Does Family Makes a Difference ? : Mid-Term Effects of a School/Home-Based Intervention Program to Enhance Reading Motivation

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Abstract

This study examined the effects of a school/home-based intervention program designed to enhance the reading motivation of Swiss fourth graders (N = 713). In order to identify the specific contribution of the home environment, the program was implemented in one group *without* (*S* group = school-based, N = 244) and in one group *with* (*SH* group = school/home-based, N = 225) parental participation. The intervention, which was based on the principles of Self-Determination Theory (SDT, Deci & Ryan, 2002), lasted one school year, with a follow-up assessment 5 months later. Effects of the treatment were investigated in a pretest–posttest control group design. Multilevel analyses showed that the school/home-based intervention had significant effects on reading motivation, and that these effects were still detectable at 5-month follow-up. The effects at follow-up differed significantly from those of the school-only intervention. The findings highlight the important role of the family in the sustained promotion of reading motivation.

Keywords: reading motivation, family literacy, school, intervention study

1. Introduction

Promoting reading literacy is a worldwide concern. The declines in reading motivation that are typically observed in the elementary school years and beyond are thus a cause for serious concern (Eccles, Wigfield, Harold, & Blumenfeld, 1993; Gambrell, Codling, & Palmer, 1996; Meece & Miller, 1999; for the high school years, see Gottfried, Fleming, & Gottfried, 2001). Declines in academic motivation have been widely attributed to school factors (Gottfried, Marcoulides, Gottfried, & Oliver, 2009). However, home-based factors are probably just as relevant. According to Wang, Haertel, and Walberg (1993), family environment and parental support rank third in the list of factors influencing school achievement, after cognitive competencies and class management. Indeed, research has confirmed that family has a strong impact on reading motivation (Baker, Scher, & Mackler, 1997; Leseman & de Jong, 1998). Both family status/structure variables and process characteristics are important here, the former often being mediated by the latter (cultural practice in the family; Baumert, Watermann, & Schümer, 2003). The motivational practices of parents may thus impact their children's school success (Gottfried et al., 2009). Given that motivational decline in reading usually begins in the latter years of elementary schooling, fourth grade appears to be a sensitive period in which intervention programs designed to promote reading motivation are especially warranted.

The last three decades have seen the development of numerous and diverse intervention programs in the domain of reading literacy, some of them combining skill instruction with motivational support (e.g., Guthrie, McRae, & Lutz Klauda, 2007; Souvignier & Mokhlesgerami, 2006). Although this combined approach seems very promising, the studies in question have generally neglected to consider the family context. Unlike school, the family's primary task is not to instruct the child, but to give motivational and emotional support if needed (Baker, 2003). Given this complementarity, it makes sense

to foster partnerships between the school and the family (Epstein, 2001) and thus to establish coherent motivating learning environments for reading. Indeed, meta-analyses on the effectiveness of family literacy programs have shown diverse effects on reading achievement (Mol, Bus, De Jong, & Smeets, 2008; Sénéchal & Young, 2008; van Steensel, McElvany, Kurvers, & Herppich, 2010).

Most previous studies on reading motivation have been correlative in nature, and few have involved experimental manipulation (Guthrie et al., 2007). In general, studies on home-based interventions have focused on early literacy and not considered reading motivation in particular (for an overview, see Sénéchal & Young, 2008; van Steensel et al., 2010). Although families have considerable potential to foster reading motivation (McElvany & Artelt, 2009), intervention programs connecting the family and school settings are rare (e.g., Morrow & Young, 1997).

This study aims to close these gaps in the literature. In this article, we therefore evaluate the effects of a school/home-based intervention program designed to enhance the reading literacy of fourth grade students by focusing on motivational outcomes. The program was also implemented as a school-only intervention without parental participation, making it possible to gauge the respective contributions of family and school. Both interventions lasted one year. Effects were evaluated at the end of the school year as well as at follow-up 5 months later.

1.1 Promoting Reading Motivation

Two possible approaches to promoting reading motivation can be identified by reference to the distinction between situational and habitual (intrinsic) reading motivation. Whereas situational reading motivation refers to the motivation that individuals experience while reading a certain text at a specific point in time, habitual motivation is more stable and less situation dependent (Möller & Schiefele, 2004). Interest research uses the terms

