Use of Praise and Reprimands as Critical Ingredients of Teacher Behavior Management: Effects on Children's Development in the Context of a Teacher-mediated Classroom Intervention

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Abstract

This intervention study examined teachers' use of verbal praise and reprimands as specific components of teacher behavior management that can promote children's development in schools. The impact of teacher praise and reprimands on children's development was examined in the context of a teacher-mediated, classroom intervention. The sample involved 570 children and 30 teachers from 2nd grade classrooms in 15 primary schools. The Good Behavior Game was implemented in half of the classrooms based on random assignment within schools. Teacher behavior management (praise for appropriate behavior and reprimands for inappropriate behavior) was observed during regular classroom lessons. Hyperactive, Disruptive, and Withdrawn child behavior were assessed using teacher and peer reports, Global self-concept and Emotional engagement were assessed using child self-reports. All variables were assessed at the beginning (pre-test) and at the end (post-test) of the school year. Multilevel regression models accounted for the nested structure of the data. The results suggested positive effects of fewer reprimands and more praise on child outcomes (except Emotional school engagement), although the results differed by informant. We also found indirect effects of the GBG on child outcomes via teacher praise and reprimands. Overall, the study suggests that teachers' use of praise and reprimands is a malleable classroom factor that influences children's behavioral and socio-emotional development.

Keywords: teacher behavior management, child development, classroom intervention, universal prevention

Use of Praise and Reprimands as Critical Ingredients of Teacher Behavior Management: Effects on Children's Development in the Context of a Teacher-mediated Classroom Intervention

In recent years, there has been a special interest in the influence of classroom quality on children's development in elementary school settings. In particular growing attention is being paid to the role of teachers in creating high-quality classroom environments (Hamre et al., 2013). However, there is limited knowledge of *specific* components of effective teacher behavior that contribute to classroom quality. In this intervention study, we examined two theoretically important teacher behaviors, verbal praise and reprimands, to explain differences in children's development across classrooms.

Classroom Quality, Effective Teacher Behavior, and Universal Prevention

At present, there is a strong interest in improving classroom quality. Contemporary theories offer a broad and holistic view and distinguish classroom quality into three main domains: the socio-emotional, the management-organizational, and the instructional (Evans, Harvey, Buckley, & Yan, 2009; Hamre & Pianta, 2010; Hamre et al., 2013). In each of these domains, the salient role of teacher behavior and teacher-student interaction quality is emphasized. From a prevention science perspective, a broad and holistic view on classroom quality, despite its many strengths, may have certain limitations. To understand how teacher-mediated classroom interventions may impact children's development, researchers argue the need for more narrow, single-component assessments of the behaviors of teachers that are targeted by the intervention (Evans et al., 2009; Snyder et al., 2011; Thomas, Bierman, Powers, & Conduct Problems Prevention Research Group, 2011).

Classroom prevention programs implemented by teachers are relatively cost-effective methods to improve classroom quality in a way that promotes learning and adjustment in all children and at the same time strengthen teachers' professional development. To theoretically understand how these programs work, it is necessary to uncover which teacher-mediated processes account for intervention effects on children's development (Hamre & Pianta, 2010). To this end, narrow rather than broad assessments are needed to identify the specific subcomponents of behaviors of teachers that are changed by the intervention. We therefore examined teachers' use of praise and reprimands as behavioral markers of behavior management in the context of a teacher-mediated, classroom intervention.

Praise and Reprimands as Teacher Behavior Management Techniques

Behavior management constitutes a central part of daily teaching and is an important indicator of proximal classroom quality. Failure to effectively manage student behavior can have detrimental effects on the behavioral adjustment and engagement of students (Clunies-Ross, Little, & Kienhuis, 2008; Sutherland, Wehby, & Copeland, 2000). Guided by behavioral learning theory and principles of operant conditioning, there is wide consensus about the importance of positive reinforcement of appropriate behavior using contingent praise for the prevention of oppositional behavior and the promotion of on-task and compliant student behavior (e.g., Stormont, Smith, & Lewis, 2007). Punitive contingencies, in contrast, have shown to be counterproductive, initiating more off-task and oppositional behavior in the long run (Gable, Hester, Rock, & Hughes, 2009; Van Acker & Grant, 1996).

Moreover, use of praise and reprimands is believed to shape the socio-emotional functioning of children in the classroom. Frequent use of negative remarks, even when directed to another child, could create a negative classroom climate (Cadima, Doumen, Verschueren, & Buyse, 2015) and induce negative feelings in children, thereby impeding children's sense of security and self-esteem. Insecurity and low self-esteem may constrain children's social classroom behaviors and emotional engagement and result in more withdrawn and avoidant attitudes (Burnett, 2002; Cadima et al., 2015; Raver et al., 2009; Reyes, Brackett, Rivers, White, & Salovey, 2012).

