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Specificity of Reading Self-Efficacy Among Primary School Children

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Abstract

We investigated the specificity of reading self-efficacy among second- to fifth-grade children in Finland ($N = 1,327$). Bandura (1997) theorized that efficacy beliefs can be assessed at different levels of specificity; however, empirical support for this view is scarce among young children. Efficacy beliefs targeting reading-related activities were assessed at three specificity levels (general, intermediate, and specific). Confirmatory factor analysis revealed that these specificity levels are separable, but correlated, and the structure was invariant across gender and grade level. Self-efficacy factors were positively associated with reading fluency, but the strength of these associations varied according to specificity level. Findings suggest that reading self-efficacy in primary grades can and should be assessed at different specificity levels according to varying research aims.

Keywords: Self-Efficacy, Reading, Elementary Schools, Beliefs, Reading fluency

Specificity of Reading Self-Efficacy among Primary School Children

Beliefs people hold about their capabilities and the outcomes of their efforts significantly influence their learning, motivation, and achievement (Bandura, 1997; Pajares, 1996; Schunk, 1991). In academic settings, *self-efficacy* refers to beliefs about one's perceived capability to perform given academic tasks at designated levels (Schunk, 1991). Self-efficacy affects performance in such tasks. Compared to students with low self-efficacy, those with a high sense of self-efficacy have been shown to set more ambitious goals and aims for learning (Bandura, Barbaranelli, Caprara & Pastorelli, 2001; Schnell, Ringeisen, Raufelder, & Rohrmann, 2015), use more effective cognitive strategies (Zimmerman, Bandura, & Martinez-Pons, 1992), self-regulate their learning better (Pintrich & De Groot, 1990), and invest more effort and persistence even in challenging tasks (Schnell et al., 2015). Thus, efficacy beliefs might be especially relevant for developing skills that require extensive training, effort, and persistence, such as reading fluency. Reaching automaticity in reading, that is, becoming capable of fluent and effortless decoding (LaBerge & Samuels, 1974), requires persistence and extensive repetition. In addition, with increasing fluency of decoding, the reader is able to focus more on the meaning of the text. In this way, fluency forms a bridge to reading comprehension, as suggested by Pikulski and Chard (2005). However, little research has been aimed at understanding the role of children's efficacy beliefs in the development of reading fluency.

Efficacy beliefs are context-specific and can be assessed at various levels of specificity (Bandura, 1997). Existing empirical evidence from work with adolescents and adults substantiates this notion (Bong, 2001, 2002a; Bong & Hocevar, 2002). However, few studies have aimed to reveal whether this is the case also among primary school children, who might have less differentiated beliefs as their metacognitive skills and self-knowledge are still developing (Bandura, 1997; Harter, 2012). Moreover, the relationship between self-

efficacy and skills seems to differ according to the level of specificity at which self-efficacy is assessed (e.g., Bong, 2002a; Pajares & Miller, 1995; Usher & Pajares, 2009). Again, evidence of these differences is largely absent in research on younger children. In this study, we address these limitations by investigating whether the specificity of self-efficacy suggested by Bandura (1997) can be observed in young children. We do so in the context of reading fluency among a sample of Finnish primary school children.

Specificity of Self-Efficacy

Efficacy beliefs are domain-specific beliefs (Bong, 1997). Even within a single domain, such as reading, writing, or math, they vary in different contexts and in relation to particular subskills (Bruning, Dempsey, Kauffmann, McKim, & Zumbrunn, 2013; Shell, Colvin, & Bruning, 1995). In addition, efficacy beliefs vary in level (i.e., level of task demand), strength (weak or strong), and specificity (generality; Bandura, 1997). In the present study, we focus on the specificity of students' efficacy judgments in a domain-specific context: reading.

Bandura (1997) suggested that efficacy beliefs can be distinguished and measured at three levels of specificity: general, intermediate, and specific. The *general level* is a belief in one's personal efficacy, without a specification of the activities or the conditions under which they must be performed. The *intermediate level* refers to "a class of performances within the same activity domain under a set of conditions sharing common properties" (p. 49). The *specific level* correspond to self-efficacy for a particular performance that takes place in a particular context. That is, children may hold varying beliefs of their capabilities in general (e.g., "I can learn to be good at math"), for certain competencies (e.g., "I can calculate how much money I have"), or for specific tasks (e.g., "I can solve this math problem").

Reading self-efficacy has been studied at different specificity levels, but the levels are not typically explicated. In the next section, we describe the different ways in which reading

self-efficacy has been operationalized at the item level. Table 1 presents sample items used in previous studies conducted with primary school children. These items are classified according to the targeted specificity levels described above.

To measure *general level* self-efficacy, researchers typically ask students to evaluate their general confidence in performing well, with or without explicit reference to a particular domain (e.g., "I am a good reader," MRQ; Baker & Wigfield, 1999; see Table 1). In various studies on reading (e.g., Baker & Wigfield, 1999; Lee & Zentall, 2015; Smith, Smith, Gilmore, & Jameson, 2012; Wigfield, Guthrie, Tonks, & Perencevich, 2004), general level reading self-efficacy has been examined by using the self-efficacy subscale of the Motivation for Reading Questionnaire (MRQ; Baker & Wigfield, 1999), or the Children's Self-Efficacy Scale (Bandura, 2006). To evaluate self-efficacy at the *intermediate level*, researchers have asked students to judge their confidence in tasks such as "Read one of your textbooks" (Shell et al., 1995) or "Read out loud in front of class" (Carroll & Fox, 2017). The intermediate level has sometimes been labeled as task-specific (Bong, 2001, 2002a; Bong & Hocevar, 2002) or skill-specific (Shell et al., 1995). At the most *specific level* of self-efficacy, students are presented with concrete tasks and asked to judge their confidence of successfully completing them (see Table 1). For example, students have been shown reading comprehension questions and then asked to rate their confidence in correctly answering each question (e.g., Schunk & Rice, 1991, 1993).

Although the aforementioned studies show that reading self-efficacy can be measured at different levels of specificity, the previous studies have not precisely targeted the question of differentiation of self-efficacy by specificity level. In most reading self-efficacy research, self-efficacy has been examined at one specificity level within a given study (e.g., Carroll & Fox, 2017; Lee & Zentall, 2015; Wigfield et al., 2004). Because multiple levels of specificity have not often been simultaneously measured, little is known about whether reading self-

efficacy is indeed differentiated in form and function. Furthermore, when various specificity levels have been assessed in the same study, the factor structure of self-efficacy has not been reported. For example, Piercey (2013) investigated several dimensions of reading self-efficacy among children in Grades 4-6, including self-efficacy for self-regulation in reading, general self-efficacy, test-specific self-efficacy, self-efficacy for academic reading, and self-efficacy for extracurricular reading. Although these dimensions represent both the general and intermediate levels that Bandura (1997) described, this particular study did not examine the factor structure of the various items used.

Existing empirical evidence regarding the specificity of self-efficacy has largely been based on studies of high school and college students, and in domains other than reading. Bong and her colleagues examined whether efficacy beliefs in domains such as math, English, and Korean, form separate factors based on the specificity level of underlying items (Bong, 2001, 2002a; Bong & Hocevar, 2002). Their analyses revealed that efficacy beliefs form distinct but correlated factors according to specificity levels, which they labeled as subject- (or course-), task- (or content-), and problem-specific self-efficacy. These levels correspond roughly to the previously presented general, intermediate, and specific levels. Similar findings have been reported among younger students (seventh graders) in math (Phan, Ngu, & Alrashidi, 2017). Specificity levels of self-efficacy have been assessed simultaneously in other studies as well (e.g., Pajares & Miller, 1995; Usher & Pajares, 2009); however, the factor structure of self-efficacy scores at each level of specificity has not been reported.

Self-efficacy theorists have underscored the need to consider specificity level and its correspondence to performance (see Bandura, 1997; Bong, 2006; Pajares, 1996). Indeed, the relationship between self-efficacy and performance has been found to be stronger when the specificity of self-efficacy and performance measures match (see Talsma, Schüz, Schwarzer,

& Norris, 2018). The few studies that have directly examined different specificity levels within the same study have found this association to be stronger when self-efficacy was assessed at a level of specificity corresponding to the skills being assessed (e.g., Bong, 2002a; Pajares & Miller, 1995; Usher & Pajares, 2009). For example, Pajares and Miller (1995) found that students' self-efficacy for solving specific math problems was more strongly associated to performing such math problems than was self-efficacy assessed at domain-general level, which was a better predictor of students' general math performance. In reading, intermediate level self-efficacy showed stronger relationship to reading achievement and amount of reading than did general self-efficacy (Piercey, 2013). These findings notwithstanding, there is a paucity of research on specificity and correspondence in the reading literature as well as among younger students. Most previous findings were obtained from adolescent and adult samples (e.g., Bong, 2002a; Pajares & Miller, 1995; Phan et al. 2017; Usher & Pajares, 2009).

Specificity of Young Children's Reading Self-Efficacy

Self-appraisal skills, like other cognitive skills, gradually improve with development as children get older (Bandura, 1997). In middle childhood, as a result of cognitive development, children's self-representations become more differentiated, which allows them to create self-representations that differ across domains and contexts; at the same time, these representations become more integrated (see Harter, 2012). These improving self-appraisal skills allow children to judge their own efficacy. The development of a sense of agency makes efficacy beliefs particularly important during this developmental period (Harter, 2012). According to social cognitive theory, self-efficacy develops in reciprocal interaction with one's environment and is dependent on how learners interpret mastery experiences, vicarious experiences, verbal and social persuasions, and their own physiological and affective states (Bandura, 1997). Young children have accumulated fewer experiences, but as

they age and expand their learning environment from family to school, these efficacy-relevant experiences become more frequent.