situational and *personal* or *individual* interest (Schiefele & Streblow, 2006) to describe the same distinction. In principle, there are thus two potential points of intervention for the promotion of reading motivation: the *person* (changing dispositions directly through training approaches designed to enhance the achievement motive; see Heckhausen, & Heckhausen, 2008) and the *situation* (changing dispositions indirectly by setting up the learning environment in a way that is conducive to motivation). Recent programs designed to promote reading motivation have tended to focus on the second approach (Schiefele & Streblow, 2006). By activating situational interest on a repeated basis, these programs aim to develop general, lasting dispositions toward a topic or an activity. In the domain of reading, this means creating learning environments in which students are given repeated opportunities to read and work on texts of engaging content and form in attractive learning settings (Schraw, Flowerday, & Lehman, 2001). The maintenance of situational interest over time may lead to the development of individual interest. Hidi and Renninger's (2006) four-phase model of interest development elaborates on the distinction between situational and individual interest, differentiating each into two further phases of interest development (*triggered situational interest/maintained situational interest* and *emerging/well-developed individual interest*). According to Krapp (2002, p. 400), however, the transition from situational to individual interest is rarely made, because this process requires identification with the object of interest. Nevertheless, studies have shown that it is possible to promote intrinsic reading motivation by generating situational reading interest (e.g., Guthrie, Hoa, Wigfield, Tonks, & Perencevich, 2006). Furthermore, Guthrie, Wagner, Wigfield, Tonks, Humenick, and Littles (2007) found that changes in students' situational interest predicted changes in general reading motivation. Other researchers have reported similar findings, suggesting that interesting and autonomy-supporting instructional environments are especially favorable for motivational development (Hidi, Berndorff, & Ainley, 2002; Krapp, 2002; Lipstein &

Renninger, 2006, and others). These findings have yet to be confirmed by longitudinal studies, however.

According to Krapp (1992), a person's situational interest is the mental state resulting from the interaction between his or her existing individual interest in an object and the characteristics of the learning environment (interestingness). Person-specific factors such as values, goal orientations, and the quality of emotional experience (needs) can facilitate the emergence of situational interest, allowing a direct connection to be drawn to self-determination theory (SDT, Köller, Baumert, & Schnabel, 2000; Krapp, 2005). According to Deci and Ryan (2002), what is crucial for the development of lasting intrinsic learning motivation is the degree to which a person's basic psychological needs for autonomy, competence, and social relatedness can be fulfilled. It is possible to capitalize on this relationship in education by developing approaches that combine positive motivational experience with the fulfillment of these basic psychological needs. SDT thus provides a useful theoretical basis for promoting motivation – not only in the school domain, but also in other educational contexts, such as the home (Grolnick, 2003).

1.2 Motivating Reading Environments at School and at Home

School and family are considered to play complementary roles in promoting reading literacy (McElvany, 2008; Mullis, Martin, Gonzales, & Kennedy, 2003). In the following, we outline theoretical considerations on how reading motivation might be fostered in the school and family environments, respectively.

According to the principles of SDT, teachers can foster students' situational interest by offering them opportunities for choice (Guthrie, Wigfield, & Perencevich, 2004; Pilgreen, 2000). Allowing students to select their own material to read independently enhances their experience of *autonomy* (Deci & Ryan, 2002). It also allows them to pursue their existing interests, which in turn plays an important role in fostering motivation (Hidi & Renninger,

2006; Krapp, 2002). Furthermore, an optimal level of challenge (i.e., the choice of appropriate texts, achievement grouping) and meaningful performance feedback can enhance students' perceived *competence* if provided in an autonomy-supportive context (Deci, Vallerand, Pelletier, & Ryan, 1991). Further in line with SDT, cooperative learning in small groups is highly motivating in the classroom context because it fulfills the need for *social relatedness* (Lou, Abrami, & d'Apollonia, 2001). Characteristics of cooperative learning settings include positive interdependence, individual responsibility, helpful face-to-face-interactions, and feedback (Slavin, 2005). Several of the methods developed to promote reading comprehension are based on cooperative learning (Guthrie et al., 2004; Palincsar & Brown, 1984; Schreblowski & Hasselhorn, 2001).

The same theoretical considerations apply to family context, and particularly to the homework situation. However, the advantage of the family environment over the school environment is that it has the potential to facilitate highly adaptive interactions. According to McElvany and Artelt (2009), some clear advantages of home environment are: (1) the intensity of the one-to-one interaction between parent and child, (2) the opportunity to establish a strong tradition of positive reading behavior within families, and (3) the possibility of direct feedback. Thus, the family environment bears a high potential for individualized promotion of reading motivation. In her discussion of parental behaviors that are conducive to motivation, Grolnick (2003) – with reference to the principles of SDT – advocates autonomy-supporting rather than controlling behaviors. Indeed, research on homework support has shown that parental control and interference may have demotivating effects (Grolnick, 2003; Niggli, Trautwein, Schnyder, Lüdtke, & Neumann, 2007), whereas motivationally supportive family environments foster reading motivation. Baker (2003) reported that the affective quality of home literacy interactions at age 5 predicted children's self-reported motivation for reading in first grade and in second grade. In this study, positive

affective interactions during shared reading were associated with meaning-related talk, whereas negative interactions were associated with parental attempts to instruct and control their child. Groeben and Schroeder (2004) also found affective quality to be important for motivationally supportive reading socialization. They noted that parent–child interactions may impact the child's motivation if the child is considered to be actively involved in the process of constructing meaning when talking about texts. Other aspects of the family environment that foster reading motivation are cultural activities and resources (e.g., books) and parents' reading behavior and valuing of reading (i.e., their function as role models, McElvany & Artelt, 2009).

