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Promoting elementary school students' autonomous reading motivation: Effects of a teacher professional development workshop

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ABSTRACT

Responding to the declining trend in reading motivation in and beyond the elementary school years, the authors aimed to enhance late-elementary school students' autonomous reading motivation. Toward this end, the authors evaluated the influence of a teacher professional development grounded in self-determination theory on fifth-grade students' ($n = 664$) autonomous motivation for in-school and leisure-time reading. A quasi-experimental repeated measures design was set up with experimental and control conditions. The experimental condition consisted of teachers participating in a professional development workshop aimed at providing the knowledge and skills necessary to implement an autonomy-supportive and structuring teaching style, whereas the control condition included teachers who continued with their current teaching repertoire. Multilevel piece-wise growth analyses corroborated that students in the experimental group reported increased recreational autonomous reading motivation from pretest to posttest relative to the control group. Additional analyses made clear that boys in particular benefitted from their teachers' professional development.

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Upon completing their elementary school education, students are expected to have learned to read and to be reading to learn (Alexander, 2012; Duke & Carlisle, 2011). To achieve this goal, it is essential that students become competent in reading as well as committed and motivated to read throughout elementary school. Recent research into reading motivation (e.g., De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012; Guay et al., 2010) has indicated that not only reading motivation in general, but the type of students' reading motivation in particular must be considered—a point which is emphasized by self-determination theory (SDT; Deci & Ryan, 2000; Ryan & Deci, 2000). Students' autonomous reading motivation in particular—which occurs when students read for pleasure or out of perceived personal significance—positively contributes to their reading comprehension skills (De Naeghel et al., 2012; Becker, McElvany, & Kortenbruck, 2010; Wang & Guthrie, 2004). In this respect the observed decline in students' reading for pleasure in and beyond the elementary school years is cause for concern (Guthrie & Davis, 2003; Guthrie & Wigfield, 2000; Sainsbury & Schagen, 2004; Unrau & Schlackman, 2006). In the present study therefore we aimed to test whether providing elementary school teachers with a professional development workshop aimed at adopting a more motivating style during reading activities would serve as a buffer against the observed decline in late-elementary school students' autonomous reading motivation.

We focused on teaching style as the unit of intervention, as the motivation literature generally indicates that teachers' motivating style affects students' motivation during classroom activities (Reeve, 2006; Ryan & Deci, 2000). Past work in the field of SDT has revealed the relevance of an autonomy-supportive and well-structured teaching style in fostering autonomous motivation (e.g., Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009; Skinner & Belmont, 1993). Promising in this regard is the fact that recent intervention studies have demonstrated that teachers can develop a more motivating style through an intensive yet brief workshop focused on motivational teaching (Su & Reeve, 2011). Despite the recent increase in research into reading motivation (e.g., Becker et al., 2010; Guthrie, Klauda, & Ho, 2013; Watkins & Coffey, 2004), intervention studies focusing on teachers' motivational style in relation to students' motivation for reading have remained relatively scarce (Guthrie, McRae, & Klauda, 2007).

Autonomous and controlled reading motivation

Reading motivation is a multifaceted and complex concept (e.g., Baker & Wigfield, 1999; De Naeghel et al., 2012; Watkins & Coffey, 2004), consisting of different aspects. At present the multidimensionality of reading motivation is most commonly studied by means of the Motivation for Reading Questionnaire (MRQ; Wigfield & Guthrie, 1997). However, Watkins and Coffey (2004) indicated "a lack of support for the proposed structure of the MRQ" (p. 116). Moreover, this instrument is based on an accumulation of different motivation theories (e.g., self-efficacy theory, achievement goal theory, expectancy-value theory) and motivational constructs (e.g., reading attitudes, reading interests), implying that the MRQ is not based on a unequivocal theoretical frame of reference. Nevertheless, an underlying unambiguous theory of motivation is essential to

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develop an in-depth understanding of children's motives to engage in an activity (Reeve, 2009). Therefore, the present study opts for a unequivocal theoretical frame of reference, namely SDT (Deci & Ryan, 2000; Ryan & Deci, 2000). SDT has been established as a well-validated and coherent theoretical framework for the conceptualization and promotion of motivation in educational contexts (e.g., Jang, Reeve, & Deci, 2010; Reeve, 2009).

A distinction has traditionally been made between intrinsic motivation, defined as doing an activity for its own sake, and extrinsic motivation, defined as engaging in an activity to attain an outcome separable from the activity itself (Becker et al., 2010; Ryan & Deci, 2000). SDT revises this classic distinction by differentiating between qualitatively different types of extrinsic motivation (i.e., external, introjected, identified regulation) which vary in the extent to which the regulation of the behavior has been accepted (i.e., internalized). Through this process of differentiation the distinction between relatively more autonomous and more controlled types of motivation has come to the fore (Ryan & Connell, 1989; Ryan & Deci, 2000). The MRQ (Wigfield & Guthrie, 1997) seems to be grounded mainly in the classic intrinsic-extrinsic motivation distinction, as scales with respect to qualitatively different types of extrinsic motivation (i.e., introjected and identified regulation) seem not to be present.

Recent research has empirically established the distinction between autonomous and controlled motivation with regard to the reading motivation of late-elementary school students (De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012). Autonomous reading motivation involves engaging in reading activities with a sense of willingness and consists of two subtypes. The most autonomous optimal type of reading motivation is intrinsic motivation, which is illustrated by children's engagement in reading because it is exciting, enjoyable, or fun on its own. This prototype of autonomous reading motivation reflects an inherent tendency to look for novelty and challenges (Ryan & Deci, 2000). Nevertheless, even if children lack such spontaneous interest in reading, they still can be autonomously motivated for reading. If children identify with the personal significance and meaning of reading, reading is perceived as instrumental, yet the reader has fully endorsed (i.e., internalized) the importance of reading. This type of autonomous reading motivation is called identified regulation. For instance, a child who frequently reads novels because he or she likes them or because he or she understands the value of doing so would display intrinsic and identified regulation, respectively.

Autonomous reading motivation is differentiated from controlled reading motivation, which involves reading with a sense of pressure or coercion. Controlled reading motivation too, consists of two subtypes. Some children read to meet external demands, such as meeting expectations, obtaining rewards, or avoiding punishment. This type of reading motivation, which occurs as a function of external demands, is called external regulation. Nevertheless, pressure does not always originate in external demands, but can also result from internal causes, such as the avoidance of guilt and shame or the attainment of contingent self-worth. This type of controlled motivation, caused by internal pressure, is called introjected regulation. A boy who reads to avoid thinking of himself as lazy or because his parents threaten to withdraw certain privileges if he does not read constitute examples of introjected and external types of regulation, respectively.

Although the body of work investigating reading motivation from an SDT perspective is limited, a number of interesting findings have been published (De Naeghel et al., 2012). First, the distinction between autonomous and controlled reading motivation has been established—both with regard to reading activities at school (i.e., academic context) as well as during leisure time (i.e., recreational context) in prior research (De Naeghel et al., 2012). Second, girls were found to report higher levels of autonomous reading motivation across both domains, whereas controlled reading motivation was equal across genders (De Naeghel et al., 2012; Guay et al., 2010). These findings corroborate previous research indicating that girls have a more favorable motivation for reading (e.g., girls attach more importance to reading and believe to be more successful at reading; Baker & Wigfield, 1999; Logan & Johnston, 2009; Martínez, Aricak, & Jewell, 2008; Swalander & Taube, 2007; Wigfield & Guthrie, 1997) than boys. Third, autonomous reading motivation was found to relate to more desirable outcomes, including a greater frequency of leisure-time reading, more teacher-rated reading engagement, and higher scores on a standardized reading comprehension test, whereas controlled reading motivation related to lower reading comprehension scores (De Naeghel et al., 2012). The pattern of correlation between the types of motivation and reading-related outcomes was especially clear-cut in the recreational reading context. In short, the study by De Naeghel et al. (2012) is consistent with SDT (Ryan & Deci, 2000) and previous studies conducted within the educational domain (e.g., Haerens, Kirk, Cardon, De Bourdeaudhuij, & Vansteenkiste, 2010; Grolnick & Ryan, 1987), as the findings suggest that increased motivation does not necessarily bring about positive outcomes when the motivation is controlled rather than autonomous in nature. In other words, autonomous reading motivation can be considered as a qualitatively better type of reading motivation than controlled reading motivation.

