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DOI

[10.1016/j.appdev.2017.09.004](https://doi.org/10.1016/j.appdev.2017.09.004)

Publication date

2017

Document Version

Final published version

Published in

Journal of Applied Developmental Psychology

[Link to publication](#)

Citation for published version (APA):

Roorda, D. L., Spilt, J. L., & Koomen, H. M. Y. (2017). Teacher-child interactions and kindergartners' task behaviors: Observations based on interpersonal theory. *Journal of Applied Developmental Psychology*, 53, 74-85. <https://doi.org/10.1016/j.appdev.2017.09.004>

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Teacher-child interactions and kindergartners' task behaviors: Observations based on interpersonal theory



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ARTICLE INFO

Keywords:

Affiliation
Control
Complementarity
Engagement
Performance
Observations

ABSTRACT

The present study examined how teachers' interpersonal behaviors (control, affiliation) and complementarity tendencies (i.e., return low control with high control and high affiliation with similar affiliation) were related to children's task behaviors (engagement, performance). Furthermore, we investigated whether the strength of these associations depended on children's externalizing and internalizing behaviors. Our sample included 48 teachers and 179 kindergartners (94 boys; mean age = 66.75 months) who were selected to represent a variation of externalizing and internalizing behaviors. Independent observers rated teachers' interpersonal behaviors and children's task behaviors. Teacher control was negatively related to both children's task engagement and performance, whereas teacher affiliation was not associated with children's task behaviors. Furthermore, associations between teachers' complementarity tendencies on control and children's task performance depended on the level of control that children displayed themselves. To conclude, teachers should be made aware that controlling behaviors could be detrimental for children's task behaviors.

1. Introductions

There is ample evidence that teachers' perceptions of their relationships with individual children predict children's school engagement and performance (e.g., Hamre & Pianta, 2001; Hughes, Luo, Kwok, & Loyd, 2008; Roorda, Koomen, Spilt, & Oort, 2011). Far less is known, however, about teachers' interpersonal behaviors towards individual children and how these behaviors relate to children's task behaviors (i.e., task engagement and performance). Interpersonal theory (Leary, 1957) offers a framework to observe teachers' interpersonal behaviors, by displaying them on two dimensions, affiliation (i.e., the degree of friendliness versus hostility in interactions) and control (i.e., the degree of leadership/initiative versus passiveness). Furthermore, this theory provides opportunities to understand how interaction partners influence each other during interaction processes (i.e., complementarity tendencies; Roorda, Koomen, Spilt, Thijs, & Oort, 2013).

In the present study, we used very specific observations of teacher-child interactions to examine how teachers' interpersonal behaviors and complementarity tendencies were associated with children's engagement and performance on a story completion task in kindergarten. We investigated how teachers' affiliation and control behaviors and complementarity tendencies were associated with kindergartners'

engagement with and performance on an ecologically valid small group task. Furthermore, as teacher-child relationships seem to have more impact on children at risk for school maladjustment (Hamre & Pianta, 2001; Silver, Measelle, Armstrong, & Essex, 2005), we investigated whether teachers' interpersonal behaviors and complementarity tendencies were more strongly related to the engagement and performance of children who were at risk due to relatively high levels of externalizing or internalizing behavior.

1.1. Interpersonal theory and the complementarity principle

According to the interpersonal theory (Leary, 1957), interaction processes can be described on two orthogonal dimensions: control and affiliation. Affiliation, which measures the affective quality of interactions, refers to the degree of proximity, warmth, and support in the interaction and varies from friendliness to hostility. Control, on the other hand, describes the degree of power and influence in the interaction and ranges from leadership/initiative to passiveness (Gurtman, 2001; Kiesler, 1996). As such, control refers to interpersonal qualities, such as initiative and leadership during interactions, instead of intrapersonal qualities, such as self-control and self-regulation (Eisenberg, Valiente, & Eggum, 2010; Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009; Skinner, Wellborn, & Connell, 1990).

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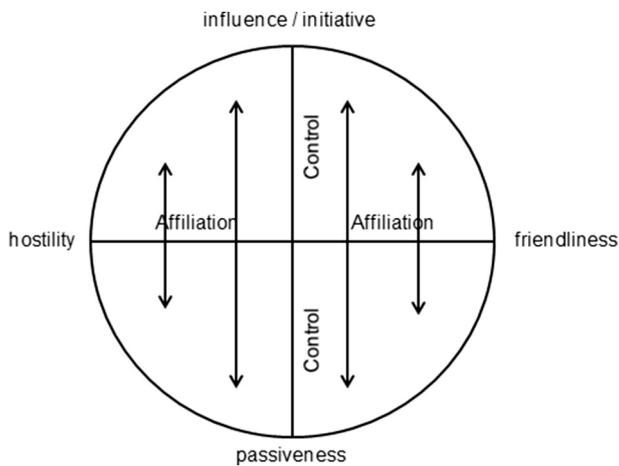


Fig. 1. Interpersonal circumplex. The arrows represent complementary behaviors.

Apart from providing two dimensions on which interpersonal behaviors can be displayed, interpersonal theory also offers a way to describe and explain how interaction partners influence each other during interactions. This idea is formulated in the complementarity principle, which states that someone's interpersonal behaviors tend to elicit specific reactions from the interaction partner (Sadler & Woody, 2003). Interpersonal behaviors are complementary if they are opposite on the control dimension and similar on the affiliation dimension (Carson, 1969/1972). Thus, leadership/initiative will elicit passive behavior in the interaction partner and passiveness will lead to leadership/initiative. In contrast, friendliness will elicit friendly behaviors in the interaction partner and hostile behaviors will lead to hostility (see Fig. 1). Imagine, for example, that kindergarten children are given a task in which they have to place different sets of pictures in a logical chronological order and tell the corresponding story to the teacher (i.e., the task that was used in the present study). When the teacher asks the child to tell the story, the child could react in different ways. For instance, the child could do nothing and ignore the teacher (i.e., low control, low affiliation). The teacher may then respond with “You have to tell the story, I am not going to say it again” in an angry tone of voice (i.e., high control, low affiliation), which would be a complementary reaction. The child could also react in a different way, for example, “I don't want to tell that stupid story” (i.e., high control, low affiliation). In response, the teacher may just remain silent but look irritated (i.e., low control, low affiliation), which would be a complementary response. Some teachers, however, may respond as described above (i.e., “You have to tell the story, I am not going to say it again”), which would be an anticomplementary reaction as far as the control dimension is concerned. Interpersonal behaviors are considered to be anticomplementary if people respond with similar behaviors on the control dimension and with opposite behaviors on the affiliation dimension. Interpersonal complementarity is theorized to exist, because it confirms people's self-concepts and makes people experience their interactions as comfortable and anxiety-free (Kiesler, 1996; Tracey, 2004). As a consequence, interaction partners who respond complementarily on each other are expected to work more effectively together and to have higher performances than partners who react anticomplementarily (Estroff & Nowicki, 1992).

