The Problem of Reading Motivation Multidimensionality: Theoretical and Statistical Evaluation of a Reading Motivation Scale

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Reading motivation is multidimensional and a critical contributor to students' reading comprehension skill. Its multidimensionality is problematic, as there is currently no consensus on the dimensions underlying reading motivation, which are being tested through a variety of instruments that lack statistical validation. Our goal was to discuss the structure, reliability, and validity of a reading motivation scale in relation to prior theoretical proposals. The scale considered four affirming and four undermining reading motivations and was tested with 172 students from 2nd to 6th grade. Its structure was assessed using CFA and EFA. A four-factor structure had the best fit for the data: (1) Reading value and intrinsic motivation; (2) reading devalue and avoidance; (3) perceived self-efficacy; and (4) perceived difficulty. The results supported some prior theoretical distinctions, but question the appropriateness of widely used scales and suggest the need for more research on the multidimensionality of reading motivation.

Keywords: reading motivation; scale; factor analysis, affirming motivations, undermining motivations

Introduction

Reading motivation is pivotal to understanding students' reading comprehension skill and development. As Guthrie and Wigfield (1999) pointed out: "constructing meaning during reading is a motivated act" (p. 199). To understand a text, readers must behave deliberately and purposefully; comprehension is not a passive process. Moreover, students must commit considerable time and effort to master the skills and strategies involved in reading comprehension to become effective and efficient comprehenders. In other words, students must be motivated toward reading activities to achieve good reading comprehension (Wigfield et al., 2016).

Reading motivation has been theorized as a multidimensional phenomenon (Schiefele et al., 2012; Wigfield & Guthrie, 1997) that involves the beliefs, values, and

goals children assign to reading (Eccles & Wigfield, 2002). However, this multidimensionality can be problematic, because there is currently no consensus on what reading motivation is or what its dimensions are, which has resulted in a range of different frameworks and assessments for this critical aspect of reading comprehension (Conradi et al., 2014; Davis et al., 2018; Schiefele et al., 2012). These differences in conceptualization and measurement also make comparisons between studies extremely difficult (Conradi et al., 2014; Schiefele et al., 2012).

A recent review by Davis et al. (2018) identified at least 16 different self-report scales of reading motivation used in published research papers. The scales vary in their definition of what reading motivation is and in the number of separate dimensions of reading motivation that they assess – from one to eleven. The authors conclude that there is little consensus on the number of dimensions that compose reading motivation, as well as an inconsistent use of terminology. The range of different approaches might be explained by a lack of theory guiding the development of many of the scales. Davis et al. (2018) suggested that further work is needed to examine the multidimensionality of reading motivation, accompanied by the development of robust reading motivation scales, that cover wider age-spans and are validated by more sophisticated structural analyses.

The goal of this study was to develop and test a theoretically valid reading motivation scale for Primary Education students. Our approach included a comprehensive review of previous scales and theoretical frameworks used in the study of reading motivation to inform item selection, determination of the best fit for theoretically derived dimensional structure, and statistical evaluation of the best-fitting scale's internal consistency.

Proposals on how to measure Reading Motivation Multidimensionality

The measurement of reading motivation has a long history, with the first scales developed

in the 1980s. As Davis et al. (2018) pointed out in their review, scales have varied widely in their conceptualization of what reading motivation is and how it should be measured. In this section, we review three key theoretical frameworks and resulting questionnaires for the measurement of reading motivation as a multidimensional construct: The Motivation for Reading Questionnaire (MRQ), The Motivation to Read Profile (MRP), and the more recent development of questionnaires that include both affirming and undermining reading motivations (the Adolescent Motivation for School/Outside of School Reading questionnaire—AMSR/AMOSR, and the Motivations for Reading Information Books School/Nonschool questionnaire—MRIB-S/MRIB-N). These three distinct proposals have been used in numerous countries around the world, and they have inspired revised versions and adaptations in languages such as English, Slovene, Spanish, Greek, Norwegian, and Chinese. A database search in Web of Science, Scopus, and Google Scholar shows that at least 4.000 published papers have referenced or used one of these scales.

The Motivation for Reading Questionnaire (MRQ)

The Motivation for Reading Questionnaire (MRQ) developed by Wigfield and Guthrie (Wigfield et al., 1996; Wigfield & Guthrie, 1997) is one of the most widely used instruments in reading motivation research, available in English, Greek, Norwegian, and Chinese (Davis et al., 2018). The scale was proposed for third to sixth-grade students but was tested with only fifth and sixth-graders (Wigfield & Guthrie, 1997). It incorporates four main dimensions of reading motivation: self-efficacy beliefs about reading achievement; intrinsic reading motivation and learning goals; extrinsic reading motivation and performance goals; and the social aspects of reading motivation.

The scale assesses 11 subdimensions of reading motivation and has 54 items in total (see Table 1). Students are required to read each statement and decide whether that statement talks about a person who is like them or not, using a Likert response format with

four levels: “very different from me”, “a little different from me”, “a little like me”, and “a lot like me”.

[Table 1 near here]

Wigfield and Guthrie (1997) analyzed the factor structure of the 11 subdimensions with a sample of 105 fourth and fifth-grade students, and found that they did not cluster in the four proposed dimensions. An Exploratory Factor Analysis (EFA) carried out with the composite values of the 11 subdimensions[1] resulted in three factors: the first one included social reasons for reading, reading efficacy, reading curiosity, reading involvement, and reading recognition. The second factor included compliance, reading for grades, reading challenge, and importance. Therefore, both of these factors included subdimensions from all the proposed theoretical dimensions. The third factor included only competition in reading and reading work avoidance. It is important to note that three subdimensions presented crossed loadings (involvement, recognition, and challenge), and that six of the 11 subdimensions had low internal consistency ($\alpha < .70$). Despite these results, the authors used composite scales of intrinsic reading motivation (using the subdimensions of efficacy, curiosity, and involvement) and extrinsic reading motivation (using the subdimensions of recognition, grades, and competition) for the subsequent analyses reported in the paper.

Despite the lack of clarity in the original factor structure, the MRQ scale has been used extensively and also adapted in later research. Wang and Guthrie (2004) used a revised version with 384 fourth-grade students that included only eight of the 11 original subdimensions, omitting reading efficacy, importance, and work avoidance (see Table 2). The authors hypothesized that these eight subdimensions would cluster into two bigger dimensions: intrinsic motivation (challenge, curiosity, and involvement) and extrinsic

[1] The sample size was considered insufficient for EFA to be conducted on the 54 items.

motivation (competition, recognition, grades, social, and compliance). The reasons for including a previous self-efficacy subdimension (reading challenge) in the dimension of intrinsic motivation are unclear, as is the rationale to merge the social dimension with extrinsic motivation. The authors report that they left out reading efficacy, importance, and work avoidance "because they are related to a different theoretical framework" (Wang & Guthrie, 2004, p. 169), although that framework is not specified. The authors also added one item and deleted another, resulting in 45 items. The results of a Confirmatory Factor Analysis (CFA) provided evidence for a two-factor structure, statistically confirming the distinction between intrinsic and extrinsic reading motivation.

[Table 2 near here]

Several other authors have used short versions of the MRQ that fit their research goals. For instance, to assess the dimension of intrinsic reading motivation, McGeown et al. (2012) used three subdimensions of the revised version of the MRQ proposed by Wang and Guthrie (2004): challenge, curiosity, and involvement. Logan et al. (2011) used the same three subdimensions of intrinsic motivation of the revised MRQ, but rephrased the items to make them easier to understand. Hiebert and Daniel (2018) used an abbreviated 18-item version of these three subdimensions but added the subdimension of reading efficacy from the original MRQ to create a single dimension of intrinsic reading motivation. This provides a clear example of how researchers have conceptualized intrinsic motivation in different ways; some include perceived reading self-efficacy as an element of intrinsic motivation, whilst others consider it to be independent. Another concern is that the original MRQ scale considered reading challenge as a subdimension of reading self-efficacy, yet the revised version includes this subdimension as part of intrinsic motivation and omits the dimension of self-efficacy completely. These different versions of the same

scale show that there is lack of consensus on which subdimensions represent which dimensions.

Although the extensive adaptations and uses of the MRQ scale reflect its flexibility and usefulness, the inconsistent use of names for different dimensions and subdimensions of the scale creates difficulties when comparing studies and integrating their findings into a coherent theoretical framework of reading motivation. Moreover, the structure of the scale has not received empirical support since its original formulation. Watkins and Coffey (2004) assessed the structure of the 11 subdimensions of the MRQ using CFA and EFA, and found that the theoretical dimensions were not clearly identified. Instead, an eight-factor structure was found to fit the data better, a pattern replicated by Baker and Wigfield (1999). Watkins and Coffey (2004) expressed concern for the lack of discussion on the theoretical dimensions that comprise reading motivation and the widespread use of the scale without validation of its structure. They also highlight other methodological limitations of the validation of the scale by Wigfield and Guthrie in 1997, such as the use of factor analyses on separate groups of items, rather than on the entire 54 items, a procedure that does not permit the conclusive identification of the scale's structure. The authors conclude that more research on the factor structure is needed and propose that, until clarification on the dimensions is achieved, the scale should not be used as a dependent variable in reading motivation research. Ten years later, Conradi et al. (2014) and Schiefele et al. (2012) have highlighted the same problems not only with the MRQ, but with most current instruments of reading motivation.