Promoting students' autonomous motivation in the classroom

Motivating style of the teacher

According to SDT, students' autonomous motivation can be stimulated if teachers nurture students' innate psychological needs for autonomy, competence, and relatedness (Deci & Ryan, 2000; Ryan & Deci, 2000; Skinner & Belmont, 1993; see **Figure 1**). The need for autonomy refers to the experience of a sense of volition and psychological freedom when engaging in an activity and to being the initiator of one's own behavior. Supporting students' need for autonomy during reading activities allows them to opt for reading materials they find interesting themselves and to actively grasp the significance and value of reading. Competence involves the experience of being confident and effective in action. When students feel efficacious and competent in reading, they will be more likely to develop interest in reading and identify with the value of reading. The need for relatedness refers to the experience of feeling connected to and accepted by others. Children will be more likely to

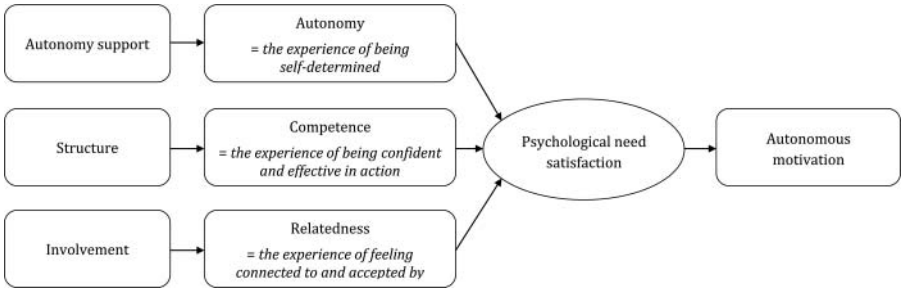

Figure 1. Teaching dimensions supporting students' basic psychological needs and hence encouraging autonomous motivation (self-determination theory; based on Reeve, 2009).

participate in reading when reading is valued by relevant others to whom they feel connected (e.g., teachers, parents). In other words, when teachers adopt a teaching style supportive of students' needs for autonomy, competence, and relatedness during reading activities, a greater willingness or higher autonomous motivation to participate in reading is expected to be evoked. From this perspective, the important role of teachers in facilitating students' optimal motivation is stressed.

To support readers' autonomy, teachers do well to adopt an autonomy-supportive teaching style. Autonomy-supportive teachers attempt to identify, nurture, and develop their students' inner motivational resources (e.g., preferences, values, and interests; Reeve & Jang, 2006). To identify students' inner motivational resources, autonomy-supportive teachers dedicate time to listening to their students, allowing them to voice their opinions. An autonomy-supportive teacher would, for instance, organize student-initiated reading circles and book promotion activities. Autonomy-supportive teachers further nurture students' inner resources by providing students time to work in their own way or by giving students age-appropriate choices. During reading activities, autonomy-supportive teachers nurture their students' interests, for instance by offering a choice between different reading topics potentially of interest to their students or by providing time for independent reading. Finally, to build new inner motivational resources, autonomy-supportive teachers provide meaningful rationales for assigned tasks, thereby relying on noncontrolling informational language (Jang et al., 2010; Reeve & Jang, 2006). Teachers can, for instance, apply reading activities in a meaningful context (e.g., reading about current events, making a class garden, solving riddles) and, hence, assert the relevance of reading in their students' daily lives. Several studies have demonstrated that autonomy-supportive teacher behavior is related to autonomous motivation (e.g., Soenens & Vansteenkiste, 2005) and positive learning outcomes, such as deep-level learning (e.g., Vansteenkiste, Simons, Lens, Soenens, & Matos, 2005) and performance (e.g., Black & Deci, 2000).

Although prior studies have mainly focused on autonomy-supportive teacher behavior as a strategy to promote autonomous motivation, more recent research increasingly emphasizes the importance of simultaneously providing teacher autonomy support and structure (e.g., Vansteenkiste et al., 2010; Jang et al., 2010). Structure is said to support children's need for competence and refers to the communicating of clear expectations and the delineation of the steps required for the student to attain the desired outcome(s) (Jang et al., 2010; Skinner & Belmont, 1993). A structured visit to the library, for instance, involves clear communication about the specific planning and organization of the visit, a statement of the visit's duration, and a discussion of the students' expected behavior (e.g., selecting different types of books). Moreover, structuring teachers provide step-by-step directions and help when needed, give positive feedback, are encouraging, offer hints, and provide optimal challenges (Mouratidis, Vansteenkiste, Lens, & Sideridis, 2008; Jang et al., 2010; Skinner & Belmont, 1993). A structuring teacher would, for instance, provide guidance and help to children when they encounter difficulties in searching for or reading information in order to prepare a lecture on a self-selected topic. Past research has indicated that the experimental induction of positive feedback enhances autonomous motivation (e.g., Mouratidis et al., 2008; Vallerand & Reid, 1984) and that both perceived (e.g., Mouratidis, Michou, Vansteenkiste, & Lens, 2013) and observed (Jang et al., 2010) structure contribute to engagement and self-regulated learning through the facilitation of competence satisfaction.

Complementary to the teaching dimensions of autonomy support and structure is teachers' interpersonal involvement, which supports students' need for relatedness with teachers and peers (Connell & Wellborn, 1991; Deci & Ryan, 2000). Teachers are involved with their students when they invest personal resources, express affection, and enjoy time spent with their students (Reeve, Jang, Carrell, Jeon, & Barch, 2004). Involvement is positively related to students' behavioral and emotional engagement in the classroom (Skinner & Belmont, 1993).

Interventions in the promotion of teachers' motivating style

As the benefits of a motivating teaching style have become increasingly well established in the SDT-related literature, a new generation of intervention studies has emerged. The critical question posed by such studies involves whether teachers can adopt an autonomy-supportive and structuring teaching style based on professional development opportunities and whether their students will benefit from their teachers' professional development in terms of their autonomous motivation. A recent meta-analysis by Su and Reeve (2011) of 19 SDT-grounded intervention studies—10 of which were conducted among teachers (e.g., Chatzisarantis & Hagger, 2009; Collins, 2001; deCharms, 1972; Reeve et al., 2004)—has shown that socializing agents (i.e.,

teachers, coaches, parents) can develop a more autonomy-supportive style. A detailed deconstruction of the activities offered during professional development indicated that the provision of both knowledge-based and skill-based activities was critical to helping teachers adopt a more autonomy-supportive teaching style. In addition, for teachers to see the relevance and to adopt a motivating teaching style, it is critical that teachers' psychological needs for autonomy, competence, and relatedness are met during professional development activities (i.e., congruent teaching approach; Aelterman et al., 2013; Swennen, Lunenberg, & Korthagen, 2008).

Based on their meta-analysis Su and Reeve (2011) formulated several recommendations for the design of effective autonomy-supportive professional development programs. For instance, they argued in favor of the inclusion of multiple elements of autonomy support within relatively brief sessions and the utilization of different types of media to deliver the content. They also suggested that the instructors and teachers discuss their prior beliefs, and that they provide follow-up activities (e.g., take-home informational booklets, electronic reminders).

Some limitations in the literature must also be acknowledged. A limited number of studies included in the meta-analysis were conducted in an elementary education context (e.g., Collins, 2001; deCharms, 1972), and none explicitly focused on the promotion of reading motivation. Moreover, prior intervention studies have focused primarily on autonomy-supportive strategies, thereby failing to take into account the complementary teaching dimensions of structure and interpersonal involvement. Yet, recent research has shown that the simultaneous provision of teacher autonomy support and structure yields the most desirable outcomes (e.g., Jang et al., 2010; Vansteenkiste et al., 2010).

Although the body of literature on reading motivation has gradually expanded over the past decade (e.g., Becker et al., 2010; Schiefele, Schaffner, Möller, & Wigfield, 2012; Wang & Guthrie, 2004; Watkins & Coffey, 2004; Wigfield & Guthrie, 1997), intervention studies explicitly focused on promoting motivation for reading are relatively rare (Guthrie et al., 2007). One exception in this regard has been the Concept-Oriented Reading Instruction (CORI) program. CORI involves a combination of reading strategy instruction, conceptual knowledge in science, and support for students' reading motivation and is introduced during an intensive teacher professional development program (Guthrie, 2004; Guthrie & Cox, 2001; Guthrie et al., 1996). The theoretical justification for particular CORI motivational strategies (e.g., recognizing students' interests, affording choices) is in line with the aforementioned principles of SDT (Guthrie, Wigfield, & VonSecker, 2000). The effectiveness of CORI has been corroborated by several studies, as students participating in CORI report higher intrinsic reading motivation and reading engagement (Guthrie et al., 2007; Guthrie et al., 2000; Wigfield et al., 2008). Whereas CORI is particularly focused on the reading of informational texts related to science inquiry and the promotion of intrinsic reading motivation, the present study focuses on motivation for reading in a broader sense—meaning that reading is not limited to a particular genre or topic and that both intrinsic and identified motives for reading (i.e., autonomous reading motivation) are addressed.

Aim of the present study

The general purpose of the present study was to evaluate whether an in-service teacher professional development workshop aimed at encouraging teachers to adopt a motivating teaching style would have an impact on students' autonomous reading motivation. In line with previous SDT-related research (e.g., Aelterman et al., 2013; Jang et al., 2010; Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009), the present study focused on teacher autonomy support and teacher structure. As noted by Jang et al. (2010), "both autonomy support and structure make important contributions to supporting students' classroom engagement" (p. 588). As involvement often co-occurs with autonomy support and structure (Reeve & Jang, 2006) and teachers report to invest greatly in the interpersonal relationships with their students (De Naeghel, Van Keer, & Vanderlinde, 2012), involvement was not taken into account as a separate teaching dimension during the teacher professional development workshop.

The present study addresses the following specific research questions. First, do teachers participating in an in-service teacher professional development workshop have a positive impact on their students' autonomous reading motivation in the short term and relatively longer term as compared to those involved in a delayed-treatment control group? In this respect, it was expected that the students of teachers who participated in the professional development workshop would not only report more autonomous motivation for school reading activities (i.e., academic reading), but that the positive effects would also be generalized to leisure-time reading (i.e., recreational reading). Second, in light of previous work showing that boys display less autonomous motivation for reading (De Naeghel et al., & Rosseel, 2012), does the in-service teacher professional development workshop have a differential effect on boys and girls in the short term and relatively longer term?