Although the importance of reinforcing appropriate behavior through praise is widely recognized, in educational practice, the praise to reprimands ratios tend to be low (for reviews see Beaman & Wheldall, 2000; Jenkins, Floress, & Reinke, 2015). Observations in elementary classrooms by Leff et al. (2011), for instance, showed far less use of praise (about 2.5 times per 10 minutes) than use of reprimands (about 4.0 to 6.5 times per 10 minutes). Hence, from a prevention perspective, there is a critical need for interventions that can boost the use of praise for compliant behavior and at the same time reduce teachers' use of reprimands in response to non-compliant behavior.

Research on Change in Teacher Behavior, Classroom Quality, and Child Outcomes

In most research, classroom quality and effective teacher behavior are considered stable factors that are assessed at one point in time (Ponitz, Rimm-Kaufman, Brock, & Nathanson, 2009; Reyes et al., 2012; Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009). However, it is highly likely a teacher's pedagogical practices are influenced and shaped by the socio-behavioral dynamics within the classroom. High levels of student behavior problems, for example, may constrain teachers' abilities to effectively manage the classroom and increase teachers' use of reprimands, especially when teachers start to feel tired (Friedman-Krauss, Raver, Morris, & Jones, 2014). There is thus a need for research that captures the dynamic nature of classroom quality and that examines changes in teachers' behaviors over time. To address this need, we studied teacher behavior in the context of a classroom-based intervention and examined whether changes in teacher behaviors can prompt changes in children's development.

To date, research on the efficacy of classroom-based prevention programs implemented by teachers tends to focus on child outcomes (for a review see Hughes & Barrois, 2010). Far less research has examined intervention effects on classroom quality or teacher practices (Brown, Jones, LaRusso, & Aber, 2010; Cappella et al., 2012; Raver et al., 2008; Rimm-Kaufman & Sawyer, 2004). Moreover, when researchers did examine effects on teacher or classroom outcomes, it was typically not tested whether improvements in classroom quality (induced by the intervention) accounted for findings of improved child adjustment. Hughes and Barrois (2010) concluded in their review on classroom-based interventions that, consequently, it is not well understood how teachers can be supported in establishing a positive classroom climate that fosters the development of individual children. The study of Snyder et al. (2011) in preschool classrooms is a notable exception. This study demonstrated that a short-term behavior management training could increase positive and decrease negative behaviors of teachers. These changes in teachers' behaviors, in turn, explained concurrent decreases in the behavior problems of disruptive children.

Present Study

To summarize, the predominant view on classroom quality and teacher behavior to date is broad and holistic. However, from a prevention science perspective, there is a need for more narrow assessments of teacher behavior that can help identify the specific role of various subcomponents of teacher behavior in teacher-mediated, proximal classroom processes that can shape children's development. Furthermore, research is needed that examines whether *changes* in teacher behavior and classroom quality can explain *changes* in children's outcomes (Jenkins et al., 2015). In particular randomized controlled intervention research in classrooms can offer a highly valuable context within which such teacher-mediated processes can be examined (Hughes & Barrois, 2010).

To address these issues, we examined the effects of teachers' use of reprimands and praise on child outcomes in the context of an intervention study with the Good Behavior Game (GBG). The GBG is a universal intervention, aimed at preventing disruptive behaviors and promoting on-task behavior in elementary classrooms. It takes the form of a game, played during regular lessons, between teams of approximately five to six children. Each team receives a number of cards at the start of the game. When a predefined rule is violated by one of the team members, the teacher takes a card away. If at least one card remains at the end of a session, the team receives a reward. Children are placed in teams based on different levels of behavior problems in such a way that each team is capable to keep at least one card at the end of the session. In the Dutch version of the GBG, implemented in this study, teachers are trained to praise teams of children, individual children, or the whole classroom for compliant behavior following predefined rules. In addition, teachers are encouraged not to respond with verbal remarks to non-compliant and disruptive behavior. Instead, they respond to non-compliant behavior in a neutral way, that is by removing a card from a team of children when a team member violates a predefined rule.

The GBG is believed to have a positive impact on children through positive peer pressure as children work together in teams to show the desired behaviors and are rewarded as a team (e.g., Witvliet, van Lier, Cuijpers, & Koot, 2009b). Kellam et al. (1998) emphasize, however, that the GBG targets social adaptation processes that involve teachers as well. The GBG helps teachers to appropriately communicate social task demands and to reinforce desired responses while preventing ineffective behaviors like the use of verbal reprimands that have been found to perpetuate rather than to prevent disruptive student behaviors (Kellam et al., 1998). In line with this reasoning, we studied the hypothesized role of teachers by examining changes in teachers' use of praise and reprimands.

