Self-regulation for learning intervention in reading comprehension: an integrative review

Intervenção em autorregulação para aprendizagem na compreensão de leitura: uma revisão integrativa

Adriana Satico **FERRAZ**[1] (iD) 0000-0002-9856-0094

Acácia Aparecida Angeli dos **SANTOS**[1] (iD) 0000-0002-8599-7465

Abstract

This integrative review aimed to investigate the structure of successful interventions in the development of self-regulation for learning to optimize reading comprehension of Basic Education students. The search for articles was carried out in five databases, and by the method of searching for quotes. Of the 137 items retrieved, 13 were eligible. The samples of the reported interventions were composed of students from the 3rd to 6th grade, from American, German, and Slovenian schools. The interventions were of an instructional type, focusing on developing self-regulatory strategies to develop reading comprehension. The studies indicated that participation in the interventions increased the students' performance in this cognitive-linguistic skill. It is assumed that this review can assist psychologists and educators in preparing, applying, and monitoring the results of intervention programs to develop students' self-regulation in carrying out tasks that involve reading comprehension.

Keywords: Basic education; Motivation; Reading skills; Self-management; Strategies for learning.

Resumo

O objetivo desta revisão integrativa foi investigar a estrutura de intervenções bem-sucedidas no desenvolvimento da autorregulação para aprendizagem a fim de otimizar a compreensão da leitura pelos alunos da educação básica. As buscas pelos artigos foram realizadas em cinco bases de dados, bem como através do método de busca por citações. Dos 137 artigos recuperados, 13 eram elegíveis. As amostras das intervenções reportadas eram compostas por alunos do 3º ao 6º ano de escolas estadunidenses, alemãs e eslovenas. As intervenções eram do tipo instrucional, com foco no

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desenvolvimento de estratégias de autorregulação para desenvolver a compreensão de leitura. Os estudos indicaram que participar das intervenções elevava o desempenho dos alunos nessa habilidade cognitivo-linguística. Presume-se que esta revisão pode auxiliar psicólogos e educadores na elaboração, aplicação e acompanhamento dos resultados de programas de intervenção para desenvolver a autorregulação dos alunos na realização de tarefas que envolvem a compreensão de leitura.

Palavras-chave: *Educação básica; Motivação; Habilidades de leitura; Autogestão; Estratégias de aprendizagem.*

Training in language practices in Basic Education (1st and 9th grade) aims to develop and strengthen students' proficiency in reading and reading comprehension. It is recommended that textual and visual materials are presented and worked on to stimulate the student's critical sense and autonomy regarding the use of language (Ministério da Educação, 2017). It is noteworthy that reading comprehension is highly valued as a cognitive-linguistic skill that facilitates learning and the development of critical thinking (Oliveira, Trassi, Santos, & Cunha, 2017; Tonks & Taboada, 2015).

When considering the teaching and learning process as a whole, promoting student self-regulation can help psychologists guide teachers in their pedagogical practices applied to the development of reading comprehension (Boruchovitch & Gomes, 2019; Wigfield, Gladstone, & Turci, 2016). Self-Regulation for Learning (SRL), as proposed by the Social Cognitive Theory, occurs through the interdependence of individual aspects, linked to feelings, emotions and thoughts, behavior, and the environment in which students find themselves (Zimmerman, 2015). For Zimmerman (2013, 2015), the SRL is conceived in six dimensions, referring to the motive, the method, the time management, the self-declared behavior, and the physical and social environment. These dimensions are made up of constructs and skills (key-process) that can be developed in students to favor their learning, including reading comprehension.

Based on this model, the student's motivation for learning is represented by self-efficacy, the achievement goals, and intrapersonal causal attributions. Self-efficacy refers to the student's perception of his or her competence to perform a specific activity (Bandura, 2005), in the case of the present study, reading comprehension. In turn, the motivational orientation towards achieving goals varies according to the student's focus on the teaching-learning process. Thus, when performing a task, the students' objective may be to acquire knowledge (orientation towards the learning goal), evidence their good performance when obtaining high scores (performance-approach goal) or avoid being exposed by their poor performance (performance-avoidance goal) (Senko, Hulleman, & Harackiewicz, 2011; Wigfield et al., 2016). Regarding intrapersonal causal attributions, they are linked to the interpretations made by students about the possible causes that led them results of success or failure in school (Weiner, 2018).

Student self-efficacy levels for reading are linked to student autonomy and interest (Butz & Usher, 2015; Wigfield et al., 2016) and are related to reading fluency (Peura et al., 2019). Fluent reading denotes precision and speed in decoding words. Thus, when this skill is well established, it favors students' proficiency in reading comprehension (Santos & Pacheco, 2017). In this regard, Guthrie, McRae, and Klauda (2007) already indicated that developing self-efficacy and the learning goal in students can result in gains in reading comprehension. Interventions in these constructs still promote positive effects on the development of autonomy and cooperation between students.

