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Beyond Gold Stars: Improving the Skills and Engagement of Struggling Readers through Intrinsic Motivation

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ABSTRACT

The current pilot study assessed the impact of a motivational intervention on the task-avoidant behaviors, task-engagement behaviors, and skill growth of elementary-age readers attending a remedial summer reading program. We randomly assigned students (ages 7–10) either to an experimental condition ($n = 24$) that integrated strategies emphasizing autonomy and mastery into 2 specialized reading curricula or to a control condition ($n = 23$) that coupled the same curricula with material rewards. Analysis of pre- and posttesting revealed that relative to the control group the intervention group made significantly greater gains on measures of high-level reading skills and exhibited significantly more task-engagement behaviors. We discuss implications for future research and education, especially in relation to the relevance of such interventions for preventing stagnation in struggling readers' skill development.

As early as elementary school, students who struggle in reading have been found to be more task avoidant than their typically reading peers (Sideridis, Morgan, Botsas, Padelidiu, & Fuchs, 2006). Partially as a result of their avoidant behaviors, struggling readers acquire literacy skills at a slow rate, which triggers further task evasion and contributes to the widening gap in their reading abilities (Huang, 2012; Polychroni, Koukoura, & Anagnostou, 2006; Sideridis et al., 2006; Stanovich, 1986; Tabassam & Grainger, 2002). Few investigations have explored the impact of instruction designed explicitly for the purpose of fostering motivation for reading (Guthrie, McRae, & Klauda, 2007; Kim et al., 2016), and only one known study has specifically targeted struggling readers in an experimental format (Guthrie et al., 2009). By and large, remedial reading instruction implies that motivation is a byproduct of skill development. Investigations into the most effective method for engaging struggling readers have relied on a mixed bag of approaches, which includes using games (Charlton, Williams, & McLaughlin, 2005), computer programs (Howell, Erickson, Stanger, & Wheaton, 2000), and a combination of these tools in conjunction with extrinsic incentives such as, stickers and prizes (Mendez, Pelzmann, & Frank, 2016).

Many specialists responsible for remediating weaknesses in reading (e.g., special educators, reading specialists, and reading coaches) rely on extrinsic incentives as a primary motivational tool because they are tangible and relatively easy to implement (Fawson & Moore, 1999; Gambrell, 1996; Strickland, Ganske, & Monroe, 2002). Furthermore, many of the incentives are effective as short-term solutions to assuaging some of the emotional and behavioral sequelae associated with reading disabilities—namely, the demonstration of avoidance behaviors and negative attitudes toward reading activities (e.g., Harter, Whitesell, & Junkin, 1998; Polychroni et al., 2006; Tabassam & Grainger, 2002; Zeleke, 2004). The current exploration embedded practical strategies based in the theoretical underpinnings of self-determination theory (SDT) into specialized reading instruction to foster student engagement through intrinsic motivation.

Academic engagement and motivation

In light of the link between reading frequency and reading achievement (Onatsu-Arvilommi & Nurmi, 2000; Pfof, Dörfler, & Artelt, 2013; Stanovich, 1986), it is important to consider students' engagement, which can be described as (a) self-directed behavior, including behaviors like independent task initiation and task completion; (b) exertion of effort, including persistence; and (c) making meaning out of classroom experiences (Connell & Wellborn, 1991; Hughes & Kwok, 2006; Reeve, Jang, Carrell, Jeon, & Barch, 2004). SDT is a prominent theory of motivation that seeks to understand students' academic engagement and avoidance by distinguishing between action that is internally motivated and that which is externally coerced (Deci & Ryan, 1985; Ryan & Deci, 2000).

SDT

SDT conceptualizes behavior as falling along a continuum. On one end of the continuum, behavior is extrinsically motivated and performed in order to achieve external rewards (e.g., prizes, grades, or praise) or to avoid consequences. The importance or meaningfulness of such behavior is not internalized. Intrinsically motivated behavior, on the opposite end, is guided by personal investment, interest, and the internalization of standards.

In general, intrinsic motivation has been found to be significantly positively associated with psychological benefits (Deci & Ryan, 1985; Ryan & Deci, 2000) and academic outcomes, such as grades and standardized test scores (Lepper, Corpus, & Iyengar, 2005; Taylor et al., 2014). Intrinsically motivated learners demonstrate high levels of independence and efficiency and possess the metacognitive abilities and motivational beliefs to understand, monitor, and direct their own learning (Bereby-Meyer & Kaplan, 2005; Gillet, Vallerand, & Lafrenière, 2012; Guthrie, Wigfield, & VonSecker, 2000; Niemiec & Ryan, 2009; Patall, 2013; Patall, Cooper, & Wynn, 2010; Reeve, 2012; Zimmerman, 2002).

