Motivational Practices in Reading Interventions for Students With or at Risk for Dyslexia
Literature Synthesis and Meta-Analysis

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The purposes of this study were to (a) describe the extent to which motivational practices are incorporated in foundational reading interventions for students with or at risk for dyslexia in kindergarten through Grade 5 (K–5) and (b) explore whether the presence and type of motivational practices (i.e., supports vs. strategies) within foundational reading interventions influenced the magnitude of the intervention effects on reading outcomes. We analyzed the same set of studies as Hall et al. (2022), who meta-analyzed experimental and quasi-experimental research of reading interventions implemented with K–5 students with or at risk for dyslexia from 1980 to 2020. Results of the current study show that only 44% of the interventions included motivational practices. The majority (84%) of those interventions addressed student motivation and engagement through motivational supports, such as game-like activities, paired work, and setting improvement goals. A much smaller percentage (16%) provided explicit motivational strategy instruction. Results indicated that reading interventions that include direct motivational strategy instruction tend to have larger effects on reading outcomes than both interventions without any motivational practices and those that include motivational supports only. The positive effect of motivational strategy instruction was stronger on measures of word reading than overall reading or reading comprehension outcomes. These findings highlight the need to address motivational challenges of students with reading difficulties and lend insight into how foundational reading skills interventions can be bolstered through incorporating motivational strategy instruction. **Key words:** *dyslexia*, *meta-analysis*, *motivation*, *reading intervention*

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RESEARCH supports a reciprocal relation between motivation and reading development (Hebbecker et al., 2019; Morgan & Fuchs, 2007). Significant challenges with acquiring reading skills and early reading failure impact motivation negatively (Morgan et al., 2008), and the loss of motivation to read

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results in disengagement from reading (less exposure to print and fewer practice opportunities), which further exacerbates reading challenges (e.g., Ladd & Dinella, 2009). Increased engagement in reading (a manifestation of reading motivation; Unrau & Quirk, 2014) and positive reading self-concept (an affective component of reading motivation) have been found to longitudinally predict higher reading achievement (e.g., Guthrie et al., 2001; Quirk et al., 2009). In contrast, once a negative spiral of reading difficulty and low motivation emerges (e.g., Ladd & Dinella, 2009; Quirk et al., 2009), children with early reading difficulties are likely to show continued reading and motivational challenges that can become increasingly intractable. Especially troubling are findings that such a negative feedback loop is more pronounced for students with the most heightened risk for learning disabilities, including dyslexia (Morgan et al., 2008).

Early difficulties in learning to read can contribute to the establishment of maladaptive motivational patterns characterized by poor self-efficacy in reading, lack of intrinsic motivation, and increased avoidance goals and behaviors (Baird et al., 2009; Botsas & Padeliadu, 2003; Hen & Goroshit, 2014; Lackaye & Margalit, 2006; Lau & Chan, 2003; Lee & Zentall, 2012; McGeown et al., 2012; Polychroni et al., 2006). For example, Cho et al. (2015) found that students with reading difficulties who do not respond adequately to reading intervention tend to have lower levels of self-efficacy than typical readers. Such differences in self-efficacy were not present between students with reading difficulties who had a positive prognosis following intervention and typical readers. Coupled with emerging evidence that the role of motivation in predicting reading outcomes tends to be larger in students with reading disability than typical readers (Cho et al., 2022), these findings point to the need to address motivational challenges in reading interventions, especially for students with reading difficulties and disabilities, including dyslexia.

WHAT IS READING MOTIVATION?

Academic motivation is what energizes and determines the direction, intensity, and quality of one's achievement-related behaviors (Ryan & Deci, 2000). Domain-specific reading motivation is often defined as one's desire to read; it impacts reading engagement (reading amount, breadth, persistence; Guthrie & Klauda, 2015) and is influenced by beliefs, values, and goals (Schiefele et al., 2012). There are intrinsic and extrinsic types of reading motivation (Ryan & Deci, 2000; Schiefele et al., 2012). Students who are intrinsically motivated to read find personal enjoyment in reading to learn or for entertainment; reading is an inherently pleasurable activity. Conversely, students who are extrinsically motivated exhibit a desire to read for reasons other than pure enjoyment (i.e., because in doing so they will earn tangible incentives or perform at a higher level than their peers; Stutz et al., 2017).

Development of reading motivation

Extrinsic to intrinsic motivation

Research has consistently demonstrated the benefit of intrinsic motivation for reading achievement and the potential adverse impact of extrinsic motivation on reading (Cho et al., 2022; Hebbecker et al., 2019). Yet, motivation is better understood as a developmental continuum from extrinsic to intrinsic, increasing in degree of learner autonomy. According to Self-Determination Theory (SDT; Deci & Ryan, 1985; Ryan & Deci, 2000), the transition from being externally to internally motivated is described as a process by which a student learns to regulate achievement-related behaviors. Contexts that support individuals' psychological needs in terms of sense of competence, relatedness/belonging, and autonomy promote this process of initiating and regulating behaviors autonomously in ways that lead to intrinsic motivation (Deci & Ryan, 2012).

To illustrate the transition from extrinsic to intrinsic motivation, consider a child

with reading difficulties who lacks motivation to read after prior experiences with reading tasks have not resulted in feelings of success or competence. According to Expectancy Value Theory (EVT; Wigfield & Eccles, 2000), an individual's prior experiences with a task shape both their perception of the task's value and their expectations for success. Thus, this child who previously struggled with reading may see little value in the task of reading and believe further engagement with reading is unlikely to result in success. Together, the child's low perceived value and expectation of failure may result in the child being entirely unmotivated to read (*amotivation*). Nevertheless, the child may still engage in reading primarily to earn rewards, such as screen time or a sticker on a classroom reading chart (*external regulation*). Moreover, with the right selection of text materials and instructional support for this externally regulated behavior, the child may begin to enjoy getting positive attention from others in relation to reading and begin to alter their perception of its value. At this point, the child's reading behaviors continue to be externally controlled by their interactions with others (e.g., a teacher); however, the child has begun to introject others' values about reading (*introjected regulation*). Over time, with continued instructional support, the child may experience repeated successes with reading tasks and become increasingly autonomous in choosing to read. They may come to value reading and see the importance of becoming a better reader as reading becomes increasingly central to their identity (*identified regulation*). Eventually, the child may fully integrate the task of reading with their personal identity as a reader (*integrated regulation*), leading to an intrinsic motivational state when reading (*internal regulation*).

Situational interest to individual interest

Similarly, Interest Theory has identified four phases of an individual's development from situational to individual interest (Hidi & Renninger, 2006). Situational interests are mainly triggered by the context of a given activity (e.g., an activity's game-like presentation, the introduction of surprising information to pique interest in an activity, initially identifying an activity's personal relevance, working in groups on an activity). Once the situational interest is initiated, it can be maintained through engagement with meaningful tasks. Throughout these initial two stages of situational interest development (i.e., *situational interest initiation* and *maintenance*), interest is still primarily regulated by external factors. In contrast to situational interest, individual interest in reading can be understood as a predisposition to be intrinsically motivated to read. In the first phase of individual interest in reading (i.e., *emerging individual interest*), a child will choose to engage in reading even after the situation and tasks that triggered and maintained the situational interest have been terminated. Yet, the child may still need encouragement from others to persist when they encounter challenges in their reading. In the final phase, the child develops a relatively stable predisposition of being interested in reading for its own sake (i.e., *individual interest*). This fully developed phase of individual interest aligns with the intrinsic motivational state of *internal regulation* and is characterized by positive feelings and attitude toward reading, engagement in reading in the absence of external rewards, and persistence when reading tasks are challenging.