In the present study, we investigated whether higher degrees of complementarity in teachers' responses to young children's interpersonal behaviors were positively associated with children's performance on a school task. In addition to children's actual performance on the task, we also focused on their engagement with the task because teachers' supportive behaviors seem to affect children's performance through their effect on children's engagement (Skinner et al., 1990). Therefore, engagement is considered to be an important variable to take into account when studying children's task behaviors.

1.2. Teachers' interpersonal behaviors and children's engagement and performance

Interpersonal theory has frequently been used in research on teachers' interpersonal styles in secondary education (see Wubbels & Brekelmans, 2005 for a review). These researchers traditionally measure students' perceptions (and sometimes teachers' perceptions) of the degree of proximity (or affiliation) and influence (or control) in teacher style by means of the Questionnaire on Teacher Interaction (QTI; Wubbels & Levy, 1991). The QTI studies usually found positive associations between both teacher affiliation and control on the one hand and students' school engagement and performance on the other hand (Wubbels & Brekelmans, 2005). Most of the QTI studies, however, focused on students in secondary education and not on young children. As far as we know, only Zijlstra, Wubbels, Brekelmans, and Koomen (2013) applied the QTI to the kindergarten setting. Just as in secondary school studies, they found that both teacher control and affiliation were positively associated with children's mathematics achievement. Still, the QTI studies mainly focused on students' perceptions of teachers' interpersonal behaviors towards an entire class and not on teachers' actual interactions with individual children.

With regard to the degree of affiliation in interactions between teachers and individual children, research based on other theories (e.g., attachment theory; Pianta, 1999) has mainly focused on the association between teachers' perceptions of the affective quality of the relationship and young children's school engagement and performance. Teacher reports of favorable teacher-child relationships (measured in terms of, for example, closeness, warmth, or support) were associated with more school engagement and better academic performance over time (Baker, 2006; Hamre & Pianta, 2001; Hughes et al., 2008). However, studies on the affective quality of teacher-student relationships did not take into account how teachers and children influenced each other during daily interactions and how these interaction processes influenced children's task behaviors. Studies that did observe daily interactions usually focused on teacher-child interactions at the classroom level (i.e., teachers' interpersonal behaviors towards the entire group of children) and not on interactions between teachers and individual children (e.g., Cadima, Doumen, Verschueren, & Buyse, 2015; Cadima, Leal, & Burchinal, 2010; Curby, Downer, & Booren, 2014; Downer et al., 2012; Pakarinen et al., 2014; Pakarinen, Lerkkanen, Poikkeus, Siekkinen, & Nurmi, 2011). The few studies that did examine how interactions between teachers and individual children related to children's engagement and performance, found that teachers' positive behaviors towards the child (e.g., McDonald Connor, Son, Hindman, & Morrison, 2005; Rimm-Kaufman et al., 2002) or an overall positive quality of the interaction (e.g., Downer, Booren, Lima, Luckner, & Pianta, 2010; Ladd, Birch, & Buhs, 1999) were positively associated with children's engagement and performance. Thus, in line with the QTI studies, these observational studies suggest that high levels of teacher affiliation towards individual children will be associated with more engagement and better performance in these children. These observational studies, however, did not observe how children's interpersonal behaviors elicited specific responses from their teachers (i.e., complementarity tendencies) and how these were associated with children's task behaviors. Furthermore, most of these previous studies used questionnaires and test scores or school grades as global indicators of children's engagement respectively performance. In contrast, the present study used independent observer ratings to measure children's engagement and performance on a specific school task. A few studies provided evidence that teachers' affiliation behaviors will also be associated with independent observer ratings of task behaviors (e.g., Dotterer & Lowe, 2011; Doumen, Koomen, Buyse, Wouters, & Verschueren, 2012).

With respect to the degree of control in teachers' interpersonal behaviors towards individual children, associations with children's engagement and performance have hardly been examined. There is some evidence that high levels of teacher intrusiveness and overcontrol

towards individual children are related to lower performance on a test of vocabulary skills in first grade (McDonald Connor et al., 2005). Furthermore, teacher coercion appeared to be associated with lower levels of both child-reported and teacher-reported engagement in a sample of third to sixth graders (Skinner, Kindermann, & Furrer, 2009). Finally, kindergartners seemed to participate more actively in conversations with teachers if teachers were low on conversational control (Evans & Bienert, 1992), which might indicate that they will also participate more in learning activities if their teachers are low on control. Similarly, Pakarinen et al. (2014) found that high control in terms of classroom organization (on the class level) increased children's social dependence in performance situations. Based on these exemplary studies, we would expect that higher levels of teacher control would be related to less engagement and worse performance in children. In contrast, based on the QTI studies, we would hypothesize that higher levels of teacher control would be associated with more engagement and better performance (Wubbels & Brekelmans, 2005).

1.3. Teachers' complementarity tendencies and children's engagement and performance

With regard to complementarity, some evidence has been found that the complementarity principle can also be applied to teacher-child interactions. Pennings et al. (2014) found evidence that complementarity on both control and affiliation existed in interactions between two secondary school teachers and their respective class of students (Pennings et al., 2014). Furthermore, socially inhibited kindergartners, who were observed in a dyadic setting outside the classroom, reacted complementarily on their teachers' affiliation behaviors, whereas teachers responded complementarily on children's controlling behaviors (Thijs, Koomen, Roorda, & ten Hagen, 2011). Finally, in the sample of the present study, both teachers and individual kindergartners responded complementarily on the control dimension but not on the affiliation dimension (Roorda et al., 2013). Although studies on complementarity thus provide preliminary evidence that the complementarity principle can be used to explain teacher-child interaction patterns, it remains unknown how teachers' complementarity tendencies are associated with children's engagement and performance.

Previous research on interactions between college students has found that students with complementary interaction styles performed better on a jigsaw puzzle task than dyads with anticomplementary styles (i.e., dyads who responded similar on control and opposite on affiliation; Estroff & Nowicki, 1992). Likewise, Markey, Lowmaster, and Eichler (2010) showed that undergraduate students who interacted more complementarily liked each other more, completed tasks faster, and made less mistakes on tasks than students who did not interact complementarily. However, it is still unknown whether complementarity in the context of teacher-child interactions is facilitative of children's performance. Therefore, we investigated whether teachers' complementarity tendencies were related to young children's engagement and performance. We hypothesized that higher levels of complementarity in teachers' responses to children would be associated with more engagement with the task and better performance, whereas higher levels of anticomplementarity would be related to less task engagement and worse performance.

Although complementarity seems to be advantageous for people's task performance (Estroff & Nowicki, 1992; Markey et al., 2010), complementarity might also intensify negative interaction patterns (Kiesler, 1996), which may be especially the case in the context of teacher-child interactions. For example, if teachers return children's hostile behaviors with hostility, interactions may become increasingly negative (Rimm-Kaufman et al., 2002). Therefore, complementarity within hostile interactions may have less positive effects on children's task behaviors than complementarity within friendly interactions. Likewise, if teachers return children's passiveness with high control, children may become even more passive (Evans & Bienert, 1992; Roorda et al., 2013) and,

hence, less actively involved in the task. Therefore, we also investigated whether the effect of teachers' complementarity tendencies on children's engagement and performance depends on the overall level of child control and affiliation during the interaction.

