

## Reading Comprehension Improvement for Spanish Students: A Meta-Analysis

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### Abstract

A systematic review of interventions to improve reading comprehension was conducted in Spanish-speaking students. Studies included had to have an experimental or quasi experimental design, the equivalence of groups in reading comprehension before intervention had to be controlled, and the participants had to be school-age. Thirty nine studies met the above criteria and were considered. A meta-analysis of random effects was carried out obtaining a combined effect-size estimate of 0.71. The interventions that proved to be more effective were those based on comprehension strategies like locating the main ideas or making inferences, and those interventions combining teaching of strategies with other methods such as motivation or improvement of decoding. Only two studies reported about whether results remained over time after intervention, so maintenance of results is an aspect that should be included in future research.

*Keywords:* Comprehension strategies, meta-analysis, reading comprehension.

### Resumen

Se realizó una revisión sistemática de intervenciones para la mejora de la comprensión lectora en español. Se incluyeron estudios realizados con alumnado en edad escolar con diseños experimentales o diseños cuasi-experimentales, que habían controlado la equivalencia de los grupos en comprensión lectora antes de la intervención. Se localizaron 39 estudios con los que se hizo un meta-análisis de efectos aleatorios obteniendo una estimación combinada del tamaño del efecto de 0.71. Se muestra la eficacia de las intervenciones basadas en estrategias de comprensión, como la identificación de ideas principales o la construcción de inferencias, y de las que combinan la enseñanza de estrategias con otros métodos como la motivación o la mejora de la decodificación. Solo dos estudios proporcionaron información sobre cómo se mantenían los resultados tiempo después de finalizar la intervención por lo que se considera que ése tendría que ser uno de los puntos a tener en cuenta en futuras investigaciones.

*Palabras clave:* Comprensión lectora, estrategias de comprensión, meta-análisis.

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## Introduction

Several international studies show that, at least since 2000, the reading comprehension of Spanish-speaking students has not improved (Mullis, Martin, Foy, & Druker, 2012, OECD, 2010).

There is a lack in efforts to improve the reading comprehension of students, and it is due to the absence or lack of dissemination of strategies, programs and intervention methods which have proved their efficacy. Evidence of this deficit is that there is no agency to review the effectiveness of the methods to improve reading comprehension used for Spanish-speaking students. Confirmation of this shortcoming is that there is no synthesis of published research on the effectiveness of those methods.

This situation contrasts with English-speaking countries, especially the United States, where evidence-based practice promotes the use of research-based instructional methods. Agencies and institutions such as What Works Clearinghouse, Best Evidence Encyclopedia, or Promising Practices Network are available in those countries; these institutions review and analyze research on educational programs to make recommendations on methods which are supported by rigorous studies and the most effective interventions.

Moreover, various revisions have reported on the effectiveness of different interventions. A

very important one is the report of the United States National Reading Panel (NRP, 2000), which reviewed 215 studies on methods to improve reading comprehension, concluding that there were seven forms of intervention with a firm scientific basis. Those are the following: self-monitoring of comprehension, cooperative learning, graphic and semantic organizers, story structure, question answering, question generating and summarizing.

Some later reviews focus on a particular kind of student, for example, elementary students (Slavin, Lake, Chambers, Cheung, & Davis, 2009), or students with learning disabilities (Berkeley, Scruggs, & Mastropieri, 2010; Edmonds et al., 2009; Solis et al., 2012). Other reviews focus on different types of programs or strategies such as reciprocal teaching of comprehension strategies (Rosenshine & Meister, 1993), question generation (Rosenshine, Meister, & Chapman, 1996), repeated reading (Therrien, 2004), reading aloud interventions (Swanson et al., 2011), classroom discussions about texts (Murphy, Wilkinson, Soter, Hennessy, & Alexander, 2009), self-monitoring strategies (Joseph & Evehigh, 2011), or writing activities to improve reading comprehension (Graham & Herbert, 2010). These reviews show that students with and without learning disabilities can improve their reading comprehension through interventions

based on text activities such as the use of comprehension strategies or text analysis.