We first examined the effects of praise and reprimands on children's behavioral and socio-emotional functioning while controlling for baseline levels of these variables. This was done to test whether changes in rates of praise and reprimands could predict changes in child outcomes across classrooms. Second, to examine whether teachers' use of praise and reprimands could be an effective mechanism through which a teacher-mediated intervention like the GBG can enhance children's development, we also tested indirect effects of the Dutch GBG on child outcomes via teacher praise and reprimands. Because in our sample teachers have a new class of children each year, we studied within-year effects to capture the change in

teacher behavior in interactions with the same class of children and to investigate whether these changes could affect the development of these children.

To assess teachers' use of praise and reprimands, frequency scores were calculated. To this end, we used an observational tool that has been developed in line with the aims of the GBG (Van der Sar, 1999). The tool is easy to administer and may therefore be used by school consultants in the context of teacher consultation and training.

Previous research with the same sample has provided initial evidence for the effects of observed teacher reprimands and praise on children's peer-nominated externalizing behaviors over the course of two school years (Leflot, Van Lier, et al., 2010). The current study replicated and extended these findings in at least four important ways. First, we did not only focus on externalizing child outcomes but we examined a larger range of outcome variables including measures of socio-emotional outcomes. Second, we examined effects on teacher reported and child self-reported outcomes (in addition to peer reported outcomes) to obtain more robust evidence. Third, unlike Leflot et al., 2010, we examined within-year changes because we wanted to know whether changes in teachers' behaviors might have effects on children within the same year. Fourth, methodologically, unlike Leflot et al. (2010) we examined teacher reprimands and praise in a multilevel model and modeled teacher and intervention effects at the classroom level to account for the nested structure of the data.

Method

Sample

The sample included 30 teachers from 15 elementary schools located in rural to moderately urban communities (between 9000 and 90000 inhabitants) in the Dutch-speaking region of Belgium. In each school, two 2nd grade classrooms participated of which one was randomly assigned to the intervention condition and one to the control condition. All children were eligible for participation. 97% of the children received parental consent, resulting in a sample of 570 children (49.5% boys, M_{age}= 7 years, 5 months, SD=4.6 months). The study included an advantaged sample: most children were White/Caucasian (> 95% were of Belgian nationality) and most of their parents were highly educated (63% of the mothers and 57% of the fathers had completed higher education relative to 51% and 36% of the Flemish population, Belgium Federal Government, 2009). Teachers (93% female, M_{age}=36 years, SD=9.4 years) had on average 13 years of teaching experience (SD=9.1). Slight differences between groups were found for peer reported Hyperactive and Oppositional Behavior, teacher reported Withdrawn Behavior, and Emotional School Engagement at baseline (ps < .10, Cohen's d = .15-.17).

Procedure and Design

Data were collected before the implementation of the intervention at the beginning of the school year (Wave 1: September-October) and at the end of the year (Wave 2: May-June).

Classroom-based intervention: The Good Behavior Game

The GBG is a universal classroom preventive-intervention that offers teachers a reinforcement-based, group-management strategy. The primary aims are to prevent disruptive and non-compliant behavior and to reinforce on-task behavior (Barrish, Saunders, & Wolf, 1969; Dolan, Jaylan, Werthamer, & Kellam, 1989). The efficacy of multiple versions of the GBG has been shown in a variety of randomized controlled intervention studies (Nolan,

Houlihan, Wanzek, & Jenson, 2014). The Dutch version (Van der Sar & Goudswaard, 2001), implemented in this study, had been adapted in line with the Dutch culture and insights from learning theory that emphasize the importance of rewarding compliant behavior rather than punishing non-compliant behavior (Gable et al., 2009). The Dutch version is comparable to other modified versions of the GBG that focus on the reinforcement of positive behaviors (Nolan et al., 2014). Classroom rules were positively formulated, teachers did not mention names of children who violate rules nor give teams penalty points, teams did not compete for rewards but all teams having cards left received a reward, and team members were actively encouraged to support each other in good behavior.

The GBG was played three sessions per week (see also Leflot, Van Lier, et al., 2010). In the introduction phase (months 1-3), the play time was gradually increased from 10 to 45 minutes per session. In the expansion phase (months 4-6), play time further increased to half a day. In the generalization phase (months 7-8), generalization of behavior outside GBG sessions was encouraged. Teachers received a half-day training at the start of each of the three phases and supervision during the year (8 one-hour visits) from a consultant trained by a licensed GBG trainer (Dutch version). Teachers received an average score of 9.2 (*SD*=1.38) on a 0-12 point scale measure of implementation quality, indicating reasonable but not perfect quality (Leflot, Van Lier, Onghena, & Colpin, 2013). The results can thus be interpreted as reflecting the effects of the GBG in "real-life" situations.

