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Teacher-child relationships and interaction processes: Effects on students' learning behaviors and reciprocal influences between teacher and child

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General Introduction

Affective teacher-student relationships have been theorized and frequently found to influence various aspects of students' school adjustment, among which school engagement and academic achievement (e.g., Graziano, Reavis, Keane, & Calkins, 2007; Pianta, Hamre, & Stuhlman, 2003; Pianta & Steinberg, 1992; Wentzel, 1997). In research on teacher-student relationships, a distinction can be made between relationships and actual interactions. Although these concepts are often used interchangeably, it is relevant to distinguish between them. According to developmental systems theory (Pianta et al., 2003), relationships in a broad sense consist of four elements that reciprocally influence each other: features of individuals (developmental history and biological factors), information exchange processes (interactive behaviors), external influences, and relationship partners' mental representations about themselves, the other and the relationship. Mental representations of the relationship and interactive behaviors have been treated as core elements in previous research. On the one hand, relationship perceptions are considered to develop from a history of daily interactions between teacher and child. On the other hand, relationship representations also guide further interactions with the relationship partner (Pianta et al., 2003).

In the present thesis, we will use the term *relationships* for teacher-student relationships in the broadest sense of the word, covering both relationship representations and interactive behaviors. In the first part, the focus is on teacher-student *relationships* in a broad sense. A meta-analytic approach was used to broadly review the impact of affective relationships on students' learning behaviors. The majority of past research has focused on relationship representations (e.g., Hamre & Pianta, 2001; Hughes, Luo, Kwok, & Loyd, 2008; Zimmer-Gembeck, Chipuer, Hanisch, Creed, & McGregor, 2006), whereas less attention has been paid to interactive behaviors (e.g., Downer, Booren, Lima, Luckner, & Pianta, 2010; Thijs & Koomen, 2008). In the second part, we shift our focus to actual *interactions* between teachers and children. In this way, we tried to gain more information about one of the key elements of relationships and about possibilities to enhance those relationships. More specifically, we focused on reciprocal influences and elicitations between teacher and child and on mechanisms (i.e., interpersonal complementarity) that could help to explain and change these interchanges. This new information about reciprocal interaction processes may also provide knowledge about mechanisms to improve teacher-child relationships in the long run.

Affective Teacher-Student Relationships and Learning Behaviors

Several theories have played an important role in guiding research on the impact of affective teacher-student relationships. One of these theories, the *extended attachment perspective*, originated from research about mother-child relationships (Bowlby, 1969). In short, this approach argues that a positive relationship between teacher and child promotes feelings of security in the child. Security is considered to be a necessary precondition for exploration of the environment, engagement in learning activities, and school performance. Therefore a favorable relationship between teacher and child will stimulate the child's learning behaviors (Al-Yagon & Mikulincer, 2004; Hamre & Pianta, 2001; Howes, Hamilton, & Matheson, 1994; Pianta, 1999; Rey, Smith, Yoon, Somers, &

Barnett, 2007). *Self-system theory* (Connell & Wellborn, 1991) and *self-determination theory* (Deci, Vallerand, Pelletier, & Ryan, 1991; Ryan & Powelson, 1991) offer another, though not competitive, point of view on the association between teacher-student relationships and learning. These theories argue that students will become engaged in learning activities if their basic psychological needs (i.e., the need for relatedness, competence, and autonomy) are met (Skinner & Belmont, 1993). Consequently, children who are engaged in learning activities will also perform better on achievement tests and receive higher grades (Skinner, Wellborn, & Connell, 1990). Teachers can help to fulfil those needs by being emotionally involved with students, by providing structure, and supporting students' autonomy.