Spanish-speaking countries may use the information provided by institutions and research synthesis of English-speaking countries, but there are two problems in doing so. The first problem is that there is evidence that reading comprehension in languages with transparent orthographies, such as Spanish, is less influenced by the decoding ability than English reading comprehension (Florit & Cain, 2011; Share, 2008). The second inconvenience is that intervention strategies can be used with Spanish-speaking students, but normally, programs, and materials are written in English preventing therefore their use with Spanish-speaking students.

To improve this situation, the main purpose of this study is to offer a synthesis of research made until 2012 on interventions to improve Spanish reading comprehension. Investigations with experimental or quasi-experimental designs, conducted with students from kindergarten, elementary, middle and high schools are reviewed. The moderators taken into account are: the way in which participants are allocated to groups, the comprehension assessment with standardized tests or with tests prepared by the researchers, the control of fidelity implementing interventions, the quality of studies, the type of intervention

applied, the number of students per instructor and the relationship between instructor and students. All these factors have led to a difference in the effect size in the reviews cited above.

## Method

### Search strategy

A search was conducted using the following methods: search in databases, search for references in the studies which were already located, manual search in the library of a university, and contact of relevant authors.

The databases consulted were, in alphabetical order, the following: CogPrints, Conycit, Ebsco, Educ@ment, E-book, Dialnet, Google, Proquest Dissertations and Theses, Isi web of Knowledge, Mastesis, Periodicals Index Online, PsycINFO, publications of the Unesco Chair for Reading and Writing, Redined, Sage, SciELO, Theseus, and University of Navarre library catalog.

The key words used for the search were *comprehension*, *reading comprehension*, or their equivalents in the language of the database. We limited the search to Spanish or added the word Spanish in English databases. Terms used in Google search were Spanish equivalents for *reading comprehension improvement intervention*, and "*reading comprehension*" re-

search “*control group*”. We also made a search on Google Scholar, looking for studies that cited any of the 56 that were found in the databases.

A manual search was conducted by consulting the indexes of the following Spanish journals: *Anales de Psicología*, *Bordón*, *Cognitiva*, *Estudios de Psicología*, *Infancia y Aprendizaje*, *Lectura y Vida*, *Ocnos*, *Psicológica*, *Psicothema*, *Revista de Investigación Educativa*, *Revista Española de Pedagogía*, *Revista de Psicodidáctica*, and *Spanish Journal of Psychology*. Finally, we requested information from 43 people who had done research on Spanish-language reading comprehension. We obtained response from 27 of them.

### **Inclusion and exclusion criteria**

We included studies that had the following characteristics: a) an intervention to improve reading comprehension was carried out; b) participants were Spanish-speaking students in non-university education; c) there was, at least, a control group; d) participants had been randomly assigned to the intervention or control group, if they had not, it was established that groups were equivalent in reading comprehension before intervention, or differences were statistically controlled; e) enough data was provided in order to calculate the effect size of the intervention.

We excluded studies that did not meet the above criteria and studies that shared the sample, or part of it. However, the major reasons for exclusion were the lack of equivalence of the groups and not providing sufficient information to calculate the effect size of the intervention on reading comprehension.

After this search we identified 177 references. We could not get the full text of 50 of them, and we selected 29 publications from the remaining references. Those publications described 39 separate studies with 3,520 participants. Eleven of these studies had been published as dissertations, chapters, in journals without peer reviews, or submitted for publication, and the remaining ones had been published in peer reviewed journals.

### **Coding procedure**

Two researchers, both hold a PhD in education, developed and piloted a coding manual, and independently recorded the information contained in the studies with it. The reliability of the evaluators was checked comparing a third of the records randomly selected. In the qualitative variables average Cohen's kappa was .61, and the results were between 0 and .89. For quantitative variables, the average intraclass correlation was .99, and the results were between .96 and 1. Following this analysis, all variables whose Cohen's kappa was

less than .60 were reformulated in the coding manual, and after that, all disagreements were resolved by consensus, analyzing the studies again.

