The simple view of reading in 4th grade grade students from a public school in Quito

La concepción simple de la lectura en alumnos de 4º de primaria de una escuela fiscal de Quito

Research

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Abstract

The simple view of reading is a model that tries to explain the reading comprehension from two variables which are decoding accuracy and oral language comprehension. There is an extensive research on this model in English readers. Although, some studies have been done in other languages with transparent orthographic systems, there are few investigations with Spanish readers. The purpose of this study has been to collect data on the applicability of the simple view of reading to Spanish reading comprehension, so 87 students of a public school from Quito were assessed with the PROLEC-R and CLP tests. The results show that join fluency or reading speed to the model may be more appropriate to explain the Spanish reading comprehension. Oral comprehension was the most related variable to the text reading comprehension; even thought decoding and reading speed made a small additional contribution. On the other hand, reading comprehension of sentences was only related in a significant way to decoding accuracy. These results show that the oral comprehension, the decoding accuracy and the decoding speed are essential in teaching and assessing reading.

Keywords: Reading acquisition, linguistic competence, reading comprehension, Spanish, Ecuador, educational research.

Resumen

La concepción simple de la lectura es un modelo que trata de explicar la comprensión lectora a partir de dos variables, que son la habilidad para la descodificación y la comprensión del lenguaje oral. En los últimos años se ha desarrollado un extenso conjunto de investigaciones sobre este modelo en lectores de inglés. Aunque se han realizado estudios en otros idiomas con sistemas

ortográficos transparentes, apenas ha habido investigaciones en lectores de español. El propósito de esta investigación ha sido recoger datos sobre la aplicabilidad de la concepción simple de la lectura a la lectura del español. Para ello se evaluó con la batería PROLEC-R y con el test CLP a 87 alumnos de una escuela pública de la ciudad de Quito. Los resultados indican que incorporar la fluidez o velocidad de lectura al modelo puede ser más adecuado para explicar la comprensión lectora del español. La variable más relacionada con la comprensión lectora de textos fue la comprensión oral, aunque la descodificación y la velocidad de lectura hicieron una pequeña contribución adicional. En cambio, la comprensión lectora de oraciones sólo se relacionó de forma significativa con la descodificación. Esto indica que en la enseñanza y en la evaluación de la lectura es necesario considerar especialmente la comprensión oral, la precisión en la descodificación y la velocidad en la descodificación.

Descriptores: Adquisición de la lectura, competencia lingüística, comprensión de lectura, español, Ecuador, investigación educativa.

Introduction[1]

The simple view of reading (SVR) is a model of reading comprehension that proposes that reading comprehension is the result of the interaction between two large groups of processes: decoding processes and processes of general comprehension of language.

The original formulation of this idea (Gough and Tunmer, 1986; Hoover and Gough, 1990) proposes that reading comprehension is the result of the interaction between decoding, which can be evaluated by word or pseudo-words reading tests, and comprehension of the language, which can be evaluated through oral comprehension tests with content similar to that used to evaluate reading comprehension.

This model has been extensively investigated to the extent that three meta-analyzes have been published about it. The first of these meta-analyzes (Gough, Hoover and Peterson, 1996) reviewed 17 studies with primary or university English-speaking students, finding relationships between decoding and reading comprehension and between language comprehension and reading comprehension, in the same sense as the proposals by the SVR.

The second meta-analysis (Florit and Cain, 2011) compared 20 studies carried out with English-speaking students who started reading with 13 studies carried out with students who started reading in other European languages with more transparent spellings, such as Greek, Dutch, French or Finnish. This work shows how during the first years of reading learning a difference can be found between English and other more transparent languages. In English, the ability to decode influences reading comprehension more than language comprehension, while in other languages, language comprehension is more related to reading comprehension than decoding. In addition, in those languages with transparent spelling, reading fluency seems to relate to reading comprehension to a greater extent than accuracy in word reading.

The third meta-analysis is that of Ripoll, Aguado and Castilla-Earls (2014), whom located 62 studies carried out with English speaking primary students. Although confirming the existence of the relationships between decoding and reading comprehension and between language comprehension and reading comprehension identified in previous meta-analyzes, Ripoll *et al.* find that there is also a moderate relationship between decoding and understanding of the language.

