Three Decades of Research on Individual Teacher-Child Relationships: A Chronological Review of Prominent Attachment-Based Themes

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Attachment theory has played a prominent role in the study of affective relationships between teachers and individual children in school settings. This review synthesizes three decades of attachment-based research on teacher-child relationships roughly covering the period between 1992 and 2022. Five key themes were discussed: (1) conceptualization and assessment, (2) secure base and autonomous exploration, (3) safe haven and self-regulation, (4) attachment history and relationship (dis)continuity, and (5) teacher sensitivity and mentalization. Following a narrative review approach, a selection of pivotal research studies was made and chronologically presented to illustrate research developments per theme. The results indicated that the conceptualization and assessment of teacher-child relationships holds largely, but not completely, across different developmental phases, cultural contexts, measurement methods, and informants. In addition, research confirmed the role of the secure base and safe haven functions of teacher-child relationships in promoting children's emotional security at school. Furthermore, progression has been made through the development of multiple measurement methods for both teachers and children, by expanding research from early childhood education up to secondary education, and by more recent cross-cultural studies. However, there is still limited insight in mechanisms that explain (dis)continuity in relationships over time, and a striking lack of research on dyadic teacher sensitivity and mentalization as antecedents of teacher-child relationships. Research directions for the following decade(s) of research are discussed per theme.

Keywords: teacher-child relationships, attachment theory, assessment, secure base, safe haven, teacher sensitivity, relationship continuity, chronological review

INTRODUCTION

Teacher-child relationships have been extensively studied in the past decades. The growing body of research consistently shows that affective relationships between teachers and individual children shape children's development inside and outside schools (McGrath and Van Bergen, 2015; Spilt et al., 2022). Attachment theory (Bowlby, 1969/1982; Ainsworth, 1973) has played a prominent role in this domain of research. In the early 1990s, attachment researchers began to study children's relationships with non-familial caregivers. One reason for the growing concern for children's

relationships with non-familial caregivers was the observation that "*wider networks of caregivers now provide care once confined to smaller, familial systems*" coupled with concerns about the consequences of "*large numbers of children coming to school with inadequate relationship histories*" (Pianta, 1992a, p. 3). One of the first publications addressing attachment relationships in a "multiple caretaker environment" was the seminal volume "Beyond the Parent: The Role of Other Adults in Children's Lives" (Pianta, 1992a). This volume contained a collection of pioneering research articles on the role of relationships with non-familial adults in children's (early) lives including child-care teachers and (pre)school teachers. Pianta's publication can be considered the springboard for attachment-based research on teacher-child relationships, characterized by a specific focus on the affective and dyadic nature of teacher-child relationships. Now, three decades later, the key question for this article is how attachment-based research on teacher-child relationships in (pre)school settings has developed ever since and what insights it has yielded. Our literature review aims to explain how attachment theory has contributed to our current understanding of the role of teacher-child relationships in children's lives.

Theory-based literature reviews, grounding research in a particular theory, are scarce. Scholars have noted a general lack of theory use in the school psychology literature that limits progress in the field (Kelly et al., 2021). By reviewing the application of the attachment framework to understand teacher-child relationships, we hope to stimulate theory-based research and practice in this area. For advanced scholars, this review aims to identify gaps in knowledge and directions for forthcoming research. This way we hope to provide an incentive for the continuation of attachment-based research on teacher-child relationships to further develop and refine theoretical understanding of teacher-child relationships. For scholars who are new to this domain of research, this overview may present an introduction into attachment-based research on teacher-child relationships.

ATTACHMENT THEORY EXTENDED TO TEACHER-CHILD RELATIONSHIPS

Interpersonal relationships between teachers and students have been extensively studied in educational research. Educational researchers typically examine teacher-child relationships at the classroom level. Inspired by interpersonal theory, the main focus is on teachers' interaction styles in balancing affiliation (warmth) and control (directivity) to engage children in classroom activities and promote child learning (Wubbels and Brekelmans, 2005). Attachment-based research adds a more specific relationship-focused perspective through its emphasis on the *affective* and *dyadic* nature of teacher-child relationships. The attachment-based perspective on teacher-child relationships can be traced back to the 1990s. Guided by a strong background in mother-child attachment research, attachment researchers became increasingly interested in non-familial relationships in early education and child care settings (Pianta, 1992a). They were particularly interested in teachers as subsidiary or *ad hoc* attachment figures and raised questions of whether and

how teachers could support children's emotional security when parents were absent. A new line of research emerged with a strong focus on teacher-child relationships as attachment-like bonds at the individual teacher-child level.

Parents are typically considered the *primary attachment figures* in children's lives. However, it is evident that for most children parents are not the only caregivers. Children spend many hours in day care centers and schools, in separation from their parents, which raises all kinds of questions: What happens when parents are not available and other adults are taking over the caregiving role? Do children develop attachment relationships with non-familial caregivers when parents are absent? Can non-familial caregivers provide children the necessary *emotional security*? To what extent can non-familial caregivers fulfill the *secure base* function of caregivers in educational contexts? Those were the first questions that triggered research on individual teacher-child relationships (Pianta, 1992a). Guided by attachment theory, it was predicted that children would seek proximity to teachers when parents were not available and develop attachment-like relationships with teachers (cf. infra Theme 1). It was further expected that the *secure base* and *safe haven* functions of parent-child relationships would also be visible in teacher-child relationships (cf. infra Themes 2 and 3), and that teachers' *availability and sensitivity* would predict the quality of the teacher-child relationship (cf. infra Theme 5). Finally, given the premise that children internalize attachment experiences into *internal working models* of self and others, it was expected that there would be *continuity* between parent-child and teacher-child relationships (cf. infra Theme 4). At the same time, relationships with teachers were expected to make a unique contribution to children's development above and beyond familial attachments. Thus, children's development was expected to be better predicted by the sum of children's (familial and non-familial) attachment relationships than solely by children's parent-child attachment relationships (Van IJzendoorn et al., 1992).

This review synthesizes how attachment-based research about teacher-child relationships developed over 30 years. To this end, we reviewed a selection of key research. To be able to provide a succinct review, we chose a clear focus that is on teacher-child relationships in (pre)school settings and not in child care settings. We made this decision based on qualitative differences between these settings: In educational settings, unlike in child care, teachers are instructors focusing on academic readiness or skill acquisition and their instructional role becomes increasingly dominant over their caregiver role as children progress through school (Rimm-Kaufman and Pianta, 2000).

STRUCTURE OF THE NARRATIVE REVIEW

This review presents a chronological overview of attachment-based research on teacher-child relationships in (pre)school settings from roughly 1992 onward (Pianta, 1992a). We explain how key concepts in attachment theory have guided research on dyadic teacher-child relationships by reviewing a selection of peer-reviewed research that illustrates attachment-based themes.

It was not our aim to provide an exhaustive overview or synthesis of all (published and unpublished) research as is done in systematic reviews. Instead, we adopted a narrative review approach in which pivotal papers are selected by the authors to illustrate research developments in a particular domain of research.

The review is guided by a theoretical model consisting of basic tenets of attachment theory applied to teacher-child relationships (**Figure 1**). These basic tenets are reflected in five prominent themes, according to which the review is structured: (1) conceptualization and assessment, (2) secure base and autonomous exploration, (3) safe haven and self-regulation, (4) attachment history and relationship (dis)continuity, and (5) teacher sensitivity and mentalization. These concepts guided the literature search and were used as search terms in combination with the search term "attachment" or "attachment theory." Forward and backward citation tracking was also used to identify key research.

For each theme, we reviewed the research developments across three decades. The first decade locates roughly between 1992 and 2002, the second decade between 2002 and 2012, and the third decade between 2012 and 2022. Not all themes have received equal attention across the three decades. In case of limited research, we review research of only one or two decades or combine the research across decades. Where possible, we present research in a chronological order. We end our review with suggestions for the fourth decade of research.

RESULTS

Theme 1: Conceptualization and Assessment of Teacher-Child Relationships

The key point at issue in the first series of attachment-based studies was whether attachment theory could be a valid framework to describe or conceptualize the affective nature of dyadic teacher-child relationships in school contexts. This was not an either-or issue but involved different questions about (associations between) children's security and proximity seeking behaviors, exchanges of affect, and the role of teachers' responses to children's signals of need for care (Pianta, 1992c; Van IJzendoorn et al., 1992). By the end of the first decade, a three-dimensional conceptualization of teacher-child relationships was obtained, based on observational research and teacher reports, that showed strong resemblance with qualities of parent-child relationships (Closeness, Conflict, Dependency; Pianta, 2001). In the second decade, children's own perspective and narrative interview methods were added to allow for a more comprehensive understanding of the nature of teacher-child relationships. Across the third decade, new issues emerged including teacher-child relationships across developmental phases (e.g., adolescence), cultural differences in conceptualization and assessments, and the (lack of) recognition of dependency as a relevant dimension ofteacher-child relationships.