Method

Design

A quasi-experimental repeated measures (i.e., pretest, posttest, retention test) design was established. Of a group of teachers who agreed to participate ($N = 38$), 12 teachers were randomly selected to participate in the experimental condition. Teachers in the experimental condition participated in an in-service professional development workshop on how to provide autonomy support and structure in classroom reading activities. Teachers in the control condition ($n = 26$) took part in a delayed workshop, organized after the completion of the retention test, and consequently continued their current teaching repertoire throughout the period of study. We purposefully opted for a larger control group, as more dropout was expected in the control condition given the delayed added value (i.e., professional development) for daily teaching practice. Teachers in both conditions did not differ significantly with respect to the amount

of time spent on reading instruction and reading activities prior to our study, $t(31) = 0.53$, $p = .597$. The design can be referred to as quasi-experimental because entire class groups were assigned to the experimental or control condition, respectively, and the research was conducted in a natural classroom setting.

Procedure

The research was conducted from September 2011 until March 2012. A team of five trained researchers and research assistants collected pretest, posttest, and retention test data by administering student questionnaires. Pretest data were collected at the beginning of the school year (late September 2011)—that is, prior to the in-service teacher professional development workshop. Teachers in the experimental group received an in-service professional development workshop mid-October 2011. At the end of the session teachers completed two questionnaires to evaluate the workshop. Posttest and retention test data were collected at midterm December 2011 and in late March 2012, respectively. Passive informed consent was obtained from the parents of the fifth-grade students involved in the present study, providing them the opportunity to withdraw their child from participation in the study.

Participants

Thirty-eight fifth-grade teachers and 664 students from 27 elementary schools throughout Flanders, Belgium, participated in the present study. The majority of children were from middle-class families, with 16.7% being eligible for a grant.[1] The age of the students ranged from 9 to 12 years old, with an average of 10.38 years ($SD = 0.48$ years) at the beginning of the school year. Boys (48%) and girls (52%) were roughly equally distributed within the sample. The class size was, on average, 18.92 students per class ($SD = 5.25$ students). The majority of the students (92.6%) listed Dutch, which is the language of instruction in Flanders, as their native language. Teachers were, on average, 38 years old ($SD = 10.1$ years) and had on average 15 years of teaching experience ($SD = 9.20$). Seven teachers (18%) were men, which is representative of the gender distribution of teachers in Flemish elementary schools.

Table 1 summarizes the individual characteristics of both students (i.e., gender, native language, and whether they were eligible for a grant) and teachers (i.e., gender, age, and years of teaching experience) in the experimental ($n_{students} = 206$, $n_{teachers} = 12$) and control classes ($n_{students} = 458$, $n_{teachers} = 26$), respectively. Given the limited number of children who reported speaking a language other than Dutch—only 6.33% of the sample indicated Arabic or Berber, Turkish or Kurdish, or other language (e.g., French)—two categories, Dutch and language other than Dutch, were created to simplify further analyses. According to chi-square tests, students in the experimental and control condition did not differ significantly in the distribution of gender, $\chi^2(1, N = 664) = 0.44$, $p = .505$; native language, $\chi^2(3, N = 664) = 4.17$, $p = .244$; or the number of students who received a scholarship, $\chi^2(1, N = 664) = 0.00$, $p = .992$.

In-service teacher professional development workshop

The one-day in-service teacher professional development workshop (duration: 4 hr 30 min) focused on how to enhance fifth-grade students' autonomous reading motivation. The workshop aimed to assist teachers in developing the knowledge and skills necessary to implement an autonomy-supportive and structuring motivating style in classroom reading activities.

Pilot test of the teacher workshop

A pilot test of the in-service teacher professional development workshop was performed to optimize its quality and effectiveness. Participants in the pilot test consisted of eight educational researchers, each experienced in different facets of the workshop (i.e., expertise in reading research, motivation [SDT] research, or research concerning innovative instructional strategies). During an evaluative group discussion after having participated in the workshop, the participants underscored the importance of repeatedly emphasizing the rationale of the workshop and more explicitly acknowledging teachers'

Table 1. Demographic characteristics of the fifth-grade students and their teachers.

Characteristics	Students		Characteristics	Teachers		
	Experimental group	Control group		Experimental group		Control group
	n (%)			n (%)		
Gender			Gender			
Male	95 (46.10)	224 (48.90)	Male	3 (25)		4 (15.38)
Female	111 (53.90)	234 (51.10)	Female	9 (75)		22 (84.62)
Total	206 (100)	458 (100)	Total *M (SD)*	12 (100)		26 (100)
Native language						
Dutch	190 (92.20)	425 (92.8)				
Other	15 (7.30)	27 (5.90)	Age	44.12 (10.25)	*M (SD)*	34.32 (8.34)
Missing	1 (0.50)	6 (1.30)	Years of teaching experience	19.58 (9.86)		12.77 (7.96)
Total	206 (100)	458 (100)				
Scholarship						
Yes	35 (17.00)	76 (16.60)				
No	159 (77.20)	346 (75.50)				
Missing	12 (5.80)	36 (7.90)				
Total	206 (100)	458 (100)				

expertise. The workshop was subsequently adapted to reflect these suggestions. The underlying rationale was stated more frequently during the workshop and illustrated more clearly in the associated PowerPoint (Microsoft Corporation, Redmond, WA) presentation. Teachers' expertise was also more explicitly recognized by creating additional opportunities for them to share their classroom experiences (e.g., providing more time for teachers to discuss their own classroom reading-promotion strategies and preferred reading materials).

Content

Prior to participating in the professional development workshop teachers received a preparatory assignment (i.e., bring your favorite reading material for fifth-grade students, an example of a book report handed in by one of your students, and a picture or object related to your classroom reading-promotion activities) meant to evoke reflection on their own teaching behavior during reading lessons and to enable the instructor to more fully take into account teachers' interests during the workshop. The workshop consisted of four parts: (a) introduction, (b) discussion of the theoretical background, (c) overview and interactive application of motivating strategies (e.g., cases, classroom examples), and (d) application exercise (micro teaching; see Aelterman et al., 2013). A detailed outline of the professional development workshop is provided in Appendix A.

First, after briefly introducing the rationale (i.e., enhancing students' willingness and autonomous motivation to read; De Naeghel et al., 2012) and structure of the session, teachers introduced themselves by sharing their classroom reading-promotion strategies and preferred reading materials for fifth-grade students. Teachers referred to strategies such as visiting the public library, reading aloud, inviting youth authors, cross-age peer tutoring, etc., and presented different books as examples of interesting reading material. This opportunity for teachers to share their interests and experiences enabled the instructor to identify and further nurture teachers' interests.

Second, the underlying theoretical background was discussed. The importance of distinguishing between different types of reading motivation (i.e., autonomous versus controlled motivation; De Naeghel et al., 2012; Sierens et al., 2009; Ryan & Deci, 2000) in particular was clarified through interactive exercises (i.e., partner work and group discussion). Teachers were invited to first give examples of reasons for their own reading in daily life before reflecting upon their students' motives for reading. Further, the significance of an autonomy-supportive and structuring motivating style for encouraging autonomous types of reading motivation was elucidated and illustrated with quotes from previous focus group and case study research (De Naeghel et al., 2012; Reeve & Jang, 2006; Skinner & Belmont, 1993).

Third, specific strategies to provide autonomy support and structure during reading activities were summarized and exemplified. During this part, teachers were presented seven strategies to provide autonomy support: (a) dedicating time to listen to their students, (b) dedicating time for student talk, (c) asking what students want, (d) taking students' perspective, (e) providing students time to work in their own way, (f) providing choices, and (g) offering a rationale. Further, seven strategies to provide structure were discussed: (a) clearly communicating expectations, (b) responding consistently, (c) providing step-by-step directions, (d) giving positive feedback, (e) providing encouragement and offering hints, (f) offering help and support, and (g) providing optimal challenges. Teachers were asked to reflect, in pairs, on possible applications of these motivating strategies in their own reading practice. In addition, while working in small groups, teachers were given the opportunity to apply these strategies to real-life cases based on previous case study research, such as their students' book reports, reading activities and projects on both the class and school level (De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012). Fourth, teachers prepared an autonomy-supportive and structured reading activity in small groups, which was demonstrated to the larger group by means of microteaching.