Measures

Teacher reprimands and praise. We assessed rates of behavior-specific verbal Praise and Reprimands directed to teams of children, individual children or the whole classroom using an observation tool developed specifically for research with the GBG (Van der Sar, 1999). At three occasions, teachers were observed live for 10 minutes during regular lessons (i.e., non-GBG sessions) to allow for the observation of generalization effects. Frequency of Praise for compliant behavior and Reprimands for non-compliant behavior were tallied on an observation sheet during intervals of 20 seconds (followed by 10 seconds registration time) by two trained observers. Mean scores per 10 minutes were calculated. Inter-rater reliability was assessed prior to data collection at Wave 1 and 2 based on three sessions of one teacher observation. The percentages of inter-rater agreement were 95.8% for Praise and 90.0% for Reprimands across observation intervals. To examine inter-rater agreement while controlling for chance, frequency scores were dichotomized to represent presence or absence of the defined behavior in each 20-second observation interval. Because Cohen's kappa is strongly influenced by the prevalence of the observed behavior, we calculated the agreement coefficient (AC1) statistic (Gwet, 2008). The AC1 was .96 for praise and .86 for reprimands, indicating good reliability.

Child outcomes

Teacher reports of Hyperactive and Oppositional behavior. The Problem Behavior at School Interview-revised (PBSI-r; Erasmus Medical Center, 2000) was used to assess Hyperactive ("This child cannot sit still, is hyperactive"; 8 items; α = .92) and Oppositional behavior ("This child frequently talks back"; 7 items; α =.92). Teachers rated items on a 5-point Likert scale (0 = never applicable, 4 = often applicable). The PBSI has demonstrated adequate validity (e.g., Witvliet et al., 2009a/b).

Teacher reports of Withdrawn behavior. The Asocial Behavior subscale of the Child Behavior Scale (Ladd & Profilet, 1996) measures children's withdrawn behavior or their inclination to distance themselves from peers ("This child keeps classmates at a distance"; 6 items, α =.90). The items are rated on a 3-point Likert scale (1 = doesn't apply, 2 = applies sometimes, 3 = certainly applies). Validity has been indicated by significant associations with other teacher questionnaires and observations of child behavior (Ladd & Profilet, 1996).

Peer reports of Hyperactive, Oppositional, and Withdrawn behavior. Children were asked to nominate all classmates who met the behavioral descriptions "Cannot sit still in the classroom" (Hyperactive), "Does not listen in school" (Oppositional), and "Does not play much with other children" (Withdrawn), following widely-used procedures for peer nomination assessments (Cillessen & Bukowski, 2000). For each child, the number of nominations was divided by the number of participating children minus 1 (children were not allowed to nominate themselves). Research indicates that peers are valid informants of child internalizing and externalizing behavior (Witvliet et al., 2009a).

Child self-reports of Global self-concept. Global self-concept refers to a person's perceived worth as a person. It was assessed with the Self-Perception Profile for Children (SPPC; Harter, 1985), adapted for children from age 7 (Leflot, Onghena, & Colpin, 2010). The scale consists of 6 items (e.g., 'I would like to be different' reversed coded item, αs = .65-.79) rated on a 3-point Likert-scale (1 = not true, 3 = true). The SPPC adaptation for young children has demonstrated adequate factorial validity (Leflot, Onghena, et al., 2010).

Child self-reports of Emotional School Engagement. The School Liking and Avoidance Questionnaire (SLAQ; Ladd, 1990; Van de Water, Buyse, & Verschueren, 2004) is a self-report measure of Emotional School Engagement that measures positive feelings about school (School Liking; 9 items, e.g., 'Is school fun?', α = .90) and the desire to avoid school (School Avoidance; 5 items, e.g., "Would you like to stay home from school?', α =.79). Items were rated on a 3-point Likert-scale (1 = no, 2 = sometimes, 3 = yes). The SLAQ has demonstrated meaningful associations with children's social and academic school adjustment.

