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Effect of Key2Teach on Dutch teachers' relationships with students with externalizing problem behavior: a randomized controlled trial

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Abstract

The teacher-student relationship plays an important role in the academic and behavioral development of primary school children with externalizing problem behavior. However, such problem behavior often threatens the quality of the teacher-student relationship. Teacher-focused coaching intervention Key2Teach aims to improve elements of the relationship between teachers and students with externalizing problem behavior and consists of two phases and four building blocks. This intervention provides primary school teachers with insight into their mental representation of the relationship and opportunities to practice functional interaction skills. In a randomized controlled trial (RCT), effects of Key2Teach on different aspects of the relationship between teachers and students with externalizing problem behavior were examined. In two cohorts, 103 dyads consisting of a teacher and a student with externalizing problem behavior in grades 3–6 were assessed three times during a school year. Fifty-three dyads received the intervention (intervention group), whereas 50 dyads received no intervention (control group). Data were collected on teacher-reported teacher-student closeness and conflict, and on teacher interaction skills in various domains. Results show a significant increase in closeness and a decrease in conflict as a result of Key2Teach, with substantial effect sizes. No effects on teacher interaction skills were found. This study indicates that Key2Teach may help teachers to improve elements of the relationship they have with students with externalizing problem behavior. Implications for practice and future research are discussed.

Keywords Teacher-student relationships · Key2Teach · Intervention · Externalizing problem behavior · Teacher interaction skills

K. Hoogendijk and J.G. Holland share first authorship.

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Introduction

Teaching and interacting with students with externalizing behavior can be challenging for teachers. This challenge may become increasingly apparent, as many European countries focus on the integration and mainstreaming of students in need of additional support in regular schools or adopt other policies to promote inclusive education (Ferguson 2008). Inclusive education challenges the value of special schools and aims to create one educational environment for all students, including students with severe levels of emotional and behavioral problems (Ferguson 2008). As Goransson and Nilholm (2014) emphasize the need to provide a definition of inclusion, the concept of inclusion not just refers to the placement of children with special educational needs in classes with typical students, but also to meeting their social and academic needs as well as those of others, thereby creating a valuable environment for all students. To do so, teachers must be supported to engage in supportive interactions and develop positive and supporting relations with all students in class.

With the adoption of the new legislation in 2014 (Act on “Passend Onderwijs”), Dutch education policies promote mainstreaming and integrating more students with additional support needs in regular schools, including students with severe, clinically diagnosed social-emotional and behavioral problems. Figures from the Health Behavior in School-aged Children study in the Netherlands show that 13.6% of students in regular primary school had (sub)clinical behavioral problems and 24% of the students had (sub)clinical hyperactivity problems (Looze et al. 2014). Teachers may encounter difficulties in handling such externalizing problem behavior (Harrison et al. 2012; Kaakinen 2017), which may threaten the development of a supportive student-teacher relationship. Research has demonstrated that teachers’ interaction with students with externalizing problem behavior is characterized by less sensitive and more controlling behavior when compared to their interaction with students without behavior problems (Roorda et al. 2013). This is worrisome, as research has demonstrated that deterioration of the student-teacher relationship can have negative consequences for the well-being of both students and teachers (Doumen et al. 2008; Spilt et al. 2011; Hagenauer et al. 2015; Hamre et al. 2008), and that especially students with externalizing problem behavior benefit from an emotionally supportive teacher (Buyse et al. 2008). Therefore, there is a need for an intervention aimed at improving the teacher-student relationship and promoting positive interaction patterns between students and teachers. In this study, the effects of teacher-focused coaching intervention Key2Teach on different aspects of the relationship between teachers and their students with externalizing problem behavior are examined using a randomized controlled trial (RCT).

Teacher-student relationships

A large number of studies have focused on the teacher-student relationship and its importance. In our study, we use Pianta’s Conceptual Model of Teacher-Child Relationships (Pianta 1999a; Pianta et al. 2003), which draws from research on social development as well as basic work in attachment (Sabol and Pianta 2012). This model is derived from developmental systems theory and is frequently used in research and school improvement efforts that focus on the role of teacher-student relationships in the development and improvement of social and academic competencies of students. Pianta (1999a) describes four components involved in the teacher-student relationship in his model, which are interrelated (Pianta et al. 2003). The first component concerns features of the individuals interacting with each other (Saft and Pianta

2001), including biological features, such as gender or temperament, but also aspects like personality, self-worth, and intelligence. The second component concerns the mental image individuals have of their relationship with the other, which Bowlby (1969) and Sroufe and Fleeson (1988) call the representation of the relationship. The third component concerns information exchange processes or the interaction patterns between those involved, which are expressed in behavior, language, and other (non-verbal) communication (Pianta and Hamre 2009). The last component concerns the context of the relationship, such as the classroom, the school, and the school district (Pianta et al. 2003).

Positive and negative qualities in the teacher-student relationship may influence the development of those involved. The positive relational quality of "closeness" reflects the degree of openness, warmth, and security in the relationship (Koomen et al. 2012), and research has shown that students who experience a close teacher-student relationship perform better in school, exhibit less problem behavior, and have better social skills (Buyse et al. 2009; Cornelius-White 2007; Roorda et al. 2013). The negative relational quality of "conflict" refers to the degree of negative, discordant, unpredictable, and unpleasant teacher-student interactions (Koomen et al. 2012) and may lead to increased problem behavior by students, exclusion by peers, and less involvement in the curriculum and social situations in class, resulting in poor academic performance (Doumen et al. 2008; Kosir and Tement 2014; Mikami et al. 2012; Stipek and Miles 2008). With regard to teachers, high levels of conflict in their relationships with students may result in stress, burn-out, and absenteeism (Mashburn et al. 2006; Spilt et al. 2011). Experiencing a negative relationship can therefore have serious consequences for both teacher and student.

In a problematic relationship between a teacher and a student with externalizing problem behavior, two elements of this relationship are often challenged: the mental representation a teacher has of the relationship with this student and the interaction patterns between them. These elements relate to respectively the second and third components of the Conceptual Model of Teacher-Child Relationships (Pianta 1999a). Teachers often have a negative representation of their relationship with students with externalizing problem behavior. This may result in even higher teacher-reported levels of externalizing problem behavior, which may deteriorate the relationship even further (Doumen et al. 2008; Roorda et al. 2013). In addition, the interaction processes between teachers and students with externalizing problem behavior can often be considered dysfunctional, as teachers are less sensitive and more controlling towards these students (Roorda et al. 2013), which does not contribute to the academic and social-emotional development of the student (Spilt and Koomen 2009; Pianta 1999a). Students with externalizing problem behavior and their teachers may therefore benefit from an intervention that focuses on improving these elements of the relationship.

