Improvements of self-regulation procedures for fifth graders' reading competence: Analyzing effects on reading comprehension, reading strategy performance, and motivation for reading

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ABSTRACT

In this study, reciprocal teaching (RT) was combined with specific self-regulation procedures to promote the reading comprehension of fifth grade students. Twenty four classes with $N = 534$ students were assigned to RT plus strategy implementation procedures (RT + SIP), RT plus outcome regulation procedures (RT + ORP), RT plus strategy implementation and outcome regulation procedures (RT + SRL), or RT without explicit instruction in self-regulation. At maintenance students assigned to the three self-regulation conditions outperformed RT students according to a standardized measure of reading comprehension. RT + SIP and RT + SRL students outperformed RT as well as RT + ORP students using a measure of reading strategy performance. However, reading comprehension was only mediated by strategy performance under the RT + SRL condition. Among students assigned to the RT + ORP condition, an improvement in reading motivation between pretest and posttest and between posttest and maintenance was observed.

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1. Introduction

Over the recent decades, educational researchers have analyzed the cognitive, metacognitive, and motivational skills required for competent reading and examined various ways of fostering these skills in school-aged children (National Reading Panel, 2000). Moreover, a growing body of research is examining how reading comprehension can be facilitated by the use of self-regulated reading strategies (Afflerbach, Pearson, & Paris, 2008). While there has been a large amount of laboratory research on the relationship between self-regulation and performance, relatively little is known about the relations between specific self-regulation procedures and learning outcomes and how to foster self-regulated learning in the context of whole-class instruction. The main goal of the present study was to examine how specific self-regulatory activities would be correlated with specific aspects of competent reading.

1.1. Theoretical and empirical background

The theoretical basis for the present research is the definition of reading comprehension as a process, combining the extraction and construction of meaning through an interaction between text and reader, with an overall involvement with written language (Snow, 2002). A recent model which accounts for the complexity of reading comprehension is Cromley and Azevedo's (2007) direct and inferential mediation (DIME) model which is based on Kintsch's (1988) construction—integration model (Kintsch & Kintsch, 2005). The DIME model hypothesizes relationships between background knowledge, vocabulary, word reading, reading strategies, and inference that together act as a basis for reading comprehension. According to the DIME model, the use of reading strategies is related to the ability to draw inferences which, in turn, fosters a deeper comprehension of the text.

Educational researchers have developed approaches to foster reading comprehension through instruction in reading strategies (Alexander, Graham, & Harris, 1998). Nowadays, there is reliable empirical evidence that instructing older elementary students in the application of cognitive reading strategies (e.g., generating questions or summarizing) results in a higher level of reading comprehension (Slavin, Lake, Cheung, & Davis, 2009; Spörer, Brunstein, & Kieschke, 2009). One of the most promising multi-strategy approaches used to promote reading comprehension in elementary classrooms is reciprocal teaching (RT, Palincsar & Brown, 1984). In RT, students are instructed in the use of four strategies: clarifying, summarizing, questioning, and predicting. According to this method, students read in small groups and

collaboratively construct comprehension with the help of their peers. Students take over responsibility by leading group work and giving feedback on the group members' strategy application. In a meta-analytic review, Rosenshine and Meister (1994) found average effect sizes of $d = .32$ for a standardized reading comprehension test, favoring RT over comparison conditions.

1.2. Integrating self-regulation procedures into explicit strategy instruction

The empirical research suggests combining explicit instruction in strategy use with instruction in planning, monitoring, and evaluating the learning process (Dignath, Buettner, & Langfeldt, 2008) and, thus, supplementing strategy instruction with self-regulated learning activities. Zimmerman (2002) provides an analysis of self-regulation in his description of self-regulated learning as a cyclical process based on three phases. In the forethought phase students set learning goals and engage in strategic planning. In the performance phase students use cognitive, meta-cognitive, and motivational strategies to accomplish the learning task. According to this model, learning strategies fulfill the function of a learning tool used to foster progress in an academic skill. In the self-reflection phase, evaluative processes occur after learning. In this way, self-regulated learners are able to reflect on their strategy implementation and learning outcome as well as their feelings of self-satisfaction. Promoting such self-regulated activities in conjunction with the application of cognitive strategies results in better learning outcomes than strategy instruction alone (De Corte, Mason, Depaepe, & Verschaffel, 2011; Graham, Harris, & Zito, 2005; Schünemann, Spörer, & Brunstein, 2013). Moreover, learners who engage in a self-regulated learning process have demonstrated substantial gains in self-efficacy for learning (Schunk & Pajares, 2010) and learning motivation (Wigfield et al., 2008).