The Motivation to Read Profile (MRP)

Parallel to the development of MRQ, Gambrell et al. (1996) developed the Motivation to Read Profile (MRP) based on Expectancy-Value Theory (Eccles et al., 1983; Wigfield & Eccles, 2000). From this theoretical perspective, reading motivation comprises only two

dimensions: reading self-concept and reading value. *Reading self-concept* is understood as students' perceived competence in reading, both in absolute terms and relative to their peers, while *reading value* is students' appreciation of reading activities and tasks, time spent in reading engagement, and the social value of reading (Eccles et al., 1983; Gambrell et al., 1996; Wigfield & Eccles, 2000).

According to Expectancy-Value Theory, for students to be motivated towards a task, they must not only believe they are competent in it but also believe that it is an important activity. One relevant aspect of this proposal is that the dimensions of self-concept and reading value combine social and individual aspects of reading motivation. In contrast, the MRQ proposes that the social aspect of reading motivation, conceptualized as extrinsic reading motivation, is independent of the individual aspect, conceptualized as intrinsic reading motivation dimension.

The MRP includes a survey and a conversational interview designed for primary students (second to sixth graders). The survey assesses self-concept and reading value with a 4-point Likert response scale. The self-concept items are designed to elicit responses about students' perceived competence in reading individually and relative to their peers (e.g., "Reading is (very easy – kind of easy – kind of hard – very hard) for me", "I read (not as well as – about the same as – a little better than – a lot better than) my friends"). The reading value items are designed to elicit responses about how students value reading activities and tasks, time spent reading, and how they perceive the social value of reading (e.g., "Knowing how to read well is (not very important – sort of important – important – very important)", "Reading a book is something I like to do (never – not very often – sometimes – often)", "My best friends think reading is (really fun – fun – OK to do – no fun at all)").

The authors obtained evidence of validity for their theoretical framework, as well as good internal consistency, in an analysis of the scores of 330 students from third and fifth grade. A factor analysis confirmed the two-factor structure and Cronbach's alpha was high for each of the two dimensions (self-concept = .75; value = .82) (Gambrell et al., 1996). The MRP has been translated to Slovene and Spanish and has been used in numerous studies with students from 2nd to 8th grade (Davis et al., 2018).

A revised version of the MRP scale (MRP-R) was developed by Malloy et al. (2013). The goal of this revision was to reflect cultural and linguistic changes in the USA, such as the increase in digital reading resources, which was not considered in the original scale. The authors assessed the reliability of the scale with 281 students from third, fourth, and fifth grade. Cronbach's alphas were higher than the original scale (self-concept = .81; value = .85). The structure of the scale was not assessed.

Together these studies provide good statistical evidence of the reliability and validity of the MRP. In that respect it is preferable to the MRQ, but it assesses only self-concept and value of reading, and does not consider other relevant dimensions of reading motivation (Davis et al., 2018), such as intrinsic reading motivation. Interestingly, the revised version of the MRQ (Wang & Guthrie, 2004) left out the subdimensions of reading efficacy and importance, two aspects that fit with the MRP proposal of self-concept and reading value. Therefore, the two scales propose different conceptualizations of reading motivation and how it should be measured (see Table 2).

Assessment of Affirming and Undermining Reading Motivations

In recent years, researchers have proposed a reorganization of the dimensions of reading motivation considered by previous reading motivation scales and taking into account dimensions included in the MRQ and the MRP (see Table 2). The new categorization proposes two types of reading motivations: affirming and undermining

reading motivations (Coddington, 2009; Guthrie et al., 2009, 2012; Klauda & Guthrie, 2015; van Steensel et al., 2019). *Affirming motivations* are positive aspects that motivate students to read, such as a high perceived reading self-efficacy or a high enjoyment of reading in their leisure time. *Undermining motivations* are negative aspects that weaken students' motivation to read, such as a high perceived difficulty of reading activities. This distinction is based on the hypothesis that affirming and undermining motivations are not different ends of a continuum but entirely separate constructs and affects. Therefore, a low score on an affirming motivation should not necessarily entail a high score on an undermining motivation. For example, two students might have a low intrinsic motivation, therefore not showing a particular enjoyment in reading activities, but only one of them might manifest a high avoidance of reading activities (Coddington, 2009).

Affirming and undermining motivations are proposed to group into pairs of dimensions, each pair including an affirming and an inverse undermining motivation. For example, the inverse of perceived self-efficacy is perceived difficulty, conceptualized as students' perception of their difficulty in completing a reading task. However, students can maintain both beliefs and perceptions of difficulty and efficacy about a reading task. Therefore, they are proposed to be separate constructs (Coddington, 2009). The distinction between undermining and affirming motivations allows a more complex understanding of students reading motivation (Guthrie et al., 2009; Klauda & Guthrie, 2015; van Steensel et al., 2019). The proposal is novel in highlighting the independence of negative dimensions of reading motivation, an aspect that was not considered in either the MRQ or MRP.

To assess these affirming and undermining motivations, Coddington (2009) developed the Adolescent Motivation for Outside of School Reading questionnaire (AMOSR) and the Adolescent Motivation for School Reading questionnaire (AMSR). Both scales include items for three affirming and three undermining motivations.

Affirming motivations are intrinsic motivation, perceived self-efficacy, and prosocial goals. Undermining motivations are reading avoidance, perceived difficulty, and antisocial goals (see Table 3). Intrinsic motivation is the affirming pair of reading avoidance, perceived self-efficacy pairs with perceived difficulty, and prosocial goals is the affirming pair of antisocial goals. The authors hypothesized that the dimensions in each pair would be independent from each other, therefore confirming that they were different affects and not ends of a continuum.

In both scales, each dimension includes seven items, and each item consists of a remark and a Likert response format with four levels: “Not at all like me”, “Not like me”, “Somewhat like me”, “A lot like me”.

[Table 3 near here]

Coddington (2009) performed three independent Principal Component Analyses (PCA), one for each pair of dimensions, and found support for the distinction between affirming and undermining motivations for the pairs of self-efficacy/difficulty and prosocial/antisocial goals, but not for the pair of intrinsic motivation/reading avoidance. Guthrie et al. (2009) created a similar questionnaire with only two pairs of dimensions: intrinsic motivation/reading avoidance and perceived self-efficacy/perceived difficulty. The results of two independent EFA (one for each pair) supported the distinction between affirming and undermining motivations for these two pairs: Intrinsic motivation was an independent factor from reading avoidance and not an end of the same continuum; similarly, perceived self-efficacy and difficulty were independent. van Steensel et al. (2019) used the version of Guthrie et al. (2009) and found similar results. The authors confirmed the independence of the factors within each pair through CFA. They also found that undermining motivations, particularly perceived difficulty, explained unique variance in reading achievement.

It is important to note that both Coddington (2009) and Guthrie et al. (2009) assessed the structure of their scales using separate factor analyses for each of the pairs of dimensions and did not perform a CFA using the whole questionnaire. When a factor analysis on all the items was conducted, 14 of the original 54 items were deleted and two items from the intrinsic motivation dimension were moved to the self-efficacy dimension to achieve a good model fit (van Steensel et al., 2019). These results suggest that the structure of the scale has not received sufficient empirical support for its validity and must be further explored in future studies.

Following this line of work, Guthrie et al. (2012) developed two questionnaires designed to assess affirming and undermining motivations: The Motivations for Reading Information Books School questionnaire (MRIB-S) and the Motivations for Reading Information Books Nonschool questionnaire (MRIB-N). Both scales focus on middle school students' motivations for reading nonfiction books. The affirming reading motivations include intrinsic motivation, value of reading, reading efficacy, and peer value of reading. The undermining reading motivations included reading avoidance, devalue of reading, perceived difficulty in reading, and peer devalue of reading (see Table 2). The dimensions of peer value and peer devalue are similar to those of prosocial and antisocial goals of Coddington (2009), conceptualized as the respect and help offered to classmates (e.g., peer value: "Other students respect my reading of information books for school."; e.g., peer devalue: "My peers think it's strange that I read information books outside of school."). The value and devalue of reading dimensions coincide with the dimension reading value from the MRP and importance of reading from the MRQ. The authors define reading value as the importance students place on reading in general, and information books in particular. Reading devalue is conceptualized as students' opinion that reading is not important or useful, or that it is a waste of time. Once again, factor analysis was

performed for each pair of dimensions, not the whole scale. The results confirmed a two-factor structure for each of the pairs.