Improving teacher-student relationships

Various interventions aiming to improve the teacher-student relationship have focused on either improving the mental representation teachers have of this relationship or their interaction skills. One of such interventions is the Relationship-Focused Reflection Program (RFRP; Koomen and Spilt 2013). In this intervention, the teacher's narrated account of the relationship with a specific student is compared to recent interactions between teacher and student. Research by Spilt et al. (2012) showed that the RFRP improved teacher-reported closeness between teachers and students and increased teacher sensitivity, which refers to the degree to which the teacher's supportive behavior is adapted to a child's academic and socioemotional

needs. Reflecting on the mental representation of the relationship may provide teachers with the insight they need to effectively modify their interaction skills and behavior (Spilt and Koomen 2009).

Other interventions have focused on improving teacher-student interaction by promoting positive interactions between teachers and students, which may contribute to the academic and social-emotional development of the student (Pianta 1999a). Studies on the effects of two interventions focusing on the improvement of teacher's functional interaction patterns, MyTeachingPartner (MTP) and Banking Time (Driscoll and Pianta 2010; Pianta et al. 2008), showed that the teacher-student relationship as well as students' academic achievements improved as a result of the intervention. Besides such protocolled interventions, there are a number of coaching methods that are regularly used to support teachers' interactions with students within the individual context of a classroom, like functional behavior analysis, Video Interaction Guidance (VIG; Allen 1967; Hayes et al. 2001) and Synchronous Coaching (Coninx et al. 2012; Rock et al. 2009). Functional behavior analysis originates from cognitive behavioral therapy and can be used to discuss behavior, thoughts, and feelings about specific situations in class (Ellis 1991). VIG and Synchronous Coaching have proved effective in various areas of student functioning, such as task behavior and engagement (Fukkink et al. 2011; Rock et al. 2009).

These interventions and methods have mostly focused on either improving the mental representation or the interaction patterns. Focusing on both of these components of the teacher-student relationship within one intervention may be a promising challenge (Sabol and Pianta 2012).

Key2Teach

Key2Teach is a teacher-focused coaching intervention developed as an extension of existing interventions, like the RFRP (Koomen and Spilt 2013), VIG (Allen 1967; Hayes et al. 2001), and Synchronous Coaching (Coninx et al. 2012; Rock et al. 2009). The intervention is designed to improve a conflictual relationship between a teacher and a student with externalizing problem behavior (Van Veen et al. 2015). Key2Teach consists of two phases and four building blocks. The first phase is designed to provide the teacher with insight into his or her own representation of the teacher-student relationship and how this representation influences his or her actual interactions with the student. To this end, the coach uses two building blocks: the Relationship-Focused Reflection Program (building block one), which leads to a unique profile of the relationship between teacher and student (RFRP; Koomen and Spilt 2013) and elements of functional behavior analysis (building block two; Ellis 1991), which provides the teacher with insight into the relationship between his or her mental representation and his or her behavior towards this student.

The second phase aims to promote positive interaction patterns between teachers and students with externalizing problem behavior by focusing on the interaction skills of the teacher. To this end, the third and fourth building blocks are used: Video Interaction Guidance (VIG; Allen 1967; Hayes et al. 2001) and Synchronous Coaching (Coninx et al. 2012; Rock et al. 2009). During VIG, the coach uses video material to discuss actual interaction patterns between the teacher and the student. The Synchronous Coaching sessions provide the teacher with direct opportunities to practice functional interaction skills in the classroom by coaching the teacher while teaching using bug-in-ear technology.

Although various building blocks of Key2Teach have individually been proven effective in improving the teacher-student relationship and professionals' interaction skills (Fukink et al. 2011; Rock et al. 2009; Spilt et al. 2012), no research has yet addressed the combined effect of the four building blocks on the relationship between teachers and students with externalizing problem behavior.

The current study

The goal of this study is to examine the effects of Key2Teach on elements of the relationship between Dutch primary school teachers and students with (sub)clinical levels of externalizing problem behavior, using a randomized controlled trial (RCT). Teacher-student dyads are randomly assigned to either the control or experimental condition. The following research questions are examined: (1) Does Key2Teach improve the teacher's mental representation of the relationship with their student? (2) Does Key2Teach improve the functional interaction skills of the teacher? Regarding the first research question, we expect an increase in teacher-student closeness and a decrease in the teacher-student conflict as a result of Key2Teach. With regard to our second question, we expect an improvement in observed and student-rated teacher interaction skills.

Method

Design

Effects of Key2Teach were examined in an RCT, using an intent-to-treat design. Teachers in general education who received the intervention were compared to teachers who received support as usual (Dutch Trial Register: NTR3811). Two cohorts of primary school teachers were included (school year 2013–2014 and school year 2014–2015). In the spring of 2013 and 2014, primary schools located within one hour of travel from the main research location received a digital invitation to take part in the study. School principals or individual teachers could contact the researchers to receive more information on participation. Schools were excluded from participation if other behavioral interventions were being implemented. Teachers could only participate if they taught in grades 3 to 6 for a minimum of 2.5 days per week. In each school, at least two teachers had to participate.

When teachers were interested in participating in the study, more information about the study was provided by the researchers. Teachers received an information leaflet and a permission form, to be returned within 2 weeks. Selection of teachers took place between June and September 2013 (first cohort) and March and July 2014 (second cohort). Because of feasibility, power, and expected dropout, inclusion ended when a number of 150 teachers were reached (Fig. 1, flow chart). Twenty-three teachers withdrew before the start of the study, either because teachers considered the study too much of a time investment or were too busy with other tasks, such as their school switching locations or the implementation of new educational methods. At the start of the new school year, parents received an information leaflet and a permission form. If schools preferred so, a parent information meeting was organized at school by the researchers. Only children with parental permission were involved in the study.

At the start of the study, a screening took place in which the teacher filled out the Conduct subscale and the Hyperactivity subscale of the Strengths and Difficulties Questionnaire (Van