Motivation-related processes: Beliefs, values, and goals

These trajectories of motivation and interest development are supported by changes in motivation-related cognitive processes and particularly in an individual's beliefs, values, and goals (Wigfield & Guthrie, 2000).

Beliefs

There are several aspects of reading-related motivational beliefs. First, individuals hold beliefs about the malleability of ability or intelligence, often referred to as implicit theories of intelligence or mindset (Dweck, 2006;

Dweck & Reppucci, 1973). Briefly, an individual with a *growth mindset* believes that human attributes, such as intelligence or being a "good reader," can be developed over time through "personal effort, good learning strategies, and lots of mentoring and support from others" (Dweck & Yeager, 2019, p. 482). In contrast, an individual with a *fixed mindset* believes that human attributes are innate, or predetermined, such that no amount of effort or determination is likely to drastically alter what an individual can achieve (Dweck & Yeager, 2019). Students endorsing a growth mindset are more likely than those with a fixed mindset to identify themselves as readers as they progress from an amotivational state to a state in which they are developing and maintaining intrinsic motivation as evidenced by their engagement with reading (Cho et al., 2019; Haimovitz et al., 2011; Lee et al., 2022). In a similar vein, students who attribute reading outcomes to internal and relatively malleable factors (e.g., effort, strategy use) believe they have personal agency in their reading development (i.e., rather than attributing reading outcomes to uncontrollable factors such as luck or innate ability). Thus, they are more intrinsically motivated.

Motivational beliefs also include competence-related beliefs, including one's perceived competence or self-efficacy, beliefs about one's own ability, and one's expectancies for success (i.e., outcome expectancy). As alluded to earlier, both SDT (Deci & Ryan, 1985; Ryan & Deci, 2000) and EVT (Wigfield & Eccles, 2000) highlight the key role of competence-related beliefs in the development of motivation. According to SDT, a sense of competence is one of three basic human needs (i.e., competency, relatedness, autonomy) and is necessary for an individual to develop intrinsic motivation. Similarly, EVT identifies an individual's expectation of success as one of two critical determinants of motivation. For an individual to move from amotivation to an initial extrinsic motivational state, it is necessary to increase the chance of their reading success and support the individual's development of a positive outlook on their own reading ability.

Values

Task value is the second determinant of motivation identified in EVT. Reading task value can be understood as an individual's perception of the value of reading, including utility value (i.e., reading for its usefulness), attainment value (i.e., reading because it is central to one's identity), and intrinsic value (i.e., reading for its own sake). Although these categories are not mutually exclusive, the reasons for which a learner values a reading task can help shape their motivational pattern for reading. For example, a student who places high utility value on reading is likely to display more extrinsically oriented motivation (i.e., *external* or *introjected regulation*) than a student who sees high attainment value in reading and has integrated reading with their personal identity (i.e., demonstrating *integrated regulation*). Those who find inherent value in reading will be intrinsically motivated to read (i.e., demonstrating *internal regulation*).

Goals

Motivation is goal-directed, and the types of goals one pursues impact motivation. According to Achievement Goal Orientation (AGO) theory (Dweck & Leggett, 1988), individuals have different reasons—or goals—when they engage in achievement-related behaviors. One type of goal focuses on learning a particular skill or body of knowledge and developing one's competence; these are called mastery or learning goals. A second type of goal focuses on the self and demonstrating personal competence; these are called performance goals. Performance goals frequently lead learners to be extrinsically motivated in reading by introjecting regulation (e.g., reading to get others' recognition), whereas mastery goals typically move learners to be more intrinsically motivated (e.g., reading to learn). Achievement goal research has shown that mastery goals are positively associated with reading comprehension via

increased emotional and cognitive engagement, but performance goals can be detrimental to reading comprehension, especially among struggling upper elementary readers (Cho et al., 2019, 2022). One possible explanation for these differential associations is that setting a mastery goal helps students to maintain their attention to the reading task at hand, whereas performance goals can evoke worries and other thoughts irrelevant to reading, drawing cognitive resources away from the reading task and impeding comprehension.

Another goal theory, Goal-Setting Theory, conceptualizes goals in narrower terms than does AGO theory. According to Goal-Setting Theory, a goal is defined as a desired end state that is specific and proximal (Locke & Latham, 2002). Goals are intricately related to the success of self-regulation, which, from the perspective of goal attainment, may be defined as "context-specific process[es] that are used cyclically to achieve personal goals" (Zimmerman, 2000, p. 13). Self-regulation involves three phases: forethought, performance control, and self-reflection. During the forethought phase, a student will set a goal and decide the strategy to use. During the performance control phase, a student will execute the plan and monitor whether they are making progress toward achieving the goal. Finally, during the self-reflection phase, a student will evaluate the effectiveness of the strategy and one's behavior and make adjustments to their plan. Research consistently finds that setting a challenging but specific and achievable goal results in better outcomes than setting more general, vaguely defined, or abstract goals; precise and specific goals tend to motivate people to engage in goal-directed behaviors and persist in using strategies to achieve those goals (Schunk, 2001).

INSTRUCTIONAL PRACTICES THAT SUPPORT MOTIVATION

Motivation is best understood as a context-specific and malleable factor affected by instructional practices rather than as a stable personal trait (Eccles & Wigfield, 2020). Several instructional practices have been found to support students' development of motivation by initiating situational interest in reading and helping unmotivated students become extrinsically motivated. These include designing *game-like activities* (e.g., games such as bingo, word hunt, and fluency games, beating one's prior record on timed activities) or using *extrinsic motivators* (e.g., tangible rewards such as stickers and gold coins, earned preferential activities). Other instructional practices can help students to maintain situational interests and transition to more internally regulated motivational states. For example, providing students with opportunities to engage with a variety of *texts that are aligned with student interest* can not only initiate situational interest but also support students to engage in personally meaningful activities. Moreover, providing a *collaborative work environment* through paired reading or a cooperative learning structure, in which students work together toward achieving a common goal, can increase students' sense of belonging (one of three prerequisite psychological needs for intrinsic motivation development) and perception of the social value of reading (i.e., reading has value because it is an activity one can do together with peers). Peer collaboration can also support positive competence beliefs (i.e., increased self-efficacy) because, when students work in pairs or in small groups, they get frequent opportunities to respond, experience mastery, and vicariously experience reading success by observing successful peers. Autonomy-supportive practices are also critical in the development of intrinsically regulated motivation and, eventually, intrinsic motivation. Simple procedures, such as *providing choices* (e.g., areas to read, texts, partners), have been found to support students' autonomy. Finally, teachers can provide motivational support for students by *setting improvement goals* and providing students with repeated practice opportunities to help them improve reading accuracy and fluency

over time. Such focus on learning and improvement can not only promote students' adoption of learning/mastery goals rather than performance-oriented goals (e.g., goals that encourage competition with peers) but also improve students' self-efficacy in reading by providing mastery experiences. This type of support can foster students' adoption of a growth mindset and constructive attribution of reading success as students witness their reading ability improving with practice. Similarly, teachers can use *growth mindset-facilitating process feedback* or discourse that helps students adopt a more adaptive attribution for their reading difficulties and successes. All these instructional practices can be incorporated into foundational reading skills interventions to ensure instruction is motivating and engaging. We refer to them as *motivational supports*.