1.4. The moderating role of children's externalizing and internalizing behaviors

Indications have been found that the quality of teacher-child relationships is more important for the school functioning of certain groups of children than for others (e.g., Roorda et al., 2011). According to the academic risk hypothesis (Hamre & Pianta, 2001), teacher-child relationships are more important for the school adjustment of children who are at risk for academic failure, because these children have more to gain or to lose. Both children with high levels of externalizing behavior and children with high levels of internalizing behavior are considered to be at risk for academic maladjustment, because they tend to be less engaged with school and to perform worse than average children (Baker, 2006; Gruman, Harachi, Abbott, Catalano, & Fleming, 2008; Henricsson & Rydell, 2006; Rimm-Kaufman & Kagan, 2005; Stipek & Miles, 2008). Moreover, ample evidence has been found that children with high levels of externalizing and internalizing behavior are at risk for developing negative relationships with their teachers (Henricsson & Rydell, 2004; Jerome, Hamre, & Pianta, 2009; Rudasill, 2011). In addition, some indications have been found that negative teacher-child relationships are only predictive for the work behaviors of children with high levels of problem behaviors (Hamre & Pianta, 2001). Therefore, we examined whether children's levels of externalizing and internalizing behaviors affected the associations between teachers' interpersonal behaviors and complementarity tendencies and children's task behaviors. We expected that teacher-child interactions would have more impact on the task engagement and performance of children with higher levels of externalizing or internalizing behavior than on those of children with lower levels of externalizing and internalizing behavior (Hamre & Pianta, 2001).

1.5. Present study

In the present study, we examined whether teachers' interpersonal behaviors (i.e., control and affiliation) and complementarity tendencies were related to children's task engagement and performance in a sample of kindergartners. This sample was selected to represent the heterogeneity and variation of externalizing and internalizing behavior that can be found in regular kindergarten classrooms. We investigated whether the strength of these associations depended on children's levels of externalizing and internalizing behavior. Finally, we examined whether the associations between teachers' complementarity tendencies and children's engagement and performance were moderated by the overall levels of child control and child affiliation during the interaction. Different from previous studies, we observed teachers' interactions with individual children on a very detailed level (i.e., in 5-second intervals) and examined how teachers' interpersonal behaviors and complementarity tendencies were related to children's engagement and performance on a story completion task. Both teachers' interpersonal behaviors and children's engagement and performance were observed in the same small group task setting. We took this approach because we were interested in the immediate links between teacher-child interactions and children's task behaviors (cf., Estroff & Nowicki, 1992).

First, we hypothesized that higher levels of teacher affiliation would be related to more engagement with the task and better task performance of children (e.g., Ladd et al., 1999; McDonald Connor et al., 2005; Wubbels & Brekelmans, 2005). However, we did not formulate specific hypotheses about the associations between teacher control and children's task behaviors (cf., McDonald Connor et al., 2005; Skinner et al., 2009; Wubbels & Brekelmans, 2005). Furthermore, we expected that children would be more engaged and perform better if teachers

reacted more complementarily to them, whereas they would be less engaged and perform worse if teachers responded with more anticomplementary behaviors (Estroff & Nowicki, 1992; Markey et al., 2010). We also hypothesized that higher levels of complementarity would be especially positive if children themselves displayed higher levels of control and affiliation during the interaction. Finally, we expected that teachers' interpersonal behaviors and complementarity tendencies would have more impact on the engagement and performance of children with high levels of externalizing or internalizing behavior (Hamre & Pianta, 2001). We hypothesized that the effect of complementary responses would be especially positive if children themselves displayed higher levels of control and affiliation during the interaction.

2. Method

2.1. Selection

Our sample was selected from a larger sample of 961 Dutch kindergartners (55% boys). Schools in the neighborhood of Amsterdam and Utrecht were asked to participate. Due to practical reasons, these schools needed to be within reach of a train station. When schools agreed to participate, we asked all kindergarten teachers whether they were willing to take part in the present study. Informed consent was then obtained from both teachers and parents. To select four children from each classroom, teachers' ratings of children's externalizing and internalizing behaviors were used. Ratings were available for 10 to 26 children per teacher. Per classroom, children were divided in four groups: one group with low scores on both externalizing and internalizing behavior (i.e., average children), one group with high scores on both externalizing and internalizing behavior (i.e., inhibited-disruptive children), one group with high scores on externalizing behavior and low scores on internalizing behavior (i.e., disruptive children), and one group with high scores on internalizing behavior and low scores on externalizing behavior (i.e., inhibited children). Cut-off scores were based on the median values as observed in another randomly-selected sample of kindergartners ($N = 1557$; Spilt, Koomen, Thijs, Stoel, & van der Leij, 2010), which were 1.33 for internalizing behavior and 1.21 for externalizing behavior on a four-point scale (ranging from 1 to 4). In classrooms where none of the children could be categorized in a particular group, we selected the child with scores closest to the cut-off scores to represent this group. In the full sample, the distribution of children across groups was as follows: 272 children were categorized in the average group, 206 children in the inhibited group, 244 children in the disruptive group, and 239 children in the inhibited-disruptive group.

After children were categorized into groups, one child was randomly selected from each category for participation in the present study. We used this stratified selection procedure to select a sample of children which represented the heterogeneity and variation of externalizing and internalizing behaviors as they can be found in regular kindergarten classrooms. As mean levels of externalizing and internalizing behavior tend to be low in regular kindergarten classrooms (cf., Spilt et al., 2010), an entirely random selection of children would probably have led to a skewed distribution of these variables. Therefore, we first categorized children in those four groups to guarantee variation in children's levels of externalizing and internalizing behavior and to approach a more normal distribution of these behaviors in the selected sample. We did not aim to select a high risk sample or extreme groups and, hence, we used the median values rather than clinical values to categorize children into groups and subsequently selected children randomly from each group. After selection, skewness and kurtosis scores were respectively 1.96 and 4.33 for externalizing behavior and 1.11 and 1.23 for internalizing behavior, indicating that these behaviors were relatively normally distributed. Teachers were not aware of this selection procedure.

2.2. Sample

Our final selected sample included 179 kindergarten children (94 boys, 85 girls) and their 48 teachers from 23 Dutch regular schools. Children's mean age was 66.75 months ($SD = 6.41$) and most children ($N = 127$) had the Dutch nationality. No information was available about children's socioeconomic backgrounds. Teachers (all female) were on average 40.37 years old ($SD = 11.76$) and had on average 13.27 years of teaching experience ($SD = 11.19$). Our sample was part of a short-term intervention study focused at improving either teachers' mental representations of the relationship or their actual interactions with two of the selected children (Spilt, Koomen, Thijs, & van der Leij, 2012). To prevent effects of the intervention on the associations under examination, we only used observations from the first measurement occasion, which was scheduled before the start of the intervention. Originally, the selected sample consisted of 192 children (105 boys), however, 13 children were absent at the first occasion and were thus excluded from the analyses.