Data Analysis

Path models were analyzed in Mplus (Muthén & Muthén, 1998-2011). The MLR estimator was used to evaluate model fit accounting for the multilevel structure of the data. Student-level (level 1) predictors were the student outcomes at baseline (wave 1). Classroom-level (level 2) predictors included intervention condition (0=control, 1=GBG) and Praise and Reprimands (grand-mean centered). At the student level, child outcomes (wave 2) were regressed on baseline scores (wave 1). At the classroom level, child outcomes (wave 2) were regressed on Praise and Reprimands (wave 2). Praise and Reprimands were regressed on initial levels of Praise and Reprimands (wave 1) respectively to control for baseline levels. In addition, child outcomes and Praise and Reprimands were regressed on intervention condition. In this way, both direct and indirect effects (via changes in Praise and Reprimands) of the intervention on child outcomes were modeled (Table 2 and 3). Indirect effects were tested using the product of coefficients estimator (Fairchild & McQuillin, 2010).

Seven cases were excluded because of missing data in the independent child variables. There were no missing data on teacher behavior. The covariance coverage, that is the proportion of values present, ranged between 0.99 and 1.00. We used full information

maximum likelihood (FIML) estimation to account for missing data. Because of the small number of teachers in each condition (n=15), we report statistical significant results as $p<.01$, $p<.05$, and $p<.10$ (two-tailed). Standardized path coefficients were reported to indicate effect sizes (Kline, 2005).

Results

Descriptive statistics and correlations are reported in Table 1. Positive intervention effects were found (Table 2). In comparison to control classrooms, teachers in intervention classrooms used both significantly fewer Reprimands and more Praise at post-intervention (Wave 2) while controlling for pre-intervention levels (Wave 1).

Path Models

Intervention effects on child outcomes

Path models including both the effects of the GBG and teacher behavior on child outcomes were analyzed (Table 3). There was a significant reduction in peer reported Oppositional Behavior in GBG classrooms compared to control classrooms. No other direct intervention effects were found.

Effects of observed teacher behavior on child outcomes

Effects of observed teacher Reprimands. Reprimands predicted significantly higher levels of teacher-reported Hyperactive Behavior at the end of the school year, while controlling for baseline levels of Hyperactive Behavior and baseline levels of Reprimands (Table 3). Reprimands also predicted higher levels of peer reported Oppositional Behavior and lower levels of child reported Global Self-concept. Reprimands did not significantly predict teacher reported Oppositional and Withdrawn Behavior, peer reported Hyperactive and Withdrawn Behavior, and child reported School Liking and Avoidance.

Effects of observed teacher Praise. Praise predicted significantly lower levels of teacher reported Withdrawn Behavior at the end of the school year, while controlling for baseline levels of Withdrawn Behavior and Praise. Praise also predicted significantly lower levels of peer reported Withdrawn Behavior and peer reported Hyperactive Behavior. Praise did not significantly predict teacher reported Hyperactive and Oppositional Behavior, peer reported Oppositional Behavior, and child reported Global Self-concept and School liking and Avoidance (Table 3).

Indirect intervention effects on child outcomes via observed teacher behavior

As we sought to understand the role of teacher behavior, we only report indirect intervention effects for child outcomes for which we had detected significant effects of Praise and Reprimands (but see Table 3 for all results). We found significant indirect intervention effects on teacher reported Hyperactive Behavior, peer reported Oppositional behavior, and child self-reported Global Self-concept via Reprimands. In addition, there were significant indirect intervention effects on teacher-reported Withdrawn Behavior via Praise but non-significant indirect effects on peer-reported Withdrawn or Hyperactive Behavior.

Discussion

This study addressed the need for intervention research to investigate whether changes in teacher behavior can induce changes in children's development (Hughes & Barrois, 2010). More specifically, the study aimed to uncover what specific components of effective teacher behavior may contribute to children's development by observing teachers' use of verbal

praise and reprimands. This was done in the context of a teacher-mediated, classroom intervention, the Dutch Good Behavior Game (GBG). Overall, the results suggest that more effective behavior management, defined as lower levels of reprimands for non-compliant behaviors and higher levels of praise for compliant behaviors, enhances children's development over the course of a school year, although the results were not consistent across informants. The findings substantiate current theorizing on classroom quality that emphasizes the centrality of teachers' behaviors and interactions with students (e.g., Hamre et al., 2013).