These scales provide a valuable reclassification of the dimensions of reading motivation into the categories of affirming and undermining motivations, an aspect that is not considered by the MRQ or the MRP, as they consider only positive dimensions of reading motivation. Regarding the differentiated effects of these two aspects on reading comprehension, a positive relationship has been found between affirming motivations and reading comprehension, and a negative relationship between undermining motivations and reading comprehension (Guthrie et al., 2009; Klauda & Guthrie, 2015; van Steensel et al., 2019). Importantly, the use of these scales has suggested that undermining reading motivations might be particularly relevant for students with reading comprehension difficulties, as the students' low value of reading or their perceived difficulty of reading activities could be a crucial determinant of their reading motivation (Klauda & Guthrie, 2015; van Steensel et al., 2019), an aspect that is not considered by the MRQ or the MRP.

However, more discussion is needed on the rationale to consider affirming and undermining dimensions as independent, but at the same time as pairs of theoretically inverse constructs. As the previous research has shown, the dimensions seem to be indeed orthogonal. Therefore, they decision to consider them pairs lacks statistical evidence and is only supported in theory. The structural analyses conducted in the pairs of dimensions and not in the whole scales does not allow the exploration of these relationships.

In summary, the development of scales to assess reading motivation scales has had a long history. Together, the body of evidence strongly suggests that it is critical to clarify what we mean by reading motivation, and there is currently no consensus on the best theoretical model nor on the most valid or reliable scale to measure this important construct. Indeed, both the theoretical validity and measurement reliability of these scales

remains largely untested, with more research needed to assess their proposed structures and dimensions.

Research Goal

The goal of this study was to develop and test a theoretically valid reading motivation scale for Primary Education students. Our approach included a comprehensive review of previous scales and theoretical frameworks used in the study of reading motivation to inform item selection, determination of the best fit for theoretically derived dimensional structure, and statistical evaluation of the best-fitting scale's internal consistency.

A multidimensional view of reading motivation was adopted, assessing a wide range of dimensions that could be relevant for a population of primary education students. We considered previous research instruments and their theoretical frameworks, in particular, the MRQ, MRP, and the proposals to assess affirming and undermining reading motivations. The scale that we constructed was proposed to include eight dimensions of reading motivation: intrinsic reading motivation, reading avoidance, perceived self-efficacy, perceived difficulty, value of reading, devalue of reading, social value, and social devalue. These eight dimensions were thought to comprise three relevant distinctions proposed by previous scales: affirming and undermining motivations, reading value and self-concept, and individual and social motivations.

The validity of the theorized eight factor structure was tested with CFA. If a poor fit was found, EFA was then used to explore the most appropriate structure of this scale. The results were compared with previous research to evaluate the coherence of the structure that had the best statistical fit.

Method

The following procedure was followed: First, design of the scale through an in-depth

review of available motivation scales. Second, revision of the scale by experts. Third, pilot study. Fourth, fieldwork and analysis of the structure and reliability of the scale.

Design

To design the scale, the following instruments were reviewed in-depth: The MRQ (Wigfield & Guthrie, 1997) and its revised version (Wang & Guthrie, 2004); the MRP (Gambrell et al., 1996), its revised version (Malloy et al., 2013), and its Spanish version (Navarro et al., 2018); the AMOSR and AMSR (Coddington, 2009), the reading motivation scale to assess affirming and undermining motivations (Guthrie et al., 2009), and the MRIB-S and MRIB-N (Guthrie et al., 2012).

Based on these scales, working definitions of the eight dimensions were developed (see Table 4).

[Table 4 near here]

First, every item in the instruments was categorized according to the eight dimensions and organized in a spreadsheet, allowing a comparison of how the different questionnaires assessed each dimension. The first author did the categorization following the theoretical proposals and conceptualizations of each scale. Between 24-56 items were found for each dimension, with reading devalue being the most underrepresented dimension on the previous scales, and intrinsic reading motivation the most represented.

Second, five items were selected for each dimension. This number was selected following the recommendations of MacCallum et al. (1999) regarding optimal number of indicators to represent a dimension, and also to keep the total number of items on the scale at a reasonable number for young students. The items were chosen according to their theoretical and statistical relevance (items with high loadings and repeated across different scales were chosen over items with low loadings or that were considered in only one of the instruments), and seeking theoretical saturation, that is, the focus was on having all aspects

of a dimension represented. Items that were deleted in the original studies of each scale were not included.

Third, a Spanish translation was drafted for each of the five items selected. The total number of items on the scale was 40 items (five for each of the eight dimensions).

The instrument is aimed at students from 2nd to 6th grade. To ensure that the items were formulated in a clear and appropriate format for the youngest population, the procedures and methodology used in the previously mentioned instruments were reviewed, as well as articles that propose guidelines for the design of questionnaires for children (Bell, 2007; Borgers et al., 2003; de Leeuw, 2011; Platt, 2016). Based on this review, it was decided that the clearest formulation for young students was a question format (for example: "Do you like to read?"), and the number of alternatives was adjusted to a maximum of three. It was also ensured that each choice contained complete information, avoiding vague or abstract options (for example, options of the type "never" or "always" were avoided, favoring complete and self-explanatory answers of the type "Yes, I really like to read"). Therefore, all items included three alternatives and followed the same logic of a) Yes, b) Sometimes or sort of, and c) No. For example, “Do you enjoy reading books for school?” had the following options: a) Yes, I like to read books for school; b) I kind of like to read books for school; c) I don’t like to read books for school.

Expert judgment

The 40-item instrument was sent to three language experts for their revision. Two of these reviewers were specialists in reading comprehension research with preschool and primary students. The third reviewer was a specialist in assessing reading comprehension and motivation in children with quantitative and qualitative methods. The experts were asked to review the instrument considering clarity in the phrasing of the items, appropriateness to the target population (2nd to 6th grade), and possible biases or problems of social

desirability. Based on the experts' comments, some wording was changed to make the items clearer and more appropriate for the students. The consistency of the language used throughout the scale was also revised to ensure a formal but age-appropriate wording. After this revision, the presentation order of the items was redistributed to ensure that every 8-item set of questions included a question of each dimension. This way, if some students could not complete the scale, they would have answered a similar number of questions per dimension. The exact order of the items was selected at random.

Pilot

A pilot of the scale was carried out in August 2021 with 69 students (12 from 2nd grade, 14 from 3rd grade, 12 from 4th grade, nine from 5th grade, and 22 from 6th grade. 37 female, 32 male. Age_m = 9.55 years).

Because of the COVID-19 pandemic, the scale was piloted online through Google Forms. The sample was by convenience and using snowball procedure. Parents known to the researchers were invited and then asked to suggest other parents of children attending 2nd to 6th grade. The link to the scale was sent by email to the students' mothers, fathers, or guardians. All participants and their guardians had to complete informed assent and consent, respectively. The students came from ten schools, nine private schools, and one subsidized by the government. All schools served mostly students from a medium-high socioeconomic status, except the subsidized school that served students from a medium-high socioeconomic status. All private schools had above-average scores in the 2019 national standardized reading assessment (national average = 241, schools average = 275, range 252-302). The subsidized school had a slightly below-average score in the assessment (School reading score = 235).

Before completing the scale, the students had to declare if someone was helping them answer. Forty students declared that someone helped them read the scale questions

(57.9%): 58% of 2nd grade, 57% of 3rd grade, 42% of 4th grade, 78% of 5th grade, and 64% of 6th grade. This result showed that it was necessary to support students to complete the scale in the classroom by reading the items aloud.

The scale's final question requested the students to leave their comments or suggestions about the items. This question was open and voluntary. Twenty students answered this question. Of these, four students stated they had no comments, four said some questions sounded similar or were repeated, and two said the scale did not take too long. On the other hand, one student said that the scale was very long. One student recommended including the option "I don't know", and another criticized that there were many questions about the opinion of friends and that "they did not know what they think".

Finally, two students specifically commented on question 18 ("How do you feel when you read?" Alternatives: "When I read, I feel happy"; "When I read, I feel more or less happy"; "When I read, I don't feel happy"). One said they didn't want to answer this question, "not because I don't feel happy, but because I feel normal". The other student said that they found it strange that the only available emotion was happiness.

Given these comments, it was decided to modify the question's wording to make it less abstract and focus more clearly on the dimension at the item's core (intrinsic reading motivation). The final phrasing was, "Does it make you happy to start a new book?".

Regarding the behavior of the questions, most of them showed variability. Item 2, "Do you make fun of your classmates if they read in their free time?" did not show any variability, as 100% of the students answered that they did not make fun of their classmates. Since this is a negative question with a high social desirability component, it was moved to a more advanced position on the scale (it became question number 8), and it was amended to lower its negativity. The new phrasing was, "Do you find it strange that your classmates read in their free time?".