It is important to distinguish the provision of motivational supports from instructional practices that specifically and explicitly teach students strategies to regulate their beliefs, values, and goals related to reading. We refer to these instructional practices as *motivational strategy instruction*. Researchers who consider motivation a critical contributor to reading success for students with reading difficulties have evaluated the effects of interventions that embed motivational strategy instruction within reading instruction for these students. These motivational strategy instructional interventions teach students to be more goal-directed by incorporating *goal setting* and having students *monitor progress* toward their goals or monitor their performance (e.g., Miciak et al., 2018), have growth mindset beliefs about reading (Denton et al., 2020), attribute their reading difficulties to effort and strategy use rather than to their reading disability alone (e.g., Berkeley et al., 2011; Morris et al., 2012), and teach students to engage in self-talk to reinforce and internalize their positive thoughts and reading behaviors (Toste et al., 2019).

The distinction between motivational supports and instructional strategies corresponds to the content approach categories defined by McBreen and Savage (2021), such that strategies align with self-regulatory instruction and goal/attribution training approaches whereas motivational supports can be understood as autonomy-supportive and interest-based practices. We believe motivational supports and motivational strategy instruction can serve different functions along the developmental continuum of motivation. Although motivational supports are essential practices to help unmotivated students feel more motivated and engaged in the instruction, they may not be sufficient to help students persist through challenges they encounter when reading. In other words, such supports may fall short of moving students from external to internal regulation of their reading behaviors. Given that many students with reading difficulties may have solidified maladaptive reading motivational patterns, these students may need motivational strategy instruction that explicitly teaches them how to regulate their thoughts (e.g., changing ability attribution of failure to effort attribution) and reading behaviors to disrupt the negative spiral of low motivation and low reading achievement.

IMPORTANCE OF READING MOTIVATION IN FOUNDATIONAL READING SKILLS

Models of reading that account for the motivational characteristics of students have focused mainly on reading comprehension because of the critical importance of engagement with text in the process of generating text-based and situational models of text (Duke & Cartwright, 2021; Wigfield & Guthrie, 2000). Yet, it stands to reason that reading motivation also plays a pivotal role in the development of foundational reading skills for the following reasons. First, a recent meta-analysis by Toste et al. (2020) shows motivation is as highly correlated with code-based foundational reading skills ($r = .19$) as it is with other reading skills (e.g., meaning-focused skills or general reading achievement; $r = .21-.23$). Second, one mechanism by which motivation exerts a

positive effect on reading achievement is through reading volume (Schaffner et al., 2013; Wigfield & Guthrie, 1997), which is a critical factor in word reading development (Nation, 2017). In particular, the development of high-quality lexical representations is key to accurate and efficient word reading skill (Perfetti & Hart, 2002) and multiple exposures to words in various contexts provides a reader with the opportunity to develop an elaborated and nuanced database about the orthographic, phonological, and semantic patterns of individual words.

How do foundational reading skills interventions address reading motivation?

Critics of code-based reading instruction and interventions that emphasize foundational skills (e.g., phonemic awareness, phonics) have disparaged such instruction as mechanical and demotivating for students (e.g., Archer & Hughes, 2010). In fact, recognizing the common perception of foundational reading skills intervention as tedious drill and practice, the National Reading Panel (NRP, 2000) identified motivational components in foundational reading skills interventions as a topic in need of further research. More specifically, the NRP called for researchers to develop foundational reading interventions that also incorporate motivational components. Such a dual focus may serve to both increase student engagement in foundational skills instruction and maximize intervention effects by simultaneously addressing students' reading and motivational challenges. Since the publication of the NRP report more than 20 years ago, other researchers have echoed its call for greater attention to the ways in which foundational reading skills interventions address student motivation (e.g., Pressley et al., 2006). Nevertheless, there have been only a handful of studies on this topic (e.g., Quirk & Schwanenflugel, 2004).

Quirk and Schwanenflugel (2004) argued for the importance of motivation for the reading achievement of *all* students but identified three core motivational constructs with particular relevance for struggling readers: (1) reading efficacy (one's beliefs in their ability to read); (2) outcome attributions (one's beliefs about the causes of reading successes or failures); and (3) task value (beliefs about the importance of becoming a better reader). Across these three constructs, Quirk and Schwanenflugel specified 12 motivational features (e.g., readers explicitly observe skill progress, focus is on individual learning with as little competition as possible; utility value; p. 15) and then analyzed five supplemental remedial reading programs for evidence of each feature. The selected programs (DISTAR, PHAST [Phonological and Strategy Training], Early Steps, Reading Recovery, Reading Apprenticeships) varied in philosophical approaches, were commonly used for students with reading disabilities, and had a research base evaluating their effectiveness. Quirk and Schwanenflugel found that, although each of these five programs included at least one motivational feature, several features were absent from all reviewed programs. For example, none of the remedial programs taught students to self-set goals and monitor progress toward those goals, which supports the development of positive reading efficacy through mastery experience. Nor did any program explicitly teach students how to make constructive outcome attributions (i.e., attributing outcomes to effort/strategy use rather than ability), which has implications for future effort and task persistence. The authors concluded that, although all five programs included some features that were likely to promote positive reading efficacy, help students attribute reading outcomes to strategy use, or enhance the task value of reading, they do so implicitly. Making motivation a more *explicit* aspect of remedial reading programs may increase the programs' ability to adequately address both reading and motivational challenges of participants.

Similarly, although not specific to reading, a review of studies on Direct Instruction (Engelmann & Colvin, 2006), which is characterized by its explicitness and systematicity

and includes reading programs such as DIS-TAR, Reading Mastery, and Corrective Reading, reported a null effect on affective (motivational) outcomes, including attitudes, self-esteem, and behaviors (Stockard et al., 2018). Moreover, echoing the concern of both the NRP (2000) and Quirk and Schwanenflugel (2004), Stockard et al. reported that affective outcomes are reported as auxiliary, rather than central, targets of the interventions. Although a recent meta-analysis has examined the effects of motivational reading interventions (McBreen & Savage, 2021), only 15 out of 49 studies included in that review focused on intervention effects for students with reading difficulties and only five addressed foundational reading skills (i.e., Aro et al., 2018; Cirino et al., 2017; Denton et al., 2020; Toste et al., 2017, 2019). The lack of foundational reading skills interventions with an explicit motivational focus highlights the need to better understand both the extent to which foundational skills interventions address the reading motivation needs of students with reading difficulties and the impact of motivational practices on student reading outcomes. Moreover, none of these studies focused on students with reading difficulties, for whom motivational support might be critical in reading development.

PRESENT STUDY

This is a secondary analysis of data collected during a recently published meta-analysis, which examined the effects of reading interventions that included instruction in foundational skills on reading outcomes for elementary-grade students with or at risk for dyslexia (Hall et al., 2022). We had two primary aims in the present study. First, we aimed to describe the extent to which motivational practices were included in reading interventions for kindergarten through Grade 5 (K–5) students with or at risk for dyslexia. Second, we aimed to explore whether the impact of reading interventions on reading outcomes depended on the presence and type of motivational practices incorporated

into the instructional design. In particular, we examined whether interventions yielded stronger reading outcomes when (a) motivational supports are incorporated or (b) students are taught to use generalizable motivational strategies, controlling for the effects of other factors (i.e., student and intervention characteristics, outcome domain, and research methods). Given the Hall et al. (2022) findings that outcome type moderated intervention effects (i.e., the mean effect was smaller for reading comprehension outcomes than for word reading/spelling outcomes), we examined the effects of motivational practices on word reading and spelling outcomes separately.

METHOD

Identification of studies

We took advantage of a corpus of studies identified in the recent meta-analysis investigating the effects of reading interventions for K–5 students with or at risk for dyslexia (Hall et al., 2022) to better understand how motivational practices were incorporated in these interventions. Details of the search procedure are described in Hall et al. (2022). There was a total of 53 studies within 51 publications (38 identified through the database search and 14 identified through the ancestral search) identified for inclusion. Figure 1 represents the search procedure and results at each stage of the search process.

