



## Can reading fluency and self-efficacy of reading fluency be enhanced with an intervention targeting the sources of self-efficacy?



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### ARTICLE INFO

#### Keywords:

Reading fluency  
Self-efficacy of reading  
Sources of self-efficacy  
Elementary school  
Intervention

### ABSTRACT

The first aim of the study was to analyze whether reading fluency and self-efficacy of reading fluency (SE-rf) are malleable for children (Grades 3–5) with deficits in fluent reading via a 12-week special education program targeting both reading fluency and the sources of SE-rf (SE-program). The second aim was to investigate whether changes in SE-rf are related to changes in reading fluency. The SE-program (n = 40) was contrasted with the SKILL-program (n = 42) providing training solely in reading fluency. The groups showed equal improvements in reading fluency. Positive change in SE-rf emerged only in the SE-group, and this change was associated with changes in fluency, but the association depended on the reading measure. The findings indicate that a reading fluency intervention supporting self-efficacy by providing concrete feedback and helping children to perceive their progress can yield positive changes in self-efficacy. More research is needed on the variability in intervention responsiveness.

### 1. Introduction

In recent years, interest has increased in the “non-cognitive” factors of school learning, such as motivation, emotions, beliefs, and contextual features (Farrington et al., 2012; Lazowski & Hulleman, 2016). Indications are that these diverse and partly overlapping factors are as essential as cognitive skills in determining academic outcomes, especially among low-achieving children (Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009; see also Gutman & Schoon, 2013). Similar notions have appeared in intervention studies, which have shown that cognitively focused interventions have not produced the expected positive results on learning outcomes for children with learning difficulties, with the exception of phonological skills training for early reading problems (see Kearns & Fuchs, 2013). On the other hand, positive and long-lasting effects on achievement have been gained when using social-psychological interventions that target students' personal experiences (for a review, see Yeager & Walton, 2011).

In the domain of reading, the importance of self-concept and motivation has been shown in developmental (in transparent orthography see Lepola, Poskiparta, Laakkonen, & Niemi, 2005) and intervention studies. The research on interventions focusing either on the skill solely, but also evaluating changes in self-concept and motivation (e.g., Morgan, Fuchs, Compton, Cordray, & Fuchs, 2008), or focusing on both

(e.g., Guthrie, McRae, & Klauda, 2007) indicates that targeting merely the skill does not suffice when it comes to creating an effective intervention among struggling readers (see also Marsh & Craven, 2006; Retelsdorf, Köller, & Möller, 2014).

In the present study, we focus on academic self-efficacy (SE-a), more specifically, on SE of reading fluency (SE-rf). SE-a refers to one's task-specific beliefs in his or her ability to perform a given academic task at a designated level (Bandura, 1997) and has been shown to be associated with academic performance among adults (e.g., Honicke & Broadbent, 2016; Multon, Brown, & Lent, 1991; Richardson, Abraham, & Bond, 2012), adolescents (e.g., Komarraju & Nadler, 2013; Lee, Lee, & Bong, 2014; Zuffianò et al., 2013), and children (e.g., Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). Less is known about SE of reading, especially about SE-rf, because previous SE-studies have mainly focused on reading comprehension, which has been found to have a strong association with SE (Cho et al., 2015; Guthrie et al., 2007; Hornstra, van der Veen, Peetsma, & Volman, 2013; Lee & Jonson-Reid, 2016; Schunk & Rice, 1993; Taboada, Tonks, Wigfield, & Guthrie, 2009). Recently, however, Carroll and Fox (2017) found that SE was particularly important for developing word-reading skill among children between 8 and 11 years of age, whereas no association was found with comprehension.

The relevance of SE for early reading skill and for gaining fluency

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(i.e., ability to read accurately and with speed) can be understood in light of the so-called self-teaching hypothesis (Share, 1995), which proposes that the development of accurate and speeded reading skill necessitates independent practice (cf. self-teaching). Thus, becoming a fluent reader requires repetitive practice to consolidate the orthographic and word-specific knowledge underlying fluent and effortless word recognition, which, in turn, entails perseverance and confidence in one's ability to become fluent. SE-research has shown that students with higher reading SE are more likely to be perseverant (Linnenbrink & Pintrich, 2003), whereas students with low SE tend to avoid challenging reading activities (Zimmerman, 2001). This lessens the time spent reading and diminishes the number of words read, thus hindering reading fluency development.

The development of reading skills can be seen as a process in which comprehension is the ultimate goal. Fluent decoding skill is an essential element in this process, forming an explicit bridge to comprehension (Fuchs, Fuchs, Hosp, & Jenkins, 2001; Pikulski & Chard, 2005). Fluency is especially relevant in orthographically transparent languages, such as Finnish, where children develop an accurate decoding skill as early as the first grade (Seymour, Aro, & Erskine, 2003) and where reading disability is mainly manifested as problems in gaining an efficient decoding skill (Aro, 2004; Aro & Wimmer, 2003; Landerl & Wimmer, 2008). Thus, finding effective interventions for students struggling with becoming fluent readers is of the utmost importance. Unfortunately, in the reading interventions, the effect sizes on reading fluency measures have been low (Flynn, Zheng, & Swanson, 2012) and fluency interventions have been associated with lower effect sizes than reading comprehension interventions (Scammacca et al., 2015). The two main skill-oriented approaches toward developing reading fluency are interventions based on repeated reading and those aiming to increase the amount of reading practice in educational settings (see Huemer, 2009). Studies show that repeated reading is the most effective intervention for improving fluency among students with learning disabilities (Lee & Yoon, 2017; for review see Stevens, Walker, & Vaughn, 2017). However, there are indications that the positive effects of repeated reading might to be specific to the trained material, thus restricting its efficacy (Berends & Reitsma, 2006; Heikkilä, Aro, Närhi, Westerholm, & Ahonen, 2013).