Other items that showed little variability were item 6 (“Is it important to know how to read well?”), as only two students said that it was not important or only “sort of important”. Item 10 (“Do you think that people who read a lot are boring?”), only two students thought they were “a little boring”, and no student said that people who read a lot are indeed boring. And item 14 (“Do you try to convince your classmates that reading is a waste of time?”), only one student said they sometimes did try to convince their classmates that reading was a waste of time. As these items did show some variability and it was expected that the sample of the study would be bigger and more heterogeneous, these items were not changed for the final version of the scale. Moreover, most students in the pilot had a guardian or parent with them while answering the scale, which could have increased the social desirability of these items.

The final scale items can be seen in Table 6.

Participants and Procedure

Three public schools from the Metropolitan Region, Santiago, Chile, were contacted to participate in the study. All the parents of students from 2nd to 6th grade were contacted and invited to participate in the study. After receiving the informed consent of the parents and informed assent of the students from 2nd to 6th grade, the students were assessed in their classroom at a time designated by the schools. The procedure, informed consents, and assents were all revised and approved by the Ethics Committee in Social Sciences and Humanities of the University of Chile. All the schools had a medium-low socioeconomic status and below average results on the 2019 national reading assessment (national average = 241, schools average = 206, range 197-211).

A member of the research project visited the school in the designated time slot, explained the scale to the students, and read every question aloud so that the students with reading comprehension difficulties could answer the scale without problems.

To assess reading comprehension, the ACL test was applied (Evaluación de la comprensión lectora, Catalá et al., 2007). The test has a version for each grade (2nd to 6th). The reliability of the test has been assessed using the KR-20 indicator, which has shown appropriate results between 0.76 and 0.83 in the different school grades. Each student gets a raw total score of maximum 24 in 2nd grade, 25 in 3rd grade, 28 in 4th grade, 35 in 5th grade, and 36 in 6th grade. The test provides 10 standardized reading comprehension levels, based on the total score of the student on the test.

The test was applied to the whole class in one hour (on a different day than the reading motivation scale), with each student completing the test individually.

One hundred and seventy-two students completed the reading motivation scale (see Table 5), and 145 of these students also completed the reading comprehension test.

[Table 5 near here]

Analyses

First, descriptive analyses of the items were performed. Additionally, bivariate correlations between items were analyzed to explore the proposed structure of the scale.

Second, an 8-factor CFA using maximum likelihood estimation with robust standard errors was performed. To assess the model, absolute and comparative fit indices were used according to the following cut-off criteria indicating a good fit (Hu & Bentler, 1999; West et al., 2012): χ^2, $p > .05$; Comparative Fit Index (CFI) ≥ .95; Tucker-Lewis Index (TLI) ≥ .95; Root Mean Square Error of Approximation (RMSEA) ≤ .06; and Standardized Root Mean Square Residual (SRMR) ≤ .08. To assess reliability, the internal consistency of each dimension was assessed using ordinal alpha, given the ordinal nature of the data (Gadermann et al., 2012). Coefficients above .80 were considered reliable, .70–.79 relatively reliable, .60–.69 marginally reliable, and below .59 unreliable, using the criteria recommended by Davis et al. (2018) and Sattler (2006).

Third, given the poor fit of the CFA, an EFA with oblique rotation was performed to explore the possible structure of the scale. An oblique rotation was chosen because correlations between the factors were expected. The internal consistency of the new solution was assessed using ordinal alpha. In addition, evidence of predictive validity was assessed through correlations with reading comprehension ability.

Results

Descriptive Results

The descriptive results of the items are presented in Table 6. The item that shows the lowest variability is item 5 ("Is it important to know how to read well?"), which shows a very high mean, skewness, and kurtosis. These high scores are due to almost all students (90%, $n = 154$) choosing the option "Yes, it's very important to know how to read well". Only 2% of the students ($n = 4$) said it wasn't important to know how to read well, and 8% ($n = 14$) considered that reading well was "sort of important".

[Table 6 near here]

Correlations between items are shown in the Appendix. To allow comparison between items, they were organized according to their dimension. The full table of correlations is available from the authors. Most items show positive and significant correlations with the other items of their dimension, although nearly all dimensions present at least one item that seems problematic, with many items showing non-significant correlations with the items of their dimension, and instead positive and significant correlations with items from other dimensions.

Confirmatory Factor Analysis

Mardia's test of multivariate normality was significant (Mardia Skewness = 13610.575, p

< .001; Mardia Kurtosis = 7.997, $p < .001$), therefore maximum likelihood estimation with robust standard errors was used.

The 8-factor model did not show an appropriate fit: $\chi^2 = 1122.861$, $p < .001$; CFI = .666; TLI = .634; RMSEA = .063; SRMR = .092.

The loadings of the items are presented in Table 7. Most items show significant and high loadings aligned with the hypothesized directions. However, most dimensions show high heterogeneity in item loadings, suggesting that of the items with significant loadings, only some items are explaining most of the variance in that factor (Brown, 2006). Weak items are indicated in Table 7.

[Table 7 near here]

The internal consistency analysis of each dimension (see Table 6) showed good reliability only for Intrinsic reading motivation, acceptable reliability for Perceived self-efficacy and Difficulty, marginal reliability for Reading avoidance, Reading value, and Social value, and poor reliability for Reading devalue and Social devalue.

Exploratory Factor Analysis

Given the structural and reliability problems with the CFA model, an EFA was conducted. Mardia's test of multivariate normality was significant, thus principal factor method of extraction was used (Tabachnick & Fidell, 2014). The following criteria were considered to decide the number of factors to extract: Kaiser-Guttman criterion (eigenvalues > 1); Scree test, and Parallel test. According to all three criteria, four factors should be extracted (see Figure 1).

[Figure 1 near here]

The unrotated EFA model (see Table 8) indicated that a 4-factor solution explained 29% of the total variance, and that all factors showed eigenvalues > 1. A 4-factor EFA

with oblique rotation (Oblimin) was carried out. The results (see Table 8) show that six items did not load on to any factor.

[Table 8 near here]

The structure of the four-factor model suggests that the items cluster together in two affirming and two undermining factors:

- **Factor 1: Reading value and intrinsic motivation (affirming).** It includes mainly Intrinsic reading motivation and Social value items. It also includes two items of Reading avoidance, two of Reading value, and one of Reading devalue. The loading of the item of Reading devalue is problematic, as it should have a negative loading. It is also the item with the lowest loading and commonality, suggesting that this item is not aligned with the other items in the factor. Considering the content and focus of the items in this factor, we can conclude that it is a positive factor focused on the enjoyment and value of reading, including individual and social values.
- **Factor 2: Perceived difficulty (undermining).** It includes all the items of Perceived difficulty of reading and one item of Perceived self-efficacy with a negative and rather low loading and commonality. The items in this factor focus mainly on readers' perceived difficulty when faced with a reading activity, which can also be conceptualized as a negative reading self-concept.
- **Factor 3: Reading devalue and avoidance (undermining).** It includes mainly items of Reading devalue and Social devalue, with two items of Reading avoidance. The loadings of the items are mostly homogeneous and in the expected directions. The items in this factor focus mainly on devalue and avoidance of reading activities.

- **Factor 4: Perceived self-efficacy (affirming).** It includes most items of Perceived self-efficacy, two items of Intrinsic motivation, one item of Reading value, and one item of Reading avoidance. The intrinsic motivation items focus on students' appetite for reading challenges, suggesting that this aspect could be understood as aligned with perceived self-efficacy. The item of reading value also focuses on students' ability or positive self-concept, as they must assess their ability to learn from texts. The item of reading avoidance shows the lowest loading and commonality, which suggests that this item is not properly aligned with the rest of the items in this factor. Considering the content and focus of the items, this factor focuses mainly on readers' positive self-concept.

In total, seven items did not clearly load on any factor (items 33, 5, 16, 10, 6, 17, and 31), and one item loaded positively when it should have loaded negatively (item 3). These eight items were deleted, with the final scale including 32 items. Factor 1 has 11 items, Factor 2 six items, Factor 3 eight items, and Factor 4 seven items.

The factor correlations were mostly low (see Table 9), providing evidence for each factor's independence. To evaluate evidence of predictive validity of the new structure, correlations with reading comprehension were carried out. Composite scores of each factor and of the complete scale were created, using reversed scores of the negative items in the affirming dimensions and on the complete scale score. The correlation of the complete scale with reading comprehension is positive and significant. All the dimensions show significant correlations with reading comprehension, except Factor 1 (reading value) that shows an unexpected negative correlation that is non-significant (p = .074). When looking at the distribution of these scores (scatterplot is available from the authors), no clear relationship between these two variables is found, as students with low and high reading value achieved low scores in reading comprehension.

Internal consistency of the new factors and of the complete scale was tested using ordinal alpha, with all results being above .76.