First Decade

In the first decade of research, roughly between 1992 and 2002, the key question was whether teacher-child relationships could be conceptualized as attachment relationships. First attempts were made to describe the affective quality of teacher-child relationships along the attachment dimensions of security, anxious/resistance, and avoidance (Pianta and Nimetz, 1991; Howes and Ritchie, 1999). It was observed that children displayed similar behaviors in their relationships with teachers as with mothers, including keeping track of the teacher, seeking comfort and reassurance, attending to facial expressions and emotions, and using the teacher as secure base for exploration (Pianta et al., 1997; Koomen et al., 1999). These proximity seeking behaviors bore a clear resemblance to children's proximity seeking in parent-child relationships. Observational research was complemented with questionnaire data from teachers. Guided by theoretical knowledge of parent-child attachment classifications and the Attachment Q-set, Pianta and colleagues developed a teacher-report questionnaire (Pianta and Nimetz, 1991; Pianta and Steinberg, 1992), the forerunner of the Student Teacher Relationship Scale (Pianta, 2001). Research with this questionnaire yielded evidence for similar attachment-related dimensions including proximity seeking behavior (e.g., "this child seeks help, recognition, and support from me") and anxiousness or insecurity (e.g., "this child constantly needs reassurance from me"). Significant associations were found with measures of engagement and self-regulation, including positive task behaviors and frustration tolerance (Pianta et al., 1997). Moreover, negative and positive effects of early teacher-child relationships on academic and behavioral outcomes were reported to last up to eight grade while controlling for initial levels of child functioning (Hamre and Pianta, 2001). These findings showed that teachers' reports of teacher-child relationship qualities were not redundant with other teacher-reported school readiness measures but, on the contrary, provided unique information for the understanding of children's development and progression through school.

Toward the end of the first decade, research with (the forerunner of) Pianta's Student Teacher Relationship Scale (STRS; Pianta, 2001) accumulated in a final version for early childhood education (up to 8 year-old students), including three attachment-based dimensions: (1) *conflict:* the degree of negative feelings, unpredictability, and wariness, (2) *dependency:* the degree of excessive proximity seeking and the child's inability to gain a sense of security from the relationship, and (3) *closeness:* the degree of trust and proximity, open communication, attunement, and comfort seeking behavior. Whereas closeness refers primarily to children's safe haven use of teachers, dependency primarily indicates that a child fails to use the teacher as a secure base from which to explore, while conflict thwarts the safe haven as much as the secure base function (Verschueren and Koomen, 2012). The publication of the STRS as an easy-to-administer and valid teacher-report questionnaire provided a strong impetus for future research.

Together these first studies showed that teacher-child relationships could be assessed through an attachment lens.

However, there were certainly limits to the resemblance between teacher-child and parent-child relationships. Teacher-child relationships were typically less intense and intimate than parent-child relationships (Kontos, 1992). Contextual constraints like (limited) time spent together, teacher-child ratio's, teacher role perceptions and values, an emphasis on didactic interactions, and children changing teachers every year clarify why teacher-child relationships are not as affective, intense, enduring, and exclusive as parent-child relationships. Consequently, scholars looking back on research in this first decade came to the conclusion that teacher-child relationships should not be considered "full-fledged" attachment bonds but rather "*ad hoc*" attachments, meaning that teachers can fulfill the role of attachment figures and promote children's sense of security when parents are absent (Verschueren and Koomen, 2012; Verschueren, 2015). The teacher-child relationship thus is, for most children, probably not an attachment bond but does have an attachment component (Cassidy, 2008), that is temporally fulfilling attachment-based functions like providing a secure base and safe haven to children at school (Verschueren and Koomen, 2012; Verschueren, 2015).

Second Decade

The STRS became the most widely-used questionnaire to examine teacher-child relationships from the teacher's perspective. However, given the limitations of single-informant questionnaires, researchers started to explore new ways of assessing the affective nature of teacher-child relationships to allow for a more thorough assessment. The first instruments to assess the child's inside perspective were published in the second decade of research. In addition, there were a few attempts to obtain a more elaborate view on teachers' experiences through the use of narrative interviews. These two trends emerged in the second decade of research, roughly between 2002 and 2012.

The Child's Perspective

Guided by attachment theory, it was recognized that children may develop their own unique internal working model of the teacher-child relationship that would not necessarily correspond with their teacher's relationship perceptions. In previous years, older children's perceptions of affective relationship quality had already been investigated based on other theoretical models (e.g., social-motivational and social support models), targeting attachment-related constructs such as felt security (Ryan et al., 1994), psychological proximity seeking and emotional quality (Lynch and Cicchetti, 1992), and perceived support (Hughes, 2011). This body of research demonstrated the unique contribution of child perceptions to child outcomes above and beyond teacher perceptions of the relationship (Hughes, 2011). From the second decade on, scholars started developing child-perspective instruments based on attachment theory, aimed at capturing the three-dimensional conceptualization of teacher-child relationship quality resembling the teacher-reported STRS.

For young children in kindergarten, instruments were developed measuring the child's perception of the relationship with the teacher in a standardized interview setting. Mantzicopoulos and Neuharth-Pritchett (2003) constructed the Y-CATS, capturing a three-dimensional factor structure

including warmth, conflict, and autonomy, which was also found in a Dutch kindergarten setting (Spilt et al., 2010). Reliabilities were relatively low but small associations with teacher relationship reports for content related constructs supported the instrument's validity as well as the assumed unique perspective on the relationship of child and teacher for warmth and conflict. No associations, however, were found between autonomy and the dependency scale of the STRS. In later years, Gregoriadis and Grammatikopoulos (2014) used an instrument based on the attachment Q-set (Waters and Deane, 1985) to assess indicators of closeness and conflict through the child's perspective in kindergarten. The two dimensions could be reliably assessed but associations with teacher perceptions were not reported.

In addition to standardized interviews, several child questionnaires were developed with the explicit aim of measuring the STRS constructs, closeness, conflict, and dependency, from the child's perception. Koepke and Harkins (2008) started with making a close adaptation of items and response alternatives of the STRS, presented to individual children in the lower years of grade school. They only found sufficient reliability for the closeness dimension and no agreement with the teacher's perception of the relationship whatsoever. The child-report measure of Vervoort et al. (2015; CARTS), presenting statements in two steps to early elementary children, was based on the STRS and the Y-CATS, supplemented with some new items. The three dimensions, closeness, conflict, and dependency were found sufficiently reliable, however, only child-reported closeness and conflict converged with teacher reports on the parallel STRS-scales. Child-reported dependency had more in common with closeness (both child- and teacher-reported) than with teacher-reported dependency, and may reflect rather an effective use of the teacher as a source of support (cf, instrumental dependency, Sroufe, 2021) than a lack of a secure base. For upper elementary children, Koomen and Jellesma (2015) developed the SPARTS, which was primarily based on STRS-items, supplemented with a few items from the Relatedness scales (Lynch and Cicchetti, 1992) and some new items. Next closeness and conflict, a third dimension was revealed that did not assess dependency but a new relationship dimension called negative expectations, referring to insecure feelings and unfulfilled needs of the child. All three dimensions were sufficiently reliable and again only child-reported closeness and conflict converged with the parallel STRS-scales. The SPARTS-construct negative expectations, however, did show meaningful associations with emotional problems, and hyperactivity and was, differently from the CARTS-construct dependency, negatively associated with child-reported closeness. Together these findings suggest that child-reported negative expectations of the SPARTS is a more negative relationship construct than the CARTS-construct dependency, referring to a fundamental lack of trust in the teacher that, in addition to the secure base function, seems to undermine the role of the teacher as safe haven.

In the second decade, scholars also started using more implicit techniques to capture the mental representation of the teacher-child relationship in especially young children. Based on work on family drawings, Harrison et al. (2007) started

using young children's drawings to get a new perspective on teacher-child relationships, more recently followed by Zee et al. (2020) for older elementary children. Eight different relationship dimensions could be assessed with these drawings: two positive dimensions (pride/happiness and vitality/creativity), five negative dimensions (tension/anger, bizarreness/dissociation, emotional distance/isolation, role reversal, and vulnerability), and an overall dimension (global pathology). These studies reported small to medium associations with the STRS scales closeness and conflict, but again, associations with dependency were lacking. Finally, Roubinov et al. (2020) used another implicit technique, that is a narrative hand puppet interview. Children were assumed to identify with one of two hand puppets, making contradictory statements. Their answers were coded into a measure for relational closeness, which correlated modestly with teacher-reported closeness.

