# Chapter 8
# Children's Academic Self-efficacy in Reading and Reading Development—From Theory to Practice


**Pilvi Peura, Tuija Aro, Eija Räikkönen, Helena Viholainen, and Mikko Aro**

**Abstract** Self-efficacy has been found to be an important predictor of various learning-related outcomes. In this chapter, we focus on the role of academic self-efficacy in the context of reading among school-aged children. We first discuss measurement of reading self-efficacy both theoretically and in the light of recent empirical findings. We then turn on reviewing how reading self-efficacy contributes to reading achievement and development and focus on the variations in this relationship. Recent findings on how reading self-efficacy changes and develops over time as well as the varying role of the four theorized sources of self-efficacy in this development are being discussed. Finally, we look more closely on how reading self-efficacy can be intervened as a part of reading support by explicitly targeting the four sources of self-efficacy. The chapter concludes with suggestions for future research on children's academic self-efficacy in reading. Increased understanding of the individual processes in reading self-efficacy development seems to be needed to better address the needs of different groups of students with differentiated instruction.

**Keywords** Self-efficacy · Sources of self-efficacy · Reading fluency · Primary school · Longitudinal · Person-centered approach

## Introduction

To become a fluent reader is a hallmark of primary school education and thus a pivotal academic skill. Later on, reading to learn is needed every day and everywhere in the modern world. Fluent reading skills can thus be seen as the *sine qua non* of all academic learning. Some children have more difficulty in gaining reading skills, and overall, children's interest in reading and their reading skills have been found to decrease in recent years. We know much about the cognitive factors that hamper or support reading development (Lyytinen et al., 2004). Recently, more attention has also been given to the non-cognitive factors, such as motivation, in this development

P. Peura (✉) · T. Aro · E. Räikkönen · H. Viholainen · M. Aro
University of Jyväskylä, Jyväskylä, Finland
e-mail: pilvi.i.peura@jyu.fi



M. S. Khine and T. Nielsen (eds.), *Academic Self-efficacy in Education*,
https://doi.org/10.1007/978-981-16-8240-7_8

(see Toste et al., 2020). In this chapter, we will focus specifically on the role of academic self-efficacy (ASE) in the context of reading. More specifically, ASE in reading refers to children's beliefs about their capabilities in reading. In this chapter, this specific part of ASE will be referred as reading self-efficacy.

The chapter begins with discussions on what kind of efficacy beliefs children actually have concerning reading and how these beliefs have been measured in primary school-aged children. Children's self-efficacy evaluations and their specificity are discussed both theoretically and in light of empirical findings in reading. We then focus on reviewing how reading self-efficacy is known to contribute to reading achievement and development. The role of self-efficacy for learning in different reading sub-skills is discussed, as efficacy beliefs may be differently related to different reading sub-skills. The next section describes what we know about how efficacy beliefs change over time, and the role of the four theorized sources of self-efficacy in this development is discussed. Finally, the possibilities to support children's reading self-efficacy as a part of reading instruction are considered, and implications for the practice are suggested. The chapter concludes with future considerations for ASE research in reading.

## Self-efficacy Evaluations in Reading

### *Specificity*

According to Bandura (1997), beliefs about our capabilities are context specific: that is, we hold multiple beliefs of our academic capabilities, which can vary across different skill areas (such as math or reading; Bong, 1997) but also within a skill or domain between different sub-skills (Shell et al., 1995). Hence, a child can believe in his/her skills in arithmetic but may lack that self-efficacy in geometry, for example. In addition, efficacy beliefs are assumed to also vary in *level* (i.e., level of task demand), *strength* (weak or strong) and *specificity* (generality; Bandura, 1997, p. 42). *Specificity,* which we will focus upon in more detail in this chapter, refers to the generality of self-efficacy beliefs—that is, a student can hold high efficacy beliefs in his/her capabilities in academic skills in general or hold high self-efficacy only in certain contexts or tasks. Bandura (1997) theorized that efficacy beliefs differ at three levels of specificity: general, intermediate and specific. The *general level* refers to beliefs about one's capabilities in general and can refer either to general academic efficacy beliefs, such as "I'm sure I can perform well at school," or to general beliefs in a certain skill area, such as "I'm sure I can perform well in reading." The *intermediate level* refers to beliefs regarding certain competencies or sub-skills, such as "I'm sure I can write a novel." The most *specific level* refers to beliefs in one's capability to perform a particular task, such as "I'm sure I can read this text." Correspondingly, people have varying beliefs about their capabilities, for example, in reference to math in general, certain math competencies or specific math tasks (e.g., Bong & Hocevar,

2002). Moreover, each of these beliefs is important to explore, as they may affect our functioning and skill development differently (Pajares & Miller, 1995). Although the conceptualization and methods of measurement of self-efficacy may affect its relationship to achievement, this has received less attention in reading research, as we discuss in the following section.

## *Measurement of Reading Self-efficacy*

Self-efficacy research is more plentiful in other skill areas, such as in math and science than in reading (Klassen & Usher, 2010). In reading studies, self-efficacy has been conceptualized in various ways, both in relation to different specificity levels and to operationalizations that come close to related constructs, such as self-concept. This somewhat complicates the integration of prior research findings. In the following, we will look more closely at the ways in which self-efficacy has been measured in prior studies in reading.