1.3 Research Questions

The school/home-based reading motivation program implemented in the present research was developed in accordance with the principles of design-based research (Design-Based Research Collective, 2003). The aim of design-based experiments is to develop innovative learning environments in specific domains of practice, based on close cooperation between researchers and practitioners. The focus of the present study was on the practicability and effectiveness of a reading program designed to establish partnerships between the school and the family. In order to identify the specific contributions of the school and the family, we compared the effects of two treatments, one in which the program was implemented *with* parental participation in reading homework and one *without* the parental participation component. We hypothesized (1) that the program would have significant effects on reading motivation at the end of intervention in both treatment groups relative to a control group and (2) that – due to the duration of the intervention (28 weeks) – these gains would be maintained at follow-up 5 months later. Furthermore, we expected (3) that students in school/home intervention classes would show significantly higher post-intervention

reading motivation scores than students in the school-only intervention classes because of the additional impact of parental support on motivation during reading homework.

2. Method

2.1 The LIFUS Reading Program

The main objective of the LIFUS Program[1] was to promote fourth grade students' reading literacy by establishing motivationally supportive reading environments. Thus, the program aimed at changing the *quality* of reading experiences, rather than their quantity. The motivational components of the intervention were based on the principles of SDT (Deci & Ryan, 2002) and interest theory (Hidi & Renninger, 2006; Krapp, 2002). In the following, we describe the full school/home intervention program with particular reference to the three basic psychological needs identified by SDT: autonomy, competence, and social relatedness (see Table 1).

Please insert Table 1 about here

Home reading environment. Based on the findings of homework research, parents were asked to support their child's motivation during reading homework by fostering the child's autonomy and by avoiding controlling or interfering behaviors (Grolnick, 2003; Niggli et al., 2007; Pomerantz, Moorman, & Litwack, 2007). Specifically, parents were instructed to provide *autonomy support* by letting the child read the text silently at his or her own pace, providing material such as dictionaries, remaining available for questions, and giving the child hints as to strategy use rather than complete solutions. They were asked to avoid *controlling* and *interfering behaviors* such as staying with the child during the reading process, listening to the child reading aloud, or interrupting the child to ask questions or correct pronunciation. Further, parents were familiarized with detailed, domain-specific

[1] LIFUS: German abbreviation for "Reading Within Family and School."

behavioral scripts (O'Donnel & Dansereau, 1992) for supporting their child's use of three reading strategies (*activating background knowledge*, *predicting*, and *summarizing*; Guthrie, 2004; Palincsar & Brown, 1984). These three strategies were intended to facilitate pre-and post-reading discussion between parent and child. Homework was preparatory for the following school day, and thus fostered motivation by generating the expectancy of being prepared and succeeding at school (Eccles & Wigfield, 2002).

In preparation for the home intervention, parents received two evening training sessions of about 3 hours each. The children also participated in the second session, allowing strategy use to be trained in a semi-authentic homework situation. Personal coaching was offered to parents throughout the period of the intervention. They were also provided with an instruction booklet, which helped them to remember the content of the training sessions and to apply the reading strategies consistently (for details of parental training, see Villiger, Niggli, & Wandeler, in press). Students were given a checklist reminding them of the main steps of strategy use.

School reading environment. The school-based component of the intervention consisted of two cooperative learning settings or scenarios that alternated every two weeks. The *first scenario* consisted of student-generated questioning (King, 1992) combined with a Teams-Games-Tournament (TGT; DeVries & Mescon, 1975). Students worked in groups of three or four on short texts distributed by the teacher. Autonomy was facilitated during the question-generating phase. In the subsequent TGT, students challenged their classmates with their self-generated questions about the text. Achievement grouping assured the experience of competence in each phase of work and for each level of performance (Lou, Abrami, Spence, Poulsen, Chambers, & D'Apollonia, 1996). A feedback system provided scores to each individual student, which were then aggregated within the group. The *second scenario* was a combination of a Literature Circle (a working group of three or four students) and Readers

Theater (Worthy & Prater, 2002), a method that is based on Repeated Reading (Samuels, 1997). In the Literature Circle, students were free to choose book texts (narrative and expository) according to their interests. They clarified comprehension questions and discussed their impressions of the text with the other members of their group. Subsequently, they chose and prepared a section of text for a Readers Theater performance. Because students prepared a very short passage of text, they were able to read it fluently and to concentrate on expressiveness (Griffith & Rasinski, 2004). In this scenario, the performance was a crucial moment of experiencing competence. Both of the scenarios are consistent with the precepts of cooperative learning, which – through the interdependence of group members and peer acceptance – fulfills the basic need for social relatedness. Students are responsible for their own learning as much as for the group's result (Slavin, 2005). Furthermore, pre- and postreading discussions may foster text comprehension and increase student motivation (Almasi, 2002).

Teachers received 6 hours of training in preparation for the school-based component of the intervention and had access to an ongoing support system throughout the school year (three personal coaching sessions in the classroom, discussion meetings, web forum). Furthermore, they were given a detailed description of the reading program that summarized its content and included numerous worksheets ready for use in the classroom.

The intervention lasted 28 weeks (approximately one school year). At home, students spent about 3 x 20 minutes per week on reading homework; their parents joined them for part of that time. At school, students spent about 100 minutes per week on program-related tasks. The same texts were used for both interventions. Students in the control group were given conventional reading instruction.