[Table 9 near here]

Discussion

The goal of this study was to develop and test a theoretically valid reading motivation scale for Primary Education students. Our approach included a comprehensive review of previous scales and theoretical frameworks used in the study of reading motivation to inform item selection, determination of the best fit for theoretically derived dimensional structure, and statistical evaluation of the best-fitting scale's internal consistency.

CFA did not confirm the 8-factor structure proposed by Guthrie et al. (2012) that includes four affirming and four undermining reading motivations: intrinsic reading motivation, reading avoidance, perceived self-efficacy, perceived difficulty, value of reading, devalue of reading, social value, and social devalue. This study is novel in analyzing all dimensions previously proposed for reading motivation with a single sample and analysis. Our results suggest that substantially different results can be obtained when analyzing single dimensions or pairs of dimensions (as in the studies of Coddington, 2009; Guthrie et al., 2009, 2012), that when analyzing the complete scale with all proposed dimensions. Our study also includes a measure of predictive validity, which adds to the robustness of the results and allows a more complex discussion of the factorial structure.

Instead of an 8-factor structure, EFA suggested a four-factor structure in which the factors can be conceptualized as: Reading value and intrinsic motivation, Reading devalue and avoidance, Perceived self-efficacy, and Perceived difficulty. Therefore, items clustered together according to them being affirming or undermining motivations, and according to them being focused on reading value or readers' perception of self-efficacy. The distinctions between reading value, social value, and intrinsic reading motivation were not

clearly found, but the dimensions focused on readers' self-concept were clearly separate from the ones focused on reading value. Internal consistency of the complete scale and of the four factors was good, and correlations with reading comprehension provided evidence of predictive validity.

Relevance of Undermining Reading Motivations

In support of the proposals that affirming dimensions are indeed independent of undermining dimensions, the suggested pairs of dimensions did not tend to cluster together. For example, perceived self-efficacy items were clearly separated from perceived difficulty items. The low correlations between factors also supported the independence between positive and negative motivations, in line with previous work (Coddington, 2009; Guthrie et al., 2009, 2012; Klauda & Guthrie, 2015; van Steensel et al., 2019).

Interestingly, the dimension of perceived difficulty was the most clear and well structured factor, with significant loadings in the confirmatory and exploratory analyses, suggesting that this negative motivation is particularly distinct. This result is relevant, as it implies that a student might have a high perceived efficacy of its ability to read and comprehend a text, and at the same time perceive that reading activities are difficult. This independence questions the appropiateness of proposing undermining dimensions as inverse pairs of affirming dimensions. The pairing implies a dependence that is not supported by the statistical analysis. Future research should explore possible motivation profiles of students with both high affirming and undermining dimensions. This research could shed light on the relationship between the positive and negative aspects of reading motivation.

The results also highlight that the separate assessment of undermining dimensions of reading motivation is possible and it could be useful to detect particular aspects of demotivation in students as young as second graders. Undermining motivations may be

especially useful to measure in students with specific reading comprehension difficulties (Klauda & Guthrie, 2015; van Steensel et al., 2019), because it could provide a specific focus for intervention. Experimental studies have found that interventions that integrate work on reading abilities with the promotion of reading motivation are useful on increasing the reading comprehension of students with difficulties (Guthrie et al., 2004, 2012; Toste et al., 2017, 2019), and that targeting only the students' weak skills might be insufficient to improve students' reading problems (Morgan et al., 2008). Therefore, the assessment of undermining dimensions of reading motivation can be a crucial aspect for future research and interventions. However, it is important to consider the possibility that the clustering of negative items in this study is due to a measurement aspect, since it has been previously observed that students tend to answer negative and positive questions in different ways (Watkins & Coffey, 2004). This is problematic and reliable ways of assessing undermining motivations must be further explored in future research.

Support for Reading Value and Readers' Self-Concept

A clear distinction was found between perceived self-efficacy and reading value items, and between perceived difficulty and reading devalue items. These results support the proposal of the Expectancy-Value Theory that there are two main dimensions at the core of reading motivation: readers' self-concept and reading value (Eccles et al., 1983; Gambrell et al., 1996; Wigfield & Eccles, 2000). This suggests that some dimensions of reading motivation, such as intrinsic reading motivation and reading value, might not be independent, and that more clarity is needed on the composition of each dimension. The lack of distinction between reading value and intrinsic reading motivation is consistent with the proposal that the perceived value of reading is an aspect of intrinsic reading motivation, and has to therefore be assessed as a subdimension of intrinsic motivation (Davis et al., 2020; Wigfield & Guthrie, 1997). From this perspective, intrinsic reading

motivation focuses on the individual reasons for engaging in reading activities, and includes reasons such as the enjoyment of reading, the appreciation of reading activities, and a positive attitude toward reading (Schiefele et al., 2012). In contrast, readers' self-concept includes their perception of being competent and able to read a text successfully and their awareness of their reading difficulties, which can be considered as separate reading motivation constructs (Davis et al., 2018; Schiefele et al., 2012).

Distinction between Social and Individual Aspects of Motivation

Also consistent with Expectancy Value Theory is the fact that individual and social aspects clustered together according to their positive or negative characteristics (e.g., social value clustered with reading value and intrinsic reading motivation in a factor focused on reading value, and social devalue clustered with reading devalue and reading avoidance in a factor focused on reading devalue). This suggests that individual and social aspects of reading value are not independent. Future research should reexamine the role of the social aspects of motivation in reading motivation. The relevance of the role of parents and peers in reading motivation has been neglected (Coddington, 2009), prioritizing the study of extrinsic goals for reading, such as reading for a good grade or because it is mandatory for school. These external motivations are clearly distinct from the intrinsic goals for reading, such as reading for pleasure or enjoyment (Wang & Guthrie, 2004). However, social aspects of motivation are different from the extrinsic reasons for reading assessed in reading motivation scales such as the MRQ. The students' perception of how their peers and family value reading activities and their eagerness to share and respect reading opinions are seem to be intertwined with the students' individual visions and attitudes toward reading. It is also important to remember that most reading motivation scales use a self-report format and, therefore, all social dimensions are understood from the point of view of the student. Further exploration of direct assessments of the parents and peers'

values of reading could present different results.

Unclear Dimensions of Reading Motivation

A relevant result is that some items that were supposed to assess one dimension of reading motivation did not cluster with the other items of their dimension, and instead clustered with other dimensions. This result highlights previously reported problems with the assessment of reading motivation and the difficulty in proposing clear definitions of independent dimensions (Conradi et al., 2014; Davis et al., 2018; Schiefele et al., 2012).

This problem is evident in the dimension of intrinsic reading motivation, in which two items that focused on students' enjoyment of reading challenges clustered with the items of perceived self-efficacy. This is coherent with the original proposal of the MRQ that students' appetite for reading challenges is an element of their perceived self-efficacy, and not of their intrinsic motivation. However, these items were later moved to the dimension of intrinsic reading motivation in the revised version of the scale (Wang & Guthrie, 2004), without a clear justification for this change. Recent research has also found problems with this dimension, which was solved by moving the items from the intrinsic motivation dimension to the self-efficacy dimension to achieve good statistical results (van Steensel et al., 2019).

The non-significant correlation of the factor of reading value and intrinsic motivation with reading comprehension is also evidence of its unclear interpretation. It is relevant that most students had low reading comprehension and high reading value. This homogeneity might explain the lack of relationship between these two variables.

The results suggest a need to reconsider what we are talking about when we talk about intrinsic reading motivation. Ryan and Deci (2000) defined intrinsic motivation "as the doing of an activity for its inherent satisfactions rather than for some separable consequence. When intrinsically motivated, a person is moved to act for the fun or

challenge entailed rather than because of external prods, pressures, or rewards." (p. 56). Based on their Cognitive Evaluation Theory (CET), the authors propose that intrinsic motivation is intertwined with feelings of competence and autonomy related to the task. As we can see, even the seminal definitions from over 20 years ago are unclear in the distinction between perceived self-efficacy and intrinsic motivation, which suggests that the confusions in measures and theoretical definitions might be due to a lack of clarity in how these two dimensions affect each other and differentiate. Future studies should provide more evidence on the appropriateness of including subdimensions like students' value of reading activities and reading challenges in the dimension of intrinsic reading motivation. More research is crucial, as intrinsic reading motivation is widely the most assessed aspect of reading motivation (Davis et al., 2018).

This study has some limitations, the most pertinent listed here. First, the sample size compromises our ability to generalize study findings: A bigger sample would have enabled the use of CFA and EFA in different subsamples, together with more statistical power. Second, our desire to evaluate eight previously proposed dimensions of reading motivation, resulted in a restricted number of items for each. Future research that focuses on fewer dimensions or, different sets of dimensions with different samples, would provide the opportunity to evaluate a greater number of items to develop a more robust scale.