Despite these understandings about how efficacy beliefs develop and change, little is known about the approximate age at which efficacy beliefs become differentiated in middle childhood. Studies in early primary school show that young children's efficacy beliefs can vary between different learning contexts (Wilson & Trainin, 2007) and situations (Määttä, Järvelä, & Perry, 2016). Previous studies also show increasing differentiation in other dimensions of self-efficacy: older students' (high-school and secondary) efficacy beliefs seem to be more subject-specific (Bong, 2001) and more differentiated on the basis of the difficulty level (Street, Malmberg, & Stylianides, 2017) than are the beliefs of younger students (primary and middle school).

In the domain of reading, self-efficacy measures have been targeted typically at assessing general level beliefs (e.g., Lee & Zentall, 2015; Smith et al., 2012; Wigfield et al., 2004). Self-efficacy has often been conceptualized in ways similar to self-concept with items tapping perceived competence or relative ability comparisons (see Bong & Skaalvik, 2003). However, such general level measures may have some disadvantages. First, young children may evaluate their reading efficacy with specific tasks or situations in mind, even when asked about their general self-efficacy. For example, Guthrie et al. (2007) found that fourth graders did not describe their general reading ability but they seemed to have well-formed conceptualizations of their self-efficacy in reference to particular reading tasks. Children might similarly be answering generally-worded items by thinking of different reading subskills. General items do not typically point to specific subskills (e.g., "I am a good reader," MRQ). Furthermore, children have been found to describe their efficacy in reading in terms of their reading fluency skills (e.g., Butz & Usher, 2015; Henk & Melnick, 1998; Troyer, 2017) or word reading skills (Guthrie et al., 2007) rather than their reading

comprehension skills. This suggests that when students consider their efficacy in reading, they place a good amount of emphasis on their ability to read fluently. In addition, general beliefs have been found to be less sensitive to change than specific reading efficacy beliefs in reading interventions (see Unrau et al., 2017).

Self-efficacy has been found to be positively related to primary school children's reading skills, but the strength of this relationship has been inconsistent. Some studies have found rather small associations between self-efficacy and reading skills (e.g., Liew, McTigue, Barrois, & Hughes, 2008; Smith et al., 2012), whereas others have found a stronger relationship (e.g., Carroll & Fox, 2017; Guthrie et al., 2009; Mercer et al., 2011). This is likely because both the self-efficacy measures and those used to assess targeted reading subskills have largely varied. Consequently, further research is needed before any conclusive claims about the relationship between self-efficacy and reading performance can be made. Moreover, the specificity of self-efficacy assessment may affect this relationship. Investigating reading self-efficacy at different levels of specificity in the same study could offer a more fine-tuned picture of children's reading self-efficacy and shed more light on the association between self-efficacy and reading skill.

Gender Differences in Reading Self-Efficacy

Some evidence suggests that girls and boys differ with regard to their self-assessments in the domain of reading. In general, studies have found girls and women to have higher self-efficacy in language-related areas (see Huang, 2013). However, findings specific to self-efficacy in reading self-efficacy have been mixed. Some studies have found that girls report higher reading self-efficacy than do boys (e.g., Baker & Wigfield, 1999; Wigfield & Guthrie, 1997; Smith et al., 2012); others have found no gender differences (Carroll & Fox, 2017; Piercey, 2013). A closer look at these studies suggests that girls and boys did not differ when they were asked to make fine-grained efficacy judgments, but gender differences did emerge

when self-efficacy was assessed at a more general level. This might indicate that gender differences are more evident in general level assessments focusing on relative ability comparisons or perceived competence (Schunk & Meece, 2006). In addition, the studies in which gender differences emerged targeted reading comprehension. Less is known about gender differences in self-efficacy in different subskills of reading. In Finland, which is the context of this study, gender differences in reading performance have been especially large and have favored girls (recent PISA findings, OECD, 2016). This might indicate that boys have less exposure to diverse reading experiences compared to girls. Thus, boys may also have fewer experiences on which to build their reading self-efficacy and might therefore differ in their self-efficacy for reading in primary school.

Reading Fluency

The present study focuses on self-efficacy in the context of reading, specifically on *reading fluency*. Reading fluency refers to automatized decoding and word recognition processes (LaBerge & Samuels, 1974). Fluent reading is defined as an accurate, rapid, and expressive skill (Kuhn & Stahl, 2003). Fluency is seen as the bridge to meaning making (Pikulski & Chard, 2005); when reading becomes automatized and fluent, the reader is better able to focus on text comprehension. Reading automaticity develops gradually, and with increased automaticity in decoding, cognitive resources are freed for understanding text (LaBerge & Samuels, 1974). Empirical evidence has shown that (early) reading fluency predicts later reading comprehension skills (e.g., Kim, Petscher, Schatschneider, & Foorman, 2010). In this study, we define reading fluency as automaticity of reading (combination of high accuracy and a good reading rate), which is a precursor to reading comprehension. Reading fluency is an especially central aspect of reading development in transparent orthographies, such as Finnish, where children typically master accuracy by the end of first grade (Seymour, Aro, & Erskine, 2003). However, many children still have difficulty

achieving an automatized level of decoding and word recognition (Aro, 2004; Landerl, Wimmer, & Frith, 1997; Seymour, Aro, & Erskine, 2003). Furthermore, problems in rate of reading are often characteristic of reading disabilities (Ziegler, Perry, Ma-Wyatt, Ladner, & Schulte-Körne, 2003).

Reading fluency is gained with practice and repetition. To become a fluent reader, a child needs the effort and persistence to independently practice reading in and out of school, as Share (1995) has proposed in his self-teaching hypothesis. Efficacy beliefs have shown a positive association to reading amount (e.g., Schüller, Birnbaum, & Kröner, 2017; Wigfield & Guthrie, 1997), reading enjoyment (Lee & Zentall, 2015), and effort expended in reading (Galla et al., 2014). Therefore, they have a plausible link to reading fluency. However, previous research showing the link between children's self-efficacy and reading in primary school (e.g., Liew et al., 2008; Lee & Jonson-Reid, 2016; Smith et al., 2012) has mainly focused on reading comprehension, rather than fluency, as an outcome. A few prior studies have shown self-efficacy to be positively related to reading fluency (i.e., operationalized as word, sentence or text reading speed and accuracy), but with the exception of the study by Carroll and Fox (2017), these efforts have focused on students in middle school and beyond (Guthrie, Coddington, & Wigfield, 2009; Ho & Guthrie, 2013; Mercer, Nellis, Martínez, & Kirk, 2011). Some evidence has shown that, in young children (8 to 11 years old), efficacy beliefs are related specifically to reading fluency but not to reading comprehension (Carroll & Fox, 2017). Achieving reading fluency skills is an important step in reading development; therefore, understanding how beliefs might relate specifically to reading fluency seems important. Furthermore, early beliefs about fluency may influence more generalized self-beliefs about reading later in a young person's development. Obtaining more knowledge of young children's self-efficacy for reading fluently and determining how this relates to their

actual reading abilities might help researchers and practitioners to support positive efficacy beliefs as well as fluency development.

The Present Study

The present study focuses on the specificity of self-efficacy among primary school children and its relationship to students' reading fluency. Our main research aim was to investigate whether different specificity levels of self-efficacy, as hypothesized by Bandura (1997), can be identified in primary school children. A hypothetical three-factor structure of reading self-efficacy (see Figure 1), in which the different specificity levels were correlated, was formed on the basis of previous research (Bandura, 1997; Bong, 2001, 2002; Bong & Hocevar, 2002). In past research, self-efficacy beliefs representing different levels of specificity have often been combined (e.g., Joët, Usher, & Bressoux, 2011; Solheim, 2011). We therefore compare this three-factor model to simpler one- and two-factor models based on the assumption that children's beliefs may not be as differentiated as those of older students. We also examine gender- and age-related differences in the specificity of self-efficacy assessment across Grades 2-5. Finally, we examine the associations between reading self-efficacy, measured at three levels of specificity, and reading fluency, to investigate whether the specificity of children's efficacy judgments show varying relations to their reading fluency. The associations were examined both between and within genders and grade levels. We hypothesized that the relationship between self-efficacy and reading fluency would be positive, in line with previous findings (e.g., Carroll & Fox, 2017; Mercer et al., 2011). However, we made no hypothesis regarding possible differences in the strength of the associations between self-efficacy at different specificity levels and fluency, given the lack of substantive research with this age group.

Method

Participants and Procedure

A total of 1327 children (48.08% girls) participated in the study, which was part of a longitudinal investigation (i.e., the Self-Efficacy and Learning Disability Intervention research project, 2013–2015) focused on children's self-beliefs and reading and math development. Volunteering schools and teachers were recruited for the study and a total of 20 primary schools from urban and semi-urban areas participated[1]. Students' participation was voluntary, and parents gave written informed consent for participation. The Ethical Committee of the first author's university evaluated the research procedure. Of the participants, 13.41% ($n = 178$; $M_{age} = 8.41$ years, $SD = .32$) were in Grade 2, 35.49% ($n = 471$; $M_{age} = 9.34$ years, $SD = 0.31$) were in Grade 3, 28.86% ($n = 383$; $M_{age} = 10.40$ years, $SD = 0.33$) were in Grade 4, and 22.23% ($n = 295$; $M_{age} = 11.38$ years, $SD = 0.33$) were in Grade 5 ($M_{age} = 9.97$, $SD = 1.05$; range = 7.84 to 12.83 years).

At the end of the first semester of the school year, students were visited by trained research assistants during one regular class session. Students were asked to report their reading self-efficacy. They then took part in an assessment of their reading fluency (see below). Trained research assistants supervised the assessment. Practice items were used to familiarize the children with the response scale used. All questionnaire items were read aloud to students to ensure that all children could answer the questions irrespective of their reading skill.