In most studies, children's reading self-efficacy is assessed by operationalizing self-efficacy as general-level beliefs in reading (e.g., Lee & Zentall, 2017; Smith et al., 2012). Similarly, many reading motivation scales include subscales of self-efficacy in which self-efficacy is conceptualized as general level self-efficacy (e.g., self-efficacy subscales of MRQ, Baker & Wigfield, 1999; YRMQ, Coddington & Guthrie, 2009). In some reading studies, self-efficacy has been assessed more broadly, in terms of ASE (Galla et al., 2014; Mercer et al., 2011), which refers to assessing whether students believe they are able to meet general academic demands. In few studies, the focus has been on more specific level beliefs in reading. In these studies, students are asked to rate 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), which can be understood to assess *intermediate level* beliefs. Even fewer attempts have been made to assess self-efficacy in relation to concrete reading tasks, that is, at the most *specific level*. Schunk and Rice (e.g., 1991, 1993) conducted small-scale studies in which they asked students to rate their self-efficacy in correctly answering each reading comprehension question shown to them.

As a result of the focus of the previous studies, our understanding of children's self-efficacy in reading seems to be based mostly on children's general level beliefs. This may affect the interpretations that are made of reading self-efficacy and therefore our understanding of the role of self-efficacy in relation to reading development. First, the way how general self-efficacy is operationalized has often strayed from the original theorization of self-efficacy articulated by Bandura (1997). Self-efficacy has been operationalized as students' perceived competence (e.g., "I am good reader"), or the focus has been on social comparison (e.g., "I learn more from reading than most students in the class"), rather than targeted future capabilities and self-referent evaluations (e.g., "I can learn to read") in line with the original conceptualization of self-efficacy (Bong, 2006). These operationalizations partly overlap with those of self-concept (Bong & Skaalvik, 2003). Self-efficacy researchers have repeatedly

criticized the use of incongruent operationalizations that do not follow the theoretical groundings of self-efficacy (Klassen & Usher, 2010; Schunk & DiBenedetto, 2020). Although self-efficacy and self-concept are closely related constructs and share many similarities, they are found to differ even from the beginning of the first school year (McTigue et al., 2019) and have some differences in the ways they affect learning (Bong & Skaalvik, 2003).

Second, it may be that not all children have well-formed beliefs of their general capabilities in reading. Rather, when children were interviewed about their beliefs regarding their capabilities as readers, they described their self-efficacy in relation to specific reading situations (Guthrie et al., 2007). It is suggested that the more specific evaluations develop first, and then, with increasing experience with texts and reading situations, these beliefs are later integrated into more general views of one's reading capabilities (Guthrie et al., 2007). In addition, when students are asked about their reading capabilities in general, they may have very different sub-skills of reading in mind, and these may differ from those assumed or intended by the researchers. Children are found to recall their capabilities to read fluently (Butz & Usher, 2015; Henk & Melnick, 1998) or their word-reading skills (Guthrie et al., 2007; Klauda et al., 2020) rather than their reading comprehension skills when they have evaluated their reading self-efficacy, whereas the outcome skill has often been reading comprehension skills. Therefore, it may be that children's self-efficacy evaluation and the outcome skill assessed by researchers have not fully corresponded. This is something that might be considered when interpreting the associations found between self-efficacy and reading skills. It is also possible that the variation with regard to the skills children have in mind when responding is the reason for the finding that general efficacy beliefs seem to be more miscalibrated or biased than more task-specific beliefs (Talsma et al., 2020).

We still have little understanding of whether children's beliefs differ at the various specificity levels, and whether and how the varying operationalizations affect our findings and conclusions of the functional role of reading self-efficacy. Recent findings indicate that children may have these varying beliefs about their capabilities from the age of 8 years onward (Peura et al., 2019b). That is, children may feel self-efficacious about their general reading capabilities (i.e., "I'm certain I can learn to read faster") but their intermediate-level beliefs (i.e., "I'm certain I can read a book") or their beliefs in specific reading tasks (i.e., "I'm certain I can read this text") may be different. In the following, we discuss the possibilities for how the specificity of self-efficacy may affect our interpretations of children's reading self-efficacy.

## *Gender- and Age-Related Differences in Reading Self-efficacy*

Differences in the strength of children's self-efficacy have been studied especially in relation to students' gender and age. Gender differences have received more attention, and in reading or, more broadly, in literacy activities, common assumption is that girls believe in their capabilities in these activities more than boys (see Huang,

2013). However, the empirical findings on gender differences show a more varied picture. Taking the studied specificity level of self-efficacy into consideration may offer some explanations for these inconsistent findings. Girls are found to have higher reading self-efficacy when general efficacy beliefs are assessed (Smith et al., 2012; Wigfield & Guthrie, 1997), whereas when children's specific efficacy beliefs related to reading tasks are evaluated, differences between girls and boys are not documented (Carroll & Fox, 2017; Piercey, 2013).One plausible explanation may be that gender role stereotypes or expectations, such as that "reading is for girls" (Nowicki & Lopata, 2017), are more evident when students make general level evaluations of their capabilities in reading. In these kinds of evaluations, children may focus more on relative ability comparisons, rather than when they make more specific evaluations of their capabilities in specific reading tasks. It may also be that general level evaluations are more influenced by whether one likes reading overall. When all three specificity levels were studied together, differences between boys and girls were not found either on the general or specific levels, but quite unexpectedly, boys had slightly higher intermediate level self-efficacy in reading than girls (Peura et al., 2019b). This finding favoring boys may relate to the fact that the intermediate level targeted self-efficacy in recreational reading activities and in digital reading (e.g., reading on the Internet), which may be contexts boys spent more time with and may thus feel more self-efficacious in.

