



FACULTAD DE CIENCIAS SOCIALES
ESCUELA DE PSICOLOGÍA
PROGRAMA DE DOCTORADO EN PSICOLOGÍA

**GENDER IDENTITY AND STEREOTYPES AS KEY FACTORS IN READING
MOTIVATION: THREE STUDIES IN SECONDARY SCHOOL IN CHILE**

Doctoral Dissertation of:
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Presented to the Escuela de Psicología of the Pontificia Universidad Católica de Chile to
opt for the academic degree of Doctor in Psychology

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June, 2021

Santiago, Chile

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Acknowledgements

I greatly appreciate my family, especially my mother María Angélica, for her enormous and constant support during my academic training, and particularly during my doctoral studies. For teaching me to trust myself and strive for my goals, as well as encouraging me to challenge traditional gender roles. To my son Luciano for enlightening my life with his existence and his unconditional love and teaching me to be a better person every day.

I am very grateful to professor Sandy Taut for giving me the opportunity to start with her the study of this topic, for teaching me rigorous research, and the importance of contributing socially with it. Also, for always encouraging me to develop my interests and dream big. I appreciate my advisor Katy Strasser, for her support and encouragement throughout the process of developing this research, especially in the most challenging moments. For her academic rigor, intelligence, and creativity, and for me being an example of a woman in the academy. To professor Héctor Carvacho for his friendship, and for his support during the design and development of this research through his valuable and creative suggestions. I also thank professor Ursula Kessels, from the Freie Universität Berlin, for welcoming me and integrating me into her research team during my doctoral internship, greatly enriching the development of the second study of this dissertation.

To my friends, doctoral colleagues, and professors at the School of Psychology UC for their significant contributions to my doctoral training and personal development.

To my partner Gabriel for accompanying me and lovingly encouraging me during the last stage of my doctorate studies.

I thank all the students and schools that participated in this research, without them these studies would not have been possible. To my research assistants Josefina Melero and Valentina Palma, for their valuable contribution during the data collection stage, as well as in the development of support material with a gender perspective for teachers and schools.

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Funding Sources

This doctoral research was conducted with the support and resources provided by the Agencia Nacional de Investigación y Desarrollo (ANID), through the National Doctorate Grant number 2116177.

Ethical Standards

All procedures and instruments used in this research were in accordance with ethical standards and approved by the Social Sciences and Humanities Ethics review board at the Pontificia Universidad Católica de Chile (report number 18013100), and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Legal guardians of all participants, as well as participants themselves, gave explicit consent for participation.

Abstract

The goal of this dissertation was to identify the role of sex, gender identity, reading gender and other stereotypes, in the reading motivation of Chilean secondary school students, controlling for language arts achievement and SES. In addition, it sought to evaluate the differential effect of gender identity and stereotypes in the reading motivation of female and male students. To achieve this general goal, three studies were carried out to delve into different gender-related factors that contribute to explain the disadvantage of males compared to females in academic achievement in reading.

Study 1 analyzed the role of students' identification with expressive and instrumental traits, as well as their adherence to Reading Gender Stereotypes (RGS) in their reading motivation. The results indicate that females have a greater reading self-concept and value associated to reading in comparison to males, and students present RGS, since they believe that this is an activity more typical of females than males. Finally, it was observed that adherence to RGS explained significant variance in students' reading self-concept, as well as expressive identity traits explained variance in the value that students associated with reading.

Study 2 analyzed how fictional students with high and low liking for reading are perceived by both students and teachers, as well as the way in which this perception would especially harm the involvement of male students in activities related to reading. The findings show that secondary school students hold gender stereotypes about reading, because they perceive reading to be less associated with masculinity than femininity. Furthermore, students and teachers judged characters who like to read in other stereotyped ways.

Study 3 delves into findings of study 1. It evaluated not only the direct effects of sex, students' gender identity and their adherence to RGS, on reading motivation, but also the indirect effects of these variables, as well as the differential effects for the sample of female and male students. The results reveal only direct effects of sex, in favor of female students, in their reading motivation. Moreover, the results show a differential effect of RGS. While for female students, adherence to the reading=females stereotype has a

positive effect on their reading self-concept, for males it has a negative effect on their reading value.

Taken together, these findings show that traditional notions about gender have an explanatory role in the wide gender gaps in reading motivation of male and female students. Given the predictive role of motivation in achievement, it is essential to challenge the stereotypes associated with this area of knowledge. Implications for the reading teaching-learning processes in secondary school education are discussed, highlighting the importance of a non-sexist education to advance progress towards equity and reducing educational gender gaps.

Introduction

Equity in education is one of the main current concerns of educational systems worldwide (Organization for Economic Co-operation and Development [OECD], 2019). Ensuring an inclusive and equitable education, which promotes equal learning opportunities for all, is a central and long-standing objective of the nations in the world (Roemer & Trannoy, 2016). The United Nations proposes as one of the Sustainable Development Goals (SDG) to ensure that everyone, regardless of their personal characteristics and circumstances, has access to the best educational opportunities and to help all students develop their potential. Equity therefore implies, from a rights perspective, ensuring that each student acquires the skills they need to fully participate in society. This in order to properly use resources and improve educational and social results. Accomplishing these goals is essential to guarantee not only social cohesion, but also the ability of a country to compete in a global economy (Assembly, 2015).

There are various contextual and individual factors that put some students at an academic disadvantage in relation to others, threatening the horizon of equity in education. A large amount of evidence shows that among the most relevant contextual factors is the students' socioeconomic status (SES) (OECD, 2018), and among the individual factors, students' sex¹ (OECD, 2015). These factors can help shape students' aspirations, motivation, and attitudes, in turn influencing their educational outcomes.

Specifically, the results of various studies consistently show that students from higher socioeconomic status (SES) obtain better results in various disciplines, compared to those with worse socioeconomic conditions. Likewise, with certain variations between countries, male students have historically outpaced women in academic achievement in mathematics and science, while women have presented higher achievements in reading (OECD, 2016). In Chile this is particularly relevant given the wide gaps in the academic

¹ The term sex is used here to refer to the biological difference between women and men, and the term gender, to refer to socially constructed characteristic, expectations and roles for femininity and masculinity (Lips, 2020).

achievement in different disciplines, both in national and international tests (e.g., Educational Quality Agency, 2019a, 2019b; Mullis, Martin, Foy, & Hooper, 2016, 2017).

In relation to sex gaps in learning, it is striking that in recent years, both in Chile and in several countries around the world, the gap in mathematics has been decreasing (Educational Quality Agency 2019b; Hyde et al., 2008; OECD, 2015). However, in reading the gap in favor of women persists and is observed in all countries in which standardized performance assessments are carried out (e.g., Educational Quality Agency, 2019a, 2019b; Holbrook, 1988; Mullis et al., 2016, 2017; OECD, 2019; Samuels, 1943). For instance, in all countries and economies that participated in the Program for International Student Assessment (PISA) in 2018, 15-year-old females significantly outperformed males in reading, almost 30 points on average. Furthermore, on average in the countries evaluated, 28% of males did not reach Level 2 proficiency in reading (OECD, 2019). Surprisingly, research on the factors that could explain males' disadvantage in reading is relatively scarce. Therefore, while the lack of equity in learning by students' SES can be understood from the differences in access to cultural and economic resources at home, attitudinal differences in families, among others (OECD, 2018), the sex gap in favor of males in certain disciplines, and in favor of females in others such as reading is yet to be fully understood. This dissertation consists of three studies with secondary school students and language teachers, which address this problem from the perspective of reading motivation and its explanatory psychosocial factors.

Sex gaps in academic achievement in reading

Various studies have shown the important role of reading in both general academic achievement (Connor et al, 2011; Cooper, Moore, Powers, Cleveland, & Greenberg, 2014), as well as in performance in different life areas (Britt, Rouet, & Durik, 2017). Therefore, one of the biggest concerns of education systems in the world is to ensure that all students achieve a good reading level, so that as citizens they have the knowledge and skills necessary to reach their full potential (OECD, 2019). However, the results of standardized academic achievement tests in reading reveal large differences in favor of

females. In the case of Chile, significant gaps are observed at all levels evaluated, as well as an increase in the gap in secondary school (Educational Quality Agency 2019a, 2019b). For example, the results of the Progress in International Reading Literacy Study (PIRLS) in 2016 reveal that in 48 of the 50 participating countries, including Chile, girls have better academic performance in reading than boys (Mullis et al., 2017). Accordingly, the results of the Third Regional Comparative and Explanatory Study (TERCE) in 2013 reveal that in reading and writing in third grade, female students perform significantly better than male students in all participating countries. In sixth grade, inequality was greater, both at the regional level and in Chile, which would account for an increase in the sex gap as the school progresses (Gelber, Treviño, & Inostroza, 2016). A similar panorama is observed in the results of the Program for International Student Assessment (PISA) in 15-year-old students. In the last evaluation, all countries presented a gap in favor of women (OECD, 2019). Accordingly, the results of the Chilean “System for Measuring the Quality of Education” (SIMCE) have revealed during the last decades, gaps in favor of females in reading. While sex gaps in mathematics in secondary school have been disappearing, reading gap it has remained in both primary and secondary school, increasing in higher educational levels (Educational Quality Agency, 2019b). However, very few studies have delved into the factors associated with the sex gap in favor of females in reading in secondary education.

In summary, the results of national and international achievement tests reveal that although, regardless of sex, most Chilean students present low levels of educational achievement in reading, it increases in the case of male students in higher courses (Educational Quality Agency, 2019b). This is relevant as sex gaps in reading could have long-term consequences for students’ personal and professional futures. Students who are left behind and lack basic reading skills may face serious difficulties in higher education, in the job market, and in their everyday life (Connor et al., 2011; Snow, 2002). On the other hand, there is a sex segregation in the choice of study fields, professions, and trades, with males being under-represented in areas related to social sciences, caring for others, education, food, and clothing (Guerrero, Provoste, & Valdés, 2006; Ñopo, 2012;

UNESCO, 2012; United Nations Development Program, 2010; World Bank, 2012). Therefore, it becomes highly relevant to ask: what factors explain the sex differences in academic achievement in reading?

Factors associated with learning to read

While the neurosciences have identified some average differences in brain structure between men and women (Joel, Berman, Tavor, Wexler, Gaber, Stein, Shefi,... & Assaf, 2015; Joel, Persico, Salhov, Berman, Oligschläger, Meilijson, & Averbuch, 2018), to date there is no robust evidence that shows differentiated brain processes according to sex during learning, nor that these brain differences have an influence when persons learn something new (Fine, Joel, & Rippon, 2019; OECD, 2007). Furthermore, results of meta-analyses reveal that there exist few substantive sex differences in verbal skills (Hedges & Nowell, 1995; Hyde & Linn, 1988). On the other hand, as mentioned, in recent decades, many countries have made significant progress in reducing, and even closing, the sex gap in learning outcomes (OECD, 2015). Therefore, disparities in academic achievement between the sexes do not appear to be innate or inevitable.

Research on this topic has highlighted several factors that contribute to the explanation of variations in academic achievement of females and males between countries and over time. Some of these factors include differences in boys' and girls' socialization processes, both at home and at school (e.g., Hadjar et al., 2014). In relation to this, there is evidence that both parents (e.g., Muntoni & Retelsdorf, 2019; Tiedemann, 2000a) and teachers (e.g., Gunderson, Ramirez, Levine & Beilock, 2012; Muntoni & Retelsdorf, 2018; Tiedemann, 2000b, 2002) present differentiated expectations and practices in relation to learning of boys and girls in different domains. Therefore, parents and teachers can interact differently with boys and girls, which can generate differentiated learning opportunities and disparities in learning outcomes (e.g., Espinoza & Taut, 2016; Rodríguez-Planas & Nollenberger, 2018; Nollenberger, Rodríguez-Planas, & Sevilla, 2016). For instance, teachers may hold different beliefs about the interests and abilities of boys and girls, which may affect their assessments of student performance, which, in turn,

may reinforce or reduce gender gaps in academic achievement (e.g., Hadjar et al., 2014; Muntoni & Retelsdorf, 2018). These beliefs can also vary from one country to another, depending on the social norms and economic conditions prevailing in a period of time (vanHek, Kraaykamp, & Wolbers, 2016).

Another very relevant factor is reading motivation, since it has been shown to be a significant predictor of academic achievement in reading (Becker, McElvany, & Kortenbruck, 2010; Schwabe, McElvany, & Trendtel, 2015). Various international studies reveal that males have less reading motivation and a worse reading self-concept than females (Baker & Wigfield 1999; McGeown, 2015; Wigfield & Guthrie, 1997), especially towards the end of the school trajectory (Coles & Hall, 2002; Kelley & Decker, 2009; McKenna, Conradi, Lawrence, Jang, & Meyer, 2012). In addition, gender stereotypes linked to academic skills have been identified as a relevant factor for achievement, since some studies show that both students and teachers associated mathematics with masculinity (e.g., Cvencek, Meltzoff, & Greenwald, 2011; Makarova & Herzog, 2015), and reading with femininity (e.g., Muntoni & Retelsdorf, 2018; Nowicki & Lopata, 2017). Moreover, the phenomenon known as Stereotype Threat (Aronson et al., 1999; Steele, 1997) reveals the negative impact that stereotypes have on the performance of a member of a negatively stereotyped group. Several studies have shown that stereotype threat can affect not only students' performance, but also their motivation in academic subjects (e.g., Fogliati & Bussey, 2013; Spencer, Logel, & Davies, 2016; Thoman, Smith, Brown, Chase, & Lee, 2013). In the Chilean context, there is only one study on gender stereotypes associated with academic subjects carried out with elementary school students (Huepe, Salas, & Manzi, 2016). To date, there are no studies that analyze teachers' stereotypes, even though international literature shows that their beliefs have an impact on their practices and these on the students' attitudes (Keller, 2001; Li, 1999).

On the other hand, some studies have revealed that, controlling for students' sex, gender identity is a relevant factor in their commitment and involvement in the different academic subjects (McGeown, Goodwin, Henderson, & Wright, 2012; Pajares & Valiente, 2001). For example, the Theory of Interests as a Model of Identity Regulation

(Kessels, Heyder, Latsch, & Hannover, 2014) indicates that individuals are more likely to be motivated in domains that according to their perception fit their gender identity. So far there is only international empirical evidence supporting this theory in mathematics and science (Heyder & Kessels, 2015, 2017). It is important to highlight that both boys and girls vary in the extent to which they identify with stereotypical masculine and feminine traits and roles. Hence, it becomes relevant to delve into the role of gender identity and stereotypes in the reading motivation of Chilean male and female secondary school students.

This dissertation aimed to identify the role of sex, gender identity and reading gender stereotypes, in the reading motivation of Chilean secondary school students, controlling for reading achievement and SES. To achieve this general goal, three studies were carried out in order to delve into different gender-related factors that contribute to explain the disadvantage of males compared to females in academic achievement in reading. The first study analyzed the existence of sex differences in two motivational variables -reading self-concept and value associated with reading- in Chilean adolescents, controlling for their reading achievement. Furthermore, Study 1 analyzed the role of students' gender identity, specifically their identification with expressive and instrumental traits, as well as their adherence to Reading Gender Stereotypes (RGS) in their reading motivation. In the second study, the presence of different stereotypes associated with people who like to read was explored, both in samples of students and secondary school language teachers. Specifically, Study 2 analyzed how persons with high and low liking for reading are perceived by students and teachers, as well as the way in which this perception would especially harm the involvement of male students in activities related to reading. The inclusion of teachers in Study 2 allowed us to have a broader look at gender and other stereotypes in the school context that may have an effect on gender gaps in reading. The third study delved more in depth into the findings of Study 1, evaluating not only the direct effects of sex, students' gender identity and their adherence to RGS, on reading motivation, but also the indirect effects of these variables, as well as the differential effects for the sample of male and female students. As previous literature

shows, social constructions around gender can have differential effects for males and females in an area of knowledge that is stereotypically considered as a feminine domain, such as reading. In this way, in Study 3 it was especially relevant to delve into the differential effects for females and males of identifying with gender traits and roles, as well as adhering to RGS in their reading self-concept and value.

Taken together, these three studies contribute to understanding how attitudes toward an area of the knowledge highly stereotyped, may be influenced not only by students' sex, but also by social constructions around gender, as well as by diverse stereotypes that are associated with people who like to read. This is especially relevant for the design of initiatives that seek to contribute to equity in reading learning during adolescence, a moment in the school trajectory in which educational gaps widen significantly.

The research goals, hypotheses, and methodological design of each of three studies included in this dissertation are specified below.