Measures

Reading self-efficacy. The reading self-efficacy questionnaire was developed according to Bandura's (2006) guidelines. Items specifically targeted reading fluency skills in primary school grades and were presented in Finnish. Researchers with expertise in reading development and in self-efficacy were consulted in item formulation. Three different

specificity levels of self-efficacy for reading fluency were assessed: specific, intermediate, and general level (see Table 2). All items began with question stem, "*How certain are you that you can…*". Participants then rated the strength of their confidence for mastering given activities using a seven-point scale (1, "*I'm totally certain I can't*," to 7, "*I'm totally certain I can*"). An initial version of the self-efficacy questionnaire was piloted with a small group of students, and on the basis of those results, modifications were made to the response scale and wording of the items.

To assess *general level reading self-efficacy* (3 items), an item from the Children's Self-Efficacy Scale (Bandura, 2006) was modified to tap several aspects of reading fluency. Bandura's (2006) original item in the context of reading was, "How confident are you that you can learn to read?*"* but, because Finnish children can typically read by this age, we used three different items that asked students to rate their confidence for reading faster (rate), for reading with fewer mistakes (accuracy), and for understanding what they have read (comprehension). Accuracy is one component of reading fluency (Kuhn & Stahl, 2003), and comprehension, as noted above, requires sufficient fluency (LaBerge & Samuels, 1974).

Intermediate level reading self-efficacy (3 items) was assessed by asking students to rate their confidence for everyday reading activities that require fluent reading (i.e., reading subtitles on TV, texts on the Internet, and a long book, see Table 2). These contexts were selected because each is a typical context for primary school children and requires fluent reading skills. For instance, in Finland, all foreign-language TV programs have subtitles, which appear only for short period of time on the screen. Therefore, a sufficient rate of fluency is required. To be able to read the subtitles is an important milestone of reading development for many children, and also an activity that children frequently describe as a means of mastery in reading. Similarly, reading long texts, such as a long book, requires

greater fluency for reading to be enjoyable and for the reader to focus on meaning instead of code.

To assess *specific level reading self-efficacy* (8 items), researchers presented students with 10 paragraphs of increasing length (from one sentence to a long passage). Students were asked to judge how confident they were in their ability to read each presented paragraph aloud in 30 seconds.[2] To ensure that students could understand this time frame, researchers first demonstrated a 30-second pause. Each paragraph was then presented on an overhead projector for a short time (5 seconds), so that students could visualize the length. The first two items were considered as practice items and were excluded from the final analysis.

Reading fluency. *Reading fluency* was assessed with three, time-limited tests: the word chain test, (Lindeman, 1998), the sentence verification test (Salmi, Eklund, Järvisalo, & Aro, 2011), and the text reading task (Salmi et al., 2011). These tests assessed the automaticity (speed and accuracy) of word-, sentence-, and text-level reading fluency as well as silent and oral reading fluency. Children were instructed to perform each task as quickly and accurately as possible. The *word chain test* consisted of clusters of 2-4 words with no spaces between them (78 word chains in all). The task for the child was to read and separate the words with a vertical line as fast as they could. The test score reflected the number of correctly-identified words within 3.5 minutes. This test was group administered. *The sentence verification* task was a Finnish adaptation of the Woodcock-Johnson Reading Fluency task (Woodcock, McGrew, & Mather, 2001) and consisted of 70 easy and short factual statements (e.g., "Strawberries are red"). Students were asked to read the sentences and then to mark whether the given statement was correct or incorrect. The test score was the number of correct responses given within two minutes. This test was also group administered. In the *text reading* task, children read an informational and age-appropriate 251-word text aloud. The test score was the number of words read correctly within 1.5 minutes. Because this task

involved reading aloud, this test was administered individually either in the same or following day as the class session. All reading fluency test scores were standardized within each grade level prior to the full sample analysis.

Statistical Analyses

All analyses were conducted using the MPlus software, version 7.3 (Muthén & Muthén, 1998–2012). Means and standard deviations for self-efficacy and reading fluency items were calculated by gender and by grade level. Pearson correlations among the variables were calculated for the full sample. To test the hypothesis that reading self-efficacy consists of beliefs at different specificity levels in primary school children, three competing confirmatory factor analysis (CFA) models were constructed. Initially, the hypothesized three-factor model (Model 1, Figure 1) was constructed, in which items GEN1-GEN3 were loaded on the general level reading self-efficacy factor, items INT1-INT3 on the intermediate level factor, and items SPES3-SPES10 on the specific level factor. All three factors were set to correlate with one another.

Three item parcels were used as indicators of the specific level self-efficacy in lieu of single items. The item parcels were formed so that each parcel consisted of varying levels of length: the first parcel (R1) included items SPES3 +SPES6 + SPES10, the second parcel (R2) included items SPES4 + SPES9, and the third parcel (R3) included items SPES5+ SPES7+ SPES8 (for the variable names see Table 2). The use of item parceling in place of individual items has several psychometric and estimation advantages (Little, Cunningham, Shahar, & Widaman, 2002). First, the multivariate normality assumption that underlies structural equation modeling is better met with item parcels than with individual items. Second, with item parceling, the number of items that have been measured to represent a construct can be reduced to an optimal just-identified level. Third, various indexes of model fit are expected to be more acceptable when parcels, rather than individual items, are modeled.

Two competing factors models were constructed to test the structure of self-efficacy. Model 2 was based on the assumption that reading self-efficacy is a unidimensional construct, and all items were set to load on one factor. A correlated two-factor model (Model 3) was then constructed, in which items GEN1-GEN3 loaded on one factor representing general efficacy beliefs, and items INT1-INT3 and items SPES3-SPES10 loaded on a second factor representing more fine-grained efficacy judgments. In addition, a second two-factor model (Model 4) was constructed, in which items GEN1-GEN3 and items INT1-INT3 loaded on one factor representing more general beliefs, and items SPES3-SPES10 loaded on a second factor representing specific beliefs.

Responses to the self-efficacy items were somewhat skewed to the left (kurtosis range: 0.03 to 5.65, skewness range: -0.28 to -2.16). Therefore, the robust maximum likelihood estimator (MLR) was used in all analyses (Muthén & Muthén, 1998-2012). Data were nested within 20 schools and 75 classes. To determine the proportion of the variance in self-efficacy due to class and school, intra-class correlations (ICCs) were calculated. The ICCs for the self-efficacy variables at the class level were small to moderate ($ICC_{GENERAL} =$ .004 to .029, $ICC_{INTERMEDIATE} =$.029 to .135, $ICC_{SPECIFIC} =$ .156 to .169). ICCs at the school level were close to zero ($ICC_{GENERAL} =$ .003 to .019, $ICC_{INTERMEDIATE} =$ .006 to .037, $ICC_{SPECIFIC} =$ .049 to .064). The ICCs for the reading fluency variables were also close to zero (ICC range: .01 to .11). The hierarchical nature of the data was taken into account by estimating unbiased standard errors using the TYPE = COMPLEX option in MPlus. The data set included 6.61% missing values. Little's (1988) MCAR test showed that data were not missing completely at random, $\chi^2(437) = 940.014$, $p < .001$. However, because the reason for missing values was either students' absence from school on the day of data collection or their choice to skip single items, the data were considered to be missing at random (MAR). Therefore, the Full-Information-Maximum-Likelihood (FIML) procedure was used in all

analyses to handle missing data (Enders, 2010). The FIML uses all information in the data without imputing missing values.

The overall goodness-of-fit of the tested models was evaluated with the χ^2 test. The p value of χ^2 test should be greater than .05. However, as the χ^2 test is sensitive to a large sample size ($N = 1327$ in the present study) and due to the non-normality of the data, the following fit indexes were also used: Comparative Fit Index (CFI; Bentler, 1990), Tucker-Lewis Index (TLI; Tucker & Lewis, 1973), Root Mean Square Error of Approximation (RMSEA; Steiger, 1990) with a 90% confidence interval, and Standardized Root Mean Square Error (SRMR; Hu & Bentler, 1995). Values smaller than 0.06 for RMSEA and 0.08 for the SRMR, and values higher than 0.95 for both the TLI and the CFI, were considered representative of a well-fitting model to the data (Hu & Bentler, 1999).

We next tested the superiority of the competing nested self-efficacy models (Models 1-4) by examining the Satorra-Bentler scaled χ^2 difference test (Satorra & Bentler, 2001). A significant χ^2 difference test denotes that the model with fewer degrees of freedom (i.e., fewer constraints) fits the data better, whereas a non-significant χ^2 difference test denotes that the model with greater degrees of freedom (i.e., more constraints) fits the data better.

After choosing the best self-efficacy model, we ran multigroup invariance comparison tests separately by gender and grade level. Group invariance was tested by comparing the fit of the baseline model (i.e., parameters of the model were freely estimated in all groups under investigation) to that of the constrained model (i.e., factor loadings constrained to be equal across the groups), using the Satorra-Bentler scaled χ^2 test (Satorra & Bentler, 2001). Given that the χ^2 test is sensitive to large sample sizes, we also used the change in CFI and RMSEA criteria (see McCallum, Browne & Cai, 2006; Cheung & Rensvold; 2002) to evaluate invariance. A change of less than or equal to -.01 in CFI (Cheung & Rensvold, 2002) and a change of less than +.015 in RMSEA (Chen, 2007) indicates that the hypothesis of invariance

of factor loadings or intercepts should not be rejected, even though the χ^2 test might indicate a significant result. Gender and grade level differences in the latent means of self-efficacy factors were examined using Wald's test (Muthén & Muthén, 1998-2012). Cohen's *d* was used as a measure of effect size of the mean differences (Cohen, 1988).