Thus, Guthrie et al. (2007) suggest that the way the student perceives the activities that require reading comprehension is also related to the performance goals. Guided by the performance-approach goal, the student presents the need to show exemplary achievements in reading comprehension tasks for colleagues and teachers. In turn, the student guided by the performance-avoidance goal does reading activities out of fear of not getting a good achievement (Ferraz, Cantalice, & Santos, 2019; Stutz, Schaffner, & Schiefele, 2016).

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Among the skills of the six SRL dimensions that can be improved through interventions, the learning strategies, time management, organization of the physical environment, selective help-seeking, and the student's self-reflection about their performance (Boruchovitch & Gomes, 2019; Zimmerman, 2013). It is noteworthy that self-reflection involves self-evaluation, self-monitoring, and self-reactions generated by the students, based on their judgment of their performance in a given activity. These judgments can positively or negatively impact the students' actions since, based on them, their behavior can be maintained or changed (White & DiBenedetto, 2015).

Learning strategies can encourage self-regulation of this skill and help students increase their reading proficiency, which represents an alternative to improving school performance (Perry, Albeg, & Tung, 2012). The development of strategies aimed at reading can help students use them in a more conscious, autonomous, and consistent manner with what is necessary for tasks that require understanding textual material (Vieira, 2014; Wigfield et al., 2016).

Those as mentioned above theoretical and empirical meanings indicate that it is possible to develop preventive and remedial intervention programs in order to develop and strengthen the key-process of six SRL dimensions to improve the reading comprehension in Basic Education (Boruchovitch & Gomes, 2019; Perry et al., 2012; Vieira, 2014; Wigfield et al., 2016; Zimmerman, 2013). Review studies bring elements that aim to support Psychology and Education professionals in sustaining their applied practices to increase the proficiency of students in reading comprehension (Boruchovitch & Gomes, 2019; Perry et al., 2012).

The literature indicates that SRL interventions provide good results for reading comprehension development. Because of this, the present integrative review aimed to analyze the constituent aspects of interventions that developed students' self-regulation, focusing on SRL dimensions' key-process to increase the students' reading comprehension skills. This review focused on studies developed with students of school grades equivalent to the Brazilian Elementary and Middle School, considering Brazil and other countries' educational context.

Thus, in this review were analyzed the types of intervention programs reported in the studies; how self-regulation was used in interventions to optimize reading comprehension, considering the SRL dimensions' key-process; the characteristics of the samples submitted to the interventions, and the previous preparation of the professionals to apply for the intervention programs. It was also verified, in this review, which was the constructs and skills assessed in the different moments of the intervention programs (pre- and post-test and follow-up assessment), and if there was an indication of the psychometric properties of the psychological instruments/tests used in these assessments. Also, it assessed the researchers' type of data analysis procedure to assess the effectiveness of interventions.

Method

In this study, the search strategy for the articles had two stages. The first stage was carried out in databases with Brazilian and foreign journals in their indexation, whose studies have a scope compatible with the objectives of this review. In October 2019, we consulted the Education Resources Information Center, PsycINFO, the *Red de Revistas Científicas de América Latina y el Caribe, España y Portugal* (Network of Scientific Journals of Latin America and the Caribbean, Spain, and Portugal), the Scientific Electronic Library Online, and the *Portal de Periódicos Eletrônicos de Psicologia* (Portal of Electronic Journals in Psychology) databases. We used to retrieve the articles, keywords in Portuguese, "*aprendizagem autorregulada*" AND "*intervenção*" AND "*compreensão de leitura*" and, in English, "self-regulated learning" AND "intervention" AND "reading comprehension." We do not establish a specific period for conducting searches to retrieve the largest possible number of studies. These searches were set up to retrieve peer-reviewed scientific articles.

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Another criterion used in the searches was to stipulate that the keywords should appear in the title and/or in the abstract and/or in the studies' keywords.

The second stage of the search strategy included analyzing the reference list of the four articles retrieved in the first part of the research. The purpose of this type of search is to retrieve studies that fit the objectives of the review, but that did not appear in the database consultation (Littlewood & Kloukos, 2019).

The verification of the scope of the material retrieved in the two searches was done manually, from reading the title, abstract, and method of the articles. As inclusion criteria, the article should report on the application of intervention programs to develop SRL to improve the reading comprehension of students of school grades equivalent to Brazilian Elementary and Middle School and other countries' educational context. We only selected articles that reported interventions that focused on SRL dimensions' key-process by Zimmerman (2013) or that indicated the concept of self-regulation from Social Cognitive Theory (Bandura, 2005). As an exclusion criterion, we eliminated duplicate articles and those over which access could not be obtained.