Midway through elementary school, however, moderate declines in intrinsic motivation have been documented, particularly for struggling readers (Gottfried, Fleming, & Gottfried, 2001; Unrau & Schlackman, 2006). Significant research has examined whether the use of extrinsic incentives plays a role in undermining students' intrinsic motivation (e.g., Cameron & Pierce, 1994; Corpus, McClintic-Gilbert, & Hayenga, 2009; Deci et al., 1999; Lepper et al., 2005). Although early findings yielded mixed results (Cameron & Pierce, 1994; Deci et al., 1999), more recent findings support positive correlations between intrinsic motivation and academic performance and negative correlations between extrinsic motivation and achievement (Corpus et al., 2009; Lepper et al., 2005; Patall et al., 2010; Ryan & Deci, 2000, 2011; Tze, Klassen, & Daniels, 2014).

SDT in learning environments

Intrinsic motivation and engagement

Social contexts play a critical role in the development of intrinsic motivation. Specifically, learning environments that support students' needs for autonomy, belonging, competence, and meaning tend to promote intrinsic motivation and increase associated engagement behaviors during academic tasks (Belland, Kim, & Hannafin, 2013; Ryan & Deci, 2000; Turner, Warzon, & Christensen, 2011). Educators who support students' autonomy by offering choice have students who demonstrate a greater personal investment in their work (Ciani, Middleton, Summers, & Sheldon, 2010; Patal, 2013) and increased task engagement (Assor, Kaplan, & Roth, 2002; Jang, Reeve, & Deci, 2010; Reeve & Jang, 2006). Moreover, when students feel a sense of belonging in their classroom and are simultaneously offered a rationale or meaning for engaging in tasks, they report greater satisfaction and an enhanced focus on the process of learning (Patrick, Turner, Meyer, & Midgley, 2003; Turner & Patrick, 2008).

Extrinsic motivation and avoidance

Whereas emotionally responsive and autonomy-supportive educational settings prime feelings of security and are associated with greater learning and persistence among students (Turner et al.,

2002), task avoidance is often associated with environments that rely heavily on extrinsic motivation. Tangible incentives essentially function as a neutral, possibly negative, prime because the presence of rewards can send a message that acceptance is contingent on a particular type of performance. Given their propensity toward evaluative comparisons with their peers (Gurney, 1988; Guthrie & Davis, 2003), struggling readers may be particularly sensitive to social features of a learning environment that are behaviorally contingent. Furthermore, students who perceive a loss of control over their behavior are unlikely to maintain their behavior once the coercive features are removed (Reeve, 2009; Reeve & Jang, 2006), and incentives tend to lose motivational strength over time (Vansteenkiste, Lens, & Deci, 2006).

In summary, classroom environments that offer appropriate challenges and emphasize the importance of developing competence by offering process-based feedback, normalizing mistakes, and/or offering a multitude of opportunities to demonstrate new knowledge are associated with improvements in learning (Elliot & Dweck, 1988; Turner et al., 2002; see Table 1).

Research questions

The current study sought to address struggling readers' predilection for task avoidance by expanding the content of their specialized summer reading instruction to include strategies that support students' need for autonomy, belonging, competence, and meaning (Dweck & Leggett, 1988; Ryan & Deci, 2000; Turner et al., 2011).

A cluster randomized controlled intervention, described below, was utilized in order to measure the impact of the motivational strategies on struggling readers' task-engagement behaviors, task-avoidant behaviors, and overall reading skill development. In particular, the study sought to answer the following questions: Do students who receive evidence-based reading instruction embedded with motivational strategies experience (a) an increase in reading ability compared to controls, (b) an increase in engagement behaviors compared to controls, and (c) a decrease in task avoidance classroom behaviors compared to controls?

Methods

Participants

Sample characteristics

Participants consisted of 47 students (26 females) between 7 and 10 years old ($M = 8.16$, $SD = 0.81$) from the following racial backgrounds: White or Caucasian (not Hispanic), 84%; African American or Black, 8%; and Hispanic or Latino, 8%. All of the students were considered by their parents to be struggling with reading. Additional characteristics, including clinical diagnoses, can be found in Table 2.