Coding procedures

Coding occurred in two phases. In Phase 1, Hall et al. (2022) coded for characteristics of participants, interventions, outcome measures, and research methods within included studies. Eight coders participated in a 3-hr training session and independently coded articles until they obtained a minimum of 90% reliability in each coding category. Once coding began, all articles were independently double coded by two members of the research team and discrepancies were resolved by the first author.
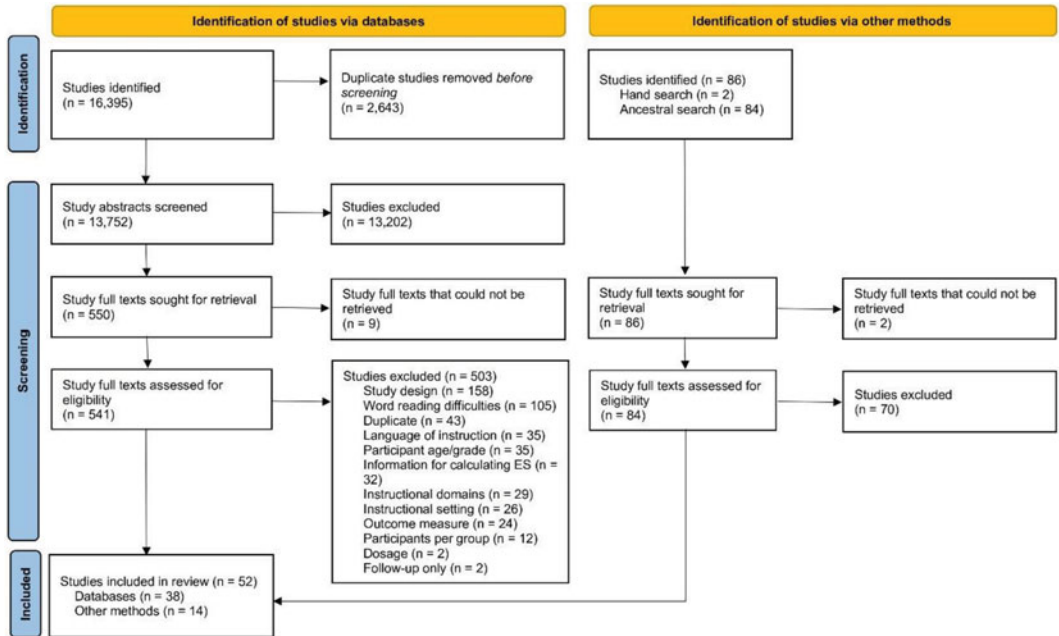
Figure 1. PRISMA search flow diagram. This figure is available in color online (www.topicsinlanguage disorders.com).

In Phase 2, two members of our author team coded studies for information related to (a) motivational supports, (b) motivational strategies, and (c) motivation outcomes. Information about motivation-related codes is provided in Table 1. Coders participated in a 1-hr training session and achieved more than 95% reliability before coding the studies. All studies were independently coded by two individuals. There was 91% agreement within the motivational supports category, 98% agreement in the motivational strategies category, and 97% agreement in the motivation outcomes category. Disagreements were resolved via discussion and consensus.

Effect size calculation and meta-analytic procedures

To measure intervention effect size, we used standardized mean differences between the intervention and control groups adjusted for small-sample bias estimated with Hedges' g (Hedges, 1981). Before estimating mean effect size across studies, we identified one outlier that was above three times

the interquartile range (Tukey, 1977) and winsorized its value to the upper fence value. Given the multiple sources of dependencies in the effect size estimates (multiple treatment/comparison groups and multiple outcome measures within a single study), we used a three-level, multivariate random-effects model, assuming a correlation of .80 and using study as a clustering unit. Moreover, we used robust variance estimation to apply a small-sample correction to standard errors, hypothesis tests, and confidence intervals (Pustejovsky & Tipton, 2022; Tipton & Pustejovsky, 2015).

To address our second aim, interventions were classified into three categories: interventions with no motivational practices, interventions with only motivational supports to enhance student engagement, and interventions that taught students to use generalizable motivational strategies (i.e., strategies that address reading beliefs, values, and goals). We refer to this variable as *type of motivational practices*. We fit two sets of moderator analyses separately for combined

Table 1. Definitions of variables used in motivation coding

Category	Variable	Definition
Motivational supports	Choice (C)	Intervention provided students with choice (e.g., areas to read, texts, partners).
	Interesting texts (IT)	Intervention included interesting texts (e.g., multiple genres of texts, texts aligned with student interest).
	Game-like activities (G)	Intervention involved game-like activities (e.g., earning points).
	Extrinsic motivators (EM)	Intervention utilized extrinsic motivators (e.g., tangibles, earned activities).
	Focus on improvement (I)	Intervention included setting goals focused on self-improvement as compared with performance goals focused on competition (e.g., beating one's record).
	Purpose for reading (P)	Intervention included setting a purpose or goal for reading either as part of prereading activities or to discuss the value of reading.
	Peer collaboration (PC)	Intervention offered opportunities for peer collaboration or opportunities to read in pairs.
	Growth mindset feedback (GMF)	Intervention included growth mindset-focused feedback or teacher talk.
Motivational strategies	Goal setting, progress monitoring, and reflection (SR)	Students were taught to engage in at least two of the three phases of self-regulation: (a) set goals and a strategy/plan to meet their goals; (b) monitor their progress toward their goals; and (c) reflect on their progress and effectiveness of their strategy/plan.
	Growth mindset (GM)	Students were taught to endorse a growth mindset.
	Attributions (A)	Students were taught to make constructive attributions related to their learning.
	Self-talk (ST)	Students were taught to utilize self-talk to support their learning.
Motivation outcomes	Reading motivation outcome	Reported measuring an outcome related to student reading motivation (e.g., Reading Self-Concept Scale).

reading outcomes—for word reading/spelling outcomes and for reading comprehension outcomes. For each outcome model, we first fit a meta-regression model with the type of motivational practices to obtain mean effects of intervention that fall into one of the three categories (no motivational practices vs. intervention with motivational support only vs. intervention with motivational strategy instruction). Then, we fit a multiple meta-regression model to examine the effects of type of motivational practices on reading outcomes controlling for covariates included in Hall et al. (2022). These covariates included the following: grade (K–Grade 2 vs. Grades 3–5), group size (small-group vs. one-on-one), inclusion of particular instructional components (i.e., multisensory activities, morphology/vocabulary instruction, spelling instruction, phonological awareness instruction), intervention dosage, total sample size, research design (randomized controlled trial vs. cluster randomized trial vs. quasi-experimental design), and outcome

measure domain (word reading/spelling, phonological awareness, text reading, reading comprehension).

According to recommendations that researchers identify α levels based on study considerations (Miller & Ulrich, 2019), we selected an α level of .10. This decision was influenced by a few factors, including (a) the exploratory nature of the study; (b) the limited number of studies that examine the effects of reading interventions incorporating motivational practices, particularly studies that include motivational strategy instruction ($n = 5$); and (c) that Type II error is actually more problematic in this study than Type I error because false-negatives may prevent further research into the impact of motivational practices within reading whereas false-positives may just call for more research in a relatively understudied topic.

