. A., & Pettit, G. S. (2003). Differential risks of covarying and pure components in mother and teacher reports of externalizing and internalizing behavior across ages 5 to 14. *Journal of Abnormal Child Psychology*, *31*, 267–283. <https://doi.org/10.1023/A:1023277413027>
- Koepke, M. F., & Harkins, D. A. (2008). Conflict in the classroom: Gender differences in the teacher–child relationship. *Early Education and Development*, *19*, 843–864. <https://doi.org/10.1080/10409280802516108>
- Konold, T. R., & Pianta, R. C. (2007). The influence of informants on ratings of children's behavioral functioning: A latent variable approach. *Journal of Psychoeducational Assessment*, *25*, 222–236. <https://doi.org/10.1177/0734282906297784>
- Koomen, H. M., & 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>
- Kraemer, H. C., Measelle, J. R., Ablow, J. C., Essex, M. J., Boyce, W. T., & Kupfer, D. J. (2003). A new approach to integrating data from multiple informants in psychiatric assessment and research: Mixing and matching contexts and perspectives. *American Journal of Psychiatry*, *160*, 1566–1577. <https://doi.org/10.1176/appi.ajp.160.9.1566>
- Ladd, G. W., Birch, S. H., & Buhs, E. S. (1999). Children's social and scholastic lives in kindergarten: Related spheres of influence? *Child Development*, *70*, 1373–1400. <https://doi.org/10.1111/1467-8624.00101>
- La Voy, S. K., Pedersen, W. C., Reitz, J. M., Brauch, A. A., Luxenberg, T. M., & Nofsinger, C. C. (2001). Children's drawings: A cross-cultural analysis from Japan and the United States. *School Psychology International*, *22*, 53–63. <https://doi.org/10.1177/0143034301221005>
- Lewis, D., & Greene, J. (1983). *Your child's drawings . . . Their hidden meaning*. Hutchinson.
- Lynch, M., & Cicchetti, D. (1997). Children's relationships with adults and peers: An examination of elementary and junior high school students. *Journal of School Psychology*, *35*, 81–99. [https://doi.org/10.1016/S0022-4405\(96\)00031-3](https://doi.org/10.1016/S0022-4405(96)00031-3)
- Madigan, S., Brumariu, L. E., Villani, V., Atkinson, L., & Lyons-Ruth, K. (2016). Representational and questionnaire measures of attachment: A meta-analysis of relations to child internalizing and externalizing problems. *Psychological Bulletin*, *142*, 367–399.
- Marsh, H. W., Craven, R. G., & Debus, R. (1991). Self-concepts of young children 5 to 8 years of age: Measurement and multidimensional structure. *Journal of Educational Psychology*, *83*, 377–392. <https://doi.org/10.1037/0022-0663.83.3.377>
- Mashburn, A. J., Hamre, B. K., Downer, J. T., & Pianta, R. C. (2006). Teacher and classroom characteristics associated with teachers' ratings of prekindergartners' relationships and behaviors. *Journal of Psychoeducational Assessment*, *24*, 367–380. <https://doi.org/10.1177/0734282906290594>
- McGrath, K. F., & Van Bergen, P. (2015). Who, when, why and to what end? Students at risk of negative student–teacher relationships and their outcomes. *Educational Research Review*, *14*, 1–17. <https://doi.org/10.1016/j.edurev.2014.12.001>

- McGrath, K. F., Van Bergen, P. V., & Sweller, N. (2017). Adding color to conflict: Disruptive students' drawings of themselves with their teachers. *Elementary School Journal*, *117*, 642–663. <https://doi.org/10.1086/691567>
- Mejia, T. M., & Høglund, W. L. (2016). Do children's adjustment problems contribute to teacher-child relationship quality? Support for a child-driven model. *Early Childhood Research Quarterly*, *34*, 13–26. <https://doi.org/10.1016/j.ecresq.2015.08.003>
- Murray, C., & Murray, K. M. (2004). Child level correlates of teacher-student relationships: An examination of demographic characteristics, academic orientations, and behavioral orientations. *Psychology in the Schools*, *41*, 751–762. <https://doi.org/10.1002/pits.20015>
- 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* (6th ed.).
- Nesdale, D., & Pickering, K. (2006). Teachers' reactions to children's aggression. *Social Development*, *15*, 109–127. <https://doi.org/10.1111/j.1467-9507.2006.00332.x>
- Nosek, B. A. (2005). Moderators of the relationship between implicit and explicit evaluation. *Journal of Experimental Psychology: General*, *134*, 565–584.
- Nosek, B. A. (2007). Implicit-explicit relations. *Current Directions in Psychological Science*, *16*, 65–69.
- Nurmi, J. E. (2012). Students' characteristics and teacher-child relationships in instruction: A meta-analysis. *Educational Research Review*, *7*, 177–197. <https://doi.org/10.1016/j.edurev.2012.03.001>
- Nurmi, J. E., Viljaranta, J., Tolvanen, A., & Aunola, K. (2012). Teachers adapt their instruction according to students' academic performance. *Educational Psychology*, *32*, 571–588. <https://doi.org/10.1080/01443410.2012.675645>
- Pianta, R. C. (1999). *Enhancing relationships between children and teachers*. American Psychological Association.
- Pianta, R. C., Hamre, B., & Stuhlman, M. (2003). Relationships between teachers and children. In W. M. Reynolds & G. E. Miller (Eds.), *Handbook of psychology* (Vol. 7). *Educational psychology* (pp. 199–234). Wiley.
- Pianta, R. C., Longmaid, K., & Ferguson, J. E. (1999). Attachment-based classifications of children's family drawings: Psychometric properties and relations with children's adjustment in kindergarten. *Journal of Clinical Child Psychology*, *28*, 244–255. https://doi.org/10.1207/s15374424jccp2802_11
- Pianta, R. C., & McCoy, S. (1997). The first day of school: The predictive utility of an early school screening program. *Journal of Applied Developmental Psychology*, *18*, 1–22.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Sage.