Table 1. Classroom elements that support intrinsic motivation.

Construct	Instructional goal	Instructional strategies
Autonomy	<ul style="list-style-type: none"> Support choice in practicing and demonstrating knowledge, and share decision-making power. 	Academic choice
Belonging	<ul style="list-style-type: none"> Develop a supportive learning community in which individuals feel valued and supported. Emphasize the sharing of ideas and the pursuit of common goals. 	Class constitution; Peer compliments
Competence	<ul style="list-style-type: none"> Utilize challenge as a tool for improving ability. Offer a structured and systematic platform for engaging in challenges, reflecting on the process, and coping with failure. Use process-based feedback to reinforce the importance of specific achievement behaviors, such as strategy use, effort, and reflection. 	Supersets; Noticing and naming
Meaning	<ul style="list-style-type: none"> Communicate the value of instructional concepts to students' larger personal interests and aspirations. 	Hopes and dreams

Table 2. Participant demographic characteristics by group.

Characteristic	Intervention group ($n = 24$)	Control group ($n = 23$)	χ^2	p
Mean age (years)	8.42 \pm 0.83	7.96 \pm 0.93		
Mean grade	2.71 \pm 1.0	1.83 \pm 0.98		
Gender				
Male	10	11		
Female	14	12		
Diagnosis				
Anxiety	1	1	0.001	.975
ADHD	3	5	0.710	.400
Dyslexia	13	8	1.79	.181
Communication	3	4	0.222	.638
Nonverbal	0	2	2.18	.140
PDD	2	2	0.002	.965

Note. ADHD = attention-deficit/hyperactivity disorder; PDD = Pervasive Developmental Disorder.

Sample recruitment

Participants were recruited from an independent tuition-based summer reading program that is designed for struggling readers, and financial stipends were available for families who demonstrated need. Upon applying, parents were informed of the intended institutional review board–approved research, and all of the families who enrolled in the summer program agreed to participate in the research.

Teachers

Teacher participants ($n = 8$) consisted of experienced educators with a master's degree in education or a related field and specialized training in their respective reading curriculum (RAVE-O[®] (Reading through Automaticity, Vocabulary, Engagement and Orthography Plus) or Wilson Reading Program[®]). As part of their participation, instructors were compensated \$150 in addition to their salary.

Measures

Data were collected at four time periods: 2 weeks before the program began, during the first and final weeks of the program, and 2 weeks after completion. Students' reading ability was assessed both before and after the program. One half of the measures were randomly double scored to ensure reliability. Classroom observations were simultaneously conducted by two research assistants who were blind to instructional conditions to record the frequency of achievement behaviors during instruction.

Reading ability

Several important aspects of participants' reading ability were measured, including single-word reading and decoding ability, connected-text fluency, and reading comprehension. These measures and interrater reliability data are described here.

Single-word reading and decoding ability. The Woodcock Reading Mastery Tests–Revised Word Identification (WRMT WI) and Word Attack (WRMT WA) subtests (Woodcock, 1987) were administered to assess the students' ability to recognize individual sight words and decode phonetically regular nonwords. Interrater reliability was .97. The Test of Word Reading Efficiency Sight Word Efficiency and Phonemic Decoding Efficiency (TOWRE PDE) subtests (Torgesen, Wagner, & Rashotte, 1999) were administered to assess students' single-word reading and decoding efficiency. Interrater reliability was .92.

Connected-text reading ability and comprehension. The Standardized Reading Inventory–2 (SRI; Newcomer, 1999) was used to measure students' reading accuracy and comprehension with

connected-text passages. Standard scores were calculated separately for students' word reading accuracy and their comprehension abilities. Interrater reliability was .93. The Dynamic Indicators of Basic Early Literacy Skills Oral Reading Fluency subtest (DIBELS ORF; Good, Kaminski, Smith, Laimon, & Dill, 2003) was used to assess the rate and accuracy with which students could read grade-level passages. Interrater reliability was .98.