The information collected from each study was its identification: description of the sample (school grade, intellectual capacity, decoding level, level of comprehension, learning disabilities, socio-economic level and area where the participants studied -urban/rural), information on persons who carried out the interventions, method (sample selection, group formation, type of control group, equivalency of groups, how reading comprehension was assessed, and the way in which fidelity of treatment implementation was checked), intervention characteristics (type of intervention, implementation, duration), and outcomes (effect size at the end of intervention and effect size at follow-up).

When several studies shared the same sample or part of it, only one of them was selected, choosing the study that had the largest sample or gave more detailed information. In studies with more than two groups a group without treatment was chosen as control group, if possible. If there were several groups receiving different treatments it was chosen among them, in this order, the one which had less attrition, the one with a better description of the intervention, the one with more participants, or, if

we could not use these criteria, we chose a group randomly.

When the intervention results were assessed with different comprehension tests a standardized test was chosen to calculate the effect size. If not possible, the reviewers decided which test assessed better the reading comprehension, and in case of doubt or disagreement they selected a test randomly.

The methods to improve reading comprehension were classified into three groups. The first one consists of decoding-based interventions, including phonological ability, letter knowledge, reading accuracy, and fluency improvement. The second group includes comprehension strategy interventions such as activation of prior knowledge, making inferences, sorting out of text ideas, synthesizing (finding main ideas, summaries or outlines) and self-monitoring of comprehension. The interventions in the third group combine strategies from the second group with other interventions, such as those from the first group, vocabulary enhancement, reasoning skills, answering questions, or motivation.

The quality of each study was assessed by giving one point for each of the following information: socio-economic level of students, area where they studied, instructor, sample selection, assignment of participants to the groups, type of student grouping, classes that

intervention replaced, number of students per teacher, number and length of sessions, and type of texts used. Two additional points were awarded if an assessment of implementation fidelity was made and if a follow-up assessment was conducted.

### **Effect-size calculation and meta-analysis method**

People for which this research method is unfamiliar can find general information in Botella and Gambará (2002), or Sánchez-Meca and Botella (2010), among others.

The effect size was calculated as Hedges'  $g$  because 56% of the studies were conducted with samples of fewer than 50 participants and this measure removes possible positive bias which Cohen's  $d$  may show when sample sizes are small. First we calculated Cohen's  $d$  employing Wilson's calculator (<http://gunston.gmu.edu/cebcp/EffectSizeCalculator/index.html>), and then we converted it to Hedges'  $g$ .

We had clear that we were comparing different types of interventions and hence a common effect size was unlikely, so we employed a random effects model (Raudenbush, 2009) for meta-analysis. The formulas offered by Borenstein, Hedges, Higgins, and Rothstein (2009) were included in a spreadsheet of Open Office. The weighting of the studies was done using the inverse of the variance.

The meta-regressions were calculated using Wilson's extension Metareg for SPSS ([http://mason.gmu.edu/~dwilsonb/downloads/spss\\_macros.zip](http://mason.gmu.edu/~dwilsonb/downloads/spss_macros.zip)).

### **Control of publication bias**

Publication bias was controlled by visual inspection of a funnel plot, calculating the fail safe  $N$ , and comparing the results of studies published in peer reviewed journals with those published in other media.

## **Results**

### **Participants**

Participants in the reviewed studies were students from kindergarten to 10th grade. In the studies where the sample selection was described, the sample is incidental (74%). In most groups there were no restrictions applied due to intellectual capacity of the students (79%), the existence of special education needs (82%), the ability to decode (77%), or the level of reading comprehension (74%). There was no information about the socio-cultural status of students in 64% of the studies, and in the remaining predominated middle class population. Thirty-eight percent of the groups studied in urban areas, 3% in rural areas, and 13% were formed of students who came from both areas. Such infor-

mation was not provided in the remaining groups. The sample sizes of the studies included in meta-analysis were of 10 to 825 participants, with a mean of 90 and a median of 41.