We contextualize our findings in three ways. First, we report amount of variance explained (R^2) to complement information about statistical significance. Second, we supplement our findings by providing 95% prediction intervals around the mean effects for the three types of motivational practices. This prediction interval represents the range within which 95% of the treatment effects would fall and provides information about heterogeneity in the scale of effect sizes (*SD* units). In other words, a 95% prediction interval estimates where the true effects are to be expected for 95% of similar studies that may be conducted in the future and thus can be used to better understand the effects of motivational practices and the heterogeneity within a set of studies with different types of motivational practices (IntHout et al., 2016; Tipton et al., 2022). Third, when presenting the results and discussing our findings, we use an effect size benchmark developed by Kraft (2020) based on analyses from 747 randomized controlled trials. According to Kraft, effect sizes for educational interventions between 0.05 and 0.20 should be considered medium-sized effects and those above 0.20 should be considered large. Thus, when there are differences in mean effect size estimates above 0.05, we use comparative language in the description of the findings.

RESULTS

Aim 1: Study features

Table 2 summarizes the motivational practices employed in the 70 treatment conditions evaluated within the 53 studies included in the present meta-analysis. Of the 70 treatment conditions, 31 included motivational practices (44%). Of the 31 treatment groups that included motivational practices, 26 (84%) included only motivational supports (e.g., involved game-like activities, offered opportunities for peer collaboration, focus on improvement) and only five (16%) taught students motivational strategies (e.g., students learned to set goals and monitor their progress, make constructive attributions, or utilize self-talk). Notably, four of the five treatment conditions that provided motivational strategy instruction also incorporated at least one motivational support. Interestingly, only two studies measured motivational outcomes (Storey et al., 2020; Toste et al., 2019) despite so many incorporated motivational practices to enhance student motivation and engagement. Of note, only Toste et al. reported effects of intervention on students' self-reported reading motivation; Storey et al. used teacher report collected as part of their social validity measure. Among the interventions that provided motivational supports, the most common support was game-like activities as part of phonological awareness instruction or word reading games (65%), followed by peer collaboration including paired reading time (46%), setting improvement goals and providing multiple practice opportunities to improve reading accuracy and fluency (38%), setting purposes for reading as part of the prereading activities (27%), offering opportunities to read texts that align with student interests (23%), and providing extrinsic rewards (12%) or/and choices (12%). The number of motivational supports included ranged from one to five, with most of the

Table 2. Study motivational features

Study[a]	Motivation Practices	Motivation Support	Motivation Strategy	Motivation Outcome
Al Otaiba et al. (2005)—TAILS 4 days	Y	G, I, P	None	N
Al Otaiba et al. (2005)—TAILS 2 days	Y	G, I, P	None	N
Baker et al. (2000)	Y	C, IT	None	N
Blachman et al. (2004)	Y	IT, G, I	None	N
Burns (2011)	Y	G	None	N
Christodoulou et al. (2017)	Y	P	None	N
Coyne et al. (2013)	N			
Denton et al. (2010)	Y	P, PC	None	N
Denton et al. (2014)—EI	Y	I, PC	None	N
Denton et al. (2014)—GR	N			
Donegan et al. (2020) Study 1	N			
Duff et al. (2014)	Y	PC	None	N
Fawcett et al. (2001)	N			
Fives et al. (2013)	N			
Frantz (2000)—Decoding Deficit Only	Y	G, PC	None	N
Frantz (2000)—Decoding and Comprehension Deficit	Y	G, P, PC		
Georgiou et al. (2020)—SWI	N			
Georgiou et al. (2020)—Simplicity	N			
Graham et al. (2002)	Y	G, EM, I, PC	None	N
Gunn et al. (2005)—Non-Hispanic	N			
Gunn et al. (2005)—Hispanic	N			
Hagans & Good (2013)	N			
Hatcher et al. (2006)	Y	PC	None	N
Jenkins et al. (2004)—More Decodable Texts	N			
Jenkins et al. (2004)—Less Decodable Texts	N			
Little et al. (2012)	N			
Lovett et al. (2017)	Y	G	SR	N
Mathes et al. (2003)—PALS	Y	G, PC	None	N
Mathes et al. (2003)—TDI	N			
Mayfield (2000)	N			
Miciak et al. (2018)	Y	PC	SR, A	N
Morris et al. (2012)—PHAST	Y	None	SR, A	N
Morris et al. (2012)—PHAB + RAVE-O	N			
Morris et al. (2012)—PHAB + CSS	N			
Nicolson et al. (1999)	Y	PC	None	N
O'Callaghan et al. (2016)	N			
O'Connor et al. (2002)—RLM	Y	IT	None	N
O'Connor et al. (2002)—CM	N			
O'Shaughnessy & Swanson (2000)—PAT	Y	G	None	N
O'Shaughnessy & Swanson (2000)—WAT	Y	G	None	N
Scanlon et al. (2005)—Text Emphasis	N			

(continues)

Table 2. Study motivational features (*Continued*)

Study[a]	Motivation Practices	Motivation Support	Motivation Strategy	Motivation Outcome
Scanlon et al. (2005)—Phonological Skills Emphasis	N			
Simmons et al. (2011)	N			
Storey et al. (2020)	Y	EM	None	Y
Torgesen et al. (2010)—RWT	Y	IT, G, PC	None	N
Torgesen et al. (2010)—LIPS	N			
Toste et al. (2019)—MWR	Y	G, I	None	Y
Toste et al. (2019)—MWR + MB	Y	G, I	SR, ST	Y
Vadasy, Jenkins, Antil, & Wayne (1997)	Y	IT	None	N
Vadasy, Jenkins, Antil, Wayne, & O'Connor (1997)	Y	C	None	N
Vadasy et al. (2000)	N			
Vadasy et al. (2005)—Reading Practice	N			
Vadasy et al. (2005)—Word Study	N			
Vadasy et al. (2006)	N			
Vadasy et al. (2007)	N			
Vadasy & Sanders (2008a)—1:1 Tutoring	N			
Vadasy & Sanders (2008a)—1:2 Tutoring	N			
Vadasy & Sanders (2008b)	N			
Vadasy & Sanders (2009)—Teachers Implement	N			
Vadasy & Sanders (2009)—Paraprofessionals Implement	N			
Vadasy & Sanders (2010)	N			
Vadasy & Sanders (2011)	N			
Vaughn, Mathes, et al. (2006)	Y	G, I, P	None	N
Vaughn, Cirino, et al. (2006)	Y	G, I, P	None	N
Vellutino et al. (2008)	N			
Wang & Algozzine (2008)	N			
Wanzek & Vaughn (2008) Study 1	N			
Wanzek & Vaughn (2008) Study 2	N			
Wanzek et al. (2020)	Y	I	None	N
Wise et al. (1999)	Y	C, IT, G, EM, PC	SR	N

Note. A = attributions; C = choice; EM = extrinsic motivators; G = game-like activities; I = focus on improvement; IT = interesting text; N = no; P = purpose for reading; PC = peer collaboration; SR = goal setting, progress monitoring, and reflection; ST = self-talk; Y = yes.
[a]For studies with more than one treatment group, the treatment group name is also listed in this column.

studies including one motivational support (47%) to two or three supports (47%), with a few including four or five types of motivational supports.