Finally, the relationship between the different levels of self-efficacy and reading fluency was examined using structural equation modeling. First, the factor structure of reading fluency was examined using CFA to determine whether the reading fluency measures indeed describe the same construct. Next, a model in which the different levels of self-efficacy and reading fluency were set to correlate was specified. Invariance in the strength of the associations between different specificity levels of self-efficacy and reading fluency was examined using multigroup invariance comparison tests separately both between and within genders and grade levels using the Satorra-Bentler scaled χ^2 test (Satorra & Bentler, 2001). Cohen's *q* was used as a measure of effect size for the differences in the correlations between level of self-efficacy measure and reading fluency (Cohen, 1988). Results are presented using standardized parameter estimates (i.e., the variances of the variables are fixed to one).

Results

Descriptive statistics for the observed reading self-efficacy and fluency variables are reported in Table 3 by gender and by grade level. In general, children reported high levels of reading self-efficacy. Intercorrelations among the self-efficacy and reading fluency variables for the full sample are presented in Table 4.

The Structure of Self-Efficacy in Reading

Table 5 presents the model descriptions and goodness-of-fit indexes for the competing self-efficacy models. The hypothesized three-factor model of self-efficacy (Model 1) fit the data well (χ^2 (24) = 59.038, $p < .001$). However, to confirm whether this fit the data best, we investigated three competing models. The unidimensional model (i.e., Model 2) did not fit the

data well. Both of the two-factor models (Models 3 and 4) had a better fit than Model 2; however, they did not reach the fit values of Model 1. Also, the Satorra-Bentler χ^2 tests showed that the best approximation with the data was achieved with Model 1 (Table 5). The best-fitting three-factor model of self-efficacy, representing specific, intermediate, and general level self-efficacy, is presented in Figure 2. All factor loadings and error variances were statistically significant. Correlations between the factors were positive and moderately high. The highest correlation was between intermediate and general level self-efficacy ($r =$ .67, $p < .001$). The lowest correlation was between specific and general level self-efficacy ($r = .39$, $p < .001$).

To confirm that the three-factor structure of reading self-efficacy was similar across gender and grade level, invariance comparisons were conducted. As shown in Table 6, factor loadings and intercepts could be set equal across genders and grade levels. The results suggest that the three-factor structure of reading self-efficacy is invariant between girls and boys and between students in Grades 2-5.

However, we did find differences in factor means between groups by gender and grade level (see Tables 6 and 7). Specifically, the mean of intermediate level self-efficacy differed between genders ($\chi^2(1) = 14.59$ $p < .001$) and grade levels ($\chi^2(9) = 111.94$ $p < .001$). Boys reported higher intermediate level self-efficacy than girls ($d = 0.25$), and older children reported higher intermediate level self-efficacy than younger children (means at each grade level differed at $p < .05$, $d_{range} = 0.21–0.74$, except for the mean between students in Grades 4 and 5)[2]. Mean differences by grade level were also found in the most specific level of self-efficacy: older children reported higher self-efficacy than younger children (means at each grade level differed at $p < .005$, $d_{range} = 0.22–0.88$)[3]. The effect sizes of these differences were large between students in Grade 2 and older students, and small to medium between students in other grade levels. Covariances were invariant across gender ($\chi^2(3) = 2.02$ $p =$

.57*)*. However, factor variances differed slightly with girls showing more variance in their responses than boys ($\chi^2(3)$ = 9.43 *p* = .03). Covariances and variances slightly differed between grade levels.

Associations Between Reading Self-Efficacy and Reading Fluency

To examine whether the self-efficacy factors were positively related to reading fluency as hypothesized, the correlations between self-efficacy factors and reading fluency were next calculated. Prior to this examination, the factor structure of reading fluency was examined and found to be satisfactory ($\chi^2(0)$ = 0, *p* < 0.001; RMSEA = .00, CFI = 1.00; TLI = 1.00; SRMR = .00, i.e., the model was a saturated model). The factor loadings were statistically significant and high (standardized loadings .92, .88, .84) and the residual variances were statistically significant and positive.

The associations between each level of self-efficacy and reading fluency factor were added to the model. The model showed a good fit to the data ($\chi^2(48)$ = 106.30, *p* < .001; RMSEA = .03, CFI = .99; TLI = .99; SRMR = .02). Associations between the different specificity levels of self-efficacy and reading fluency were all statistically significant (see Table 8.). The intermediate level self-efficacy had the strongest (*r* = .52, *p* < .001), and general level self-efficacy the weakest (*r* = .34, *p* < .001), association with reading fluency. However, the effect sizes of the differences were moderate between intermediate and specific level associations (*q* = 0.22), but small between intermediate and specific (*q* = 0.17) and general and specific (*q* = 0.05) level associations. Invariance comparisons indicated that the strength of the associations did not differ between girls and boys ($\chi^2(3)$ = 6.91, *p* = .07), but small differences were found between grade levels ($\chi^2(9)$ = 21.46 *p* = .011). However, after freeing the paths for Grade 2 children, the associations did not differ between students in Grades 3 to Grade 5 ($\chi^2(6)$ = 8.71, *p* = .19). The associations between self-efficacy and reading fluency by grade level are reported in Table 9.

The strength of the associations between self-efficacy and reading fluency varied according to specificity level of self-efficacy within genders ($\chi^2(2) = 125.07$, $p < .001$), as well as within each grade level (invariance comparisons within all grade levels $p < .001$)[4]. The intermediate level self-efficacy showed a stronger relationship to reading fluency compared to the specific and general level for girls and boys ($q = .37$, $q = .12$) and especially for second graders ($q = .37$, $q = .37$), but also for students in Grade 3 ($q = .10$, $q = .28$), Grade 4 ($q = .18$, $q = .21$), and Grade 5 ($q = .13$, $q = .13$). The specific level self-efficacy showed a moderately stronger relationship to reading fluency compared to the general level within girls and boys ($q = .25$) as well as slightly stronger within all grade levels ($q_{range} = .01-.18$).

Discussion

The purpose of this study was to examine the specificity of efficacy beliefs among primary school children and to investigate their relationship to reading fluency. Our analyses revealed three distinct but correlated types of children's reading self-efficacy: general, intermediate, and specific. These findings suggest that children's reading self-efficacy, at least in the Finnish context, consists of beliefs at various specificity levels. Some children may feel more efficacious for reading in general but may feel less so when confronted with an actual reading task. However, even though students' efficacy beliefs were distinguishable from one another, the beliefs at different specificity levels were positively correlated. Correlations between the self-efficacy factors were strongest between proximal levels of specificity. For example, general level self-efficacy correlated more strongly with intermediate than with specific level self-efficacy. In general, these findings support Bandura's (1997) theorizing that efficacy judgments are made at varying levels of specificity particularly in the context of children's primary school reading. These findings also corroborate previous empirical findings obtained with older students and in other domains (Bong, 2001, 2002; Bong & Hocevar, 2002). To our knowledge, this study is the first to

demonstrate that, even among students as young as second grade, efficacy beliefs in reading are interrelated but separable with regard to specificity level. Children can therefore be assumed to evaluate their own reading capabilities at varying levels of granularity.

We also found that children's efficacy beliefs were differentiated based on the specificity level regardless of their age or gender. Nevertheless, small differences in the strength of self-efficacy were found. It was somewhat unexpected that boys reported higher reading self-efficacy at the intermediate level than did girls, as previous research has primarily suggested that girls report higher reading self-efficacy (e.g., Smith et al., 2012; see also Huang, 2013). This prior research, however, targeted general beliefs and focused on reading comprehension. Our findings suggest that gender differences vary according to the level of specificity at which reading self-efficacy is measured. It seems from our findings that boys feel more self-efficacious in digital reading activities than do girls. Some evidence has suggested that boys engage more in digital reading activities (see Brozo et al. 2014), which may lead them to experience digital reading differently. Even so, the effect sizes were small to moderate, suggesting fairly modest differences between girls and boys. More research is needed before making any conclusive claims.

We also found age-related differences in the strength of self-efficacy. As expected, younger children reported lower intermediate and specific level self-efficacy than did older children. Given that the reading tasks presented to students were similar for all students, it is reasonable to expect younger children to have lower self-efficacy, in line with their developmental stage. Previous findings concerning age-related differences in children are somewhat inconsistent. Some studies have reported that older children show higher reading self-efficacy (Carroll & Fox, 2017; Shell et al., 1995) whereas others have found a decrease in reading self-efficacy across the school-age years (Smith et al., 2012). Others have found a curvilinear pattern indicating a decrease in self-efficacy after Grade 3 followed by a gradual

increase through Grade 6 (Hornstra et al., 2013). This previous work did not consider level of specificity in self-efficacy assessment, however. Our findings suggest that differences in the strength of self-efficacy depend not only on respondents' age, but also on the specificity level and context in which self-efficacy is being measured. Therefore, when considering developmental differences in the strength of self-efficacy, researchers should also consider these additional factors.

Consistent with few previous findings showing the association between self-efficacy and reading fluency (e.g., Carroll & Fox, 2017; Mercer et al., 2011), we found that self-efficacy was positively related to reading fluency. That is, children who believed in their capabilities to perform various reading tasks requiring fluent reading skills were more likely to be fluent readers. Of the three levels of specificity we examined, we found that intermediate level self-efficacy showed the strongest association to reading fluency. In other words, the more children believed in their capabilities in reading activities related to daily life, the better their reading fluency skills were. General level beliefs were less related to reading skills, in line with the findings from previous studies (e.g., Piercey, 2013). The strength of the associations between self-efficacy and reading fluency differed according to the level of specificity of the self-efficacy measure, and these associations differed in girls and boys as well as in all grade levels. Thus, our findings highlight that the specificity level at which self-efficacy is assessed also influences the relationship found between self-efficacy and reading skills. Our findings mirror those obtained in research with older students and in different domains (e.g., Bong, 2002a; Pajares & Miller, 1995; Usher & Pajares, 2009) as well as recent reviews (Talsma et al., 2018). Bandura (1997) underlined the importance of studying self-efficacy at a level of specificity that corresponds to the performance outcome of interest. As he noted, "sensitive measures of efficacy beliefs link operative capabilities to the levels of challenge in particular domains of functioning" (Bandura, 1997, p. 38).