- Roorda, D. L., Verschueren, K., Vancraeyveldt, C., Van Craeyevelt, S., & Colpin, H. (2014). Teacher-child relationships and behavioral adjustment: Transactional links for preschool boys at risk. *Journal of School Psychology*, *52*, 495–510. <https://doi.org/10.1016/j.jsp.2014.06.004>
- Rubin, K. H., & Coplan, R. J. (2004). Paying attention to and not neglecting social withdrawal and social isolation. *Merrill-Palmer Quarterly*, *50*, 506–534. <https://doi.org/10.1353/mpq.2004.0036>
- Rudasill, K. M. (2011). Child temperament, teacher-child interactions, and teacher-child relationships: A longitudinal investigation from first to third grade. *Early Childhood Research Quarterly*, *26*, 147–156. <https://doi.org/10.1016/j.ecresq.2010.07.002>
- Rudasill, K. M., Hawley, L., Molfese, V. J., Tu, X., Prokasky, A., & Sirota, K. (2016). Temperament and teacher-child conflict in preschool: The moderating roles of classroom instructional and emotional support. *Early Education and Development*, *27*, 859–874. <https://doi.org/10.1080/10409289.2016.1156988>
- Snijders, T. A. B., & Bosker, R. J. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. Sage.
- Sointu, E. T., Savolainen, H., Lappalainen, K., & Epstein, M. H. (2012). Cross informant agreement of behavioral and emotional strengths between Finnish students and teachers. *Scandinavian Journal of Educational Research*, *56*, 625–636. <https://doi.org/10.1080/00313831.2011.621135>

- 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>
- Stipek, D., & Miles, S. (2008). Effects of aggression on achievement: Does conflict with the teacher make it worse? *Child Development, 79*, 1721–1735. <https://doi.org/10.1111/j.1467-8624.2008.01221.x>
- Stuhlman, M. W., & Pianta, R. C. (2002). Teachers’ narratives about their relationships with children: Associations with behavior in classrooms. *School Psychology Review, 31*, 148–163.
- Tandon, M., Cardeli, E., & Luby, J. (2009). Internalizing disorders in early childhood: A review of depressive and anxiety disorders. *Child and Adolescent Psychiatric Clinics of North America, 18*, 593–610. <https://doi.org/10.1016/j.chc.2009.03.004>
- 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.
- Valiente, C., Swanson, J., & Lemery-Chalfant, K. (2012). Kindergartners’ temperament, classroom engagement, and student–teacher relationship: Moderation by effortful control. *Social Development, 21*, 558–576. <https://doi.org/10.1111/j.1467-9507.2011.00640.x>
- Van Leeuwen, K., Meerschaert, T., Bosmans, G., De Medts, L., & Braet, C. (2006). The Strengths and Difficulties Questionnaire in a community sample of young children in Flanders. *European Journal of Psychological Assessment, 22*, 189–197. <https://doi.org/10.1027/1015-5759.22.3.189>
- van Widenfelt, B. M., Goedhart, A. W., Treffers, P. D. A., & Goodman, R. (2003). Dutch version of the Strengths and Difficulties Questionnaire (SDQ). *European Child and Adolescent Psychiatry, 12*, 281–289. <https://doi.org/10.1007/s00787-003-0341-3>
- Verkuyten, M. (1998). Perceived discrimination and self-esteem among ethnic minority adolescents. *Journal of Social Psychology, 138*, 479–493.
- Verkuyten, M., & Thijs, J. (2004). Global and ethnic self-esteem in school context: Minority and majority groups in the Netherlands. *Social Indicators Research, 67*, 253–281. <https://doi.org/10.1023/B:SOCL.0000032339.86520.5f>
- Verkuyten, M., & Thijs, J. (2006). Ethnic discrimination and global self-worth in early adolescents: The mediating role of ethnic self-esteem. *International Journal of Behavioral Development, 30*, 107–116. <https://doi.org/10.1177/0165025406063573>
- Verkuyten, M., & Thijs, J. (2010). Ethnic minority labeling, multiculturalism, and the attitude of majority group members. *Journal of Language and Social Psychology, 29*, 467–477. <https://doi.org/10.1177/0261927X10377992>
- Verschuere, K., & Koomen, H. M. (2012). Teacher–child relationships from an attachment perspective. *Attachment and Human Development, 14*, 205–211. <https://doi.org/10.1080/14616734.2012.672260>
- Zee, M., de Jong, P. F., & Koomen, H. M. Y. (2016). Teachers’ self-efficacy in relation to individual students with a variety of social-emotional behaviors: A multilevel investigation. *Journal of Educational Psychology, 108*, 1013–1027. <https://doi.org/10.1037/edu0000106>
- Zee, M., & Koomen, H. M. (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., & de Jong, P. F. (2018). How different levels of conceptualization and measurement affect the relationship between teacher self-efficacy and students’ academic achievement. *Contemporary Educational Psychology, 55*, 189–200. <https://doi.org/10.1016/j.cedpsych.2018.09.006>
- 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>
- Zee, M., & Roorda, D. L. (2017). *Leerkracht-leerling relatietekeningen in het basisonderwijs. Trainings- en coderingshandleiding* [Student-teacher relationship drawings in elementary school. Training and coding manual]. University of Amsterdam.
- Zhang, X., & Sun, J. (2011). The reciprocal relations between teachers’ perceptions of children’s behavior problems and teacher–child relationships in the first preschool year. *Journal of Genetic Psychology, 172*, 176–198. <https://doi.org/10.1080/00221325.2010.528077>