Overall, differences between girls and boys are still found to be small. Therefore, looking at the individual variation across genders which might extend our understanding of reading self-efficacy might be a more fruitful approach for comprehending mechanisms behind the differences in reading self-efficacy. When the focus is on simple group differences, our attention may be drawn away from more relevant individual differences. Researchers should also be careful to interpret and translate findings to the public so as not to sustain and reinforce unnecessary gender expectations related to reading, but rather to help to reduce them. Continuous efforts on trying to identify risk factors that may expose children to low beliefs in their capabilities, and especially those factors on which we can and should place special emphasis in educational practices, are needed (Peura, 2021).

Children may evaluate their reading self-efficacy differently at varying ages. The few findings considering age-related differences have been inconsistent, possibly due to the varying operationalization of reading self-efficacy. When children's beliefs in specific reading tasks are evaluated, older children are found to have higher self-efficacy than younger children (Carroll & Fox, 2017; Peura et al., 2019b). Conversely, when general level efficacy beliefs in reading are assessed, an opposite pattern is found (Smith et al., 2012)—that is, younger children have higher reading self-efficacy. These findings seem reasonable, as the task-specific beliefs likely develop in tandem with the growing skills of children. General beliefs, on the other hand, come close to more general views of oneself and seem to follow observations of decline that are made in related constructs, such as in self-concept (Scherrer & Preckel, 2019). Whether the relation between self-efficacy and reading skills varies at different age phases needs still to be researched. Recent findings underline the

importance of reading-related beliefs to reading performances from the first years of schoolings (McTigue et al., 2019; Peura et al., 2019a).

## Relationships Between Reading Self-efficacy and Reading Development

The well-known positive effects of high self-efficacy have also been documented in reading. Students with high self-efficacy seem to put forth more effort and persistence in reading, spend more time on reading activities and read more for enjoyment than students with low beliefs about their skills (Galla et al., 2014; Schüller et al., 2017; Wigfield & Guthrie, 1997; Lee & Zentall, 2017). Furthermore, efficacy beliefs are found to directly relate to students' reading achievement among primary school children (Hornstra et al., 2016; Smith et al., 2012). The strength of this positive association between self-efficacy and reading skills has, however, varied. Possible reasons for the varying findings may relate to the variation in the studied sub-skill of reading as well as to the ways how self-efficacy has been operationalized. Looking at these issues more closely may help to understand whether and how efficacy beliefs contribute to reading development overtime.

In the area of reading, self-efficacy has been mainly studied in relation to reading comprehension rather than in relation with other sub-skills of reading. Efficacy beliefs may, however, have a somewhat different role in different sub-skills of reading. Among middle school and older students, self-efficacy is found to positively associate with both reading fluency and reading comprehension (Ho & Guthrie, 2013; Mercer et al., 2011). Among primary school students, we know less about this, but Carroll and Fox (2017) found that efficacy beliefs linked positively to reading fluency, yet not to reading comprehension. It also seems that the strength of the association somewhat varies between the sub-skills of reading: The associations between self-efficacy and reading fluency are found to be rather strong (Carroll & Fox, 2017; Peura et al., 2019a), whereas rather small associations between self-efficacy and overall reading achievement have been documented (Liew et al., 2008; Smith et al., 2012). It may be that younger students consider reading as the ability to read quickly and fluently and may thus evaluate their reading self-efficacy in reference to their capabilities in reading fluency, whereas older children consider reading more as the ability to comprehend what is read. Further research is needed to elucidate age-related differences and whether efficacy beliefs differently affect children's reading performances in diverse reading areas.

Another consideration in the relationship between self-efficacy and skills relates to the ways self-efficacy is measured and operationalized. In general, more specific efficacy beliefs are found to show stronger relations to performance than more general efficacy beliefs (see Talsma et al., 2018). Still, this issue has been little considered in reading. Piercey (2013) showed that the relationship between reading self-efficacy

and reading achievement is stronger when they are assessed at corresponding specificity. Similarly, general reading self-efficacy showed the weakest association with reading skills (Peura et al., 2019a). In longitudinal studies, prior self-efficacy, rather surprisingly, has not been found to predict reading development over time (Galla et al., 2014; Guthrie et al., 2007; Mercer et al., 2011), nor later reading achievement (Lee & Zentall, 2017; Liew et al., 2008). In the aforementioned studies, children's general ASE or general reading self-efficacy was assessed. On the contrary, when Lee and Jonson-Reid (2016) assessed children's self-efficacy for specific reading tasks, they found it to predict children's later reading achievement. In a study, in which different specificity levels of reading self-efficacy were assessed, the associations between self-efficacy and reading development were found to vary according to the studied specificity level (Peura et al., 2019a). That is, children's intermediate level beliefs, which referred to beliefs of their capabilities for everyday reading activities, such as reading a book, positively predicted reading fluency development, whereas general or specific beliefs did not. These findings suggest that the differing empirical observations might be explained by the varying predictive power of the diverse beliefs, in line with Bandura's notions (1997).