In summary, this study contributes to the discussion on the multidimensionality of reading motivation by providing statistical evidence of both validity and internal consistency of a scale, using a single sample and analysis. Our results provide support for the proposal of the Expectancy Value Theory and for the distinction between affirming and undermining reading motivations. The results suggest that reading motivation is composed of two main dimensions, reading value and readers' self-concept, which include social and individual aspects, and that these two dimensions have distinct and independent affirming

and undermining affects: a positive reading value and a negative reading devalue, and a positive readers' self-concept (perceived self-efficacy) and a negative readers' self-concept (perceived difficulty).

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Appendix

Table A1. Correlations between items of Intrinsic Motivation, Reading avoidance, Perceived Self-efficacy, and Difficulty

Dimension	Item	1	9	18	32	39	7	12	20	27	38	2	13	22	30	33	4	15	23	25
Intrinsic Motivation	1																			
	9	.56**																		
	18	.62**	.63**																	
	32	.33**	.37**	.39**																
	39	.11	.23**	.25**	.37**															
Reading Avoidance	7	-.05	-.08	-.02	-.07	-.10														
	12	-.24**	-.06	-.08	-.10	.03	.20*													
	20	-.53**	-.45**	-.45**	-.25**	-.02	.15	.22**												
	27	-.29**	-.27**	-.27**	-.14	-.14	.09	.25**	.37**											
	38	-.26**	-.23**	-.31**	-.25**	-.27**	.11	.15	.23**	.34**										
Perceived Self-efficacy	2	.22**	.28**	.23**	.16*	.20**	-.07	.01	-.11	-.26**	-.07									
	13	.17*	.08	.15	.28**	.33**	-.08	-.09	-.07	-.17*	-.24**	.28**								
	22	.13	.18*	.28**	.21**	.25**	-.17*	-.12	-.20**	-.14	-.19*	.21**	.31**							
	30	.20**	.24**	.25**	.14	.23**	.01	.02	-.03	-.10	-.16*	.27**	.35**	.26**						
	33	.30**	.22**	.27**	.22**	.21**	.03	-.04	-.21**	-.25**	-.21**	.13	.28**	.16*	.29**					
Perceived Difficulty	4	-.08	.03	-.03	-.02	-.03	-.01	-.01	-.05	.06	-.04	-.25**	-.12	-.08	-.10	-.07				
	15	-.14	-.13	-.10	-.07	-.05	.14	.20*	.13	.14	.10	-.26**	-.19*	-.26**	-.12	-.13	.25**			
	23	-.06	-.08	-.03	-.10	-.19*	.21**	.18*	.10	.16*	.05	-.21**	-.27**	-.39**	-.10	-.07	.29**	.39**		
	25	-.04	-.03	.03	-.04	.01	.07	.10	.11	.09	-.01	-.29**	.01	-.15	-.19*	-.10	.30**	.30**	.33**	
	36	-.17*	-.09	-.10	-.01	.12	.10	.10	.09	.17*	-.01	-.17*	-.14	-.24**	-.18*	-.16*	.41**	.32**	.39**	.31**

Table A2. Correlations between items of Reading Value, Devalue, Social value, and Social devalue

Dimension	Item	5	16	21	26	37	3	10	24	29	34	6	11	19	28	35	8	14	17	31
Reading Value	5																			
	16	.10																		
	21	.10	.09																	
	26	.30**	.25**	.12																
	37	.23**	.21**	.31**	.23**															
Reading Devalue	3	.05	-.06	.19*	.04	.28**														
	10	-.12	-.22**	-.09	-.13	-.08	.04													
	24	.03	-.12	.11	-.12	-.04	.28**	.07												
	29	-.05	.01	-.07	-.08	-.12	.12	.11	.32**											
	34	-.06	-.17*	-.10	-.04	-.12	-.02	.30**	.14	.24**										
Social Value	6	.03	.11	.02	.15	.13	.10	-.07	-.11	-.07	-.03									
	11	.03	.15*	.27**	.22**	.24**	.27**	-.18*	.02	-.01	-.06	.09								
	19	.12	.12	.26**	.28**	.25**	.14	-.06	-.14	-.18*	-.08	.11	.34**							
	28	-.11	.12	.20*	.13	.13	.20*	-.02	-.04	.01	.15	.05	.32**	.24**						
	35	.14	.12	.27**	.25**	.33**	.08	-.13	-.14	-.06	-.05	.09	.34**	.36**	.33**					
Social Devalue	8	-.04	.07	.00	-.08	-.01	.16*	.00	.17*	.10	.13	-.01	.11	.03	.15*	.08				
	14	-.12	-.01	.16*	-.08	.11	.14	.09	.19*	.13	.34**	.04	.04	.07	.26**	.11	.26**			
	17	-.05	.09	-.09	.02	-.14	.00	-.00	-.04	-.07	.03	.07	-.11	-.16*	-.14	-.12	.03	.05		
	31	.01	.01	-.04	-.08	-.00	.03	-.06	.10	.01	.21**	-.03	-.04	-.18*	-.20**	-.20**	.04	.01	.23**	
	40	.04	.07	.05	.10	-.03	.04	.03	.13	.10	.25**	.12	.05	-.07	.20*	.04	.30**	.33**	.02	-.06

* $p < .05$. ** $p < .01$.

Table 1. Definition and Examples of Reading Motivation Dimensions and Subdimensions from MRQ (Wigfield & Guthrie, 1997)

Dimension	Subdimension	Definition	Item Example
Self-efficacy	Reading efficacy	Beliefs about one's reading skills.	"I am a good reader"
	Reading challenge	The satisfaction of working and mastering a complex text.	"I like hard, challenging books"
Intrinsic motivation and learning goals	Reading curiosity	The desire to learn from books.	"I read about my hobbies to learn more about them"
	Reading involvement	The pleasure of reading a well-written text and connecting with it.	"I make pictures in my mind when I read"
	Importance of reading	The value of being a good reader.	"It is very important to me to be a good reader"
	Reading work avoidance	The aspects students don't like about reading.	"I don't like reading something when the words are too difficult"
Extrinsic motivation and performance goals	Competition in reading	The desire to outperform others in reading.	"I like being the best at reading"
	Recognition for reading	The gratification of receiving a tangible form of recognition for successful reading.	"I like having the teacher say I read well"
	Reading for grades	The desire to read well to be evaluated favorably.	"I read to improve my grades"
Social motivation	Social reasons for reading	The desire to share reading experiences with friends and family.	"My friends and I like to trade things to read"
	Compliance	Reading to complete an external requirement or goal.	"I read because I have to"

Table 2. Comparison of Reading Motivation Dimensions considered in the Scales

Dimensions and Subdimensions of Reading Motivation according to the MRQ (Wigfield & Guthrie, 1997)		Correspondence with the Dimensions and Subdimensions of the MRQ			
Dimension	Subdimension	MRQ-R (Wang & Guthrie, 2004)	MRP (Gambrell et al., 1996)	AMOSR/AMSR (Coddington, 2009)	MRIB-S/MRIB-N (Guthrie et al., 2012)
Self-efficacy	Reading efficacy	-	Self-concept	AM: Perceived self-efficacy. UM: Perceived difficulty	AM: Perceived self-efficacy. UM: Perceived difficulty
	Reading challenge	Moved to Intrinsic Motivation	-	AM: Intrinsic Motivation	AM: Intrinsic Motivation
Intrinsic motivation and learning goals	Reading curiosity	Reading curiosity	-	AM: Intrinsic Motivation	AM: Intrinsic Motivation
	Reading involvement	Reading involvement	-	AM: Intrinsic Motivation	AM: Intrinsic Motivation
	Importance of reading	-	Reading value	-	AM: Reading value UM: Reading devalue
	Reading work avoidance	-	-	UM: Reading avoidance	UM: Reading avoidance
Extrinsic motivation and performance goals	Competition in reading	Competition in reading	-	-	-
	Recognition for reading	Recognition for reading	-	-	-
	Reading for grades	Reading for grades	-	-	-
Social motivation	Social reasons for reading	Moved to Extrinsic Motivation	Reading value	-	-
	Compliance	Moved to Extrinsic Motivation	-	-	-
Dimensions not considered in the MRQ				AM: Prosocial goals UM: Antisocial goals	AM: Peer value UM: Peer devalue

Note. AM: Affirming motivation, UM: Undermining motivation, "-" means that the subdimension was not included in the scale

Table 3. Definition and Examples of Affirming and Undermining Reading Motivations from AMOSR and AMSR (Coddington, 2009).