First, we examined whether changes in rates of praise and reprimands could explain concurrent changes in children's behavioral and socio-emotional development across a school year. Higher rates of reprimands were associated with increases in teacher- and peer-reported externalizing behavior and decreases in children's self-worth. These findings are consistent with previous research suggesting that negative remarks of teachers initiate increases in defiant and non-compliant behavior (Gable et al., 2009; Leff et al., 2011; Sutherland et al., 2000; Van Acker & Grant, 1996). It is not clear why higher levels of reprimands predicted teacher-rated hyperactive but not teacher-rated oppositional behavior (although a moderately-large standardized effect was found), whereas the reversed pattern was seen for peer-reports (i.e., teacher reprimands predicted peer-rated oppositional but not peer-rated hyperactive behaviors). The finding that verbal reprimands predicted low global self-concept may be explained by the attachment perspective on teacher-child interactions (e.g., Doumen, Buyse, Colpin, & Verschueren, 2011). Teachers who frequently use negative remarks, even when directed to another child, could undermine children's trust in the teacher's sensitivity and emotional availability. Children may perceive these reprimands as a message that they are unworthy of the teacher's affection and care. This could impede students' feelings of security and self-worth and contribute to externalizing problems (Burnett, 2002; Doumen et al., 2011). Also, when children have little trust in their teachers, they may be unwilling to follow classroom rules and persist in disruptive behaviors.

Verbal praise, but not reprimands, predicted less withdrawn behavior at the end of the school year (according to both teacher- and peer-reports). By frequently praising appropriate behavior, teachers may create a predictable, friendly, and safe environment that encourages children to engage in social interactions (Wilson, Pianta, & Stuhlman, 2007). Low rates of praise, in contrast, may increase socio-emotional insecurity among children and make children withdraw from social interactions. Furthermore, consistent with the literature showing the importance of praising children for appropriate behaviors, we found a significant effect of praise on reductions in peer-rated hyperactive behavior. No effects of praise were found on teacher-rated hyperactive behavior and on teacher- and peer-rated oppositional behavior. It is possible that positive effects of praise on externalizing behavior only occur when praise is used in combination with other proactive management strategies (e.g., clear communication of expectations and rules, use of pre-correction and scaffolding, cf. Gable et al., 2009), which were not examined in the current study.

Somewhat unexpectedly, no significant effects of praise and reprimands were found on children's emotional school engagement. An explanation for these non-significant results could be that teacher behaviors have a stronger effect on children's *classroom* engagement than on children's *school* engagement (cf. Burnett, 2002; Reyes et al., 2012).

Second, we examined indirect effects of the GBG on child outcomes via reprimands and praise. This was done to test whether teachers' use of reprimands and praise could be a "mediating mechanism" through which change in child development can be produced by a teacher-mediated classroom intervention like the GBG. Traditionally, it is assumed that total intervention effects on outcomes are a necessary precondition to examine mediation. However, there are strong arguments against this assumption (MacKinnon, Krull, & Lockwood, 2000; Rucker, Preacher, Tormala, & Petty, 2011). Rucker et al. (2011), for example, synthesized previous research and found that detection of indirect effects in the absence of total effects occurs almost half of the time in social psychology research. They argued that ignorance of such effects can seriously hinder theory development on psychological processes. We also found indirect effects in the absence of total effects. Only one significant total effect of the GBG on child outcomes (i.e., peer-rated oppositional behavior) was found when teacher behavior variables were *not* included in the model, while several significant indirect effects of the GBG on child outcomes via teacher behavior were found. Specifically, the GBG was found to reduce externalizing behavior and to promote a positive global self-concept by decreasing rates of reprimands. Likewise, positive effects of the GBG on less withdrawn behavior were found via increases in teacher praise. However, not all of the possible indirect effects were significant. Although changes in praise were associated with changes in peer-rated hyperactive and withdrawn behaviors, the GBG did not seem to affect these behaviors, neither directly nor indirectly.

Overall, this intervention study provides initial support for the influence of teacher praise and reprimands on some child outcomes by showing that changes in rates of teacher praise and reprimands, induced by the GBG, were associated with changes in these child outcomes. The results extend the findings of Leflot, Van Lier, et al. (2010) in the same sample by indicating not only that praise and reprimands influence children's externalizing behaviors but also that children become less inclined to withdraw from peers when levels of praise increase and that reprimands jeopardize children's self-worth. It thus calls attention to the differential effects of praise and reprimands, which implies that it is necessary for teachers to *both* increase the use of praise and to reduce the use of reprimands. Moreover, this study showed that these effects can be measured already in the same year.

Study Limitations and Future Research

There are several limitations that should be considered for a correct interpretation of the findings. First, for a more 'true' test of mediation, research is needed that includes more post-intervention assessments for a more 'true' test of mediation (i.e., by assessing changes in teacher behavior *before* changes in child outcomes). Moreover, multiple post-intervention assessments are needed to examine reciprocal effects as improvements in teachers' and children's behaviors induced by the intervention may mutually reinforce each other. Second, we found effects of teacher behavior on teacher-, peer- and child-reported outcomes but the results were not consistent across the different reporters. Third, the study included an ethnically-homogeneous and "advantaged" population sample (i.e., relatively high education level of parents) and replication in other populations is needed. Fourth, some moderate to large standardized effects did not reach significance. Although many classroom-intervention studies examining teacher behavior have included smaller samples, the number of teachers

that participated in this study was still small (N=30) and replication in a larger sample is needed to confirm the (non-significant) findings.