This study offers another noteworthy extension to previous research. Research on reading motivation has focused primarily on reading comprehension as an outcome of interest. We extend that to the relatively understudied facet of reading fluency. To our knowledge, only one study has examined the association between efficacy beliefs and reading fluency in children in classes below Grade 5 (i.e., Carroll & Fox, 2017). Our findings confirm this pattern by showing that efficacy beliefs relate to reading fluency in early primary school grades. Reading fluency may be a context in which efficacy beliefs play an important role, especially in primary school, where fluency is a skill children are actively developing and increasingly aware of as they are asked to read aloud.

In addition, fluency development is largely guided by independent reading practice (self-teaching hypothesis; Share, 1995). Efficacy beliefs, which are related to the willingness, persistence, and effort one devotes to practicing the relevant skill, might therefore be especially important in developing reading fluency. Our self-efficacy measure was specifically designed to assess students' efficacy beliefs about their reading fluency. Therefore, another explanation for the relatively strong relationship between self-efficacy and reading fluency might be that we asked children to rate their confidence in activities specifically requiring fluent reading skills. As discussed, when children evaluate their general level self-efficacy they may have different tasks and subskills of reading in mind, which might not align with the targeted reading skills being assessed. Thus, extending the previous research by studying self-efficacy with more specific measures, which also more explicitly target the specific subskills of reading, such as fluency, could enrich our understanding of children's efficacy beliefs and their relation to reading.

The findings of this study have implications for teachers and practitioners. Efficacy beliefs were found to be related to reading fluency as early as Grade 2, indicating the need for early interventions to support positive self-efficacy and to prevent the vicious cycle of low

efficacy beliefs which can result in diminished reading practice. When the goal is to enhance reading fluency, supporting both self-efficacy and reading skills should be a priority. In addition, when teachers or practitioners are trying to understand and support the beliefs children hold about their capabilities as readers, it is important to consider the specificity level of efficacy beliefs. For example, students may feel self-efficacious in some reading tasks but not in reading more generally; therefore, asking students to gauge their self-efficacy at varying levels of specificity could help teachers to more explicitly support students' positive beliefs in those areas in which they lack confidence. The findings of this study suggest that children could benefit from those who encourage them in life's daily reading tasks. Providing positive feedback and supporting students' perceived capabilities to handle daily reading activities, in addition to encouraging independent reading, might raise children's confidence in those activities that in turn support their reading fluency (Aro et al., 2018; Butz & Usher, 2015).

In the future, studying children's reading self-efficacy at different levels of specificity could provide a richer picture of the function of these beliefs given that efficacy beliefs at different levels seem to show varying relationships to achievement, learning, and motivation. We should carefully consider how to operationalize self-efficacy, the specificity of the beliefs, and their correspondence to the studied reading context (see also Conradi, 2014; Klassen & Usher, 2010; Pajares, 1996). Longitudinal designs exploring the stability and development of self-efficacy in terms of these varying specificity levels, as well as the developmental dynamics between self-efficacy and reading fluency would enable a deeper understanding of patterns in self-efficacy development. For instance, specific measures seem to be more sensitive to fluctuations in efficacy beliefs than general measures (Bong, 2002b; Phan et al., 2017, see also Unrau et al. 2017). Thus, studying efficacy beliefs at various

specificity levels might better capture the developmental patterns in beliefs and in their relation to reading development.

We recognize some limitations in the present study. First, we studied the specificity of self-efficacy explicitly in the context of reading fluency; thus, the findings may not translate to other domains and skills. Children's efficacy beliefs may be less differentiated for unfamiliar skill areas and particularly those in which learners receive less feedback on their performance. Second, we did not study reading performance at different specificity levels as we did for self-efficacy. Just as self-efficacy in reading can be measured at different levels, so can reading competence (i.e., in specific tasks or more generally such as in reading habits). In this study the focus was reading fluency which is best assessed with specific measures. However, further research would benefit from studying the relationships between different levels of self-efficacy and different reading outcomes. Third, the present study was based on cross-sectional data. Therefore, this study gives a snapshot of the structure of self-efficacy. Longitudinal studies examining the self-efficacy at various levels of specificity would lead to a better understanding of self-efficacy development. Finally, beliefs differ in different contexts and in relation to specific subskills. Determining specificity levels in self-efficacy measures is not a precise science. We recognize that a certain degree of overlap might be present in the self-efficacy measures assessed here. Moreover, it is hard to completely separate comprehension and fluency at the item level, especially as the practical purpose of independent reading is always related to meaning, and not simply rapid and accurate decoding.

The results of this research contribute to the larger body of work on academic self-efficacy by demonstrating that reading efficacy beliefs are differentiated by level of specificity among learners who are in the early years of schooling and that the association between self-efficacy and reading fluency depends on the level at which self-efficacy is

assessed. Thus, self-efficacy in young children should be studied with the specificity of the

construct in mind, as suggested by Bandura (1997) and other scholars.

Footnotes

[1] Finland continues to be a rather homogenous society in that socioeconomic and demographic differences are small compared to many other countries (see PISA 2015, at http://www.oecd.org/pisa). In the cities where this sample was collected, 95% of the population is Finnish speaking and the number of immigrants is low (3.2%). In addition, Finnish schools are relatively homogeneous: 96 percent of schools are publicly maintained (Official Statistics of Finland, 2017), and children attend the nearest public school to their home. In general in Finland, reading achievement varies little between schools and between classes (see PILRS, 2016 at http://timssandpirls.bc.edu/pirls2016/international-results/). In addition, the socioeconomic variation between schools is small (e.g. OECD, 2013). Given the provision of free, public education up to the university level, socioeconomic background variables tend to play less of a role in Finland than in many other countries.

[2] Supplemental material (the actual paragraphs) is available from the first author upon request.

[3] Results of the invariance comparison test across grade levels and effect sizes for all grade-level differences are available upon request from the first author.

[4] Effect sizes for all grade-level differences are available upon request from the first author.

References

Aro, M. (2004). *Learning to read: The effect of orthography.* (Doctoral dissertation, University of Jyväskylä). Retrieved from http://urn.fi/URN:ISBN:951-39-1722-3

Aro, T., Viholainen, H., Koponen, T., Peura, P., Räikkönen, E., Salmi, P., Sorvo, R., & Aro, M. (2018). Can reading fluency and self-efficacy of reading fluency be enhanced with an intervention targeting the sources of self-efficacy? *Learning and Individual Differences*, *67*, 53-66. doi.org/10.1016/j.lindif.2018.06.009

Bandura, A., (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.

Bandura, A., (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents*, (pp. 307–337). Greenwich, CT: Information Age Publishing.

Bandura, A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (2001). Self-efficacy beliefs as shapers of children's aspirations and career trajectories. *Child Development*, 187–206.

Baker, L., & Wigfield, A. (1999). Dimensions of children's motivation for reading and their relations to reading activity and reading achievement. *Reading Research Quarterly*, *34*(4), 452–477. http://www.jstor.org/stable/748216

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *107*(2), 238.

Bong, M. (1997). Generality of academic self-efficacy judgments: Evidence of hierarchical relations. *Journal of Educational Psychology*, *89*(4), 696.

Bong, M. (2001). Role of self-efficacy and task-value in predicting college students' course performance and future enrollment intentions. *Contemporary Educational Psychology*, *26*(4), 553-570. doi: 10.I037//0022-0663.93.1.23

Bong, M. (2002a). Predictive utility of subject-, task-, and problem-specific self-efficacy judgments for immediate and delayed academic performances. *The Journal of*

Experimental Education, *70*(2), 133–162.

Bong, M. (2002b). Stability and structure of self-efficacy, task-value, and achievement goals and consistency of their relations across specific and general academic contexts and across the school year. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA. Report retrieved from http://files.eric.ed.gov/fulltext/ED470665.pdf

Bong, M. (2006). Asking the right question: How confident are you that you could successfully perform these tasks. In F. Pajares & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents*, 287-305. Greenwich, CT: Information Age Publishing.

Bong, M., & Hocevar, D. (2002). Measuring self-efficacy: Multitrait-multimethod comparison of scaling procedures. *Applied Measurement in Education*, *15*(2), 143–171.

Bong, M., & Skaalvik, E. M. (2003). Academic self-concept and self-efficacy: How different are they really? *Educational Psychology Review, 15*(1), 1–40.

Brozo, W. G., Sulkunen, S., Shiel, G., Garbe, C., Pandian, A., & Valtin, R. (2014). Reading, gender, and engagement. *Journal of Adolescent & Adult Literacy*, *57*(7), 584-593. doi:10.1002/jaal.291

Bruning, R., Dempsey, M., Kauffman, D. F., McKim, C., & Zumbrunn, S. (2013). Examining dimensions of self-efficacy for writing. *Journal of Educational Psychology*, *105*(1), 25. doi: 10.1037/a0029692

Butz, A. R., & Usher, E. L. (2015). Salient sources of early adolescents' self-efficacy in two domains. *Contemporary Educational Psychology*, *42*, 49–61. doi:10.1016/j.cedpsych.2015.04.001

Carroll, J. M., & Fox, A. C. (2017). Reading self-efficacy predicts word reading but not comprehension in both girls and boys. *Frontiers in Psychology*, *7*. doi:10.3389/fpsyg.2016.02056

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling*, *14*(3), 464-504. doi: 10.1080/10705510701301834

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, *9*(2), 233-255. doi: 10.1207/S15328007SEM0902_5

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Erlbaum.