Construct	Dimension	Definition	Item Examples
Affirming reading motivation	Intrinsic motivation	Students' behaviors initiated out of curiosity, interest, and a willingness to learn new things, without the expectancy of a reward.	"I enjoy the challenge of reading for school" "I enjoy reading outside of school"
Undermining reading motivation	Reading avoidance	Students' behaviors and strategies to evade reading activities.	"I guess a lot when reading in Reading/Language Arts so I can finish quickly" "I choose to do other things instead of reading outside of school").
Affirming reading motivation	Perceived self-efficacy	Students' perception of competence and capacity to read well.	"I think I am a good reader for Language Arts/Reading class" "I believe I am a good reader outside of school"
Undermining reading motivation	Perceived difficulty	Students' perception that reading tasks are difficult for them to perform.	"The materials I read for Reading/Language Arts are too difficult" "It is hard for me to understand reading materials outside of school"
Affirming reading motivation	Prosocial goals	Students' prosocial interactions focused on cooperating and following rules in and outside the classroom.	"I respect other students' comments about what they read in Language Arts/Reading class" "I offer to help my friends with reading outside of school"
Undermining reading motivation	Antisocial goals	Students' antisocial interactions focused on avoiding cooperation, and instead making fun of other students' opinions and comments about reading.	"I make fun of my classmates' opinions about what they read for Language Arts/Reading class" "I try to convince my friends that reading outside of school is a waste of time"

Table 4. Definitions of the Reading Motivation Dimensions included in the Scale

Dimension	Working Definitions
Intrinsic motivation	Students' drive to read for internal reasons, such as enjoyment, satisfying curiosity, a willingness to learn new things, or the satisfaction of working and mastering a complex text.
Reading avoidance	Students' behaviors and strategies to evade or minimize reading activities and tasks.
Perceived self-efficacy	Students' positive beliefs and perceptions about their reading skills, competence, and capacity to read well.
Perceived difficulty	Students' perception that reading tasks are too difficult or challenging for them to perform.
Reading value	Students' appreciation of reading activities and tasks and their beliefs that reading is a relevant and appealing activity.
Reading devalue	Students' devalue of reading activities and tasks, and their beliefs that reading is an unimportant or boring activity.
Social value	Students' desire to share reading experiences and opinions with friends and family, the respect of peers reading activities and opinions, and the perception that peers respect their reading activities and opinions.
Social devalue	Students' perception that reading is not a valued activity for their peers, the disrespect of peers reading activities and opinions, and the perception that peers disrespect their reading activities and opinions.

Table 5. Sample Description

School grade	*n*	Female	Male	Age_m	*RC*
2nd grade	34	19	15	8.16	5.90
3rd grade	33	22	11	9.36	6.29
4th grade	38	15	23	10.23	10.11
5th grade	37	15	22	11.36	11.82
6th grade	30	17	13	12.55	10.96
Total	172	88	84	10.26	9.04

Note. RC = Mean reading comprehension raw total score

Table 6. Internal Consistency and Items Descriptive Results

Dimension	Ordinal α	Item		n	mean	SD	median	min	max	skew	kurtosis
Intrinsic Motivation	.82	1	¿Te gusta leer los libros que te piden para el colegio? (Do you like to read books for school?)	172	1.22	0.75	1	0	2	-0.38	-1.15
		9	¿Te gusta leer en tu casa? (Do you enjoy reading at home?)	171	1.15	0.74	1	0	2	-0.24	-1.14
		18	¿Te pone feliz empezar a leer un nuevo libro? (Does it make you happy to start a new book?)	170	1.20	0.81	1	0	2	-0.38	-1.39
		32	¿Lees sobre los temas que te interesan? (Do you read about subjects that interest you?)	167	1.42	0.70	2	0	2	-0.77	-0.64
		39	Si un libro te interesa, ¿lo leerías aunque sea difícil? (If a book interests you, would you read it even if it's hard?)	167	1.50	0.71	2	0	2	-1.04	-0.30
Reading Avoidance	.67	7	¿Intentas leer lo menos posible? (Do you try to read as little as possible?)	171	1.05	0.82	1	0	2	-0.10	-1.52
		12	Cuando tienes que leer libros para el colegio ¿tratas de evitar leerlos? (When you have to read books for school, do you try to avoid it?)	170	0.66	0.75	0	0	2	0.65	-0.99
		20	¿Prefieres hacer otras cosas en vez de leer? (Do you prefer to do other things instead of reading?)	169	1.04	0.74	1	0	2	-0.07	-1.20
		27	¿Te molesta tener que leer los libros para el colegio? (Does it bother you having to read books for school?)	171	0.53	0.72	0	0	2	0.98	-0.45
		38	¿Crees que leer es aburrido? (Do you think reading is boring?)	167	0.50	0.68	0	0	2	0.98	-0.27
Perceived Self-efficacy	.71	2	¿Crees que eres un buen lector/a? (Do you think you're a good reader?)	171	1.15	0.65	1	0	2	-0.16	-0.71
		13	¿Puedes entender palabras difíciles cuando lees? (Can you understand difficult words when you're reading?)	171	0.88	0.68	1	0	2	0.15	-0.89
		22	¿Puedes entender los libros que lees? (Can you understand the books that you read?)	171	1.31	0.68	1	0	2	-0.47	-0.83
		30	¿Puedes responder correctamente preguntas sobre una lectura? (Can you correctly answer questions about a text?)	170	1.26	0.60	1	0	2	-0.18	-0.59
		33	¿Puedes explicarle a un compañero/a de qué se trataba una lectura? (Can you explain to a classmate what a text was about?)	167	1.27	0.79	1	0	2	-0.51	-1.25
Perceived Difficulty	.78	4	¿Te equivocas cuando lees en voz alta? (Do you make mistakes when you read aloud?)	172	1.30	0.67	1	0	2	-0.43	-0.80
		15	¿Crees que las lecturas para el colegio son difíciles de leer? (Do you think the things you read for school are hard?)	170	0.84	0.74	1	0	2	0.26	-1.16
		23	¿Necesitas ayuda para leer? (Do you need help to read?)	170	0.86	0.79	1	0	2	0.24	-1.38
		25	¿Tus compañeros/as son mejores que tú para leer? (Are your classmates better than you at reading?)	171	1.28	0.65	1	0	2	-0.35	-0.76
		36	¿Es difícil para ti leer en voz alta en clases? (Is it hard for you to read aloud in class?)	168	1.13	0.79	1	0	2	-0.23	-1.36

Reading Value	.67	5	¿Es importante saber leer bien? (Is it important to know how to read well?)	172	1.87	0.40	2	0	2	-3.23	10.17
		16	¿Crees que las personas que leen mucho son interesantes? (Do you think that people who read a lot are interesting?)	167	1.41	0.76	2	0	2	-0.83	-0.82
		21	¿Crees que leer es más importante que las otras actividades que haces en el colegio? (Do you think that reading is more important than the other activities you do in school?)	171	1.35	0.69	1	0	2	-0.56	-0.81
		26	¿Aprendes de los textos que lees para el colegio? (Do you learn from the texts you read for school?)	171	1.49	0.63	2	0	2	-0.80	-0.39
		37	Cuando seas grande ¿te gustaría ser una persona que lee mucho? (When you are grown up, would you like to be a person who reads a lot?)	167	1.28	0.71	1	0	2	-0.44	-0.95
Reading Devalue	.59	3	¿Crees que leer bien tiene poca importancia? (Do you think reading well is unimportant?)	171	0.92	0.90	1	0	2	0.16	-1.76
		10	¿Crees que las personas que leen mucho son aburridas? (Do you think people who read a lot are boring?)	171	0.35	0.64	0	0	2	1.63	1.29
		24	¿Crees que leer para el colegio te toma demasiado tiempo? (Do you think reading for school takes too much of your time?)	171	0.79	0.79	1	0	2	0.39	-1.31
		29	¿Crees que hay cosas más importantes que leer para colegio? (Do you think there are more important things to do than to read for school?)	171	0.92	0.80	1	0	2	0.15	-1.43
		34	¿Crees que leer es una pérdida de tiempo? (Do you think reading is a waste of time?)	166	0.31	0.60	0	0	2	1.74	1.81
Social Value	.68	6	¿Te interesa saber qué están leyendo tus amigos/as? (Does it interest you to know what your friends are reading?)	171	1.16	0.74	1	0	2	-0.26	-1.15
		11	¿Con tus amigos se recomiendan libros para leer? (Do you and your friends recommend books to each other?)	171	0.77	0.85	0	0	2	0.45	-1.49
		19	¿Te gusta hablar con tus amigos/as sobre lo que estás leyendo? (Do you like to talk to your friends about what you are reading?)	170	1.15	0.80	1	0	2	-0.28	-1.39
		28	¿Tus amigos/as te piden tu opinión sobre los libros que has leído? (Do your friends ask your opinion about the books you've read?)	169	0.72	0.82	0	0	2	0.56	-1.29
		35	¿Te gusta hablar con tu familia sobre lo que estás leyendo? (Do you like to talk to your family about what you're reading?)	167	1.17	0.81	1	0	2	-0.31	-1.42
Social Devalue	.51	8	¿Te parece extraño que tus compañeros/as lean en su tiempo libre? (Do you think it's strange that your classmates read in their spare time?)	172	0.49	0.78	0	0	2	1.16	-0.35
		14	¿Tratas de convencer a tus compañeros/as de que leer es una pérdida de tiempo? (Do you try to convince your classmates that reading is a waste of time?)	171	0.27	0.64	0	0	2	2.11	2.76
		17	¿A tus compañeros/as les da lo mismo cómo te va en las pruebas de lectura? (Do your classmates not care how you do in reading tests?)	171	1.01	0.81	1	0	2	-0.01	-1.48
		31	¿A tus amigos/as les da lo mismo tu opinión sobre los libros que has leído? (Do your friends not care about your opinion about the books you have read?)	167	1.04	0.80	1	0	2	-0.06	-1.44
		40	¿Tus amigos/as creen que es raro leer fuera del colegio? (Do your friends think it is weird to read outside of school?)	167	0.53	0.74	0	0	2	0.98	-0.52