2.2 Sample

Participants were 713 fourth grade students (47.8 % male) from 40 classrooms in 23 schools in the German-speaking part of the Canton of Freiburg in Switzerland. The students were on average 9.95 years old; 81.3 % had German as their mother tongue.

The intervention classes were recruited through interested teachers and (in one third of cases) school officials. Of the 27 intervention classes, 14 were allotted to the school (*S*) intervention group ($N = 244$) and 13 to the school/home (*SH*) intervention group ($N = 225$). Of the parents, 96.6% attended at least one training session and 88.2% attended both. The control group ($N = 244$) consisted of 13 classes that were matched with the *SH* intervention group. This matching procedure was conducted by school district officials, based on the criteria *class size*, *socioeconomic structure*, *first language*, *geographical situation* (urban/rural), *teaching competence*, and *experience*. Although random assignment remains the gold standard of research, it is difficult to realize in educational research. Therefore, matched studies can be valid if differences between experimental and control groups are controlled for (Slavin, 2003). No statistical differences in class characteristics were found between the three groups at baseline (see Table 2).

Please insert Table 2 about here

Moreover, no statistical differences in teacher characteristics such as *age*, *gender*, *years of experience*, or *preferences for teaching styles* were found between the groups. One class in the *SH* intervention group had to be excluded because the questionnaires were not completed correctly. The corresponding matched class in the control group was also excluded.

2.3 Procedure

The data were collected in the 2006/07 and 2007/08 school years. Intervention *SH* and data collection from the control group took place in the first wave; intervention *S*, in the second. At three points of measurement in each year, participants completed paper and pencil

questionnaires in regular lesson time. The initial assessment (pretest) took place before the intervention started, at the beginning of fourth grade. The second measurement (posttest) was administered at the end of the intervention, after about 9 months (i.e., at the end of the school year). The follow-up assessment was conducted 5 months after the end of the intervention (and after a 7-week vacation), at the beginning of the fifth grade, again in the regular classroom context. In fifth grade, most of the classes had a new teacher. However, class composition remained the same for 34 classes. The composition of the other six classes (one from an intervention group) changed due to student transition to different schools.

2.4 Instruments

The questionnaire consisted of items and scales from existing instruments as well as specially developed scales. A 4-point Likert-type scale ranging from 1 (*completely disagree*) to 4 (*completely agree*) was used for the multi-item constructs.

Reading motivation. Reading motivation was assessed with the German reading motivation questionnaire by Bonerad and Möller (2005), which is partly based on Wigfield and Guthrie's (1997) Motivation for Reading Questionnaire. This questionnaire, which covers several dimensions of motivation (intrinsic and extrinsic) was implemented in full. However, in accordance with the aims of the treatment, the present analysis focuses on *reading enjoyment* as an intrinsic dimension. This component concerns the pleasure of reading for its own sake. Four items tapped reading enjoyment (e.g., "It's fun to read books"; "If I had time, I would read more"; T1 α = .90; T2 α = .91; T3 α = .93).

Grade in reading. The grade that participating students were awarded for reading at the end of the first semester of fourth grade (February 2007/2008) was used as an outcome variable to control for any possible influence on motivation. The highest possible grade is 6, the lowest is 1. Thus, high scores indicate desirable learning outcomes.

Quality of teaching (students' perception). Quality of teaching was used as a control variable to capture teacher effects (Raudenbush, 2008). The 6-item scale, which was adapted from Helmke (1988), included general and domain-specific items describing teacher characteristics. Originally, we intended to measure three dimensions: sensitivity (e.g., "My teacher knows my strengths and weaknesses in German"), clarity (e.g., "Our teacher explains things well"), and class management (e.g., "My teacher calms down students who disturb the class"). However, a principal components analysis did not differentiate between the three scales, but suggested a single-factor solution (T2 α = .71).

Students' *family background* was assessed in terms of three components: parental educational background, quantity of books, and first language.

Parental educational background. The parental educational background (PEB) was assessed for mothers and fathers separately, with the highest level of education of either parent being included in the analyses. The seven response categories were collapsed into three broader categories: (1) no education; basic or vocational education (40.6%); (2) high school education (30.7%); (3) college or university education (28.6%). Two dummy variables were created for the subsequent analyses (low and high educational level, medium level as the reference group).

Quantity of books. The number of books in the home was assessed using a similar procedure to that developed by Moser and Tresch (2003), with responses being given on a 4-point Likert-type scale: 1 = 0–10 books, 2 = 11–50 books, 3 = 51–100 books, 4 = more than 100 books.

First language. The first language was coded with a dummy variable: Swiss or High German (1) vs. others (0).

2.5 Statistical Analyses

To test the effectiveness of the intervention, we ran regression analyses to assess change in reading enjoyment, controlling for the initial level. Given the nested structure of the data (students within classes), a multilevel analysis (Raudenbush & Bryk, 2002) was conducted in which the treatment was entered at the class level. Thus, the standard errors are estimated more conservatively. We conducted two separate multilevel analyses to investigate the short- and mid-term effects of the treatment, the first measuring changes between pretest and posttest, the second assessing changes between pretest and follow-up.