Further research is needed to address several remaining issues. First, we examined overall rates of praise and reprimands. We therefore do not know whether teachers changed their behaviors in relation to individual children and whether children might have been differently affected by these changes. Observations of praise and reprimands in response to the behaviors of specific target children are needed to assess differential effects within classrooms. Additionally, fine-grained coding of behaviors and moment-to-moment analyses of both teacher and child behaviors are recommended to examine how teachers and children influence each other (cf. Roorda, Koomen, Spilt, Thijs, & Oort, 2013). Second, our measurement of teacher praise and reprimands, though specific, was rather limited in that we do not know whether the GBG improved teachers' *effective* use of praise. Praise statements are assumed to be most effective when teachers explicitly mention the appropriate behavior being displayed in their praise (e.g., following a predefined rule) instead of using a more general statement like 'good job' (Gable et al., 2009). Third, it would be interesting for future research to study teacher praise and reprimands in relation to other components of behavior management (e.g., clear communication of expectations). Fourth, to examine whether teachers generalized their newly-acquired skills to new classes with new students, future research could follow teachers for more than one year. Finally, future research could compare the GBG method with other strategies for increasing praise and reducing reprimands (Cavanaugh, 2013; Reinke, Lewis-Palmer, & Merrell, 2008; Rusby, Crowley, Sprague, & Biglan, 2011).

Implications for Practice

The importance of praising good behavior, rather than reprimanding children for poor behavior, is widely acknowledged in educational practice. However, observational research has repeatedly shown that teachers tend to use praise rather infrequently (Jenkins et al., 2015) and that praise to reprimands ratios are typically low (e.g., Leff et al., 2011). The present findings indicate, however, that rates of praise and reprimands can be altered by the GBG. Importantly, declining rates of reprimands and increasing rates of praise were observed outside GBG sessions, indicating that teachers' generalized their skills to regular classroom conditions. These findings thus support the effectiveness of the GBG as a program for teacher professional development and training.

From a prevention science perspective, this research addressed the need for single-component assessments of effective teacher behavior to help identify ingredients of effective teacher behavior (Evans et al., 2009; Snyder et al., 2011; Thomas et al., 2011). The study supports the use of an easy and efficient observation tool for the assessment of teacher praise and reprimands as indicators of behavioral management skills and proximal classroom quality (Van der Sar, 1999). School consultants can use this tool for teacher consultation and training. By offering an easy and cost-effective method, teacher behavior and classroom quality can be strengthened in such a way that all children can benefit.

Compliance with Ethical Standards

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Tables

Table 1. Means (SD) and Correlations at Wave 1 and Wave 2

	Wave 1 M (SD)	Wave 2 M (SD)	1	2	3	4	5	6	7	8	9	10	11
Child variables (*N*=570)													
Teacher reports													
1. Hyperactive	1.97 (.88)	2.01 (.90)	-	.79***	.12***	.59***	.59***	.13***	-.11***	-.11***	.06	-.08	-.13
2. Oppositional	1.63 (.72)	1.70 (.74)	.77***	-	.11***	.54***	.55***	.12***	-.08*	-.12***	.05	-.04	-.05
3. Withdrawn	1.12 (.29)	1.12 (.30)	.15***	.16***	-	.05	.06	.24***	-.07	-.04	.06	-.11***	-.06
Peer reports													
4. Hyperactive	.14 (.20)	.16 (.22)	.67***	.58***	.08**	-	.79***	.15***	-.16***	-.17***	.12***	.04	.03
5. Oppositional	.12 (.18)	.14 (.21)	.64***	.61***	.13***	.81***	-	.21***	-.16***	-.21***	.13***	.06	.02
6. Withdrawn	.07 (.09)	.07 (.10)	.10**	.12***	.35***	.11***	.12***	-	-.14***	-.05	.10*	-.02	.06
Child self-reports													
7. Self-concept	2.67 (.38)	2.71 (.40)	-.18***	-.23***	-.08	-.21***	-.28***	-.18***	-	.18***	-.16***	-.05	-.08
8. School Liking	2.54 (.50)	2.52 (.47)	-.14***	-.16***	-.12***	-.20***	-.19***	.00	.36***	-	-.68***	.00	-.06
9. School Avoidance	1.86 (.62)	1.80 (.58)	.15***	.14***	.08	.21***	.20***	.01	-.28***	-.74***	-	.02	.02
Teacher variables (*N*=30)													
Observations													
10. Reprimands	8.55 (6.43)[2]	4.62 (3.50)[2]	.09**	.05	-.01	.05	.07	.09**	-.17***	-.07	.06	-	.46***
11. Praise	1.08 (1.49)[2]	2.04 (2.64)[2]	.05	.07	-.11***	.03	.05	-.06	-.02	-.06	.02	-.13***	-