Thus, in current training programs (Graham et al., 2005; Horner & Shwery, 2002; Souvignier & Mokhlesgerami, 2006), students are instructed in planning and evaluating the whole learning process as described in Zimmerman's (2002) model. However, it could be argued that, in this cyclical model, at least two sets of self-regulatory procedures can be distinguished: *self-regulation of learning outcome* and *strategy implementation regulation* (see also Boekaerts & Corno, 2005). In the domain of reading, a desired learning outcome might be to understand a text. Here, self-regulated students ideally set reading comprehension goals before reading, monitor their comprehension progress while reading, and evaluate whether they have reached their learning outcome goals after reading. In this way, students self-regulate with regard to their desired learning outcome. Furthermore, students receive feedback on their comprehension progress when reflecting performance outcomes (Wigfield, Klauda, & Cambria, 2011). Providing feedback to students influences students' self-regulated efforts and motivation to continue to improve. The self-regulation of learning outcomes would help not only to improve reading comprehension but also to foster the *motivational engagement in reading* in terms of enjoying academic tasks (Guthrie & Wigfield, 2000). Therefore, outcome regulation procedures should be strongly correlated with students' individual perception of skill development and, hence, foster domain-specific learning motivation (Wigfield et al., 2008).

Moreover, it is assumed that self-regulated learners use learning strategies in order to reduce a perceived discrepancy between their current state of knowledge and a desired learning outcome (Zimmerman, 2002). Thus, students need to plan which reading strategies might be useful in a specific learning situation. After choosing an appropriate strategy they then need to monitor the application of the strategy and evaluate its effectiveness. Within

such a set of self-regulatory procedures, students self-regulate the implementation of a specific reading strategy. Regarding its effects, planning, monitoring, and evaluating the strategy implementation should help students to acquire strategic skills and thereby improve the quality of reading strategy performance (see also Brunstein & Glaser, 2011).

Recently, Schünemann et al. (2013) analyzed how students' reading competence could be promoted by these two sets of self-regulatory procedures. In the aforementioned study, intact classes were assigned to a no-treatment comparison condition, RT without explicit instruction in self-regulation or RT plus explicit instruction in strategy implementation and outcome regulation procedures. At the end of the training, students assigned to the two intervention conditions outperformed control students in measures of reading comprehension. Furthermore, relative to conventional RT students, students assigned to the enriched RT condition were better able to maintain their reading performance over time. In an attempt to explain their findings, Schünemann et al. (2013) focused on the possibility that the effect of the condition incorporating strategy implementation and outcome regulation procedures into RT depended on the individual strategy use of the students. An additional explanation, not raised in the study, might be that students' reading comprehension was promoted by enhanced reading motivation. Moreover, the nature of the study design only allowed for an analysis of the joint effects of the two sets of self-regulatory procedures. Hence, the question as to whether strategy implementation and outcome regulation procedures were correlated with specific aspects of engaged reading remained unanswered.

1.3. Present research

In the present work, the incremental effects of two sets of self-regulatory procedures in the teaching and use of reading comprehension strategies were examined. For this purpose, conventional RT was enriched with self-regulatory procedures designed to foster (a) strategy implementation, (b) outcome regulation, and (c) strategy implementation and outcome regulation. More specifically, in the strategy implementation condition (RT + SIP), students were instructed to set reading strategy goals, monitor their strategy use, and reflect on their strategic behavior. Hence, self-regulation was focused on using specific reading strategies. In the outcome regulation condition (RT + ORP), students learned to set reading comprehension goals and to evaluate how much their reading comprehension had improved. Therefore, self-regulation was focused on progress in reading comprehension. In the self-regulated learning condition (RT + SRL), students were instructed to set both reading strategy and comprehension goals, monitor their strategy use, and reflect on their strategic behavior and reading comprehension. Here, self-regulation was particularly focused on using specific reading strategies to improve reading comprehension.

One of the study's key objectives was to compare the effectiveness of the three enriched RT conditions with a conventional RT condition. Differences between conditions were tested using measures of reading comprehension, strategy performance, and reading motivation in a pretest–posttest-maintenance design. Building on recent research in self-regulated reading (Schünemann et al., 2013), it was anticipated that students assigned to the enriched treatment conditions would achieve better results than the RT students in our measures of competent reading particularly *at maintenance*. This expectation is in line with Zimmerman's view (2002) that self-regulated learners can rely on conditional and procedural knowledge to execute their newly acquired skills, although external support has already been faded out. Moreover, that ability to self-regulate one's own learning process may foster