In conclusion, studies have been quite effective in capturing the child's perspective on the relationship qualities closeness and conflict with both explicit and implicit methods, although it should be emphasized that research with implicit methods lags far behind in numbers. At the same time, it is striking that studies have been less successful in grabbing hold of the child's perspective with regard to dependency. The relationship dimension dependency therefore seems more tied to evaluation through the teacher's perspective.

Narrative Interviews With Teachers

Although the majority of research relied exclusively on teacher questionnaires like the STRS, new research emerged starting to explore teacher-child relationships through the lens of teachers' mental representations of relationships with individual children. Like parents, teachers are believed to develop a mental representation of the relationship with a child based on a shared history of interactions and experiences (Pianta et al., 2003). This mental representation entails beliefs and expectations about the child (perceptions and expectations about likeability, sociability, teachability, ...), the self (a sense of self-efficacy and agency in different roles, e.g., caregiver, socializer, instructor, behavior manager, ...), and the self-other relationship (expectations and perceptions of trust, intimacy, reciprocity, and sharing versus unreliability, discordance, distance, ...). These mentally represented beliefs and expectations are believed to be associated with an affective tone, referring to the affective dimension of mental relationship representations. It is assumed that a mental representation of a relationship provides a lens through which a child's behavior is interpreted and responded to by a teacher, thus guiding everyday moment-to-moment interactions (Spilt et al., 2011).

Guided by a longstanding tradition to use narrative interviews to capture attachment representations of adults, the Teacher Relationship Interview (TRI; Stuhlman and Pianta, 2002) was developed to capture teachers' mental representations of relationships with individual children. The TRI was adapted from the Parent Development Interview (Button et al., 2001). As opposed to questionnaires, requiring teachers to evaluate the qualities of the relationship on a set of pre-formulated items, the TRI asks teachers to narrate a number of relational

experiences (that are afterward coded by an independent coder). The TRI may thus elucidate more implicit qualities of teachers' processing of relational experiences with a child. Research using both the TRI and STRS reported a moderate degree of convergence (Spilt and Koomen, 2009; Koenen et al., 2019), thus emphasizing the distinctiveness and complementary value of both assessment methods.

First cross-sectional studies with the TRI emerged in the second decade of research. Stuhlman and Pianta (2002) found that representations of negative affect (anger) were related to overt expressions of negativity in teacher-child interactions. This research confirmed the connection between the quality of moment-to-moment interactions and mentally represented qualities of the teacher-child relationship. Research in samples of children with and without externalizing behavior showed that teachers' mental representations of relationships with disruptive children were more strongly characterized by negative affect, including anger and helplessness (Spilt and Koomen, 2009). Research in the third decade remained sparse, although a later study examining unique associations with different externalizing behaviors (hyperactivity vs. conduct problems) further revealed that teachers' mental representations were characterized by more positive affect and sensitive practices in relationships with children displaying hyperactivity, whereas there was more represented negative affect (anger) when it came to conduct problems (Bosman et al., 2019). These findings show that teachers' mental representations of relationships with individual children are shaped by children's behavioral characteristics.

Third Decade

Despite all attempts to capture the multidimensional construct of teacher-child relationships, dependency remained largely overlooked and was treated like a stepchild, often neither mentioned nor measured in research on teacher-child relationships. It was not until the end of the third decade that a call for research on dependency was launched for a special issue on teacher-child dependency to prompt research on this dimension (Verschueren and Koomen, 2021). In the third decade, it became also apparent that there were subtle cultural differences in the understanding of teacher-child relationships, and in particular in the dimension of dependency. Furthermore, researchers began to ask what affective teacher-child relationships from an attachment perspective could still mean for older children and their teachers. Attention gradually shifted from childhood to adolescence, or from relationships in (pre)elementary education to relationships in secondary education. Below, we address these three topics: the renewed attention to teacher-child dependency, cultural differences, and relationships with adolescents.

Dependency: A Forgotten Construct?

As research into teacher-child relationships progressed during the second decade, less and less attention was paid to the dependency dimension. Although research attempting to validate the three-dimensional factor structure of the STRS in non-US samples did include dependency (e.g., Gregoriadis and Tsigilis, 2008; Drugli and Hjemdal, 2012; Fraire et al., 2013;

Milatz et al., 2014), dependency was often left out in empirical studies on the antecedents, correlates, and consequences of teacher-child relationships (e.g., Baker, 2006; Harrison et al., 2007) or combined with conflict to a more general negative relationship factor (e.g., Hamre and Pianta, 2001), and was not represented anymore in the 15-item short form of the STRS (Pianta, 1992b) that was often used in later research (e.g., O'Connor et al., 2012). As a consequence, dependency was also left out as a separate dimension in meta-analytic reviews such as those of Roorda et al. (2011, 2017). This is striking given its prominent position in the pilot version of the STRS compared to conflict (Pianta and Nimetz, 1991).

One of the reasons for this declining interest obviously was the mediocre reliability of the five-item scale of the original STRS (Koomen et al., 2012). In addition, doubts were also expressed about the validity of dependency as a measure of dyadic relationship quality versus just being an indicator of child development (Doumen et al., 2009; Spilt and Koomen, 2009). In the beginning of the third decade, a new impetus for the study of dependency came from (culturally) adapted dependency scales, showing satisfying psychometric qualities in European countries (e.g., Koomen et al., 2012; Milatz et al., 2014). But research on the specific meaning of dependency in children's lives and development received renewed attention only recently by a special issue on dependency in teacher-child relationships (Verschueren and Koomen, 2021). A meta-analysis in this special issue (Roorda et al., 2021) substantiated the developmental significance of dependency by revealing small to medium associations with engagement, academic achievement, and prosocial behavior; medium associations with externalizing behavior; and even medium to large associations with internalizing behavior.

The special issue took the reader back to essentials in the conceptualization of dependency within attachment theory, such as the importance of focusing on dependency as a relationship characteristic reflecting children's uncertainty about the availability of a specific caregiver, which may vary among relationships, instead of an enduring individual trait that characterizes a child through the years in different contexts (Sroufe, 2021; Verschueren and Koomen, 2021). Moreover, scholars in this issue reflected on the multifaceted nature of dependency (Sroufe, 2021; Verschueren and Koomen, 2021) by drawing attention to the first studies ever to focus on dependency of children on teachers. In this first research a clear distinction was found between emotional dependency, defined as chronically and excessively seeking proximity and support and therefore closely related to the present dependency concept, on the one hand, and the developmentally more appropriate type of instrumental dependency, defined as support and help seeking in effective ways, on the other (Sroufe et al., 1983; Sroufe, 2005). Children with secure histories scored higher on instrumental dependency but lower on emotional dependency compared to children with insecure (resistant or avoidant) histories. There clearly is a need for more conceptual and empirical work in this area, including the question of which methods (e.g., teacher perception, observation) are most suitable to capture this more comprehensive picture.

Cultural Issues

As research on teacher-child relationships worldwide accumulated, cultural issues in the understanding and assessment of teacher-child relationships started to emerge. From the second decade onward, the dominant framework for assessment of teacher-child relationships had been the three-dimensional structure of the STRS covering closeness, conflict, and dependency. Although the STRS was developed from a predominantly Western perspective, research in non-Western samples proved that this three-dimensional structure held across cultures [whether assessed from the child's or the teacher's perspective, see Chen et al. (2019),Gregoriadis et al. (2021), and Vahidi et al. (2022)]. However, cultural differences emerged in the associations between the three dimensions. Whereas studies in more individualistic (Western) countries had usually found a correlation between dependency and closeness ranging from not-correlated to negatively correlated, studies in more collectivistic (Eastern) countries repeatedly reported small to medium positive correlations between closeness and dependency (Gregoriadis et al., 2020; Vahidi et al., 2022). This suggests that dependency is not as negative in collectivistic countries as in individualistic countries. In Western countries, relational dependency may be at odds with the emphasis on autonomous exploration and independence that characterizes individualistic cultures, thus being considered disturbing and something that should be discouraged. Conversely, in collectivistic cultures, relational dependency may align (at least to some extent) with ethics of interdependence valuing child-adult relatedness, and may therefore be considered a more adaptive feature (Gregoriadis et al., 2020, 2021; Vahidi et al., 2022). However, Sroufe (2021, p. 585) cautions that "a positive correlation between closeness and dependency rated by the same teacher is not testimony that high emotional dependency is good." It may be more correct to interpret this finding as teachers merely reporting feelings of warmth and closeness for children who excessively express their neediness.