The output of the software package used for the multilevel analyses (HLM 6.04; Raudenbush, Bryk, Cheong, & Congdon, 2004) does not report standardized regression coefficients. Before performing the multilevel analyses, we therefore standardized all continuous variables (M = 0, SD = 1) to enhance the interpretability of the resulting regression coefficients. The regression coefficients indicate the proportion of a standard deviation by which the dependent variables will increase or decrease if the predictors change by one standard deviation. Dichotomous variables were retained in their original metric. The average amount of missing data per variable was 4.0% (maximum: 7.9%). Multiple imputation was used to estimate the missing values (Schafer & Graham, 2002). To this end, five complete datasets were generated using the AMELIA II software (King, Honaker, Joseph, & Scheve, 2001). The multilevel analyses were then conducted five times and the results synthesized using the formulae proposed by Rubin (1987).

The perceived quality of teaching (measured at T2) was aggregated at the class level to form an index of students' shared assessment of quality within each class (mean). The variable was also entered at the individual level (using grand mean centering) to control for the validity of the class-level measure. Intra-class correlations were calculated to provide an indication of the reliability of the individual students' ratings, ICC(1), and of the aggregated students' rating at the class level, ICC(2) (see Bliese, 2000; Snijders & Bosker, 1999). The

ICC(1) for quality of teaching was .12, indicating considerable differences between teachers. The ICC(2) was .70, indicating that the class-level assessment of the quality of teaching was reliable. The hypotheses were tested with a two-tailed significance test.

2.6 Treatment Check

To check consistency of implementation and commitment to the program, we asked teachers to complete a weekly report twice during the period of the intervention. Teachers indicated the texts used for cooperative learning, the time dedicated to the program per lesson and over the week, and the quantity of homework assigned per day. A written overall evaluation at the end of the school year revealed that, of the 27 teachers in the intervention classes, 16 had administered the intervention in full. The other 11 teachers had missed a maximum of 2 weeks' sessions. Moreover, project managers checked for program consistency by visiting each participating class during the interventions. In evaluation sessions at the end of the school year, teachers reported that they were highly satisfied with the intervention and its implementation. A survey of the teachers in the control classrooms revealed that, on average, the same amount of time was dedicated to reading instruction and reading homework per week in control classrooms as in intervention classrooms.

Parents in the *SH* intervention group also reported on homework activities with their child twice during the period of intervention, completing questionnaires on the duration of their involvement in homework and the use of reading strategies. Between 18% and 38% of parents reported using each reading strategy at least once per week, with several strategies being applied each week (Niggli, Wandeler, & Villiger, 2009). Parental participation in the treatment checks was 83.6% (TC1; $N = 188$) and 84.0% (TC2; $N = 189$); the return rate for parent questionnaires (full sample) was 95.6% (T1; $N = 700$) and 93.0% (T2; $N = 700$). The level of parental participation in the study was thus highly satisfactory.

3. Results

3.1 Descriptive Analyses

Development of motivation was analyzed for each group separately. Table 3 reports means and standard deviations for reading enjoyment by group.

Please insert Table 3 about here

The means for reading enjoyment were conspicuously high for all groups (3.11 on a 4-point scale being the lowest mean value). The mean score of the *S* intervention group increased slightly from T1 to T2, but decreased to below the T1 level at T3. The mean reading enjoyment score of the *SH* group showed a greater increase from T1 to T2, but dropped back to the T1 level at T3. In contrast, the control group showed a decrease in reading enjoyment between T1 and T2 and barely any change between T2 and T3. The between-group differences in mean reading enjoyment at T1 were not statistically significant (see Table 2).

Means and standard deviations for all measures used in this study, as well as the correlations between the variables, are reported in Table 4.

Please insert Table 4 about here

A gender comparison revealed that girls reported significantly higher reading enjoyment and received significantly better grades in reading than boys. Parental educational background (PEB) was significantly associated with the quantity of books at home. Moreover, children with a high PEB had significantly better grades in reading – and children with low PEB had significantly lower grades – than children with medium PEB. Reading enjoyment was significantly associated with quantity of books in the home and with reading grade, with the strength of this correlation increasing over time. Student-perceived quality of teaching significantly correlated with reading enjoyment at all three points of measurement, and particularly at T2. The intercorrelations of reading enjoyment over time (T1–T2–T3) were moderate, indicating fairly high stability of motivation.

3.2 Predicting Reading Enjoyment Immediately After the Intervention

Our first hypothesis was that both treatments would have a positive impact on reading motivation at the end of the intervention. To test this hypothesis, we conducted multilevel analyses with reading enjoyment at T2 as the dependent variable (see Table 5). Because the measure at T1 was included as a control variable, the regression coefficients can be interpreted as measures of change.

Please insert Table 5 about here

Indicators of family background (PEB, quantity of books, first language), gender, grade in reading, and reading enjoyment at T1 were used to predict reading enjoyment. Model 1 (M1) integrates the main predictors on the individual level; model 2 (M2) includes the two treatment group variables (dummyized: treatment or not), indicating the respective effects of the two treatments; finally, model 3 (M3) controls for quality of teaching at both levels.