Table 7. Eight-Factor CFA Results

Dimension	Item		Estimate	Std. Error	*Z*	*p*	Std. Loading
Intrinsic Motivation	1	Do you like to read books for school?	.531	.049	10.832	< .001	.725
	9	Do you enjoy reading at home?	.519	.049	10.668	< .001	.725
	18	Does it make you happy to start a new book?	.650	.039	16.553	< .001	.819
	32	Do you read about subjects that interest you?	.296	.059	4.987	< .001	.433
	39	If a book interests you, would you read it even if it's hard?	.173	.072	2.391	.017	.249
Reading Avoidance	7	Do you try to read as little as possible?	.169	.101	1.673	.094	.209*
	12	When you have to read books for school, do you try to avoid it?	.236	.084	2.814	.005	.312
	20	Do you prefer to do other things instead of reading?	.534	.057	9.330	< .001	.732
	27	Does it bother you having to read books for school?	.378	.064	5.950	< .001	.510
	38	Do you think reading is boring?	.275	.060	4.610	< .001	.428
Perceived Self-efficacy	2	Do you think you're a good reader?	.354	.064	5.565	< .001	.558
	13	Can you understand difficult words when you're reading?	.360	.068	5.287	< .001	.527
	22	Can you understand the books that you read?	.376	.073	5.157	< .001	.550
	30	Can you correctly answer questions about a text?	.266	.077	3.436	.001	.442
	33	Can you explain to a classmate what a text was about?	.285	.088	3.232	.001	.372
Perceived Difficulty	4	Do you make mistakes when you read aloud?	.267	.077	3.485	< .001	.404
	15	Do you think the things you read for school are hard?	.434	.062	7.053	< .001	.593
	23	Do you need help to read?	.535	.068	7.900	< .001	.699
	25	Are your classmates better than you at reading?	.324	.065	4.991	< .001	.499
	36	Is it hard for you to read aloud in class?	.414	.079	5.226	< .001	.533
Reading Value	5	Is it important to know how to read well?	.038	.030	1.283	.200	.121*
	16	Do you think that people who read a lot are interesting?	.220	.081	2.725	.006	.298
	21	Do you think that reading is more important than the other activities you do in school?	.289	.070	4.099	< .001	.428
	26	Do you learn from the texts you read for school?	.240	.074	3.259	.001	.386
	37	When you are grown up, would you like to be a person who reads a lot?	.456	.074	6.137	< .001	.665
Reading Devalue	3	Do you think reading well is unimportant?	.095	.153	0.620	.536	.106*
	10	Do you think people who read a lot are boring?	.159	.088	1.808	.071	.262*
	24	Do you think reading for school takes too much of your time?	.409	.085	4.782	< .001	.529

	29	Do you think there are more important things to do than to read for school?	.310	.090	3.452	.001	.389
	34	Do you think reading is a waste of time?	.283	.083	3.395	.001	.498
Social Value	6	Does it interest you to know what your friends are reading?	.135	.069	1.951	.051	.189*
	11	Do you and your friends recommend books to each other?	.526	.067	7.839	< .001	.622
	19	Do you like to talk to your friends about what you are reading?	.449	.067	6.667	< .001	.572
	28	Do your friends ask your opinion about the books you've read?	.407	.076	5.327	< .001	.500
	35	Do you like to talk to your family about what you're reading?	.479	.064	7.466	< .001	.601
Social Devalue	8	Do you think it's strange that your classmates read in their spare time?	.329	.146	2.258	.024	.439
	14	Do you try to convince your classmates that reading is a waste of time?	.389	.128	3.034	.002	.619
	17	Do your classmates not care how you do in reading tests?	-.039	.124	-0.312	.755	-.049*
	31	Do your friends not care about your opinion about the books you have read?	-.019	.102	-0.184	.854	-.024*
	40	Do your friends think it is weird to read outside of school?	.346	.114	3.029	.002	.479

Note. * Items with low and non-significant loadings.

Table 8. Four Factor EFA with Oblimin Rotation

Dimension	Item		Factor 1	Factor 2	Factor 3	Factor 4	h^2
Intrinsic	1	Do you enjoy reading books for school?	.73				.559
Intrinsic	9	Do you enjoy reading at home?	.69				.535
Intrinsic	18	Does it make you happy to start a new book?	.74				.659
Avoidance	20	Do you prefer to do other things instead of reading?	-.67				.522
Avoidance	27	Does it bother you having to read books for school?	-.36				.241
Value	21	Do you think that reading is more important than the other activities you do in school?	.45				.221
Value	37	When you are old, would you like to be a person who reads a lot?	.55				.409
Devalue	3	Do you think that reading well is unimportant?	.35				.219
Social value	11	Do you and your friends recommend each other books?	.59				.341
Social value	19	Do you like to talk to your friends about what you are reading?	.55				.334
Social value	28	Do your friends ask your opinion about the books you've read?	.45				.346
Social value	35	Do you like to talk to your family about what you're reading?	.57				.336
Self-efficacy	2	Do you think you're a good reader?		-.36			.281
Difficulty	4	Do you make mistakes when you read aloud?		.59			.337
Difficulty	15	Do you think the texts you read for school are hard?		.51			.380
Difficulty	23	Do you need help reading?		.55			.426
Difficulty	25	Are your classmates better than you at reading?		.52			.284
Difficulty	36	Is it hard for you to read aloud in class?		.64			.399
Avoidance	7	Do you try to read as little as possible?			.44		.240
Avoidance	12	When you have to read books for school, do you try to avoid it?			.45		.249
Devalue	24	Do you think reading for school takes too much of your time?			.37		.336
Devalue	29	Do you think there are more important things to do than read for school?			.36		.203
Devalue	34	Do you think reading is a waste of time?			.48		.286
Social devalue	8	Do you think it's strange that your classmates read in their spare time?			.42		.198
Social devalue	14	Do you try to convince your classmates that reading is a waste of time?			.48		.247
Social devalue	40	Do your friends think it is weird to read outside of school?			.39		.152

Intrinsic	32	Do you read about subjects that interest you?				.35	.299
Intrinsic	39	If a book interests you, would you read it even if it's hard?				.60	.367
Avoidance	38	Do you think reading is boring?				-.32	.259
Self-efficacy	13	Can you understand difficult words when you're reading?				.47	.287
Self-efficacy	22	Can you understand the books that you read?				.40	.292
Self-efficacy	30	Can you correctly answer questions about a text?				.48	.309
Value	26	Do you learn from the texts you read for school?				.37	.273
Self-efficacy	33	Can you explain to a classmate what a text is about?				.27	.205
Value	5	Is it important to know how to read well?				.28	.091
Value	16	Do you think that people who read a lot are interesting?				.28	.161
Devalue	10	Do you think that people who read a lot are boring?			.23		.151
Social value	6	Does it interest you to know what your friends are reading?				.22	.074
Social devalue	17	Do your classmates don't care how you do in reading tests?				.26	.078
Social devalue	31	Do your friends don't care about your opinion about the books you have read?		.19			.064
Eigenvalues			5.85	2.92	1.58	1.29	
Explained Variance			15%	7%	4%	3%	
Accumulated Variance			50%	25%	14%	11%	

Note. h^2 = commonalities.

Table 9. Factor Correlations, Internal Consistency, and Descriptive Results

	F1	F2	F3	*RC*	α	*M*	*SD*
Factor 1 (+ Reading value & Intrinsic motivation)				-.15	.89	12.28	5.23
Factor 2 (- Perceived difficulty)	-.09			-.38**	.79	6.21	2.77
Factor 3 (- Reading devalue & Avoidance)	-.05	.17		-.44**	.76	4.97	3.24
Factor 4 (+ Perceived self-efficacy)	.32	-.15	-.10	.22*	.78	9.19	2.89
Complete scale				.25*	.87	38.29	9.29

Note. *RC* = correlations with reading comprehension score. α = ordinal alpha. * $p < .01$, ** $p < .001$