Motivational strategy instruction was mainly incorporated into interventions primarily focused on word-level reading, except for the case of the treatment evaluated by

Miciak et al. (2018); that intervention included multiple intervention components. All five interventions that included a motivational strategy component taught students to engage in the self-regulatory process by helping them set goals, monitor their progress or behaviors, and reflect on whether they met their goals. Two of the interventions combined the self-regulatory process with attribution retraining (Miciak et al., 2018; Morris et al., 2012), and another intervention added instruction in positive self-talk (Toste et al., 2019). Lovett et al. (2017) and Morris et al. (2012) evaluated the effects of the same intervention: the PHAST reading program (Lovett et al., 2000). In the PHAST program, several word identification strategies are taught. As the number of taught strategies increases, the intervention supports students' flexible use of different strategies by having them engage in a "game plan" to select a strategy and monitor whether it works or not. Moreover, there is an emphasis on helping students identify unhealthy attributions about causes for reading outcomes (and the degree to which effort has the potential to cause change in reading outcomes) by interleaving discourse to retrain students' maladaptive attributions (i.e., teaching students that reading success is a result of flexible strategy use and persisting even when a first attempt is unsuccessful). Students are also introduced to multisyllabic words (challenging) and asked to use their strategies (game plan) as they get ready to read more complex texts. In addition, in Lovett et al., PHAST was combined with the RAVE-O (Retrieval, Automaticity, Vocabulary Elaboration, Orthography) program (Wolf et al., 2009), which emphasizes the connections among phonology, orthography, and semantics, as well as integration and efficient access of these linguistic components at the sublexical, lexical, and text levels. RAVE-O also incorporated many game-like practice opportunities to enhance student engagement with the instruction. Toste et al. (2019) incorporated motivational beliefs training with their multisyllabic word reading instruction. Students were initially taught how to use positive self-talk to enhance their readiness (motivation) for the lesson and to support their efforts to learn during the lesson. Later in the lesson, students were taught to identify their strengths and needs related to reading, to develop goals, and to form positive thoughts while working to achieve these goals. Beyond this motivational beliefs training, students engaged in word play games in which they had multiple opportunities to blend word parts. Students also practiced reading multisyllabic words in a timed activity in which they were asked to improve their speed with each repeated reading.

Wise et al. (1999) examined effects of a phonological awareness, phonics, and text reading intervention that incorporated behavior and academic goal setting and progress monitoring. At the beginning of each lesson, students identified their behavior and academic goals (e.g., using strategies, helping each other) and evaluated whether the goals were met at the end of the lesson. Several motivational supports were incorporated into the intervention, including game-like activities, opportunities to choose and read books that were of interest, and opportunities to collaborate with friends by asking questions and giving each other hints. Students also earned tokens when they met their self-set goals, which could be traded for small prizes.

Miciak et al. (2018) examined the effects of a 2-year, multicomponent intervention provided daily to small groups of upper elementary-grade students. In Year 2 of the program, a self-regulation instructional component was incorporated into vocabulary instruction to draw students' attention to improvements in their vocabulary knowledge. At the beginning of the lesson, students set goals focused on (a) the number of vocabulary words they aimed to learn during the lesson and (b) their self-regulation (i.e., they identified constructive attribution statements they could use to support their effort and perseverance). Students evaluated whether their goals were met at the end of the lesson.

Aim 2: Meta-analytic findings

Table 3 presents estimates of average effect size disaggregated by type of motivational practice on combined, overall reading outcomes. Descriptively speaking, interventions with motivational strategy instruction tended to have larger effects ($g = 0.462$) than interventions with no motivational practices at all ($g = 0.341$) or interventions with only motivational supports ($g = 0.309$). When we included all the covariates in the model, the type of motivational practices did not statistically significantly moderate the effects of reading intervention ($F = 1.80$, $df = 2, 5.07$, $p = .256$). The proportion of variance explained by the type of motivational practices was 9.30%. As shown in Table 3, the effects of interventions with only motivational supports did not differ from the effects of interventions without any motivational practices ($B = -0.019$, $p = .789$) controlling for covariates. Effects of interventions with motivational strategy instruction did not differ from interventions without motivational practices, although descriptively speaking, such interventions with motivational strategy instructional components tended to have larger effects ($B = 0.172$, $p = .142$). To better understand the heterogeneity of the effects of motivational practices, we obtained 95% prediction intervals separately for studies in each motivational practice category. A 95% prediction interval describes the range within which 95% of the effects would fall (IntHout et al., 2016; Tipton et al., 2022). Results indicated a substantial amount of variability, with 95% prediction intervals ranging from -0.154 to 0.816 for studies without motivational practices, from -0.057 to 0.744 for studies with only motivational supports, and from -0.406 to 1.248 for studies with motivational strategy instruction.

Effects on word reading/spelling outcomes showed a similar pattern to that on combined reading outcomes (see Tables 4 and 5). Interventions with motivational strategy instruction tended to have a larger effect ($g = 0.527$) than interventions with only

Table 3. Average effect size disaggregated by the type of motivational practice

Moderator	Number of Effect Sizes	Number of Comparisons	Number of Studies	Effect Size (β)	SE	df	p	95% CI	
								Lower	Upper
Overall reading									
None	186	39	31	.331	0.050	29.811	<.001	0.229	0.433
Motivational support	135	26	24	.323	0.054	21.388	<.001	0.210	0.435
Motivational strategy instruction	30	5	5	.462	0.096	3.425	.0130	0.176	0.749
Word reading/spelling									
None	114	39	31	.351	0.056	29.636	<.001	0.237	0.465
Motivational support	79	26	23	.340	0.063	20.480	<.001	0.208	0.472
Motivational strategy instruction	20	5	5	.527	0.098	3.344	.0100	0.232	0.822
Reading comprehension									
None	34	28	21	.254	0.055	18.119	.0010	0.115	0.350
Motivational support	23	19	17	.359	0.062	14.544	<.001	0.227	0.505
Motivational strategy instruction	8	4	4	.358	0.217	3.107	.1940	-0.319	1.035

Table 4. Results from multiple moderator analysis for overall reading outcomes

Moderator	Effect Size (β)	SE	df	p
Intercept	.088	0.167	10.76	.610
Grade (K–2)	.197	0.137	13.21	.174
Small group	.034	0.099	10.27	.734
Multisensory	−.186	0.169	4.67	.325
Morphology/vocabulary	−.078	0.116	12.12	.514
Spelling	.17	0.084	10.95	.070
Phonological awareness	.013	0.086	21.83	.883
Outcome type				
Phonological awareness	.101	0.072	15.45	.177
Text reading	−.082	0.045	12.12	.097
Reading comprehension	−.077	0.032	26.57	.023
Dosage	.002	0.001	14.222	.049
Total sample size	−.001	0	5.261	.129
Design				
Quasi-experimental	−.281	0.173	3.66	.186
Other	.153	0.11	13.876	.188
Type of motivational practices				
Motivational support	−.005	0.075	10.089	.948
Motivational strategy	.178	0.09	3.631	.127

Table 5. Results from multiple moderator analyses for word reading/spelling and reading comprehension outcomes

Moderator	Word Reading/Spelling				Reading Comprehension			
	Effect Size (β)	SE	df	p	Effect Size (β)	SE	df	p
Intercept	.026	0.191	10.959	.896	.046	0.154	8.951	.773
Grade (K–2)	.196	0.144	12.753	.197	.059	0.170	10.828	.734
Small group	.085	0.104	14.354	.427	.211	0.129	15.666	.121
Multisensory	−.141	0.145	4.590	.379	−.256	0.273	2.077	.445
Morphology/ vocabulary	−.062	0.110	13.044	.581	−.110	0.122	14.238	.381
Spelling	.171	0.095	10.935	.099	.041	0.098	11.350	.678
Phonological awareness	.064	0.086	20.694	.467	.183	0.131	13.483	.185
Dosage	.002	0.001	13.514	.013	.001	0.001	12.280	.685
Total sample size	−.001	0.001	5.289	.234	.000	0.001	5.491	.846
Design								
Quasi-experimental	−.262	0.168	3.711	.200	−.21	0.279	1.729	.541
Other	.156	0.106	14.359	.161	.218	0.157	8.782	.200
Type of motivational practices								
Motivational support	.004	0.087	13.253	.962	.144	0.070	8.782	.058
Motivational strategy	.222	0.099	3.762	.092	.165	0.156	15.063	.331

motivational supports ($g = 0.334$) or those with no motivational practices ($g = 0.355$). When we included all the covariates in the model, the type of motivational practices did not statistically significantly moderate the effects of reading intervention ($F = 2.39$, $df = 2$, 5.49, $p = .180$); yet, it accounted for 7.88% of the total variance explained in effect sizes. Effects of interventions with only motivational supports did not differ from effects of interventions without any motivational practices ($B = 0.003$, $p = .968$). Interventions with motivational strategy instruction tended to show larger effects than interventions without any motivational practices ($B = 0.222$, $p = .088$). Results indicate a substantial amount of variability, with 95% prediction intervals ranging from -0.169 to 0.834 for studies without motivational practices, from 0.072 to 0.723 for studies with only motivational supports, and from -0.330 to 1.297 for studies with motivational strategy instruction.