Empirical research has supported the hypothesized link between teacher-student relationships and students' learning (e.g., Graziano et al., 2007; Pianta & Steinberg, 1992; Wentzel, 1997). Some studies even found that the impact of the affective teacher-student relationship lasted beyond one single school year (e.g., Hamre & Pianta, 2001; Hughes et al., 2008). The impact of the quality of the teacher-student relationship has been investigated for students from preschool (e.g., Garner & Waajid, 2008) to high school (e.g., Zimmer-Gembeck et al., 2006). Although literature suggests that students become increasingly independent from teachers and more oriented towards peers as they make the transition to middle school (Buhrmester & Furman, 1987; Hargreaves, 2000; Lynch & Cicchetti, 1997), the quality of the teacher-student relationship also appears to influence the learning behaviors of secondary school students (e.g., Tucker et al., 2002; Zimmer-Gembeck et al., 2006).

There is, however, considerable disagreement between individual studies in the strength of the reported associations between teacher-student relationships and learning: Some studies found non-significant associations of around zero (e.g., Valeski & Stipek, 2001; Verkuyten & Thijs, 2002), whereas others found significant correlations of around .60 (Gorman, Kim, & Schimmelbusch, 2002; Thijs & Koomen, 2008). To integrate these contrasting findings and to obtain more insight in the actual associations between affective teacher-student relationships and learning behaviors, we chose a meta-analytic approach for the first study of this thesis. Previous meta-analyses provided broad evidence for the impact of positive teacher behaviors on students' affective and cognitive learning outcomes (Allen, Witt, & Wheelless, 2006; Cornelius-White, 2007; Witt, Wheelless, & Allen, 2004). However, these meta-analyses only focused on one specific aspect of teacher behavior (i.e., teacher immediacy; Allen et al., 2006; Witt et al., 2004) or, on the contrary, used broad aggregates of both teacher behaviors and students outcomes (Cornelius-White, 2007). In the second chapter of this thesis, we aimed to obtain more in-depth knowledge about the impact of teacher-student relationships on students' learning by concentrating on specific subsets of teacher behaviors and student outcomes. In contrast to these previous meta-analyses, we focused on the affective quality of the relationship between teachers and *individual* students and also included the *negative* dimension of the teacher-student relationship. Concerning relationship quality, we distinguished between positive (e.g., closeness, relatedness, involvement, emotional support, warmth) and negative (e.g., conflict, rejection, dissatisfaction with teacher, relational negativity) aspects of the relationship. With regard to students' learning behaviors, we made a distinction between school engagement and academic

achievement. Our meta-analytic sample included students from preschool to twelfth grade.

Intervention and Focus on Interaction Processes

Because of the relevance of teacher-student relationships for students' school adjustment, it is considered important to promote positive relationships between teachers and students and to intervene in negative relationships. As Hamre and Pianta (2001) found that conflictual relationships with kindergarten teachers hampered children's school functioning in lower and upper elementary school, and for boys even in middle school, it seems important to start those interventions at an early age. However, until now, evidence-based interventions specifically targeted at improving teacher-child relationships have been scarce. Two of the existing interventions are My Teaching Partner (MTP; Pianta, Mashburn, Downer, Hamre, & Justice, 2008) and Banking Time (BT; Driscoll & Pianta, 2010; Driscoll, Wang, Mashburn, & Pianta, 2011). MTP is a two-year long web-mediated consultation program and focuses on relationships at the classroom level. After one year, significant increases in three of the seven observed teacher behaviors were found (i.e., teacher sensitivity, instructional learning formats, and language modeling; Pianta et al., 2008). BT consists of two six-weeks intervention periods and is directed at relationships between teachers and individual children who are having difficulties in the classroom. This intervention elicited small increases (alpha was set at .10) in teachers' perceptions of closeness in the relationship and children's frustration tolerance, task orientation, and competence, and decreases in conduct problems. However, no intervention effects were found on observer ratings of teacher-child interactions (Driscoll & Pianta, 2010). Although these results provide a first indication that BT and MTP could be used to improve teacher-child relationships, effects seemed to be relatively small considering the time and energy invested by teachers.