These observations seem important for both theory and practice. They imply that more emphasis should be placed on what kinds of efficacy beliefs in reading are being measured. This relates to the congruent operationalization of self-efficacy, as well as its correspondence for the reading context under study. Studying reading self-efficacy in various ways may reveal an enriched understanding of how self-efficacy interacts with reading behaviors and performances. Teachers and practitioners should be aware and observant of this variation in beliefs; children's general beliefs of their reading capabilities might not tell the whole story of their reading self-efficacy.

## Development of Reading Self-efficacy

As efficacy beliefs are known to be important in reading skill development, knowledge of how these beliefs evolve, and change seems essential. Efficacy beliefs are considered to be rather malleable perceptions of one's capabilities which change more easily than other related self-beliefs, such as self-concept (Bandura, 1997; Bong & Skaalvik, 2003). It is likely that changes in these beliefs happen in childhood (Bandura, 1997), when skills develop rapidly. In general, children are found to become more self-efficacious of their capabilities over time (e.g., Hornstra et al., 2016). As efficacy beliefs are closely related to the skills of a learner, it seems reasonable that when skills develop, confidence in one's skills also increases. However, contradictory findings exist, as a recent meta-analysis concluded that self-efficacy is stable over time (Scherrer & Preckel, 2019), although the direction of change observed in self-efficacy varied notably across the reviewed studies. Prior findings differ also in considering the stability of children's self-efficacy (cf. Phan & Ngu, 2016; Phan et al., 2018) as well as in considering the shape patterns in which self-efficacy is found to change (e.g., linear, nonlinear) (cf. Hornstra et al., 2016; Phan,

2012). This variability in the findings suggests that children may differ in how their self-efficacy changes and develops.

Thus far, little research has considered how efficacy beliefs related to reading change. Schöber et al. (2018) studied change in secondary school students' reading self-efficacy over a year and found that students became more self-efficacious of their reading capabilities over the study period. Likewise, Peura et al. (2021) found that primary school children's reading self-efficacy, in general, increased over a year. Interestingly, when also variability in changes in reading self-efficacy was considered with a person-centered approach, four different trajectories of change emerged over a follow-up period of one year (Peura et al., 2021). The findings showed that all children do not follow the same patterns of changes in their reading self-efficacy; rather, some children become more self-efficacious over time; whereas, others lower their self-efficacy. Most of the children were on a positive learning cycle where they hold high self-efficacy which further increased over time. Some children had lower initial levels of self-efficacy, but their beliefs in their capabilities increased over time. Another group of children held rather high and relatively stable self-efficacy over the year. On the other hand, some children had low initial self-efficacy, and they were found to end up having even lower beliefs in their capabilities over time. These observations of the variability in self-efficacy development follow the findings in related research of self-concept in literacy, in which children's self-concept development is found to follow different trajectories of change through the school years (Archambault et al., 2010).

Focusing more on the heterogeneity in self-efficacy development could enrich the understanding of how self-efficacy changes. In this way, understanding of the individual processes in development and the individual reciprocal interactions in which self-efficacy is theorized to develop in social cognitive theory (Bandura, 1997) could be gained. Some students seem to be more vulnerable to losing their reading self-efficacy, and increasing understanding of this variability could help to identify those children who are most in need of support and to design individualized support for their self-efficacy. Applying person-centered approaches (Howard & Hoffman, 2018) could help to capture this variability in the ways how reading self-efficacy fluctuates.

## *Experiences that Build Reading Self-efficacy*

Efficacy beliefs are considered to form and change in a process of triadic reciprocity between environmental, personal and behavioral influences (Bandura, 1997). Four information sources are especially essential in self-efficacy development: mastery experiences, verbal persuasions, vicarious experiences and physiological and emotional states (Bandura, 1997). These experiences are considered context dependent; that is, mastery experiences in science are likely to raise confidence particularly in science. It has also been found that the experiences students use as their source of self-efficacy somewhat vary between skill areas (Butz & Usher, 2015;

Usher et al., 2019). Thus far, sources of self-efficacy have been studied rather little in reading contexts. In the following, the four sources, and the current understanding of their role in building students' reading self-efficacy, are introduced.

*Mastery experiences*—that is, interpretations of past experiences as successes—have consistently shown to have the most powerful effect on one's self-efficacy (see Byars-Winston et al., 2017; Usher & Pajares, 2008). This seems to also be true in reading, where the most frequently reported efficacy-building experiences are found to be students' successful experiences in reading (Butz & Usher, 2015). Children have described that their own performances—that is, being able to read difficult words and/or challenging parts of a story—inform them whether they are efficacious in reading (Guthrie et al., 2007). Experiences of mastery in reading are found to be essential also in shaping children's self-efficacy development. Children who experienced high levels of mastery in reading are found to become more self-efficacious in their capabilities in reading over time (Peura et al., 2021). On the contrary, those children who lost their confidence in their own capabilities in reading experienced less mastery in reading (Peura et al., 2021).