Model 1 shows that gender significantly predicted reading enjoyment at T2, with girls' reading enjoyment showing a significantly higher increase at T2 than boys'. Likewise, grade in reading significantly predicted reading enjoyment at T2, with students with high reading grades showing a significantly higher increase in reading enjoyment between T1 and T2 than poor readers. Family background variables (PEB, quantity of books, and first language) were not significant predictors. When the two treatment variables were included on the class level (M2), there was barely any change in the regression coefficients of the student-level variables. However, the *SH* treatment significantly predicted reading enjoyment, whereas no effect was found for the *S* treatment. Inclusion of the treatments only explained an additional 1% of variance in this model. When quality of teaching was controlled (model 3), the *SH* treatment effect was even stronger. Furthermore, quality of teaching (individual level) emerged as a significant predictor of reading enjoyment and explained an additional

4% of the variance. Additional analyses examining interactions between control variables and reading motivation showed that all students benefited equally from the intervention.

3.3 Predicting Reading Motivation 5 Months After the Intervention

To test our second hypothesis – that our interventions would have lasting effects on reading motivation – we conducted multilevel regression analyses for reading enjoyment at T3 as the dependent variable, using the same predictor variables and model specification as described above.

Model 4 with the predictors on the individual level showed almost no change relative to Model 1 predicting reading enjoyment at T2. Gender and grade in reading were still statistically significant predictors above and beyond reading enjoyment at T1. Again, family background had no significant effect. However, first language did appear to be a significant predictor in the mid-term, with students with a mother tongue other than German showing a significantly greater increase in reading enjoyment at T3. When the two treatment variables were included on the class level (M5), the *SH* treatment group variable remained significant, though the effect was smaller. In model 6, quality of teaching again proved to be significant at the individual level. The other coefficients were similar to those found in models 4 and 5. This model explained 34% of the variance in reading enjoyment.

The findings of treatment effects presented thus far are to be interpreted relative to the control group. Further analyses were conducted to test for differences between the two treatments (Hypothesis 3), using the *SH* intervention group as the reference group. Results showed no significant differences between the two intervention groups in terms of reading enjoyment at T2. However, significant differences were found at T3. Specifically, the *SH* intervention had a significantly higher impact on reading enjoyment than the *S* intervention, but only at follow-up.

Additional analyses showed that the treatment did not affect students' extrinsic reading motivation.

4. Discussion

This study examined and compared the mid-term effects of a school/home-based intervention and a school-only intervention designed to prevent the decrease in students' reading motivation that is typically observed in fourth grade. Analyses aimed to identify the specific contributions of the school and family environments and thus to determine the role that family can play in promoting reading motivation.

4.1 Effects of the Treatments on Reading Motivation at T2

Relative to the control group, the results showed significant positive effects of the *SH* treatment on reading enjoyment at T2. The finding that the school/home-based program was particularly effective in fostering motivation seems to confirm our hypothesis that involvement of home environment in the intervention program brings supplementary benefits. However, although the difference in the effects of the two intervention groups relative to control group is remarkable, caution must be taken in interpreting this finding, as no significant difference was found when the two interventions were compared directly.

The *SH* treatment effects are especially striking given the high means for reading motivation at each point of measurement, even before the intervention (see Table 3). Surprisingly, these ceiling effects did not preclude an increase in reading enjoyment scores in the *SH* treatment group. Although the complexity of the school-based intervention did not allow the specific effects of its components (i.e., cooperative learning, students' experience of autonomy, and competence; Deci & Ryan, 2002) to be measured, the intervention as a whole was evidently efficacious. In fact, the effects found may be attributable to the variety of methods used in the LIFUS intervention, which fundamentally changed daily teaching practices (see Slavin, Lake, Chambers, Cheung, & Davis, 2009).

4.2 Mid-Term Effects of the SH Treatment

The follow-up data at T3 again showed significant positive effects of the *SH* treatment relative to the control group, although the effects were weaker than at T2. How is this weakened effect to be explained? At the beginning of fifth grade, students in the *SH* group experienced the end of a motivating reading program as well as a change of teacher. These anti-climatic factors may to some extent explain the decline in reading motivation observed.

Nevertheless, the positive effects found for the *SH* group at follow-up – which differ significantly from the effects found for the *S* group – are evidence for the mid-term effectiveness of the *SH* reading program and for parental involvement in particular. The relative stability of the home environment relative to the school environment (e.g., changes in teachers) at this time may be one explanation for this finding. Whereas the school-based component of the intervention stopped at the end of fourth grade and with a change of teachers, it seems likely that the pre- and postreading communication and other positive literacy activities established at home during the intervention period persisted – though possibly in a less structured way – beyond the end of intervention. This finding emphasizes one of the clear advantages of family environment outlined by McElvany and Artelt (2009), namely the "opportunity to establish a strong tradition of positive reading behavior" (p. 81). The duration of the intervention (one school year) may well have contributed to establishing such a tradition of engaging communication about reading contents.