Study 1: Is reading a feminine domain?: The role of gender identity and stereotypes in reading motivation in Chile

The goal of this study was to identify the contribution of Chilean high school students' gender identity and Reading Gender Stereotypes (RGS) to their reading motivation (reading self-concept and value associated to reading), controlling for reading achievement, SES, and student' sex. Based on previous literature on this topic, it was hypothesized that female students have a higher reading self-concept and value associated to reading than male students. Moreover, it was expected high school students to endorse RGS, in the sense that attribute greater academic ability and a higher level of reading motivation to female students than male students. Finally, it was expected that gender identity and RGS to contribute unique variance to reading motivation. Specifically, that identification with expressive traits, will have a positive linear effect on the reading motivation of the total sample of students, while identification with instrumental traits will have a negative effect. As for RGS, it was expected that female students who more

strongly endorse RGS (that reading=female) will exhibit higher reading motivation, while male students who adhere more strongly to RGS will experience the opposite effects.

To test the hypotheses, a correlational-comparative design was used, with student sex as a grouping variable and language arts achievement as control variable. Student SES was controlled by design, since all participants belong to medium-low SES schools. 115 Chilean secondary students completed measures of reading motivation, gender identity and reading gender stereotypes (RGS). A multivariate analysis of variance, paired samples t-test and a multiple regression analysis were carried out, in order to test the relation between sex and gender-related variables and students' reading motivation.

Study 2: Gender-stereotyped perceptions of students who like to read: Experimental evidence from Chilean students and teachers

This study sought to examine the different stereotypes associated with reading achievement and interest in a sample of secondary-school students and language-teachers in order to gain a more complete picture of the stereotypes regarding reading in the school context. Participants read short vignettes about characters who were either male or female and who either liked or did not like to read, and after that they were asked to rate these characters on several traits. According to data from previous research, and based on the results of Study 1, it was hypothesized to find that both students and teachers exhibited gender and other stereotypes associated with reading. Specifically, it was expected that students and teachers will perceive female target students as more motivated to read; presenting more reading behaviors; having higher school achievement in general; and more traits typically related to being good student at school than male targets. On the other hand, it was expected that students and teachers will perceive targets who like to read as more feminine; less masculine; having higher school achievement; and to display more traits typically related to being good student at school than targets who do not like to read. Moreover, it was hypothesized that students will perceive targets who like to read as more likeable; but less popular than students who do not like to read. Finally, it was expected that the effect of reading enjoyment on likeability, femininity/masculinity, as well as

perception of school achievement, will be larger for female targets than for male targets. Conversely, it was expected the negative effect of reading enjoyment on popularity to be stronger for males than for females.

The Study 2 consisted in two vignette studies -one sub-study with 303 Chilean secondary students, and another with 136 Chilean secondary language teachers- that sought to test whether students and teachers exhibit stereotypes associated with reading, including gender and other stereotypes. Participants were asked to read short descriptions of fictional characters (vignettes) and then to answer questions about the target character's academic and personal characteristics. Both studies used a 2 (target's gender: male vs. female) x 2 (target's reading enjoyment: high or low) factorial design, both factors varied between subjects, to examine the effect of a target's gender and reading enjoyment on participants' judgments about the target's academic and personal characteristics. Two exploratory factor analyses were conducted to identify the dimensions underlying the participants' ratings of the targets in several traits. Bi-factorial analysis of variance (ANOVA) were carried out to test different stereotypes about reading hold for participants.

Study 3: Direct and indirect effects of sex, gender stereotypes and gender identity in male and female students' reading motivation

This study aimed to identify if social constructions around gender have a differential effect on the reading motivation of male and female students. Specifically, the study test whether gender identity and Reading Gender Stereotypes (RGS) have an effect on the relation between students' sex and their reading motivation. Consistent with extant literature, as well as with Study 1 results, it was hypothesized sex differences in favor of female students in reading self-concept and value. This direct effect of sex on reading motivation was expected to be mediated by the students' gender identity (their identification with gender roles and traits). Finally, it was expected differential effects for male and female students of their adherence to RGS and of their gender identity. For females it was expected their adherence to RGS (reading=female) to have a positive effect

on their reading motivation, while it was expected the opposite effect for males. On the other hand, feminine gender roles and expressive traits were expected to be positively associated with reading motivation, but this positive effect was expected to be stronger for females. Conversely, masculine gender roles and instrumental traits were expected to have a negative effect on the two motivational variables, and this effect should be more pronounced for males than females.

Study 3 evaluated the same sample of 303 Chilean secondary school students from Study 2, through self-report questionnaires that measured gender identity, reading gender stereotypes (RGS) and reading motivation. In order to test whether students' gender identity mediated the relation between sex and reading motivation, structural equation models were carried out. Additionally, to evaluate the differential effect of students' RGS and gender identity on the motivation of male and female a multigroup analysis was carried out.

Study 1

Is reading a feminine domain?: The Role of Gender Identity and Stereotypes in Reading Motivation in Chile

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Paper published in 2020 in Social Psychology of Education Journal

<https://doi.org/10.1007/s11218-020-09571-1>

Abstract

In Chile, as in other countries, there are large gender gaps in reading achievement. One factor that may explain some of these results is male and female students' motivation towards reading and books. The present study examined gender-related factors that contribute to explain students' reading motivation. One hundred and fifteen Chilean secondary students completed measures of reading motivation, gender identity and reading gender stereotypes. A multivariate analysis of variance showed that after controlling for language arts achievement, female students exhibited higher levels of reading motivation, in both dimensions: self-concept and value. Paired samples t-tests showed that all participants, male and female, viewed reading as a more feminine endeavor, revealing reading gender stereotypes. A multiple regression analysis showed that reading gender stereotypes explained significant variance in students' reading self-concept. Expressive identity traits (stereotypically feminine) as well as self-reported sexism both explained significant variance in the value that students associated with reading. The study offers empirical evidence about a relevant but understudied topic, especially in this region. These findings may contribute to the promotion of equal literacy development opportunities for students of both sexes in Latin America.

Key words: gender identity, stereotypes, reading motivation, self-concept

1 Introduction and literature overview

One central aim of educational policies worldwide is to achieve learning in all students, regardless of their social group (Organization for Economic Co-operation and Development [OECD], 2016). In Chile, this concern is particularly relevant given the wide gaps in academic achievement of different groups of students both in national and international tests (Educational Quality Agency, 2018, 2019a, 2019b; Mullis, Martin, Foy, and Hooper, 2016). Assessments in Chile and elsewhere in the world reveal that socioeconomic status (SES) and sex² are the variables that best explain the lack of equity in learning (OECD, 2016). Results show that students from higher socioeconomic levels obtain better results than those with poorer socioeconomic conditions; males outperform females in mathematics and sciences; and females, on the other hand, achieve higher scores in reading than males (OECD, 2016).

Notwithstanding the above, in recent years the gender gap in mathematics has been narrowing in several countries (including the United States and Chile) (Educational Quality Agency, 2019b; Hyde, Lindberg, Linn, Ellis, and Williams, 2008). However, in reading comprehension the gaps have remained stable and, in the case of Chile, they have widened, especially towards the end of the school trajectory (Educational Quality Agency, 2019b). This situation is especially relevant considering that reading comprehension is a fundamental requirement for academic success (Connor et al., 2011; Snow, 2002), as well as for participation in an increasingly literate society (Snow, Burns, and Griffin, 1998).

During the last decades, several international investigations have been carried out around this topic, identifying individual and contextual variables that may explain the gap. These variables include skills, attitudes towards different areas of knowledge, identity, gender stereotypes, beliefs and expectations of parents and teachers, and pedagogical practices. Regarding biological factors, it is noteworthy that although the neurosciences

² The term *sex* will be used to refer to the biological difference between men and women, and the term *gender*, to refer to socially constructed characteristics and roles, ascribed to the masculine and feminine (Barberá, 1998).

have identified some average differences in brain structure and functioning between men and women, there is no reliable way of dividing brains into “male” or “female” based on their morphology or function (Joel, Berman, Tavor, Wexler, Gaber, Stein, Shefi,...and Assaf, 2015), and furthermore, there is no evidence that average brain sex differences are linked to learning (OECD, 2007). In addition, there are few differences in verbal cognitive abilities between men and women (Hedges and Nowell, 1995; Hyde and Linn, 1988). All this would suggest that gender gaps in learning are more likely to be the result of socialization than of biological factors.

Despite the relevance of this issue, few studies have explored the social factors associated with the gender gap in favor of women in secondary education reading. Most of the research in Chile has focused on math gaps, and/or primary school. This study aims to contribute to the understanding of this phenomenon, focusing on the role of identity and gender stereotypes in the reading motivation of Chilean high school students.

1.1 Differences between males and females in reading achievement

The gender gaps in favor of females in reading achievement are well documented. The results of the 2016 PIRLS test (*Progress in International Reading Literacy Study*) revealed that in 48 of the 50 participating countries, fourth grade female students had a better reading performance than boys. This gap has persisted since the origins of the test and has not been reduced in recent years (Mullis, Martin, Foy, and Hooper, 2017).

Additionally, the 2013 results of the Third Regional Comparative and Explanatory Study in Latin America and the Caribbean (TERCE), show that third grade females perform significantly better than males in reading and writing in all 15 participating Latin-American countries. In sixth grade, only in Ecuador and Guatemala, males present a slight advantage. In the case of Chile, a significant difference was found in favor of girls in both grade levels. This advantage was larger in sixth grade than in third grade, and it was larger than the regional gap (Gelber, Treviño, and Inostroza, 2016). Consistently, the latest results of PISA (*Program for International Student Assessment*) revealed that in the 79 countries evaluated there is a gap in favor of female 15-year-olds in reading (OECD,

2019). In Chile that gap has remained steady during the last three evaluations (Educational Quality Agency, 2019a, 2019b).

In the same line, results of the 2018 Chilean “System for Measuring the Quality of Education” (SIMCE) showed a gap in favor of female students in reading comprehension in all the grade levels tested (4th, 6th, and 10th), which widens as students’ progress in school. In addition, in recent years Chilean male students –especially those from high SES groups- have significantly decreased their reading scores, widening the gender gap even more (Educational Quality Agency, 2019b).

Furthermore, although there are no significant differences in the results of Chilean male and female students in the language portion of the university selection test (Department of Evaluation, Measurement and Educational Registration, 2016), Chilean students do exhibit sex differences in their choice of field of study. More men than women choose careers and jobs related to science, information, technology, and industry, and more women choose occupations related to social sciences, care of others, education, food and clothing (Ñopo, 2012; UNESCO, 2012; United Nations Development Programme, 2010; World Bank, 2012).

1.2 Factors associated with reading achievement

How can these persistent achievement gaps be explained? Some of the factors that affect reading achievement, and which may affect males and females differently, are cognitive abilities (e.g. Hyde and Linn, 1988); attitudes towards reading (e.g. Kelley and Decker, 2009); gender identity (e.g. Kessels, Heyder, Latsch, and Hannover, 2014); teaching practices of parents (e.g. Sénéchal and Lefevre, 2002) and teachers (e.g. Younger, Warrington, and Williams, 1999); parents’ and teachers’ beliefs about literacy (e.g. Sonnenschein, Brody, and Munsterman, 1996; Wolter, Braun, and Hannover, 2015); the home environment (e.g. Strasser and Lissi, 2009); gender stereotypes (e.g. Steffens and Jelenec, 2011); and SES (e.g. Neuman, 2006). Regarding these factors, the most explored so far have been contextual variables such as home literacy environment and teaching practices (e.g. Nag, Vagh, Dulay, and Snowling, 2019; Sénéchal and LeFevre,

2014), or individual cognitive variables, whereas individual differences in the social dimension, such as beliefs or identity, have received less attention with regards to sex differences. However, sex differences in verbal cognitive skills are few (Hedges and Nowell, 1995; Hyde and Linn, 1988), while numerous studies show that there are sex differences in attitudes and beliefs toward reading (e.g. Heyder, Kessels, and Steinmayr, 2017; McGeown, 2015). In the next section we discuss what is known about sex differences in these non-cognitive variables related to reading achievement.

1.3 Attitudes towards reading

While differences in verbal cognitive abilities between men and women are few (Hedges and Nowell, 1995; Hyde and Linn, 1988), numerous studies show that there are sex differences in attitudes toward reading. One of the attitudinal variables that has been most studied, due to its important relationship with academic success, is motivation (Gutman and Schoon, 2013). Research reveals that males feel less motivated and committed as readers than females (Baker and Wigfield 1999; McGeown, 2015; Smith and Wilhelm, 2002; Wigfield and Guthrie, 1997), and that this intensifies with age (Kelley and Decker, 2009; McKenna, Conradi, Lawrence, Jang, and Meyer, 2012). The questionnaires of the PISA 2009 test confirmed the lower commitment to reading by male adolescents in the 65 participating countries (OECD, 2010).

While there are many theories on motivation (Gutman and Schoon, 2013), a model that has been widely used in the school context in relation to the gender gap, is the Expectancy-Value Theory (Eccles, 1983, Wigfield and Eccles, 2000). According to this theory, the performance, persistence and choices of individuals can be explained based on their expectations of how well they will do in a given activity, and on the value that they attribute to that activity. Task value encompasses the importance of the task for the self, the task interest, the task's utility, and the task's cost (in terms of time, effort, stress or loss of other valued elements). Expectations of achievement have to do with specific beliefs individuals have about their future success in a task, and are usually measured

asking students how well they believe they could do a given task. Expectations of achievement frequently overlap with self-concept and self-efficacy regarding that task.

Expectancy-value theory has been tested mainly for math achievement (e.g. Meece, Wigfield, and Eccles, 1990). However, some studies show that beliefs about one's competence in language arts, together with task value, predict academic achievement and choice in that subject area as well (Eccles, 1987, Eccles et al., 1994; Spinath, Spinath, Harlaar, and Plomin, 2004; Watt, 2004). Because girls tend to have a better self-concept in language than boys, and also value reading tasks more, expectancy-value theory is successful in explaining their higher performance in that area (Eccles, Wigfield, Harold, and Blumenfeld, 1993; Jacobs, Lanza, Osgood, Eccles, and Wigfield, 2002; Kelley and Decker, 2009; Marinak and Gambrell, 2010; Wigfield et al., 1997). Accordingly, a recent study conducted in Germany that applied the expectancy-value model showed that boys' underachievement in language in high school was explained by their academic self-concept and task value, in addition to their parents' perceptions. These findings indicate that students' motivational beliefs are relevant in explaining males' lower achievement in language arts (Heyder, Kessels, and Steinmayr, 2017).

1.4 Reading-related Gender Stereotypes (RGS)

Because it predicts that beliefs about the importance of a task and about one's ability to accomplish it will influence motivation, expectancy-value theory is consistent with the possibility that academic gender stereotypes explain some differences in motivation and achievement between males and females (Halpern, 2006; Martinot et al., 2011; Plante et al., 2009).

Gender stereotypes are defined as beliefs about the characteristics that men and women are likely to have, including skills, preferences and personality traits. Often, they are prescriptive beliefs as well, which reflect what men and women should be (Deaux and LaFrance, 1998).

Studies of gender stereotypes about academic achievement have revealed that more mathematics skill is usually attributed to males (Cvencek et al., 2011), and more

reading skill to women (Eccles, et al., 1994; Freedman-Doan et al., 2000; Martinot, Bages, and Desert, 2011; Steffens and Jelenec, 2011). Consistently, academic gender stereotypes have been shown to predict academic self-concept, academic achievement, course choice, and career aspirations (Guimond and Roussel, 2001; Halpern, 2006; Martinot et al., 2011; Plante et al., 2009). Specifically regarding reading, studies with self-report questionnaires, implicit measures, and in-depth interviews, have revealed that high school students perceive tasks related to reading as feminine (Millard, 1997; Plante, Théorêt, and Favreau, 2009; Steffens and Jelenec, 2011).

The perception of reading tasks as more appropriate or easier for females could affect both the achievement expectations and perceived value of a task for males and females. Social Identity Theory (Tajfel, 1974; Tajfel and Turner, 1979) posits that membership in a group provides the basis for self-evaluation, and that intergroup comparisons can also play an important role in that process. In this way, the stereotype that women are better for reading than men (RGS), would have a positive effect on females' self-concept as readers, and a negative effect in that of males.

However, this process may very well be dependent on how much a person identifies with gender stereotypes. That is to say, if reading is considered a feminine endeavor because it is seen as a “reflexive” or “calm” activity, for example, and these traits are stereotypically associated with women, then a woman who for whatever reason does not identify as reflexive or calm, may be less affected by these reading-related gender stereotypes. Therefore, it is possible that gender identity plays a relevant role on the way in which reading and gender stereotypes relate to each other.

1.5 Gender identity

Gender identity has been defined as the feeling a person has about being male or female (Berberá, 1998; Egan and Perry, 2001; Wood and Eagly, 2009). It is linked to the degree to which a person considers as part of their identity the characteristics and roles socially assigned to men and women (Rocha-Sánchez, 2009).