Papers that met the eligibility criteria were included in a Microsoft Excel® spreadsheet to be analyzed. We extracted from these studies information regarding authorship and year of publication, the structure of interventions (constructs and skills developed through self-regulation to improve reading comprehension), total *N* sample and students per session, the number of sessions, and the length of each session. We also investigated the samples' sociodemographic characteristics, relative to the country, the school grade, and the average age of the students. We verified the constructs assessed during the pre-test, post-test, and follow-up assessment after the intervention ended, the psychometric properties of the instruments used in the assessment, and the data analysis procedures.

Results and Discussion

Figure 1 shows the flowchart containing the application of the eligibility criteria. In the end, 13 articles reached the pre-established criteria to be analyzed in this review.

Next, Table 1, we included the data extracted from the 13 retrieved articles. The description of the results and discussion follows the order of this review's objectives, to indicate the procedures adopted in the interventions that reported SRL development to improve students' reading comprehension.

The articles in Table 1 had in common the application of interventions using instructional material. This type of intervention aims to support students' SRL to promote their adherence to strategies that facilitate reading comprehension (Boruchovitch & Gomes, 2019; Schunk & Rice, 1987; Voellinger & Spörer, 2014).

Except for the study by Regent (2010), which aimed to compare a single experimental group with a control group, the other studies compared the effectiveness of two to four groups with different types of interventions to develop their SRL, aiming at reading comprehension. Interventions that encompassed a more significant number of SRL key-process, such as motivation and self-evaluation, resulted in greater reading comprehension than those that involved fewer (Souvignier & Mokhlesgerami, 2006; Spörer & Schünemann, 2014; Stoeger, Sontag, & Ziegler, 2014; Voellinger & Spörer, 2014). The gains were also more significant to those whose interventions were based on traditional teaching practices (Spörer, Brunstein, & Kieschke, 2009; Wigfield et al., 2008).

As for the most used constructs in the intervention programs, motivation is highlighted, represented by the achievement goals. In the study by Schunk and Rice (1989), they inserted these goals into two types of intervention – one to guide the student while applying the strategies and the other to lead the strategy to the desired final result: improving reading comprehension. The consideration of the specifics of achieving goals
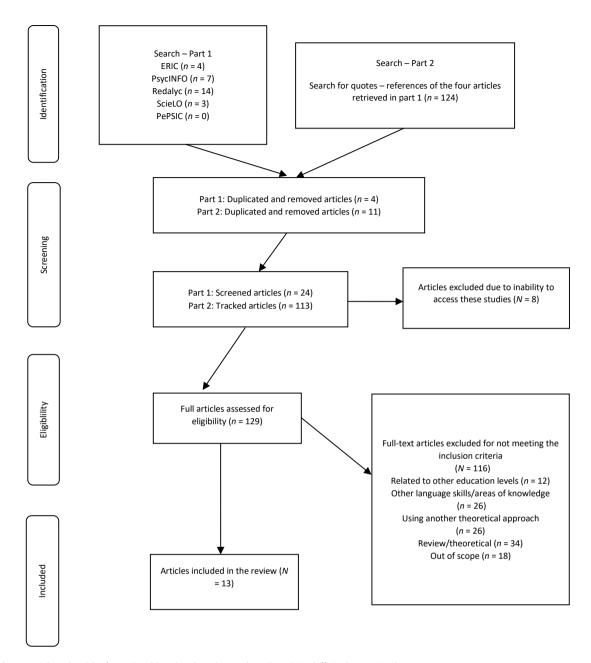
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Figure 1. Selected Articles for Review (Flowchart based on Moher, Liberati, Tetzlaff, & Altman, 2009).

Note: ERIC: Education Resources Information Center; PePSIC = Periódicos Eletrônicos de Psicologia. Redalyc: *Red de Revistas Científicas de América Latina y el Caribe, España y Portugal*; SciELO: Scientific Electronic Library Online.

in students' motivational quality to develop their SRL skills tends to have a positive impact on engagement and persistence (Stutz et al., 2016; Wigfield et al., 2016).

Still, about the motivation constructs, the intrapersonal causal attributions were also used during the interventions reported in the studies. The attributional training carried out by Carr and Borkwoski (1989) stands out through the exhibition of drawings that enabled the dialogue between researchers and students on how they misconstrued their gains and their difficulties using the strategies of reading during the

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Table 1

Contents of the Interventions, sociodemographic characteristics of the samples, structure, constructs, and skills assessed in the intervention process