The students in the *SH* intervention group reported significantly higher reading enjoyment at T2 than did the students in the control group. Does this finding indicate that situational interest was successfully established in the classroom (Hidi & Renninger, 2006)? And did repeated situational interest lead to the development of intrinsic motivation in the present study? If that were the case, it would imply complex spillover effects between school and home that cannot be differentiated. Because interest was a criterion in designing the

interventions, rather than a measured outcome variable, these questions cannot be answered definitively. However, the effects found on reading enjoyment, which represents a measure of intrinsic motivation (Bonerad & Möller, 2005; Wigfield & Guthrie, 1997), indicate that the *SH* intervention indeed influenced a situation-independent aspect of motivation. In view of Krapp's (2002, p. 400) comment about the difficulty of developing personal interest or intrinsic motivation, however, these effects must be interpreted with caution. Although family involvement appears to be promising in our study, the effects found are not strong enough for definite conclusions to be drawn. Further investigations are needed to confirm these effects on the long term.

4.3 Power of Family Background to Predict Reading Enjoyment

Our findings on the relationships between family background variables and reading proficiency (grades) confirm earlier findings (Baker et al., 1997; Organisation for Economic Co-operation and Development, 2003). Children with less educated parents were disadvantaged in terms of achievement and children with more educated parents had benefits in terms of achievement *and* motivation. It indicates that school does not necessary fulfill its compensatory function and that school programs adapted to the needs of students from socially disadvantaged backgrounds are necessary during middle elementary school (Lai, McNaughton, Amituanai-Toloa, Turner, & Hsiao, 2009). However, the present intervention succeeded in enhancing students' reading enjoyment, irrespective of their socioeconomic background. Parents' application of behavioral scripts during homework time may have minimized the differential effects of socioeconomic background.

The findings of the positive outcomes of our school/home-based intervention hold promise for future family literacy programs. Literacy processes in families *are* changeable, even if structural characteristics are not. If a strong tradition of positive reading behavior can be developed within the family, there is potential for long-term positive effects on motivation

(McElvany & Artelt, 2009). Furthermore, the findings of this study comparing a school/home-based program with a school-only program highlight the complementary role of the family in fostering reading motivation (Baker, 2003).

4.4 Limitations and Future Research

The present research focused on the immediate and mid-term effects of an intervention designed to foster students' reading motivation. Although reading outcomes such as text comprehension are crucial for motivation (Guthrie, Wigfield, Metsala, & Cox, 1999; McElvany, Kortenbruck, & Becker, 2008), we did not include them in this investigation. However, cognitive outcomes and their relationship with motivational aspects of reading will be addressed in future research. A further limitation is the lack of additional data regarding quality of implementation. It would be worth obtaining observational data and examining which aspects of teacher behavior are conducive to the success of the intervention. Likewise, observational data from the home environment might provide useful insights into the quality of implementation and into which contextual factors of parent–child interactions were particularly beneficial.

Our findings should be widely generalizable to regions with similar demographics, as the participating classes represented two thirds of the fourth grade classes in the district. Yet generalizability may be limited by the fact that two thirds of the teachers in the intervention classes volunteered their participation (Slavin, 2003). However, we minimized effects of self-selection by conducting a rigorous matching procedure, and between-group comparisons confirmed that the intervention groups and the control group did not differ significantly on diverse covariates (see Table 2).

Future research in this field should concentrate on developing school/family literacy programs and confirming their mid- and long-term effects on students' reading motivation. On the basis of our findings, we suggest that efforts to foster students' reading motivation can

benefit substantially from ongoing parental support embedded in a strong tradition of literacy interactions and activities. However, the success of such literacy programs is likely to depend on the social conditions (i.e., at-risk families; van Steensel et al., 2010) and socio-cultural backgrounds of the families involved (Goldenberg, Rueda, & August, 2008). In order to provide best possible motivational support for each student, it will be important to account for these aspects.

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Table 1

Components of the LIFUS Intervention Program Based on the Principles of Self-Determination Theory (Deci & Ryan, 2002)

Reading environment		Autonomy	Competence	Social relatedness
Home		- Support of child's autonomy during homework - Avoidance of control and interference - Use of autonomy-supportive reading strategies	- Preparatory homework for next day (expectancy effects)	- Reading strategies guide pre- and postreading discussion between parent and child about text
School	Group work and TGT[a] (scenario 1)	- Generation of questions for TGT	- Achievement grouping; chance for all to win - Score (feedback system)	- Cooperative learning - Social interdependence - Individual responsibility
	Literature Circle and RT[b] (scenario 2)	- Free choice of books and text sections for RT	- Performance in class - High experience of fluent and expressive reading	- Cooperative learning - Social interdependence - Individual responsibility

Note.

[a]TGT = Teams-Games-Tournament.

[b]RT = Readers Theater.