Conradi, K., Jang, B. G., & McKenna, M. C. (2014). Motivation terminology in reading research: A conceptual review. *Educational Psychology Review*, *26*(1), 127–164. doi: 10.1007/s10648-013-9245-z

Enders, C. K. (2010). *Applied missing data analysis*. New York, NY: Guilford Publications.

Galla, B. M., Wood, J. J., Tsukayama, E., Har, K., Chiu, A. W., & Langer, D. A. (2014). A longitudinal multilevel model analysis of the within-person and between-person effect of effortful engagement and academic self-efficacy on academic performance. *Journal of School Psychology*, *52*(3), 295–308. doi:10.1016/j.jsp.2014.04.001

Guthrie, J. T., Coddington, C. S., & Wigfield, A. (2009). Profiles of reading motivation among African American and Caucasian students. *Journal of Literacy Research*, *41*(3), 317-353. doi.org/10.1080/10862960903129196

Guthrie, J. T., Hoa, A. L. W., Wigfield, A., Tonks, S. M., Humenick, N. M., & Littles, E. (2007). Reading motivation and reading comprehension growth in the later elementary years. *Contemporary Educational Psychology*, *32*(3), 282–313. doi:10.1016/j.cedpsych.2006.05.004

Harter, S. (2012). *The construction of the self: Developmental and sociocultural foundations*. New York, NY: Guilford Press.

Henk, W. A., & Melnick, S. A. (1998). Upper elementary-aged children's reported

perceptions about good readers: A self-efficacy influenced update in transitional

literacy contexts. *Literacy Research and Instruction*, *38*(1), 57-80.

doi:10.1080/19388079809558277

Ho, A. N., & Guthrie, J. T. (2013). Patterns of association among multiple motivations and

aspects of achievement in reading. *Reading Psychology*, *34*(2), 101-147.

doi.org/10.1080/02702711.2011.596255

Hornstra, L., van der Veen, I., Peetsma, T., & Volman, M. (2013). Developments in

motivation and achievement during primary school: A longitudinal study on group-

specific differences. *Learning and Individual Differences*, *23*, 195-204.

https://doi.org/10.1016/j.lindif.2012.09.004

Hu, L. T., & Bentler, P. M. (1995). Evaluating model fit. In R. Hoyle (Ed.), *Structural

equation modeling: Issues, concepts, and applications* (pp. 76–99). Newbury Park, CA:

Sage.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure

analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling:

A Multidisciplinary Journal*, *6*(1), 1–55.

Huang, C. (2013). Gender differences in academic self-efficacy: A meta-analysis. *European

Journal of Psychology of Education*, *28*(1), 1–35. doi: 10.1007/s10212-011-0097-y

Joët, G., Usher, E. L., & Bressoux, P. (2011). Sources of self-efficacy: An investigation of

elementary school students in France. *Journal of educational psychology*, *103*(3), 649.

doi: 10.1037/a0024048

Klassen, R. M., & Usher, E. L. (2010). Self-efficacy in educational settings: Recent research

and emerging directions. In Urdan, T. C., & Karabenick, S. A. (Eds.). (2010). *The

decade ahead: Theoretical perspectives on motivation and achievement* (pp. 1-33).

Emerald Group Publishing Limited.

Kim, Y. S., Petscher, Y., Schatschneider, C., & Foorman, B. (2010). Does growth rate in oral reading fluency matter in predicting reading comprehension achievement? *Journal of Educational Psychology*, *102*(3), 652. doi: 10.1037/a0019643

Kuhn, M. R., & Stahl, S. A. (2003). Fluency: A review of developmental and remedial practices. *Journal of educational psychology*, *95*(1), 3.

LaBerge, D., & Samuels, S. J. (1974). Toward a theory of automatic information processing in reading. *Cognitive psychology*, *6*(2), 293-323.

Landerl, K., Wimmer, H., & Frith, U. (1997). The impact of orthographic consistency on dyslexia: A German–English comparison. *Cognition*, *63*(3), 315–334. doi:10.1016/S0010-0277(97)00005-X

Lee, Y. S., & Jonson-Reid, M. (2016). The Role of Self-Efficacy in Reading Achievement of Young Children in Urban Schools. *Child and Adolescent Social Work Journal*, *33*(1), 79-89. doi: 10.1007/s10560-015-0404-6

Lee, J., & Zentall, S. S. (2015). Reading motivation and later reading achievement for students with reading disabilities and comparison groups (ADHD and typical): A 3-year longitudinal study. *Contemporary Educational Psychology*. Advance online publication. doi: 10.1016/j.cedpsych.2015.11.001

Liew, J., McTigue, E. M., Barrois, L., & Hughes, J. N. (2008). Adaptive and effortful control and academic self-efficacy beliefs on achievement: A longitudinal study of 1st through 3rd graders. *Early Childhood Research Quarterly*, *23*(4), 515-526. doi: doi.org/10.1016/j.ecresq.2008.07.003

Lindeman, J. (1998). ALLU: Ala-asteen Lukutesti [ALLU: Reading test for elementary school]. Turku, Finland: University of Turku. *Center for Learning Research*.

Little, R. J. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*, *83*(404), 1198–1202.

Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling*, *9*(2), 151–173. doi:10.1207/S15328007SEM0902_1

MacCallum, R. C., Browne, M. W., & Cai, L. (2006). Testing differences between nested covariance structure models: Power analysis and null hypotheses. *Psychological Methods*, *11*(1), 19. doi: 10.1037/1082-989X.11.1.19

Mercer, S. H., Nellis, L. M., Martínez, R. S., & Kirk, M. (2011). Supporting the students most in need: Academic self-efficacy and perceived teacher support in relation to within-year academic growth. *Journal of School Psychology*, *49*(3), 323-338. doi.org/10.1016/j.jsp.2011.03.006

Muthen, L., & Muthen, B. (1998–2012). Mplus user's guide. Los Angeles, CA: author.

Määttä, E., Järvelä, S., & Perry, N. (2016). Personal and contextual contributors to young children's activity-based perceived self-efficacy. *Scandinavian Journal of Educational Research*, *60*(4), 417-434. doi.org/10.1080/00313831.2015.1024161

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research*, *66*(4), 543–578.

Pajares, F., & Miller, M. D. (1995). Mathematics self-efficacy and mathematics performances: The need for specificity of assessment. *Journal of Counseling Psychology*, *42*(2), 190. doi:10.1037/0022-0167.42.2.190

Phan, H. P., Ngu, B. H., & Alrashidi, O. (2017). Contextualised self-beliefs in totality: an integrated framework from a longitudinal perspective. *Educational Psychology*, 1-24. doi: 10.1080/01443410.2017.1356446

Piercey, R. R. (2013). *Reading self-efficacy in early adolescence: Which measure works best?* (Doctoral dissertation, University of Kentucky). Retrieved from http://uknowledge.uky.edu/edp_etds/10

Pikulski, J. J., & Chard, D. J. (2005). Fluency: Bridge between decoding and reading comprehension. *The Reading Teacher*, *58*(6), 510-519.

Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, *82*(1), 33. http://dx.doi.org/10.1037/0022-0663.82.1.33

Salmi, P., Eklund, K., Järvisalo, E., & Aro, M. (2011). LukiMat-Oppimisen arviointi. *Käyttäjän opas*.[A screening tool of reading and spelling for Grade 2. User's manual.] Jyväskylä: Niilo Mäki Institute.

Satorra, A., & Bentler, P. M. (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika, 66*, 507–514. doi:10.1007/BF02296192.

Schnell, K., Ringeisen, T., Raufelder, D., & Rohrmann, S. (2015). The impact of adolescents' self-efficacy and self-regulated goal attainment processes on school performance: Do gender and test anxiety matter? *Learning and Individual Differences*, *38*, 90–98. doi:10.1016/j.lindif.2014.12.008

Schunk, D. H. (1991). Self-efficacy and academic motivation. *Educational Psychologist*, *26*(3–4), 207–231.

Schunk, D. H., & Meece, J. L. (2006). Self-efficacy development in adolescence. In F. Pajares & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents*, (pp. 71-96). Greenwich, CT: Information Age Publishing.

Schunk, D. H., & Rice, J. M. (1991). Learning goals and progress feedback during reading comprehension instruction. *Journal of Literacy Research*, *23*(3), 351–364.

Schunk, D. H., & Rice, J. M. (1993). Strategy fading and progress feedback effects on self-efficacy and comprehension among students receiving remedial reading services. *The Journal of Special Education*, *27*(3), 257–276.

Schüller, E. M., Birnbaum, L., & Kröner, S. (2017). What Makes Elementary School

Students Read in Their Leisure Time? Development of a Comprehensive

Questionnaire. *Reading Research Quarterly*, *52*(2), 161-175. doi:10.1002/rrq.164

Seymour, P. H., Aro, M., & Erskine, J. M. (2003). Foundation literacy acquisition in

European orthographies. *British Journal of Psychology*, *94*(2), 143-174.