Classroom observations of behaviors

Observations were conducted by trained research assistants who recorded the frequency of students' adaptive and maladaptive achievement behaviors (including language) in the classroom using a modified version of the Observing Patterns of Adaptive Learning survey (Patrick et al., 1997). The current checklist organizes adaptive classroom achievement behaviors considered engagement and maladaptive achievement behaviors considered avoidance into three commonly used subscales: Self-Directed Behavior, Exertion of Effort, and Meaning (Connell & Wellborn, 1991; Furrer & Skinner, 2003; Hughes & Kwok, 2006; Reeve & Jang, 2006). Data were collected on the frequency with which students demonstrated each behavior in a given lesson (no use of language or behavior = 0, one instance = 1, two instances = 2, three or more instances = 3). Separate subscales scores and a total overall composite were calculated for engagement and avoidance behaviors. Interrater reliability was .90. (See the Appendix for a sample of the observation recording sheet.)

Setting

Participants attended an established, independent 5-week summer program based on a university campus in the northeastern United States. During the half-day program, 2 hrs were dedicated to daily small-group specialized reading instruction, and in between the instructional hours the students participate in an activity break, during which time they can engaged in physical, art, or science activities.

Procedure

Approximately 2 weeks before the start of the program, all participants underwent a preprogram reading assessment administered individually by trained research assistants. Participants' scores on the assessments of reading ability were used to formulate mixed-age instructional groups of similar ability levels that did not exceed six students. Groups were randomly assigned to the intervention condition. In order to account for any instructional confounds, each teacher taught one control group and one intervention group (Morris et al., 2010). Both instructional conditions, experimental and control, were based on positive reinforcement and were designed to elicit positive responses (i.e., satisfaction or pleasure) from the students.

Each group received daily instruction in both the RAVE-O and Wilson Reading Program curricula, proven to improve fluency and phonics skills, respectively (Morris et al., 2010; Stebbins, Stormont, Lembke, Wilson, & Clippard, 2012; Wilson & O'Connor, 1995; Wolf et al., 2009). The Wilson Reading Program is a structured literacy program that provides explicit instruction in the phonetic components of language. Daily 10-part lessons systematically and directly introduce students to individual phonemes and offer guided practice in reading and spelling these phonemes in single words, phrases, and controlled connected-text passages (Wilson & O'Connor, 1995). The RAVE-O program is a multicomponential reading program that addresses the multiple linguistic processes that contribute to fluent reading and comprehension. In addition to focusing on the phonemic and orthographic components of words, RAVE-O lessons also instruct children on semantic, syntactic, morphological, and text comprehension strategies (Wolf, 2010).

All teachers in the control group utilized a token economy, in which daily academic tasks were incentivized in a manner typical of classroom instruction. For example, as part of their participation in the study, teachers put the daily schedule on the board and told each student that if he or she

completed all of the activities, as monitored on a star chart, the student would be able to choose from the prize box at the end of the lesson. Prizes consisted of small toys or attractive stickers.

Motivational strategies

The motivational strategies that were embedded into instruction for the intervention group were based on four principles found to be essential for developing autonomous forms of motivation and learning goals: autonomy, belonging, competence, and meaning. Rather than using one strategy in isolation, a variety of strategies were integrated across instructional activities to address the complexity of student engagement (Ryan & Deci, 2000; Turner et al., 2011). Many of the strategies were derived from the Responsive Classroom[®] curriculum, an evidence-based, whole-classroom instructional approach that focuses on engaging students in academic experiences and fostering a positive learning community. The regular use of Responsive Classroom is associated with greater gains in reading achievement and positive outcomes on measures of behavior and attitude change (Rimm-Kaufman, Fan, Chiu, & You, 2007).

Autonomy strategies. The primary characteristic that differentiates autonomy-supportive teachers from those with a controlling style is the instructional focus on students' choice in the learning process (Flink, Boggiano, & Barrett, 1990; Reeve, Bolt, & Cai, 1999). In the current study, students' choices during learning were addressed through a structured academic choice activity.

Academic choice. Academic choice is a semistructured activity designed to promote autonomous behavior that was developed by Responsive Classroom. During academic choice, the teacher establishes the goal of the lesson and provides students with choices as to how they can demonstrate their knowledge. The students plan out their selection, manage their time, work independently, and engage in a reflection in which they share their learning experience with classmates, which might include sharing the products of their learning with the group or a private self-evaluation. Whatever the form, the emphasis is on helping students make sense of their concrete experiences, and teachers can use guiding questions to help develop their metacognitive thinking, such as "What went well?" and "What can you do next time to make it go even better?" The cycle of planning, working, and reflecting is designed to foster feelings of competence and autonomy that are essential to autonomous motivation and learning goals.