Factor analysis, in particular the examination for measurement (non)invariance at the item level, is another way to examine cross-cultural differences in the conceptualization and assessment of teacher-child relationships. Subtle differences across cultures at the item-level were first reported by Chen et al. (2019). Cultural differences in child perceptions of closeness were most noticeable. In close relationships with teachers, Dutch students felt more at ease with their teachers and shared more personal information than their Chinese counterparts. However, Chinese students experienced more recognition and help when feeling uncomfortable. This latter finding may suggest that the safe haven function of the teacher-child relationship is more prominent in collectivistic cultures. Some item-level differences were also found in teacher-perceived dependency. A child being continually fixed on the teacher was found to receive a higher (teacher-reported) dependency score in relationships with Chinese teachers than in relationships with Dutch teachers. Conversely, a child seeking continuous confirmation from the teacher, was found to receive a higher (teacher-reported) dependency score in relationships with Dutch teachers than in relationships with Chinese teachers. This seems to suggest

that confirmation seeking behavior is more accepted (and considered less disturbing) in collectivistic cultures than in individualistic cultures. In sum, the scant cross-country research indicates that there are a few subtle conceptual differences, in particular in closeness and dependency, that need more in-depth investigation.

Adolescence and Secondary Schools

In the first decade, attachment-based research into teacher-child relationships was almost exclusively focused on early childhood education. This aligned with the assumption that teachers in their role of attachment figures are primarily important for young children, as the attachment systems of young children get more easily activated and young children's ability for self-regulation is more limited (Verschueren and Koomen, 2012). Given this initial focus on early childhood education, the STRS (Pianta, 2001) was developed for and validated in preschool and early grade school samples only. In the second decade, researchers gradually shifted attention to upper elementary grades and early adolescence. This research in secondary schools, however, remained predominantly guided by motivational theories (Roorda et al., 2011). As a consequence, the focus was (and still is) mainly on (student-reported) teacher support and/or closeness, and not on conflict and dependency. Moreover, research in secondary education typically examined relationships with teachers in general and not dyadic relationships with individual (subject) teachers (for an exception see, Roorda et al., 2019). It was not until the third decade, that a specific understanding of teachers as possible *ad hoc* attachment figures in adolescence started to develop, with the dependency dimension, however, still being ignored.
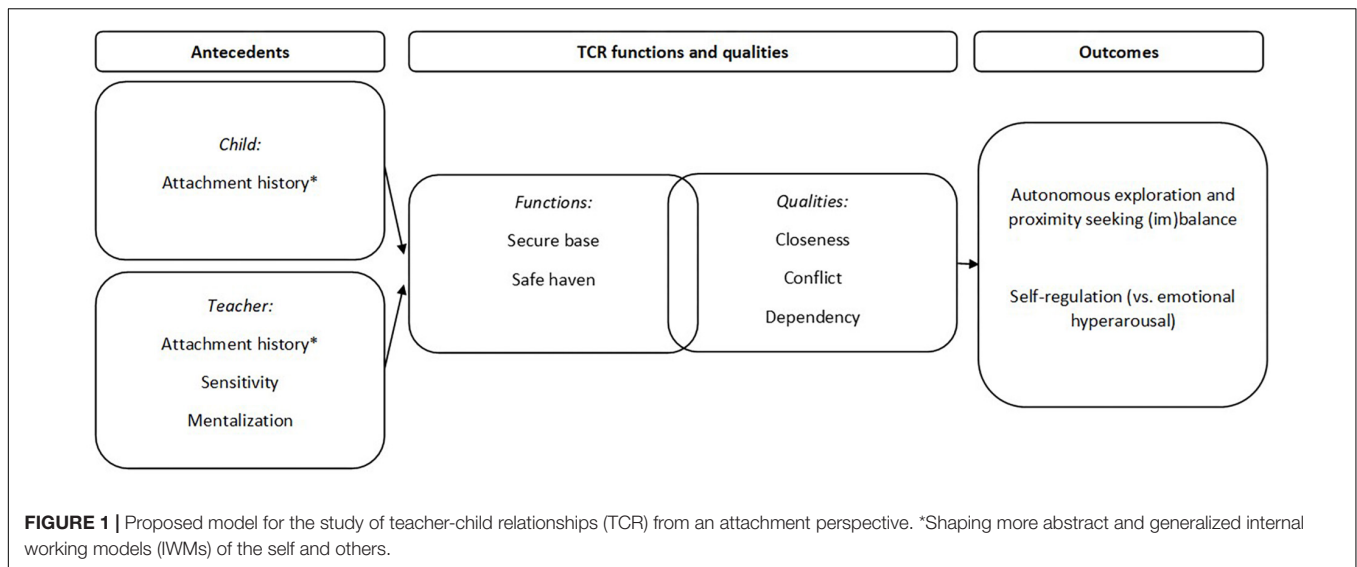
The question that arises is whether adolescents still need teachers to foster their emotional security. As children's self-regulation ability develops, the need for adult caregivers to preserve feelings of security may diminish. In addition, adolescents increasingly turn to peers as *ad hoc* attachment figures. In line with the declining need for adult caregivers, researchers reported typical declines in closeness in teacher-child relationships when children age (Jerome et al., 2009; Ansari et al., 2020). Moreover, the rate of decline of closeness has been found to increase throughout secondary school (Ettekal and Shi, 2020). It is, however, far from clear whether this decline primarily results from a fading need for closeness to teachers or is, at least to some extent, driven by the manner in which secondary education is organized. The steady decrease in closeness suggests a developmentally appropriate decline in the need for teachers as *ad hoc* attachment figures. However, a sudden and steep decline in closeness, over and above the normative rate of decline, in the transition from elementary to secondary school (Bokhorst et al., 2010; Hughes and Cao, 2018) denotes that the organization of secondary schools may play a significant role over and above typical developmental changes. Bergin and Bergin (2009) argue that "the real problem may be that secondary schools are not designed for belongingness" (p. 157). In secondary schools, children have multiple teachers and larger classes, affording teachers and children less opportunity to build personal relationships. In addition, there is a stronger emphasis on discipline, instruction, and achievement than on emotional support and relationships. This could thwart the development of close teacher-student relationships and may fuel conflict and misunderstandings.

As became clear in the first decade of attachment-based research, dyadic teacher-child relationships need time to develop (Bergin and Bergin, 2009). It is therefore conceivable that higher levels of closeness are observed in those secondary schools that afford teachers and students the necessary (leisure) time and opportunities for building trust and closeness in teacher-child relationships. Insightful in this regard is the study of Van Ryzin (2010) about students participating in a mentor advisory program. Secondary students met periodically with teacher advisors in small groups over an extended period of time to share both academic and personal issues. Almost half of the students reported a desire to use their mentor teacher as a secure base and safe haven. Using stringent criteria for the classification of persons as attachment figures, 41% of the students nominated their teacher advisor as part of their attachment network. Attachment to the teacher advisor was found to be related to growth in feelings of hope and to growth in achievement, and to be particularly important for students whose mothers did not classify as an attachment figure (Van Ryzin, 2010). Thus, in secondary schools that actively promote teacher-student bonding, we may see more teachers performing the role of *ad hoc* attachment figures for (vulnerable) students.

Developmental differences between childhood and adolescence should perhaps not be searched so much in the *importance* of teacher-child relationships as in the *functions* of teacher-child relationships (**Figure 1**, cf. Theme 2 and Theme 3). Research on the similarity of closeness across different age groups indicated that, given the same level of teacher-child closeness, older children were less likely to seek support and comfort from their teachers when upset than younger children (Koomen et al., 2012; cf. Theme 3). In the same vein, it has been suggested that the safe haven function (cf. Theme 3) becomes less important in early adolescence than the secure base function (cf. Theme 2). The study of De Laet et al. (2014) showed that adolescents do not so much turn to teachers for help when upset, but do rely on teachers for support to undertake new activities and to pursue personal goals and plans. The secure base function thus appears more prominent. This is an interesting finding given that identity formation is a key developmental task during adolescence and involves the exploration of possible selves through the trying of commitments and the investigation of new things (Verhoeven et al., 2019). Identity exploration may be facilitated through a secure base provided by teachers. As such, close teacher-child relationships in adolescence are more than a source of social capital or support. As Murray et al. (2016) demonstrated, attachment-based constructs that underly the secure base function like emotional availability, trust, and (lack of) conflict are more important to the psychosocial adjustment of adolescents than social support-based constructs.