Share, D. L. (1995). Phonological recoding and self-teaching: Sine qua non of reading

acquisition. *Cognition*, *55*(2), 151–218. doi:10.1016/0010-0277(94)00645-2

Shell, D. F., Colvin, C., & Bruning, R. H. (1995). Self-efficacy, attribution, and outcome

expectancy mechanisms in reading and writing achievement: Grade-level and

achievement-level differences. *Journal of Educational Psychology*, *87*(3), 386. doi:

10.1037/0022-0663.87.3.386

Smith, J. K., Smith, L. F., Gilmore, A., & Jameson, M. (2012). Students' self-perception of

reading ability, enjoyment of reading and reading achievement. *Learning and

Individual Differences,* *22*(2), 202-206. doi:10.1016/j.lindif.2011.04.010

Solheim, O. J. (2011). The impact of reading self-efficacy and task value on reading

comprehension scores in different item formats. *Reading Psychology*, *32*(1), 1-27.

doi.org/10.1080/02702710903256601

Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation

approach. *Multivariate Behavioral Research,* *25*, 173–180.

Street, K. E. S., Malmberg, L. E., & Stylianides, G. J. (2017). Level, strength, and facet-

specific self-efficacy in mathematics test performance. *ZDM*, *49*(3), 379-395.

Talsma, K., Schüz, B., Schwarzer, R., & Norris, K. (2018). I believe, therefore I achieve (and

vice versa): A meta-analytic cross-lagged panel analysis of self-efficacy and academic

performance. *Learning and Individual Differences*, *61*, 136-150.

doi:10.1016/j.lindif.2017.11.015

Troyer, M. (2017). A Mixed-Methods Study of Adolescents' Motivation to Read. *Teachers*

College Record, 119(5).

Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, *38*(1), 1–10.

Unrau, N. J., Rueda, R., Son, E., Polanin, J. R., Lundeen, R. J., & Muraszewski, A. K. (2017). Can Reading Self-Efficacy Be Modified? A Meta-Analysis of the Impact of Interventions on Reading Self-Efficacy. *Review of Educational Research*, *88*(2), 167–204. doi.org/10.3102/0034654317743199

Usher, E. L., & Pajares, F. (2009). Sources of self-efficacy in mathematics: A validation study. *Contemporary Educational Psychology*, *34*(1), 89-101. doi:10.1016/j.cedpsych.2008.09.002

OECD (2016). *PISA 2015 Results (Volume I): Excellence and Equity in Education.* PISA, OECD Publishing, Paris. doi: 10.1787/9789264266490-en

Wigfield, A., & Guthrie, J. T. (1997). Relations of children's motivation for reading to the amount and breadth or their reading. *Journal of Educational Psychology*, *89*(3), 420.

Wigfield, A., Guthrie, J. T., Tonks, S., & Perencevich, K. C. (2004). Children's motivation for reading: Domain specificity and instructional influences. *Journal of Educational Research*, *97*, 299–309. doi:10.3200/JOER.97.6.299-310

Wilson, K. M., & Trainin, G. (2007). First-grade students' motivation and achievement for reading, writing, and spelling. *Reading Psychology*, *28*(3), 257-282.

Woodcock, R. W., McGrew, K. S., & Mather, N. (2001). *Woodcock-Johnson tests of achievement*. Itasca, IL: Riverside Publishing.

Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self-motivation for academic attainment: The role of self-efficacy beliefs and personal goal setting. *American Educational Research Journal*, *29*(3), 663–676

Ziegler, J. C., Perry, C., Ma-Wyatt, A., Ladner, D., & Schulte-Körne, G. (2003).

Developmental dyslexia in different languages: Language-specific or universal? *Journal of experimental child psychology*, *86*(3), 169-193. doi:10.1016/S0022-0965(03)00139-5

Table 1

Examples of Reading Self-Efficacy Items Used in Studies With Children

Specificity level	Example items	Measure	Examples of studies with primary or secondary school children
General level self-efficacy	• "Please rate how certain you are that you … *can learn reading, writing, and language skills*?" • "*I know that I will do well in reading next year.*" • "*I am a good reader.*"	Children's Self-efficacy Scale, Bandura, 2006 MRQ (Self-efficacy subscale), Baker & Wigfield, 1999	Bandura, Barbaranelli, Caprara, & Pastorelli, 2001 Lau, 2009; Wigfield et al., 2004; Baker & Wigfield, 1999
	• "How confident are you that you can learn to be a good reader?" • "In general, how confident are you in your abilities in reading?"	-	Piercey, 2013
	• "How good are you at reading?"	-	Smith, Smith, Gilmore & Jameson, 2012
Intermediate level self-efficacy	• "Indicate how sure you are that you … can read a letter from a friend/read the daily newspaper?" (task subscale)	-	Shell, Colvin & Bruning, 1995
	• "How confident are you that you can … understand all the words on a page in one of your schoolbooks? …read and understand the newspaper?"	-	Piercey, 2013
	• "Rate how certain you are that you can … read out loud in front of class?"	-	Carroll & Fox, 2017
	• "Can you figure out hard words when reading?"	-	Guthrie, Coddington, & Wigfield, 2009
Specific level self-efficacy	• Reading comprehension tasks presented for participants. • Students are subsequently asked to judge their capability of correctly answering those questions.	-	Schunk & Rice, 1991, 1993
	• Long reading passages followed by multiple problems. Students rated how confident they were to correctly solve problems presented.	-	Bong & Hocevar, 2002*

Note. Asterisk denotes high school student participants.

Table 2

Items in the Reading Self-Efficacy Scale

Reading self-efficacy	How certain are you that you can…	Cronbach's alpha
General level: SE for Learning to Read Fluently	…learn to read faster? (GEN1) …learn to read so that you make fewer mistakes? (GEN2) …learn to read so that you understand everything you read? (GEN3)	.79
Intermediate level: SE for Daily Reading Activities	…read all the subtitles of a TV program easily? (INT1) …read long texts on the Internet? (INT2) …easily read a long book? (INT3)	.70
Specific level: SE for Reading Specific Paragraphs	…read this paragraph aloud in 30 seconds? (8 paragraphs of varying lengths) (SPES3-SPES10)	.93

Note. Original items were presented in Finnish. SE = self-efficacy.

Table 3

Descriptive Statistics of Observed Variables by Gender and Grade Level

Variable	Girls (*n* = 638) *M* (*SD*)	Boys (*n* = 689) *M* (*SD*)	Grade 2 (*n* = 178) *M* (*SD*)	Grade 3 (*n* = 471) *M* (*SD*)	Grade 4 (*n* = 383) *M* (*SD*)	Grade 5 (*n* = 295) *M* (*SD*)
Self-efficacy[a]						
General SE 1	6.32 (1.11)	6.29 (1.04)	6.22 (1.31)	6.35 (1.10)	6.27 (1.09)	6.27 (0.99)
General SE 2	6.22 (1.10)	6.15 (1.10)	6.29 (1.09)	6.20 (1.10)	6.17 (1.13)	6.16 (1.06)
General SE 3	5.96 (1.21)	5.98 (1.10)	6.30 (1.01)	5.99 (1.18)	5.98 (1.27)	5.95 (1.16)
Intermediate SE 1	6.22 (1.34)	6.45 (1.10)	5.17 (1.93)	6.14 (1.40)	6.39 (1.15)	6.58 (0.92)
Intermediate SE 2	6.13 (1.32)	6.43 (1.01)	5.92 (1.57)	6.16 (1.31)	6.37 (1.08)	6.39 (1.06)
Intermediate SE 3	5.22 (1.70)	5.22 (1.62)	4.87 (2.12)	5.16 (1.70)	5.21 (1.68)	5.33 (1.53)
Specific SE 3	6.47 (1.15)	6.52 (1.07)	5.43 (1.98)	6.28 (1.34)	6.58 (0.94)	6.73 (0.80)
Specific SE 4	6.08 (1.45)	6.18 (1.32)	4.96 (2.14)	5.84 (1.62)	6.22 (1.21)	6.48 (1.03)
Specific SE 5	5.48 (1.68)	5.53 (1.66)	4.19 (2.24)	5.17 (1.87)	5.56 (1.57)	5.98 (1.30)
Specific SE 6	4.94 (1.82)	4.86 (1.88)	3.62 (2.22)	4.53 (1.94)	4.94 (1.80)	5.43 (1.60)
Specific SE 7	4.24 (1.95)	4.21 (1.98)	3.20 (2.16)	3.88 (2.00)	4.26 (1.93)	4.74 (1.83)
Specific SE 8	3.60 (1.94)	3.53 (1.97)	2.82 (2.10)	3.24 (1.99)	3.56 (1.89)	4.05 (1.88)
Specific SE 9	3.07 (1.87)	3.00 (1.93)	2.43 (1.95)	2.80 (1.91)	3.03 (1.84)	3.42 (1.91)
Specific SE 10	2.55 (1.82)	2.34 (1.78)	2.11 (1.93)	2.26 (1.77)	2.45 (1.76)	2.70 (1.86)
Reading fluency						
Word reading[b]	93.33 (41.60)	83.34 (40.82)	44.73 (26.06)	72.78 (29.43)	99.50 (35.28)	123.53 (37.67)
Sentence reading[c]	30.47 (11.17)	29.02 (11.17)	18.21 (7.15)	26.38 (8.21)	32.52 (9.77)	38.29 (10.99)
Text reading[d]	114.64 (37.26)	109.95 (36.24)	77.08 (33.76)	104.39 (31.69)	120.29 (32.49)	135.73 (30.87)

Note. SE = self-efficacy. [a] 7-point scale. [b] Word chain test (Lindeman, 1998) max. score = 214. [c] Sentence verification test (Salmi, Eklund, Järvisalo, & Aro, 2011) max. score = 70. [d] Text reading task (Salmi et al., 2011) max. score = 251.