*Verbal persuasions*, such as positive feedback and encouragements from parents, teachers and peers, also build students' confidence in their own skills in reading (Butz & Usher, 2015; Guthrie et al., 2007). Verbal persuasions are suggested to be especially important in the early phases of skill development (Bandura, 1997). When children are acquiring new skills and at the same time forming beliefs about their capabilities, they may be especially sensitive to the feedback and social support they receive with regard to their skills. At this stage, children experiencing that they receive less of this kind of support seem to be harmful. In reading, experienced lack of feedback and support from significant others (teacher, parents, peers) and, more importantly, the loss of this support over time are found to relate to children's decreasing self-efficacy over time (Peura et al., 2021). These findings underline the importance of continuous and explicit social support for learning from teachers and parents.

*Vicarious experiences*—that is, observing others performing well, such as peers and teachers—inform students of their own capabilities as well. The influence of social models is assumed to be especially important when students have low confidence or little experience in the task in question (Bandura, 1997). However, in meta-analyses, this source has been found to be related only weakly or not at all to students' self-efficacy (see Byars-Winston et al., 2017). Still, rather little is known of the role of this source in reading. Butz and Usher (2015) found that students with high self-efficacy reported vicarious experiences in reading more often than students with low self-efficacy. In younger children, children who reported fewer vicarious experiences over time decreased in confidence in their own capabilities in reading over the year (Peura et al., 2021). To ensure that all children could experience positive reading models, more knowledge of whom children perceive as vicarious models in reading would be needed. For low-performing children, coping models may be especially beneficial (Pajares, 2006).

Interpretations of *physiological and emotional states*, such as anxiety, tension, stress reactions or joy, also affect students' self-efficacy. Strong negative emotional reactions (such as anxiety) are likely interpreted as a sign of incapability, but we still have rather little understanding of the role of this source in reading. Butz and Usher (2015) found that students reported few physiological and emotional experiences in reading, and these experiences did not differ between low and high self-efficacy students. When students were explicitly asked to rate their level of reading-related negative arousals (Peura et al., 2021) or were asked about their feelings while reading a challenging book (Klauda et al., 2020), some expressed high negative arousal toward reading or stated that they were nervous while reading. Negative arousal in reading situations was found to relate also to lower beliefs of one's reading capabilities (Peura et al., 2021). Conversely, those students who reported little and, over time, diminishing negative arousal in reading became more confident of their own reading capabilities over a year. The role of negative emotions, such as anxiety, for learning and self-efficacy has been acknowledged, especially in mathematics (Sorvo et al., 2017; see also Barroso et al., 2020). Recent findings indicate that anxiety can also be specific to reading (Ramirez et al., 2019). If a child feels anxious during reading, it may hamper learning in various ways—for example, by loading working memory and hindering concentration and engagement, which may make the child feel that she/he is less capable of learning. Reducing negative arousals in reading situations calls for sensitive practices and the creation of a safe atmosphere for all kind of emotions to be expressed.

## Intervening Children's Reading Self-efficacy Through the Four Sources

Given the importance and positive effects of children's ASE for their learning and reading activities, it is essential to ask how reading self-efficacy can be supported, and whether self-efficacy can be promoted by providing experiences and support through the four sources of self-efficacy as proposed in social cognitive theory (Bandura, 1997). In general, interventions targeting self-efficacy are found to be effective and gain change in reading self-efficacy (Unrau et al., 2018). In their meta-analysis Unrau et al. (2018) found that interventions that targeted two or three of the theorized sources of self-efficacy were more effective to change self-efficacy than those that targeted only one source or other issues (such as learning goals). However, none of the reviewed studies targeted all four sources of self-efficacy. In addition, the way how self-efficacy was measured was found to affect the changes revealed in self-efficacy: ASE assessed with regard to specific reading contexts and tasks were more sensitive to change than general beliefs (Unrau et al., 2018). Most of the included studies assessed ASE or related constructs (such as self-concept), and reading self-efficacy was explicitly assessed in a few studies. In the following, we will present findings of an intervention study that targeted reading self-efficacy by explicitly supporting the

four sources of self-efficacy (see Aro et al., 2018) in more detail as, to our knowledge, this is the first intervention study to target the four sources of reading self-efficacy.

The reading self-efficacy intervention focused on primary school children from grade levels 2–5, who participated in a 12-week self-efficacy intervention targeting both self-efficacy and reading fluency. This "self-efficacy group" was contrasted with the "skill group", which received intervention focused solely on reading fluency support. Children with difficulties in reading were selected for the intervention, as children who constantly struggle with their learning seem to be more vulnerable to decreased motivation and low beliefs in their skills (Klassen, 2007). They may also have less positive efficacy-building experiences (Paananen et al., 2019; Usher & Pajares, 2008). In addition, the beliefs of low-performing children are likely challenging to intervene in, as difficulties in reading tend to be permanent (Torppa et al., 2015) and views of oneself tend to maintain.