There are multiple theoretical perspectives about the development of gender identity. One that has gained importance in recent decades is the multifactorial theory of gender identity. This theory was elaborated by Spence (1993) and posits that gender identity has four components. The first component consists of masculinity and femininity traits, which are aligned with the categories of the instrumental (masculine) versus the expressive (feminine). The second component relates to gender stereotypes, the beliefs shared by a social group about activities, traits or attributes that distinguish men and women. The third components are gender roles, activities that are considered dominant or characteristic of one sex and are associated with a social role. The last component corresponds to attitudes towards gender roles, which refer to the evaluation of different roles that men and women are assigned (Rocha-Sánchez, 2009). Regarding identification with so-called male and female traits, one of the most used instruments is the Bem Sex Role Inventory (BSRI; Bem, 1974), which evaluates individuals' identification with traits that are high in instrumentality and/or agency (such as assertiveness, competitiveness and independence) and with traits linked to expressiveness and care of others (such as dependency, deference, cooperation and care) (Bem, 1974).

Students' identification with traits that are stereotypically masculine or feminine may play a relevant role on their tendency to engage in different activities. The Identity-Based Motivation Theory (Elmore and Oyserman, 2012), claims that individuals prefer to act in ways that feel in line with their social identities, such as gender identity. More specifically to gender, the Interests as Identity Regulation Model (Kessels, et al., 2014) claims that individuals are more likely to be interested in domains that they perceive as fitting their gender identity, while they exclude themselves from those they consider to be discrepant. According to this theory, the stereotypes that associate reading with femininity would generate a mismatch between masculine gender identities and reading involvement, motivation, and perhaps even success.

Consistent with these views, McGeown, Goodwin, Henderson, and Wright (2012) found that among 182 primary school students, intrinsic reading motivation was better explained by gender identity than by sex itself. However, Vantieghem, Vermeersch and

Van Houtte (2014a) obtained inconsistent results regarding gender identity and reading motivation. In a study with more than six thousand Flemish seventh graders, both boys and girls scored higher in reading self-efficacy when their gender identity matched their sex. According to the interests as identity regulation model, and if reading is considered a feminine activity, this result should be expected for girls, whereas for boys it is against what the model predicts. The authors explained this surprising result alluding to the lower wellbeing of both boys and girls who have lower gender typicality, because of the socially challenging position this creates for the youngsters. An alternative explanation, however, could be related to the degree to which students actually believe reading to be feminine or masculine (i.e. RGS), a factor that was not measured in that study. Conceivably, the strength of gender identity's association with reading motivation could vary depending on how much the student endorses stereotypes that view reading as a predominantly feminine activity. In the present study we seek to evaluate the joint contribution of gender identity and gender stereotypes in the reading motivation of male and female high school students. Additionally, this is the first study of this type conducted in a sample of Latin American secondary students, contributing to the generalization of previous results regarding the role of gender factors on reading motivation.

2 Goals and Hypotheses

The present study seeks to identify the contribution of gender identity and reading gender stereotypes (RGS), to the reading motivation of Chilean high school students (reading self-concept and value), controlling for reading achievement and student' sex.

2.1 Specific goals

1. Identify sex differences in students' reading self-concept and the value they give to reading.
2. Examine the presence and degree of adherence to reading-gender stereotypes in Chilean high school students.

3. Determine the contribution of students' gender identity and their adherence to reading-gender stereotypes to their self-concept and the value they place on reading, controlling for their general gender stereotypes (sexism).

2.2 Hypotheses

Consistent with previous research, we expect female students to exhibit a higher academic self-concept and to attribute greater value to reading than male students. We also expect high school students to endorse RGSs, in the sense that they associate reading with females and attribute greater academic ability and a higher level of reading motivation to female students compared to males. Finally, we expect gender identity and RGSs to contribute unique variance to reading motivation. Specifically, it is hypothesized that identification with expressive identity traits, will have a positive linear effect on the level of reading motivation of the total sample of students, while identification with the instrumental traits will have a negative effect. As for RGS, it is expected that female students who more strongly endorse RGS (that reading=female) will exhibit higher reading motivation (reading self-concept and value), while male students who adhere more strongly to those stereotypes will experience the opposite effects. That is, the students' reading motivation will correlate with their belief that their own gender is associated with reading.

3 Methodology

3.1 Design

The study had a correlational-comparative design (Balluerka and Vergara, 2002), with student sex as a grouping variable. Student SES was controlled by design, since all participants belong to medium-low SES schools. The Chilean educational system is one of the most socioeconomically segregated school systems in the world, and therefore there is very little SES variability within each type of school (Valenzuela, Bellei, and de los Ríos, 2013).

3.2 Participants

Participants were 115 9th, 10th, 11th and 12th grade students (53% female) from two urban schools in the Metropolitan Region of Chile. The schools were selected through personal contacts with teachers. Average age of students was 15.91 years ($SD = 1.077$), with a range of 14 to 19 years.

3.3 Instruments

3.3.1 Reading motivation

An adaptation of the Motivation to Read Profile (Gambrell, Palmer, Coding and Mazzoni, 1996) was used. A version for primary students that had been validated in Chile (Navarro, Orellana, and Baldwin, 2018) was used as a base, and modifications were added from the revised version of the original instrument (Malloy, Marinak, Gambrell, and Mazzoni, 2013), as well as from the version for adolescents (Pitcher, et al., 2007). The resulting self-report questionnaire contains 20 four-point items. It consists of two scales that measure two dimensions of the expectancy-value theory (Eccles, 1983; Wigfield and Eccles, 2000): reading self-concept and value associated with reading. The first scale contains 10 items about how the student perceives him or herself, and how they think they are perceived by his or her peers with respect to reading skills. The second scale contains 10 items on the importance students attribute to reading, as well as their commitment to it (see Appendix 2). Cronbach's alpha in our sample was 0.808 for self-concept and 0.824 for value (Table 1).

3.3.2 Reading-gender stereotypes (RGS)

A questionnaire created for the purposes of this research was used, which measures explicit gender stereotypes regarding reading. This instrument asks participants to indicate which group –men or women- is better at and more inclined to certain activities ("*Comparing men and women, who do you think...?*"). The instrument has two scales. The first scale, Gender Stereotypes about Reading Skills (9 items), concerns the skills necessary to engage in different reading activities. The Gender Stereotypes about Reading

Motivation scale, which has 9 items, addresses reading preferences and values. Each item is scored in a seven-point scale as follows 1: men much more than women; 2: men more than women; 3: men a little more than women; 4: men and women alike, 5: women a little more than men; 6: women more than men; 7: women much more than men (see Appendix 3). Cronbach's alpha was 0.840 for the reading skills stereotypes scale, 0.814 for the motivation stereotypes scale, and 0.882 for the total scale (Table 1). In order for the scores to have the same meaning for males and females in our sample, we calculated the degree to which each student believes that their own gender has more reading skills and reading motivation. To do this, men's score was reversed. The scores thus generated we called "Total RGS recoded".

3.3.3 Gender identity

To assess gender identity, we used the scales of expressive and instrumental traits of the Gender Identity Inventory, developed by Rocha-Sánchez and Díaz-Loving (2011) with an adult Mexican population. These two scales include a total of 20 items, each of which consists of a trait. For each trait, participants are asked to evaluate the degree to which that trait is an attribute of themselves, in a five-point Likert scale. The traits were divided in instrumental (masculine) or expressive (feminine) according to the theoretical proposal of Bem Sex Role Inventory (BSRI; Bem, 1974), which has shown good psychometric properties in different countries and age ranges, proving to be a suitable way to measure masculinity and femininity in different settings (for a review see Vafaei, et al., 2014). Instrumental traits were Aggressive, Competitive, Objective, Reflective, Strong, Bossy, Risk-taking, Dominant, Self-sufficient, Independent and Assertive. The expressive traits, on the other hand, were Tender, Affectionate, Attentive, Sweet, Warm, Sentimental, Sympathetic, Complacent and Emotional (see Appendix 4). Each participant received an instrumental and an expressive score, depending on their identification with each set of traits. Internal consistency of the scales was $\alpha=0.887$ for expressive traits scale and $\alpha=0.782$ for the receptive traits scale (see Table 1).

3.3.4 Sexism (General Gender Stereotypes)

In order to isolate variance due to individuals' beliefs about gender and reading, from their beliefs in general gender stereotypes, a measure of general gender stereotypes, or sexism, was included in all analyses. To measure sexism we used two scales from the Gender Identity Inventory (Rocha-Sánchez and Díaz-Loving, 2011): the general gender stereotypes scale, and the attitudes towards gender roles scale. The general gender stereotypes scale contains 36 statements about stereotypical characteristics of men and women. The attitudes towards gender roles scale consists of 21 items that require participants to evaluate their agreement with traditional roles assigned to men and women. Both are scored in a five-point Likert response format (1: totally disagree, 5: totally agree) (see Appendix 4). The two scales exhibited a very high correlation ($r = .758$), so they were collapsed into a single sexism scale. The Cronbach's alpha was 0.968 (see Table 1).

3.3.5 Reading achievement

In order to control for the impact that previous achievement may have on the students' motivation, self-concept, values and attitudes, we used as a control the participants' previous year GPA in language arts, as informed directly by the school. In Chile, high school language arts focuses mostly on three main learning goals: literature (including narrative, lyrical and drama), reading comprehension (including comprehending different types of texts), and literacy for citizenship. In addition to the language arts grades, a teacher report was also used in order to control for impact of previous achievement on reading motivation. For this report, we asked each language art teacher to rank the students in their class in their reading skills.

Table 1.

Internal consistency indices of the scales used

Instrument	Scale	Cronbach's Alpha
Reading Motivation Scale	Reading Self-concept	0.808
	Value associated with reading	0.824
Gender Identity Inventory	Expressive traits	0.887
	Instrumental traits	0.782

	Sexism	0.968
Reading Gender	RGS about skills	0.840
Stereotypes Questionnaire (RGS)	RGS about motivation	0.814
	Total RGS	0.882

3.4 Procedure

Principals were invited to participate in the study through email and were asked to sign a letter of authorization. Subsequently, the students were invited to participate, emphasizing the voluntary nature of participation and confidentiality of information. Students who agreed to participate signed an assent for minors and received a letter of informed consent for parents. Data collection was conducted during the school day in the students' classrooms. The surveys took about one hour to complete. All procedures were in accordance with ethical standards and approved by the Social Sciences and Humanities Ethics review board at the main author's institution.

3.5 Data analysis

To achieve our first goal, we conducted a multivariate analysis of variance (MANOVA) and covariance (MANCOVA) with student' sex as a grouping variable and language arts GPA as a covariate. Because there was a large negative correlation between GPA and teacher ranking ($r = -.65$), only the grade was used as an indicator of academic achievement.

For the second goal, a one-sample t-test was conducted to compare the total RGS and the two RGS subscales to the answer corresponding to the option "men and women alike" (same=4). In addition, a multivariate analysis of variance (MANOVA) was performed with the scales of the RGS questionnaire as a dependent variable and students' sex as a grouping variable, to evaluate gender differences in the level of RGS presented.

For the last goal, two hierarchical linear regression analyses were carried out, one for each reading motivation score (one for reading self-concept and one for reading value). In both cases, control variables were introduced first (student' sex, previous achievement (grades), and general sexism). In a second block the Gender identity variables (expressive traits and instrumental traits), and RGS were entered. In order to preserve degrees of

freedom, we only used the total RGS score (recoded) in the regression analyses (see Appendix 1).

4 Results

4.1 Assumptions check

There was no autocorrelation in the residuals, given that the Durbin-Watson test value of the predictive model of reading self-concept was 2.26 ($p = .180$), and for the value associated was 2.18 ($p = .342$). The Index of Inflation of the Variance between predictors (VIF), indicate that there is no multicollinearity among the predictors used in models of both outcome variables, since all present values within acceptable ranges (< 2.19 , Cohen, West, and Aiken, 2014). Finally, the distribution of the residuals of estimated models was normal.

4.2 Descriptive and group comparison statistics

Regarding the academic achievement of the participants, average language arts grade was 5.30 ($SD = .90$) on a scale of 1.0 to 7.0 (the Chilean grade scale). Female students had significantly higher grades ($ME = 5.49$; $SD = .95$) than males ($ME = 5.09$; $SD = .79$) ($t(113) = -2.507$, $p = .014$).

On the other hand, mean reading self-concept was 2.67 ($SD = .46$) and mean reading value was 2.76 ($SD = .49$). Regarding group differences, reading motivation was higher for females both in self-concept ($F(1, 113) = 10.616$, $p = .001$, $\eta^2 = 0.086$), and value ($F(1, 113) = 25.851$, $p < .000$, $\eta^2 = .186$). Controlling for grades, these sex differences remain for self-concept ($F(1, 112) = 6.543$, $p = .012$, $\eta^2 = .055$), and also for value ($F(1, 112) = 19.801$, $p < .000$, $\eta^2 = .150$),

Regarding the second goal, participants exhibited gender stereotypes associated with reading (RGS), both with regards to skills $t(114) = 9.128$, $p < .000$ and motivation $t(114) = 13.318$, $p < .000$, as well as in total score $t(114) = 11.372$, $p < .000$. There were no differences between males and females in level of RGS about skills ($F(1, 113) = .065$, $p = .800$) nor in RGS about motivation ($F(1, 113) = .585$, $p = .446$).

Descriptive statistics are shown in Table 2.

Table 2.

Descriptive statistics of variables of the study

	Males Media (SD)	Females Media (SD)	Total Media (SD)
Reading Motivation Scale			
Reading Self-concept	2.528 (0.429)	2.798 (0.455)**	2.671 (0.462)
Value associated with reading	2.533 (0.437)	2.958 (0.456)**	2.759 (0.494)
Total Reading Motivation	2.530 (0.387)	2.878 (0.420)**	2.715 (0.439)
Gender Identity Inventory			
Expressive traits	3.218 (0.766)	3.371 (0.781)	3.299 (0.775)
Instrumental traits	2.948 (0.644)	2.949 (0.630)	2.948 (0.634)
Sexism	2.398 (0.563)	1.918 (0.487)**	2.144 (0.575)
RGS Questionnaire			
RGS about skills	4.436 (0.476)	4.461 (0.573)	4.450 (0.528)
RGS about motivation	4.525 (0.556)	4.601 (0.516)	4.565 (0.536)
Total RGS	4.480 (0.471)	4.531 (0.487)	4.507 (0.478)

SD= Standard Deviation

* $p < .005$; ** $p < .001$

4.3 Results of multiple regression models

Regression models explained significant variance in both reading self- concept ($F(6,108)= 6.527; p= .000$), and reading value ($F(6, 108)= 11.398, p= .000$).

As shown in Table 3, the control variables (sex, grades, and general sexism) explain 18.1% of the variance in reading self-concept, which is significant ($F(3,111)= 4.412, p= .000$). Only student's sex and grade were significant predictors in this model, but not general sexism ($\beta_{sex}=0.165, t=1.888, p= .010$; $\beta_{grades}= 0.128, t= 2.635, p= .010$; $\beta_{sexism}= -0.111, t=-1.366, p=.175$). When gender identity variables and RGS were added in model 2, they explained an additional and significant 8.7% of variance in reading self-concept ($F_{change}(3, 108)= 4.270, p= .007$). In model 2, student's sex and grades ceased to be significant predictors ($\beta_{sex}= 0.013, t= 0.109, p= .913$; $\beta_{grades}= 0.093, t= 1.966, p= .052$). After accounting for the other variables in the model, RGS was a significant predictor of reading self-concept ($\beta= 0.168, t= 2.079, p= .040$), but not gender identity variables

($\beta_{expressive}=0.078, t=1.440, p=.153$; $\beta_{instrumental}=0.123, t=1.789, p=.076$). The final model explains 26.8% of the variance of reading self-concept ($F(6,108)=6.527, p=.000$).

As for value associated with reading, the control variables (sex, grade, and general sexism) explain 33.0% of the variance, which is significant ($F(3,111)=18.281, p=.000$). Only students' sex and their general sexism were significant predictors, but not grades ($\beta_{sex}=0.253, t=2.993, p=.003$; $\beta_{grades}=0.074, t=1.577, p=.118$; $\beta_{sexism}=-0.297, t=-3.773, p=.000$). When gender identity variables and RGS were added in model 2, they explained an additional and significant 7.9% of variance in reading value ($F_{change}(3, 108)=4.830, p=.003$). In model 2, students' sex ceased to be significant, but not sexism ($\beta_{sex}=0.100, t=0.881, p=.380$; $\beta_{sexism}=-0.293, t=-3.781, p=.000$). After accounting for the other variables in the model, only identification with expressive traits (feminine gender identity) was a significant predictor of reading value ($\beta=0.164, t=3.144, p=.000$), while RGS only reached marginal significance ($\beta=0.138, t=1.780, p=.078$). Identification with instrumental traits (masculine gender identity) was not a significant predictor of value associated with reading, after controlling for all other variables in the model ($\beta_{instrumental}=-0.024, t=-0.360, p=.719$). The final model explains 40.9% of the variance of reading value ($F(6,108)=12.467, p=.000$).