As can be seen, most SVR studies have been conducted with English speakers. The English language has a very opaque spelling system because of the complexity of the correspondences between letters and sounds. That is why it

is very risky to transfer a reading model based on data obtained from speakers of English to other languages (Share, 2008).

Regarding the possible application of SVR to reading comprehension in Spanish, the work of Florit and Cain (2011) should be taken with caution, since only one of the selected studies (Proctor, Carlo, August and Snow, 2006) provided data about Spanish. In addition, the participants in this study were 4th grade bilingual students in Spanish and English.

Florit and Cain suggest that the lack of studies in languages such as Spanish could be due to the fact that one of their selection criteria was that the studies were published in English, in that sense there could be other studies published in Spanish not considered in that meta-analysis.

Ripoll (2011) found only three studies examining the relationships between decoding, language comprehension and reading comprehension in students with Spanish as their mother tongue (Cuetos, Rodríguez and Ruano, 2007; Morales, Verhoeven and van Leeuwe, 2008; 2011). The first reference in Spanish to the CSL is from Alegría (2006), who calls it "simple reading model", but until 2012 were not found the first studies that try to analyze the utility of this model to explain reading comprehension in native speakers of Spanish (Infante, Coloma and Himmel, 2012, Kim and Pallante, 2012).

The usefulness of CSL to explain reading comprehension of Spanish-speaking monolinguals has been investigated with Chilean students (Infante et al., 2012, Kim and Pallante, 2012), Spanish (Mesa, Melgarejo y Saldaño, 2013) and Peruvians (Morales, Verhoeven and van Leeuwe, 2008, 2011, Tapia, Aguado and Ripoll, 2016).

One of the main uses of this model is to serve as a guide for the teaching of reading competence, for the early detection of problems in that competency and for guiding the actions to address these problems. In this sense, faced with an orientation that considers that the understanding of texts is a learning domain with its own entity, as can be seen in Ecuadorian education (Ministry of Education, 2012), CSL states that it does not make sense to separate the domain Of comprehension of written texts of the oral domain, since oral comprehension is a necessary component for reading comprehension.

The main purpose of this study is to contribute new data, in this case with Ecuadorian students, about the validity of CSL to explain reading comprehension in Spanish speaking students. But it is also intended to analyze how the relationships between the components of the model vary when the decoding is evaluated by means of measures of accuracy or measures of speed and when the reading comprehension is evaluated by tests of comprehension of texts and by tests of understanding of sentences.

Theoretical and methodological basis

A correlational method was used to achieve the study objectives. This method has been chosen for a theoretical reason: that CSL is a model that exposes the relationships among its components. However, there is also a practical reason: as a consequence of the above, most CSL studies have a correlational approach, so that the adoption of this method allows comparisons to be made.

The CSL model established the need to evaluate students' performance in decoding, listening comprehension and reading comprehension, with the aim to quantify the relationships between the three variables. In order to delve deeper into these relationships, decoding was measured with accuracy and speed measures and reading comprehension with measures of sentence comprehension and text comprehension.

The participants evaluated were 87 students of 4th grade of primary education of the Public School Costa Rica, located in the Nayón Parish of the city of Quito. This school collaborates with the "Theater of Readers" program at the UDLA Educa Children's Library and evaluations were carried out as part of that program.

The students were evaluated with the PROLEC-R reading test and the reading comprehension test CLP 4, form A. The PROLEC-R test consists of several subscales that value perceptual, lexical, syntactic and semantic processes of reading, namely, reading letters (naming letters), discriminating pairs of words that are the same or different (same-different), reading reading of pseudo-words, comprehension of grammatical structures, interpretation of punctuation marks, comprehension of sentences, reading comprehension of texts and oral comprehension. In all tests, except for the comprehension ones, both the accuracy (number of correct answers) and the time used to perform them are considered. In comprehension tests (grammatical structures, sentence comprehension, text comprehension and oral comprehension) only accuracy is considered. The PROLEC-R test has an average reliability, measured with Cronbach's alpha, of 0.79.

The CLP 4 test values reading comprehension using multiple choice questions and a classification tasks, based on three narrative texts. The form A of the CLP 4 test has a reliability, as measured by Pearson's product-moment correlation. Of 0.971.

Students were evaluated individually during the month of October 2015 at their school premises. A total of 89 students were evaluated, but data from two of them were discarded and could not be completed.