Children in the self-efficacy intervention were explicitly provided positive experiences of the four theorized sources of self-efficacy (for a more detailed description of the intervention, see Aro et al., 2018). To provide *mastery experiences*, individually challenging but reachable tasks adapted to each child's skill level were used. Mastery experiences were further supported by directing children's attention to their own improvement and recognizing the improvement by providing concrete visual feedback of the progress and improvement during training. The aim was to help the child to interpret the learning experiences as experiences of mastery in reading, which was further supported by the feedback that was given by the teacher and peers. Accordingly, to provide *verbal persuasion*, positive, explicit, systematic and concrete feedback was given on each child's practice, effort, and particularly on improvement. Feedback was given for improvement connected to the ability to learn and for the effort and persistence during learning. *Vicarious experiences* were assured with working groups of peers with an equal level of reading, and children's attention was focused on the improvements of others and peer feedback (mastery and coping models). Moreover, children were encouraged to compare their performance to their own previous performance, not to the performance or improvements of other children. *Emotional and psychological states* were considered by making these emotions visible by naming them, discussing learning-related emotions through stories and encouraging children's own observations and comments on their reading performance, emotions and practice. In addition, opportunities to express feelings toward practice were provided. Reading self-efficacy interventions have rarely explicitly targeted emotional experiences. Emotional arousals may, however, remain unnoticed in normal teaching procedures—likely unintentionally. Teachers are found to acknowledge students' negative emotions and failure expressions, by giving them inexplicit positive feedback ("Yes, you can") rather than explicitly discussing the reasons behind these expressions (Vehkakoski, 2020). Therefore, specific attempts to focus and give time to the learning-related affective arousals and the interpretation children give to these experiences may be needed. Especially if the child subsequently struggles with learning and performs poorly in comparison with classmates, it may be hard to see one's own progress, which may evoke negative emotions.

Most importantly, children receiving explicit self-efficacy support improved more in their self-efficacy than the group receiving only skill support (for more details, see Aro et al., 2018). In addition, the change in self-efficacy accounted for significant variation in reading fluency gains during the intervention only in the self-efficacy group, although children in both groups improved in their reading fluency. The findings thus implied that supporting motivation and reading skills together can have benefits in comparison with targeting merely the skills of a learner. This may be especially true for the struggling readers. Accordingly, improvement only in achievement may not be enough to yield positive changes in self-efficacy, at least during the limited observation period. The skill improvement may not transfer to the experiences of mastery automatically if the child has not experienced that he/she has improved. Rather, children seem to benefit from specific attempts to provide concrete evidence and feedback of children's progress that enables them to see their progress and improvement, as well as helps them to link the amount of effort to that improvement. These kinds of supports can help children to see both their skills and their beliefs in their skills as malleable and challenge their views of themselves. Teachers' sensitivity to the interpretation children give of learning experiences as well as to their affective arousals in learning situations is essential in providing this support. Children with high self-efficacy are found to benefit also from reading skill support more (Ronimus et al., 2020). High efficacy beliefs may help children to see and recall their progress and also to interpret their achievements as successes, which may boost them to achieve further.

## Future Considerations in Reading Self-efficacy Research

Although the understanding of the role of reading self-efficacy in children's reading development is continuously increasing, some caveats have remained. One such issue is the individual processes of how self-efficacy functions in learning and the individual experiences children gather in their learning environments. As discussed earlier, a person-centered approach may be one way to enhance understanding of the individual processes and the ways self-efficacy affects reading behaviors and skill development. Children may also be differently responsive to self-efficacy support. Some children may have low reading skills but high self-efficacy to use the skills, whereas others may not struggle with the reading skills but more with their confidence in using their reading skills. These two groups of children would likely need different kinds of support and benefit from different kinds of interventions.

Individual differences also relate to the miscalibration of self-efficacy (Hattie, 2013; Klassen, 2007): That is, children may be excessively under- or overconfident of their skills. Some students may have low reading skills but still hold high beliefs about their skills, or vice versa. For such students, the association between beliefs and skills might be negative. Thus, although in general the relation between self-efficacy and reading skill is positive, the average association may mask important individual variation in this relationship. The effects of miscalibration on children's performance

and learning in reading are largely unknown. Miscalibration may also offer one explanation for the finding that, despite the overall positive effects of reading self-efficacy interventions, all children are not found to improve their reading self-efficacy during interventions (Aro et al., 2018; Unrau et al., 2018). For overconfident students, which low-performing students are particularly likely to be, the mere improvement in beliefs may not even be a desirable outcome. Some children might actually benefit more from better calibrated—that is, more realistic—beliefs and observations of their reading performances, rather than higher efficacy beliefs. Overly optimistic beliefs can be harmful if they lead to maladaptive learning behaviors, such as lack of effort and persistence. Whether aims to support self-efficacy can help students to better calibrate their self-efficacy has been rarely explored. While the benefits of high self-efficacy have received the most attention in the self-efficacy literature, researchers' understanding of what is the most adaptive level of self-efficacy that enables children to use their potential in reading and cultivates their learning, motivation and overall well-being still needs fine-tuning.

Efficacy beliefs seem to influence reading development from early on. Still, understanding of how early these beliefs actually develop and how they form is limited. Increasing comprehension of the early reading-related experiences and on how children gather these experiences from their environments—that is, how they select, weight and integrate the experiences—could help us to better design targeted support to provide positive experiences related to reading. Advancing understanding of for whom the experiences are particularly beneficial and needed could help us in this effort. For example, children with learning difficulties might especially need individualized support to have access to positive source experiences (Paananen et al., 2019). Enriched understanding of how apt children are overall in changing their beliefs, and how quickly changes—for example, in pedagogical practices (differentiated tasks, supportive feedback)—change children's experiences and self-appraisals could be gained with more intensive data collection (e.g., time series, experience sampling).