Authorship (year)	SRL dimensions' key-process developed in the interventions	Country (grade)	N sample; N students per session (M_{age})	N Sessions (length)	Constructs and skills assessed in the pre-test, post-test, and follow-up
Schunk and Rice (1987)	Self-efficacy, value attributed to reading strategies, feedbacks on self-efficacy	USA (4th and 5th)	40; 5-6 (11.2 years old)	15 (35m)	Self-efficacy for reading comprehension, reading comprehension
Carr and Borkowski (1989)	Intrapersonal causal attributions	USA (3rd, 4th, and 5th)	50; 6-7 (9.8 years old)	6 – twice a week (30m)	Intrapersonal causal attributions, strategies for reading comprehension, assimilation of reading content, self-esteem
Schunk and Rice (1989)	Self-efficacy, achievement goals	USA (4th and 5th)	33; 5-6 (11.2 years old)	15 (35m)	Self-efficacy to identify the main ideas of the text, reading comprehension
Schunk and Rice (1991)	Self-efficacy, feedback on the achievement goals	USA (5th)	30; 5-6 (11.3 years old)	15 (35m)	Self-efficacy for reading comprehension, reading comprehension
Mason (2004)	Self-instruction, achievement goals, self-monitoring, self-reinforcement	USA (5th)	32; 4 (10.5 years old)	11-15 (20m)	Reading comprehension of expository texts, retelling the content that was read in a text, self-efficacy, intrinsic motivation, self-perception about the effectiveness of the intervention program
Souvignier and Mokhlesgerami (2006)	Achievement goals, self-evaluation, intrapersonal causal attributions, mental images	Germany (5th)	593; does not report the number of sessions (11 years old)	20 (45m)	Reading comprehension, use of reading strategies, competence to apply reading strategies, self-efficacy, the achievement goals
Wigfield et al. (2008)	Motivation	United States (4th)	492; 22-27 (does not inform age)	12 (90m)	Reading comprehension, use of reading strategies, motivation to read, student engagement to read (answered by the teacher)
Spörer, Brunstein, and Kieschke (2009)	Modeling through interpersonal relationships	Germany (3rd, 4th, 5th, and 6th)	210; 4-6 (does not report age)	14 – twice a week (45m)	Reading strategies, reading comprehension
Regent (2010)	Self-evaluation	Slovenia (does not report school grade)	69; 37 (does not inform age)	Does not report the length of sessions (8 hours total)	Motivation, metacognition, use of teaching material, speed of information processing, reading comprehension
Schüneman, Spörer, and Brunstein (2013)	Achievement goals, self-monitoring, self-evaluation	Germany (5th)	323; 3-5 (11.04 years old)	14 – twice a week (45m)	Reading comprehension, reading fluency, use of reading strategies, self-efficacy to read, type of language spoken at home
Spörer and Schünemann (2014)	Achievement goals, planning, self-monitoring	Germany (5th)	534; does not report the number of sessions (10.55 years old)	14 – eight week period (45m)	Reading comprehension, use of reading strategies, motivation, reading fluency
Stoeger, Sontag, and Ziegler (2014)	Achievement goals	Germany (4th)	763; does not report the number of sessions (9.8 years old)	7 (40-60m, at school; 20-30m, at home)	Self-regulated learning (general), reading, reading comprehension, assessment of the intervention process (identification of the main ideas of texts)
Voellinger and Spörer (2014)	Motivation	Germany (does not report school grade)	380; 4-6 (11.1 years old)	6 – twice a week (45m)	Reading fluency, reading comprehension

Note: SRL: Self-regulated Learning.

intervention sessions. These researchers presented the students with the differences between the internal causal attributions that were more easily controlled by the student, the case of effort, and the external and uncontrollable causal attributions, such as luck and task difficulty. Incorporating the components of causality attributions into interventions has shown positive results regarding the appropriate use of recall strategies for reading, performance in reading comprehension, and more functional attributional beliefs for this cognitive-linguistic skill.

Another motivational construct worked on in the interventions was self-efficacy. Anticipating that this construct interferes with the student's motivation, Schunk and Rice (1987) feedback interviews throughout the activities so that, within the reality of each one, the students perceived themselves capable of learning and applying the reading strategies. In turn, in the intervention program conducted by Schünemann, Spörer, and Brunstein (2013), the encouragement of self-regulation of strategies for carrying out reading activities increased students' self-efficacy for reading. Given these intervention programs' results, higher levels of self-efficacy in carrying out activities that involve reading comprehension tend to optimize students' performance in this skill and vice versa (Wigfield et al., 2016).

Based on the above, the focus on motivation for SRL in interventions helps guide the professional who conducts the intervention to develop reading strategies in students. Motivation is continuously indicated by Psychology and Education professionals as one of the SRL components linked to student adherence in activities that require reading comprehension (Boruchovith & Gomes, 2019; Bzuneck & Boruchovitch, 2016; Souvignier & Mokhlesgerami, 2006).

The studies in Table 1 also indicate that the stimulus to SRL through self-reflection, represented by self-evaluation and self-monitoring, was applied to make the student think about the effectiveness of the reading strategies learned during the intervention. These skills help students adjust their learning strategies if they identified that something should be improved (Mason, 2004; Regent, 2010; Schünemann et al., 2013; Souvignier & Mokhlesgerami, 2006; Spörer & Schünemann, 2014). In the intervention sessions developed by Spörer and Schünemann (2014), students were encouraged to record their self-evaluation and self-monitoring progress in logbooks, spreadsheets, and performance diagrams. As they learned to self-regulate these skills, the researchers gradually withdrew these supplementary resources.