Furthermore, most knowledge about teacher-child relationships in the early school years is based on teacher reports about the relationship (e.g., Hamre & Pianta, 2001; Palermo, Hanish, Martin, Fabes, & Reiser, 2007; Peisner-Feinberg et al., 2001). Far less is known about the negotiation processes in actual interactions between teachers and individual children. Most observational studies on teacher-child interactions or teacher behaviors toward individual children have used global ratings or time sampling methods that were aggregated to an overall measure of interaction quality (e.g., Coplan & Prakash, 2003; Downer et al., 2010; Thijs & Koomen, 2008). To gain more insight in children's interactive behaviors and reciprocal influences between teacher and child, a different approach seemed to be needed. Interpersonal theory (Leary, 1957) may be used as a framework for describing and interpreting both teachers' and children's interactive behaviors and mutual effects as it offers two basic dimensions on which almost all variations in interpersonal interactions can be captured (Sadler & Woody, 2003). Moreover, it provides a mechanism (i.e., the complementarity principle) to explain reciprocal influences which may also be used as starting point to intervene in negative interaction cycles (Kiesler, 1996). In chapters three to five, we examined whether interpersonal theory and the complementarity principle may indeed be used to describe and explain observed interactions between teachers and kindergarten children. Moreover, we investigated whether this theory could be used to promote

positive interactions and to intervene in negative interaction cycles.

Interpersonal Theory and the Complementarity Principle

According to interpersonal theory (Leary, 1957), interpersonal styles and interactions can be described on two basic dimensions. The first dimension, control, expresses the degree of power and influence displayed during interactions and ranges from dominance to submissiveness. The second dimension, affiliation, represents the degree of warmth and proximity in interactive behaviors, and varies from friendliness to hostility. A key concept in interpersonal theory is the complementarity principle, which states that an individual's interpersonal behaviors tend to elicit a predictable set of responses in the interaction partner. Therefore, persons (e.g., therapists or teachers) could intentionally alter their own interactive behaviors to elicit changes in the behaviors of their interaction partner (e.g., clients or children). Interpersonal complementarity has been conceptualized in different ways (e.g., Orford, 1986; Wiggins, 1982), among which Carson's (1969/1972) is most common. According to Carson's approach, interactive behaviors and styles are complementarily when they are located opposite on the control dimension, and correspondingly on the affiliation dimension. Thus, hostility evokes hostile behaviors in the interaction partner, whereas submissiveness leads to dominant behaviors.

Interpersonal complementarity can be measured at three different levels (Tracey, 2004): trait level (i.e., interpersonal style across different situations), situational level (i.e., aggregate ratings of interactions or situations), and interaction level (i.e., actual behaviors during a specific interaction within a specific context). Tests of complementarity are considered to be weakest at the trait level and strongest at the interaction level. Tracey (2004) has argued that it is best to study complementarity at the most specific behavioral interaction level, because most of the theory is built at the behavioral interchange level. In addition, aggregate measures of interpersonal behavior are usually poor estimates of interpersonal behavioral exchanges, because they overlook information about negotiation processes which are assumed to be crucial to all interpersonal interactions (Tracey, 2004). Therefore, the studies presented in this thesis analyzed interactive behaviors and interpersonal complementarity at the interaction level.

Interpersonal complementarity is considered to apply mostly to unstructured settings, in which both interaction partners have the same status (Kiesler, 1996). In contrast, school settings are generally relatively structured and teachers and children have different social roles. However, some attempts have been made to implement interpersonal theory in the school setting.

Interpersonal Theory in the School Setting

The two dimensions of interpersonal behavior have often been used in research on teachers' interpersonal styles in secondary education (see Wubbels & Brekelmans, 2005 for an overview), and occasionally in the highest grades of primary school (e.g., Kokkinos, Charalambous, & Davazoglou, 2009). These researchers traditionally measure the degree of proximity (or affiliation) and influence (or control) in the *teacher style* by means of the Questionnaire on Teacher Interaction (QTI; Wubbels & Levy, 1991).

Studies that used the QTI usually found substantial and positive associations of both proximity and influence with students' cognitive and affective school adjustment (Wubbels & Brekelmans, 2005). However, these studies did not investigate interpersonal complementarity in teacher-student interactions, neither did they focus on the dyadic level.