2.3. Procedure

Observations took place in a small group setting in the kindergarten classroom with one teacher and the four selected children. Children had to perform a task in which they had to place three different sets of three pictures in a logical chronological order and tell the corresponding story to their teacher (for a more detailed explanation of the task, see Task Performance). This task was selected because it invites interaction between the teacher and each of the four children. The task took place in the natural ecology of the classroom and the small group task setting was comparable to small group work as it often occurs in kindergarten classrooms. In this way, we chose a task that was considered largely representative for the tasks that children do in kindergarten classrooms and, hence, allowed an examination of naturally occurring teacher-child interactions and task settings. Teachers were told that they were free to perform the task the way they wanted and that we were interested in how they usually interacted with the selected children. Each child was given his/her own set of pictures and most children completed the task individually. However, there were also some teachers who stimulated the children to help each other and let them work together. Because teachers were free to perform the task the way they wanted, the length of the video-fragments ranged from 7.58 to 30.75 min ($M = 16.17$, $SD = 4.52$).

Observations were scheduled in the spring of the kindergarten school year. The observations were videotaped and rated afterwards by different groups of trained observers (i.e., different observers for teacher-child interactions, engagement, and performance). These observers were all undergraduate students who were trained in advance until they reached an acceptable level of agreement. Per variable, most video-fragments were rated by only one observer but several randomly selected fragments (11–15%) were double coded to allow the examination of interrater reliability. In case of disagreement between observers, one of these ratings was randomly selected to be included in the analyses.

Teachers reported about children's externalizing and internalizing behaviors prior to the observations. We used teachers' ratings of children's externalizing and internalizing behaviors both for the selection of children and as moderator variables because we were mainly interested in how children behaved in the school setting and externalizing and internalizing behaviors tend to be context dependent. In addition, teachers' ratings of externalizing and internalizing behavior tend to be more reliable than, for example, parents' ratings (Stone, Otten, Engels, Vermulst, & Janssens, 2010). An overview of all study variables can be found in Table 1.

Table 1
Overview and definitions of study variables.

Variable	Definition	Operationalization
Predictors		
Teacher control	The degree of power, influence, and initiative in teachers' interpersonal behaviors towards each individual child in the small group setting.	Observations on a 6-point scale ranging from (1) "shows a passive attitude towards the child, and does not try to influence his/her behavior at all" to (6) "tries to have a strong influence on the child, has (or takes) complete control over the situation without acknowledging and permitting any independent contribution from the child".
Teacher affiliation	The degree of proximity, warmth, and support in teachers' interpersonal behaviors towards each individual child in the small group setting.	Observations on a 6-point scale ranging from (1) "is defensive, morose, or unfriendly to the child" to (6) "is strongly positive, clearly supportive, companionable, or warm, both verbally and nonverbally".
Complementarity on control	The degree to which the teacher responds with opposite behaviors on individual children, that is, returns low levels of child control with high control and vice versa.	Correlations between Teacher Control t and Child Control $t - 1$ (recoded), ranging from high levels of anticomplementarity (i.e., high negative correlations) to high levels of complementarity (i.e., high positive correlations).
Complementarity on affiliation	The degree to which the teacher responds with similar behaviors on individual children, that is, returns high levels of child affiliation with high affiliation, and low levels of child affiliation with low affiliation.	Correlations between Teacher Affiliation t and Child Affiliation $t - 1$, ranging from high levels of anticomplementarity (i.e., high negative correlations) to high levels of complementarity (i.e., high positive correlations).
Externalizing behavior	Children's undercontrolled and outwardly directed behaviors during the previous months as reported by the teacher. These behaviors tend to be annoying and disruptive for others, such as hyperactivity and aggression.	Questionnaire completed by teachers.
Internalizing behavior	Children's overcontrolled and inwardly directed behaviors during the previous months as reported by the teacher. These behaviors tend to represent problems with the self and frequently involve behavioral deficits and patterns of social avoidance, such as anxious and withdrawn behavior.	Questionnaire completed by teachers.
Child control	The degree of individual children's initiative and self-assured attitude during the interaction with the teacher.	Observations on a 6-point scale, ranging from (1) "is totally passive and shows no initiative, acts only when explicitly or repeatedly asked by the teacher" to (6) "adopts an active self-assured attitude toward the teacher. For example, lets the teacher know what it wants, tries to convince the teacher, or openly argues with the teacher".
Child affiliation	The degree of individual children's warmth, pleasantness, and spontaneity during the interaction with the teacher.	Observations on a 6-point scale, ranging from (1) "is indifferent, defensive, morose, unfriendly, or cheeky to the teacher" to (6) "is very pleasant, companionable, spontaneous, or warm to the teacher".
Outcome variables		
Task engagement	The degree of individual children's engagement with the task, including both children's engaged behaviors (i.e., behavioral engagement) and their engaged feelings and emotions (i.e., emotional engagement) towards the task.	Observations on two 7-points scales (aggregated measure). The first scale ranges from (1) "actively tries to avoid the task, seems to want to have no part in it, and tries to abandon it as soon as possible" to (7) "is actively involved with the task virtually throughout the entire session, displays no diversionary tactics, does its best to finish the task as good as possible". The second scale ranges from (1) "does not show any enthusiasm, does not seem to care about its own performance, seems bored, frustrated, or angry or makes an unhappy, apathetic, or tired impression" to (7) "is happy during the entire task, is sincerely interested, has fun and is glad if it succeeds, stays enthusiastic and interested if the task becomes difficult".
Task performance	The degree of individual children's performance on the task, including the degree to which children were able to place the three pictures in a logical chronological order and the degree to which they were able to tell a correct chronological story about the pictures.	Observations on a 4-point scale and a 3-point scale (combined measure, sum scores). The first scale ranges from (1) "no, despite help from the teacher" to (4) "yes, correct without help". The second scale ranges from (1) "totally wrong" to (3) "completely right".
Covariates		
Gender	Children's gender.	0 = boy, 1 = girl
Control towards group	The mean of teachers' control behaviors towards the four children in the group.	Based on observations of Teacher Control towards individual children (aggregated measure).
Affiliation towards group	The mean of teachers' affiliation behaviors towards the four children in the group.	Based on observations of Teacher Affiliation towards individual children (aggregated measure).
Interaction duration	The total length of the video fragment.	Based on observations, ranging from 7.58 to 30.75 min.

2.4. Measures

2.4.1. Teacher-child interactions

Teacher Control and Teacher Affiliation were measured to represent teachers' interpersonal behaviors with individual children. To be able to analyze teachers' complementarity tendencies, Child Control and Child Affiliation were also measured. Teacher Control and Child Control were used to create a measure of teachers' complementarity tendencies on the control dimension (i.e., Complementarity on Control), whereas Teacher Affiliation and Child Affiliation were used to create a measure of teachers' complementarity tendencies on the affiliation dimension (i.e., Complementarity on Affiliation).