At the moment, changes in learning environments, such as new technology-enhanced learning environments and distance learning, challenge the ways educators monitor learning, give feedback to students and support their learning. For example, students' failure expressions and emotional reactions may remain unnoticed in these environments. On the other hand, these environments can open up new opportunities for support, as the adaptive environments, for example, often enable monitoring of the individual learning process better, which creates opportunities for increased individual feedback. The ideas of social cognitive theory could be used in implementing support for learning and motivation in these environments. Among adult learners, self-efficacy support in online learning environments is found to be beneficial for their learning (Huang et al., 2020). Learning and reading in these environments are continuously increasing. As young readers navigate online environments, they also need support for their motivation and confidence.

## Conclusions

In the first years of school, positive beliefs about one's capabilities as a reader seem to boost for better reading performance. This implies that educators should be attentive to children's beliefs and aim to identify those children who already have low confidence in their skills at the beginning of schooling. In this chapter, we emphasized the idea that a closer look at how reading self-efficacy is measured can help us understand the variation in children's efficacy beliefs as well as their functional role in reading. To get better insights into the fluctuations in children's beliefs in the moment as well as over their development, we should try to capture the very beliefs that come into play in reading situations. Social cognitive theory works well as a standpoint to design support for struggling readers. Providing positive learning experiences through the four sources of self-efficacy is a beneficial way to support children's beliefs. An increased understanding of the variation in children's experiences could help us to understand how children respond to pedagogical practices and what kind of support is most beneficial, both for reading development and for children's self-efficacy. Researchers and practitioners need to continue studying how to best support young readers, as children's beliefs can either engage or disengage them toward reading activities.

## References

Archambault, I., Eccles, J. S., & Vida, M. N. (2010). Ability self-concepts and subjective value in literacy: Joint trajectories from grades 1 through 12. *Journal of Educational Psychology, 102*(4), 804.

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.

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.

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

Barroso, C., Ganley, C. M., McGraw, A. L., Geer, E. A., Hart, S. A., & Daucourt, M. C. (2020). A meta-analysis of the relation between math anxiety and math achievement. *Psychological Bulletin, 147*(2), 134–168.

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

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* (pp. 287–305). 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.

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

Byars-Winston, A., Diestelmann, J., Savoy, J. N., & Hoyt, W. T. (2017). Unique effects and moderators of effects of sources on self-efficacy: A model-based meta-analysis. *Journal of Counseling Psychology, 64*(6), 645.

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*.

Coddington, C. S., & Guthrie, J. T. (2009). Teacher and student perceptions of boys' and girls' reading motivation. *Reading Psychology, 30*, 225–249.

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.

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.

Hattie, J. (2013). Calibration and confidence: Where to next? *Learning and Instruction, 24*, 62–66.

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.

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. https://doi.org/10.1080/02702711.2011.596255

Hornstra, L., van der Veen, I., & Peetsma, T. (2016). Domain-specificity of motivation: A longitudinal study in upper primary school. *Learning and Individual Differences, 51*, 167–178.

Howard, M. C., & Hoffman, M. E. (2018). Variable-centered, person-centered, and person-specific approaches: Where theory meets the method. *Organizational Research Methods, 21*(4), 846–876.

Huang, C. (2013). Gender differences in academic self-efficacy: A meta-analysis. *European Journal of Psychology of Education, 28*(1), 1–35. https://doi.org/10.1007/s10212-011-0097-y

Huang, X., Mayer, R. E., & Usher, E. L. (2020). Better together: Effects of four self-efficacy-building strategies on online statistical learning. *Contemporary Educational Psychology, 63*, 101924.

Klassen, R. M. (2007). Using predictions to learn about the self-efficacy of early adolescents with and without learning disabilities. *Contemporary Educational Psychology, 32*(2), 173–187.

Klassen, R. M., & Usher, E. L. (2010). Self-efficacy in educational settings: Recent research and emerging directions. In T. C. Urdan & S. A. Karabenick (Eds.), *The decade ahead: Theoretical perspectives on motivation and achievement* (pp. 1–33). Emerald.

Klauda, S. L., Taboada Barber, A., & McAllen, E. B. (2020). Reading motivation in Spanish-speaking dual language learners: Comparing two types of student report. *Reading Psychology, 41*(6), 605–630.

Lee, J., & Zentall, S. S. (2017). 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, 50*, 60–71.

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.

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.

Lyytinen, H., Aro, M., Eklund, K., Erskine, J., Guttorm, T., Laakso, M. L., Leppänen, P., Lyytinen, P., Poikkeus, M., Richardson, U., & Torppa, M. (2004). The development of children at familial risk for dyslexia: Birth to early school age. *Annals of Dyslexia, 54*(2), 184–220.

McTigue, E. M., Solheim, O. J., Walgermo, B., Frijters, J., & Foldnes, N. (2019). How can we determine students' motivation for reading before formal instruction? Results from a self-beliefs and interest scale validation. *Early Childhood Research Quarterly, 48*, 122–133.

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.

Nowicki, E. A., & Lopata, J. (2017). Children's implicit and explicit gender stereotypes about mathematics and reading ability. *Social Psychology of Education, 20*, 329–345.