Thijs, Koomen, Roorda, and ten Hagen (2011) did apply the complementarity principle to the school setting and investigated whether complementarity was found in dyadic interactions between teachers and relatively inhibited kindergartners. Teachers' and children's interactive behaviors were observed by independent raters in terms of affiliation as well as control. Interactive behaviors were rated every five seconds to allow the examination of reciprocal influences between interaction partners. The authors found that teachers reacted complementarily on the control dimension but not on the affiliation dimension. In contrast, children responded complementarily on affiliation but not on control. However, children who were shy or shared positive relationships with their teachers did also respond complementarily on the control dimension. Furthermore, teachers' and children's interactive behaviors were also influenced by the behavior of their interaction partner on the other dimension: Teachers displayed less affiliation if children showed more control and were less controlling if children displayed more affiliation. Children showed more affiliation if teachers were more dominant and displayed more control if teachers displayed more affiliation toward them. The results of Thijs and colleagues (2011) provided a first indication that the complementarity principle can be successfully applied to the school setting. In Chapter 3, we used follow-up measures of the same sample to investigate whether a teacher training based on interpersonal theory could be used to change teachers' and children's interactive behaviors. Interpersonal theory and the complementarity principle were explained to teachers and we offered suggestions based on the complementarity principle about how teachers could alter children's interactive behaviors. For instance, we explicated to teachers that they could elicit more initiative from children by being less dominant themselves and more affiliation by displaying more affiliation themselves.

Both the study of Thijs and colleagues (2011) and Chapter 3 used the same sample of relatively inhibited children, and teacher-child interactions were observed in a dyadic setting outside the classroom without any other children present. This specific setting made it possible to observe all teacher-child dyads under comparable conditions. Nevertheless, the results of these two studies may not fully apply to interactions within the classroom context. In addition, the findings for these children, who were selected on their degree of social inhibition, may not pertain to children with different behavior repertoires.

Interactions Between Teachers and Behaviorally Different Children Within a Classroom Setting

As the degree of complementarity in interpersonal interactions is considered to depend on the setting in which the interactions take place (Kiesler, 1996), it is important to replicate the findings of Thijs and colleagues (2011) in the natural ecology of the classroom setting. In general, interactions between teachers and children take place in settings in which a large number of other children are present. This means that teachers have to

divide their attention between different children in the classroom. More specifically, this implies that children will only receive individual attention from the teacher for short periods of time, whereas in a dyadic setting teachers could devote all their attention to an individual child. The presence of other children may influence the degree of control and affiliation of both teacher and child. For instance, children may be less inclined to initiate interactions to teachers when they are in a group setting, especially if they are socially inhibited (e.g., Coplan & Prakash, 2003). In addition, complementarity might be stronger in a dyadic setting, because both interaction partners are more focused on each other's behaviors, and behaviors are probably more easy to interpret for the interaction partner if there is no distraction because of other children. However, to what extent interactions in the classroom setting actually differ from interactions in a dyadic setting still needs to be investigated. To be able to investigate this, observation scales are needed that are valid for use in a group setting. The observation scales for control and affiliation (Thijs et al, 2011) were developed for use in a dyadic setting. In the fourth chapter of this thesis, we investigated whether these observation scales are also suitable for use in a group setting. Teachers and children were observed during the same task as used by Thijs and colleagues (2011), however, in the present study, the task was performed in a small group setting with one teacher and four children who varied in their levels of externalizing and internalizing behavior. The validity of the scales for teacher control and teacher affiliation was examined by relating them to teachers' relationship perceptions, children's internalizing and externalizing behaviors, and children's gender.

There are several indications in literature that the affective quality of teacher-child relationships depends on children's levels of problem behaviors: Both teachers and externalizing children generally report about their relationships as being more conflictual, less close, and less positive than average children (e.g., Henricsson & Rydell, 2004; Thijs & Koomen, 2009). In addition, teachers perceived their relationships with internalizing children as being less close than their relationships with normative children (e.g., Arbeau, Coplan, & Weeks, 2010). Furthermore, as interpersonal complementarity on the control dimension was only found for highly inhibited children and not for children with lower levels of inhibition (Thijs et al., 2011), it is not evident whether the findings of Thijs and colleagues (2011) also apply to interactions between teachers and children with different behavior profiles. In Chapter 5, we tried to replicate the findings of Thijs and colleagues (2011) in a sample of children who varied in their levels of externalizing and internalizing behavior. In this chapter, interactive behaviors were observed in a small group setting within the classroom to investigate whether interpersonal complementarity also exists in the natural ecology of the kindergarten classroom. In addition, we examined whether teachers' unfavorable perceptions of their relationships with problem behavior students could also be revealed in actual interactions between teachers and children with high levels of externalizing and/or internalizing behavior.