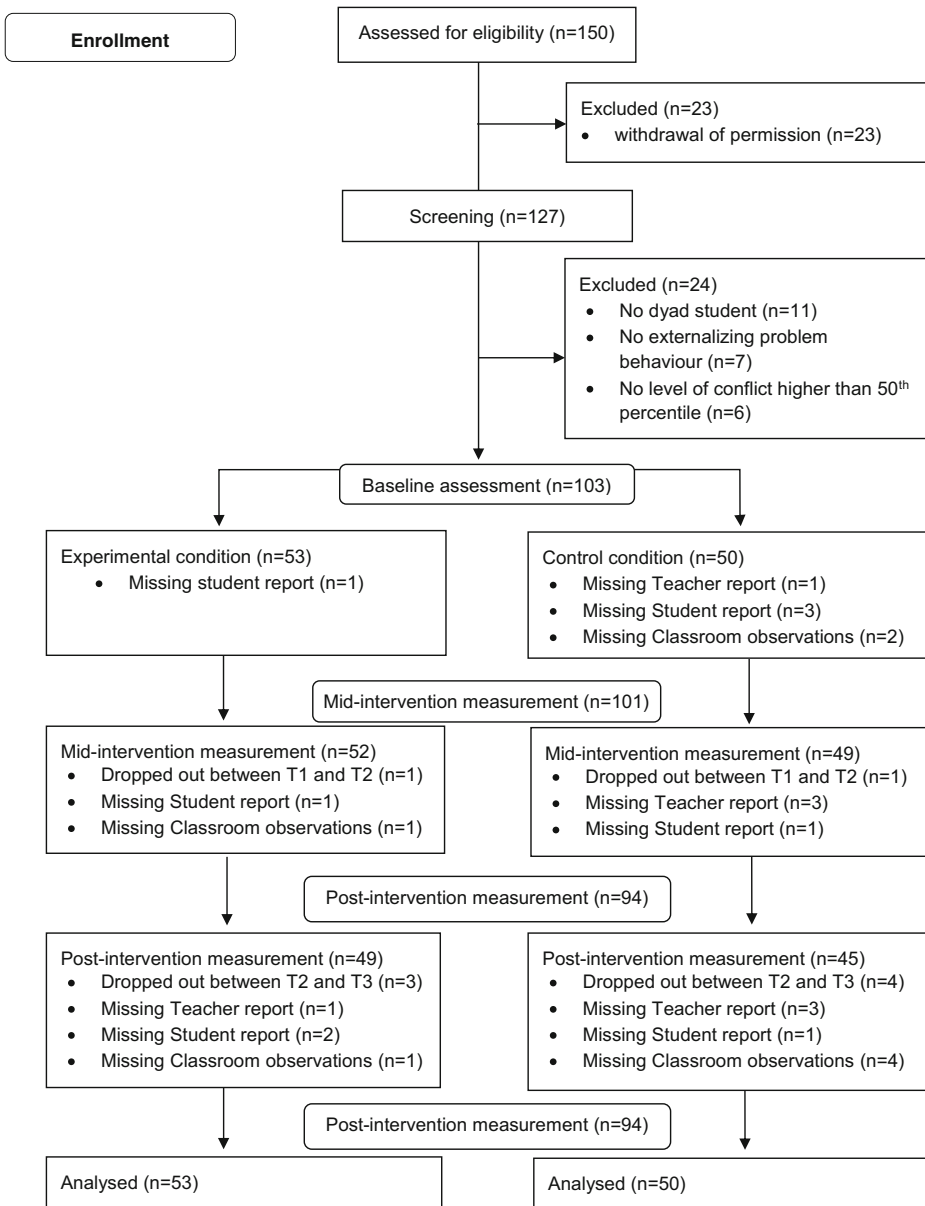


Fig. 1 Flowchart of participating teachers and dyad-students (missing data were handled by using the FIML approach in Mplus)

Widenfelt et al. 2003), as well as the Conflict subscale of the Student-Teacher Relationship Scale (Koomen et al. 2007) for every student in their class. Based on these reports, teacher-student dyads were determined. These dyads consisted of students who had (sub)clinical levels of externalizing problem behavior according to their teachers (at least above the 90th percentile) and the most conflictual relationship in the class (at least above the 50th percentile). Dyads were randomly assigned to the control or experimental condition. The research protocol was approved by the Medical Ethics Committee Southwest Holland (METC-ZWH, 13-023).

In both the experimental and control condition, three measurements took place during the school year. Pre-intervention data were collected in the fall, at least 6 weeks after the start of the school year. Screening data and pre-intervention data were used as baseline data (T1). When the first phase of Key2Teach was completed, the mid-intervention measurement (T2) took place in January, and the post-intervention measurement (T3) took place in June, after Key2Teach was finished. Teachers and students completed questionnaires during each measurement. Teachers had access to a website where questions could be answered digitally. Students filled out their questionnaires on paper during classroom measurement sessions, supported by trained research assistants. These research assistants checked all questionnaires for missing items and immediately asked students to fill out items that were missing. During each measurement, the trained research assistants also recorded 4 × 15 min of teachers and their students on video for CLASS observations. Video recordings were checked for sound and image quality and redone if they were not satisfactory. Research assistants received a 1-day training on how to record the video observation materials and how to support students during measurements.

Participants

The screening was completed by 127 teachers (Fig. 1, flow chart). After screening, 24 teachers dropped out for the following reasons: no dyad-student because of withdrawal of student permission ($n = 11$), a lack of externalizing problem behavior in students ($n = 7$), and a lack of conflict scores higher than the 50th percentile ($n = 6$). Thus, our final sample consisted of 103 teachers: 46 teachers in the first cohort (2013–2014) and 57 in the second cohort (2014–2015). The randomized assignment to the intervention and the control group was performed for these 103 teachers after the initial selection process.

Teachers Of the participating teachers ($n = 103$), 76.7% were female, and teachers were on average 38.5 years old (ranging between 23 and 62 years). On average, they had 12.62 years of working experience (ranging between 0 and 38 years). The teachers were divided over 44 schools (range 1–5, 33 schools with two dyads, two schools with one dyad, and nine schools with more than two dyads).

After randomization, the experimental group consisted of 53 dyads and the control group consisted of 50 dyads. The control group did not significantly differ from the experimental group at the start of the study with regard to teachers' age ($t(101) = .58, p = .56$), students' age ($t(101) = .42, p = .67$), teachers' years of working experience ($t(101) = .10, p = .92$), teacher gender ($\chi^2(1) = 2.16, p = .14$), and students' gender ($\chi^2(1) = 2.16, p = .14$) or any of the outcome variables (Table 1).

Of the 103 teachers participating during the pre-intervention measurement, nine dropped out over the course of the study. Dropout was not related to condition ($\chi^2(1) = .01, p = .93$), teachers' age ($t(101) = 1.00, p = .32$), or teachers' gender ($\chi^2(1) = .00, p = 1.00$).

Dyad-students Of the 103 dyad-students, 77% were boys. These students were on average 10.1 years old (ranging between 7.3 and 14.1 years). On average, students attended grade 4 (ranging between grades 3 and 6). The gender distribution among the teacher-student dyads was as follows: 18 male-boy dyads, 6 male-girl dyads, 61 female-boy dyads, and 18 female-girl dyads.