Low impact of reading fluency interventions and importance of SE for developing reading skill advocate a better understanding of SE-rf. According to the social cognitive theory (Bandura, 1997), SE beliefs are formed based on interpretations of previous experiences (mastery experiences), encouragement received from others (social/verbal persuasion), observations of others' mastery experiences (vicarious experience), and feelings while engaged in or thinking about an activity (physiological and affective states). Of these, mastery experiences have been reported as the most powerful source of SE among children and adolescents in different scholastic domains (see Britner & Pajares, 2006; Joët, Usher, & Bressoux, 2011; Pajares, Johnson, & Usher, 2007; Usher & Pajares, 2008, 2009). Although the sources of reading SE have received less attention, the few existing studies among early adolescent learners suggest that along with mastery experiences, social persuasion or feedback are sources for inferring one's reading self-efficacy (Butz & Usher, 2015; Guthrie et al., 2007; Henk & Melnick, 1998).

Studies among individuals with learning difficulties indicate that in addition to having lower SE-a (e.g., Hampton & Mason, 2003; Klassen & Lynch, 2007; Yuen, Westwood, & Wong, 2008), their skill level may influence what sources they rely on and which sources are available to them to form their SE-a. For example, they may have fewer opportunities for experiencing success than their peers (Arslan, 2013; Hampton & Mason, 2003; Usher & Pajares, 2006, 2008). Therefore, special attention should be given to providing experiences of success to students who are struggling with learning as the unavailability of appropriate sources may influence the development of SE-a, leading to a vicious circle.

The existing intervention studies (e.g., on strategies, goal-setting,

and feedback; García & Fidalgo, 2008; Schunk & Rice, 1993) assessing SE-a have shown positive outcomes in SE-a, persistence, interest, and performance (see also Gutman & Schoon, 2013; Zimmerman, 2001), as well as indicating that changes in SE-a may have a mediating effect in explaining changes in achievement outcomes (Schunk, 1983). SE-intervention studies in the domain of reading have mainly focused on comprehension. In a recent review of intervention studies by Unrau et al. (2018), measures of reading comprehension were found to have a significant impact on self-efficacy. However, the studies included in the review targeted reading comprehension, while studies on decoding were not included, and self-efficacy was a secondary concern of importance. Thus, there is need for intervention studies targeting both the skill and self-efficacy, especially in the area of decoding. To the best of our knowledge, the only intervention studies on both self-beliefs and reading fluency are a single-case study by Ferrara (2005), a study with 11 primary school children by Robson, Blampied, and Walker (2015), and a larger randomized controlled trial by Toste, Capin, Vaughn, Roberts, and Kearns (2017) on motivational beliefs (i.e., beliefs about the self and reading, self-reflection, positive self-talk, and recognition of negative statements). These studies show that interventions incorporating self-beliefs in reading fluency instruction can yield positive results in reading and reader self-perception or attributions. However, the sample sizes were small (except in Toste et al., 2017), the focus of the interventions was not explicitly on SE, and the measures used did not specifically tap into SE-rf.

In their meta-analysis, Unrau et al. (2018) indicated that intervention effects become larger as the number of sources of SE included in the reading comprehension intervention increases. Despite the well-documented importance of the sources of SE, intervention studies that explicitly target all the four sources of SE suggested by the social cognitive theory are few, and none have focused on SE-rf. To our knowledge, the only study targeting all four sources of SE among elementary school children has focused on writing skills. In their experiment, García and de Caso (2006) aimed at improving the writing skills of fifth- and sixth-grade students with learning difficulties or low achievement using a 10-session program in which the four sources (mastery experiences, verbal persuasion, vicarious experiences, psychological and affective state) were incorporated. They found a positive intervention effect and concluded that writing can be improved by enhancing children's writing SE "through establishing a good psychological and affective climate, giving verbal persuasion, demonstrating their mastery, and using vicarious experience" (p. 23).

In the present study, we investigated whether reading fluency and SE-rf are malleable among third- through fifth-grade students by introducing a 12-week special education program specifically targeting the four sources of SE-rf, along with reading fluency training (SE-program). The SE-program participants were compared with participants of an equally intensive program that only provided the children with reading fluency training (SKILL-program). Furthermore, we studied whether individual changes in SE-rf were associated with reading fluency development within and between the groups. The specific research questions were:

- 1) Do the SKILL- and SE-groups differ in their development of (a) reading fluency and (b) SE-rf during the intervention and follow-up periods?
- 2) Is a change in SE-rf during the intervention period associated with a change in reading fluency after controlling for school, grade, and pre-intervention levels of reading fluency and SE-rf? And, if so, is the association different between the SKILL- and SE-groups?

## 2. Methods

### 2.1. Procedure and participants

The current study was part of the longitudinal Self-Efficacy and

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