Congruent teaching approach

To optimize teachers' motivation and learning, a congruent teaching approach was adopted (e.g., Swennen et al., 2008). According to the literature on congruent teaching (e.g., Swennen et al., 2008), it is important to teach what you preach, or to be a good model of the kind of teaching you would like to promote when designing teacher professional development. Consistent with the SDT perspective, not only can students' motivation be optimized by supporting their psychological needs for autonomy, competence, and relatedness, but teachers will also benefit from a motivating teaching style during teacher professional development (Aelterman et al., 2013; Deci & Ryan, 2000; Skinner & Belmont, 1993). Specifically, teachers are more likely to value, adopt, and implement a motivating teaching style when they have participated in a similarly-modeled teacher workshop. To satisfy teachers' need for autonomy, their active participation was encouraged by providing multiple opportunities for collaborative learning (e.g., group discussion on motives for reading; reflection, in pairs, on the application of autonomy-supportive and structuring motivation strategies), the expression of interests and experiences (e.g., sharing current reading-promotion strategies), and the formulation of opinion (e.g., reflecting on the application of the proposed strategies to real-life cases, evaluation of the workshop). To make teachers feel competent, the proposed motivating strategies were explained, illustrated by both the instructor and the teachers, themselves, and applied to real-life examples of classroom-reading activities. Moreover, a reading atmosphere was created in the meeting room by displaying fifth-grade reading material (narrative and informative books, journals, and comics), literature on reading promotion, and posters on reading-related topics (e.g., book awards, book promotion, reading aloud, children's book week).

Furthermore, the in-service professional development workshop took into account the recommendations of Su and Reeve (2011) regarding the effectiveness of autonomy-supportive professional development programs. Stated more precisely, (a) multiple elements of autonomy support were included (e.g., taking students' perspectives into account, providing encouragement, using noncontrolling language), (b) different media were used to present the content (i.e., instructional booklets, PowerPoint presentation), (c) the workshop was offered in a relatively brief session of moderate duration (i.e., one-day

workshop), (d) a follow-up activity was offered (i.e., take-home informational booklet and electronic reminders), and (e) prior beliefs about effective reading motivation strategies were discussed.

Appreciation of the workshop

Teachers in the experimental group evaluated the professional development workshop at the end of the session. In line with the intended congruent teaching approach, teachers corroborated that they had experienced support for their own psychological needs ($M_{autonomy} = 5.21$, $M_{competence} = 5.00$, $M_{relatedness} = 5.69$ on a 7-point Likert-type scale; 1 = strongly disagree to 7 = strongly agree) during the workshop in their responses to the Activity Feeling States Scale (AFS; Reeve & Sickenius, 1994; $\alpha_{autonomy} = .71$, $\alpha_{competence} = .85$, $\alpha_{relatedness} = .78$). In addition, teachers indicated their positive perceived value of the autonomy-supportive and structuring teaching style ($M = 3.89$ on a 5-point Likert-type scale; 1 = strongly disagree to 5 = strongly agree) and their optimistic expectations to successfully implement this teaching style in their classroom reading activities ($M = 3.90$), in their responses to the Implementation Questionnaire Autonomy-Support and Structure (based on the Cooperative Learning Implementation Questionnaire [CLIQ]; Abrami, Poulsen, & Chambers, 2004; $\alpha_{perceived\ value} = .75$, $\alpha_{expectancy\ of\ success} = .71$). Moreover, teachers' overall need satisfaction during the workshop was significantly and positively correlated with both their perceived value of the autonomy-supportive and structuring teaching style ($r = .64$, $p = .026$) and their expectation that they would be able to successfully implement this teaching style ($r = .81$, $p = .002$). These correlations are in line with the intended congruent teaching approach as teachers are more likely to value and implement a motivating teaching style when they have participated in a similarly-modeled teacher workshop. In addition to these quantitative data, teachers expressed their appreciation of the workshop in oral and written feedback. The combination of discussing the theoretical background information and sharing personal experiences was particularly highly valued.

Follow-up

At the end of the professional development workshop teachers received a take-home informational booklet. This booklet described the theoretical background of the session (i.e., What is reading motivation? How to promote reading motivation?), illustrated the autonomy-supportive and structuring motivating strategies with reading-related examples (e.g., organizing reading circles, advertising readers' choice, offering optimal challenging reading tasks), and offered hints to create an optimal reading climate in the classroom (e.g., creating an attractive reading corner, hanging out posters on book promotion or children's book week, preparing reading aloud activities). Moreover, after the professional development workshop a weekly electronic reminder was sent out by the researchers to encourage teachers to implement an autonomy-supportive and structuring motivating style during reading activities as well as to complete a structured journal.

Treatment fidelity

Each week, teachers in the experimental condition completed a structured journal as a treatment fidelity check. Teachers started keeping the structured journal immediately after the workshop and continued to complete it until the posttest (i.e., nine weeks; for an example of a completed structured journal, see Appendix B). In these journals they reflected and reported on their efforts to implement an autonomy-supportive and structuring motivating style during reading activities, at the end of each week. More particularly, teachers evaluated their overall weekly efforts to adopt autonomy-supportive and structuring instructional behavior during reading activities on two corresponding scales ranging from one to ten. Further, they reported each week those points of interest regarding autonomy-support and structure which they had paid attention to (for an overview of the motivation strategies to implement, see Appendix B) and completed a reading activity report which specified the content, goals, and duration of their classroom reading activities. All teachers completed their journals at least seven of nine weeks, indicating their commitment to the professional development. As journals were completed at the end of each week, they indicate a retrospective report of the teacher on their instructional behavior during reading activities.

All teachers reported having been engaged in autonomy-supportive ($M = 7.44$ on a scale ranging from 1 to 10, $SD = 1.12$) and structuring instructional behavior ($M = 7.08$ on a scale ranging from 1 to 10, $SD = 1.21$) in reading activities across the nine-week period. In addition, they on average indicated three points of interest each week relevant to autonomy-supportive motivation strategies and three points of interest concerning structuring strategies. The most regularly indicated points of interest were increasing time for student talk, allowing students more to work in their own way, and asking what students want with respect to autonomy-supportive strategies and clearly communicating expectations, offering hints, and providing optimal challenges regarding structuring strategies. These strategies were implemented across a variety of reading activities (e.g., reading aloud, book promotion, book reports, independent reading, library visits, reading in a meaningful context, peer tutoring sessions, creative activities). Teachers on average organized three reading activities per week, accounting for approximately 140 min weekly in-class activities.

Measures

SRQ-Reading Motivation

Students' reading motivation was measured by means of the SRQ-Reading Motivation (De Naeghel et al., 2012) on each of the measurement occasions. The SRQ-Reading Motivation has been shown to be a reliable and valid questionnaire for measuring late-elementary school students' autonomous (i.e., intrinsic and identified) and controlled types of reading motivation (i.e., introjected and external) in prior research (De Naeghel et al., 2012). Each of the 17 items was administered once with regard to motivation for academic reading (e.g., "I read for school, because it is important for me to read") and once with regard to motivation for recreational reading (e.g., "I read in my free time, because it is important for me to read"). In this respect, academic reading was defined as reading at school and for homework and recreational reading

Table 2. Internal consistency coefficients subscales of SRQ-Reading Motivation.

Scale	Cronbach's α		
	Pretest	Posttest	Retention test
Recreational context			
Autonomous motivation	.94	.93	.94
Controlled motivation	.86	.84	.86
Academic context			
Autonomous motivation	.94	.94	.95
Controlled motivation	.86	.86	.85

referred to reading during students' leisure time. Items were scored on a 5-point Likert-type scale, ranging from 1 (*disagree a lot*) to 5 (*agree a lot*). The internal consistency of the autonomous and controlled reading motivation subscales was high, with Cronbach's α values above .84 for all subscales (see **Table 2**). More information on the complete development of the SRQ-Reading Motivation can be found in De Naeghel et al. (2012).

Data analysis

Descriptive statistics and internal consistency coefficients were computed using SPSS 18. To investigate the short-term (posttest) and relatively longer term (retention test) impact of the in-service teacher professional development workshop on the growth rate of students' autonomous reading motivation in the academic and recreational context (Research Question 1) and possible interactions with gender (Research Question 2), multilevel piece-wise growth analysis was performed in MlwiN 2.22 (Centre for Multilevel Modelling, University of Bristol, UK). Multilevel analysis was used because the problem under investigation has a clear hierarchical structure: measurement occasions (level 1) are clustered within students (level 2), which are in turn nested within classes (level 3). In such a sample, the individual student observations are generally not fully independent because of selection processes and owing to the common history and experiences individuals share by being part of the same group or class (Hox, 1994). With respect to the first and the second research question, the time span from pretest to retention test was split into two pieces: the first piece covers the change from pretest to posttest (P_1) and the second covers the evolution from posttest to retention test (P_2).

With regard to the first research question, a three-step procedure was implemented. The first step concerned the estimation of the three-level conceptual null models for academic and recreational autonomous reading motivation. These models served as the baseline with which subsequent more complex models were compared. The second step consisted of the inclusion of student background characteristics, which possibly explain students' autonomous reading motivation. Only significant explanatory variables ameliorating the models were retained, as parsimonious models are preferred. Finally, the third step concerned the addition of the variable condition, which enabled us to examine the first research question. Because we were particularly interested in the differential progress of the experimental group contrasted against the control group, the interaction effects with P_1 and P_2 were added. To investigate the second research question, interaction effects between gender, condition and the time variables P_1 and P_2 were included in the models. To obtain a better understanding of the statistical power of the most important effects, standardized regression coefficients—which can be interpreted as effect sizes—were calculated. To elaborate on the first and the second research questions, students' evolution in autonomous reading motivation was studied in greater depth. A detailed overview of all subsequent models and their estimates is provided in **Tables 3** and **4**, respectively.