Belonging strategies. Teachers who are particularly good at building learning communities in which individuals feel valued and supported do so by emphasizing the sharing of ideas and the pursuit of a common goal (Johnston, 2004; Lewis & Tsuchida, 1997). Social support, in particular during reading tasks, has been identified as an important contributor to overall engagement (Klauda & Wigfield, 2012). In the current intervention, students' needs for belonging were addressed through several strategies, including (a) creating a class constitution and (b) facilitating peer compliments.

Class constitution. The Responsive Classroom approach teaches students that a constitution is necessary because it considers the voice of all constituents and helps make the classroom a safe place where everyone can learn (Charney, 2002). A constitution aids in the formation of a learning community because everyone contributes and agrees to its importance (via a signing ceremony), and the constitution is developed only after students have articulated their personal learning goals. Thus, rather than being restrictive and imposed from an authority, a constitution is intended to foster greater autonomy, learning, and motivation because it aids participants in achieving their personal objectives.

Peer compliments. In typical classrooms, the initiate–response–evaluate model of questioning (i.e., the teacher inquires, students respond, and the teacher evaluates) establishes a dynamic in which the teacher is the sole source of praise and criticism. However, when students interact on a regular

basis and pursue shared goals with guidance from the class constitution, they are able to appropriately respond to one another's academic and emotional needs. Encouraging students to deliver compliments to one another, rather than simply relying on the teacher for feedback and praise, has the potential to further strengthen the perception of the classroom as a learning community.

Competence strategies. The competence strategies used in this intervention were created to complement the RAVE-O and Wilson curricula and to extend existing techniques by offering a platform for engaging in challenges and coping with failure. Students' reactions to failure are a critical determinant of their goal orientation and subsequent achievement behaviors (Dweck, 2000; Dweck & Leggett, 1988).

In order to transform students' understanding of healthy learning tasks, several strategies were used, including (a) utilizing supersets, which offered a concrete metaphor for the importance of challenging oneself; and (b) noticing and naming behaviors, which offered an approach for delivering feedback that was process, rather than person, based.

Supersets. Superset activities used the metaphor of muscle development to help students understand the role of challenges in developing reading skills. Just as an athlete must regularly increase the weight of his or her dumbbells in order to develop muscles, longitudinal neurological findings posit that the brain is strengthened when an individual is exposed to challenging material (Ramsden et al., 2011). Brain plasticity has been effectively used as an illustrative example of the way in which competency can be developed through challenge (Dweck, 2008).

The superset metaphor and accompanying activities were developed by the authors to serve as brief, highly concrete exercises that engaged students in tasks slightly above their instructional level of reading ability. These exercises involved single-word reading, connected-text reading, and/or dictation. Teachers used superset activities not only to illustrate the importance of challenges in building reading muscles but also to help students think metacognitively about their learning experiences.

Noticing and naming. When the teacher notices and names positive student behaviors, he or she uses process-based feedback, which features behavior instead of traits (e.g., "I noticed how hard you are working to sound out that word") and increases the likelihood of persistence and engagement (Johnston, 2004; Mueller & Dweck, 1998).

Meaning strategies. Reading instruction that may seem prescribed and unrelated to students' interests can be made meaningful when students are supported in discovering how even foundational reading skills can support them in achieving their larger hopes and dreams.

Hopes and dreams. This meaning strategy from Responsive Classroom used during the program encouraged purposeful learning by helping students identify their hopes and dreams (i.e., goals) for themselves as learners. During the first days of the program, teachers and students shared their personal objectives. For example, one teacher stated, "My hope is that the summer reading program is a place you want to be and that you will be able to do important work." Hopes and dreams are reflected on and revised throughout the summer program.

Teacher trainings and fidelity

Efforts to maintain treatment fidelity for both the control and the intervention groups incorporated three levels of support: training, monitoring, and consultation. Head teachers were trained in the control and intervention strategies prior to the start of the program and participated in three weekly training/feedback meetings, during which time they raised questions, offered solutions, and, when necessary, generated alternative strategies. Intervention strategies were phased in over the course of the first 3 weeks of the program, and teachers completed daily lesson checklists to track the frequency with which they used each motivational strategy. Finally, weekly observations of both the intervention

and control conditions informed feedback and ongoing consultations with the teacher. A similar fidelity procedure was implemented in a comparable intensive summer reading program with success (Christodoulou et al., 2015).