Note 1. ***p < .01, **p < .05, *p < .10 (two-tailed)

Note 2. Rate per 10 minutes

Note 3. Correlations at Wave 1 are above the diagonal; correlations at Wave 2 are below the diagonal

TEACHER PRAISE AND REPRIMANDS

Table 2. Intervention effects on Observed Teacher Behavior at Wave 2 while Controlling for Baseline Levels (N=30)

	Reprimands		Praise	
	B (SE)	β	B (SE)	β
Direct effects				
Outcome$_{W1}$	.13 (.08)	.25	1.02 (.30)***	.58
GBG	-1.93 (.83)**	-.42	.95 (.45)**	.28

Note. ***$p < .01$, **$p < .05$, *$p < .10$ (two-tailed), $_{W1}$ = Wave 1

Table 3: Multilevel Prediction of Child Outcomes at Wave 2 while Controlling for Baseline Levels (N=570)

| | Teacher reports | | | | | | Peer reports | | | | | |
| | Hyperactive | | Oppositional Behavior | | Withdrawn Behavior | | Hyperactive | | Oppositional Behavior | | Withdrawn Behavior | |
	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β	B (SE)	β
Direct effects												
Outcome$_{w1}$	.824 (.039)***	.821	.733 (.043)***	.757	.581 (.059)***	.595	.832 (.033)***	.766	.900 (.045)***	.777	.633 (.081)***	.534
GBG	.089 (.170)	.261	.054 (.142)	.182	.066 (.041)	.742	-.008 (.014)	-.510	-.026 (.12)**	-1.269	-.008 (.011)	-.368
Reprimands$_{w2}$	.071 (.035)**	.477	.043 (.029)	.331	.008 (.009)	.205	.001 (.002)	.132	.005 (.003)*	.536	.002 (.002)	.163
Praise$_{w2}$	.009 (.020)	.048	.006 (.023)	.033	-.024 (.006)***	-.458	-.004 (.002)*	-.444	.003 (.002)	.258	-.004 (.002)**	-.295
Indirect effects												
GBG via Reprimands$_{w2}$	-.138 (.075)*		-.083 (.052)		-.015 (.016)		-.002 (.005)		-.009 (.005)*		-.003 (.004)	
GBG via Praise$_{w2}$	.009 (.018)		.005 (.021)		-.022 (.013)*		-.004 (.003)		.003 (.002)		-.004 (.003)	
Explained variance (R²)												
Within level	.674		.573		.353		.587		.604		.285	
Between level	.203		.098		.224		.393		.867		.215	

Note 1. ***p < .01, **p < .05, *p < .10 (two-tailed), $_{w1}$ = Wave 1, $_{w2}$ = Wave 2

Note 2. Reprimands$_{w2}$ and Praise$_{w2}$ were controlled for baseline levels and regressed on intervention status (see Table 2 for these effects).

Table 3 (continued): Multilevel Prediction of Child Outcomes at Wave 2 while Controlling for Baseline Levels (N=570)

	Child self-reports					
	Self-concept		Emotional School Engagement			
			School Liking		*School Avoidance*	
	B (SE)	β	B (SE)	β	B (SE)	β
Direct effects						
OutcomeW1	.430	.416	.374	.409	.392	.434
	(.041)***		(.043)***		(.035)***	
GBG	-.052	-.891	-.067	-.863	.014	.124
	(.034)		(.046)		(.065)	
ReprimandsW2	-.022	-.867	-.014	-.411	.019	.377
	(.007)***		(.011)		(.014)	
PraiseW2	-.002	-.074	-.006	-.143	.002	.024
	(.005)		(.013)		(.018)	
Indirect effects						
GBG via	.043		.027		-.036	
ReprimandsW2	(.014)***		(.016)*		(.020)*	
GBG via	-.002		-.006		.002	
PraiseW2	(.004)		(.014)		(.017)	
Explained variance (R^2)						
Within level		0.173		0.167		0.188
Between level		0.689		0.283		0.129

Note 1. ***$p < .01$, **$p < .05$, *$p < .10$ (two-tailed); $_{W1}$ = Wave 1, $_{W2}$ = Wave 2

Note 2. Reprimands$_{W2}$ and Praise$_{W2}$ were controlled for baseline levels and regressed on intervention status (see Table 2 for these effects).