Table 1 Averages and standard deviations at T1, T2, and T3 and test of pre-intervention measurement differences (T1) between conditions on all outcome variables

Measure	Control condition						Experimental condition						Test of baseline differences				
	T1		T2		T3		T1		T2		T3		N	M (SD)	t	df	p
	N	M (SD)	N	M (SD)	N	M (SD)	N	M (SD)	N	M (SD)	N	M (SD)					
STRS-Closeness	47	38.98 (8.08)	45	38.78 (8.13)	40	39.93 (9.03)	52	40.29 (7.71)	52	42.19 (7.39)	48	45.40 (6.15)	48	45.40 (6.15)	-.83	97	41
STRS-Conflict*	50	32.12 (9.70)	42	29.90 (11.53)	37	26.81 (11.20)	53	31.09 (9.89)	48	26.54 (11.38)	45	21.58 (8.19)	45	21.58 (8.19)	.53	101	60
CLASS-Emotional Support	48	4.16 (0.97)	49	4.34 (0.67)	43	4.41 (0.73)	53	4.32 (0.82)	51	4.36 (0.53)	49	4.26 (0.73)	49	4.26 (0.73)	-.92	99	36
CLASS-Classroom Organization	48	6.24 (0.67)	49	6.34 (0.60)	43	6.31 (0.56)	53	6.15 (0.67)	51	6.47 (0.51)	49	6.22 (0.62)	49	6.22 (0.62)	-.70	99	49
CLASS-Instructional Support	48	2.98 (0.68)	49	2.84 (0.65)	43	2.85 (0.86)	53	2.99 (0.67)	51	2.89 (0.60)	49	2.77 (0.73)	49	2.77 (0.73)	-.06	99	96
QTI-Proximity	47	0.22 (0.25)	49	0.21 (0.23)	44	0.16 (0.26)	52	0.19 (0.26)	52	0.21 (0.23)	48	0.22 (0.25)	48	0.22 (0.25)	.48	97	63

*A low score means low amount of conflicts and a high score means a high amount of conflicts

Content of the Key2Teach intervention program

Key2Teach consists of two phases and four building blocks. Teacher and coach conducted 12 sessions and two videotaped lessons. Table 2 includes information on the various sessions: topic of the session, session duration, instruments, and homework. The sessions were conducted using a specified protocol, which contains information about theoretical background, instruction for every session, and an educational program for coach and teacher.

Phase 1 consists of four sessions. First, the Relationship-Focused Reflection Program (building block one) was conducted. As part of this program, the Teacher Relationship Interview (TRI; Pianta 1999b; Koomen and Lont 2004) was conducted by the coach during session 1. This interview was translated into a unique profile of the teacher-student relationship that was based on the teacher's story, including the strengths and weaknesses related to the teacher's pedagogical skills (sensitivity of discipline, providing a secure base, perspective taking, and understanding of the child's needs and beliefs about efficacy) and the teacher's feelings (feelings of helplessness, negative affect, and positive affect) (see also Koomen and Lont 2004). The coach discussed this profile with the teacher in session 2. During sessions 3 and 4, as part of the functional behavior analysis (building block two), the teacher and coach discussed the behavior, thoughts, and feelings of the teacher and behavior of the student before and after teacher action, using a G-diagram. A G-diagram consists of five steps: antecedent, behavior, consequent, thoughts, and feelings of the teacher (Ellis 1991). The coach prepared a video clip of a classroom situation before session 3, which showed the interaction between teacher and dyad-student. Teacher and coach discussed four videotaped situations from the video clip from the perspective of the teacher (session 3) and two from the perspective of the student (session 4).

Phase 2 consists of eight sessions (session 5–12). In session 5, the teacher and coach articulated a working hypothesis as the starting point for the coaching. This working hypothesis is linked to the TRI constructs and the G-diagrams. In session 6, the targeted teacher behavior was categorized in the domains Emotional Support, Classroom Organization, and Instructional Support (Pianta and Hamre 2009; Pianta et al. 2012). These behaviors were also translated into relevant keywords. A keyword is a short, specific, and goal-oriented message, for example "look at the student," "compliment," or "encourage" (Coninx et al. 2012). These keywords were subsequently used as input for the Synchronous Coaching sessions.

During sessions 7, 9, and 11, Synchronous Coaching sessions (building block four) were conducted. The coach was situated at the back of the classroom during a lesson. Using bug-in-ear technology (Coninx et al. 2012; Rock et al. 2009), the coach immediately provided the teacher with a relevant keyword when there was an opportunity to practice the previously discussed interaction skills. These lessons were videotaped and discussed in sessions 8, 10, and 12.

During session 8, 10, and 12, Video Interaction Guidance sessions (building block three: VIG; Hayes et al. 2001) were conducted. The coach and teacher analyzed video fragments of student-teacher interaction together. By slowing down and analyzing the video image-by-image (micro-analysis), interaction patterns were identified by the teacher, as well as their thoughts and feelings during these interactions (Jansen et al. 2013). Whitmore's (2009) GROW model (goal, reality, options, will) was used to discuss how the teacher practiced their target interaction skills. This GROW model enabled coaches to discuss with the teacher (G) which goal he/she aimed to achieve, (R) what happened in reality, (O) which other opportunities the teacher had to act, and (W) what the teacher would do differently next time.

Table 2 Sessions Key2Teach

	Building block	Instruments	Duration (minutes)	Homework for the teacher	Exposure n (N) teachers
Phase 1 Session 1	Insight Introductions and Relationship-Focused Reflection Program (RFRP)	Teacher Relationship Interview (TRI; Pianta 1999b; Koomen and Lont 2004)	45–60		53 (53)
Video tapped lesson Session 2	Discussing relationship profile (following RFRP) and introduction of functional behavioral analysis	Relationship profile (Koomen and Lont 2004)	30 45–60		53 (53)
Session 3	Functional behavioral analysis	G-diagrams (Ellis 1991)	45–60	1. Making 4 G-diagrams	52 (52)
Session 4 Phase 2	Functional behavioral analysis Skills	G-diagrams (Ellis 1991)	45–60	2. Reflection session	52 (52)
Session 5	determining working hypothesis	Micro-analysis (Allen 1967; Hayes et al. 2001)	45–60	3. Making 4 G-diagrams	49 (49)
Videotaped lesson Session 6	Selecting keywords based on working questions	Micro-analysis	30 45–60		49 (49)
Session 7	Synchronous Coaching	Bug-in-ear technology (Coninx et al. 2012; Rock et al. 2009), keywords (Pianta and Hamre 2009; Pianta et al. 2012)	30–45	4. Reflection Bug-in-ear session	49 (49)
Session 8	Video Interaction Guidance	Micro-analysis and GROW model (Whitmore 2009)	45–60		49 (49)
Session 9	Synchronous Coaching	Bug-in-ear technology, keywords	30–45	5. Reflection Bug-in-ear session	49 (49)
Session 10	Video Interaction Guidance	Micro-analysis and GROW model	45–60		43 (49)
Session 11	Synchronous Coaching	Bug-in-ear technology, keywords	30–45	6. Reflection Bug-in-ear session	44 (49)
Session 12	Video Interaction Guidance and end	Micro-analysis and GROW model	45–60		49 (49)

Key2Teach training for coaches

In the experimental condition, 14 coaches provided the coaching intervention Key2Teach to 53 teachers. The average amount of teachers appointed to a coach was 3.17 (ranging between 1 and 10). All coaches were already certified School-VIG-coaches (LBBO 2016) before they started the Key2Teach training. Coaches were trained to use the Key2Teach method by the research team using a standardized protocol (Van Veen et al. 2015). This training consisted of three 4-h training sessions and eight (first cohort) to four (second cohort) 4-h intervision meetings. Training was provided by the (synchronous) video coaches who were involved in developing the Key2Teach method, RFRP trainers, and the researchers involved. The intervision meetings were led by the (synchronous) video coaches.