Analytic technique

The current analyses assessed the impact of motivational strategies on struggling readers' literacy skills and achievement behaviors when they were embedded within an evidence-based reading curriculum. SPSS Version 22[®] missing data analysis revealed that data were missing at random and due to a small number of skipped items, with no item skipped more than once. Pairwise deletion was used.

To assess whether the groups (intervention and control) were comparable in terms of reading ability at baseline, a one-way between-groups multivariate analysis of variance (MANOVA) was conducted. Age-based standardized scores were used for all analyses, except for the DIBELS, which does not provide standard scores and relies on a raw score of words correct per minute. Preliminary assumption testing was conducted, and the assumption of homogeneity of variance-covariance matrices was not met. Therefore, rather than reporting Wilks's lambda, we report Pillai's trace as a more robust statistic (Tabachnick & Fidell, 2013). Also, the Sight Word Efficiency and Phonemic Decoding Efficiency subtests of the TOWRE were highly correlated ($r = .89, p < .01$); the Sight Word Efficiency subtest was ultimately removed from further analysis, as students' phonemic decoding skills were of greater interest in this study. No other serious violations were noted.

To examine intervention effects across reading outcome measures (TOWRE PDE, WRMT WI, WRMT WA, SRI PC (Passage Comprehension), DIBELS ORF), a multivariate analysis of covariance (MANCOVA) was conducted on the five posttest scores with the pretest scores as the covariates. The MANOVA analysis at baseline and the MANCOVA analysis at Time 2 were selected because the dependent variables were statistically and conceptually related, and compared to univariate analysis (i.e., *T* tests) multivariate analysis limits the inflation of Type I error rates (French, Macedo, Poulsen, Waterson, & Yu, 2008). Given the relatively small sample size, associated low statistical power, and overall high probability of Type II error, whenever possible findings were evaluated in regard to their magnitude of observed effect (see Table 3).

Engagement and avoidance behaviors were analyzed both between and within groups. Tests of normality revealed that neither students' engagement behaviors nor their avoidance behaviors were normally distributed; rather, distributions were positively skewed. Nonparametric tests were used in favor of logarithmic transformation due to the fact that the behavioral data contained multiple zeros (i.e., some students were observed to exhibit zero instances of a particular behavior). Although nonparametric tests are considered less powerful than equivalent parametric approaches, Sheskin

Table 3. Pretest and posttest reading scores by group.

Measure	Time	Intervention group (<i>n</i> = 24)	Control group (<i>n</i> = 23)	<i>F</i>	<i>p</i>	η_p^2
		<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>			
TOWRE PDE	Time 1	89.13 ± 14.28	87.48 ± 21.48	1.19	.280	.026
	Time 2	84.78 ± 22.14	89.39 ± 8.81			
WRMT WI	Time 1	93.33 ± 9.39	98.04 ± 9.34	0.303	.585	.007
	Time 2	90.67 ± 22.66	97.04 ± 10.02			
WRMT WA	Time 1	94.33 ± 10.75	97.04 ± 20.08	0.128	.722	.003
	Time 2	101.75 ± 10.03	101.17 ± 10.99			
SRI PC	Time 1	8.17 ± 2.51	8.00 ± 2.24	5.92	.019	.119
	Time 2	9.54 ± 2.93	8.17 ± 2.31			
DIBELS ORF	Time 1	63.96 ± 34.40	48.78 ± 27.22	4.11	.40	.085
	Time 2	69.17 ± 38.95	47.70 ± 23.65			

Note. TOWRE PDE = Test of Word Reading Efficiency Phonemic Decoding Efficiency; WRMT WI = Woodcock Reading Mastery Tests–Revised Word Identification; WRMT WA = Woodcock Reading Mastery Tests–Revised Word Attack; SRI PC = Standard Reading Inventory, Passage Comprehension; DIBELS ORF = Dynamic Indicators of Basic Early Literacy Skills Oral Reading Fluency.

(2007) noted that in most instances evaluating data with both a parametric test and its nonparametric analog will result in the same conclusions (p. 108).