Table 3.
Multiple Linear Regression Models Results

		Not standardized coefficients		Standardized coefficients		
Reading Self-concept models		Beta	Standard error	Beta	t	Sig
Block 1 $R^2=.181$	Intercept	1.979	.400		4.954	.000
	Student's sex	.165	.087	.179	1.888	.062
	Grade	.128	.048	.248	2.635	.010
	Sexism	-.111	.081	-.138	-1.366	.175
Block 2 $R^2=.268$	Intercept	1.021	.470		2.172	.032
	Student's sex	.013	.118	.014	.109	.913
	Grade	.093	.048	.181	1.966	.052
	Sexism	-.078	.081	-.096	-.961	.339
	Expressive traits	.078	.054	.131	1.440	.153
	Instrumental traits	.123	.069	.169	1.789	.076
	Total RGS recoded	.168	.081	.253	2.079	.040

Value associated with reading models						
Block 1 $R^2 = .330$	Intercept	2.615	.387		6.767	.000
	Student's sex	.253	.085	.257	2.993	.003
	Grade	.074	.047	.134	1.577	.118
	Sexism	-.297	.079	-.345	-3.773	.000
Block 2 $R^2 = .409$	Intercept	1.944	.452		4.306	.000
	Student's sex	.100	.113	.101	.881	.380
	Grade	.049	.046	.089	1.075	.285
	Sexism	-.293	.078	-.341	-3.781	.000
	Expressive traits	.164	.052	.256	3.144	.002
	Instrumental traits	-.024	.066	-.031	-.360	.719
	Total RGS recoded	.138	.076	.195	1.780	.078

5 Discussion

According to our hypotheses and previous findings, in this study high-school female students presented a better reading self-concept and assigned more value to reading than male students (Eccles et al., 1993; Heyder, et al., 2017; Jacobs et al., 2002; Kelley and Decker, 2009; Marinak and Gambrell, 2010; Wigfield, et al., 1997). The motivation gap in favor of women remained for both self-concept and value even after controlling for academic achievement in language arts, indicating that the higher self-concept and value that high-school female students assign to reading is not entirely due to their actual performance or the feedback they get from their teachers. According to the expectancy-value theory, individuals who exhibit higher value and expectancy with regards to a given subject are more likely to get involved in those activities (Wigfield and Eccles, 2000). Therefore, males' lower value and self-concept in reading could be one of the factors that maintains sex gaps in reading achievement.

Regarding the second hypothesis of this study, results reveal that both male and female high-school students hold the belief that women have more skills and motivation for reading than men, that is, both sexes exhibit reading-gender stereotypes (RGS). This is consistent with the findings of previous international studies (Millard, 1997; Plante et al., 2009; Steffens and Jelenec, 2011), and shows gender stereotyping of an area of knowledge that is central to learning (Connor et al., 2011; Snow, 2002).

Regarding the role of RGS and gender identity on the different aspects of reading motivation, the results only partially support this study's hypothesis. After controlling for previous achievement, sex, and general sexism, RGS were relevant only for predicting reading self-concept, while gender identity -specifically feminine gender identity- was relevant only with regards to value associated with reading.

In relation to RGS, it was observed that students who believe that their own gender is better and more prone to reading, tend to have a better reading self-concept, even after controlling for their actual reading school performance and their gender identity. These results are consistent with the expectancy-value theory, which posits that motivation is influenced by societal beliefs (Wigfield and Eccles, 2000). These findings are also consistent with previous research conducted by Evans, Copping, Rowley and Kurtz-Costes (2011) with African-American adolescents in the United States. They found that in the literacy domain, girls' and boys' self-concepts were influenced by their general perceptions of the abilities of males and females. These findings imply that stereotypes about social groups held by adolescents influence their views of themselves, which would be consistent with social identity theory (Tajfel, 1974; Tajfel and Turner, 1979). The theory predicts that students that exhibit high levels of social identification and sense of belonging to a binary gender group, membership in that group, as well as intergroup comparisons, would provide a basis for self-evaluation. In this way, the stereotype that women are better for reading than men, would have a positive effect on women's self-concept as readers, and a negative effect in that of men. Social identity theory additionally predicts that the impact of stereotypes will be especially strong when gender stereotypes are salient. This raises the question of whether the effect of RGS on student self-concept that we observed here would be stronger in social contexts where the division between males and females is made more relevant, such as in segregated educational settings.

RGS did not have a significant effect on the value that students assigned to reading activities. This may be explained because our measure of RGS referred to skills and intrinsic motivation, not to the social importance of reading for boys and girls. Thus,

students' beliefs that women are better readers as well as more inclined to read, did not influence their evaluation of the value of reading for themselves.

Regarding gender identity, this variable only exhibited a significant contribution to reading value, but not to reading self-concept. Specifically, students who identified more with expressive traits such as tender, sentimental, emotional, which have traditionally been associated with women, tended to find reading tasks more valuable. It is important to remember that this association persists even after controlling for sex, and that indeed, the contribution of sex to reading value is no longer significant in the final model. This is consistent with findings of previous studies that indicate that students' gender identity is a better predictor of reading motivation (McGeown, 2015; McGeown, et al., 2012) and writing (Pajares and Valiante, 2001) than biological sex. Present results are concordant with both the interests-as-identity-regulation model (Kessels, et al., 2014), as well as with identity-based motivation theory (Elmore and Oyserman, 2012), in as much as both theories claim that people prefer to get involved and engaged in activities that are perceived as in-line with their social identities, such as gender identity. Considering that, on average, participants in this study did adhere to stereotypes that associate reading with being female, it was to be expected that their identification with stereotypically feminine traits would predict their evaluation of reading activities as valuable for them. According to the two aforementioned theoretical models, interest valuing reading can be a way for students who identify with feminine traits to demonstrate their feminine identity.

One unexpected finding was that one of our control variables, sexism, had a significant negative contribution to the value assigned to reading activities. The sexism scale was added to control for general views about males and females, and it measured individuals' endorsement of general stereotypes about male and female traits, as well as their adherence to beliefs that males and females should have different roles. Our results indicate that, after controlling for their sex, previous reading achievement, beliefs about gender-reading associations, and their gender identity, students in our sample who endorsed gender stereotypes more strongly tended to value reading less. This was

surprising because, whereas an association between reading stereotypes and reading motivation was expected, an association between general stereotypes and reading motivation was not. It is possible that this association represents a spurious relationship, since sexism tends to be associated with some cultural and personality variables that are also associated with reading habits. For example, sexism has been negatively associated with empathy, social dominance, authoritarianism, openness, and agreeableness (Hellmer, Stenson, and Jylhä, 2018), of which at least two (openness and agreeableness) have been positively associated with reading motivation (Medford and McGeown, 2012). Therefore, it is possible that the negative association between general sexism and reading value in the present study is indexing the effects of other confounding factors.

5.1 Limitations and future research

The results of this study should be interpreted in light of its limitations. One of them is the small sample size. This not only limits the statistical power and robustness of the conclusions, but also prevents the analysis of men and women separately, which would allow evaluating whether sex moderates the relationship between gender variables and reading motivation. Previous research suggests that such moderation relationships may exist; for example, that the strength of the association between gender identity and self-efficacy may be different for boys and girls (Vantieghem, et al., 2014b). Unfortunately, due to our small sample we were limited to testing main effects and could not assess such interactions. Another limitation of this study is the sociocultural homogeneity of the participants, given by the very segregated nature of the Chilean school system. It is possible that results may vary depending on school characteristics.

Future research should focus on expanding and generalizing these results, as well as developing educational applications. For example, in order to prevent negative effects of gender stereotypes on boys' reading self-concept, researchers may need to know at what point in the life cycle students begin to develop the belief that reading is a feminine activity, using longitudinal designs. It would also be interesting to explore the role played by the school institution, and particularly teachers, in reproducing or challenging RGS,

through classroom observations (Espinoza and Taut, 2016a). Finally, investigating the effect of RGS and gender identity directly on reading achievement would lend more validity to the model.

5.2 Conclusions

Taken together, the findings of this study show that social constructions of gender can play a significant role in the reading motivation of adolescents, and they highlight the importance of incorporating gender identity theory in research on gender gaps in education. Specifically, focusing on gender identity variables could advance our understanding not only of differences between the sexes in students' motivation and achievement, but of differences within sex groups as well (Vantieghem, et al., 2014b).

In terms of implications, and in line with what was proposed by Francis and Skelton (2005), men may present a better reading performance in contexts where gender stereotypes are less salient. In this sense, creating a school setting where there are fewer stereotypes and expectations about what women and men are supposed to like or be good at, could be a better way to support the reading achievement of male students, than trying to adapt the literacy curriculum and teaching practices to stereotypes of masculine subjects and gendered interests (Moss, 2011). Interventions should focus on questioning beliefs that associate different areas of knowledge with gender (Espinoza and Taut 2016b), in order to promote equal literacy learning opportunities for men and women, thus mitigating negative effects on their educational trajectories (UNESCO, 2012).

6 References

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Appendices

Study 1

Is reading a feminine domain?: The Role of Gender Identity and Stereotypes in Reading Motivation in Chile

Appendix 1. Correlations Matrix

	Reading	Value associated	Student's sex	Language Arts Grade	Total RGS recoded	Expressive traits	Instrumental traits	Sexism
	Self-concept	with reading						
Reading Self-concept	-	.610**	.284*	.420**	.429**	.399**	.367**	-.180
Value associated with reading	.610**	-	.529**	.296*	.551**	.439**	.205	-.497**
Student's sex	.284*	.529**	-	.259	.743**	.066	-.069	-.374**
Language Arts Grade	.420**	.296*	.259	-	.374**	.172	.256	-.436**
Total RGS recoded	.429**	.551**	.743**	.374**	-	.073	.043	-.241
Expressive traits	.399**	.439**	.066	.172	.073	-	.425**	-.212
Instrumental traits	.367**	.205	-.069	.256	.043	.425**	-	-.207
Sexism	-.180	-.497**	-.374**	-.436**	-.241	-.212	-.207	-

*p<.005

**p<.001

Appendix 2. Reading Motivation Scale

1. My friends believe that I am:

- ☐ a very good reader
- ☐ a good reader
- ☐ an average reader
- ☐ a bad reader

2. Reading a book is something that I like to do:

- ☐ never
- ☐ almost never
- ☐ sometimes
- ☐ frequently

3. I read:

- ☐ not as well as my friends
- ☐ almost like my friends
- ☐ a little better than my friends
- ☐ a lot better than my friends

4. My best friends think that reading is:

- ☐ very entertaining
- ☐ entertaining
- ☐ ok
- ☐ boring

5. When I read and I find a word that I do not know:

- ☐ I almost always manage to work out its meaning
- ☐ sometimes I can work out its meaning
- ☐ I almost never work out its meaning
- ☐ I never work out its meaning

6. I tell my friends about good books that I read:

- ☐ never
- ☐ almost never
- ☐ sometimes
- ☐ many times

7. When I read alone, I understand:

- ☐ almost everything I read
- ☐ some of what I read

- ☐ almost nothing of what I read
- ☐ nothing I read

8. People who read a lot are:

- ☐ very interesting
- ☐ interesting
- ☐ boring
- ☐ very boring

9. I am:

- ☐ a bad reader
- ☐ an ok reader
- ☐ a good reader
- ☐ a very good reader

10. I believe that libraries are:

- ☐ a very good place to spend time
- ☐ a good place to spend time
- ☐ a boring place to spend time
- ☐ a very boring place to spend time

11. I worry about what people my age thinks about my reading:

- ☐ frequently
- ☐ sometimes
- ☐ almost never
- ☐ never

12. Knowing how to read well is:

- ☐ not important
- ☐ a little important
- ☐ important
- ☐ very important

13. When my teacher asks me about what I have read:

- ☐ I can never think of something to say
- ☐ I almost never can think of something to say
- ☐ sometimes I can think of something to say
- ☐ I always know what to say

14. I think reading is:

- ☐ a boring way to spend time

- ☐ an ok way to spend time
- ☐ an interesting way to spend time
- ☐ an excellent way to spend time

15. Reading is:

- ☐ very easy for me
- ☐ somewhat easy for me
- ☐ somewhat difficult for me
- ☐ very difficult for me

16. When I am an adult:

- ☐ I will not spend time reading
- ☐ I will spend very little time reading
- ☐ I will spend some time reading
- ☐ I will spend a lot of time reading

17. When I'm in a group talking about books I've read:

- ☐ I hate to talk about my ideas
- ☐ I do not like to talk about my ideas
- ☐ I like to talk about my ideas
- ☐ I love talking about my ideas

18. When my teacher reads books out loud, I think it is:

- ☐ very entertaining
- ☐ entertaining
- ☐ boring
- ☐ very boring

19. When I read aloud, I am a:

- ☐ bad reader
- ☐ ok reader
- ☐ good reader
- ☐ very good reader

20. If someone gave me a book for my birthday. I would feel:

- ☐ very happy
- ☐ happy
- ☐ unhappy
- ☐ very unhappy

Appendix 3. Reading Gender Stereotypes Questionnaire (RGS)

Comparing men and women. who in your opinion:	Men much more	Men more	Men a little more	Men and women alike	Women a little more	Women more	Women much more
1. They read fast.	Men much more	Men more	Men a little more	Same	Women a little more	Women more	Women much more
2. They have a hard time understanding what they read.	Men much more	Men more	Men a little more	Same	Women a little more	Women More	Women much more
3. They easily identify the central idea of a text.	Men much more	Men more	Men a little more	Same	Women a little more	Women more	Women much more
4. They get better grades in reading.	Men much more	Men more	Men a little more	Same	Women a little more	Women More	Women much more
5. They are often wrong in reading comprehension tasks.	Men much more	Men more	Men a little more	Same	Women a little more	Women more	Women much more
6. They need help to understand complex texts.	Men much more	Men more	Men a little more	Same	Women a little more	Women More	Women much more
7. They struggle to read well.	Men much more	Men more	Men a little more	Same	Women a little more	Women more	Women much more
8. They find reading difficult.	Men much more	Men more	Men a little more	Same	Women a little more	Women More	Women much more
9. They have the facility to read complex texts.	Men much more	Men more	Men a little more	Same	Women a little more	Women more	Women much more
10. They like to read.	Men much more	Men more	Men a little more	Same	Women a little more	Women More	Women much more
11. Reading is important for their academic and personal life.	Men much more	Men more	Men a little more	Same	Women a little more	Women more	Women much more
12. They participate in activities that involve reading.	Men much more	Men more	Men a little more	Same	Women a little more	Women More	Women much more
13. They think that reading is interesting.	Men much more	Men more	Men a little more	Same	Women a little more	Women more	Women much more

Comparing men and women. who in your opinion:	Men much more	Men more	Men a little more	Men and women alike	Women a little more	Women more	Women much more
14. They worry if they do not do well in reading.	Men much more	Men more	Men a little more	Same	Women a little more	Women More	Women much more
15. They will need reading to have a good job in the future.	Men much more	Men more	Men a little more	Same	Women a little more	Women more	Women much more
16. They read many books.	Men much more	Men more	Men a little more	Same	Women a little more	Women More	Women much more
17. They find reading boring.	Men much more	Men more	Men a little more	Same	Women a little more	Women more	Women much more
18. They are likely to choose a job that requires a lot of reading.	Men much more	Men more	Men a little more	Same	Women a little more	Women More	Women much more

Appendix 4. Gender Identity Inventory

I. Regarding your relationship with people close to you, indicate the degree to which you perform the following actions:

	Never / almost never	Rarely	Sometimes	Often	Always almost always
1. I show my feelings of sadness and worry when I am with them.	1	2	3	4	5
2. I cry in front of them when I feel sad.	1	2	3	4	5
3. I talk to them and listen to their problems to help them.	1	2	3	4	5
4. I am morally with them at all times.	1	2	3	4	5
5. I give them advice when they have problems.	1	2	3	4	5

II. Thinking of yourself, indicate how well each of the following characteristics describe you*:

	Nothing	A little	Partially	Quite	Much
1. Aggressive [<i>Agresivo/a</i>]	1	2	3	4	5
2. Competitive [<i>Competitivo/a</i>]	1	2	3	4	5
3. Tender [<i>Tierno/a</i>]	1	2	3	4	5
4. Objective [<i>Objetivo/a</i>]	1	2	3	4	5
5. Affectionate [<i>Cariñoso/a</i>]	1	2	3	4	5
6. Reflexive [<i>Reflexivo/a</i>]	1	2	3	4	5
7. Attentive [<i>Atento/a</i>]	1	2	3	4	5
8. Sweet [<i>Dulce</i>]	1	2	3	4	5
9. Strong [<i>Fuerte</i>]	1	2	3	4	5
10. Warm [<i>Cálido/a</i>]	1	2	3	4	5
11. Bossy [<i>Mandón/a</i>]	1	2	3	4	5
12. Sentimental [<i>Sentimental</i>]	1	2	3	4	5
13. Risk-taking [<i>Arriesgado/a</i>]	1	2	3	4	5
14. Sympathetic [<i>Comprensivo/a</i>]	1	2	3	4	5
15. Dominant [<i>Dominante</i>]	1	2	3	4	5
16. Self sufficient [<i>Autosuficiente</i>]	1	2	3	4	5

	Nothing	A little	Partially	Quite	Much
17. Complacent [<i>Complaciente</i>]	1	2	3	4	5
18. Independent [<i>Independiente</i>]	1	2	3	4	5
19. Emotional [<i>Emocional</i>]	1	2	3	4	5
20. Assertive [<i>Asertivo/a</i>]	1	2	3	4	5

*The words in square brackets indicate the original version of the instrument in Spanish.