Measures

Student externalizing problem behavior Student externalizing problem behavior was measured using the subscales Conduct problems ($\alpha = .65$) and Hyperactivity ($\alpha = .87$) of the Strengths and Difficulties Questionnaire for the teachers (SDQ-T; Van Widenfelt et al. 2003). Teachers rated items such as “Often fights with other children or bullies them” on a 3-point scale on which 0 = not true, 1 = sometimes true, and 2 = completely true. Higher scores reflected more externalizing problem behavior. The SDQ-T is an appropriate screener to identify students with behavior problems (Janssens and Deboutte 2009; Vogels et al. 2009).

Teacher's mental representation of the teacher-student relationship Teacher perception of the teacher-student relationship was measured using the Closeness and Conflict subscales of the Dutch version of the Student-Teacher Relationship Scale (STRS; Koomen et al. 2007). The subscale Closeness ($\alpha = .90$) consists of 11 items (e.g., *I share an affectionate, warm relationship with this child*) that measure the amount of affection, warmth, and open communication the teacher experiences in relation to a specific child. Higher scores represent a closer relationship with the teacher. The subscale Conflict ($\alpha = .89$) consists of 11 items (e.g., *This child and I always seem to be struggling with each other*) assessing the extent to which the teacher experiences conflict in relation to a specific child. Higher scores represent more conflict in the relationship. Items are scored on a 5-point Likert scale ranging from *definitely does not apply* to *definitely applies*. Construct validity and convergent validity of the Closeness and Conflict scales with child and peer reports of the same construct have been demonstrated (Doumen et al. 2009; Koomen et al. 2007).

Observed functional interaction skills of the teacher To assess functional interaction skills of the teacher, video recordings of four lessons during one measurement were observed. Standardized observations were conducted using the domains Emotional Support ($\alpha = .73$), Classroom Organization ($\alpha = .72$), and Instructional Support ($\alpha = .84$) of the Upper Elementary version of the Classroom Assessment Scoring System (CLASS UE; Pianta et al. 2012). These domains together consist of 11 different dimensions that are scored on a 7-point Likert scale, with 1–2 representing low scores, 3–5 representing moderate scores, and 6–7 representing high scores, indicating more positive interaction skills. Examples of dimensions are *teacher sensitivity*, *productivity*, and *content understanding*. CLASS observers were blind for study condition of the teacher. Studies conducted in the USA (Hamre et al. 2007) and various European countries, such Belgium (Buyse et al. 2008)

and Portugal (Cadima et al. 2014), have indicated reliability and validity of various versions of the CLASS.

Training and interrater agreement CLASS CLASS observers were researchers and school-related professionals, such as teacher supervisors and school psychologists. In both study years, observers participated in a 2-day training course prior to data collection and completed the CLASS exam, for which an interrater agreement of 80% was required (within one scale-point of master code), as recommended by the developers of the CLASS (Pianta et al. 2012). This criterion was met by all 23 observers. Ten CLASS intervision sessions were organized for training during the study. During these meetings, a video clip was scored by all CLASS observers. After discussing the individual scores, a collective scoring was agreed upon. Eighty-nine percent of the individual scores were within one scale-point of the collective scoring.

To determine interrater agreement, during data collection, 22 teachers at T1 (21% of total), 26 teachers at T2 (26%), and 23 teachers at T3 (24%) were rated by two observers. Interrater agreement within one scale-point was 91% (ranging from .86 to .95) for T1, 88% (ranging from .81 to .96) for T2, and 85% (ranging from .78 to 1.00) for T3. The mean weighted kappa for the three subdomains ranged from .57 to .79 for Emotional Support, from .90 to .93 for Classroom Organization, and from .43 to .57 for Instructional Support. These interrater agreement and kappa scores can overall be considered below adequate (for instructional support) to good (for classroom organization).

Student-rated functional interaction skills of the teacher Student perception of teacher interaction skills was measured using the Proximity (opposition-cooperation) and Influence (dominance-submission) dimensions of the short version of the Questionnaire on Teacher Interaction (QTI; Wubbels and Levy 1991). Proximity ($\alpha = .89$) refers to the degree of affinity and cooperation felt by the students and higher scores indicated more positive interaction skills of the teacher. Influence ($\alpha = .23$) refers to the degree that teachers were in control over the communication process (Kokkinos et al. 2009). The QTI consists of 32 items which each contributes to the two subscales with a different amount of importance. The dyad-student reacted to statements such as “Our teacher is friendly” on a 4-point scale ranging from “never” to “always.” The QTI meets the standards of the American Evaluation Association for reliability and validity (Wubbels and Brekelmans 2005). Due to its very low internal consistency ($\alpha = .23$) in our sample, the subscale Influence was not used.

Demographic variables Demographic variables were collected using an additional questionnaire. Information pertaining to age at the pre-intervention measurement, gender, and work experience were collected for teachers. At the pre-intervention measurement, data on age and gender were collected for students.

Data analysis

The effects of Key2Teach were analyzed using Structural Equation Modeling in Mplus 8 (Muthén and Muthén 1998-2017). To evaluate the effects of Key2Teach, mid-

intervention scores (T2) and post-intervention scores (T3) were regressed on their baseline scores (T1), study condition. As none of the demographic covariates differed significantly between the control and experimental condition at baseline, none of these were selected for inclusion in these regression analyses. It is important to consider that some dyads were from the same schools. Due to power issues, the nested structure of these data was not taken into account in the analyses, although school-wide interventions, rules, climate, and school-culture may have impacted these dyads in a similar way.

Missing data ranged from 4 to 6% on STRS-Closeness and 11–13% on STRS-Conflict (both subscales of the STRS were administered using separated digital forms), 2–4% on the QTI and 1–2% on the CLASS. For all measures and time points (T1–T3), we checked whether teachers or students who provided data differed from those who did not provide data with regard to teachers' age, teachers' gender, teachers' work experience, student's age, and student's gender using *t* tests. We only found a significant difference with regard to teachers' age at time point 2 (mid-intervention scores), indicating that teachers who provided data on subscale Closeness of the STRS were older than teachers who did not provide data ($t(6.43) = -4.56, p < .00$). The full information maximum likelihood (FIML) approach uses all of the available information in the data to produce robust parameter estimates for the missing data (Muthén and Muthén 1998–2017; Peeters et al. 2015).

As saturated models limit us from computing correct indices, we focus on the size and direction of effects, as these are more informative. An alpha of 5% was used for all tests of statistical significance. Standardized mean difference effect sizes (Cohen's *d*) of intervention effects were calculated based on the adjusted means (corrected for the baseline measurement) of study outcome variables at T2 and T3 (Durlak 2009). Effect sizes with values less than 0.20 indicate small effects, values around 0.50 indicate medium effects, and values around 0.80 indicate large effects (Cohen 1992).