The unwaning importance of the secure base function found by De Laet et al. (2014) is echoed in the finding of the meta-analytic study of Roorda et al. (2017) that close teacher-child relationships become increasingly important for children's engagement in secondary school as compared to elementary school. This meta-analytic study, however, also points to a gap in our knowledge as there was limited research in secondary

FIGURE 1 | Proposed model for the study of teacher-child relationships (TCR) from an attachment perspective. *Shaping more abstract and generalized internal working models (IWMs) of the self and others.

education that had examined teacher-child relationships from the attachment-based multi-dimensional perspective. The few studies that did, indicate that closeness and conflict both play a role in adolescents' psychosocial adjustment, school functioning, and achievement (Longobardi et al., 2016; Engels et al., 2021).

Although adolescents in general may tend to rely less on teachers for a safe haven relative to younger children (either as a result of secondary school organization or as a result of a developmentally-appropriate declining need for emotional support from adult caregivers), this may be different for vulnerable adolescents. The attachment system of vulnerable youth is believed to get activated more easily, while their self-regulating ability is relatively limited, which may lead to more excessive support seeking (e.g., dependency) or other maladaptive coping strategies (e.g., self-injury). There is indeed no evidence that dependency becomes less important as children grow older (Koomen et al., 2012), on the contrary, meta-analytic evidence shows that dependency becomes even a stronger indicator of maladjustment as children grow older (Roorda et al., 2021). Other research further signify the importance of teacher-child relationships for vulnerable adolescents including youth experiencing stressful live events (Pössel et al., 2013), lacking secure mother-child attachments (Van Ryzin, 2010), or youth with mental health problems and suicidal ideation (Sun and Hui, 2007; Halladay et al., 2020).

In sum, teacher-child relationships, and in particular the secure base function, remain important in adolescence for students in general, with the safe haven function appearing in particular important for more vulnerable students.

Theme 2: Secure Base and Autonomous Exploration

Provision of a secure base and safe haven are key functions of attachment relationships. The *secure base function* refers to children's drive for *autonomous exploration* of the environment through the promotion of children's sense of *emotional security*. In a secure teacher-child relationship, a child can use the

teacher as a base for exploration. Through exploration of the environment the secure base function contributes to children's engagement in social activities and learning at school, which fosters their socioemotional and cognitive development. In insecure relationships with teachers, children may not be able to use the teacher as a basis for exploration, resulting in low social and task engagement. Children with insecure teacher-child relationships may exhibit aloof and detached behaviors, oppositional-aggressive behaviors, or excessive proximity seeking behaviors, each at the cost of autonomous exploration.

Throughout the first to third decade of research, there have been numerous correlational studies that have demonstrated effects of teacher-child relationships on children's classroom participation, task behaviors, and (dis)engagement (e.g., Birch and Ladd, 1997; Pianta et al., 1997; Hughes et al., 2008; Roorda et al., 2017; Zee and de Bree, 2017) as well as effects on social-emotional development (e.g., Zhang and Nurmi, 2012; Garner et al., 2014). In this section, we will discuss the handful of research that more explicitly tested the secure base mechanism in classroom settings. These studies are rather rare and are scattered across the second and third decade. Therefore, we discuss this research together in one section.

Second and Third Decade

Thijs and Koomen (2008) observed the secure base mechanism in a dyadic task setting in kindergarten. The results demonstrated positive effects of teacher support on the observed emotional security of socially inhibited children. In line with the secure base hypothesis, emotional security, in turn, was associated with children's task engagement. A similar kindergarten study in a small-group task setting with two children revealed that associations between observed emotional security and profiting from instruction (spontaneous recall) on a new categorization and recall task during training sessions were mediated by observed task engagement in individual children (Koomen et al., 2004). This study thus also supported the secure base hypothesis, although teacher support appeared to have no influence in this group setting with two children. It was not until 2020

that these findings were replicated in a sample of preschool children with externalizing behaviors (Alamos and Williford, 2020a), providing additional evidence for teachers' supportive interactions to contribute to children's task engagement through children's emotional security. Spilt et al. (2018) also examined the effect of observed teacher sensitivity in a dyadic setting. The study included a special education sample of children with attachment problems who were at risk of poor teacher-child relationships and were expected to be less able to use teachers as a secure base for exploration. Change in independent classroom participation and social withdrawal were assessed as proxies of autonomous exploratory behavior at the beginning and end of the school year. It was found that children with insecure-dependent teacher-child relationships showed improvement of independent classroom participation over time when dyadic teacher sensitivity was observed to be high. Conversely, a lack of sensitivity was associated with declines in independent exploratory behavior. The findings suggest that teacher sensitivity contributes to children's ability to use teachers as a secure base for autonomous exploration of the learning environment. No effects were, however, found on social withdrawal. In a sample of children with attachment problems in special education, it could be that more is needed than only a secure teacher-child relationship to improve social engagement. Alternatively, social withdrawal cannot be equated with social engagement, and future studies may need to include a more fine-grained assessment of social engagement.

Another exceptional study was the experimental study of Ahnert et al. (2013) that was published at the end of the second decade. They studied the secure base function of the teacher-child relationship in kindergarten using a priming paradigm to manipulate (stimulate) emotional security by priming children with their teacher's image (experimental condition) or with a neutral prime (control condition). It was assumed that the activation of a child's mental representation of a secure (close) teacher-child relationship would enable the child to invest energy in cognitive exploration and learning, thus facilitating cognitive processing. It was indeed found that closeness was associated with a faster execution of the task (but not with greater accurateness).

Teachers may not only provide a secure base to children for exploration of the outer world (i.e., the social classroom context or learning material) but also for exploration of the inner world (Oppenheim and Koren-Karie, 2014). Through dialogue caregivers engage children in a co-construction process of meaning-making of emotional experiences. Such guided exploration of children's inner feelings is key to raise children's emotional awareness and self-understanding. According to Oppenheim and Koren-Karie, caregivers' sensitivity in guiding this co-construction process of meaning-making of emotional experiences through dialogue with children reflects the "psychological secure base" function of the caregiver-child relationship. This idea has recently been explored in a sample of children with attachment problems in special education (Spilt et al., 2021): Teachers were asked to engage with individual children in dialogues about past emotional events. High-quality dialogues, characterized by for example sensitive teacher guidance and absence of negativity of both teachers and

children, were related to children's perceptions of more closeness and less conflict, but not to teacher perceptions of the teacher-child relationship. Research of Alamos and Williford (2020b) also attests to the importance of teachers' talk about emotions with individual children in the context of sensitive dyadic interactions. This more recent focus on more specific qualities of the secure base function of teacher-child relationships may deepen our understanding of the functions of teacher-child relationships.

Theme 3: Safe Haven and Stress-Regulation

The *safe haven* function of attachment relationships refers to the caregiver's ability to support a child that is distressed. The caregiver's role is to help the upset child to regulate feelings of insecurity and stress in order to restore feelings of *emotional security*. Through this process of co-regulation of the child's emotions and sensitive guiding of the child's behavioral responses, children develop the self-regulation skills that are necessary to cope with challenges and stress. Children who cannot rely on teachers as a *safe haven* are expected to experience more hyperarousal and to spend more energy on regulating feelings of insecurity in comparison to children who can rely on teachers for support. The (continuing) regulation of hyperarousal may deplete cognitive resources and lead to concentration problems, inflexibility, and frustration intolerance. Moreover, without adult co-regulation of emotions and behaviors in stressful circumstances at school, the development of self-regulation is expected to be impeded.

In the first decade, research indicated that security seeking behavior from children and supportive responses from teachers were central features of the teacher-child relationship in early childhood (cf. Theme 1). In addition, teacher-child relationships have been linked to children's emotion regulation abilities (e.g., Pallini et al., 2019) and social-emotional competence (e.g., Garner et al., 2014). However, few studies actually tested whether teachers could restore feelings of security in children in or immediately after stressful circumstances. The first studies observing the *safe haven* phenomenon in specifically stressful circumstances emerged in the second decade of research. We therefore start our review in the second decade of research. In the third decade, new experimental research emerged and biological measures of stress (e.g., cortisol secretion) were used to examine effects of teacher-child relationships on children's stress regulation.

Second Decade

In the second decade of research, there were two studies that tried to capture children's emotional insecurity in specific circumstances and the role of the teacher-child relationship. Little and Kobak (2003) examined daily fluctuations in children's self-esteem in response to negative events at school. It was shown that children's self-esteem was less impacted by negative events in the classroom when they had secure relationships with teachers. The study of Thijs and Koomen (2008) is one of the rare studies that examined the effects of observed teachers' sensitivity in real time. They expected that a one-on-one task setting would be mildly stressful for socially-withdrawn children.

However, they observed less emotional insecurity among socially-withdrawn children when teacher support was high, although this was not found in a setting with two children instead of one (Koomen et al., 2004). In sum, at the end of the second decade, there was first support, albeit sparse and inconsistent, for the idea that close relationships may help sustain and restore children's security feelings and sense of self both during and after stressful events.