Teachers' and children's interpersonal behaviors were originally

rated in episodes of 5 s (i.e., interval ratings; cf., Bakeman & Gottman, 1997). Because task engagement and performance were rated at the child level (i.e., only one global rating per child was given per variable), the interval ratings for teachers' interpersonal behaviors were aggregated at the child level to form one mean score for Teacher Affiliation and one mean score for Teacher Control towards each individual child.

2.4.1.1. Teacher Control and Teacher Affiliation. Teachers' interpersonal behaviors towards each individual child were rated independently by two different groups of trained observers (three observers per group) on two six-point scales (i.e., control and affiliation; Thijs et al., 2011). Teacher Control varied from (1) "shows a passive attitude toward the

child, and does not try to influence his/her behavior at all” to (6) “tries to have a strong influence on the child, has (or takes) complete control over the situation without acknowledging and permitting any independent contribution from the child”. Teacher Affiliation ranged from (1) “is defensive, morose, or unfriendly to the child” to (6) “is strongly positive, clearly supportive, companionable, or warm, both verbally and nonverbally”. Intraclass correlation coefficients (ICCs) for absolute agreement in interval ratings were fair for Teacher Affiliation (ICC = 0.54) and good for Teacher Control (ICC = 0.74; Cicchetti et al., 2006). Although the ICC for Teacher Affiliation may seem low, the number of cases in which there was a difference of more than one scale point between observers was only 1.8%. Previous studies in kindergarten have supported the reliability and validity of these scales for use in dyadic (Thijs et al., 2011) and small group settings (Roorda, Koomen, & Oort, 2012).

2.4.1.2. Child Control and Child Affiliation. Children's interpersonal behaviors were also rated on two six-point scales (Thijs et al., 2011) by two other groups of trained observers (eight observers per group). Child Control ranged from (1) “is totally passive and shows no initiative, acts only when explicitly or repeatedly asked by the teacher” to (6) “adopts an active self-assured attitude toward the teacher. For example, lets the teacher know what he wants, tries to convince the teacher, or openly argues with the teacher”. Child Affiliation varied from (1) “is indifferent, defensive, morose, unfriendly, or cheeky to the teacher” to (6) “is very pleasant, companionable, spontaneous, or warm to the teacher”. ICCs for absolute agreement in interval ratings were good for both Child Control (ICC = 0.65) and Child Affiliation (ICC = 0.61).

2.4.1.3. Teachers' complementarity tendencies. To analyze teachers' complementarity tendencies on the control dimension, correlations were computed between the interval ratings of Teacher Control (at time t) and the ratings of Child Control one episode earlier (at time $t-1$). These correlations were calculated at the child level. By calculating the correlation between Teacher Control at t and Child Control at $t-1$ for each teacher-child dyad, we were able to see how teachers reacted on individual children's behavior one episode earlier. In the same way, we calculated correlations between Teacher Affiliation at t and Child Affiliation at $t-1$. For Complementarity on Affiliation strong, positive correlations represented high complementarity tendencies (e.g., the teacher returned high affiliation in the child with high teacher affiliation and reacted on low affiliation in the child with low affiliation). In contrast, correlations around zero indicated no complementarity (i.e., no association was found between the teacher's and the child's behavior). Finally, strong and negative correlations indicated anticomplementarity (e.g., the teacher reacted with low affiliation on high affiliation in the child and vice versa). For Complementarity on Control, a strong and negative correlation originally meant that the teacher responded complementarily (i.e., responded with high control on low control in the child and vice versa). In contrast, a correlation around zero meant that the teacher did not react complementarily at all. Finally, a strong and positive correlation indicated that the teacher reacted anticomplementarily on the child (i.e. responded with high control on high control in the child and with low control on low control in the child). However, to ease interpretation of the results, we recoded the correlations for Complementarity on Control (i.e., multiplied them by -1), so that strong, positive correlations represented high complementarity, whereas strong, negative correlations reflected anticomplementarity. Complementarity on Control can, hence, be interpreted in the same way as Complementarity on Affiliation. This operationalization of complementarity is comparable to that of Pennings et al. (2014), who also found that secondary school teachers could react either complementarily (e.g., positive correlations for Affiliation), not complementarily (i.e., correlations around zero), or

anticomplementarily (e.g., negative correlations for Affiliation).

2.4.2. Task engagement

A fifth group of ten trained observers rated children's task engagement on two seven-point scales: behavioral engagement and Emotional Engagement. Behavioral engagement refers to children's behaviors towards the task (e.g., involvement, effort, persistence), whereas emotional engagement describes children's feelings and emotions towards the task (e.g., happiness, boredom; Skinner et al., 2009). Each child received one score for behavioral engagement and one score for Emotional Engagement (i.e., global ratings). Ratings were based on the first 10 min of the video-fragment to keep the observation time comparable across children. Behavioral engagement was measured with the observation scale Persistence, whereas Emotional Engagement was measured with the Enthusiasm scale (Erickson, Sroufe, & Egeland, 1985). These scales were adapted for use within a school setting by Koomen, van Leeuwen, and van der Leij (2004) and Thijs and Koomen (2008). In the present study, we further adapted these scales for use in a group setting and added more disaffection behaviors and emotions to these scales, such as bored, frustrated, and angry, based on Skinner et al. (2009). Behavioral engagement ranged from *very low* (1) “actively tries to avoid the task, seems to want to have no part in it, and tries to abandon it as soon as possible” to *very high* (7) “is actively involved with the task virtually throughout the entire session, displays no diversionary tactics, does its best to finish the task as good as possible”. Emotional Engagement ranged from *very low* (1) “does not show any enthusiasm, does not seem to care about its own performance, seems bored, frustrated, or angry or makes an unhappy, apathetic, or tired impression” to *very high* (7) “is happy during the entire task, is sincerely interested, has fun and is glad if it succeeds, stays enthusiastic and interested if the task becomes difficult”. Previous studies provided initial support for the reliability and validity of these scales for use in educational settings with kindergartners (Koomen et al., 2004; Thijs & Koomen, 2008). As scores on Behavioral and Emotional Engagement were highly correlated ($r = 0.81$, $p < 0.001$), they were aggregated to form one measure of task engagement. The ICC for this aggregated measure was good (ICC = 0.63).