III. Indicate your agreement with each of the following situations:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly
1. That the man should set the rules of the home.	1	2	3	4	5
2. That the man should participate in the care of the children.	1	2	3	4	5
3. That women should have the same freedom as men.	1	2	3	4	5
4. That the man should always have the last word.	1	2	3	4	5
5. That women should have job opportunities similar to men.	1	2	3	4	5
6. That men and women should develop the same tasks.	1	2	3	4	5
7. That the woman should do the cooking.	1	2	3	4	5
8. That the man should expresses his emotions just like a woman.	1	2	3	4	5
9. That the woman should be self-sufficient.	1	2	3	4	5
10. That the man should be the dominant one.	1	2	3	4	5
11. That the woman should develop personally and professionally.	1	2	3	4	5
12. That the women should participate in decision making.	1	2	3	4	5
13. That the woman should take care of the children.	1	2	3	4	5
14. That the man should spend time and play with the children.	1	2	3	4	5

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly
15. That the woman should dedicate herself to the domestic tasks and stay at home.	1	2	3	4	5
16. That the woman should develop outside the home.	1	2	3	4	5
17. That the man should be the strong part of the relationship.	1	2	3	4	5
18. That the man should take care of the children.	1	2	3	4	5
19. That the woman should be submissive and sacrificed.	1	2	3	4	5
20. That the man should spend more time outside the home.	1	2	3	4	5
21. That the success of man should lie in having a paid job.	1	2	3	4	5

IV. Point out how much you agree with the following statements about men and women:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Totally agree
1. A woman does is not completely fulfilled until she becomes a mother.	1	2	3	4	5
2. The man has better skills than the woman for courtship.	1	2	3	4	5
3. Emotionally the woman possesses greater strength than a man.	1	2	3	4	5
4. The central axis of a family is the father.	1	2	3	4	5
5. Being a man is better than being a woman.	1	2	3	4	5
6. It is easier for a man than for a woman to court.	1	2	3	4	5
7. Men are more aggressive than women.	1	2	3	4	5
8. The family works better if it is the man who sets the rules of the home.	1	2	3	4	5
9. Men are more rational than women.	1	2	3	4	5

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Totally agree
10. Life is easier and happier for a man than for a woman.	1	2	3	4	5
11. A mother is more affectionate than a father.	1	2	3	4	5
12. Women have innate abilities for housework.	1	2	3	4	5
13. The ideal relationship between husband and wife is one in which the man provides economic support and the woman stays at home.	1	2	3	4	5
14. Men are unfaithful by nature.	1	2	3	4	5
15. Women have a greater capacity to care for the sick.	1	2	3	4	5
16. A woman must be a virgin until marriage.	1	2	3	4	5
17. Women cannot perform the same activities as men.	1	2	3	4	5
18. All men must be risk takers and courageous.	1	2	3	4	5
19. Even if a woman works outside the home, it is the man who has to take responsibility for supporting the family.	1	2	3	4	5
20. A good wife should dedicate herself exclusively to her home and husband.	1	2	3	4	5
21. A real man does not show his feelings and weaknesses.	1	2	3	4	5
22. Men are superior to women.	1	2	3	4	5
23. Children are better educated by a mother than by a father.	1	2	3	4	5
24. Being a man implies greater responsibility than being a woman.	1	2	3	4	5
25. A man is smarter than a woman.	1	2	3	4	5
26. Life is harder for a man than for a woman.	1	2	3	4	5
27. Women are more intuitive than men.	1	2	3	4	5
28. Infidelity is unforgivable in a woman.	1	2	3	4	5

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Totally agree
29. Men are less sensitive than women.	1	2	3	4	5
30. Men like docile women.	1	2	3	4	5
31. It is the man who must take charge of protecting the family.	1	2	3	4	5
32. A real man is the one who has professional success.	1	2	3	4	5
33. A man, unlike a woman, needs several sexual partners.	1	2	3	4	5
34. A good husband is the one who provides for the family financially.	1	2	3	4	5
35. There are jobs in which men should have preference over women for promotions.	1	2	3	4	5
36. Women should recognize that there are jobs for which they do not have the necessary psychological characteristics.	1	2	3	4	5

Study 2

Gender-stereotyped perceptions of students who like to read: Experimental evidence from Chilean students and teachers

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Paper sent for publication to Sex Roles Journal

Abstract

In Chile, as in many other countries, there are medium to large gender gaps in reading achievement and motivation in favor of female students. Since research does not show substantive gender differences in verbal skills, socio-cognitive factors, such as stereotypes associated with reading, become a plausible explanation for these gender gaps. Two vignette studies were carried out to test whether secondary students (Study 1) and teachers (Study 2) exhibit stereotypes associated with reading, including gender stereotypes and others. The studies used a 2 (target's gender: male vs. female) x 2 (target's reading enjoyment: low vs. high) factorial design to examine the effect of a character's gender and reading enjoyment on participants' judgments about the character's academic and personal characteristics. Participants were 303 high-school students in Santiago (Chile) and 136 Chilean high-school language teachers. Two exploratory factor analyses were conducted in order to identify the dimensions underlying the participants' ratings of the targets in several traits. Bi-factorial analysis of variance (ANOVA) showed that high-school students hold gender stereotypes about reading, in that they perceive reading to be less associated with masculinity than femininity. Additionally, students and teachers judged characters who like to read in other stereotyped ways (e.g., less popular, better student). These studies provide empirical evidence regarding a relevant topic in education -sources of inequalities in reading achievement- which has not been deeply studied in the region. Findings could contribute to policies that promote equal literacy learning opportunities for male and female students in Latin America.

Key words: *gender, stereotypes, reading, masculinity, femininity, experimental studies*

Introduction and Literature Overview

Reading has become increasingly relevant in the different spheres of society, since it is required for various activities of daily life (Britt, Rouet and Durik, 2017). In the educational context, reading is an essential tool that all students must master in order to learn and achieve academic success in different domains (Connor et al, 2011; Cooper, Moore, Powers, Cleveland, and Greenberg, 2014). Therefore, that all students achieve a good reading level for a wide variety of purposes, is one of the biggest concerns of education systems in the world (Organization for Economic Co-operation and Development [OECD] 2019a). However, consistently the results of standardized academic achievement tests show sex³ differences favoring female students in reading in all countries evaluated, which are present from the early years of schooling (OECD, 2019b). Internationally, this pattern has been observed since the beginnings of standardized international testing (Holbrook, 1988; Samuel, 1943). In the case of Chile, gender gaps in reading have even increased in recent years, especially due to a decrease in the reading performance of male teenagers who attend their last years of secondary education (Educational Quality Agency, 2019a, 2019b). This is worrisome because some international research show that students with low reading skills are more likely to be retained in courses and to drop out of school (Finley, 2011; Ricks, 2013).

It is important to note that although recent research has identified some average differences in brain structure and functioning between men and women, there is no consistent way to classify a brain as male or female brain, based on their morphology or function (Joel, Berman, Tavor, Wexler, Gaber, Stein, Shefi,...and Assaf, 2015; Joel, Persico, Salhov, Berman, Oligschläger, Meilijson, and Averbuch, 2018). Furthermore, to date, there is no robust evidence that biological factors are to blame for these academic achievement differences (OECD, 2007).

³ We used the term *sex* to refer to the biological difference between men and women, and the term *gender*, to refer to socially constructed characteristic, expectations and roles for femininity and masculinity (Lips, 2020).

In contrast, motivation is known to play a role in reading achievement differences (Becker, McElvany, and Kortenbruck, 2010; Schwabe, McElvany, and Trendtel, 2015). Furthermore, numerous studies show that there are large sex differences in reading motivation. Male students are consistently found to feel less motivated and committed as readers than female students (Baker and Wigfield, 1999; McGeown, 2015; Smith and Wilhelm, 2002; Wigfield and Guthrie, 1997), and this gap increases as school progresses (Kelley and Decker, 2009; McKenna, Conradi, Lawrence, Jang, and Meyer, 2012). Additionally, the questionnaires of the PISA 2009 test also found that 15-year-old males exhibited lower levels of reading motivation in the 65 participating countries (OECD, 2010).

One factor that could play a role in differences in academic motivation, are stereotypes that associate gender to knowledge and academic domains. Specifically, studies show that students and teachers tend to view mathematics as a male domain (e.g., Cvencek, Meltzoff, and Greenwald, 2011), and reading as a feminine domain (e.g., Espinoza and Strasser, 2020; Muntoni and Retelsdorf, 2018; Steffens and Jelenec, 2011). This may have an effect on the level of students' motivation to engage in a domain that is perceived as inappropriate for their own sex (Kessels, et al., 2014).

Thus, socio-cognitive factors such as gender and other stereotypes turn out to be a plausible explanation for the well-documented gender gaps in favor of female students in reading motivation and achievement (OECD, 2019b).

Understanding stereotypes that are commonly attached to reading and people who read may be especially relevant for high school students and their teachers, since this is the period where sex differences in reading widen (Educational Quality Agency, 2019a, 2019b; OECD, 2019b). According to the gender intensification hypothesis (Hill and Lynch, 1983), during mid-adolescence boys and girls tend to adopt more traditional masculine and feminine characteristics and roles respectively (Klaczynski, Felmban, and Kole, 2020), being increasingly likely to conform to social norms of gender (Galambos, Almeida, and Petersen, 1990; Martin and Ruble, 2010). For this reason, disinterest in a

domain that seems inappropriate for one's gender could be used to develop and demonstrate a feminine or masculine personal identity (Kessels, et al., 2014).

The aim of this study was to investigate Chilean students' and teachers' perceptions of students who read in order to gain a fuller understanding about stereotypes that might present obstacles for male students to engage in reading. There are very few studies in the international context, and especially in Chile, that have looked at complex factors such as beliefs, expectations, and stereotypes in order to attempt to account for the gender gap in favor of females in high school reading achievement. In particular, to date there are few studies that have explored the stereotypes associated with people who read. Understanding stereotypes about reading may support the creation of interventions that can reduce their impact and promote more equal learning opportunities for both males and females.

Stereotypes on reading and gender

Stereotypes are defined as an over-generalized belief about every person of a particular group (Fiske and Taylor, 2013). Based on stereotypes, characteristics, likings, behaviors and opinions, among others, are attributed to people belonging to a certain social group, without knowing them or taking into account their personal characteristics (Eagly and Mladinic, 1989). One of the main stereotypes associated with people who read are those that link this activity with person's gender. Specifically, gender stereotypes are defined as a set of shared social beliefs regarding the characteristics and roles assigned to men and women based on their sex. They are often prescriptive beliefs, reflecting what men and women should be like, and defining what are commonly believed to be typically feminine and masculine traits (Lips, 2020). Stereotypical views of men and women emerge early in development, as researchers show that children begin to acquire them as early as three years old (Hewstone, Rubin, and Willis, 2002).

Some gender stereotypes refer to the skills or preferences of males and women in specific knowledge domains. In educational contexts, studies on explicit and implicit gender stereotypes (Nosek and Smyth, 2011) reveal that mathematics and science tend to

be linked with masculine traits by students (Cvencek, et al., 2011; Cvencek, Meltzoff, and Kapur, 2014; Guimond and Roussel, 2001; Kessels, Rau and Hannover, 2006) as well as by teachers (Makarova and Herzog, 2015). On the other hand, some studies have shown that reading is associated with feminine traits, also in students (Espinoza and Strasser, 2020; Freedman-Doan, et al., 2000; Guimond and Roussel, 2001; Martinot, Bages, and Desert, 2011; Nowicki and Lopata, 2017; Steffens and Jelenec, 2011) and teachers (Muntoni and Retelsdorf, 2018; Retelsdorf, Schwartz, and Asbrock, 2015; Wolter, Braun, and Hannover, 2015). Compared with the large number of studies that examine gender stereotypes about mathematics, those that focus on reading are fewer. However, existing international evidence reveals that secondary school students perceive reading-related areas as feminine, and they attribute more reading skills and abilities to females than males (Martinot, et al., 2011; Millard, 1997; Plante et al., 2009; Steffens and Jelenec, 2011). More specifically, Pottorff, Phelps-Zientarski, and Skovera (1996) found that boys in second, fourth, sixth, and eighth grades consider that girls are more capable of reading books than boys, and that they associate reading books more strongly with mothers than with fathers. Similarly, Millard (1997) in her interviews with seventh graders found that they associated reading activities at home and teaching reading with their mothers more than with their fathers.

Studies have also shown that students' stereotypes about gender and reading can predict their behavior and attitudes. For example, a recent study by Plante, O'Keefe, Aronson, Frechette-Simard and Goulet (2019) found that the degree to which sixth and eighth graders endorsed the stereotype that females are more proficient in language arts than males, predicted their interest in this domain. On the other hand, Muntoni, et al., (2020) found that high school students hold the stereotype that reading is for girls, and they also found a relationship between an individual measure of gender stereotypes and students' reading self-concept, self-efficacy, and motivation. This relationship was negative for males, but positive for females, indicating that adhering to the stereotype that females are good at reading is a protective factor for female students, but a risk factor for male students, regarding reading motivation.

It is important to mention that so far only one Chilean study has examined gender stereotypes associated with reading in high school students. Espinoza and Strasser (2020) found that students attributed more reading motivation and more reading skills to females compared to males. They also found that students' adherence to gender stereotypes negatively affected male students' reading self-concept. Other studies with Chilean samples have been carried out with preschoolers and in primary school. At the preschool level, del Río and Strasser (2013) found that both boys and girls held stereotypical beliefs regarding the academic skills of males and females. In primary education, a study in Chilean 3rd and 4th grade students revealed that both girls and boys exhibited implicit stereotypes viewing mathematics as a male domain and language as a female domain. In contrast, when asked to express their beliefs about math and language explicitly, both boys and girls expressed an explicit belief in an association between math and their own sex, whereas only girls explicitly expressed that language was associated with their sex (Huepe, Salas, and Manzi, 2016). Because gender stereotypes are likely to evolve with age and socialization, it is not clear if these findings can directly apply to older children and teenagers.

Teachers are an important socialization agent, so their own views and stereotypes are likely to influence those of their students. Several studies from Germany revealed that teachers tend to hold the belief that females have better reading skills than males (Muntoni and Retelsdorf, 2018; Retelsdorf, Schwartz, and Asbrock, 2015; Wolter, Braun, and Hannover, 2015, in a preschool teacher sample). Furthermore, these studies show that teachers' stereotypes predict their expectations, and these in turn are associated with gender gaps in reading achievement (Muntoni and Retelsdorf, 2018), self-concept (Retelsdorf, Schwartz, and Asbrock, 2015), and motivation (Wolter, Braun, and Hannover, 2015, in a preschool sample). However, no studies so far have examined gender stereotypes associated with reading in Chilean teachers.

Stereotypes on reading, academic behaviors and gender

There is a complex relation between perceptions of people who enjoy reading, good students and females. Not only reading, but also getting good grades (Heyder and Kessels, 2013, 2017; Jackson, 2003; Kessels, et al., 2014) and being good and diligent, are stereotyped as feminine traits and behaviors (Heyder and Kessels, 2015; Jones and Myhill, 2004). Also, the use of expressions such as “well-read” or “highly literate” to refer to educated or intelligent persons suggests the existence of a perceived association between being a reader and being a good student. Indeed, some empirical evidence supports the existence of these perceived links (Scholes, 2015, 2019a), but whether this association is driven by both of those being perceived as feminine, has not been explored.