Stimulating self-reflection is an alternative to improve reading comprehension skills and maintain motivation (Zimmerman, 2013). Through self-evaluation and self-monitoring, students gradually develop their notion of which strategies are more or less effective in understanding different texts. As they experience good results, from self-reflection on the effectiveness of the strategies adopted, their sense of self-efficacy tends to increase and, with this, they feel more motivated to perform similar activities (Boruchovith & Gomes, 2019; Butz & Usher, 2015; White & DiBenedetto, 2015).

When focusing on the interventions' target audience, Table 1 indicates that the study samples consisted of students from the 3rd to the 6th grades of American and German schools and one Slovenian educational institution. It is noteworthy that we did not identify studies with Brazilian students' samples that fit this review's scope. The verification of this gap, plus the results of the studies that made up this research, point to possible gains with the insertion of intervention programs to develop self-regulation for reading comprehension in the Brazilian educational context. This type of intervention can broaden the understanding of how self-regulation works in this cognitive-linguistic skill and, from this knowledge, be included in preventive and remedial pedagogical practices (Boruchovitch & Gomes, 2019; Bzuneck & Boruchovitch, 2016; Vieira, 2014).

These were held at school about the intervention sessions, in spaces reserved to accommodate small groups of students or classrooms for larger groups of students. In addition to the work developed at school, the intervention program by Stoeger et al. (2014) demanded that students perform homework tasks. Most interventions included groups of four to six students. The number of sessions varied according to each

intervention's purposes, which ranged from six to 15. The vast majority of sessions did not exceed one hour in duration.

These interventions suggest that the formation of smaller groups of students presents more useful results to develop their SRL for reading comprehension (Perry et al., 2012; Spörer et al., 2009). Concerning the reality of Brazilian schools, one can ponder the possible difficulty of working in small groups, considering that the Brazilian educational system is foreseen an average number of 30 to 35 students per classroom for primary education (Câmara dos Deputados, 2007). In this sense, investments in research are necessary, whose objective is to investigate the possibilities of carrying out interventions focused on developing the SRL linked to reading comprehension, which is adequate to Brazilian schools' configuration, especially those of the public education system.

The intervention sessions were both conducted by external staff, related to the research center where the studies were developed, called external instructors, and teachers trained for this purpose. The researchers responsible for the study trained the external instructors and teachers to carry out the different types of intervention in the students and to apply the instruments at each moment of the interventions (Schünemann et al., 2013; Schunk & Rice, 1987; Spörer et al., 2009; Spörer & Schünemann, 2014).

External assessors verified the proficiency of the instructors in the application of the interventions and the handling of instruments (Schünemann et al., 2013; Spörer et al., 2009; Spörer & Schünemann, 2014). At Mason (2004) and Voellinger and Spörer (2014), the interventions' accuracy was checked by monitoring the work developed by the instructors.

All articles in Table 1 reported using psychometric instruments to assess the students' initial performance in reading comprehension in the pre-test and, subsequently, the gains in this linguistic ability in the experimental and control groups in the post-test (Regent, 2010; Schünemann et al., 2013; Schunk & Rice, 1987, 1989; Souvignier & Mokhlesgerami, 2006; Spörer et al., 2009). These instruments were also intended to make a comparison between experimental groups, which intervention programs were most effective in developing SRL and reading comprehension skills (Carr & Borkowski, 1989; Mason, 2004; Schunk & Rice, 1991; Spörer & Schünemann, 2014; Stoeger et al., 2014; Voellinger & Spörer, 2014; Wigfield et al., 2008). Most of the studies used the instruments in the follow-up assessment of students after a few weeks after the completion of the intervention (Carr & Borkowski, 1989; Mason, 2004; Schünemann et al., 2013; Souvignier & Mokhlesgerami, 2006; Spörer et al., 2009; Spörer & Schünemann, 2014; Stoeger et al., 2014; Voellinger & Spörer, 2014).

The process of assessing the intervention's effectiveness allows the inclusion of standardized instruments or the construction of measures based on the intervention proposal (Stoeger et al., 2014; White & DiBenedetto, 2015). However, the second option requires the researcher's care with the instrument's psychometric properties to be built (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014), as was done in the studies by Carr and Borkowski (1989) and Schunk and Rice (1987), in which reliability estimates were verified, using pilot samples.