Results

Impact of the teacher professional development workshop on students' autonomous reading motivation

Conceptual null model

The conceptual null models predicted both the overall pretest score on autonomous reading motivation (i.e., intercepts of 3.75 and 3.70 on academic and recreational autonomous reading motivation, respectively) and the overall change from pretest to posttest (P_1 = phase 1) and from posttest to retention test (P_2 = phase 2) for all students across all classes (Model 0). The null models partitioned the variance of the pretest scores, as well as the variance of the change in P_1 and P_2, into between-classes ($p_{\text{academic}} = .068$ and $p_{\text{recreational}} = .183$), between-students ($p_{\text{academic}} < .001$ and $p_{\text{recreational}} < .001$), and between-measurements variance ($p_{\text{academic}} < .001$ and $p_{\text{recreational}} < .001$). The differences in academic and recreational autonomous reading motivation between-students (63.57% and 68.03%, respectively) clearly exceeded the differences between-classes (3.19% and 2.00%, respectively) as well as the differences between-measurement occasions (33.23% and 29.97%, respectively). As it is possible that classes, students within these classes, or both underwent a different change in autonomous reading motivation over time, random variance of the time variables P_1 and P_2 was allowed (Model 1). The level 2 variation between students in Model 1 still strongly outweighed the differences between classes.

Background characteristics

In the second step, students' background characteristics—gender (0 = girl, 1 = boy), native language (0 = Dutch, 1 = language other than Dutch), and grant eligibility (0 = no, 1 = yes), as well as the interaction between native language and grant eligibility—were included as explanatory variables. As gender was the only significant predictor, a more parsimonious model including only gender differences was estimated (Model 2). Boys reported lower academic and recreational autonomous reading motivation at pretest than girls (academic reading motivation: $M_{\text{girls}} = 3.89$, $M_{\text{boys}} = 3.58$, $p < .001$; recreational reading motivation: $M_{\text{girls}} = 3.83$, $M_{\text{boys}} = 3.55$, $p < .001$). Further, one other time-bounded effect emerged, with boys reporting a further significant decrease from pretest to posttest in terms of recreational autonomous reading motivation ($p = .044$).

Impact of the workshop

To test the hypothesis related to the first research question, the third step of the analysis consisted of adding the categorical

Table 3. Summary of the model estimates for the three-level analysis of academic autonomous reading motivation.

	Model 0	*SE*	Model 1	*SE*	Model 2	*SE*
Response	Acad. auton. motivation		Acad. auton. motivation		Acad. auton. motivation	
Fixed part						
Cons	3.75***	0.05	3.74***	0.06	3.89***	0.07
P_1	−0.02	0.03	−0.02	0.05	0.02	0.06
P_2	−0.08*	0.03	−0.08*	0.04	−0.13**	0.05
Gender (boy)					−0.30***	0.08
P_1.Gender (boy)					−0.09	0.06
P_2.Gender (boy)					0.11	0.06
Random part						
Level: Class						
Cons/cons	0.03	0.02	0.079*	0.03	0.08*	0.03
P_1/cons			−0.05*	0.02	−0.05*	0.02
P_1/P_1			0.05*	0.02	0.05*	0.02
P_2/cons			−0.02	0.01	−0.02	0.01
P_2/P_1			0.01	0.01	0.01	0.01
P_2/P_2			0.02	0.01	0.02	0.01
Level: Student						
Cons/cons	0.64***	0.04	0.92***	0.05	0.90***	0.05
P_1/cons			−0.29***	0.03	−0.30***	0.03
P_1/P_1			0.62***	0.04	0.61***	0.04
P_2/cons			0.01	0.03	0.02	0.03
P_2/P_1			−0.27***	0.03	−0.26***	0.03
P_2/P_2			0.57***	0.03	0.57***	0.03
Level: Measurement occasion						
Cons/cons	0.33***	0.01	0.00	0.00	0.00	0.00
−2*loglikelihood	4593.87		4536.39		4510.00	
DIC:						
Units: Classes	38		38		38	
Units: Students	660		660		660	
Units: Measurement occasions	1918		1918		1918	
Reference model			Model 0		Model 1	

	Model 3	*SE*	Effect sizes Model 3	Model 4	*SE*	Effect sizes Model 4
	Acad. auton. motivation			Acad. auton. motivation		
Fixed part						
Cons	3.93***	0.08		3.93***	0.08	
P_1	−0.04	0.06	−0.02	−0.00	0.07	−0.01
P_2	−0.12*	0.06	−0.06	−0.14*	0.06	−0.07
Gender (boy)	−0.30***	0.08	−0.30	−0.30***	0.09	−0.30
P_1.Gender (boy)	−0.08	0.06	−0.08	−0.17*	0.08	−0.16
P_2.Gender (boy)	0.11	0.06	0.11	0.15*	0.07	0.15
Condition (exp.)	−0.13	0.13	−0.13	−0.13	0.15	−0.13
P_1. Condition (exp.)	0.19	0.10	0.19	0.07	0.12	0.07
P_2. Condition (exp.)	−0.02	0.08	−0.02	0.04	0.10	−0.04
Condition (exp.).Gender(boy)				−0.01	0.16	−0.01
P_1. Condition(exp.).Gender (boy)				0.26	0.14	0.26
P_2. Condition (exp.).Gender (boy)				−0.13	0.13	−0.13
Random part						
Level: Class						
Cons/cons	0.07*	0.03		0.07	0.03	
P_1/cons	−0.04*	0.02		−0.04	0.02	
P_1/P_1	0.05*	0.02		0.04	0.02	
P_2/cons	−0.02	0.01		−0.02	0.01	
P_2/P_1	0.01	0.01		0.01	0.01	
P_2/P_2	0.02	0.01		0.02	0.01	
Condition (exp.)/cons						
Condition (exp.)/P_1						
Condition(exp.)/P_2						
Condition (exp.)/Condition (exp.)						
Level: Student						
Cons/cons	0.90***	0.05		0.90***	0.05	
P_1/cons	−0.30***	0.03		−0.30***	0.03	
P_1/P_1	0.61***	0.04		0.61***	0.04	
P_2/cons	0.02	0.03		0.02	0.03	
P_2/P_1	−0.26***	0.03		−0.26***	0.03	
P_2/P_2	0.57***	0.03		0.56***	0.03	
Level: Measurement occasion						
Cons/cons	0.00	0.00		0.00	0.00	

(*Continued*)

Table 3. Summary of the model estimates for the three-level analysis of academic autonomous reading motivation. *(Continued.)*

	Model 3	*SE*	Effect sizes Model 3	Effect sizes Model 4	*SE*	Effect sizes Model 4
	Acad. auton. motivation			Acad. auton. motivation		
−2*loglikelihood	4506.63			4502.46		
DIC:						
Units: Classes	38			38		
Units: Students	660			660		
Units: Measurement occasions	1918			1918		
Reference model	Model 2			Model 3		

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

variable condition to the model (Model 3). Regarding academic autonomous reading motivation, students in both conditions had an equal initial status ($p = .287$). With respect to recreational autonomous reading motivation, students in the experimental group had a lower initial status ($M_{\text{girls, experimental group}} = 3.67$, $M_{\text{boys, experimental group}} = 3.38$, $M_{\text{girls, control group}} = 3.91$, $M_{\text{boys, control group}} = 3.62$, $p = .033$). In the experimental group, students did not report significantly more progress on academic autonomous reading motivation from pretest to posttest as compared to students in the control group ($p = .060$). Students in the experimental group, however, did make significantly more progress from pretest to posttest on recreational autonomous reading motivation relative to the control group ($p = .006$, effect size of .23 *SD*). From posttest to retention test students in both the experimental and the control group underwent a roughly equal decrease in their academic autonomous reading motivation ($p = 0.028$, effect size of –.06 *SD*) and both conditions remained stable with regard to recreational autonomous reading motivation ($p = .417$). Consequently, students in the experimental group retained their relative progress in recreational autonomous reading motivation gained from pretest to posttest.

Differential impact of the workshop on boys and girls

To investigate the second research question, interaction effects between gender, condition and the time variables P_1 and P_2 were included in the models (Model 4). No differences between boys and girls in the experimental group were detected with respect to their progress on academic autonomous reading motivation from pretest to posttest. Neither boys nor girls in the experimental group made significantly more progress on academic autonomous reading motivation from pretest to posttest ($p_{\text{boys}} = .057$ and $p_{\text{girls}} = .567$) as compared to boys and girls in the control group. Boys and girls in the experimental group, however, did differ with respect to their progress on recreational autonomous reading motivation from pretest to posttest. Boys in the experimental condition reported significantly more progress in recreational autonomous reading motivation ($p = .042$, effect size of .26 *SD*) than did boys in the control group. No similar progress could be identified with respect to the recreational autonomous reading motivation of girls in the experimental condition ($p = .288$). These findings imply that boys participating in the experimental condition made more progress from pretest to posttest on recreational autonomous reading motivation (see **Figure 2**). With regard to the control group, gender differences were noted as well. Boys in the control group showed a significant decrease from pretest to posttest ($p_{\text{academic}} = .029$, effect size of –.16 *SD* and $p_{\text{recreational}} = .006$, effect size of –.20 *SD*) whereas girls did not report a significant change in reading motivation from pretest to posttest ($p_{\text{academic}} = .975$ and $p_{\text{recreational}} = .896$).