Table 2

Between-Group Comparison of Key Variables

		School (*S*)	School/home (*SH*)	Control group	Statistical comparison
N		244	225	244	
Gender (male %)		47.5	48.0	48.0	$\chi^2_{(2, 713)} = .01$ ns
Age		10.00	9.96	9.94	$F_{(2, 700)} = 2.25$ ns
First language German (%)		76.0	77.3	85.0	$\chi^2_{(2, 713)} = 4.00$ ns
PEB[a]	low (%)	38.9	43.6	39.6	$\chi^2_{(4, 657)} = 5.13$ ns
	medium (%)	27.8	30.3	34.4	
	high (%)	33.3	26.1	25.9	
Quality of teaching T1 (*M*)		4.06	4.03	4.11	$F_{(2, 712)} = .73$ ns
Reading enjoyment T1 (*M*)		3.19	3.27	3.29	$F_{(2, 712)} = 1.38$ ns
CFT[b] T1 (*M*)		30.83	31.79	31.55	$F_{(2, 703)} = 1.89$ ns

Note.

[a]PEB = Parental Educational Background.

[b]CFT = intelligence test.

Table 3

Descriptive Statistics for Reading Enjoyment

	Reading enjoyment					
	T1		T2		T3	
	M	SD	M	SD	M	SD
School (*S*)	3.19	0.75	3.23	0.72	3.11	0.81
School/home (*SH*)	3.27	0.72	3.37	0.68	3.26	0.76
Control group	3.29	0.74	3.20	0.77	3.19	0.78

Table 4

Means, Standard Deviations, and Intercorrelations for all Measures

		M	SD	1	2	3	4	5	6	7	8	9	10	11
1	Gender (male = 1)	0.48	0.50											
2	High PEB	0.29	0.45	-.03										
3	Low PEB	0.40	0.49	.00	-.52**									
4	Quantity of books	3.23	0.89	-.07	.34**	-.40**								
5	First language (German)	0.81	0.39	-.05	-.04	.00	.25**							
6	Grade in reading	5.03	0.60	-.14**	.15**	-.14**	.25**	.16**						
7	Reading enjoyment T1	3.25	0.74	-.27**	.06	-.06	.08*	-.07*	.25**					
8	Reading enjoyment T2	3.27	0.73	-.31**	.08*	-.09*	.09*	-.05	.24**	.56**				
9	Reading enjoyment T3	3.19	0.79	-.29**	.08*	-.06	.15**	-.05	.31**	.54**	.65**			
10	Group School/home	0.34	0.47	.00	.07	-.02	.06	-.03	-.05	-.06	-.03	-.07		
11	Group School	0.32	0.47	.00	-.03	.04	-.05	.08*	-.04	.02	.10*	.07	-.49**	
12	Quality of teaching	4.07	0.67	-.04	-.14**	.08*	-.08*	-.05	.03	.12*	.25**	.16*	-.01	-.03

Note. $N = 713$. PEB = Parental Educational Background. T1 = Time 1: September 2006/07, before intervention; T2 = Time 2: June 2007/08, after intervention; T3 = Time 3; November 2007/08, follow-up.

** $p < .01$. * $p < .05$.

Table 5

Predicting Reading Enjoyment at Time 2 and Time 3: Results From Hierarchical Linear Modeling

	Reading enjoyment T2									Reading enjoyment T3								
	M1			M2			M3			M4			M5			M6		
Predictors	*Coeff*		*SE (B)*	*Coeff*		*SE (B)*	*Coeff*		*SE (B)*	*Coeff*		*SE (B)*	*Coeff*		*SE (B)*	*Coeff*		*SE (B)*
Student level																		
Gender (male = 1)	-.29	***	.08	-.30	***	.08	-.29	***	.07	-.28	***	.07	-.28	***	.07	-.28	***	.07
PEB high	.03		.09	.03		.09	.08		.08	.01		.09	.01		.09	.04		.08
PEB low	-.08		.07	-.08		.07	-.10		.07	-.01		.09	-.01		.09	-.01		.09
Quantity of books	.01		.04	.01		.04	.02		.04	.08		.05	.08		.05	.08		.04
First language (German)	-.10		.09	-.11		.09	-.09		.09	-.17	*	.07	-.18	*	.07	-.16	*	.07
Grade in reading	.11	*	.04	.12	*	.04	.11	**	.04	.17	***	.03	.17	***	.03	.17	***	.03
Quality of teaching T2							.17	***	.03							.11	***	.03
Reading enjoyment T1	.48	***	.04	.48	***	.04	.46	***	.04	.43	***	.03	.43	***	.04	.42	***	.03
Class level																		
School/home intervention (SH)				.25	**	.10	.28	**	.09				.14	*	.07	.15	*	.06
School intervention (S)				.11		.10	.14		.09				-.01		.11	.00		.11
Quality of teaching T2 (mean)							.18		.09							-.01		.11
R^2	.34			.35			.39			.33			.34			.34		

Note. N = 713. PEB = Parental educational background. M1and M4 = models with only individual-level data; M2 and M5 = models with treatment variables; M3 and M6 = models including quality of teaching variable. T1 = Time 1: September 2006/2007, before intervention; T2 = Time 2: June 2007/2008, after intervention; T3 = Time 3: November 2007/2008, follow-up.

*** $p < .001$. ** $p < .01$. * $p < .05$.