Results

Pretest: Screening and preprogram comparison of groups

The intervention and control groups did not differ on most demographic characteristics, including age, gender, or diagnosis: age, $t(45) = -1.79$, $p = .08$; gender, $\chi^2(1, N = 47) = 0.18$, $p = .67$ (see Table 2 for complete breakdown of demographic characteristics by group). The two groups did, however, differ significantly from each other in terms of grade, $t(45) = -3.05$, $p < .01$. A MANOVA revealed that reading skills did not differ between the groups at pretest, Pillai's trace = .208, $F(5, 41) = 2.15$, $p = .08$. On average, the groups performed within normal limits for their age and grade. Mann-Whitney tests indicated that the two groups did not differ at pretest with regard to the frequency of either engagement or avoidance behaviors (see Table 3).

Group comparison: Program effects

Descriptive statistics and MANCOVA results for each posttest reading score, adjusting for pretest scores, were conducted (see Table 3). There was a significant difference between groups, Pillai's trace = .239, $F(5, 40) = 2.51$, $p < .05$, $\eta_p^2 = .239$ (a large effect size according to Cohen's, 1988, guidelines). Univariate analyses were conducted on each dependent measure separately to determine the locus of the statistically significant multivariate group effect. Posttest scores were significantly higher for the intervention group than the control group on SRI PC and DIBELS ORF, with medium effect sizes. There were no significant group differences on posttest TOWRE PDE scores, WRMT WI scores, or WRMT WA scores.

A Mann-Whitney test indicated that engagement behaviors at the end of the program were greater for the intervention group ($Mdn = 9.50$) than for the control group ($Mdn = 4.00$), $U = 143.00$, $p < .01$. The groups did not differ significantly in their frequency of postprogram avoidance behaviors (see Table 4). A Wilcoxon signed-ranks test revealed a statistically significant reduction in intervention participants' preprogram avoidance behaviors ($Mdn = 8.00$) compared to their postprogram avoidance behaviors ($Mdn = 5.00$), $z = -2.55$, $p < .05$, with a large effect size ($r = .37$). Control participants, in contrast, engaged in an equal number of avoidance behaviors from before the program ($Mdn = 5.00$) to after the program ($Mdn = 5.00$). Another Wilcoxon signed-ranks test revealed a statistically significant increase from intervention participants' preprogram engagement behaviors ($Mdn = 6.00$) to their postprogram engagement behaviors ($Mdn = 9.50$), $z = -3.62$, $p < .001$, with a large effect size ($r = .52$). Again, control participants did not exhibit a difference in their engagement behaviors from before the program ($Mdn = 4.00$) to after the program ($Mdn = 4.00$).

Discussion

The current study used a cluster randomized controlled design to determine the impact of a classroom intervention aimed at increasing engagement behaviors and literacy abilities among struggling readers. Although intervention and control groups demonstrated similar reading

Table 4. Mean numbers of positive and negative achievement behaviors by group.

Measure	Time	Mean rank		U	z	p
		Intervention group ($n = 24$)	Control group ($n = 23$)			
Engagement behavior	Time 1	26.75	21.13	210.00	-1.42	.157
	Time 2	29.54	18.22	143.00	-2.84	.004
Avoidance behavior	Time 1	26.35	21.54	219.50	-1.21	.228
	Time 2	22.42	25.65	238.00	-0.814	.416

achievement profiles and behaviors at pretest, group differences in reading outcomes were observed on measures of high-level skills, such as fluent reading and comprehension of text, with students who received the intervention showing relative gains at posttest and students in the control group exhibiting relative stagnation. Students who received the motivational strategies also significantly increased their frequency of engagement behaviors and significantly decreased their frequency of avoidance behaviors.

These findings are notable for several reasons. Although previous literature has highlighted the importance of supporting students' autonomous self-regulation and intrinsic motivation (Assor et al., 2002; Reeve, 2009; Reeve & Jang, 2006; Ryan & Deci, 2000), the current research expands these findings by identifying specific and practical strategies that teachers can utilize to motivate struggling readers—a historically difficult population to support.

Next, simply by the nature of incorporating additional motivational strategies, students in the intervention group spent less time receiving explicit literacy instruction; however, their growth in abilities was significantly greater than that of their peers in the control group, who presumably progressed further into the reading curriculum. It may be that the instructional climates created by the motivational intervention facilitated a greater internalization of reading skills, and as a result these students were better able to independently apply reading strategies during their assessments. Alternatively, as a result of their internalization of reading strategies, students in the intervention group may have spent more time reading outside of the program than their control peers.