In the second phase (i.e., from posttest to retention test) boys and girls reported different rates of change, but no significant differences between the experimental and control condition were found. Girls within the control and experimental group reported significant decreases in academic autonomous reading motivation from posttest to retention test ($p = .016$, effect size of –.07 *SD*) and did not experience a significant change with respect to recreational autonomous reading motivation ($p = .215$). Taking into account the evolution of girls, boys reported a significant increase, on the other hand, in recreational and academic autonomous reading motivation from posttest to retention test ($p_{\text{academic}} = .039$, effect size of .15 *SD* and $p_{\text{recreational}} = .023$, effect size of .15 *SD*).

Evolution in students' autonomous reading motivation

To elaborate on the second research question the evolution in boys' recreational autonomous reading motivation was studied in greater depth. This additional analysis examines the absolute change of boys' recreational autonomous reading motivation in the experimental group on the one hand and the control group on the other hand instead of its relative change (i.e., experimental group as compared to control group) which was reported above. With regard to boys in the experimental group, a significant increase occurred in their recreational autonomous reading motivation from pretest to posttest ($p_{\text{boys}} = .007$). During the second phase, no significant change in recreational autonomous reading motivation ($p_{\text{boys}} = .403$) was observed. Looking at the overall change from pretest to retention test, no significant evolution could be identified ($p_{\text{boys}} = .065$). With respect to the control group, boys indicated a significant decrease on autonomous motivation for recreational reading ($p_{\text{boys}} < .001$). From posttest to retention test, boys in the control group did not report a significant change ($p = .188$). From pretest to retention test, an overall decrease could be determined in recreational autonomous reading motivation ($p_{\text{boys}} = .047$).

Discussion

The present study aimed to examine the impact of an SDT-based professional development workshop for teachers on

Table 4. Summary of the model estimates for the three-level analysis of recreational autonomous reading motivation.

	Model 0	*SE*	Model 1	*SE*	Model 2	*SE*
Response	Recr. auton. motivation		Recr. auton. motivation		Recr. auton. motivation	
Fixed part						
Cons	3.70***	0.04	3.69***	0.06	3.83***	0.07
P_1	−0.01	0.03	−0.00	0.04	0.05	0.05
P_2	−0.02	0.03	−0.01	0.04	−0.06	0.05
Gender (boy)					−0.28***	0.07
P_1.Gender (boy)					−0.12*	0.06
P_2.Gender (boy)					0.10	0.06
Random part						
Level: Class						
Cons/cons	0.02	0.01	0.06*	0.03	0.06*	0.03
P_1/cons			−0.04*	0.02	−0.04*	0.02
P_1/P_1			0.03*	0.02	0.03*	0.02
P_2/cons			−0.02	0.01	−0.02	0.01
P_2/P_1			0.01	0.01	0.01	0.01
P_2/P_2			0.02*	0.01	0.03*	0.01
Level: Student						
Cons/cons	0.65***	0.04	0.30***	0.05	0.88***	0.05
P_1/cons			−0.25***	0.03	−0.26***	0.03
P_1/P_1			0.54***	0.03	0.53***	0.03
P_2/cons			−0.03	0.03	−0.02	0.03
P_2/P_1			−0.20***	0.02	−0.20***	0.02
P_2/P_2			0.46***	0.03	0.46***	0.03
Level: Measurement occasion						
Cons/cons	0.29***	0.01	0.00	0.00	0.00	0.00
−2*loglikelihood:	4385.25		4332.10		4304.01	
DIC:						
Units: Classes	38		38		38	
Units: Students	660		660		660	
Units: Measurement occasions	1918		1918		1918	
Reference model			Model 0		Model 1	

	Model 3	*SE*	Effect sizes Model 3	Model 4	*SE*	Effect sizes Model 4
	Acad. auton. motivation			Acad. auton. motivation		
Fixed part						
Cons	3.91***	0.07		3.90***	0.08	
P_1	−0.02	0.05	−0.01	0.02	0.06	0.01
P_2	−0.04	0.05	−0.02	−0.07	0.06	−0.03
Gender(boy)	−0.29***	0.07	−0.29	−0.28***	0.09	−0.28
P_1.Gender(boy)	−0.11*	0.06	−0.12	−0.19**	0.07	−0.20
P_2.Gender(boy)	0.10	0.06	0.10	0.15*	0.07	0.15
Condition(exp.)	−0.24*	0.11	−0.24	−0.23	0.14	−0.23
P_1. Condition(exp.)	0.23**	0.08	0.23	0.11	0.10	0.11
P_2. Condition(exp.)	−0.04	0.08	−0.04	0.04	0.10	−0.04
Condition(exp.).Gender(boy)				−0.03	0.16	−0.03
P_1. Condition(exp.).Gender(boy)				0.25*	0.13	0.26
P_2. Condition(exp.).Gender(boy)				−0.17	0.12	−0.18
Random part						
Level: Class						
Cons/cons	0.05*	0.02		0.05*	0.02	
P_1/cons	−0.03	0.01		−0.03	0.01	
P_1/P_1	0.02	0.01		0.02	0.01	
P_2/cons	−0.02	0.01		−0.02	0.01	
P_2/P_1	0.01	0.01		0.01	0.01	
P_2/P_2	0.03	0.01		0.03*	0.01	
Condition (exp.)/cons						
Condition (exp.)/P_1						
Condition (exp.)/P_2						
Condition (exp.)/condition (exp.)						
Level: Student						
Cons/cons	0.88***	0.05		0.88***	0.05	
P_1/cons	−0.26***	0.03		−0.27***	0.03	
P_1/P_1	0.53***	0.03		0.53***	0.03	
P_2/cons	−0.02	0.03		−0.02	0.03	
P_2/P_1	−0.20***	0.02		−0.20***	0.02	
P_2/P_2	0.46***	0.023		0.46***	0.03	

(*Continued*)

Table 4. Summary of the model estimates for the three-level analysis of recreational autonomous reading motivation. *(Continued.)*

	Model 3	*SE*	Effect sizes Model 3	Model 4	*SE*	Effect sizes Model 4
	Acad. auton. motivation			Acad. auton. motivation		
Level: Measurement occasion						
Cons/cons	0.00	0.00		0.00	0.00	
−2*loglikelihood:	4296.38			4291.46		
DIC:						
Units: Classes	38			38		
Units: Students	660			660		
Units: Measurement occasions	1918			1918		
Reference model	Model 2			Model 3		

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

fifth-grade students' autonomous reading motivation in school and leisure-time reading activities. More particularly, the differential effect of the teacher professional development workshop on the autonomous reading motivation of boys and girls was studied as well. According to the dialectical framework of SDT (Reeve, 2006; Ryan & Deci, 2000), promoting students' autonomous motivation in the classroom can be realized via a motivating teaching style. In line with previous SDT-related research (e.g., Aelterman et al., 2013; Jang et al., 2010; Sierens et al., 2009), the professional development workshop applied in the present study emphasized the enhancement of two aspects of teachers' motivating style in particular: the provision of autonomy support and the provision of structure and, hence, aimed to support students' needs for autonomy and competence, respectively.

Impact of the teacher professional development workshop on students' autonomous reading motivation

Studying the impact of an autonomy-supportive and structuring professional development workshop for teachers on students' autonomous motivation for reading is of added value, as its impact has rarely been examined in late-elementary education or in the domain of research on reading motivation. Moreover, whereas the limited number of prior intervention studies aimed at promoting motivation for reading in the classroom context merely focused on the promotion of students' intrinsic motivation for reading (Guthrie et al., 2007; Guthrie et al., 2000; Wigfield et al., 2008), the present study specifically highlights the significance of adopting an autonomy-supportive and well-structured teaching style to enhance students' autonomous motivation for reading. Reading out of pleasure and mere interest in the topic itself constitutes the most autonomous form of reading motivation. Yet, even when students do not particularly like to read, they could be autonomous in case they identify with the value and personal significance of reading (De Naeghe et al., 2012).

The first hypothesis stated that late-elementary school teachers participating in an in-service teacher professional development workshop (i.e., the experimental condition) would enhance their students' autonomous reading motivation toward both academic and recreational reading experiences as compared to teachers in the control group. This hypothesis was corroborated with respect to students' autonomous motivation for leisure-time reading, as students of teachers participating in the professional development workshop reported significant progress from pretest to posttest in terms of their recreational autonomous reading motivation relative to students in the control group. These findings are consistent with previous SDT-based studies in education (e.g., Chatzisarantis & Hagger, 2009; Reeve et al., 2004) and point to the value of investing in teacher professional development focused on an autonomy supportive and structuring motivating style as a promising strategy to enhance fifth-grade students' autonomous motivation in recreational reading experiences. The results should be refined, however, as the differential influence of gender assumed in the