Paananen, M., Aro, T., Viholainen, H., Koponen, T., Tolvanen, A., Westerholm, J., & Aro, M. (2019). Self-regulatory efficacy and sources of efficacy in elementary school pupils: Self-regulatory experiences in a population sample and pupils with attention and executive function difficulties. *Learning and Individual Differences, 70*, 53–61.

Pajares, F. (2006). Self-efficacy during childhood and adolescence: Implications for teachers and parents. In F. Pajares & T. Urdan (Eds.), *Adolescence and education: Self-efficacy beliefs of adolescents* (Vol. 5, pp. 339–367). Information Age.

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.

Peura, P. (2021). Children's reading self-efficacy: Specificity, trajectories of change and relation to reading fluency development. *JYU Dissertations.*

Peura, P., Aro, T., Räikkönen, E., Viholainen, H., Koponen, T., Usher, E. L., & Aro, M. (2021). Trajectories of change in reading self-efficacy: A longitudinal analysis of self-efficacy and its sources. *Contemporary Educational Psychology, 64*. https://doi.org/10.1016/j.cedpsych.2021.101947

Peura, P., Aro, T., Viholainen, H., Räikkönen, E., Usher, E. L., Sorvo, R., & Aro, M. (2019a). Reading self-efficacy and reading fluency development among primary school children: Does specificity of self-efficacy matter? *Learning and Individual Differences, 73*, 67–78.

Peura, P. I., Viholainen, H. J., Aro, T. I., Räikkönen, E. M., Usher, E. L., Sorvo, R. M., Klassen, M., & Aro, M. T. (2019b). Specificity of reading self-efficacy among primary school children. *The Journal of Experimental Education*, *87*(3),496–516.

Phan, H. P. (2012). The development of English and mathematics self-efficacy: A latent growth curve analysis. *The Journal of Educational Research, 105*(3), 196–209.

Phan, H. P., & Ngu, B. H. (2016). Sources of self-efficacy in academic contexts: A longitudinal perspective. *School Psychology Quarterly, 31*(4), 548.

Phan, H. P., Ngu, B. H., & Alrashidi, O. (2018). Contextualised self-beliefs in totality: An integrated framework from a longitudinal perspective. *Educational Psychology: An International Journal of Experimental Educational Psychology, 38*(4), 411–434.

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

Ramirez, G., Fries, L., Gunderson, E., Schaeffer, M. W., Maloney, E. A., Beilock, S. L., & Levine, S. C. (2019). Reading anxiety: An early affective impediment to children's success in reading. *Journal of Cognition and Development, 20*(1), 15–34.

Ronimus, M., Eklund, K., Westerholm, J., Ketonen, R., & Lyytinen, H. (2020). A mobile game as a support tool for children with severe difficulties in reading and spelling. *Journal of Computer Assisted Learning, 36*(6), 1011–1025.

Scherrer, V., & Preckel, F. (2019). Development of motivational variables and self-esteem during the school career: A meta-analysis of longitudinal studies. *Review of Educational Research, 89*(2), 211–258.

Schöber, C., Schütte, K., Köller, O., McElvany, N., & Gebauer, M. M. (2018). Reciprocal effects between self-efficacy and achievement in mathematics and reading. *Learning and Individual Differences, 63*, 1–11.

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.

Schunk, D. H., & DiBenedetto, M. K. (2020). Motivation and social cognitive theory. *Contemporary Educational Psychology, 60*, 101832.

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.

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.

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.

Sorvo, R., Koponen, T., Viholainen, H., Aro, T., Räikkönen, E., Peura, P., Dowker, A., & Aro, M. (2017). Math anxiety and its relationship with basic arithmetic skills among primary school children. *British Journal of Educational Psychology, 87*(3), 309–327.

Talsma, K., Norris, K., & Schüz, B. (2020). First-year students' academic self-efficacy calibration: Differences by task type, domain specificity, student ability, and over time. *Student Success, 11*(2), 109–121.

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.

Torppa, M., Eklund, K., van Bergen, E., & Lyytinen, H. (2015). Late-emerging and resolving dyslexia: A follow-up study from age 3 to 14. *Journal of Abnormal Child Psychology, 43*(7), 1389–1401.

Toste, J. R., Didion, L., Peng, P., Filderman, M. J., & McClelland, A. M. (2020). A meta-analytic review of the relations between motivation and reading achievement for K–12 students. *Review of Educational Research, 90*(3), 420–456.

Unrau, N. J., Rueda, R., Son, E., Polanin, J. R., Lundeen, R. J., & Muraszewski, A. K. (2018). 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.

Usher, E. L., Ford, C. J., Li, C. R., & Weidner, B. L. (2019). Sources of math and science self-efficacy in rural Appalachia: A convergent mixed methods study. *Contemporary Educational Psychology, 57*, 32–53.

Usher, E. L., & Pajares, F. (2008). Sources of self-efficacy in school: Critical review of the literature and future directions. *Review of Educational Research, 78*(4), 751–796.

Vehkakoski, T. M. (2020). "Can do!" Teacher promotion of optimism in response to student failure expectation expressions in classroom discourse. *Scandinavian Journal of Educational Research, 64*(3), 408–424.

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.