### Interventions for reading comprehension improvement

No intervention was repeated in more than three studies, and when an intervention was carried out in two or more studies it was normally because the same intervention was conducted in different studies within the same investigation. Interventions were based on comprehension strategies in 23 studies, metacognitive strategies were combined with other forms of intervention in 12 studies, 3 studies focused on decoding and there was a study that used an intervention based on reasoning skills. The con-

trol group received no intervention in 30 studies, carrying out ordinary class activities in most occasions. Alternative treatments were used in the other studies, such as variations of the treatment applied to the experimental group or class activities designed to enhance understanding.

The intervention activities that were used the most were: identification of main ideas, topic or thematic progression (22 studies), construction of inferences (21 studies), and abstracting (19 studies). Self-monitoring of comprehension, prior knowledge activation and activation of schemas and knowledge about text structures were used in 11 studies each one. Graphic organizers and generating self-questioning were used in 10 studies each one. The rest of the intervention activities was used in 8 or fewer studies.

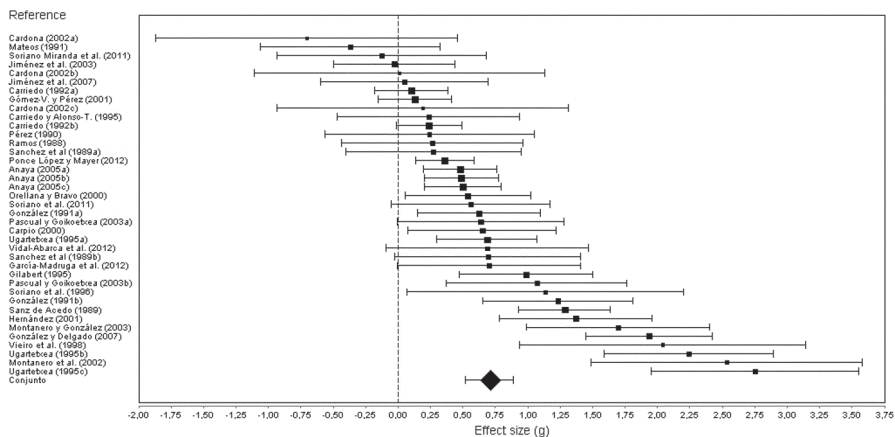


Figure 1. Forest plot of the effect sizes of the studies.

### Average effect size

Figure 1 shows the forest plot of the analyzed studies. The average effect size of all studies was  $M = 0.71$  (CI = 0.52 to 0.89,  $p < .01$ ). According to the result obtained in  $Q$  statistic ( $Q = 207.7$ ,  $p < .01$ ) we must reject the hypothesis that there is an effect common to all studies, so these results are heterogeneous. The  $I^2$  statistic ( $I^2 = 81.7$ ) indicates that almost 82% of the variance is attributable to heterogeneity.

### Analysis of moderators

Since the hypothesis that the real effect is not the same in all studies was accepted, an analysis of moderators was conducted finding no significant differences in any case. Table 1 shows the results of the main analysis performed.

Unlike initial expectations the effect size of studies with random assignment of participants to groups ( $M = 0.86$ ) was higher than that of studies with other forms of assigning participants to different treatments. As expected, the results of groups evaluated with standardized tests ( $M = 0.62$ ) were lower than those evaluated with other tests ( $M = 0.78$ ).

A scatter plot distributed the effect sizes of the studies according to the quality score obtained showing a downward trend, so that the higher quality studies the smaller effect sizes and a more reduced

dispersion. A meta-regression with the method of moments confirmed this trend ( $\beta = -0.35$ ;  $p = 0.009$ ;  $R^2 = 0.12$ ).