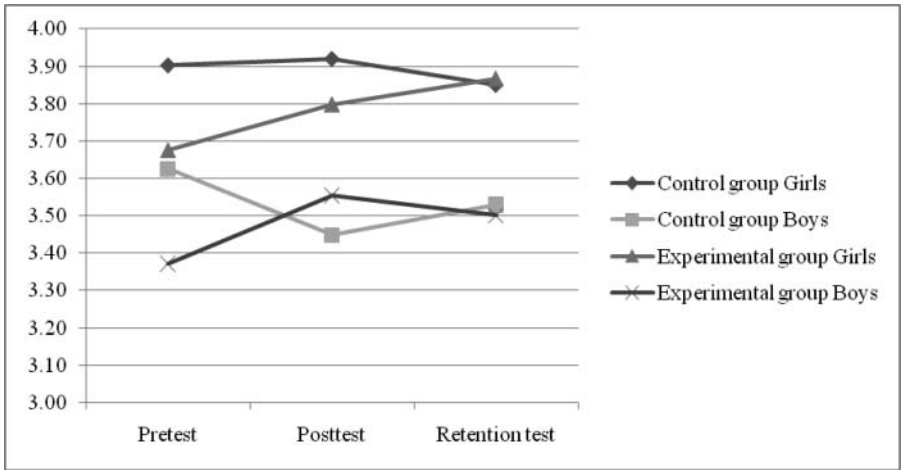

Figure 2. Evolution in average recreational autonomous reading motivation for boys and girls in the experimental group on the one hand and the control group on the other from pretest to retention test.

second research question was corroborated as well. Boys in the experimental group in particular reported significantly more progress from pretest to posttest on recreational autonomous reading motivation as compared to boys in the control group. Girls in the experimental group, on the other hand, remained rather stable from pretest to posttest. These findings imply that boys in particular benefitted from their teachers' professional development to implement a more autonomy-supportive and structuring motivating style. The results confirm the relevance of implementing an SDT-based teacher professional development workshop in the domain of reading motivation, particularly for boys in late-elementary school.

With respect to the observed gender differences, it can be expected that teachers were encouraged by the teacher workshop to identify and nurture their students' interests. As girls mainly prefer narrative literature and boys have more varied reading interests (e.g., comics, newspapers, science books, science fiction; Brozo, 2002; Gambell & Hunter, 2000; Simpson, 1996; Senn, 2012), it is possible that especially girls' preferences were previously reflected in the classroom library. Further research is necessary to examine whether the teacher professional development workshop supported teachers in their efforts to invest in collecting more varied reading material in order to reflect all of their students' interests and, consequently, made reading more attractive to boys in particular. It is also possible, however, that boys' lower initial status increased the likelihood that they would experience a greater influence as a result of the implementation of a more autonomy-supportive and structuring motivating style. In this respect, more detailed observational studies or interviews with teachers and students could seek to clarify what exactly caused the differential influence of the teacher professional development workshop on boys and girls, respectively, and whether teachers actually followed the strategies discussed in the workshop. Notwithstanding the urgent need for more in-depth research on teachers' actual behavior during reading activities and on available reading materials in Flemish elementary schools, it is certainly encouraging that boys benefitted from their teachers' professional development in the short term, since boys appear to be more at-risk when it comes to developing autonomous motivations for reading (De Naeghel et al., 2012; Baker & Wigfield, 1999; Swalander & Taube, 2007; Wigfield & Guthrie, 1997).

Despite these promising findings, a number of observations help to put the current results in perspective. First, the observed effect size of the teacher professional development workshop was rather small, .26 *SD*. In addition, notwithstanding the fact that classes were randomly assigned to either the experimental or control condition, boys in the experimental and control condition did not obtain equal pretest scores on autonomous reading motivation in leisure-time reading. It can be argued that boys in the experimental condition had more room for improvement on recreational autonomous reading motivation by starting lower, implying that the pretest differences favored the experimental group. It could also be more difficult for students who are more averse readers, however, to enhance their initial autonomous motivation for reading. Further research that avoids this kind of internal validity problem is therefore necessary to verify the results of the present study.

Second, the influence of the teacher professional development workshop was limited to boys' autonomous reading motivation in leisure-time reading. This is an interesting finding as participating teachers implemented a more autonomy-supportive and structuring motivation style during their in-school reading activities. It is possible that the recreational context in particular is characterized by increased opportunities to express their autonomous reading behavior, whereas the academic setting has greater expectations to which students must aspire. For this reason, the influence of the teachers' autonomy-supportive and structuring motivating style may more easily manifest in the recreational context.

Third, no indication of statistically significant differences between conditions was detected within the change from posttest to retention test. Although teachers in the experimental group received a take-home informational booklet and weekly electronic reminders as a form of follow-up and encouragement, no long-term influence of the teacher professional development workshop was observed. Apparently, teachers in the experimental group need more sustained and intensive professional development, including further follow-up and encouragement, to maintain the adopted autonomy-supportive and structuring motivation style. Such sustained and intensive follow-up is not only considered an important component of effective autonomy-supportive professional development (Su & Reeve, 2011), but is also more likely to lead up to behavioral changes in teachers' classroom practice (e.g., Garet, Porter, Desimone, Birman, & Yoon, 2001). In addition, the specific focus on the teaching dimensions of autonomy support and structure during the workshop without taken involvement explicitly into account, may have contributed to the lack of a long-term influence. The workshop could be enriched by including involvement and, hence, providing more explicit support to students' need for relatedness with teachers and peers during reading activities, for instance by stimulating collaborative learning, peer discussions regarding texts or books, etc. (Connell & Wellborn, 1991; Deci & Ryan, 2000). In sum, additional long-term research is needed to improve the implemented teacher professional development workshop and to ensure that the positive influence of the workshop is replicable and can help to develop elementary school students who are autonomously motivated and engaged readers for life.

Although the abovementioned observations should be kept in mind when interpreting our results, the influence of the teacher professional development workshop remains certainly noteworthy. The limited effect size needs to be evaluated in light of the intensity of the intervention. The professional development workshop in the present study was fairly brief (i.e., one day) and, as noted, the follow-up activities were limited. Yet, boys appeared to benefit in terms of increased autonomous motivation for recreational reading experiences. The positive influence of the teacher professional development on recreational autonomous reading motivation is encouraging and certainly beneficial, as autonomous reading motivation in the recreational context in particular has been found to relate to more desirable reading outcomes, such as a higher leisure-time reading

frequency, increased reading engagement, and better reading comprehension (De Naeghel et al., 2012).

Implications of the present study

The positive influence of an autonomy-supportive and structuring teacher professional development workshop on boys' progress in recreational autonomous reading motivation from pretest to posttest is of theoretical and empirical significance, as its influence has rarely been studied in late-elementary education or in the domain of research on reading motivation. The findings of the present study thus add value to the SDT framework. In addition, the positive influence of the SDT-based teacher workshop is of particular importance for teaching practice and, accordingly, for teachers' professional development in both preservice and in-service professional development. By adopting an autonomy-supportive and structuring motivating style, teachers can promote boys' autonomous motivation for recreational reading and, consequently, provide them with the reading competencies necessary to be successful in modern society. Further, the strategies proposed to support students' needs for autonomy and competence are valuable as tools for reflection on and improvement of teachers' current reading promotion practices. In this way teachers can make the reading activities in class more autonomy supportive (e.g., giving students' age-appropriate choices, providing time for independent reading, stating the relevance of reading for daily life) and structured (e.g., clearly communicating expectations, giving positive feedback, providing optimal reading challenges), without having to make time-consuming changes to the reading curriculum.

Limitations and further research

Some limitations of the present study should be acknowledged. First, only limited treatment fidelity data were collected, as the sample size in the present study made doing so difficult. Although teachers included in the experimental group completed a structured journal in which they reported on their autonomy-supportive and structuring instructional behavior and reading activities, a comment can be made on the fact that data on the quality of implementation were not collected more systematically and that no comparable structured journals were completed by teachers included in the control group. Future researchers should seek to collect more in-depth information on the quality of the implementation of the in-service teacher workshop and thus seek to grasp how teachers' opinion and actual instructional behavior changed in response to the teacher workshop. Moreover, the lack of information on the control group's reading activities is acknowledged as a limitation of the present study. Future researchers should aim to gather more detailed information on the duration and characteristics of the control group's spontaneous reading activities. A detailed comparison of reading activities in both conditions could exclude that differences in time spent reading confounded our findings and thus would strengthen our argument for the significance of teachers' motivating style. To collect more information on both conditions the use of a structured checklist by a double-blind observer could be valuable.

Second, the present study focused on the motivational impact of the implemented teacher professional development workshop and its differential impact on boys and girls. Future researchers should elaborate on the differential impact of the teacher professional development regarding different subgroups of students. In this respect, for instance, subgroups of students with different motivational profiles could be distinguished based on cluster analysis (e.g., Sierens et al., 2009). Further, it would be interesting to explore whether the positive influence of a teacher professional development workshop on students' recreational autonomous reading motivation leads to more beneficial outcomes such as increased reading behavior (e.g., leisure-time reading frequency and reading engagement) and reading performance (e.g., reading comprehension) in the longer term—as can be expected based on the associations indicated in prior research (De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012). In addition, follow-up research could supplement the SRQ-Reading Motivation with qualitative measures (e.g., interviews and observer ratings of parents and teachers, student reading diaries) to tackle the issue of social desirability related to the administration of self-reports.

Third, the in-service teacher professional development workshop considered here focused explicitly on fifth-grade teachers and their students. Although the ages of ten and eleven are an important period in children's development during which educators should attempt to tackle the declining trend in reading motivation, it would be interesting to involve more members of the school team and different grades in future studies. This would enable more structural and organizational changes within schools, aiming at establishing a motivational reading climate throughout children's educational careers. From this perspective, previous research (e.g., De Naeghel & Van Keer, 2013) has indicated that reading coaches in particular can play a significant role in autonomously motivating students to read.