The students were evaluated by 19 students of the Psycho-pedagogy of the *Universidad de as Américas.* These students received training on the application of the two evaluation tests which included previous practices of their use. The evaluation process of the students was supervised by the coordinator of the Psycho-pedagogy career.

Analysis and results

We analyze the factorial structure of the Nominate letters, Equal-different, Reading of words, Reading of pseudo-words, Punctuation marks and Oral comprehension tests, taking into account both accuracy and time measurements. Factorial analysis did not include the results of reading comprehension tests (CLP, text comprehension, sentence comprehension and grammatical structures) because CSL predicts a considerable overlap between these results and those of decoding or listening comprehension tests.

In the factorial analysis we compare three models:

First, a model with two factors: decoding and oral comprehension, which would be the two predictors of reading comprehension originally proposed by CSL.

The second model had three factors: decoding accuracy, decoding rate and listening comprehension. This model is based on the observation made by Florit and Cain (2011) that, in transparent languages, reading fluency can be a better predictor than reading accuracy. It also attempts to develop this verification, since the meta-analysis does not make it clear whether fluency incorporates the effect of decoding or can make independent contributions to the prediction of comprehension.

The third model had four factors: perceptual processes, lexical processes, syntactic processes and semantic processes. In this case it is a model based on the structure of the PROLEC-R test, to which the data belonged. The analysis was performed using the maximum likelihood method, with varimax rotation.

The data did not fit the two-factor model (p = 0.03), in addition the factors obtained in this model were related to decoding accuracy and decoding speed, not decoding and listening comprehension.

The data that did fit the three-factor model (p = 0.63) and were also distributed as expected: decoding accuracy, decoding rate and comprehension, with the peculiarity that the time of the test of Equal-different and the number of correct answers of the test of punctuation signs had more weight in the factor in which the oral comprehension was placed than in the other two factors. The data also fit the four-factor model (p = 0.68), which

also explained a portion of the variance (55.9%) greater than that explained by the three-factor model (47.8%). However, the factors did not fit the predicted structure, but the same three factors appeared as in the previous model (accuracy and rate of decoding and comprehension) and a fourth factor formed by the number of right answers in the Naming Letters test Which might be identified with naming speed, a variable that has been proposed as a predictor of comprehension after taking into account the effect of decoding and listening comprehension (Ripoll et al., 2014).

In order not to produce a too extensive correlation table, we group the results establishing:

a) a Reading Comprehension variable, formed by the sum of correct answers obtained in the CLP tests and PROLEC-R text comprehension tests, b) a variable of Comprehension of sentences, formed by the sum of correct answers of the Grammatical structures and Comprehension of sentences tests, c) a decoding Accuracy variable, formed by the number of correct answers in the Word Reading and Pseudo-words Reading tests, d) a decoding speed variable, consisting of the time invested in the Word and Pseudo-words Reading tests and e) an oral comprehension variable. Chart 1 shows the correlation matrix.

Chart 1. Correlations matrix

	CL	CF	PD	VD	CO
CL	1	0,46**	0,32*	-0,31*	0,51**
CF	0,46**	1	0,46**	-0,19	0,18
PD	0,32*	0,46**	1	-0,38**	0,20
VD	-0,31*	-0,19	-0,38**	1	-0,17
CO	0,51**	0,18	0,20	-0,17	1

Note: the significance is adjusted according to the method of Holm and is represented as follows: * $p < 0.05$; ** $p < 0.01$. RC = reading comprehension, SC = sentence comprehension, DA = decoding accuracy, DR= decoding rate, LC= listening comprehension.

For its relevance, having been an issue discussed in previous works, we will note that the correlation between accuracy in reading words and reading comprehension was 0.19 ($p = 0.08$) and the correlation between reading accuracy of pseudo-words and reading comprehension was 0.36 ($p < 0.01$).

We calculated a multiple regression to predict reading comprehension from decoding accuracy, decoding rate and listening comprehension. The regression equation was significant ($F (3.81) = 13.74$, $p < 0.01$) with an R^2 of 0.337. The reading comprehension of the participants was equal to 4.756 + 1.426 * (oral comprehension) + 0.119 * (accuracy) - 0.01 * (Speed).