Table 4

*Intercorrelations Between Reading Self-Efficacy and Reading Fluency Variables for the Full Sample (*N = 1327*)*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. General SE 1	-															
2. General SE 2	.60	-														
3. General SE 3	.46	.52	-													
4. Intermediate SE 1	.31	.29	.34	-												
5. Intermediate SE 2	.34	.37	.35	.50	-											
6. Intermediate SE 3	.31	.36	.33	.41	.41	-										
7. Specific SE 3	.21	.22	.18	.41	.38	.33	-									
8. Specific SE 4	.29	.26	.23	.43	.38	.38	.82	-								
9. Specific SE 5	.28	.27	.21	.42	.36	.40	.70	.84	-							
10. Specific SE 6	.28	.29	.21	.41	.32	.41	.59	.74	.88	-						
11. Specific SE 7	.28	.28	.22	.38	.31	.41	.50	.64	.79	.89	-					
12. Specific SE 8	.25	.28	.21	.31	.27	.38	.41	.54	.70	.81	.91	-				
13. Specific SE 9	.22	.25	.19	.27	.23	.33	.32	.45	.61	.71	.82	.90	-			
14. Specific SE 10	.16	.20	.18	.21	.17	.28	.22	.33	.47	.58	.68	.76	.86	-		
15. Word reading[a]	.20	.22	.15	.29	.23	.24	.26	.29	.30	.29	.29	.25	.23	.19	-	
16. Sentence reading[b]	.22	.24	.17	.31	.27	.28	.26	.29	.29	.28	.27	.25	.23	.19	.70	-
17. Text reading[c]	.22	.24	.17	.38	.28	.31	.27	.30	.32	.30	.30	.27	.26	.20	.64	.69

Note. All correlations are significant at $p < .001$. SE = self-efficacy. [a] Word chain test (Lindeman, 1998). [b] Sentence verification test (Salmi, Eklund, Järvisalo, & Aro, 2011). [c] Text reading task (Salmi et al., 2011).

Table 5

Fit Indices of the Competing Self-Efficacy Models and Comparisons of the Models

Model	χ^2	df	CFI	TLI	RMSEA 90%. C.I.	SRMR	Model comparisons	χ^2 difference test[a]
1. Three correlated first-order factors	57.53***	24	.99	.99	0.03 0.02–0.04	0.02	-	
2. One first-order factor	781.75***	27	.81	.74	0.15 0.14–0.16	0.15	1 vs 2	$\chi^2(3) = 311.72$***
3. Two correlated first-order factors	390.94***	26	.92	.89	0.10 0.09–0.11	0.11	3 vs 1 3 vs 2	$\chi^2(2) = 130.76$*** $\chi^2(1) = 196.89$***
4. Two correlated first-order factors	275.64***	26	.94	.92	0.09 0.08-0.10	0.06	4 vs 1 4 vs 2	$\chi^2(2) = 403.66$*** $\chi^2(1) = 78.35$***

[a] The model is improved if $p < .05$.

***$p < .001$.

Table 6

Invariance Comparisons of Specificity of Self-Efficacy of Reading by Gender and by Grade Level

Model	χ^2	df	CFI	TLI	RMSEA 90%. C.I.	SRMR	χ^2 difference test[a]	ΔCFI / ΔRMSEA
Invariance by gender								
1. Unconstrained	76.572	48	.994	.990	0.031 0.017-0.043	0.03	-	-
2. Factor loadings equal	93.454	54	.991	.988	0.034 0.022-0.045	0.04	$\chi^2(6)= 16.73, p = .010$	-0.003 / +0.003
3. Factor loadings & intercepts equal	113.333	60	.988	.986	0.037 0.027-0.048	0.05	$\chi^2(6)=27.16, p < .001$	-0.003 / +0.003
4. Factor loadings, intercepts & factor means equal	129.783	63	.985	.983	0.041 0.031-0.051	0.06	$\chi^2(3)=19.27, p < .001$	-0.003 / +0.004
5. Factor loadings, intercepts, factor means, & factor variances and covariances equal	142.08	69	.983	.983	0.041 0.031-0.050	0.11	$\chi^2(6)=12.31, p = .055$	-0.002 / +0.000
Invariance by grade level								
1. Unconstrained	179.992	96	.985	.977	0.052 0.040-0.064	0.04	-	-
2. Factor loadings equal	215.149	114	.982	.977	0.053 0.042-0.063	0.07	$\chi^2(18)= 34.99, p = .009$	-0.003 / +0.001
3. Factor loadings & intercepts equal	274.636	132	.975	.972	0.058 0.048-0.068	0.08	$\chi^2(18)=62.15, p < .001$	-0.007 / +0.005
4. Factor loadings, intercepts & factor means equal	365.495	141	.960	.959	0.071 0.062-0.080	0.11	$\chi^2(9)=69.20, p < .001$	-0.015 / +0.013
5. Factor loadings, intercepts, & factor variances and covariances equal	321.888	150	.969	.971	0.060 0.051-0.069	0.15	$\chi^2(18)=44.48, p < .001$[b]	-0.006 / +0.002 [b]

Note. Where χ^2 difference test and ΔCFI / ΔRMSEA are reported, the model was compared to the previous, less constrained model.

[a]The model is improved if $p < .05$.

[b]Invariance comparison to Model 3.

Table 7

Wald Test Results Comparing Self-Efficacy Latent Means by Grade Level

Grade Comparisons	General Level Self-Efficacy		Intermediate Level Self-Efficacy		Specific Level Self-Efficacy	
	Wald	Cohen's *d*	Wald	Cohen's *d*	Wald	Cohen's *d*
Grade 2 vs 3	1.81	0.14	9.37**	0.40	18.29***	0.47
Grade 2 vs 4	3.17	0.19	17.43***	0.59	39.29***	0.63
Grade 2 vs 5	3.52	0.21	21.08***	0.74	71.67***	0.88
Grade 3 vs 4	0.38	0.05	6.07*	0.21	9.78**	0.22
Grade 3 vs 5	0.59	0.04	12.80***	0.36	42.59***	0.49
Grade 4 vs 5	0.03	0.01	1.98	0.14	12.31***	0.28

Note. SE = self-efficacy.

p < .05, **p* < .01, ***p* < .001.

Table 8

Correlations Between the Specificity Levels of Self-Efficacy and Reading Fluency for the Full Sample (N = 1327)

	Factor	1	2	3
1.	Specific level self-efficacy	-		
2.	Intermediate level self-efficacy	.60	-	
3.	General level self-efficacy	.39	.67	-
4.	Reading fluency[a]	.38	.52	.34

Note. All correlations are significant at $p < .001$.

[a]Reading fluency scores standardized within grade level.

Table 9

Correlations Between the Specificity Levels of Self-Efficacy and Reading Fluency by Grade Level

	Factor	1.	2.	3.	4.
1.	Specific level self-efficacy	-	.63 /.62	.37 /.40	.29 /.42
2.	Intermediate level self-efficacy	.53 /.41	-	.83 /.66	.59 /.50
3.	General level self-efficacy	.49 /.41	.69 /.75	-	.30 /.27
4.	Reading fluency	.42 /.41	.56 /.51	.39 /.41	-

Note. Correlations above the diagonal are for students in Grade 2 ($n = 178$) and 3 ($n = 471$), correlations below the diagonal are for students in Grade 4 ($n = 383$) and 5 ($n = 295$). All correlations are significant at $p < .001$.
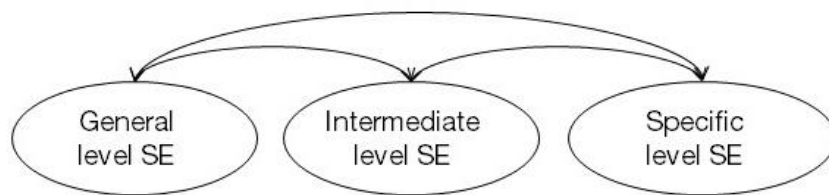
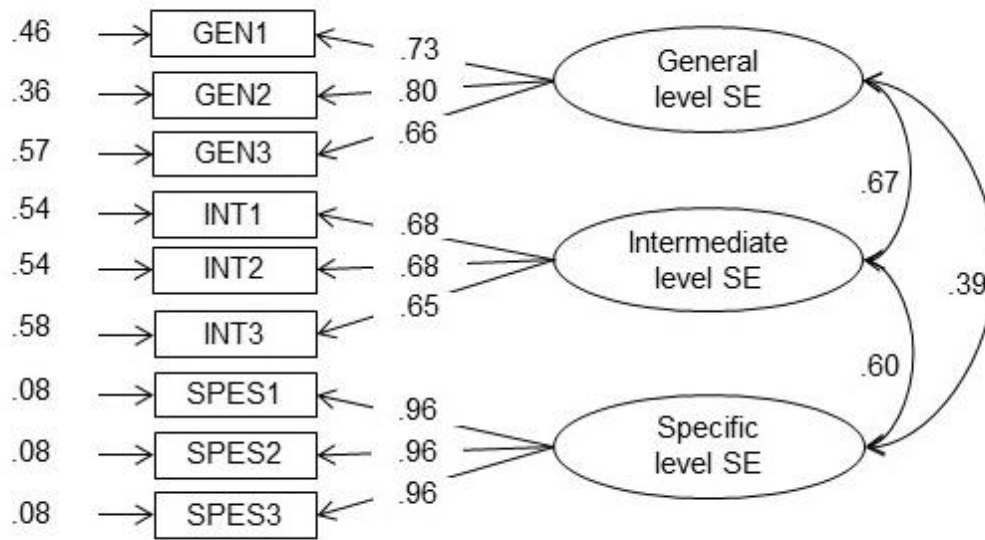*Figure 1*. Hypothesized Three-factor Model of Reading Self-efficacy. SE = self-efficacy

Figure 2. Three-factor Structure of Reading Self-efficacy. Standardized estimates are presented. All estimates are significant at p < .001. SE = self-efficacy.