On the one hand, the literature reveals that school and academic achievement are generally perceived as feminine domains (Heyder and Kessels, 2013), and good student traits are more associated to females than males. Female students are generally perceived as being more diligent and hardworking in the school context, whereas male students tend to be viewed as less interested in school activities, and more problematic behaviorally (Heyder and Kessels, 2015; Jones and Myhill, 2004). Accordingly, research has shown that both elementary and high school students believe that females are academically superior and that they exhibit more behaviors and traits that are beneficial to learning compared to males (Kessels, et al., 2014). Moreover, both students (Jackson and Dempster, 2009) and teachers (Heyder and Kessels, 2017), attribute academic effort to traits more typically feminine than masculine.

Considering these stereotypes, it is plausible that learning behaviors aligned with academic success represent a threat to the construction of a traditionally masculine gender identity (Dutro, 2003; Martino, 1999, 2003; Nowicki and Lopata, 2017; Skelton and Francis, 2011). Consistent with this, a study by Jones and Myhill (2004) found that primary and secondary school teachers perceived males with low achievement and females with high achievement as adjusted to gender expectations. Thus, whereas in female students, high academic performance was considered typical of a feminine gender, these teachers perceived high-achieving males as defying gender norms, and with low gender-typicality.

On the other hand, it is very likely that there exists a stereotype related to reading that links this activity with good academic performance in general. This belief could be based on the association of reading with an intellectual disposition and an interest in general knowledge, so that students who like to read tend to be perceived as better students in all academic domains (Scholes, 2015, 2019a). That perception is consistent with the importance of reading for success in all knowledge domains (Connor et al, 2011; Cooper, Moore, Powers, Cleveland, and Greenberg, 2014), as well as with reading proficiency as an essential skill for a wide variety of activities (OECD, 2019a). It is therefore likely that people who like to read are perceived not only as being more feminine or less masculine, but also as having higher academic achievement in general, as well as more good student traits. Therefore, are these separate stereotypes, or is the good students' expectation driving expectations about both readers and females? No study to date has been conducted that allows us to disentangle these effects.

Stereotypes about reading and peer status

Another group of stereotypes that are associated with reading are those related to peer status. Some studies show that students who like to read are attributed specific social status (Hannover and Kessels, 2004; National Literacy Trust, 2012; Schatz, Panko, Pierce and Krashen, 2010). The literature about social status in adolescence usually distinguishes between *popularity* and *likeability* (Cillessen and Marks, 2011; van der Linden, Scholte, Cillessen, Nijenhuis, and Segers, 2010). Popularity refers to power, leadership and prestige, while likeability refers to being well-liked by peers, frequently indexed by the interest in being someone's friend (Cillessen and Marks, 2011).

Regarding popularity, studies show that in the school context, adolescents perceive reading as an "uncool" activity, and people with interest in reading as boring "nerds" (National Literacy Trust, 2012), who do not go out much and with limited social skills (Schatz, Panko, Pierce and Krashen, 2010). This would make students who like to read be perceived as less popular compared to students who do not like to read. This association between reading and low popularity is higher for males than females (Scholes, 2019a),

possibly because males are expected to have more involvement with sports activities and hanging out with friends, and less interest in school activities in general and reading in particular (Martino, 1999, 2001). However, the relation between reading enjoyment and popularity is not completely clear so far, because a German study shows different results. Hannover and Kessels (2004) found that a fictitious student whose favorite subject was German was seen as much more socially competent and integrated than students who disliked humanities, whereas students who liked math and science were perceived as socially incompetent. Since reading is more strongly associated with the language arts subjects (in this case, German), this evidence would suggest that social skills and popularity are positively related with reading and negatively related to math and science. Because this tends to contradict other research (National Literacy Trust, 2012; Schatz, Panko, Pierce and Krashen, 2010), it is important to further explore these relations.

Regarding popularity, the aspects and characteristics associated with popularity in males and females could be different. In the case of males, popularity is more associated with bad behaviors compared to females (Connolly, 2004; Scholes, 2013). Therefore, it is possible that boys who read should be perceived as less popular compared to girls who read, and compared to boys who do not read. However, a recent study that interviewed working-class girls, reveals that they perceive females who like to read as unpopular but smart, and they link popularity and high social status with anti-reading identities, as well as being pretty and hanging out with boys, while academic success is associated with social marginalization (Scholes, 2019b).

In relation to likeability, there are few studies that directly explore stereotypes in relation to reading. Some evidence suggests that students' likeability is positively associated with academic behavior and performance (for a summary, see Bruyn and Cillessen, 2006). Therefore, since reading is associated with academic performance, it is reasonable to assume that interest in reading would also be associated with likeability in both sexes. However, because reading is perceived as feminine, the relationship between perceived reading interest and likeability may be stronger in the case of females than

males. Indeed, Mokros and Koff (1978) found that females with high reading achievement are perceived as more likeable than men with high reading achievement.

The Present Studies

As the previous review suggests, there may be complex links between the way that teenagers perceive their peers, and their adherence to stereotypes about academic achievement, reading, and social categories such as male, female, popular, “good student” or others. These factors have been studied mostly in an isolated manner, which prevents us from understanding their possible relationship with each other. The present study seeks to examine the different stereotypes associated with reading achievement and interest in a sample of high-school students and language-teachers, and their interrelationships.

Having more detailed knowledge about the way that stereotypes play into teenagers’ perceptions of reading may be especially relevant in Chile, given that the gender gap in academic achievement in reading in Chile increases significantly during adolescence (Educational Quality Agency, 2019a, 2019b), and that at this stage of the life cycle the relationship with peers and social status is paramount (Havighurst, 1948).

The present studies were aimed at exploring what kind of stereotypes Chilean high-school students and high-school language-teachers hold about people who read, and the relations between them. We recruited a sample of male and female students (Study 1) as well as a teacher sample (Study 2) in order to gain a more complete picture of the stereotypes regarding reading in the school context. Participants read short vignettes about characters who were either male or female and who either liked or did not like to read, and were subsequently asked to rate these characters on several traits derived from the theoretical overview presented above.

Hypotheses

According to previous literature, we expect to find that both students and teachers exhibit gender and other stereotypes associated with reading. Specifically, we expect that students and teachers will perceive female target students as more motivated

to read (Hypothesis 1a) and presenting more reading behaviors (Hypothesis 1b) than male targets. Additionally, we expect that students and teachers will perceive female targets as having higher school achievement in general (Hypothesis 1c) and more traits typically related to being good student at school (Hypothesis 1d) than male targets.

On the other hand, we hypothesize that students and teachers will perceive targets who like to read as more feminine (Hypothesis 2a) and less masculine (Hypothesis 2b) than targets who do not like reading. Students and teachers will perceive targets who like to read as having higher school achievement (Hypothesis 2c) and to display more traits typically related to being good student at school (Hypothesis 2d) than targets who do not like to read. Moreover, we expect that students will perceive targets who like to read as more likeable (Hypothesis 3a); but less popular (Hypothesis 3b) than students who do not like to read (likeability was not tested in teachers, as they are not expected to be friends with students).

We also expect some interactions between these effects. We hypothesize that the effect of reading enjoyment on likeability, femininity/masculinity, as well as perception of school achievement, will be larger for female targets than for male targets. Conversely, we expect the negative effect of reading enjoyment on popularity to be stronger for males than for females.

Overview of Studies

Two studies were carried out in order to examine students' (Study 1) and teachers' (Study 2) stereotypes about reading. Participants were asked to read short descriptions of fictional characters (vignettes) and then to answer questions about the target character's academic and personal characteristics. Both studies used a 2 (target gender: male vs. female) x 2 (target's reading enjoyment: high or low) factorial design, both factors varied between subjects (Balluerka and Vergara, 2002). All procedures were in accordance with ethical standards and approved by the Social Sciences and Humanities Ethics review board at the main author's institution.

Study 1

Method

Participants.

Participants were 303 9th to 12th grade students (51% female) from three urban schools in the Metropolitan Region of Chile. The schools were selected through personal contacts with teachers. Average age of students was 15.72 years ($SD = 1.17$), with a range of 14 to 19 years. Individual students' socioeconomic status (SES) was not available, but the schools were very homogeneous in their SES composition. Due to the way it was financed between 1985 and 2015, the Chilean educational system became one of the most segregated by SES in the world, meaning that there is little SES variability within schools (Valenzuela, Bellei, and de los Ríos, 2013). Because of this, the SES of a school tends to be a good indicator of its students' SES.

All schools in the study were voucher schools (state-funded but privately managed). Voucher schools serve more than half of the student population in Chile, although their population on average has a slightly higher SES than the population that attends public schools.

Procedure.

The principal of each school was contacted and, when authorization was obtained, all students in grades 9th to 12th were invited to participate through their parents. Around 70% percent of parents agreed for their children to participate in the study. Of these, roughly 60% of the students with parental consent, assented to participate. Data collection took place between October and December 2018 during the school day in the students' classrooms. The surveys took about 20 minutes to complete.

Materials and Conditions.

Four short vignettes -including a narrative and an illustration- were created describing fictional students. All vignettes were identical except for the gender and name of the target character (male/female), and their reading enjoyment (high/low).

In the like-to-read-conditions, participants read the following vignette:

“Álvaro/Carolina is 16 years old and currently is in the 10th grade. He/she lives with his/her parents and siblings. He/she likes to read a lot; this year he/she has read many books. One of the things Álvaro/Carolina likes to do in his/her free time is going to the library and choosing a book that interests him/her. Álvaro/Carolina also likes to watch TV shows”.

In the doesn't-like-to-read-conditions (male and female targets), participants read the following vignette:

“Álvaro/Carolina is 16 years old and is in 10th grade. He/she lives with his/her parents and siblings. He/she doesn't like to read; this year he/she has read very few books. One of the things Álvaro/Carolina likes to do in his/her free time is riding a bike. Álvaro/Carolina also likes to watch TV shows”.

Then participants were asked to complete a survey in order to rate the fictional character's academic achievement (e.g., “I think Álvaro/Carolina will get very good grades at school this year”), their reading motivation and behaviors (e.g., “I think Álvaro/Carolina attends workshops or activities outside of school related to reading”), their peer status (e.g., “I think Álvaro's/Carolina's classmates like to hang out with him/her”), as well as several questions about their personality traits including stereotypically masculine (e.g., “I think Álvaro/Carolina is competitive”), and feminine traits (e.g., “I think Álvaro/Carolina cares about others”), as well as more neutral ones (e.g., “I think Álvaro/Carolina is productive”). Participants were also explicitly asked to judge the masculinity or femininity of the character (e.g., “I think Álvaro/Carolina is very masculine”; “I think Álvaro is very much like other men”).

The complete survey included 61 items that were answered on a 4-point Likert-type scale ranging from 1 (Strongly disagree) to 4 (Strongly agree). In addition, it included a unidimensional femininity-masculinity question about the degree of masculinity or femininity attributed to the target, which was scored from 0 (very feminine) to 10 (very masculine) (“On a scale between 0 and 10, where 0 is a very feminine person and 10 is a very masculine person, ¿where on the scale would you place Álvaro/Carolina?”). Finally,

two manipulation check questions were included at the beginning of the survey regarding the target's gender (male/female) and their reading enjoyment (low/high) (See Appendix 1).

Demographic variables.

Students were asked to report their gender (1= male; 2= female) and their age.

Data Analysis.

Exploratory Factor Analysis. An exploratory factor analysis (EFA) was conducted using Mplus Version 8 software in order to identify the dimensions underlying the participants' answers to the questionnaires. We conducted exploratory analysis for two reasons. First, although some items were adapted from other scales that measure known constructs, some of them (e.g., likeability, academic expectations) did not correspond to any known or tested scale. Second, even for items adapted from existing scales, they had not been previously been used in the same study with each other, which opens the possibility that they would correlate highly with items in other scales. Therefore, we decided to conduct an exploratory analysis before constructing our measures.

A principal axis factoring (PAF) was performed on the initial pool of items (61 items). An oblique (geomin) rotation was selected because dimensions should be moderately correlated. Number of factors was determined according to the Kaiser rule, which indicates maintaining factors with eigenvalues ≥ 1 (Tabachnick and Fidell, 2013), and for which a substantive interpretation can be found. We retained an item in a factor if it had a factor loading equal to or greater than 0.4 (Tinsley and Brown, 2000). Finally, Cronbach's Alpha coefficient was used to analyze the internal consistency of each scale.

Statistical analysis. All scales were scored in such a way that a higher score indicated higher levels of the attribute. To achieve our research goals, a two-factor analysis of variance (ANOVA) was performed for all dependent variables. The two

ANOVA factors were the target character's gender (male/female) and their reading enjoyment (high/low), with four cells and 73–79 students per cell.

Results

Exploratory factor Analysis.

EFA results grouped the students' answers into 9 scales, which are described below. 1) “Expectations in math and sciences Scale” ($\alpha = .779$), referring to the beliefs about the future academic performance of the fictional target in mathematics and science (e.g., “I think Álvaro/Carolina will get very good grades in math this year”). 2) “Reading achievement and behavior Scale” ($\alpha = .963$), referring to the fictional target's academic achievement (e.g., “I think Álvaro/Carolina easily understands complex texts”), and reading behaviors (e.g., “I think Álvaro/Carolina reads novels”). 3) “Good student traits Scale” ($\alpha = .812$), referring to behaviors or personality attributes typically related to being a good student in the school context (e.g., “I think Álvaro/Carolina is trying hard”). 4) “Negative masculine traits Scale” ($\alpha = .614$), referring to stereotypically masculine behaviors that are deemed to be negative (e.g., “I think Álvaro/Carolina is aggressive”). 5) “Feminine traits Scale” ($\alpha = .769$), referring to stereotypically feminine personality traits (e.g., “I think Álvaro/Carolina is sensitive”). 6) “General femininity Scale” ($\alpha = .794$) referring to the perception that the fictional target is feminine and is like other women, without specifying the content of these categories (e.g., “I think Álvaro/Carolina is very feminine”). 7) “General masculinity Scale” ($\alpha = .842$), referring to the perception that the fictional target is masculine and is like other men, without specifying the content of these categories (e.g., “I think Álvaro/Carolina is very masculine”). 8) “Popularity Scale” ($\alpha = .861$), referring to the degree to which the fictional target is perceived as possessing leadership, prestige and a large number of friends (e.g., “I think Álvaro/Carolina has many friends”). Finally, 9) “Likeability Scale” ($\alpha = .750$), referring to participants' own liking of the fictional target, and the perception of having things in common with them, as well as an interest in being their friend (e.g., “I think I could have fun with Álvaro/Carolina”). Of the 61 items included in the analysis, a total of 5 items were excluded; two of them

because they presented factorial loads lower than 0.4; and 3 items for presenting a high factorial load in more than one factor.

Cronbach's Alpha coefficient was used to analyze the internal consistency of the scales. The results reveal that all of them present acceptable internal consistency, with the lowest one being the Negative masculine traits Scale (.614) (see Table 1).

Table 1. Internal consistency indices of the scales used in student sample

Instrument	Scale	Number of items	Cronbach's Alpha
Reading-Gender and Stereotypes questionnaires (RS)	1) Expectations in math and sciences	2	0.779
	2) Reading achievement and behavior	19	0.963
	3) Good student traits	7	0.812
	4) Negative masculine traits	6	0.614
	5) Feminine traits	7	0.769
	6) General femininity	2	0.794
	7) General masculinity	2	0.842
	8) Popularity	5	0.861
	9) Likeability	6	0.750

Assumptions check.

The results of the Kolmogorov-Smirnov test reveal that all dependent variables of the students' sample have a normal distribution. Specifically, the variable 1) Expectations in math and sciences: $KS = .274, p < .000$; 2) Reading achievement and behavior: $KS = .095, p < .000$; 3) Good student traits: $KS = .100, p < .000$; 4) Negative masculine traits: $KS = .121, p < .000$; 5) Feminine traits $KS = .101, p < .000$; 6) General femininity: $KS = .159, p < .000$; 7) General masculinity: $KS = .159, p < .000$; 8) Popularity $KS = .112, p < .000$; 9) Likeability: $KS = .108, p < .000$; and 10) Unidimensional femininity-masculinity question: $KS = .165, p < .000$. On the other hand, Levene's test of homogeneity of variances shows non-significant results in all the dependent variables, except in the unidimensional femininity-masculinity question ($p = .007$), so the error variance of each dependent variable is the same between groups, except for that last variable. However, since ANOVA is a statistically robust test, non-compliance with this assumption should not have

significant effects on the significance level of F . Finally, the Pearson linear correlation between the dependent variables reveals correlations between lower ranges $r = .599$ (see Appendix 2).

Two-factor analysis of variance (ANOVA) results.

Stereotypes associated with reading. The results of the two-factor analysis of variance (ANOVA) reveal that there are main effects of both the target's gender and target's reading enjoyment. Results are organized according to the hypotheses of this study.