Third Decade

In the third decade, research started to evaluate children's stress regulation on the basis of HPA axis activity and the release of cortisol over the course of a school day. To our knowledge, Ahnert et al. (2012) were the first to examine the secretion of cortisol, demonstrating that first grade children with secure relationships with teachers were better able to down-regulate cortisol levels throughout the day. Moreover, these children were still able to do so on Fridays when stress was more pronounced than on Mondays. Conversely, children with insecure teacher-child relationships were less successful in stress regulation on Mondays and also less successful on Fridays than on Mondays. These findings indicate that the coping resources of these children weakened throughout the school week due to the lack of a safe haven.

Causal evidence for the link between teacher-child relationship quality and children's self-regulation ability comes from experimental research. Hatfield and Williford (2017) examined the effects of Banking Time, an intervention to promote dyadic teacher-child relationships. They found greater declines in cortisol among preschool children participating in the Banking Time intervention than in the control condition. Improvements in teacher-child relationships thus appear to benefit the development of children's stress regulation at the physiological level.

Vandenbroucke et al. (2017) used an experimental design to examine the restoring effect of teacher emotional support immediately after a stressful event. The researchers used the Cyberball paradigm to simulate online social exclusion. Children played an online ball-tossing game with two virtual peers, but after a short while the two peers began to ignore the child by not tossing the ball to the child anymore. This was supposed to evoke mild distress and physiological arousal that would interfere with working memory performance. It was also assumed that such effects of (social) distress on working memory performance could be buffered in real time when adult caregivers provided emotional support. To simulate emotional support, children received an emotionally supportive audio message from a stranger (control condition), from one of their parents (parent condition), or from their teacher (teacher condition) directly following the stressful event. A buffering effect of teacher emotional support on working memory was found after social exclusion. This finding suggested that emotional support from teachers can restore emotional security immediately after a stressful event, and in such a way that insecurity feelings no longer interfere with task performance. However, this protective effect was only found for children with poor parent-child relationships, which aligns with other research suggesting that

the teacher-child relationship is especially important for at-risk children (Sabol and Pianta, 2012).

In sum, both observational and experimental studies indicate that teacher-child relationships contribute to children's stress regulation and help restore felt security in difficult circumstances.

Theme 4: Attachment History and Relationship (Dis)continuity

Continuity or concordance between parent-child and teacher-child relationships was a major theme in initial research on teacher-child relationships. On the one hand, attachment theory contends that attachment quality is "a unique reflection of the dyad's history of interactions" (Van IJzendoorn et al., 1992, p. 9). This implies limited concordance between relationships with different attachment figures. On the other hand, attachment theory also states that children's representations of parent-child relationships constitute the basis of a more generalized (superordinate) attachment model that encompasses more global feelings, beliefs, and expectations about the self (self-worth) and others (availability and trustworthiness). Such global attachment representations, based on a *history of attachment relationships*, reflect the meaning of children's overall experience with multiple caregivers and provide a lens through which they interpret and evaluate the behavior of new relationship partners, thus guiding the development of new relationships (**Figure 1**). This reasoning suggests that there is *continuity* between children's relationships with parents, current teachers, and future teachers. More recently, attachment scholars have begun to explore a third argument, namely the idea of *domain-specific* attachment representations (Sibley and Overall, 2008). Children may develop domain-specific working models for relationships with parents (family relationships) as well as domain-specific working models for relationships with teachers (school-based relationships). This implies a stronger continuity in relationships with subsequent teachers (i.e., relationships within the same domain) and less continuity or even *discontinuity* between parent-child and teacher-child relationships (i.e., relationships across domains). Moreover, domain-specific representational models could mainly be activated in their specific domain but not in other domains (Verschueren et al., 2012). This would imply that children's attachment models of relationships with parents as well as those with teachers have domain-specific effects on children's development.

Limited continuity or discontinuity may point to the possibility of compensatory functions: Caregiver-child relationships outside the primary caregiving context could offer children *corrective experiences*, which may result in modification of initially insecure attachment models of self and others. In this way, teacher-child relationships can become a *compensatory resource* for children with insecure parent-child relationships (Sabol and Pianta, 2012; Verschueren, 2015). *Continuity*, on the other hand, may constitute a hazard for children with insecure parent-child relationships because it places these children at risk for the formation of insecure relationships with teachers.

Researchers have almost exclusively focused on the influence of children's attachment history. Yet, a few scholars have also

pointed to the (assumed) importance of the attachment history of *teachers* (Pianta et al., 2003; Spilt et al., 2011). Teachers' representations of attachment relationships, based on a history of attachments in their life, may shape their ideas about how children should relate to adult caregivers as well as the extent to which they believe that teaching involves a relational component. Teachers' history of attachment relationships may also explain personal differences in teachers' desire for close relationships with children (or even the tendency to seek corrective emotional experiences through relationships with children, see Riley, 2009) and in how teachers respond to children's proximity seeking behaviors. However, research that has linked teachers' attachment history or style to the quality of teachers' dyadic relationships with children in (pre)school is virtually absent (Kesner, 2000; Granot, 2014). Consequently, our review is limited to research on children's attachment histories.

Research on children's attachment history and (dis)continuity in children's relationships across different attachment figures throughout (pre)school, as well as the compensatory role of non-familial relationships, can be found in all three decades and began already early in the first decade.

First Decade

Research in the first decade reported a moderate degree of continuity between parent-child and teacher-child relationships (Pianta and Nimetz, 1991; Lynch and Cicchetti, 1992; Pianta et al., 1997). For example, it was found that maltreated children experience less optimal relationships and less psychological proximity with teachers than they desire (Lynch and Cicchetti, 1992). Moreover, continuity was more likely to occur when there were similarities in the quality and context of care as well as sufficient time for the child and adult to spend together, which was more often the case in child care settings than school settings (Howes and Matheson, 1992; Kontos, 1992). The modest continuity found suggests that children's experiences with parents do affect their relationships with teachers at least to some extent. At the same time, it points to a fundamental role of the shared history of dyadic interactions that is unique in each relationship (Van IJzendoorn et al., 1992; Pianta et al., 2003).

In addition, first support was found for the compensatory role of teacher-child relationships. Researchers reported stronger beneficial effects of teacher-child relationships on children's academic and social development when children were insecurely attached to the mother (Mitchell-Copeland et al., 1997) or had a history of poor parenting (Hughes et al., 1999; Burchinal et al., 2002). This research points to a significant window of influence of new relational experiences to reverse early experiences (Buyse et al., 2011).

Second Decade

Research on concordance between mother-child and teacher-child relationships continued in the second decade of research. Attachment (in)security with parents was found to be modestly associated with developments in closeness and conflict across the (pre)school years (O'Connor and McCartney, 2006; O'Connor et al., 2012), but the association seemed to weaken as children grew older (Zhang, 2011; Sabol and Pianta, 2012). Research

further suggests that the influence of mother-child attachments diminishes in comparison to the influence of early teacher-child relationships on current teacher-child relationships (Howes et al., 1998; O'Connor and McCartney, 2006). Specifically, whereas relationships with kindergarten teachers were predicted by early relationships with mothers and child-care teachers, relationships with first-grade teachers were no longer predicted by relationships with mothers when relationships with child-care teachers and kindergarten teachers were taken into account (O'Connor and McCartney, 2006). It thus seems that within-domain relationships are more strongly interrelated than cross-domain relationships. The waning influence of mother-child attachments supports the idea that children may develop domain-specific internal working models of teacher-child relationships that become more differentiated from working models of parent-child relationships over time (Howes et al., 1998; Sabol and Pianta, 2012; Verschueren et al., 2012).

As longitudinal research increased, researchers started to examine the degree of continuity in teacher-child relationships throughout kindergarten and grade school (Jerome et al., 2009; Spilt et al., 2012a). Cross-year continuity was moderately strong for teacher-perceived conflict and significantly stronger for conflict than for teacher-perceived closeness (Jerome et al., 2009), which was relatively low. These findings have led scholars to speculate that conflict is a more child-driven aspect of the teacher-child relationship than closeness (Spilt et al., 2012a). Importantly, continuity in children's perceptions of closeness across teachers appears higher (Hughes et al., 2012) than continuity in teacher perceptions of closeness (Jerome et al., 2009). The higher continuity in children's closeness perceptions may be explained by these perceptions being shaped by more generalized representations of the trustworthiness of others based on a history of (domain-specific) relationships (Hughes et al., 2012).