Results

Practical implementation of Key2Teach

Fidelity of practical implementation was examined by collecting data on exposure to the intervention and adherence to the protocol. Exposure was assessed by registering the number of sessions each participating teacher attended. Results showed that 43 (81%) of the 53 teachers attended all 12 Key2Teach sessions. One teacher attended 11 sessions and five teachers attended ten sessions. Two teachers attended only two sessions and two teachers attended four sessions, but those four teachers dropped out of the study after the first phase. For 36 of the 49 (73.5%) teachers who attended 10 or more sessions, video observations of the individual sessions within their coaching trajectories were systematically coded by independent and trained coders, using a standardized observation form that was developed by the research team. Coders registered whether the core elements of the individual sessions were executed correctly. With regard to protocol adherence, these data showed that on average, 69% (range 51–88%, SD 11%) of the core elements of Key2Teach were conducted correctly by teachers and coaches.

Effectiveness of Key2Teach

Mental representation of the teacher-student relationship

The effects of Key2Teach on all outcomes are shown in Table 3. With regard to the effects on teachers' mental representation, we found a significant effect of Key2Teach on closeness and conflict as measured with the STRS (see Table 1 for average scores and standard deviations in both conditions at all time points). Teacher-reported closeness increased in the experimental group after the first phase of Key2Teach as opposed to the control condition, indicating a small effect ($d = .27$). After the second phase of Key2Teach, teacher-student closeness showed a stronger increase in the experimental group as opposed to the control condition, indicating a medium effect ($d = .54$).

The level of conflict in the teacher-student relationship did not decrease in the experimental group after the first phase of Key2Teach as opposed to the control condition. However, after the second phase, we found a significant decrease in conflict for the teachers in the experimental group, indicating a substantial effect ($d = .42$) of Key2Teach. A closer examination of the means shows that the teacher-student dyads in the experimental condition showed a stronger decrease than the teacher-student dyads in the control group.

Teachers' interaction skills

No effects of Key2Teach were found on teachers' interaction skills, both observed using the CLASS and student-reported QTI (see Table 3), indicating that Key2Teach did not affect

Table 3 Results of the regression analysis of intervention effects

Outcome	Mid-intervention measurement (T2)				Post-intervention measurement (T3)			
	<i>B</i>	<i>SE B</i>	Beta	<i>p</i>	<i>B</i>	<i>SE B</i>	Beta	<i>p</i>
Mental representation								
STRS-Closeness								
Baseline	0.79	0.07	0.76	.00	0.71	0.07	0.70	.00
Control vs experimental	2.85	1.00	0.18	.00	4.79	1.10	0.30	.00
STRS-Conflict								
Baseline	0.55	0.10	0.47	.00	0.53	0.09	0.53	.00
Control vs experimental	-2.36	2.10	-0.10	.26	-3.95	1.79	-0.20	.03
Teachers' interaction skills								
CLASS-Emotional support								
Baseline	0.21	0.06	0.32	.00	0.24	0.08	0.29	.00
Control vs experimental	-0.01	0.11	-0.01	.91	-0.20	0.15	-0.14	.16
CLASS-Classroom Organization								
Baseline	0.32	0.08	0.38	.00	0.30	0.09	0.35	.00
Control vs experimental	0.16	0.11	0.14	.13	-0.05	0.12	-0.05	.65
CLASS-Instructional Support								
Baseline	0.07	0.10	0.07	.49	-0.09	0.12	-0.07	.47
Control vs experimental	0.05	0.12	0.04	.69	-0.08	0.16	-0.05	.63
QTI-Proximity								
Baseline	0.70	0.06	0.78	.00	0.65	0.08	0.66	.00
Control vs experimental	0.03	0.03	0.06	.33	0.08	0.04	0.15	.05

Univariate models are all saturated and thus have perfect model fit

teachers' interaction skills on the observed domains Emotional Support, Classroom Organization, and Instructional Support in the experimental group.

In addition, no effect of Key2Teach on student-rated teacher Proximity was found, indicating that teachers' interaction skills did not change as a result of Key2Teach ($p = .05$, $d = .12$).

Discussion

In this study, the effects of the teacher-focused coaching program Key2Teach on the relationship between teachers and students with externalizing problem behavior in primary school were examined in a randomized controlled trial among 103 teacher-student dyads. Key2Teach consists of four building blocks, relationship-focused reflection, functional behavioral analysis, video interaction guidance, and synchronous coaching, and is designed to improve the relationship between teachers and students with externalizing problem behavior by providing teachers with insight into their mental representation of this relationship (first phase) and to improve their interaction patterns with these students (second phase). We found significant effects of Key2Teach on important aspects of the teacher-student relationship, which are discussed below.

Effects on teacher's mental representation

Results show that in line with our expectations, the first phase of Key2Teach increases teacher-reported closeness in the relationship between teachers and students with externalizing problem behavior. This is in line with results from a previous study on effects of the RFRP program, which is the first building block in the Key2Teach intervention, on disruptive students from kindergarten (Spilt et al. 2012). In contrast, Spilt et al. (2012) only found a small increase in closeness for children with initially low levels of closeness, whereas we found larger effects. This difference may be explained by the addition of a component of functional behavioral analysis to this first phase of our study, which may intensify the effects induced by the RFRP.

In addition, our results show that during the second phase of Key2Teach, the increase in teacher-reported closeness seems to be reinforced, thereby adding to the overall effect size of the intervention effect. A study on the effects of Banking Time (Driscoll and Pianta 2010), an intervention aiming to promote positive teacher interaction skills, also showed an increase in closeness in the teacher-student relationship as a result of practicing interaction skills. Both Banking Time and Key2Teach produce a medium effect. Thus, our findings suggest that combining the four building blocks of Key2Teach may strengthen the ability to change teachers' mental representation of the relationship. This may be important, as research has shown that students whose teachers experience a close teacher-student relationship perform better in school, exhibit less problem behavior, and have better social skills (Buyse et al. 2009; Cornelius-White 2007; Roorda et al. 2013).

A second finding is that the teacher-reported conflict in their relationship with students with externalizing problem behavior decreases as a result of Key2Teach. This effect was only significant after both phases of the coaching were completed. No such effect was found in previous studies. In the previous study on the effectiveness of the RFRP, no direct effect on conflict was found, although teachers' sense of self-efficacy positively impacted the decrease in conflict (Spilt et al. 2012). Future research into the effect of Key2Teach could take self-

efficacy into account as a moderator. In addition, studies examining the effectiveness of other interventions focusing on teacher-student interaction, such as Banking Time, did not demonstrate an effect on conflict (Driscoll and Pianta 2010). Thus, the combination of the four different building blocks and time to transform reflection into practice may be responsible for the decrease in conflict that we found in this study. Combining working on insight and directly practicing new, stimulative and supportive skills can play a role in reducing conflict in the relationship between teachers and students with externalizing problem behavior. This is an important finding, given the adverse behavioral, social, and academic consequences that have been associated with a conflicted teacher-student relationship (Doumen et al. 2008; Kosir and Tement 2014; Mikami et al. 2012; Stipek and Miles 2008).