Stereotypes about target's gender. Regarding the target's gender main effect, we expected that students would perceive female targets as more motivated to read (Hypothesis 1a) and presenting more reading behaviors (Hypothesis 1b) than male targets. To test these hypotheses, the ratings of the "Reading Achievement and Behavior Scale" in the four experimental conditions were compared, since the scale includes items referring to reading motivation and behavior. The results show that there is no effect of the target's gender on that scale ($F(1,295) = 1.191, p = .276$) (see Table 2), so hypotheses 1a and hypothesis 1b are not supported in the student sample. We also expected that students would perceive female targets as having higher general school achievement (Hypothesis 1c) and more traits typically related to being good at school (Hypothesis 1d) than male targets. The factor analysis did not reveal a general school achievement scale, only a factor specifically capturing math and science expectations, which can be expected to behave in a rather different way with regards to gender. Therefore, we were unable to test hypothesis 1c. To test hypothesis 1d the average results of the "Good student traits Scale" were compared in the four experimental conditions. The results reveal differences in favors of female targets who were rated on average by participants as higher in "Good student traits" ($F(1,295) = 8.436, p = .004, \eta^2 = 0.028$) than male targets, regardless of their reading enjoyment (see Table 2). Therefore, the results of this study support hypothesis 1d.

Stereotypes about targets who like to read. Regarding target's reading enjoyment main effect, we hypothesized that students would perceive targets who like to read as more feminine (Hypothesis 2a) and less masculine (Hypothesis 2b) than targets who do not like reading. We compared the average results of the different conditions on the "Negative masculine traits"; "Feminine traits"; "General femininity"; "General masculinity" scales; and in the one-dimensional femininity-masculinity question to test these hypotheses. The results show that participants rated the targets who liked to read lower on the Negative Masculine Traits ($F(1,295)= 68.520, p< .000, \eta p^2= 0.188$), as well as on the "General masculinity scale" ($F(1,295)= 11.909, p= .001, \eta p^2= 0.039$) and on the unidimensional femininity-masculinity question ($F(1,295)= 5.210, p= .023, \eta p^2= 0.017$). No differences were found depending on whether the target liked to read or not in the scales "Feminine traits" ($F(1,295)= 0.796, p= .373$), nor "General femininity" ($F(1,295)= 0.124, p= .725$) (see Table 2). Therefore, the results of the study support hypothesis 2b, but not hypothesis 2a. Additionally, we hypothesized that targets who like to read would be perceived as having higher school achievement (Hypothesis 2c) and would be rated as displaying more traits typically related to being good at school (Hypothesis 2d), than targets who did not like to read. Hypothesis 2c could not be tested because the factor analysis did not reveal a general school achievement scale. To test hypothesis 2d, we compared the average results of the different conditions in the "Good student traits Scale". The results reveal that there is a positive effect on the "Good student traits Scale" ($F(1,295)= 71.261, p< .000, \eta p^2= 0.195$) (see Table 2), thus confirming hypothesis 2d. Moreover, we expected that participants would perceive targets who like to read as more likeable (Hypothesis 3a) but less popular (Hypothesis 3b) than targets who do not like to read. We found significant group differences in the "Popularity Scale" ($F(1,295)= 7.307, p= .007, \eta p^2= 0.024$) in favor of the targets who did not like to read, but not in the "Likeability Scale" ($F(1,295)= 1.706, p= .193$) (see Table 2). Therefore, hypothesis 3b is confirmed, but not hypothesis 3a.

Finally, although it was not part of our hypotheses, we include in our analysis the "Expectations in math and sciences Scale" which emerged from EFA. This analysis is

only exploratory because it does not correspond to any of our hypotheses. We found no differences by target's gender ($F(1,295) = 0.247, p = .620$), nor by reading enjoyment ($F(1,295) = 3.260, p = .072$), in the perception of academic achievement in mathematics and science.

Interactional effects (target's gender x target's reading enjoyment). Regarding interactions, we hypothesized that the effects of reading enjoyment on likeability, femininity/masculinity, as well as perception of school achievement, would be larger for female targets than for male targets. On the other hand, we expected that the negative effect on popularity (Hypothesis 3b) would be larger for male targets than female targets. However, no interaction effects were observed to support these hypotheses. Only a main effect of target's gender was found on the "Popularity" and "Likeability" scales. Female targets were rated by participants as higher in "Likeability" ($F(1,295) = 4.806, p = .029, \eta^2 = 0.016$); and in "Popularity" ($F(1,295) = 9.523, p = .002, \eta^2 = 0.031$) than male targets regardless of their reading enjoyment.

While no specific hypotheses regarding participants' gender were proposed in our study, we checked in an exploratory analysis for any main or interactional effects of participants' gender. The results showed that one significant effect of participant's gender: males tended to rate targets generally higher in the "Good student at school Scale" ($F(1, 291) = 6.827, p = .009$).

Table 2. Descriptive statistics for the rating of the four targets, Study 1 (student sample)

Scales	Target's gender	Target's reading enjoyment		
		Low	High	Total
		M (SD)	M (SD)	M (SD)
Expectations in Math and Sciences	Male	2.51 (0.45)	2.56 (0.43)	2.54 (0.44)
	Female	2.72 (0.38)	2.58 (0.47)	2.65 (0.43)
	Total	2.61 (0.43)	2.57 (0.45)	2.59 (0.44)
Reading Achievement and Behavior	Male	1.88 (0.38)	3.16 (0.33)	2.52 (0.73)
	Female	1.89 (0.40)	3.24 (0.40)	2.59 (0.78)
	Total	1.89 (0.39)	3.20 (0.37)	2.56 (0.76)
Good student traits	Male	2.48 (0.42)	2.91 (0.38)	2.70 (0.46)

	Female	2.64 (0.38)	3.04 (0.51)	2.85 (0.50)
	Total	2.56 (0.41)	2.98 (0.46)	2.77 (0.48)
Negative masculine traits	Male	2.32 (0.37)	1.91(0.36)	2.11 (0.42)
	Female	2.32 (0.42)	2.01 (0.34)	2.16 (0.41)
	Total	2.32 (0.39)	1.96 (0.36)	2.14 (0.41)
Feminine traits	Male	2.51 (0.45)	2.56 (0.43)	2.54 (0.44)
	Female	2.72 (0.38)	2.58 (0.47)	2.65 (0.43)
	Total	2.61 (0.43)	2.57 (0.45)	2.59 (0.44)
General femininity	Male	1.61 (0.63)	1.57 (0.55)	1.59 (0.59)
	Female	2.60 (0.56)	2.60 (0.67)	2.60 (0.62)
	Total	2.10 (0.78)	2.09 (0.80)	2.10 (0.79)
General masculinity	Male	2.68 (0.71)	2.38 (0.68)	2.53 (0.71)
	Female	1.69 (0.59)	1.49 (0.52)	1.58 (0.56)
	Total	2.19 (0.82)	1.92 (0.75)	2.06 (0.80)
Popularity	Male	2.67 (0.47)	2.46 (0.54)	2.56 (0.51)
	Female	2.81 (0.52)	2.69 (0.57)	2.75 (0.55)
	Total	2.74 (0.50)	2.58 (0.57)	2.66 (0.54)
Likeability	Male	2.71 (0.54)	2.80 (0.54)	2.76 (0.54)
	Female	2.85 (0.51)	2.93 (0.53)	2.89 (0.52)
	Total	2.78 (0.53)	2.86 (0.54)	2.82 (0.53)
Unidimensional femininity-masculinity question	Male	7.16 (1.94)	6.37 (1.58)	6.77 (1.80)
	Female	3.53 (2.00)	3.29 (2.17)	3.41 (2.09)
	Total	5.37 (2.68)	5.37 (2.44)	5.37 (2.57)

N= 299 students.

M= Media; SD= Standard Deviation

All scales rating ranged from 1 to 4 (higher score indicating higher levels of the attribute), except for the unidimensional femininity-masculinity question which ranged from 0 to 10 where 0= very feminine and 10=very masculine.

Bold= Statistically Significant main effects.

Summary of Study 1 Results

We applied an experimental vignette design to test if a fictional target's gender (male vs. female) and their reading enjoyment (low vs. high) would influence students' perceptions of their academic and personal characteristics, that is to say, whether students exhibit stereotypes about reading and some social categories, personality traits, and behaviors. According to our hypotheses, female targets were perceived as possessing more traits typically related to being good at school, as well as more likeability and popularity than male targets. On the other hand, and contrary to our expectations, female and male targets were perceived similarly regarding reading achievement and behavior and negative

masculine traits. As expected, targets that liked to read were perceived as having fewer negative masculine traits, a less masculine identity, higher “good student at school traits”, and less popularity than targets who said that they did not like to read. However, regardless of whether they liked to read or not, all targets were rated similar in feminine traits, general femininity, and likeability. There were no significant interactions between the target’s gender and whether they liked to read. Regarding the scale “Expectations in math and sciences” that emerged from EFA, no differences were found according to target’s gender nor according to their reading enjoyment. These findings will be discussed in detail in the General Discussion section.

Study 2

Method

Participants.

Participants were 136 Chilean high-school teachers (77.9% females). Their average age was 38.62 years ($SD = 10.31$), with a range of 24 to 73 years. Participants were recruited through an internet survey, which was sent to them via school or personal emails, as well as disseminated through several digital platforms for teachers. The resulting sample had a similar gender distribution to that of the population of high school language teachers in Chile (73% females) (Ministry of Education of Chile, 2016). On the other hand, 26.70% of the participants taught in public schools, 54.90% in voucher schools, 13.30% in private schools, and 5.10% taught in two different types of schools. The resulting sample had a similar type of school distribution to that of the population of high school teachers in Chile (40.94% of total teachers in public schools; 47.78% in voucher schools; and 11.28% in private schools) (Ministry of Education of Chile, 2017), although public school teachers were slightly over-represented. Finally, 34.60% of the participants taught in both primary and secondary grades. The rest (65.40%) only taught at the secondary level.

Procedure.

Data collection was conducted through an online survey in order to reach more teachers. Teachers in Chile have a large amount of classroom hours and therefore do not have much time to participate in research. An online format allowed them to answer the survey at a convenient time outside of school. The digital platform used (SoSci Survey) allowed the participants to be randomly assigned to one of the four experimental conditions. Answering the survey took teachers about 20 minutes.

Materials and Conditions.

The same materials used in study 1 were used in Study 2 with teachers, except for questions about the target's likeability, which did not apply in this case. Therefore, teachers' questionnaires included 55 items in total, one unidimensional femininity-masculinity question, as well two manipulation check questions (See Appendix 3).

Demographic variables.

Teachers were asked to report their gender (1= male; 2= female) and their age. Additionally, they were asked to indicate the type of school in which they taught as well as if they taught at the secondary school level or both at the secondary and primary school levels.

Data Analysis.

Exploratory Factor Analysis. An EFA was also conducted on the initial pool of items of the teachers' sample (55 items). We used the same procedures as in Study 1.

Statistical analyses. The data analysis performed were the same as those in Study 1. The factorial design also has four cells and 27–38 teachers per cell.

Results

Exploratory factor Analysis.

10 scales emerged from EFA with teacher sample, described below: 1) “General school expectations Scale” ($\alpha = .877$), referring to beliefs about the level of performance of the fictional target in different domains of knowledge (e.g., “I think Álvaro/Carolina will get very good grades in math this year”), as well as the school in general (e.g., “I think Álvaro/Carolina will get very good grades at school this year”). 2) “Reading ability Scale” ($\alpha = .892$) referring to the level of reading ability attributed to the fictional target (e.g., “I think Alvaro/Carolina reads aloud well”). 3) “Reading motivation Scale” ($\alpha = .881$) referring to the level of reading motivation attributed to the fictional target (e.g., “I think Álvaro/Carolina reads novels”). 4) “Out-of-school reading motivation Scale” ($\alpha = .858$), referring to motivation and behaviors related to out-of-school reading (e.g., “I think Álvaro/Carolina attends workshops or activities related to reading outside of school”). 5) “Good student traits Scale” ($\alpha = .856$), referring to personality attributes related to being a good student in the school context (e.g., “I think Álvaro/Carolina is productive”). 6) “General negative traits Scale” ($\alpha = .833$), referring to negative personality traits and behaviors attributed to the fictional target (e.g., “I think Álvaro/Carolina is undecided”). 7) “Feminine traits Scale” ($\alpha = .914$), referring to stereotypically feminine personality traits attributed to the fictional target (e.g., “I think Álvaro/Carolina is understanding”). 8) “General femininity Scale” ($\alpha = .844$), referring to the perception that the fictional target is feminine and is like other women, without specifying the content of these categories (e.g., “I think Álvaro/Carolina is very feminine”). 9) “General masculinity Scale” ($\alpha = .857$), referring to the perception that the fictional target is masculine and is like other men, without specifying the content of these categories (e.g., “I think Álvaro/Carolina looks like other men”). Finally, 10) “Popularity Scale” ($\alpha = .887$), referring to the degree to which the fictional target is perceived as possessing leadership, prestige and a large number of friends (e.g., “I think Álvaro/Carolina seems interesting to his/her classmates”). Of the 55 items included in the analysis, a total of 7 items were excluded: 3 of them because did not have a factorial load greater than 0.4 in any of the factors; 2 items for presenting a high factorial load in more than one factor; and 2 items due to substantive reasons and interpretation.

Cronbach's Alpha coefficient was used to analyze the internal consistency of the scales that emerge from the data surveys. The results reveal that all of them present acceptable indexes ($> .856$) (see Table 3).

Table 3. Internal consistency indices of the scales used in teachers' sample

Instrument	Scale	Number of items	Cronbach's Alpha
Reading-Gender and Other Stereotypes questionnaires (RS)	1. General school expectations	6	0.877
	2. Reading ability	5	0.892
	3. Reading motivation	5	0.881
	4. Out-of-school reading motivation	5	0.858
	5. Good student traits	7	0.856
	6. General negative traits	5	0.833
	7. Feminine traits	6	0.914
	8. General femininity	2	0.844
	9. General masculinity	2	0.857
	10. Popularity	5	0.887

Table 4 shows a comparison of the scales that emerged from the responses of students and teachers.

Table 4. Comparison of scales from students' and teachers' samples emerged from EFA

Students' scales		Teachers' scales	
1.	Expectations in math and sciences	1.	General school expectations
2.	Reading achievement and behavior	2.	Reading ability
		3.	Reading motivation
		4.	Out-of-school reading motivation
3.	Good student traits	5.	Good student traits
4.	Negative masculine traits	6.	General negative traits
5.	Feminine traits	7.	Feminine traits
6.	General femininity	8.	General femininity
7.	General masculinity	9.	General masculinity
8.	Popularity	10.	Popularity
9.	Likeability		

Assumptions check.

The results of the Kolmogorov-Smirnov test reveal that all the dependent variables of the teachers' sample have a normal distribution. Specifically, the variable 1) General school expectations: $KS = .133, p < .000$; 2) Reading ability: $KS = .097, p = .003$; 3) Reading motivation: $KS = .120, p < .000$; 4) Out-of-school reading motivation: $KS = .103, p = .001$; 5) Good student traits: $KS = .135, p < .000$; 6) General negative traits: $KS = .172, p < .000$; 7) Feminine traits: $KS = .207, p < .000$; 8) General femininity: $KS = .232, p < .000$; 9) General masculinity: $KS = .244, p < .000$; 10) Popularity: $KS = .172, p < .000$; and 11) Unidimensional femininity-masculinity question: $KS = .228, p < .000$. On the other hand, Levene's test of homogeneity of variances shows non-significant results in all the dependent variables, except in Reading Ability ($p = .005$), so the error variance of each dependent variable is the same between groups, except for that last variable. However, since ANOVA is a statistically robust test, non-compliance with this assumption should not have significant effects on the significance level of F . Finally, the Pearson linear correlation between the dependent variables reveals correlations between lower ranges $r = .714$ (see Appendix 4).

Two-factor analysis of variance (ANOVA) results.

Stereotypes associated with reading. The results of the two-factor analysis of variance (ANOVA) reveal main effects of target's reading enjoyment factor, since there are significant group differences in different scales. No main effects of the target's gender were found in any of variables of interest. Specific results are presented according to the hypotheses of the study.

Stereotypes about target's gender. Related to target's gender main effect, we expected that teachers would perceive female targets as more motivated to read (Hypothesis 1a) and presenting more reading behaviors (Hypothesis 1b) than male targets. To test these hypotheses, the ratings of the "Reading motivation Scale", "Extra-school reading motivation Scale", as well as "Reading ability Scale", conditions were compared

for male and female targets. The results show no effect of the target's gender on any of these scales (see Table 5). Thus, hypothesis 1a and hypothesis 1b were not supported by the teachers' data. Moreover, we expected teachers to perceive female targets as having higher general school achievement (Hypothesis 1c) and more traits typically related to being good at school (Hypothesis 1d) than male targets. To test these hypotheses, ratings of the "General school achievement Scale" and the "Good student traits Scale" were compared. We found no differences according to the target's gender in these variables. Therefore, hypotheses 1c and 1d were also not supported by the teachers' data.