2.4.3. Task performance

Children's performance on a story completion task was rated by a sixth group of ten trained observers. The task consisted of three sets of three pictures on separate cards (e.g., a picture of a child in bed sleeping, a picture of an alarm clock, and a picture of the child awake and out of bed). For each set of pictures, the middle picture was given and the child had to find the antecedent and the consequent of this picture and place them in the correct chronological order. Subsequently, the child had to tell the corresponding story to the teacher. Task Performance consisted of two items: picture arrangement and story telling. The first item measured whether the child was able to place the three pictures in a logical chronological order during the first try and ranged from (1) “no, despite help from the teacher” to (4) “yes, correct without help”. The second item measured whether the child was able to tell a logical story about the pictures and ranged from (1) “totally wrong” to (3) “completely right”. As such, Task Performance measured children's insight in cause-effect relations (i.e., their capability of logic thinking) and whether they were able to tell stories that are not situated in a larger context as would be the case in, for example, a book. Performance on decontextualized story telling (i.e., narrative assessments; cf., Bitetti & Hammer, 2016) has been found to be related to young children's literacy skills and overall academic outcomes (e.g., Dickinson & Tabors, 2001; Griffin, Hemphill, Camp, & Wolf, 2004). Ratings were given for each of the three series separately but were aggregated for the present analyses to form one rating for each child. Subsequently, the scores for the two items were summed to form one measure of children's task performance on a scale from 2 (i.e., lowest score on both items for all three series) to 7 (highest score on both items

for all three series). The interrater reliability was excellent for Task Performance (ICC = 0.79).

2.4.4. Children's externalizing and internalizing behaviors

Children's externalizing and internalizing behaviors were measured with the Behavior Questionnaire for Two- to Six-Year-Olds-Modified (BQTSYO-M; Thijs, Koomen, de Jong, van der Leij, & van Leeuwen, 2004), which is a Dutch adaptation of the Preschool Behavior Questionnaire (PBQ; Behar, 1977). The broadband scale for Externalizing Behavior consists of 14 items (e.g., "Bullies other children", "A busy child"), whereas the broadband Internalizing Behavior scale includes 15 items (e.g., "Shy or timid toward other children", "Easily upset"). Teachers rated children's behaviors on a four-point scale. Previous studies have reported high internal consistencies for the BQTSYO-M (Cronbach's alpha's \geq 0.81 and 0.91 for Internalizing and Externalizing Behavior, respectively) and supported the validity of both scales (Thijs & Koomen, 2009; Thijs, Koomen, & van der Leij, 2008).

2.4.5. Covariates

Four covariates were included in the analyses. Boys tend to be less engaged, to experience less positive relationships with their teachers, and to display more externalizing behaviors than girls (Keiley, Bates, Dodge, & Pettit, 2000; Koomen & Jellesma, 2015; Lietaert, Roorda, Laevers, Verschueren, & de Fraine, 2015). Therefore, we added children's gender as a covariate in the analyses. Furthermore, to control for relational group climate (cf., Buyse, Verschueren, Verachert, & van Damme, 2009), Control towards Group and Affiliation towards Group were included as covariates. These two variables refer to the means of teachers' control respectively affiliation behaviors towards the four children in the group. Finally, because the video-fragments varied considerably in length (i.e., from 7.58 to 30.75 min), we also controlled for the duration of the video-fragment by adding Interaction Duration as a fourth covariate (i.e., the total length of the video-fragment in minutes).

2.5. Analyses

Hierarchical linear modeling was used for analyzing the data. We expected our data to have a multilevel structure with children nested within teachers. However, for task engagement, variance at the teacher level was redundant. For Task Performance, variance at the teacher level could be estimated (see Table 2 for intraclass correlation). Therefore, we examined a two-level model with variance at the teacher and child level for Task Performance, whereas we analyzed a one-level model with variance at the child level only for task engagement. Analyses were performed with SPSS Statistics version 22. To ease interpretation of results, all variables were standardized (*z*-scores).

Separate models were built for both outcome variables (i.e., task engagement and task performance). First, we included the four covariates Gender, Control towards Group, Affiliation towards Group, and Interaction Duration in the model. Second, we added Teacher Control, Teacher Affiliation, Complementarity on Control, and Complementarity on Affiliation as predictor variables. Third, we included interaction effects between teachers' interpersonal behaviors and both Externalizing Behavior and Internalizing Behavior and between teachers' complementarity tendencies and both Externalizing Behavior, Internalizing Behavior, Child Control, and Child Affiliation. Only significant interactions were retained in the model. To ease interpretation of results, we also included main effects of moderator variables (i.e., Externalizing Behavior, Internalizing Behavior, Child Control, and Child Affiliation) for significant interaction effects only. Finally, we tested whether interactions between teachers' interpersonal behaviors and complementarity tendencies and children's gender were significant. However, as none of these interaction effects was significant, they were excluded from the model.

3. Results

Descriptive statistics and correlations between predictors and outcome variables are displayed in Table 2. The small range of scores on Teacher Control, Teacher Affiliation, Child Control, and Child Affiliation could be explained by the fact that these scores were derived from the means of interval ratings. When looking at the interval level, scores ranged from 1 to 6 for Teacher Control, Child Control, and Child Affiliation, and from 2 to 6 for Teacher Affiliation.

Table 3 reports the associations between teacher-child interactions and children's task behaviors. Both Teacher Control and Complementarity on Control were negatively related with task engagement. Teacher Control was also negatively associated with Task Performance. In addition, a significant interaction effect between Complementarity on Control and Child Control on Task Performance was found: For children who displayed low levels of control themselves, Complementarity on Control was positively associated with Task Performance, whereas this association was negative for children with high levels of control (see Fig. 2).

4. Discussion

In the present study, we used interpersonal theory (Leary, 1957) to observe interaction processes between teachers and individual kindergartners in an ecologically valid small group task setting. We examined whether teachers' interpersonal behaviors (i.e., control, affiliation) and complementarity tendencies were related to children's task engagement and performance. Furthermore, we investigated whether these associations depended on children's levels of externalizing and internalizing behavior and children's levels of control and affiliation during the interaction. To prevent overestimation of associations, teacher-child interactions, children's task engagement, and children's task performance were rated by different groups of trained observers.

4.1. Teachers' control behaviors and complementarity tendencies in relation to children's task behaviors

Interestingly, high levels of teacher control seemed to have detrimental effects on children's task engagement and performance. This result was found for the whole sample of children, regardless of their levels of externalizing and internalizing behavior. Thus, in contrast to the academic risk hypothesis (Hamre & Pianta, 2001), children with higher levels of externalizing or internalizing behavior did not seem to be more susceptible for teachers' controlling behaviors than children with lower levels of externalizing or internalizing behavior. The negative associations between teacher control and children's engagement and performance are in contradiction with the QTI studies that found positive associations between teacher control and children's engagement and performance (Wubbels & Brekelmans, 2005; Zijlstra et al., 2013). A possible explanation for this contradiction might be differences in the operationalization of control. According to parent-child researchers, a distinction can be made between two sorts of control (Grolnick & Pomerantz, 2009): control in the sense of coercion, intrusion, and overcontrol, and control in the sense of structure and guidance. Coercion and intrusion usually tend to have negative effects on children's development, whereas structure usually has positive effects on children's development (Grolnick & Pomerantz, 2009). The QTI studies typically relied on student reports to measure the degree to which teachers are good leaders and the degree to which they make a secure impression. Therefore, the QTI studies may have measured the provision of structure rather than teachers' controlling behaviors and, hence, found positive associations with children's engagement and performance. In contrast, the operationalization of control in the present study seems to be more consistent with concepts like 'teacher intrusiveness and overcontrol' (McDonald Connor et al., 2005) and 'teacher coercion' (Skinner et al., 2009), and may therefore have

Table 2
Means (M), standard deviations (SD), range, intraclass correlations (ICC), design effects (DE), and correlations for predictors and outcome variables.