Third Decade

Research on relationship continuity across home and school contexts further developed in the third decade. Whereas research in the earlier decades had typically focused on teachers and parents as informants, Vu and Howes (2012) and Vu (2015) examined children's own representations of relationships with mothers and teachers. Using the same story-completion task for the assessment of both relationships, a relatively strong level of concordance was found as compared to previous research (in particular with respect to security). Yet, there were differences in representations as well. Children's representations of attachment to teachers were less hyperactivated, less disorganized, and more deactivated than representations of attachment to mothers. These qualitative differences support the notion of domain-specific internal working models of relationships. Also, this combined finding of both similarities and differences further supports the notion that teacher-child relationships are not full-fledged attachments but *ad hoc* attachments (cf. Theme 1).

When the qualities of teacher-child relationships are not merely a reflection of the qualities of the mother-child relationships, both relationships are likely to contribute to children's development. Children's development should then

be better predicted by the sum of children's relationships than by solely the mother-child relationship. O'Connor et al. (2014) reported unique independent effects of teacher-child relationships on children's internalizing and externalizing problems as reported by their mothers, taking into account early mother-child attachment security, current mother-child relationship quality, and current teacher-child relationship quality. In addition, there is some evidence for domain-specific effects on children's development. Verschueren et al. (2012) demonstrated domain-specific effects of teacher-child relationships on academic self-concept, whereas children's general self-concept was uniquely predicted by the mother-child relationship.

Research on the compensatory functions of teacher-child relationships for children with insecure parent-child relationships also accumulated toward the third decade. Buyse et al. (2011), for example, tested this assumption in preschool. They reported that children with insecure mother-child attachments were no longer at risk for more aggressive behavior in the context of close teacher-child relationships. Ben-Gal Dahan and Mikulincer (2020) tested this assumption in public high schools focusing on a school adaptive outcome, that is task persistence. They found a negative effect of children's global attachment orientations (i.e., attachment anxiety but not avoidance) on both self-reported and actual task persistence. However, perceptions of the homeroom teacher as accepting and responsive in times of need buffered the negative effect of global attachment anxiety on task persistence. However, not all studies report a buffering effect. Roubinov et al. (2020) found that child perceptions of closeness did not prevent growth in conduct problems of children exposed to harsh parenting. They did find, however, that *low* closeness exacerbated growth of conduct problems, suggesting that harsh parenting combined with non-close teacher-child relationships constitutes a double risk for the development of oppositional defiant disorders.

In sum, this line of research clearly demonstrates that both parent-child and teacher-child relationships contribute to children's development. Furthermore, as continuity across relationships is modest, there seems support for the idea that children develop mental representations of relationships with teachers that can be differentiated from their representational models of relationships with parents. However, it should be noted that continuity may also be driven by (more or less stable) child characteristics or socialization processes rather than by early attachment representations of self and others. As such, no definite conclusions can be drawn yet. In addition, evidence for compensatory effects is also inconclusive as there are multiple studies that have found no compensatory or buffering effects of close teacher-child relationships for children with poor parent-child relationships (Meehan et al., 2003; Verschueren et al., 2012; O'Connor et al., 2014; Roubinov et al., 2020).

Theme 5: Teacher Sensitivity and Mentalization

Caregiver sensitivity is considered a causal predictor of attachment quality. *Sensitivity* refers to the ability of the caregiver to perceive and interpret a child's signals and needs accurately, and to respond appropriately and promptly (Ainsworth et al., 1974). Van IJzendoorn et al. (1992, p. 9) suggested that one of the criteria to consider teacher-child relationships as "real" attachment relationships is that teacher sensitivity should be predictive of relationship quality. A teacher's sensitivity to the needs of an individual child should thus contribute to the relationship with that child (**Figure 1**). Besides caregiver sensitivity, caregiver mentalization is considered an important predictor of attachment security (Zeegers et al., 2017). Mentalization refers to the ability of the caregiver to interpret and think about behavior in terms of underlying mental states like thoughts, feelings, desires, and intentions, and has been studied as three specific, partly overlapping, abilities: mind-mindedness, reflective functioning, and parental insightfulness (Medrea and Benga, 2021).

Despite its theoretical importance, research on teacher mentalization is almost absent. Research on teacher sensitivity toward *individual* children in (pre)school settings does exist, but has remained scattered, even after three decades of research. Most research has focused on teacher sensitivity in child-care settings (Howes and Hamilton, 1992; Ahnert et al., 2006) or has examined teacher sensitivity at the *classroom* level by observing teachers' sensitivity in relation to multiple children (e.g., La Paro et al., 2006; Buyse et al., 2008), which has proven to be basically different from dyadic teacher sensitivity (Weyns et al., 2019; Nguyen et al., 2020). There is some research showing how teacher sensitivity promotes emotional security and engagement. As already outlined above (cf. Theme 2), Thijs and Koomen (2008), Spilt et al. (2018), and Alamos and Williford (2020a) observed teachers' sensitivity and/or support in dyadic task settings at school, showing improved emotional security and engagement of children when teacher sensitivity was high. In this section, we focus on dyadic teacher sensitivity and mentalization *as antecedents of* teacher-child relationship quality (closeness, conflict, and dependency) in (pre)schools. Because research in the first decade is virtually lacking and in the second decade still scarce, we review research in the second and third decade together.

Second and Third Decade

To the best of our knowledge, hardly any study has explicitly examined dyadic teacher sensitivity as an antecedent of individual teacher-child relationship quality in (pre)school. Spilt and Koomen (2012) observed dyadic teacher sensitivity in a small-group task setting on two regular school days in preschool. No direct associations with closeness and conflict were found. As the level of sensitivity was relatively high, the authors speculated that the level of sensitivity was "good enough" for most children to develop positive relationships with teachers. For girls with behavior problems, however, teacher sensitivity did prove to be important. Girls had less conflictual relationships with teachers when the level of teacher sensitivity was observed to be high. In later years, several studies (addressing other research questions) reported zero-order correlations of observed teacher sensitivity with closeness, conflict, and dependency ranging from non-significant to significant but small (Spilt et al., 2012b;

Whittaker et al., 2018; Koenen et al., 2019; Alamos and Williford, 2020a) as well as a moderate association of narrated sensitivity (assessed with the Teacher Relationship Interview) with closeness but not with conflict or dependency (Koenen et al., 2019).

Despite this lack of research on dyadic sensitivity, the first attachment-based intervention studies, that appeared at the bridge between the second and third decade, did target teachers' dyadic sensitivity as the key mechanism of change. Banking Time is perhaps the best known attachment-based intervention (Pianta, 1999; Driscoll and Pianta, 2010). The name of this intervention is a metaphor for building up positive experiences. In a series of child-directed play sessions, teachers learn to observe, narrate, and label a child's emotions and needs, communicate relational messages of care and acceptance to the child, and reduce teacher-directed behaviors. Banking Time has primarily been applied in preschool research, but its principles are also incorporated in interventions for older children, for example in secondary education (Duong et al., 2019). In some interventions, Banking Time is combined with an intervention component that targets teachers' behavior management skills (McIntosh et al., 2000; Vancraeyveldt et al., 2015). Banking Time interventions have shown mixed effects. Some studies reported improvements in teacher-reported closeness but no reduction of conflict (Driscoll and Pianta, 2010), whereas a study that included the behavior management component reported reductions of conflict but no improvements in closeness, albeit these effects were explained by the first relationship-enhancing component (based on principles of Banking Time) and not by the added behavior management component (Vancraeyveldt et al., 2015). In observational research, Banking Time was found to decrease teachers' negative interactions with children, but also, somewhat unexpectedly, to decrease positive interactions with children (Williford et al., 2017). The decrease of positive interactions may be a result of teachers having learned to limit their behaviors and interactions to allow the child more autonomy. Together, these studies provide first causal evidence that raising teachers' sensitivity and responsiveness results in improvements in teacher-child relationship quality.

At the same time, a few scholars started to explore the construct of reflective functioning, a caregiver mentalization ability, in relation to teacher sensitivity and teacher-child relationships. Stacks et al. (2013) conducted narrative relationship interviews of preschool teachers. They reported significant variation in reflective functioning between teachers. Moreover, they found that higher scores on reflective functioning were related to teachers' self-reported behaviors promoting children's social-emotional skills. Spilt et al. (2012b) used the notion of reflective functioning in the development of a relationship-focused reflection program for teachers called the LLInC program (Leerkracht Leerling Interactie Coaching in Dutch or Teacher Student Interaction Coaching when translated into English). The LLInC program is a brief coaching program that makes use of the narrative interview techniques of the Teacher Relationship Interview (TRI) to facilitate teacher reflection on internalized feelings and beliefs concerning key dimensions of the teacher-child relationships (e.g., sensitive discipline, secure base function,

perspective taking). Reflection is aimed at linking the narrated mental representation to day-to-day experiences in order to understand how mental representations guide everyday interactions (cf. Pianta, 1999). Experimental research provides indications that LLInC enhances teacher sensitivity, self-efficacy beliefs for emotional support, and relationship quality as evidenced by more closeness and less conflict in relationships with children with relational or behavioral problems (Spilt et al., 2012b; Bosman et al., 2021). There is also some evidence that LLInC supports relationships of pre-service teachers with difficult children during internships (Koenen et al., 2021).