Except for the intervention conducted by Carr and Borkowski (1989), which used an instrument to assess reading comprehension strategies, the other studies used instruments to assess reading comprehension skills. In the interventions carried out by Schünemann et al. (2013), Spörer and Schünemann (2014), Voellinger and Spörer (2014), other language skills related to reading comprehension were also assessed, such as fluency in reading. Seven studies used instruments to assess the use of reading strategies, which is consistent with the focus of the interventions since their objectives were centered on training students to use this resource to improve their reading comprehension abilities. The self-efficacy assessment for reading was prevalent among the motivational constructs (Mason, 2004; Schünemann et al., 2013; Schunk & Rice, 1987, 1989; Souvignier & Mokhlesgerami, 2006).

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The studies in Table 1 indicate that the measures used in the interventions had reliability estimates about the psychometric quality of the instruments. In this sense, the interventions conducted by Carr and Borkowski (1989) and Schunk and Rice (1987) reported the use of the test and retest, carried out with samples of pilot studies of the interventions. In the study by Mason (2004), there was an investigation of the assessors' agreement. The reliability estimates of the instruments used in the interventions were also obtained by the internal consistency indices (alpha coefficients, Spörer & Schünemann, 2014; Schünemann et al., 2013), and by the correlations between the parallel forms of tests applied in the pre- and post-test (Schunk & Rice, 1989).

Regarding the treatment of the data obtained with the interventions, the studies presented several analyzes to compare the performance of the experimental and control groups and between the experimental groups themselves. In the studies by Carr and Borkowski (1989) and Schunk and Rice (1987), they used the statistical resources of the Classical Test Theory to compare groups through parametric analyzes of variance and covariance. These analyzes were applied to ascertain the absence of performance differences in the instruments answered by students in the experimental and control groups in the pre-test stage and investigate the statistical significance of these differences between pre- and post-test stages. However, in both stages (pre- and post-test), the studies did not indicate the requirements for using parametric analyzes in the data analysis.

In the studies by Schünemann et al. (2014) and Stoeger et al. (2014), there was an indication of more specific criteria for using statistical resources. In Stoeger et al. (2014), for example, the choice for hierarchical regression models was made based on selecting students who participated in the interventions. The samples came from the same classroom, so the researchers raised the hypothesis that there would be a tendency for students to be more similar to each other than if they were from different classes (Stoeger et al., 2014). In turn, in the study by Schünemann et al. (2013), the authors opted for a data treatment that was adequate for a small sample size to compare the differences between the experimental and control groups and the size of the statistical effect generated by the interventions.

Based on the aspects above, it is necessary to consider the psychometric quality and the compatibility of the intervention proposal with the assessment tests. Since intervention programs are characterized as longitudinal studies, it is worth considering the use of instruments and data processing capable of capturing the student's changes throughout the intervention sessions, not being restricted to the verification of possible improvements through comparing pre- and post-tests. The assessment of reading comprehension must, for example, consider both the performance in this skill and the processes that are mobilized in the student to understand the text (Boruchovitch & Gomes, 2019). In turn, the statistical treatment of the data must demonstrate the specificities of the changes in student performance throughout the interventions, indicating in which aspects the intervention program was more or less successful (Schünemann et al., 2013; Spörer & Schünemann, 2014). In this topic, it is essential to emphasize the researchers' responsibility to describe in detail all the procedures adopted in the intervention to guarantee its replicability and the review of aspects to be improved.

Still, it is also valid to understand the students' opinions to measure the gains obtained with the intervention sessions regarding the data assessment and treatment process. However, it is necessary to consider the congruence of the students' self-perception about what was achieved by them in the intervention, comparing their responses using psychometric tests and observations. Students' self-perception can suffer the interference of social desirability, leading them to issue positive assessments by inferring that this will be somehow valued by the people involved, and not necessarily by perceiving his gains as a result of the intervention (Boruchovitch & Gomes, 2019; Stoeger et al., 2014).

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Final Considerations

The results of this review indicate that interventions to develop the SRL dimensions' key-process lead to improvements in the performance of students in reading comprehension. This perspective highlights the contribution of interventions that incorporate the motivation to promote SRL, since this construct helps develop learning strategies and skills linked to self-declared behavior (self-reflection), such as self-evaluation and self-monitoring.

It suggested that future studies to review self-regulation intervention programs for reading comprehension include dissertations and theses. We conjecture these studies may not have been published in article format. In this sense, interventions made with Brazilian students on this theme may be retrieved considering the material produced in graduate programs, emphasizing Psychology and Education, and the dialogue between the two fields of knowledge.

Finally, it emphasized that the inclusion of self-regulation in pedagogical practices requires that school psychologists, pedagogical coordinators, and teachers be prepared to elaborate, conduct, and assess the intervention's effects. It should be noted that one way of applying what is being investigated in research centers regarding schools that allow researchers to perform their intervention work is to provide guidance and training directed to the school staff, especially for teachers. Another possibility is the provision of training for teachers to become instructors, responsible for conducting interventions. In this case, it is necessary to monitor their performance periodically. Nevertheless, both suggestions' viability depends on financial and institutional investors to establish partnerships between schools and graduate programs, where most of these studies are currently being developed in Brazil.