	M (SD)	Range	ICC	DE	1.	2.	3.	4.	5.	6.
1. Gender	–	–	–	–	–	–	–	–	–	–
2. Control towards group	3.79 (0.23)	3.26–4.29	–	–	0.05	–	–	–	–	–
3. Affiliation towards group	4.33 (0.23)	3.89–4.74	–	–	0.13	–0.01	–	–	–	–
4. Interaction duration	16.17 (4.52)	7.58–30.75	–	–	0.05	–0.13	0.22**	–	–	–
5. Teacher control	3.79 (0.27)	3.10–4.42	0.64	2.91	–0.00	0.86**	–0.01	0.20**	–	–
6. Teacher affiliation	4.33 (0.25)	3.49–4.92	0.76	3.29	0.16*	–0.01	0.91**	0.20**	0.02	–
7. Compl. control	0.08 (0.21)	–0.55 – 0.67	0.02	1.06	–0.03	–0.10	–0.03	0.14	–0.24**	–0.01
8. Compl. affiliation	0.03 (0.18)	–0.65–0.61	0.22	1.66	0.02	–0.10	–0.05	–0.02	–0.08	–0.04
9. Externalizing behavior	1.39 (0.49)	1.00–3.41	0.00	1.00	–0.34**	–0.08	–0.14	–0.02	–0.04	–0.27**
10. Internalizing behavior	1.40 (0.39)	1.00–3.00	0.00	1.00	–0.09	0.02	–0.09	–0.00	0.10	0.00
11. Child control	3.09 (0.47)	2.16–4.22	0.00	1.00	–0.13	–0.13	–0.09	–0.12	–0.23**	–0.19*
12. Child affiliation	3.56 (0.35)	2.24–4.73	0.00	1.00	0.10	–0.17*	0.08	–0.05	–0.19*	0.00
13. Task engagement	5.06 (1.29)	1.50–7.00	0.00	1.00	0.11	–0.15*	0.18*	–0.01	–0.21**	0.13
14. Task performance	5.48 (1.18)	2.50–7.00	0.12	1.36	–0.13	–0.02	–0.05	–0.12	–0.09	–0.07

	7.	8.	9.	10.	11.	12.	13.
1. Gender	–	–	–	–	–	–	–
2. Control towards group	–0.04	0.03	–	–	–	–	–
3. Affiliation towards group	–0.10	–0.01	–0.06	–	–	–	–
4. Interaction duration	0.06	–0.07	0.28**	–0.29**	–	–	–
5. Teacher control	–0.10	0.05	0.11	–0.14	0.40**	–	–
6. Teacher affiliation	0.13	0.08	–0.01	–0.22**	0.43**	0.32**	–
7. Compl. control	–0.09	0.08	–0.01	–0.11	0.10	0.06	0.11
8. Compl. affiliation	0.04	–0.02	–0.02	–	–	–	–
9. Externalizing behavior	–	–	–	–	–	–	–
10. Internalizing behavior	–	–	–	–	–	–	–
11. Child control	–	–	–	–	–	–	–
12. Child affiliation	–	–	–	–	–	–	–
13. Task engagement	–	–	–	–	–	–	–
14. Task performance	–	–	–	–	–	–	–

Note. For Gender, 0 = boy and 1 = girl.

* $p < 0.05$.

** $p < 0.01$.

Table 3
The influence of teacher-child interactions on children's engagement and performance.

	Task engagement		Task performance	
	β (SE)	R ²	β (SE)	R ²
Predictors				
Step 1: covariates				
Gender	0.17 (0.14)	7%	-0.20 (0.14)	3%
Control towards group	0.16 (0.14)		0.24 (0.14)	
Affiliation towards group	0.30 (0.17)		-0.03 (0.17)	
Interaction duration	-0.05 (0.07)		-0.10 (0.08)	
Step 2: teachers' interpersonal behaviors				
Teacher control	-0.38 (0.15)*	12%	-0.33 (0.14)*	6%
Teacher affiliation	-0.15 (0.17)		-0.00 (0.17)	
Compl. on control	-0.15 (0.08)*		0.04 (0.08)	
Compl. on affiliation	0.07 (0.07)		-0.06 (0.07)	
Step 3: interaction effects and moderator variables				
Child control	-		0.02 (0.08)	12%
Compl. control × child control	-		-0.22 (0.07)**	
Variance				
Children (within level variance)	0.88		0.79	
Teachers (between level variance)	-		0.09	

Notes. Standardized regression coefficients are reported. For gender, 0 = boy and 1 = girl.

* $p < 0.05$.

** $p < 0.01$.

detrimental effects on children's engagement and performance. Future research might profit from observing control and structure as two separate dimensions of teachers' interpersonal behaviors to get more insight in how these two dimensions affect children's school functioning. Furthermore, our findings indicate that it is important for teachers to be aware that highly controlling behaviors will not only elicit more passiveness in children during interactions (Evans & Bienert, 1992; Roorda et al., 2013) but may also limit their engagement and performance on school tasks.

Unexpectedly, high degrees of complementarity in teachers' responses on the control dimension appeared to be related to lower task engagement. We expected that higher levels of complementarity would have a favorable effect because complementarity would confirm children's self-concepts and make them experience their interactions with

the teacher as comfortable and anxiety-free (Kiesler, 1996; Tracey, 2004). However, such an effect was not found for children's engagement with the task. Previous studies that did find positive effects of complementarity on task performance, focused on college students who did not know each other before (Estroff & Nowicki, 1992; Markey et al., 2010). In contrast, the present study focused on teachers and kindergarten children, who already knew each other for several months. Therefore, this unexpected finding might be due to age differences, the hierarchical nature of the relationship, the degree to which interaction partners already know each other, or a combination of these factors. More research is needed to find out which is the most likely explanation.

In contrast to the findings for engagement, teachers' complementary responses on the control dimension were found to be beneficial for the task performance of children who displayed low levels of control themselves. Perhaps, complementary responses of the teacher provided these passive children with the necessary feelings of comfort and security to achieve better on the task, whereas anticomplementary reactions made them feel unsafe and anxious (cf., Kiesler, 1996; Tracey, 2004; Verschueren & Koomen, 2012) and, hence, hindered their performance on the task. For children who were high on control themselves, however, teachers' complementarity tendencies were negatively associated with task performance. These inconsistencies in findings call for more research on this topic to see how teachers' complementarity tendencies on the control dimension influence different aspects of school functioning for different groups of children.