Key2Teach is a comprehensive, personalized coaching program that combines LLInC with functional behavioral analysis, video interaction guidance, and synchronous coaching (Hoogendijk et al., 2020). The authors contend that the joint focus on reflective functioning and interaction skills produces a synergy that leads to greater intervention effects. The program Key2Teach has been found to reduce conflict and increase closeness in dyadic relationships with children with externalizing problems, although it is not known which components of this comprehensive program accounted for these positive effects (Hoogendijk et al., 2020).

Together these intervention studies tentatively suggest that reflective functioning could be an antecedent of high-quality teacher-child relationships, and that reflection-inducing intervention programs may support teachers in building relationships with children with challenging behaviors.

THE FOURTH DECADE: SUGGESTIONS FOR FUTURE RESEARCH

As we look back on three decades of research, we can conclude that research on teacher-child relationships guided by attachment theory has greatly contributed to our understanding of teacher-child relationships in (pre)school contexts. All aspects of our theoretical model (**Figure 1**) have been addressed in empirical studies. Yet, there remain gaps in our understanding that we hope will be addressed in the forthcoming decade(s). For each of these issues, we provide suggestions for future research.

First, gaps remain in the assessment of teacher-child relationships across developmental phases, school levels, and cultures, and in particular with respect to the dependency dimension (cf. Theme 1). In addition, there has been limited attention to assessing more implicit processes in teacher-child relationships, including children's and teachers' perceptions of teacher-child relationships at the representational level.

Recommendations:

• Increase understanding of the role of dependency in teacher-child relationships and its effects on children's (school) development.

• Consider the concept and measurement of dependency as a multifaceted construct, and its measurement from the child's perspective through a combination of instruments and methods.

• Examine cultural differences in the three-dimensional model of closeness, conflict and dependency, and

in dyadic teacher sensitivity, to shed more light on conceptual and empirical similarities and differences in concepts and mechanisms.

● Develop concepts and measures that span different development phases (early childhood, middle childhood, adolescence) and school transitions (preschool, elementary, secondary, high) to investigate normative developments and school system influences. Investigate under what conditions and circumstances teacher-child relationships (or specific functions of the teacher-child relationship) remain important for older children, asking "how do children negotiate the need for independence and autonomy versus proximity and support when they grow older?" and "how do adolescents signal their need for proximity support?"

● Broaden understanding of teacher-child relationships by exploring more implicit processes using indirect methods like narrative interviews, drawings, or story stem tellings.

Second, teacher-child relationships are believed to contribute to children's development through its positive effects on emotional security (secure base, cf. Theme 2) and restoration of emotional security during or after stressful events (safe haven, cf. Theme 3) as basis for autonomous exploration. However, while research has established a clear link between teacher-child relationships and child development, research that focuses on manifestations of the secure base and safe haven functions in everyday interactions as the explaining mechanism through which child development is fostered remains relatively sparse. In addition, the role of emotional (in)security is often assumed but seldomly measured.

Recommendations:

● Use fine-grained assessments of teacher behaviors that reflect the secure base and safe haven functions in everyday interactions in the classroom, and examine its effects on child emotional (in)security, (maladaptive) help-seeking, and (lack of) autonomous exploratory behaviors.

● To measure child emotional (in)security, use combinations of self-reports, observations, and physiological measures of distress and resiliency.

Third, the mechanisms behind relationship (dis)continuity have remained understudied. We still do not know to what extent and how (new) relational experiences with teachers may shape children's current working models of teacher-child relationships as well as children's working models of caregiver-child relationships in general. We also have little understanding of the importance of teachers' own attachment histories for teacher-child relationships, and how this association may be mediated by representational models of caregiver-child relationships at different levels of generalization.

Recommendations:

● Increase understanding of the unique and interactive effects of parent-child and teacher-child relationships on child outcomes (as current evidence for interactive effects is inconclusive). Examine domain-specific effects of parent-child and teacher-child relationships (as teacher-child relationships may have stronger effects on school-related outcomes).

● Investigate how naturally occurring changes in relationships with teachers across schools years are related to changes in children's working models of relationships.

Examine whether dyadic teacher-child relationships may offer children corrective experiences that may induce changes in relationship-specific, domain-specific (generalized within domains) and global (generalized across domains) internal working models of relationships.

● Examine connections between relationship-specific working models of teacher-child relationships, domain-specific internal working models of teacher-child relationships and global internal working models of relationships of both teachers and children.

● Examine how teachers' own attachment history may shape (representational models of) relationships with (individual) children.

Fourth, although attachment-based interventions targeting teacher-child relationships take a strong interest in improving dyadic teacher sensitivity, there is surprisingly little research on dyadic teacher sensitivity as an antecedent of relationship quality, and even less research on teachers' mentalization ability in relationships with individual children.

Recommendations:

● Advance understanding of teacher sensitivity at the dyadic level as an antecedent of teacher-child relationship quality. Examine the validity of standardized tasks to accurately assess differences in dyadic sensitivity both within and between teachers and across tasks.

● Develop and examine measures for the assessment of teachers' capacity for mentalization (e.g., reflective functioning) as an antecedent of teacher-child relationship quality.

LIMITATIONS

This chronological review focused on developments in attachment-based research on the affective and dyadic nature of teacher-child relationships. Five main themes were distinguished that were discussed in different sections and visually sketched in **Figure 1**, including (1) conceptualization and assessment, (2) secure base and autonomous exploration, (3) safe haven and self-regulation, (4) attachment history and relationship continuity, and (5) teacher sensitivity and mentalization. For each theme, we reviewed the research developments across three decades beginning in 1992. This review by no means intended to present an exhaustive overview of all attachment-based research of the last 30 years. Rather, we presented a limited number of peer-reviewed studies that, to the best of our knowledge, were most useful to illustrate attachment-based themes in teacher-child relationship research (**Figure 1**). This review was also not intended to identify cultural differences in the antecedents, qualities, functions, or outcomes of teacher-child relationships. However, cultural issues in relationship qualities (closeness, conflict, dependency) appeared too prominent to ignore and were therefore discussed to facilitate understanding of the concept of teacher-child relationships. A systematic research review is needed to obtain the complete picture of the (lack of) knowledge and insights in cross-cultural issues concerning attachment-based teacher-child relationship research. To keep the review concise and focused, we also did not specifically address issues of student ethnicity, risk and vulnerability (for a

review, see McGrath and Van Bergen, 2015). Furthermore, our review addressed the developments in attachment-based research primarily from a theoretical perspective and not from a practical perspective. We refer readers to other reviews for how issues in teacher-child relationships can be addressed in practice (e.g., Kincade et al., 2020; Spilt et al., 2022). Finally, other perspectives and models [e.g., social and motivational perspectives; Davis (2003) and Wentzel (2012)], although not less important for our understanding of teacher-child relationships, were also beyond the scope of this review. After all, from the beginning, scholars have recognized the importance of multiple frameworks and perspectives to more fully capture the developmental meaning of teacher-child relationships (Pianta, 1992c; Verschueren and Koomen, 2012; Verschueren, 2015).

CONCLUSION

At the start of the three decennia of research, Pianta wrote that during his time as a middle school teacher in special education he "was counselor, instructor, role model, mentor, and psychological parent," to which he added that it "became apparent that the students' performance was related to my sense of closeness with them and their sense of security with me" (Pianta, 1992a, p. 1). Now, 30 years later, there is no longer just a vague notion of what teacher-child relationships are and what they might mean for children. Instead, there is now a well-studied theoretical framework of teachers as "psychological parents" and of the key importance of the teacher-child relationship as a secure base and safe haven in children's school lives. This review contributed by illustrating and discussing this research base structured around five key themes that typify the application of the attachment theory to teacher-child relationships (**Figure 1**). Besides a steady progress in theoretical and conceptual understanding, we are pleased to see that research-based insights are increasingly translated into interventions that are being implemented in schools to strengthen teacher-child relationships in practice (e.g., Kincade et al., 2020). And yet there is still a lot of research work to do as some attachment-based assumptions have remained understudied or evidence has remained inconclusive. We are looking forward to the new insights that the forthcoming decade(s) of research may bring us.

AUTHOR CONTRIBUTIONS

JS wrote the first draft of the manuscript. HK contributed to the manuscript revision. Both authors contributed to the conception of the study and read and approved the submitted version.

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