We noted a slightly different pattern of findings for reading comprehension outcomes (see Tables 4 and 5). Descriptively speaking, the effects were larger in the order of interventions with only motivational supports ($g = 0.353$), interventions with motivational strategy instruction ($g = 0.323$), and interventions that did not incorporate any motivational practices ($g = 0.282$). When we included all the covariates in the model, the type of motivational practices did not statistically significantly moderate the effects of reading intervention on comprehension outcomes ($F = 0.874$, $df = 2$, 7.87, $p = .454$); it accounted for 2.69% of the total variance explained in the effect sizes. Effects of interventions with only motivational support were not statistically different from interventions without any motivational support ($B = 0.104$, $p = .206$). Interventions with motivational strategy intervention tended to have larger effects than interventions without any motivational practices ($B = 0.165$, $p = .331$), although this effect was not statistically significant due to the small number of studies that included motivational strategy instruction and measured reading comprehension outcomes. Results indicate a substantial amount of variability, with 95% prediction intervals ranging from -0.235 to 0.818 for studies without motivational practices, from -0.043 to 0.644 for studies with only motivational supports, and from -0.618 to 1.269 for studies with motivational strategy instruction.

DISCUSSION

The field of reading research has made significant gains in understanding the science of reading and identifying evidence-based practices for early reading intervention for students with or at risk for dyslexia. However, research consistently demonstrates that some students do not adequately respond to interventions, even carefully considered and implemented ones (e.g., Berninger et al., 2002; McMaster et al., 2005; Wanzek & Vaughn, 2008). To better understand inadequate response, prior research has often focused on understanding underlying cognitive deficits that predict inadequate response and instructional practices that may increase instructional response, such as intensifying instruction (Fletcher et al., 2019). Less research has examined the role of psychological factors, such as motivation, that influence reading development and may also influence instructional response. This is concerning because it is well recognized that students with reading difficulties often develop maladaptive motivation and that this can intensify their reading challenges (e.g., Lackaye & Margalit, 2006; Lee & Zentall, 2012; McGeown et al., 2012; Polychroni et al., 2006).

Given the well-established evidence of the role of motivation-related factors, such as self-efficacy, plays in students' response to reading interventions (Cho et al., 2015) and the bidirectional relationship of motivation and reading development in students with reading difficulties (Morgan et al., 2008), researchers have suggested reading motivation may need to be a target of foundational reading skills intervention to bolster its effectiveness (e.g., Cho et al., 2022; Morgan

et al., 2008; NRP, 2000; Wigfield & Guthrie, 2000). The purpose of this literature review was to describe the use of motivational practices within studies of reading interventions for students with or at risk for dyslexia in K–5. We also sought to explore whether the impact of reading interventions on reading outcomes varies on the basis of the incorporation of motivational practices.

Incorporation of motivational practices within reading interventions

Our first research aim sought to describe the extent to which motivational practices are present in reading interventions for students with or at risk for dyslexia. Of the 70 treatment conditions reviewed, less than half reported motivational practices and only a small set of studies ($n = 5$) directly addressed student motivation. This is similar to what Quirk and Schwanenflugel (2004) noted in their analyses of the five remedial reading programs: Although many of these programs had instructional elements that may lead to improved motivation (e.g., explicit teaching routines improve self-efficacy because they provide mastery experiences), rarely did they explicitly targeted motivation. There are a few possible explanations for this finding. It may be that developers and users of reading interventions believe high-quality instructional practices will fully address student motivation. For instance, educators, program developers, and researchers may think that using explicit instructional routines (e.g., providing teacher modeling, guided practice opportunities, corrective feedback) and systematically teaching foundational skills (e.g., introducing easy skills before more advanced skills) address motivation and thus place a low priority on incorporating additional supports for motivation or teaching motivational strategies. Alternatively, it may be that they assume improvement in motivation will naturally follow when students make progress in reading. Yet, there is at least some research to question this assumption. For example, Morgan et al. (2008) found that improvements in reading did not lead to accompanying improvements in intrinsic motivation or self-concept. Moreover, echoing the sentiment raised by Stockard et al. (2018) and the NRP (2000), there are few studies to report intervention effects on motivational outcomes. And one study that did report motivational outcomes found mixed results, where students who received reading intervention reported lower positive attitudes toward reading than students in the control group but not on other reading motivation outcomes (Toste et al., 2019). Thus, the impact of foundational reading skills intervention on motivation warrants further investigation.

Motivational supports

Of the 31 interventions that reported motivational practices, most of these interventions (70%) incorporated one to two types of motivational supports, with some (30%) reporting three to five types of support. The most commonly reported motivational supports were game-like activities (65%) and peer collaboration (46%), both of which can spark and help students maintain situational interest. Game-like activities are often provided as part of phonological awareness instruction or word reading instruction as a means to enhance student engagement and make the lessons fun for students. Beyond supporting students' situational interest, peer collaboration can also foster motivation by increasing students' sense of belonging, creating a vicarious learning experience in which students observe their peers' reading successes, and providing frequent opportunities to practice with peers. It is important to note only a few studies had a cooperative learning structure where students work toward their common goals or are provided explicit scaffolds to facilitate collaborative learning to occur such as in Peer Assisted Learning Strategies (Mathes et al., 2003). Other studies provided paired reading opportunities. Only two interventions incorporated extrinsic rewards such as stickers (Graham et al., 2002) and electronic coins that can be traded for computer game activities (Storey et al., 2020) as a motivational support, which may not be completely unexpected, given the mixed

evidence about the short-term and long-term benefits of extrinsic rewards (Cho et al., 2022; Deci et al., 1999; Hebbecker et al., 2019). This is also consistent with the recommendation (Reeve, 2009) that using extrinsic rewards that may result in feelings of external control should be carefully used to help unmotivated students engage with reading, as such practices often hinder students from developing intrinsic motivation. It was unexpected to find that so few studies provided opportunities for students to read texts that align with their personal interests or interventions that offered students choices to support their learning. This pattern of findings could be a result of our focus on foundational reading skills interventions because comprehension instruction may be more conducive to incorporating such motivational supports.