Contributors

A. S. FERRAZ contributed to this study's theoretical foundation, data search, retrieval, and extraction from the reviewed articles, description, and discussion of results. A. A. A. SANTOS contributed to the conception of the article's initial idea, with the verification of the eligibility of the retrieved articles and in the final revision of the text.

References

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing*. Washington: American Educational Research Association.

Bandura, A. (2005). The evolution of social cognitive theory. In K. G. Smith & M. A. Hitt (Eds.), *Great minds in management* (pp. 9-35). New York: Oxford University Press.

Boruchovitch, E., & Gomes, M. A. M. (2019). *Como promover a autorregulação da escrita no Ensino Fundamental?* Petrópolis: Editora Vozes.

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

Bzuneck, J. A., & Boruchovitch, E. (2016). Motivação e autorregulação da motivação no contexto educativo. *Psicologia Ensino e Formação*, *7*(2), 73-84. http://dx.doi.org/10.21826/2179-58002016727584

Câmara dos Deputados (Brasil). (2007). *Projeto de Lei nº 597-B, de 2007. Altera o art. 25 da Lei nº 9.394, de 20 de dezembro de 1996, que estabelece as diretrizes e bases da educação nacional*. Brasília: Coordenação de Comissões Permanentes. Recuperado de https://www.camara.leg.br/proposicoesWeb/prop_mostrarintegra;jsessionid=7368C94108F12566E0BD3FDEB243A44D.node2?codteor=689371&filename=Avulso+-PL+597/2007

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Carr, M., & Borkowski, J. G. (1989). Attributional training and the generalization of reading strategies with underachieving children. *Learning and Individual Differences, 1*(3), 327-341. https://dx.doi.org/10.1016/1041-6080(89)90015-0

Ferraz, A. S., Cantalice, L. M., & Santos, A. A. A. (2019). Motivação para aprender e compreensão de leitura em alunos do Ensino Fundamental I. *Estudos Interdisciplinares em Psicologia*, *10*(1), 173-189. http://dx.doi.org/10.5433/2236-6407.2019v10n1p173

Guthrie, J. T., McRae, A., & Klauda, S. L. (2007). Contributions of concept-oriented reading instruction to knowledge about interventions for motivations in reading. *Educational Psychologist*, *42*(4), 237-250. https://dx.doi.org/10.1080/00461520701621087

Littlewood, A., & Kloukos, D. (2019). Searching the literature for studies for a systematic revew. Part 5: Beyond the standard electronic databases. *Statistics and Research Design, 155*, 894-895. https://dx.doi.org/10.1016/j.ajodo.2018.12.016

Mason, L. H. (2004). Explicit Self-regulated strategy development versus reciprocal questioning: effects on expository reading comprehension among struggling readers. *Journal of Educational Psychology*, *96*(2), 283-296. https://dx.doi.org/10.1037/0022-0663.96.2.283

Ministério da Educação (Brasil). (2017). *Base Nacional Comum Curricular.* Brasília: Ministério da Educação. Recuperado de http://basenacionalcomum.mec.gov.br/images/BNCC_publicacao.pdf

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Annals of Internal Medicine*, *151*(4), 264-269. https://dx.doi.org/10.7326/0003-4819-151-4-200908180-00135

Oliveira, K. L., Trassi, A. P., Santos, A. A. A., & Cunha, N. B. (2017). Teste de Cloze no ensino fundamental: evidências de validade de critério. *Psicologia da Educação, 45*, 35-44. https://dx.doi.org/10.5935/2175-3520.20170015

Perry, V., Albeg, L., & Tung, C. (2012). Meta-analysis of single-case design research on self-regulatory interventions for academic performance. *Journal of Behavioral Education*, *21*(3), 217-229. https://dx.doi.org/10.1007/s10864-012-9156-y

Peura, P. I., Viholainen, H. J., Aro, T. I., Räikkönen, E. M., Usher, E. L., Sorvo, R. M., ... Aro, M. T. (2019). Specificity of reading self-efficacy among primary school children. *The Journal of Experimental Education*, *87*(3), 496-516. https://dx.doi.org/10.1080/00220973.2018.1527279

Regent, P. (2010). Program razvoja samoregulacijskih spretnosti pri učencih osnovne šole. *Horizon of Psychology, 19*(2), 69-88. Retrieved from http://psiholoska-obzorja.si/arhiv_clanki/2010_2/regent.pdf

Santos, A. J., & Pacheco, V. (2017). A fluência e compreensão leitora em diferentes níveis de escolaridade. *Confluência*, *1*(52), 232-256. https://dx.doi.org/10.18364/rc.v1i52.172

Schünemann, N., Spörer, N., & Brunstein, J. C. (2013). Integrating self-regulation in whole-class reciprocal teaching: a moderator-mediator analysis of incremental effects on fifth graders' reading comprehension. *Contemporary Educational Psychology*, *38*(4), 289-305. https://dx.doi.org/10.1016/j.cedpsych.2013.06.002