Effects on functional interaction skills of the teacher

A third finding is that Key2Teach did not affect teachers' general interaction skills. Although the central focus of the second phase of Key2Teach is to improve teachers' interaction skills using coaching and keywords that were specified using the CLASS domains Emotional Support, Classroom Organization, and Instructional Support, no changes in teachers' general interaction skills were observed in these domains. This is not in line with studies on the effectiveness on related interventions, such as MTP, that also focused on practicing interaction skills related to these three domains and did find effects on teacher-student interaction (Allen et al. 2012). The difference between our findings and those derived from study by Allen et al. (2012) may be explained by the fact that MTP uses the CLASS framework as the core fundament of their coaching program, and teachers are coached to have a much more thorough understanding of all the dimensions and related skills in the CLASS. Key2Teach only uses the CLASS framework to provide the teacher with general insight into positive interaction skills and to determine skills and keywords in relation to the working hypothesis. Furthermore, with regard to the third building block, a meta-analysis showed positive effects of VIG on teacher-student interaction (Fukkink et al. 2011). However, the studies included in this meta-analysis only used communication skills as their outcome measure (Fukkink et al. 2011), whereas we focused on a broad variety of interaction skills, as measured by the CLASS. This may suggest that it takes more time before certain skills transfer to the broader concept of teacher-student interaction, especially when the interactions involve students with behavioral problems.

Another explanation for the lack of effect on general interaction skills as assessed by the CLASS is that Key2Teach specifically focuses on the dyadic relationship between the teacher and a student with externalizing problem behavior. It is possible that teachers do show improvements in interaction skills on a dyadic level, which are not yet visible in the classroom. Therefore, observations of interaction at the dyadic level, for example, using the inCLASS, should be included in future research (Downer et al. 2010). It is important to note that the dyad-students' individual perception of teachers' general interaction skills showed no significant change in this study. Several explanations may be given for this lack of effect. First, the teacher may have had too little time and opportunities to practice and improve functional interaction skills. Second, the first impression a class has of a teacher is crucial for the relationships this teacher develops with their students and remains quite stable over a school year (Mainhard et al. 2011). Intervention-induced improvements in interaction skills as observed by students may become clearer during the following school year. Indeed, changes due to the CLASS-based intervention MTP did not impact students until the following school year (Allen

et al. 2012). This suggests that it takes a little more time for changes to be processed at the student level.

In addition, more in-depth qualitative analyses, in which we compared teachers whose CLASS scores did and did not improve as a result of the intervention, highlighted the importance of monitoring the adequacy of the translation of the working hypothesis into relevant keywords. Those keywords should be discussed well and should consist of no more than four words (Coninx et al. 2012), which was not always the case. This was supported by the fact that this aspect of protocol adherence obtained the lowest score.

Moreover, it is also important to note that Key2Teach regards a personalized intervention; teachers focus on a variety of working hypotheses, depending on their individual relational profiles. Relatedly, the interaction skills that improved for individual teachers as a result of Key2Teach may have differed. Our findings with regard to mean-level general interaction skills may thus disguise possible working hypothesis-related improvements. Due to power issues, we were not able to validly examine individual developments. More research is needed to reveal to what extent the components of Pianta's model are interrelated, for example to what extent teachers' conceptualization of the relationships may have direct effects on the interaction patterns and vice versa, and how this influences the effects of the different building blocks of Key2Teach.

In conclusion, future studies on the effects of Key2Teach should be aware of the distinction between dyadic improvement and generic improvement. They also should take follow-up effects into account, especially when it comes to student-perceived interaction. It is also important that these studies make use of samples and designs that provide the opportunity to study personalized outcomes in more detail, and focus on an adequate implementation, especially the adherence to the specific building blocks of this intervention.

Limitations

This study has several limitations that deserve consideration when interpreting the results. Firstly, although exposure rates were quite high, the adherence percentages indicated some variety regarding the extent to which teachers implemented all core elements within the coaching program, which may have impacted the effectiveness of the intervention. However, variation in implementation is a common phenomenon in intervention studies and is indicative of the difficulties that arise when implementing an intervention in practice (Lendrum et al. 2013). A study on the implementation of Banking Time found that teacher demographics and teacher beliefs predicted implementation quality (Williford et al. 2015). It is important to note that implementation difficulties may have led to an underestimation of possible intervention effects, rather than an overestimation.

A second limitation is that we did not monitor the extent to which teachers within the same schools discussed the intervention with each other. Although the intervention involves a relatively intense process of reflection and coaching, we cannot rule out the possibility that some exchange of information on the intervention's content and components has impacted the control teachers as well.

A third limitation is that we only found an effect on teacher-rated measures. We cannot rule out possible bias that may have resulted from the fact that the teacher also received the intervention. Nevertheless, the mental representation of teachers is an important outcome when studying the teacher-student relationship, and most related studies have used similar measures (Driscoll and Pianta 2010; Spilt et al. 2012). To

mitigate possible bias, we have also used other informants such as the students and standardized observations of teacher interaction skills.

A fourth limitation concerns issues related to the reliability of the CLASS UE. Firstly, although the two domains most relevant to the intervention (i.e., Emotional Support and Classroom Organization) suggest adequate to good interrater agreement, the interrater agreement for the domain instructional support was low. This may have prevented us from detecting relevant intervention effects on this domain. Second, although the mean weighted kappa scores in this study were similar to those obtained in the Measures of Effective Teaching study (MET study) in the USA (Pianta et al. 2012), they still highlight the need for adequate training and coding when using the CLASS. In addition, we used a scoring strategy in line with previous studies (Buyse et al. 2008; Cadima et al. 2014; Hamre et al. 2007). One may however question whether a one-scale-point reliability may have impacted the reliability of the coding system. A more thorough exploration of this coding strategy may be explored in future research. Further research is needed to obtain more insight in the reliability, validity, and usefulness of the CLASS UE within the Dutch educational context.

Conclusion

Derived from developmental system theory, the teacher-student relationship is a dynamic and complex combination of personal characteristics, mental representation of the relationship, interaction patterns, and contextual factors. Research shows that a close, conflict-free teacher-student relationship may positively impact both teacher and student. In line with the focus on more inclusive education in many European countries, this study adds to the literature on ways in which teachers can improve their relationship with students with externalizing problem behavior, by examining effects of the teacher-focused coaching intervention Key2Teach. This intervention aims to improve the relationship between a teacher and a student with externalizing problem behavior, by providing teachers with insight into their mental representation of their relationship and promoting functional interaction patterns between teacher and student. This study shows that Key2Teach is able to improve closeness in the relationship between teachers and students with externalizing problem behavior. The intervention also seems to contribute to a reduction in conflict. No effects of Key2Teach were found on teachers' general interaction skills, although there is a reason to assume that this is related to the study design. Findings thus suggest that Key2Teach, which focuses on various components of the teacher-student relationship, may be a promising tool to support teachers in improving their relationship with students with externalizing problem behavior. This is important, as the quality of this relationship is highly related to the development of externalizing problem behaviors and other outcomes in children (Doumen et al. 2008). Our findings highlight the value of including reflection in teacher-focused coaching interventions. Although important questions remain, this study can be considered a small step towards improving the educational environment for children with externalizing problem behavior.