Motivational strategy instruction

Only five studies in the corpus directly taught students strategies to enhance motivation. With one exception (Morris et al., 2012), interventions that reported motivational strategy instruction also reported some type of motivational support (Lovett et al., 2017; Miciak et al., 2018; Toste et al., 2019; Wise et al., 1999). All five interventions that addressed motivational strategies taught students to engage in the self-regulatory process by teaching them to set goals and monitor their progress toward achieving those goals, with some also teaching students to use positive self-talk (Toste et al., 2019) or constructive attribution strategies (Miciak et al., 2018; Morris et al., 2012). Most of these interventions often targeted goals (goal setting) and beliefs (attributions) concurrently. Notably, previous studies with older students with reading difficulties have also combined reading comprehension strategy instruction with attribution retraining, most likely because older students with reading difficulties often do not make constructive attributions (i.e., they attribute successes to external causes, such as luck, while attributing failures to their lack of ability; Berkeley et al., 2011; Tabassam & Grainger, 2002). As we describe later, our findings suggest that attri-

bution training may be a promising approach in younger students with reading difficulties as well.

Two of the interventions that incorporated instruction in goal setting and progress monitoring (Miciak et al., 2018; Wise et al., 1999) taught students to identify short-term, proximal goals (e.g., the number of vocabulary words they aim to learn, a positive behavior they will engage in) and then to monitor their learning and behaviors within a single lesson. Although progress monitoring is an important instructional component in many early reading interventions, it is mainly used as a mechanism to inform teachers' instructional decision-making (e.g., Wanzek et al., 2008). As goal setting and progress monitoring are key elements of the self-regulatory process, using long-term progress monitoring with curriculum-based measures as a mechanism to motivate students might be a fruitful avenue for future research. In doing so, it would be beneficial to teach students effective goal-setting principles identified by Goal-Setting Theory (Locke & Latham, 2002).

Impact of motivational practices on the effects of reading interventions

Our second research aim sought to examine the effects of motivational practices on reading outcomes for students with or at risk for dyslexia. We found that the average effect on combined reading outcomes for interventions that reported motivational strategy instruction was $g = 0.462$. Although apparent differences were not statistically significant, interventions that only reported motivational supports ($g = 0.309$) or did not have any motivational practices ($g = 0.341$) tended to have smaller effects across reading measures. Although interventions with motivational strategy instruction had medium-sized effects compared with other studies according to Kraft's (2020) guidelines, taken together the low number of studies that incorporated motivational strategies and the substantial heterogeneity within each type of intervention, we interpret the results of the statistical tests and effect sizes with caution. Given that students with reading difficulties

often lack motivation to engage in reading tasks, it is not surprising that these students seemed to benefit from motivational strategy instruction. This is consistent with findings of McBreen and Savage (2021) that reading interventions with attribution training yield the largest effects on reading outcomes. Although it is difficult to directly compare our findings with theirs because McBreen and Savage combined multiple effect sizes within a study, an approach that is not attuned to understanding heterogeneity of effects (see Tipton et al., 2022), we do note that our findings are in contrast to that of McBreen and Savage's. They found that self-regulatory interventions or multicomponent interventions were associated with smaller effects than other types of motivational reading interventions, a pattern that does not align with our results, suggesting a stronger mean effect of motivational strategy instruction than other types of instruction. We were not able to examine the differential effects of different types of motivational strategy instruction, given the small number of studies and because all of them addressed self-regulation, at least partially.

Prior research (Hall et al., 2022) suggested that the effects of reading interventions varied on the basis of the domain of reading tested, with smaller effects on reading comprehension than word reading outcomes. We therefore examined the influence of motivational practices separately for word reading and reading comprehension outcomes. The effects on word reading outcomes were similar to those on overall reading outcomes. Studies with motivational strategies yielded relatively greater effects ($g = 0.527$) than those studies with motivational supports ($g = 0.334$) and those without any motivational practices ($g = 0.355$). We observed a slightly different pattern of findings on reading comprehension outcomes. Again, interventions with motivational strategy instruction ($g = 0.323$) and interventions with motivational supports ($g = 0.353$) had, on average, relatively larger effects, descriptively speaking, than interventions that did not incorporate any motivational practices ($g = 0.282$), but interventions with supports appeared slightly

more beneficial. One might hypothesize that the role of motivational practices, both motivational supports and strategy instruction, may be particularly important in the context of reading comprehension, given that reading comprehension requires prolonged engagement with text and as evidenced by several models of reading comprehension (Duke & Cartwright, 2021; Wigfield & Guthrie, 2000).

LIMITATIONS

We acknowledge that our study had limitations. First, our meta-analysis examined effects of reading interventions on reading outcomes for elementary-grade students with or at risk for dyslexia specifically, a subset of all reading interventions. Although focusing on reading intervention research for students with or at risk for dyslexia provides a unique opportunity to inform practice, we did not have enough power to draw strong conclusions for some analyses. Only a small number ($n = 5$) of studies evaluated the effects of interventions that reported motivational strategy instruction. Although this is not so much a limitation of our study, as it is a constraint of the present body of research, we acknowledge our analyses were underpowered. Second, this meta-analysis was limited by the information reported in the identified studies. Likely due to page limitations, researchers did not always provide in-depth descriptions about the interventions being tested, which sometimes made it challenging to reliably code for motivational practices. Furthermore, it is possible that an intervention may have incorporated motivational practices but authors did not report it. Therefore, the present review may not fully reflect the presence of motivational practices in reading intervention studies.

IMPLICATIONS AND FUTURE DIRECTIONS

Given that empirical research supports a reciprocal relation between motivation and reading achievement (Hebbecker et al., 2019; Morgan & Fuchs, 2007) and that the

contribution of motivation to achievement tends to be larger in students with reading difficulties than typically developing readers (Cho et al., 2022; Toste et al., 2020), it is important to explore the impacts of motivational practices on readings outcomes. The present meta-analysis revealed that most reading intervention studies for K–5 students with reading difficulties do not incorporate motivational practices. Those that do incorporate motivational practices typically incorporate motivational supports, such as game-like activities and peer collaboration. Our findings provide preliminary support for the incorporation of motivational practices within reading interventions, particularly interventions that address motivation by teaching generalizable strategies. Although the current corpus of studies does not allow for strong recommendations about the specific ways motivation should be addressed, the broader research base provides some guidance about ways to support reading engagement and motivation. Kamil et al. (2008) made four recommendations for enhancing engagement and motivation: (a) establish meaningful learning goals and specific learning processes that students can use to address those goals; (b) provide a positive learning environment that promotes student independence and autonomy; (c) make literacy experiences relevant to children's lived experiences and interests; and (d) incorporate instructional practices to develop students' goal-setting and self-directed learning. These recommendations suggest that motivation supports and strategies will be associated with improved outcomes. However, further research is needed to better understand the extent to which

these types of motivational practices (supports and strategies) influence the effects of reading interventions and which specific supports and strategies are most efficacious.

Also, in this analysis, we only analyzed immediate postintervention reading outcomes. It is possible that the impact of motivational practices within reading interventions may take time to manifest in improvements in reading. Therefore, examining the long-term impacts of integrating motivation practices into reading instruction may be an important area for future research. Furthermore, we did not examine the effects of intervention on motivation outcomes as only two studies in our corpus included a motivation outcome measure (Storey et al., 2020; Toste et al., 2019). Often, studies that explicitly taught students to use strategies to support motivation did not measure how interventions impacted motivation, such as students' attributional beliefs, nor did they examine how the changes in reading outcomes were mediated by students' motivation. Toste et al. (2019) was the only study in our corpus to report the impact of an intervention on student-reported reading motivation. They found that a motivational beliefs training program focused primarily on attribution retraining embedded within a reading intervention did not lead to statistically significant findings on motivation outcomes. However, it is worth noting that a prior study examining the same intervention did find statistically significant and large effects on motivation-related outcomes (Toste et al., 2017). The inconsistent effects on motivation outcomes underscore the need for measurement of the effects on both reading and motivation.

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