The studies were distributed according to the grade the participants in, and we sought for the resultant groups to allow the analysis of different ranges and the conservation of the greater number of studies because 8 studies included students from different grades. In all ranges of several grades we observed a positive effect with no significant differences due to the grade of the students. The meta-regression showed that there was no linear relationship between the grade of participants and the effect-size of the intervention ( $\beta = -0.01$ ;  $p = 0.95$ ;  $R^2 = 0.00$ ).

We started exploring the influence of the characteristics of the interventions analyzing the type of method used to enhance understanding. Studies based on teaching comprehension strategies ( $M = 0.63$ ) produced a moderate effect size, and studies that combined these strategies with other forms of intervention, such as motivation, questions, or vocabulary teaching produced a slightly greater effect ( $M = .96$ ). In contrast, studies based on decoding ( $M = -0.03$ ) did not produce a significant effect on reading comprehension ( $p = .94$ ). The single study which conducted an intervention based on reasoning skills obtained an effect size  $g = 1.28$ .



Table 1

*Summary of Results*

Analyzed group	<i>K</i>	<i>M</i>	CI	<i>Q</i>	<i>p(Q)</i>	<i>I</i> <sup>2</sup>
According to the way in which participants were assigned to the groups						
Subject randomization	6	0.86	0.32 - 1.40	18.16	<.01	66.94
Group randomization	16	0.63	0.34 - 0.93	58.20	<.01	74.23
Paired groups	9	0.78	0.18 - 1.38	68.24	<.01	88.27
Non randomized assignment	8	0.69	0.35 - 1.03	49.87	<.01	85.97
According to the type of control group						
No intervention	30	0.78	0.57 - 0.98	178.78	<.01	83.78
Alternative intervention	9	0.39	-0.15 - 0.94	26.64	<.01	69.75
According to the grade of participants						
Kindergarten - 2 <sup>nd</sup> grade	4	0.68	0.05 - 1.32	25.97	<.01	89.65
3 <sup>rd</sup> - 4 <sup>th</sup> grade	11	0.73	0.37 - 1.09	36.73	<.01	78.60
5 <sup>th</sup> - 7 <sup>th</sup> grade	13	0.69	0.36 - 1.01	68.00	<.01	82.35
8 <sup>th</sup> - 12 <sup>th</sup> grade	6	1.15	0.67 - 1.62	35.45	<.01	87.64
According to the assessment of comprehension						
Norm-referenced tests	18	0.62	0.35 - 0.90	101.30	<.01	93.09
Non standardized tests	21	0.78	0.53 - 1.04	95.49	<.01	79.06
According to intervention method						
Comprehension strategies	23	0.63	0.43 - 0.83	61.09	<.01	63.99
Strategies + other	12	0.96	0.54 - 1.37	118.40	<.01	90.71
Decoding and phonological skill	3	-0.03	-0.73 - 0.65	0.11	0.95	0
According to instructor						
Teachers	14	0.51	0.26 - 0.76	63.89	<.01	79.65
Other	11	0.55	0.30 - 0.80	15.96	0.10	37.33

Among the strategies, summarizing ( $k = 4$ ,  $M = 0.64$ ,  $CI = 0.23-1.05$ ), self-questioning ( $k = 2$ ,  $M = 0.84$ ,  $CI = 0.17-1.52$ ) and activating schemes (a single study with  $g = 1.69$ ) were the only ones that were used in isolation. The remaining studies combined be-

tween 2 and 8 strategies ( $k = 16$ ,  $M = 0.52$ ,  $CI = 0.25$  to  $0.79$ ). The scatter plot distributing results according to the number of strategies used showed a heterogeneous distribution, so we did not analyze the relationship between the number of strategies taught

and reading comprehension outcomes.

Among the studies using comprehension strategies, alone or in combination with other interventions, those which followed a reciprocal teaching approach ( $M = 0.51$ ) had a lower and more homogeneous result than those using different approaches such as integration in the curriculum, computer-assisted instruction or other ( $M = .81$ ). Nevertheless significant differences were not found. The groups that employed cooperative learning, all of them included as reciprocal teaching, did not achieve a significant improvement in reading comprehension ( $k = 5$ ,  $M = 0.34$ ,  $CI = -0.25-0.94$ ).