4.2. Teachers' affiliation behaviors and complementarity tendencies in relation to children's task behaviors

In previous research, ample evidence for the importance of the affective dimension of teacher-child relationships for children's school engagement and performance (Hamre & Pianta, 2001; Hughes et al., 2008; Roorda et al., 2011) was found. In the present study, however, the affective dimension of teachers' interpersonal behaviors, affiliation, was not significantly associated with children's task engagement and performance. Most of these previous findings were based on teachers' perceptions of relationship quality and not on observer ratings of actual interactions. Observational studies that did find significant associations between the affective dimension of teacher-child interactions and children's engagement and performance (Doumen et al., 2012; Ladd et al., 1999; McDonald Connor et al., 2005) were mostly based on multiple occasions. Teacher affiliation in the present study, however, was observed at only one occasion of on average 16 min. Ratings based on multiple, longer lasting occasions might probably be more suitable to capture the affective dimension of teacher-child interactions. Furthermore, Vansteenkiste and Ryan (2013) argued that is important to make a distinction between caregiver behaviors that do not support

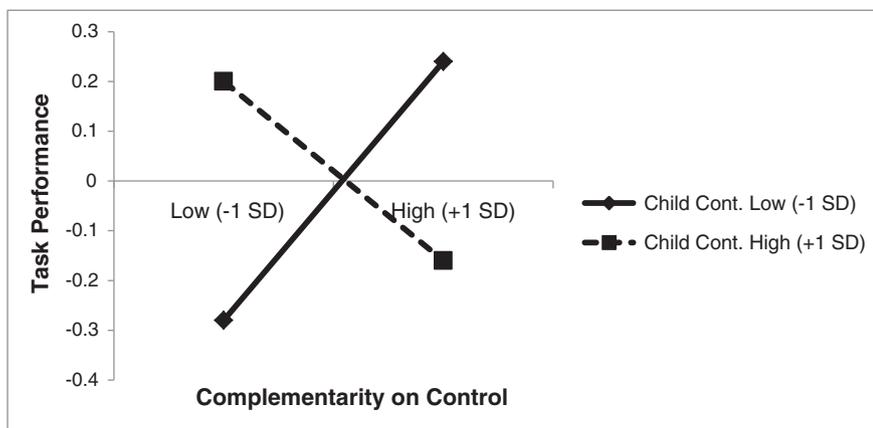


Fig. 2. Interaction effect of complementarity on control and child control (child cont.) on task performance.

children's psychological needs (e.g., low levels of warmth and support) and behaviors that actively threaten children's need satisfaction (e.g., hostility or maltreatment). The reason behind this argument is that the latter kind of behaviors are usually more harmful for children's development than the former. Likewise, Doumen et al. (2012) found that observer ratings of teacher-child conflict (i.e., negative affective dimension) were significantly associated with children's task engagement, whereas observed teacher-child closeness (i.e., positive affective dimension) was not. Therefore, it might be advisable for future research to make a distinction within the affiliation dimension and observe positive affect and negative affect as two separate dimensions (cf., Roorda et al., 2013).

4.3. Limitations and recommendations

There are several limitations that need to be taken into consideration when interpreting the results of the present study. First, we measured all study variables at one occasion, which prevents us from drawing conclusions about causality. Future research could include more measurement occasions to gain insight in how teachers' interpersonal behaviors and complementarity tendencies and children's task behaviors influence each other over longer periods of time. Furthermore, the observations of the present study were situated in the middle of the school year. The inclusion of more measurement occasions at different points during the school year may provide important insights in whether teachers' complementarity tendencies and interpersonal behaviors affect children's engagement and performance differently at the beginning, middle, and end of the year.

Second, our observations lasted on average 16 min. Although this seemed to be long enough to get an indication of how teachers' controlling behaviors are associated with children's task behaviors, this probably does not apply to teachers' behaviors on the affiliation dimension. In addition, it would be interesting to measure teacher-child interactions and children's task behaviors at different school days during different kinds of tasks (cf., Booren, Downer, & Vitiello, 2012; Vitiello, Booren, Downer, & Williford, 2012). This would enable us to get a more comprehensive view of the associations between teachers' interpersonal behaviors and complementarity tendencies and children's task engagement and performance. Furthermore, although observations are considered more objective than questionnaires, independent observers may not be able to get a complete view of children's engagement with the task, especially with regard to engaged emotions. Therefore, future studies may also profit from using both observer raters and children's self-reports to measure task engagement (cf., Skinner et al., 2009).

Third, as the specific content of interactions is not the focus of interpersonal theory, the didactic content of teachers' interpersonal behaviors was not measured in the present study. We did, however, measure the degree of control and affiliation during episodes in which teachers were giving instruction, next to more personal interactions and behavior regulation episodes. Still, future studies may profit from including the specific content of teachers' instructional behaviors as an additional predictor of children's task behaviors (cf., Downer et al., 2012).

4.4. Implications for theory and school practice

The present study provides several new insights for theory and school practice. With regard to theory, our study indicates a need for a further extension of the dimensions of interpersonal theory. That is, it might be more effective to investigate positive affect and negative affect as two separate dimensions of teachers' interpersonal behaviors instead of one affiliation dimension (cf., Doumen et al., 2012; Vansteenkiste & Ryan, 2013). With respect to the control dimension, it seems to be interesting to examine both control and structure in teachers' interpersonal behaviors. Furthermore, teachers' complementarity

tendencies on control were differently related with task performance for children who displayed either high or low levels of control themselves and the association with task engagement appeared to be in contrast with our hypothesis. Therefore, more research is needed to find out whether high degrees of complementarity on control are beneficial for different aspects of school functioning for different groups of children.

With regard to school practice, teachers could profit from a training in interpersonal theory (Roorda, Koomen, Thijs, & Oort, 2013), in which they should get specific advice with regard to the two interpersonal dimensions. With regard to the control dimension, teachers might profit most from the general advice to refrain from highly controlling behaviors towards children, as high control appeared to have negative effects on both children's task engagement and performance. A short training (two meetings) in interpersonal theory seems to be sufficient to help teachers behave less controlling towards children (Roorda et al., 2013). For children who are passive during their interactions with teachers, however, reacting with leadership to their passiveness in task situations may be beneficial for their performance on school tasks. Therefore, training programs in which teachers receive help to attune their degree of controlling behaviors to the level of initial child control in combination with the advice to respond not too controlling to children in general, might be most profitable. With respect to the affiliation dimension, our results did not provide specific clues for teacher training. However, previous research (e.g., Ladd et al., 1999; McDonald Connor et al., 2005; Roorda et al., 2011; Wubbels & Brekelmans, 2005) strongly suggests that children will profit most from friendly and warm behaviors of the teacher (i.e., high levels of affiliation).

5. Conclusion

To conclude, our findings suggested that highly controlling teacher behaviors are detrimental for children's engagement and performance on school tasks. Teachers' interpersonal behaviors on the affiliation dimension were not related to children's task engagement and performance. Still, it does not seem justified to conclude that the degree of warmth and support in teachers' actual interactions is not important for children's task engagement and performance. Finally, because we found mixed results with regard to the associations between teachers' complementarity tendencies and children's task behaviors, this might prove to be an interesting line of research to pursue for future studies.

Acknowledgements

This research was supported by grant 411-03-011 from the Netherlands Organization for Scientific Research assigned to Helma Koomen and the FMG-UvA Research Priority Grant on Affect Regulation.

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