Through another multiple regression we try to predict the sentence comprehension from the accuracy and speed of decoding and listening comprehension. The regression equation was also significant ($F (3.83) = 7.656$, $p < 0.01$) with an R^2 of 0.217. The participants' sentence comprehension was equal to 9.607 + 0.28 * (oral comprehension) + 0.209 * (Accuracy) - 0.003 * (speed).

To determine the unique contribution of the predictor variables in explaining theresult variance of reading comprehension and sentence comprehension, we performed a series of step-by-step regressions. Oral comprehension explained a single 19.3% of the variance of reading comprehension results, decoding accuracy by 2.6% and decoding speed by 2.1%.

The contribution of accuracy and decoding rate was significant if the regression only included oral comprehension and one of the two decoding measures. In contrast, when the regression included oral comprehension, decoding accuracy and decoding rate, the contribution of the latter two measures was not significant.

Decoding accuracy accounted for a unique 14.9% of the variance of sentence comprehension results, while decoding rate and oral comprehension accounted for less than 1% of the variance alone.

Naming letters results (accuracy or speed) did not make a significant contribution to text or sentence comprehension after taking into account the effects of oral comprehension, accuracy, and speed in decoding.

Discussion and conclusions

The analysis of the data indicates that in the sample evaluated, the main predictor of reading comprehension of sentences is decoding, whereas the best predictor of reading comprehension of texts is oral comprehension. The accuracy of the decoding and the decoding rate were separate factors and both variables explained a small single part of the text comprehension results, after taking into account the effect of oral comprehension. These results indicate that, for the students evaluated, a model with three predictors (oral comprehension, decoding accuracy and decoding speed) may explain better reading comprehension than the classic CSL model, which has two predictors (accuracy Of decoding and listening comprehension).

It is interesting to put these results in relation to other research on the relations between the components of CSL in speakers of languages with transparent orthography and, especially, of Spanish.

As in Florit and Cain (2011) and in several Spanish studies (Infante, 2001, Morales et al., 2008, 2011; Mesa et al., 2013), the relation between oral comprehension and text compre-

hension was greater than that of decoding with the understanding of texts. However, Infante et al. (2012) found that the relationship between decoding and reading comprehension was greater than the relation between oral comprehension and reading comprehension, which did not become significant. A similar result has been found in this study when reading comprehension is evaluated through sentence comprehension tests. In that case, decoding becomes the best and practically the only predictor. It is necessary to emphasize that Infante et al. did not evaluate the reading comprehension with a test of comprehension of sentences, but of narrative and expository texts.

Contrary to what is indicated in Florit and Cain (2011) or in Tapia et al. (2016), reading speed had no relation to text comprehension greater than that of accuracy in decoding. Mesa et al. (2013) did not have a measure of decoding accuracy to compare with that of speed. Even so, the relationship between reading speed and reading comprehension was not significant.

Finally, the part of the variance of reading comprehension results explained by decoding and oral comprehension (34%) has been identical to that obtained in Morales et al. (2011), but lower than that obtained in other studies: 60% in Joshi, Tao, Aaron and Quiroz (2012) or 50% in Tapia et al. (2016). This indicates that there is a remarkable part of the reading comprehension that cannot be explained or predicted from the decoding and understanding of language. Ripoll et al. (2014) point out how some variables have been proposed that could explain an additional part of reading comprehension after taking into account the effects of decoding and language comprehension. The best studied of these variables is denomination speed, which could explain around an additional 4% of the variance of reading comprehension results. Although it was not a goal of this study, a relationship between reading comprehension and results in a letter naming speed test were found. However, naming speed made no further contribution to the explanation of com-

prehension after taking into account the results of decoding and understanding of language.

A very important conclusion of these data is that for an adequate teaching of the reading competence it would be necessary to take into account both the accuracy in the decoding and the fluency and the comprehension of the oral language and, consequently, it would be advisable to evaluate those aspects regarding difficulties of performance in reading comprehension. From a practical perspective, Ripoll and Aguado (2016) indicate different resources to evaluate and to develop those three components that have shown to have a significant relation with the reading comprehension.} However, the dispersion in the results expressed in this section indicate that, in addition to other research on the relationships between predictors of reading comprehension, synthesis studies are needed to establish how age and other characteristics of the students or the type of tests used to measure the different variables, affect the relationships between the components of the model.

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