Conclusion

Encouraging students' willingness to read (i.e., autonomous motivation) is an important challenge given its significant influence on students' future reading behavior and performance (De Naeghel et al., 2012; Taboada, Tonks, Wigfield, & Guthrie, 2009; Wigfield & Guthrie, 1997). In this respect, the present study has indicated that a teacher professional development workshop focused on an autonomy-supportive and structuring motivating style toward school reading activities is a promising strategy for the promotion of fifth-grade boys' recreational autonomous reading motivation, at least in the short term. As boys in particular reported lower autonomous motivation for reading in the present study as well as in previous research (Baker & Wigfield, 1999; De Naeghel et al., 2012; Swalander & Taube, 2007; Wigfield & Guthrie, 1997), their reported progress is certainly encouraging. The results of the present study are of theoretical and empirical significance, especially to the SDT literature. In addition, the adopted autonomy-supportive and structuring instructional behavior can be applied by teachers and instructors to enhance the promotion of late-elementary school students' autonomous reading motivation in classroom practice.

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Note

1. In Belgium, being grant eligible indicates that a student is of lower socioeconomic status, comparable to the indication of receiving a free school meal in the United States.

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Appendix A Outline of the professional development workshop

	Objective	Content and didactical approach	Media
Preparation	Reflecting on teachers' own instructional behavior during reading lessons.	Teachers receive a preparatory assignment by email. We kindly ask you to bring the following three things to the professional development workshop: – your favorite reading material for fifth graders – an example of a book report handed in by one of your students – a picture or object related to your classroom reading-promotion activities	
1. Introduction	Explaining why the encouragement of students' reading motivation is needed.	Explaining the rationale of the session (i.e., enhancing students' willingness and autonomous motivation to read): – Illustrating that reading pleasure in Flemish (Belgian) students is limited based on recent newspaper reports. – Emphasizing the need to encourage students' reading motivation, as it contributes to reading engagement and reading comprehension. Instructor explicitly points to the significance of teachers' expertise from daily teaching practice during the session. Clarifying the structure of the session: (1) Discussion of theoretical background (2) Overview and application of motivating strategies (3) Application exercise (4) Conclusion and evaluation	PowerPoint presentation Slides 1-6
	Sharing interests and experiences with respect to reading-promotion activities.	Teachers introduce themselves. - What is your name? In which school do you teach? - How do you promote reading in your classroom? (cf. preparatory assignment) - What is your favorite reading material for fifth grade? (cf. preparatory assignment) We share our interest in reading and reading promotion.	
2. Discussion of the theoretical background	Being able to define reading motivation, thereby distinguishing autonomous and controlled reading motivation.	Defining reading motivation (i.e., Why do we read?) - Teachers discuss with their neighbor possible motives/reasons to read Why do you read? Why do your students read? Teachers note these reasons on post-its and hang these up on the board. - Teachers discuss with their neighbor how to classify all reasons/motives on the board into different categories and share their ideas with the whole group. The instructor reorganizes the post-its on the board according to teachers' ideas. Categories are labeled as follows: external pressure and internal pressure (i.e., controlled reading motivation) and personal significance and pleasure (i.e., autonomous reading motivation). Each category is discussed in detail and illustrated with quotes from teachers and students (based on previous studies and interviews).	Slides 7-12 Post-it notes + markers + board Slides 13-14 Slide 15 Slide 16-20

	Being able to explain the importance of autonomous reading motivation and how to encourage autonomous reading motivation.	Whole group discussion on fifth-grade students' autonomous and controlled reading motivation and illustration with results of prior research on students' autonomous reading motivation. Clarifying the importance of autonomous reading motivation - Autonomous reading motivation contributes to more reading engagement, higher reading frequency, and better reading comprehension as compared to controlled reading motivation - Focus on the encouragement of autonomous reading motivation Explaining how to encourage autonomous reading motivation - Significance of autonomy-supportive and structuring motivating style - Illustration with quotes from primary school teachers and reading experts (based on prior research).	
3. Overview and application of motivating strategies	Being able to apply autonomy-supportive and structuring strategies during reading activities.	Illustrating autonomy-supportive and structuring strategies – Teachers reflect, in pairs, on possible examples of autonomy-supportive and structuring strategies in their own reading practice. Teachers note these strategies on post-its and hang these up on the board (examples of autonomy support on the left side and structure on the right side). Teachers clarify their examples. Providing an overview of autonomy-supportive and structuring strategies, according to the literature and connecting these strategies to those generated by the teachers themselves.	Slides 21-22 Post-it notes + markers + board
		Autonomy support Identifying interests 1. Time listening to students 2. Time student talking 3. Asking what students want 4. Taking students' perspective	Slides 23-55
		Nurturing interests 5. Time allowing students to work in own way or read independently 6. Providing choices	
		Building new interests 7. Providing rationales	
		Supporting competence (structure) Classroom management 8. Clearly communicating expectations 9. Responding consistently en predictably	
		Learning process 10. Providing step-by-step directions 11. Giving positive feedback 12. Providing encouragement and offering hints 13. Offering instrumental help and support 14. Providing optimal challenges	

(*Continued*)

Appendix A *(Continued)*

Objective	Content and didactical approach	Media
	Exemplifying and discussing these strategies, for instance: - Time allowing students to work in own way: schedule time for independent reading, group tasks to discuss self-chosen texts, keeping reading diaries, etc. - Providing optimal challenges: "Every Friday I read aloud. If I finish the book, we do something with it. Last time we visualized the village out of book by building a scale-model. …" (quote of Mr. T fifth-grade teacher based on prior case study research) Relating autonomy-supportive and structuring strategies to teachers' examples on the post-it notes Distributing the take-home informational booklets	
	Assignment in small groups - Teachers choose and discuss one of the four assignments (1) Students' book reports Have a look at the book reports brought by the participating teachers (cf. preparatory assignment). How do these book reports facilitate/undermine students' needs for autonomy and competence? Which opportunities do you see to further strengthen autonomy support and structure? Formulate concrete hints and point to pitfalls. (2) Mr. T's classroom Read the case "Mr. T's classroom". How does Mr. T facilitate/undermine students' needs for autonomy and competence? Which opportunities do you see to further strengthen autonomy support and structure? Formulate concrete hints and point to pitfalls. (3) A reading culture at school: school library and parents Read the case "A reading culture at school". How does the school library facilitate/undermine students' needs for autonomy and competence? Which opportunities do you see to further strengthen autonomy support and structure? The school leader points to the importance of involving parents in reading promotion. Formulate concrete hints. (4) A reading culture at school: 'Jonah Sprout' and his reading boat Read the case "A reading culture at school". How does this school project facilitate/undermine students' needs for autonomy and competence? Which opportunities do you see to further strengthen autonomy support and structure? Formulate concrete hints. – Teachers share their viewpoints.	Booklets Slides 56-59 Assignments and cases

4. Application exercise	Be able to apply autonomy-supportive and structuring strategies during reading activities.	Assignment in small groups - Develop a motivating reading activity for your students of fifth grade, which you like to try out in your daily practice! (e.g., a quest in the library, reading circle with original and challenging tasks) - Integrate autonomy-supportive and structuring motivating strategies. - Present your activity to the larger group by means of micro-teaching. - Give each other constructive feedback. Hint: The reading material (i.e., narrative and informative books, journals, and comics, literature on reading promotion) on the book table can inspire you!	Narrative and informative books, journals, and comics Literature on reading promotion
Conclusion and evaluation		Overview of autonomy-supportive and structuring strategies	Slides 61-63
		Explaining the purpose of the structured journals and the electronic reminders Evaluation of the professional development workshop	Slides 64-65 Structured journals
		Activity Feeling States Scale and Implementation Questionnaire Autonomy-Support and Structure Oral and written feedback	Slide 66 Questionnaires

Appendix B Example of a structured journal

Week 1: 19th–23rd September, 2011

Points of interest

Autonomy support
- Indicate a score on 10 1—2—3—4—5—6—⑦—8—9—10
- Note your points of interest selecting the appropriate numbers from the scheme: 3, 7, and 8

Competence support
- Indicate a score on 10 1—2—3—4—5—⑥—7—8—9—10
- Note your points of interest, selecting the appropriate number(s) from the scheme: 12 and 13

Reading activity report

Date	Activity	Duration
20 September	Reading the newspaper in small groups	50 minutes
22 September	Students promote a self-chosen book by reading a passage Students model the leading character of their book out of clay	75 minutes
23 September	Teacher reads aloud	30 minutes

Appendix B Schema

Autonomy support	
Identifying interests	1. Time listening 2. Time student talking 3. Asking what students want 4. Taking students' perspective
Nurturing interests	5. Time allowing students to work in own way or read independently 6. Providing choices
Building new interests	7. Providing rationales
Supporting competence (structure)	
Classroom management	8. Clearly communicating expectations 9. Responding consistently and predictably
Learning process	10. Providing step-by-step directions 11. Giving positive feedback 12. Providing encouragement and offering hints 13. Offering instrumental help and support 14. Providing optimal challenges

Sources: Jang et al., 2010; Reeve & Jang, 2006; Skinner & Belmont, 1993; Vansteenkiste et al., 2007