We found scarce differences when the instructor was a teacher ( $M = 0.51$ ) and when he was a researcher ( $M = .55$ ). Finally, a meta-regression analyzed two variables related to the intensity with which the interventions were carried out: the ratio of students per instructor and duration. While the relationship between ratio and effect size was not significant ( $\beta = -0.02$ ;  $p = 0.92$ ;  $R^2 = 0.00$ ), a relationship was observed between duration of the intervention and effect size ( $\beta = 0.39$ ;  $p = 0.02$ ;  $R^2 = 0.15$ ).

### **Control of publication bias**

In the funnel groups with larger samples were distributed around an effect size close to  $g = 0.4$ , while in the groups with

less than 150 subjects a remarkable asymmetry was evident predominating results greater than 0.4. This configuration is typical of the fields in which there is a publication bias due to the greater difficulty to publish studies with negative or low results and small sample size preventing their authors from obtaining results that are significant, which is the main cause of publication bias (Hopewell, Loudon, Clarke, Oxman, & Dickersin, 2009).

The fail-safe  $N$  was calculated by Rosenthal's method (Rosenthal 1979). It was 3361, indicating that the results of the meta-analysis are resistant to publication bias.

Moreover, this meta-analysis included 11 groups from no peer-reviewed journals, dissertations, chapters and manuscripts submitted for publication. The effect size of these 11 groups ( $M = 0.51$ ), was lower than that of studies published in peer-reviewed journals ( $M = 0.75$ ), although the difference was not significant ( $p = .16$ ).

According to these analyses, the actual effect size may be less than that obtained in the meta-analysis, although this does not seem to alter the main result: interventions to improve reading comprehension of Spanish produce a substantial improvement.

### **Fidelity of implementation**

We considered that there was some control of treatment fidel-

ity in 44% of the studies. In 13% of the studies we assumed that such monitoring existed because the person who carried out the intervention had participated in its design. Intervention was implemented by computer in 10% of the studies. In the remaining studies (21%) intentional monitoring systems were used, usually combining different observation systems like a diary of intervention or questionnaires. Studies using intentional monitoring systems did not show a significant improvement in reading comprehension ( $k = 8$ ,  $M = 0.44$ ,  $CI = -0.04-0.92$ ).

### Follow-up

Only in two studies a follow-up of comprehension improvements was made after the posttest. Orelana and Bravo (2000) found that two years after the intervention, effect size of the intervention had gone from  $g = 0.54$  to  $g = -0.02$ . Soriano, Chebaani, Soriano and Descals (2011) found that the effect after intervention ( $g = 0.56$ ) was maintained 4 months later ( $g = 0.57$ ).

### Discussion

This review shows that, among interventions to improve reading comprehension in Spanish, those based on teaching of comprehension strategies and those that combine these teaching strategies with

other forms of intervention, produce significant improvements. Nevertheless, the few interventions based on improving decoding ability have not significantly influenced reading comprehension. Follow-up evaluations were made only in two studies at different moments, so it is unknown to what extent these results are maintained over time. No specific method has been studied independently by several research teams. There are studies that have used the same strategies, and the most used has been summarizing.

We observed no noticeable relation between improvements and the grade in which the participants were in. The results are concurrent with other reviews of studies that have applied methods of improving reading comprehension in English: summarization and teaching of mixed strategies had already been identified as methods with a firm scientific basis (NRP, 2000). The effect obtained with summarization is slightly higher, but not significantly different from that obtained by Graham and Herbert (2010), and the results obtained with reciprocal teaching are midway between those obtained by Rosenshine and Meister (1993) when standardized tests were employed in the assessments and with other sort of tests ( $M = 0.32$  and  $M = 0.88$ ).