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Compliance with ethical standards

The research protocol was approved by the Medical Ethics Committee Southwest Holland (METC-ZWH, 13-023).

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Current themes of research:

Teacher-student relationship. Professional development teachers. School intervention effects. Child psychology.

Most relevant publications in the field of Psychology of Education:

Hoogendijk, C., Tick, N. T., Hofman, W. H. A., Holland, J. G., Severiens, S. E., Vuijk, P., van Veen, A. F. D. (2018). Direct and indirect effects of Key2Teach on teachers' sense of self-efficacy and emotional exhaustion, a randomized controlled trial. *Teaching and teacher education*, 76, 1-13.

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Current themes of research:

Teacher-student relationship. Child psychology. Reflective functioning. School intervention effects.

Most relevant publications in the field of Psychology of Education:

Hoogendijk, C., Tick, N. T., Hofman, W. H. A., Holland, J. G., Severiens, S. E., Vuijk, P., van Veen, A. F. D. (2018). Direct and indirect effects of Key2Teach on teachers' sense of self-efficacy and emotional exhaustion, a randomized controlled trial. *Teaching and teacher education*, 76, 1-13.

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Current themes of research:

Effectiveness of interventions. Psychology. Developmental Psychology.

Most relevant publications in the field of Psychology of Education:

Breeman, L.D., Van Lier, Pol, Wubbels, T., Verhulst, Frank C., van der Ende, Jan, Maras, A., Hopman, J.A.B. & Tick, N.T. (2017). Developmental links between teacher-child closeness and disobedience for boys placed in special education. *Exceptionality*

Hopman, J.A.B., Van Lier, P., van der Ende, J., Struiksmá, C., Wubbels, T., Verhulst, Frank C., Maras, Athanasios, Breeman, L.D. & Tick, N.T. (2017). Impact of the Good Behavior Game on special education teachers. *Teachers and Teaching: Theory and Practice* (p. 19).

Breeman, L.D., Van Lier, Pol, Wubbels, T., Verhulst, Frank C., van der Ende, Jan, Maras, Athanasios, Struiksmá, Chris, Hopman, J.A.B. & Tick, Nouchka (2016). Effects of the Good Behavior Game on the behavioral, emotional, and social problems of children with psychiatric disorders in special education settings. *Journal of Positive Behavior Interventions*, 18 (3), (pp. 156-167).

Breeman, L.D., Van Lier, Pol, Wubbels, T., Verhulst, Frank C., van der Ende, Jan, Maras, Athanasios, Hopman, J.A.B. & Tick, Nouchka (2015). Developmental links between disobedient behavior and social classroom

relationships in boys with psychiatric disorders in special education. *Journal of Abnormal Child Psychology*, 43 (4), (pp. 787-799).

Breeman, L.D., Wubbels, T., van Lier, P.A.C., Verhulst, F.C., van der Ende, J., Maras, A., Hopman, J.A.B. & Tick, Nouchka (2015). Teacher characteristics, social classroom relationships, and children's social, emotional, and behavioral classroom adjustment in special education. *Journal of School Psychology*, 53 (1), (pp. 87-103) (p. 17).

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Current themes of research:

Higher education. Governance in education and educational effectiveness. International comparison of education systems. Evaluation of curricula in secondary and higher education. Education policy and educational program development. Assessment and monitoring of social and educational programs, psychometric analysis, multivariate and multilevel analysis, causal modelling. Research training, including in developing countries.

Most relevant publications in the field of Psychology of Education:

van Herpen, S. G. A., Meeuwisse, M., Hofman, W. H. A., Severiens, S. E., & Arends, L. R. (2017). Early predictors of first-year academic success at university: Pre-university effort, pre-university self-efficacy, and pre-university reasons for attending university. *Educational Research and Evaluation*, 23(1-2), 52-72. DOI: 10.1080/13803611.2017.1301261

Brouwer, J., Jansen, E., Hofman, W., & Flache, A. (2016). Early tracking or finally leaving? Determinants of early study success in first-year university students. *Research in Post-compulsory Education*, 21(4), 376-393. DOI: 10.1080/13596748.2016.1226584

Steur, J., Jansen, E., & Hofman, A. (2016). Towards gradueness: Exploring academic intellectual development in university master's students. *Educational Research and Evaluation*, 22(1-2), 6-22. DOI: 10.1080/13803611.2016.1165708

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Current themes of research:

Diversity and educational inequality, from the perspective of motivation, integration, and the learning environment.

Most relevant publications in the field of Psychology of Education:

M. Meeuwisse, M.Ph. Born & S.E. Severiens (2013). Academic performance differences among ethnic groups: do the daily use and management of time offer explanations? *Social Psychology of Education*, 16 (4), 599-615. doi: <https://doi.org/10.1007/s11218-013-9231-9>

M. Meeuwisse, M.Ph. Born & S.E. Severiens (2011). The family-study interface and academic outcomes: Testing a structural model. *Journal of Educational Psychology*, 103(4), 982-990. doi: <https://doi.org/10.1037/a0024420>

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Current themes of research:

Public health. Prevention for youth.

Most relevant publications in the field of Psychology of Education:

Vuijk, P., Bul, K., Brand, E., Greaves-Lord, K., Maras, A., & Kuiper, C. (2015). Let's play (serious gaming): schooltransitiemanagement voor jeugdigen met een autismespectrumstoornis. *Journal of Social Intervention: Theory and Practice*, 24(3), 69-74.

Liber, J. M. & Vuijk, P., Groot-Zijlstra, E., de, & Boo, G., de (2016). Persoonlijkheid van kinderen met disruptief gedrag en de vorming van vroege therapeutische alliantie. *Gedrags therapie*, 49, 370-393.

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Current themes of research:

Child and youth psychiatry.

Most relevant publications in the field of Psychology of Education:

Breeman LD, Wubbels T, van Lier PAC, Verhulst FC, van der Ende J, Maras A, Hopman JAB, Tick N. Teacher characteristics, social classroom relationships, and children's social, emotional, and behavioral classroom adjustment in special education. *J Sch Psychol* 53: 87-103.

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Current themes of research:

Passend onderwijs (Inclusive Education). Education, Health and Human Services Partnerships. Community Schools and Local (City) Policies. Professional and School Development. Teacher Education.

Most relevant publications in the field of Psychology of Education:

Lawson, H. & Veen, A.F.D. van (2016). *Developing Community Schools, Community Learning Centers, Extended-service Schools and Multi-service Schools: International Exemplars for Practice, Policy, and Research*. Switzerland: Springer International Publishing.

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Day, C. & van Veen, D. (1999). Maslow and a Place Called School (105-115). In J. Freiberg (Ed.), *Perceiving, Behaving, Becoming: Lessons Learned*. Alexandria, VA: ASCD.

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