Instructional characteristics that support engagement

Rather than using one motivational strategy in isolation, teachers in the intervention group were trained to draw on nine instructional activities that supported students' needs for autonomy, belonging, competence, and meaning. The intervention group emphasized the process of learning (supersets, and noticing and naming) as equivalent in importance to the products of knowledge. Teachers purposefully supported the development of a community of learners with shared goals and mutual respect (e.g., peer compliments, class constitution), and opportunities for autonomy (academic choice) and meaning making (hopes and dreams) validated students' learning preferences and personal interests.

The presence of incentives

Decreasing avoidance behaviors such as off-task behavior and incessant help seeking, which hinder students' acquisition of reading skills, was one goal of the intervention. At the end of the program, the intervention group decreased their frequency of negative achievement behaviors, whereas no change in the frequency of these behaviors was observed among the control group, which may be related to the diminishing impact of coercive tactics, like incentives, over time (Vansteenkiste et al., 2006).

Limitations

The current study has several limitations that need to be noted. Primary among them is the small sample size; thus, it is possible that significant behavioral changes found in the intervention group may have resulted from sampling error or regression to the mean (Hsu, 1989). Moreover, the behavioral data were not normally distributed, and nonparametric tests were used in favor of logarithmic transformation. Although evaluating data with both a parametric test and its nonparametric analog will often result in researchers making the same conclusions, the use of nonparametric tests did not allow for an investigation into a potential interaction effect of time and treatment group on students' positive and negative achievement behaviors. The use of standardized tests as outcome measures after a brief intervention can also be problematic because the assessments are not sensitive to small changes in raw scores.

Finally, the current sample of teachers derived from a self-selected group of educators with master's degrees, and the sample of students consisted entirely of struggling readers from families who were able to afford a tuition-based program. These factors limit the generalizability of the findings to typical readers and populations of low socioeconomic status as well as to educators without higher education.

Implications for research and practice

This study is the only known examination of how motivational strategies can be embedded within specialized reading curricula, and findings from the research lay the groundwork for future research and instructional practice. For instance, future studies could be conducted in a full-year school context in order to assess students' motivation and reading ability at multiple time points and test the mechanisms of change. Furthermore, teachers received training in these motivational strategies during a full-day workshop and four follow-up meetings, which shows that such programs are realistic and can be successfully implemented within a short period of time, in particular during extended school year programs when struggling students are prone to skill regression.

Conclusion

This study was conducted in an effort to shed light on the instructional strategies that elicit adaptive and autonomous forms of engagement among struggling readers. Behavioral and observational findings suggest that over a relatively short period of time (i.e., 40 hr of instruction over the course of 5 weeks), students who received a motivational intervention demonstrated increased task engagement and skill building compared to their peers who received the same reading programs coupled with incentives. Findings from the study have many practical implications for those who rely heavily on incentives; namely, they provide a rationale and means for an alternative approach that ensures that all students are given the cognitive and noncognitive tools necessary to meet their potential.

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Appendix A

Observation Checklist of Class Achievement Behaviors During Literacy Instruction

	Once	Twice	More than 2x
	1	2	3
SELF-DIRECTED BEHAVIORS			
Maladaptive achievement behaviors			
Passive off-task behavior (e.g., stalling off into space)			
Active off-task behavior (e.g., talking or acting in a way that does not relate to the task).			
Incessantly asks for help.			
Subtotal:			
Engagement			
Independently initiates a task.			
Persists at a task independently.			
Completes a task independently.			
Subtotal:			
MEANING			
Maladaptive achievement behaviors			
Questions the purpose of the task.			
Makes derogatory comments about a lesson/task/book (i.e., this is stupid).			
Does not attempt to connect activities to existing knowledge, recent learning or goals.			
Subtotal:			
Engagement			
Works to achieve their own goals.			
Connects a task or concept to a previous lesson task/book or greater purpose/meaning <i>without prompting</i> .			
Expresses desire/importance of "learning".			
Subtotal:			
EXERTION OF EFFORT			
Maladaptive achievement behaviors			
Actively avoids challenging tasks.			
Seems overly concerned with proving ability (comparing to others, getting things right).			
Makes comments that reflect feelings of incompetence (i.e., I can't do it).			
Subtotal:			
Engagement			
Shows willingness to at least "try" challenging tasks.			
Makes mistakes and seeks support or strategy in correcting them.			
Makes comments that reflect feelings of improvement and/or competence.			
Subtotal:			
Composite Totals			
Maladaptive achievement behaviors sum:			
Engagement sum:			