Thesis Outline

The last two decades have seen an increase in research on the association between affective teacher-student relationships and students' school outcomes. However,

noticeable differences between studies have been found in the reported strength of associations. Furthermore, most of this research has been based on teachers' (or in higher grades, children's) perceptions of the relationship. Far less is known about actual interaction processes between teachers and children. Likewise, research on possible interventions to promote positive teacher-child interactions and to decrease negative interaction cycles has been scarce. In the present thesis, we tried to gain more insight in the association between affective teacher-student relationships and students' learning behaviors by combining the findings of previous studies in a meta-analysis. In addition, we conducted empirical studies to create knowledge about negotiation processes in interactions between teachers and kindergartners and to examine the effectiveness of an intervention based on interpersonal theory.

In *Chapter 2*, a meta-analytic approach was used to integrate the findings of 99 studies on the association between affective teacher-student relationships and students' learning. These studies contain students from preschool to twelfth grade and analyses were performed for the total set of studies and separately for primary and secondary school studies. Furthermore, different analyses were conducted for positive and negative aspects of the teacher-student relationship, and for engagement and achievement as outcome variables. In addition to analyzing overall associations between teacher-student relationships and learning behaviors, we investigated whether the teacher-student relationship is more important for certain groups of students, such as ethnic minority students, or students with a low SES. Finally, we examined whether there were biases in the results of individual studies due to methodological characteristics of those studies.

Chapter 3 to 5 of these thesis are part of a larger research project which aimed to examine the applicability of interpersonal theory and the complementarity principle to the school setting. The first part of this project (Thijs et al., 2011), which was not included in the present thesis, investigated whether the complementarity principle also holds in interactions between teachers and relatively inhibited kindergartners that were observed in a dyadic setting outside the classroom. In *Chapter 3*, we used follow-up measures of this sample (Thijs et al., 2011) to investigate whether a teacher training based on interpersonal theory (Leary, 1957) could be used to promote positive teacher-child interactions and to intervene in negative interactions. This sample consisted of sixty-five kindergartners who were rated as relatively inhibited compared to their classmates. Interactions took place in a dyadic setting outside the classroom with no other children present. Teachers' and children's interactive behaviors (i.e., control and affiliation) were observed on three occasions (pretest, posttest, and follow-up) and rated by independent observers. We studied whether the training altered teachers' and children's interactive behaviors and interpersonal complementarity. In addition, we investigated whether intervention effects depended on the child's level of social inhibition.

In *Chapter 4*, we applied the observation scales for control and affiliation, which were originally developed for use in a dyadic setting, to the classroom setting. Teacher-child interactions were observed in a small-group task setting within the classroom. The sample consisted of 179 kindergartners who varied in their levels of externalizing and internalizing behavior. We investigated the reliability and validity of the scales for teacher control and teacher affiliation for use in the classroom setting. The validity of

these scales was examined by associating them with teachers' relationship perceptions and children's externalizing and internalizing behaviors, and children's gender.

In *Chapter 5*, we used the same sample as in *Chapter 4* to investigate whether the complementarity principle also holds in teacher-child interactions that take place in a small group setting within the kindergarten classroom. We analyzed teachers' and children's complementarity tendencies on both the control and affiliation dimension. In addition, we examined whether teachers' and children's interactive behaviors and interpersonal complementarity depended on children's internalizing and externalizing behaviors, interaction time (i.e., total length of interactions between teacher and child), and interaction frequency (i.e., number of separate interactions between teacher and child).

Finally, in the *General Discussion*, the findings of the different studies are combined and suggestions for future research are given.

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