Schunk, D. H., & Rice, J. M. (1987). Enhancing comprehension skill and self-efficacy with strategy value information. *Journal of Reading Behavior*, *19*(3), 285-302. https://dx.doi.org/10.1080/10862968709547605

Schunk, D. H., & Rice, J. M. (1989). Learning goals and children's reading comprehension. *Journal of Reading Behavior*, *21*(3), 279-293. https://dx.doi.org/10.1080/10862968909547677

Schunk, D. H., & Rice, J. M. (1991). Learning goals and progress feedback during reading comprehension instruction. *Journal of Reading Behavior*, *23*(3), 351-364. https://dx.doi.org/10.1080/10862969109547746

Senko, C., Hulleman, C. S., & Harackiewicz, J. M. (2011). Achievement Goal Theory at the crossroads: old controversies, current challenges, and new directions. *Educational Psychologist, 46*(1), 26-47. https://dx.doi.org/10.1080/00461520.2011.538646

Souvignier, E., & Mokhlesgerami, J. (2006). Using self-regulation as a framework for implementing strategy instruction to foster reading comprehension. *Learning and Instruction*, *16*(1), 57-71. https://dx.doi.org/10.1016/j.learninstruc.2005.12.006

Spörer, N., Brunstein, J. C., & Kieschke, U. L. F. (2009). Improving students' reading comprehension skills: effects of strategy instruction and reciprocal teaching. *Learning and Instruction*, *19*(3), 272-286. https://dx.doi.org/10.1016/j.learninstruc.2008.05.003

Spörer, N., & Schünemann, N. (2014). Improvements of self-regulation procedures for fifth graders' reading competence: analyzing effects on reading comprehension, reading strategy performance, and motivation for reading. *Learning and Instruction*, *33*, 147-157. https://dx.doi.org/10.1016/j.learninstruc.2014.05.002

Stoeger, H., Sontag, C., & Ziegler, A. (2014). Impact of a teacher-led intervention on preference for self-regulated learning, finding main ideas in expository texts, and reading comprehension. *Journal of Educational Psychology*, *106*(3), 799-814. Retreived from https://psycnet.apa.org/buy/2014-09571-001

Stutz, F., Schaffner, E., & Schiefele, U. (2016). Relations among reading motivation, reading amount, and reading comprehension in the early elementary grades. *Learning and Individual Differences*, *45*, 101-113. http://dx.doi.org/10.1016/j.lindif.2015.11.022

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Tonks, S. M., & Taboada, A. (2015). Developing self-regulated readers through instruction for reading engagement. In M. C. White & M. K. DiBenedetto (Orgs.), *Self-regulation and the common core*: *application to Ela standars* (pp. 173-187). New York: Routledge.

Vieira, D. C. (2014). *Estratégias de compreensão leitora ancoradas no construto da aprendizagem autorregulada*: *uma intervenção pedagógica* (Dissertação de Mestrado não-publicada). Universidade Federal de Pelotas, Pelotas. Recuperado de http://guaiaca.ufpel.edu.br:8080/handle/ri/2805

Voellinger, V. A., & Spörer, N. (2014). Reciprocal teaching in the classroom: fostering reading comprehension, reading fluency and strategy use. *Zeitschrift für Pädagogische Psychologie, 24*(3-4), 191-205. https://dx.doi.org/10.1024/1010-0652/a000016

Weiner, B. (2018). The legacy of an attribution approach to motivation and emotion: a no-crisis zone. *Motivation Science*, *4*(1), 24-25. https://dx.doi.org/10.1037/mot0000100

Wigfield, A., Gladstone, J. R., & Turci, L. (2016). Beyond cognition: reading motivation and reading comprehension. *Child Development Perspectives*, *10*(3), 190-195. https://dx.doi.org/10.1111/cdep.12184

Wigfield, A., Guthrie, J. T., Perencevich, K. C., Taboada, A., Klauda, S. L., McRae, A., & Barbosa, P. (2008). Role of reading engagement in mediating effects of reading comprehension instruction on reading outcomes. *Psychology in the Schools*, *45*(5), 432-445. https://dx.doi.org/10.1002/pits.20307

White, M. C., & DiBenedetto, M. K. (2015). *Self-regulation and the common core*: *application to Ela standars.* New York: Routledge.

Zimmerman, B. J. (2013). From cognitive modeling to self-regulation: a social cognitive career path. *Educational Psychologist*, *48*(3), 135-147. https://dx.doi.org/10.1080/00461520.2013.794676

Zimmerman, B. J. (2015). Motivational sources and outcomes of self-regulated learning and performance. In M. C., White & M. K. DiBenedetto (Orgs.), *Self-regulation and the common core*: *application to Ela standars* (pp. 49-64). New York: Routledge.

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