Some results do not agree with those obtained in other reviews. One is that there was almost no

difference between the interventions implemented by teachers and those carried out by others (usually researchers), unlike in Edmonds et al. (2009) where the effect was greater in interventions applied by researchers. Also remarkable is the null effect size of interventions based on improving decoding and non-significant result of studies using cooperative methods for teaching strategies that had shown positive results in the revision of the National Reading Panel (NRP, 2000).

The effect of interventions based on decoding ability was only calculated with three studies. Other reviews (Berkeley et al., 2010; Edmonds et al., 2009; Slavin et al., 2009) obtained effects between 0.09 and 0.30, which are larger when students with learning difficulties are predominant in the sample. Therefore, it should be noted that the null result obtained here could be an effect of the low number of studies, or may reflect the greater ease with which Spanish-speaking students can reach a level of decoding sufficient to succeed in the comprehension tasks.

Regarding cooperative methods of the 5 studies reporting its use three are taken from Cardona (2002), and their results are very low (between  $g = 0.19$  and  $g = -0.70$ ). These three studies are unusual because the control group received the same training as the experimental group, with the dif-

ference that the first one did not work cooperatively. These results question whether the effectiveness of methods based on cooperative learning (NRP, 2000) is due to the use of cooperative methods or to comprehension strategies taught with them.

The duration of interventions is a variable that is described but not discussed in several reviews (Edmonds et al., 2009; Solis et al., 2012; Swanson et al., 2011). In this study we found a positive relationship between length of intervention and effect size, while Rosenshine and Meister (1993) found no relationship between the number of sessions and the significance of the results, and Berkeley et al. (2010) found that interventions lasting between one week and one month produced greater effects than those that lasted more or less than that time. Our measure of the duration of intervention was somewhat different (actual time spent on the intervention) and we analyzed its relation to the understanding through meta-regression, which makes the three analysis difficult to compare.

Finally, we cannot ignore that a relationship between study quality and effect size was found, according to which the higher quality studies tend to find discrete improvements in reading comprehension. The use of standardized tests for assessing reading comprehension and intentional systems of fidelity control relate to smaller effect sizes, although the differences

with studies that do not share these features is not significant.

### **Generalization of results**

The use of a random-effects meta-analysis model allows us to generalize the obtained results to other studies from the same population, which is that of studies about methods for improving reading comprehension carried out with school aged Spanish-speaking students in which a control group is employed to calculate the effect of the intervention. However, any generalization should be made with caution, taking into account that the studies analyzed have considerable variability, as seen in the width of confidence intervals and in measures of heterogeneity, which remained high even when we analyzed groups of similar interventions according to the target processes or to the way in which comprehension skills were taught. Low heterogeneity was found only in decoding based interventions. In other cases it may happen that interventions did not produce a common effect, but different effects depending on variables that we do not have controlled.

Another limitation of this study is the small number of groups with which some analysis were performed, such as the effect of interventions based on decoding, summarizing, self-questioning or cooperative work. Taking into account the small sample size of

most of the studies located, the results of these analyses should only be considered as guidelines.

### **Implications for educative practice and research**

It can be concluded from this review that interventions based on teaching strategies and on these strategies combined with other actions such as increasing vocabulary, motivation for reading or decoding, have shown significant effects on reading comprehension of Spanish-speaking students. In contrast, in the studies analyzed, methods based only on decoding activities have shown to be useful for improving reading comprehension.

There are signs showing that teaching and practice of summarizing can be a useful intervention system, but most successful studies have combined various strategies, which include, apart from summarization, the activation of prior knowledge, identification of main ideas, self-questioning, construction of inferences, paraphrasing, schema activation, graphic organizers, and self-monitoring of comprehension. Reciprocal teaching seems to be a good method for teaching these strategies, although success was also achieved with other ways to teach and practice. In general, these systems have proved to be a more effective comprehension enhancement than ordinary class activities which per-

formed most of the comparison groups.

We need more studies to complete information in the areas in which only a few investigations have been found, and to make

comparisons between different methods of intervention. A priority for future studies should include follow-up measures to determine whether the effects of interventions are sustained over time or fade.

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