Stereotypes about targets who like to read. Regarding the effects of a target's stated reading enjoyment, we expected targets who like to read to be perceived by teachers as more feminine (Hypothesis 2a) and less masculine (Hypothesis 2b) than targets who do not like reading. We compared the ratings of the different conditions on the "Feminine traits Scale"; "General femininity Scale"; "General masculinity Scale"; and in the one-dimensional femininity-masculinity question to test these hypotheses. Results show that participants who were exposed to vignettes about targets that liked to read perceived them as exhibiting less general femininity ($F(1,131)=8.441$, $p=.004$, $\eta^2=0.061$), than participants who read about targets who do not like reading. No group differences were found according to reading enjoyment in the scales "Feminine traits" ($F(1,131)=2.541$, $p=.113$); "General masculinity" ($F(1,131)=0.001$, $p=.978$); nor in one-dimensional femininity-masculinity question ($F(1,131)=0.248$, $p=.620$) (see Table 5). Thus, contrary to what we expected, hypotheses 2a and 2b were not supported by the teachers' data.

Additionally, we hypothesized that targets who like to read would be perceived by teachers as having higher school achievement (Hypothesis 2c) and possessing traits typically related to being good at school (Hypothesis 2d), than the other targets. To test these hypotheses, we used the "General school achievement scale" and in the "Good student traits Scale". We found that targets who liked to read were perceived as having higher "General school expectations" ($F(1,131)=37.936$, $p<.000$, $\eta^2=0.225$). However, all targets were perceived similarly in terms of their "Good student traits" ($F(1,131)=$

3.102, $p = .081$) (see Table 5), regardless of whether they liked to read or not. Thus, hypothesis 2c, but not hypothesis 2d, was supported by the teachers' data. Moreover, we expected that teachers would perceive targets who like to read as less popular (Hypothesis 3b) than targets who do not like to read. We compared the "Popularity Scale" scores across conditions and, as in Study 1, found significant differences ($F(1,131) = 16.159$, $p < .000$, $\eta^2 = 0.110$) in perceived popularity in favor of the targets who did not state that they liked to read, confirming hypothesis 3b.

Finally, although it does not correspond to any of our hypotheses, we analyze the "General negative traits Scale" that emerged from EFA in the teachers' sample. Results show that participants exposed to vignettes about targets that liked to read, perceived them as exhibiting fewer general negative traits ($F(1,131) = 5.372$, $p = .022$, $\eta^2 = 0.039$) than participants who read about targets who do not like reading. No differences according to the target's gender were found on this scale. Because this scale did not match any of our hypotheses, these results are exploratory and should be interpreted with caution.

Interactional effects (target's gender x target's reading enjoyment). Regarding interactions, we expected that the effects of high reading enjoyment on hypotheses 2a, 2b, 2c, 2d and 3a would be larger for female targets than male targets. We also expected that the negative effect on popularity (Hypothesis 3b) would be larger for male targets than female targets. However, as in Study 1, no interaction effects were observed to support the hypotheses.

We were unable to check for differences by participants' gender, because the teachers' sample was not balanced in terms of participants' gender (77.9% females). However, we had no specific hypotheses regarding participants' gender, so this did not present a problem for answering our questions.

Table 5. Descriptive statistics for the rating of the four targets, Study 2 (teachers' sample)

Scales	Target's gender	Target's reading enjoyment		
		Low	High	Total
		Mean (SD)	Mean (SD)	Mean (SD)
General School Achievement	Male	2.39 (0.43)	2.80 (0.54)	2.58 (0.53)
	Female	2.42 (0.44)	2.98 (0.39)	2.75 (0.49)
	Total	2.40 (0.43)	2.89 (0.47)	2.66 (0.51)
Reading Ability	Male	2.26 (0.41)	3.12 (0.63)	2.67 (0.68)
	Female	2.36 (0.71)	3.14 (0.40)	2.82 (0.67)
	Total	2.30 (0.55)	3.13 (0.52)	2.74 (0.67)
Reading Motivation	Male	2.23 (0.44)	3.27 (0.54)	2.72 (0.71)
	Female	2.12 (0.39)	3.40 (0.37)	2.87 (0.74)
	Total	2.19 (0.42)	3.34 (0.46)	2.79 (0.73)
Out-of-school reading motivation	Male	2.18 (0.45)	2.68 (0.54)	2.42 (0.55)
	Female	2.10 (0.47)	2.79 (0.47)	2.50 (0.58)
	Total	2.15 (0.46)	2.74 (0.50)	2.46 (0.56)
Good student traits	Male	2.72 (0.48)	2.76 (0.43)	2.74 (0.45)
	Female	2.70 (0.48)	2.93 (0.38)	2.83 (0.44)
	Total	2.71 (0.47)	2.85 (0.41)	2.78 (0.45)
General negative traits	Male	2.23 (0.51)	1.88 (0.46)	2.06 (0.51)
	Female	2.05 (0.41)	2.05 (0.36)	2.05 (0.38)
	Total	2.16 (0.47)	1.97 (0.42)	2.06 (0.45)
Feminine traits	Male	2.89 (0.50)	2.71 (0.57)	2.80 (0.54)
	Female	2.90 (0.60)	2.79 (0.46)	2.83 (0.52)
	Total	2.89 (0.54)	2.75 (0.52)	2.82 (0.53)
General femininity	Male	1.87 (0.57)	1.63 (0.67)	1.76 (0.62)
	Female	2.71 (0.60)	2.35 (0.53)	2.50 (0.58)
	Total	2.21 (0.71)	2.01 (0.69)	2.10 (0.71)
General masculinity	Male	2.36 (0.74)	2.34 (0.65)	2.35 (0.70)
	Female	1.83 (0.60)	1.84 (0.50)	1.83 (0.54)
	Total	2.14 (0.73)	2.08 (0.62)	2.11 (0.68)
Popularity	Male	2.87 (0.51)	2.48 (0.56)	2.69 (0.57)
	Female	2.92 (0.38)	2.64 (0.46)	2.76 (0.45)
	Total	2.89 (0.46)	2.56 (0.51)	2.72 (0.51)
Unidimensional femininity-masculinity question	Male	7.58 (1.69)	7.56 (1.81)	7.57 (1.74)
	Female	5.31 (2.24)	5.00 (1.90)	5.13 (2.04)
	Total	6.66 (2.22)	6.23 (2.25)	6.43 (2.24)

N= 135 teachers.

SD= Standard Deviation

All scales rating ranged from 1 to 4 (higher score indicating higher levels of the attribute), except for the unidimensional femininity-masculinity question which ranged from 0 to 10 where 0= very feminine and 10=very masculine.

Bold= Statistically significant main effects.

Summary of Study 2 Results

In Study 2, we used an experimental vignette design to test if fictional target's gender (male vs. female) and reading enjoyment (low vs. high) would influence teachers' perceptions of the target's academic and personal characteristics, and therefore whether teachers present stereotypes associated with reading, related to gender and other social categories and behaviors. Contrary to our hypotheses, teachers in the study did not perceive male and female targets differently with regards to motivation to read, reading behaviors, school achievement, or traits typically associated with being good at school. In contrast, teachers did perceive targets who liked to read as having higher school achievement and as being less popular than targets who did not like to read (supporting hypotheses 2c and 3b). Of note, in this sample of teachers the effect of reading enjoyment on the general femininity scale went in the opposite direction as expected; teachers who were told about characters who liked to read, on average, rated them as less feminine and less “like” women.

Targets were rated similar in general masculinity, feminine traits, and in good at school traits regardless of whether they liked to read or not (not supporting hypotheses 2a, 2b, nor 2d). Finally, the only differential effect in the teacher sample was the negative effect of reading enjoyment on scale “General negative traits” that emerged from EFA, which was greater for male targets, but does not correspond to any of our hypotheses. All these findings will be discussed in detail in the following section.

General Discussion

We carried out two experimental vignette studies with independent samples of Chilean high school students (Study 1) and language teachers (Study 2), in order to explore the effects of a fictional student's gender and their reading enjoyment on

perceptions of their academic and personal characteristics. We were particularly interested in exploring what kind of stereotypes Chilean students and language-teachers hold about females and males who like to read.

These two studies sought to generate empirical evidence about a relevant but understudied topic, especially in Latin America. Through the use of a between-subjects design, the tendency of high-school students and language teachers to use information about reading enjoyment and gender to make predictions about people's personality and behaviors was evaluated. Given that sex differences in reading tend to widen during adolescence, studying perceptions about reading can be relevant at this age to promote more equal learning opportunities for all students (Educational Quality Agency, 2019a, 2019b; OECD, 2019b).

In general, results show that both teachers and students use enjoyment of reading as a meaningful characteristic to make inferences about a fictitious character's academic skills, their masculinity and other personality traits, and their popularity, but that only students used gender as a trait relevant to some of these judgements. The results are discussed in detail in what follows.

Associations between gender and reading/academic achievement

Students, but not teachers, exhibited gender stereotypes associated with reading, providing mixed support for hypothesis 2b. The students' stereotypes manifested in their ratings of targets who liked to read as less masculine than the rest and exhibiting fewer negative masculine traits. Students not only exhibited gender stereotypes associated with reading, but also with other academic achievement areas. Specifically, they perceived female targets as having more traits typically related to being good at school (supporting hypothesis 1d). However, several other expected associations between gender and reading or academic achievement were not substantiated by the data. Students perceived female and male targets similarly in reading achievement and behaviors, and teachers simply had identical perceptions of male and female targets in all dimensions.

Associations between reading and academic achievement

Whereas only students exhibited gender stereotypes associated with reading or academic achievement, both teachers and students tended to associate the linking of reading with being a good student and better behaved, in accordance with hypothesis 2d. Students rated characters who liked to read as having more good student traits in general than those who did not enjoy reading, while teachers rated people who like to read as displaying fewer negative traits than those who did not enjoy reading (although it does not correspond to any of our hypotheses). Also, in the case of teachers, other specific traits associated with characters who liked to read were reading ability, general school expectations, reading motivation, and extra-school reading motivation.

Associations between reading and social traits

Regarding social traits, and also according to our predictions, both students and teachers judged characters who were described as enjoying reading as less popular than those who were not (hypothesis 3b). Additionally, students did not perceive these students to be more or less likeable than the ones that were not said to like reading (hypothesis 3a)

The most notable difference between students' and teachers' ascriptions was that while, according to our expectations, students perceived targets with high reading enjoyment as less masculine, teachers rated them lower in the general femininity scale. Thus, not only teachers in this sample did not exhibit the expected stereotypes about reading as a feminine activity, but they actually exhibited the opposite tendency, in a way. Because the specific scale used to measure general femininity includes the question of how much the character is like other women, one explanation may be that teachers perceive characters who enjoy reading as more infantilized, and therefore less similar to *mature* woman, who stereotypically may have characteristics such as femininity, concern for physical appearance, and the opposite sex. This would be in line with the link found by Scholes (2019b) between anti-reading identities and girls being pretty and hanging out with boys.

Another unexpected finding was that observed effects of reading enjoyment were generally the same for male and female characters. Given the different expectations of males and females regarding reading, academic achievement, and personality, we expected that liking to read would predict different kinds of inferences when characters were male and female. This was only the case for the scale “General negative traits” in the teacher study. This is an interesting finding, however this scale emerged from EFA and it does not correspond to any of our original hypotheses. Thus, whereas on average targets who did not express a liking for reading were perceived more negatively, this difference was larger for male targets. However, because this scale does not represent any of the constructs in our conceptual framework, this finding remains exploratory and we cannot interpret it.

These results add to previous findings about how reading enjoyment is perceived as being associated with other personality traits, including those stereotypically associated with females as well as with “good students.” One of the most important findings of our study is that high school students perceived reading to be less associated with masculinity than femininity. Those results are in line with those of previous research in both students (Espinoza and Strasser, 2020; Freedman-Doan, et al., 2000; Guimond and Roussel, 2001; Martinot, Bages, and Desert, 2011; Nowicki and Lopata, 2017; Steffens and Jelenec, 2011) and teachers (Muntoni and Retelsdorf, 2018; Retelsdorf, Schwartz, and Asbrock, 2015; Wolter, Braun, and Hannover, 2015). Previous research had shown that school and academic achievement are generally perceived as feminine domains (Heyder and Kessels, 2013), and in particular, good student traits are more associated to females than males (Heyder and Kessels, 2015, 2017; Jackson, 2003; Jackson and Dempster, 2009, Jones and Myhill, 2004; Kessels, et al., 2014), but the present findings go one step beyond, showing that students will actually use the preference for reading as a source of information about the individual’s personality.

These findings are also consistent with previous research showing that adolescents perceive reading as an “uncool” activity, and people with interest in reading as having limited social skills (National Literacy Trust, 2012; Schatz, Panko, Pierce and Krashen,

2010; Scholes, 2019b). However, unlike previous studies (Martino, 1999, 2001; Scholes, 2019a), in our research we did not observe that this association between reading enjoyment and less popularity was greater for male students than for female students.

In general, findings of these two studies could indicate that stereotypes about people who enjoy reading may account for the gender gap in favor of females in high school reading. This effect could come about because, while a stereotype of reading as uncool might be an obstacle for both male and female students to engage in reading, male students would face additional obstacles if they also perceive reading as an un-masculine activity. This becomes especially relevant during mid-adolescence, when boys and girls are highly likely to conform to social norms of gender (Galambos, Almeida, and Petersen, 1990; Martin and Ruble, 2010).

Limitations and future research

The results of these studies should be interpreted in light of its limitations. One of them is the sample size of the teachers' sample, which limited the power and robustness of the findings, especially for interaction effects. Additionally, the small sample size prevented us from conducting comparisons by demographic, such as teacher sex or type of school where they teach, despite the fact that previous literature shows higher levels of sexism and gender stereotypes in lower socioeconomic contexts. Accordingly, another limitation of these studies is the sociocultural homogeneity of the student participants. It is possible that both students and teacher results may vary depending on the type of school and/or the participants SES.

Future research should focus on expanding and generalizing these results, as well as developing educational applications. For example, in order to prevent negative effects of reading stereotypes on both males and females, it would be useful to determine at what point in the life cycle students begin to develop these beliefs, using longitudinal designs. Another area of interest is the exploration of the role played by the school culture, and particularly teachers attitudes, in reproducing or challenging stereotypes associated with reading, through classroom observations (Espinoza and Taut, 2016), as well as

investigating the effect of teachers' beliefs and behaviors not only on student's stereotypes about reading, but also on their self-concept and motivation to read (Retelsdorf, Schwartz, and Asbrock, 2015; Wolter, Braun, and Hannover, 2015). Finally, investigating the effect of students' and teachers' reading stereotypes directly on their reading achievement would lend more validity to the model (Muntoni and Retelsdorf, 2018).

We expect our findings to contribute to the promotion of equal literacy development opportunities for students of both sexes in Chile and other countries, questioning stereotypes about individuals who enjoy reading. We hope that awareness of these stereotypes may contribute to the mitigation of their negative impact on students' school and higher education trajectories (UNESCO, 2012).

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Appendices

Study 2

Gender-stereotyped perceptions of students who like to read: Experimental evidence from Chilean students and teachers

Appendix 1. Students Questionnaire.

In each of the four experimental conditions, the students answered the following questionnaire:

Think about the story you just read and respond by marking with an X where applicable:
 What is the sex of the character?:
 Man:
 Woman:
 The character's liking for reading is:
 High :
 Low :

Now we would like you to indicate your degree of agreement with different statements about Álvaro/Carolina. Although you have little information about him/her, answer thinking about the idea or impression that you have formed of him/her and how you think his/her life is. Remember that there are no right or wrong answers, the best answer is the most immediate and sincere.

Mark with a cross (X) or enclosed in a circle the number that best represents your degree of agreement with the following statements:	Strongly disagree	disagree	Agree	Strongly agree
1: Strongly disagree 2: Disagree 3: Agree 4: Strongly agree				
1. I think I have many things in common with Álvaro/Carolina.	1	2	3	4
2. I think I could become a friend of Álvaro/Carolina.	1	2	3	4
3. I think I could have fun with Álvaro/Carolina.	1	2	3	4
4. I think I could invite Álvaro/Carolina to my house.	1	2	3	4
5. I think I'm very different from Álvaro/Carolina.	1	2	3	4
6. I think Álvaro/Carolina is a nice person.	1	2	3	4

	Strongly disagree	disagree	Agree	Strongly agree
7. I think Álvaro/Carolina has good grades in language.	1	2	3	4
8. I think Álvaro/Carolina will get very good grades at school this year.	1	2	3	4
9. I think Álvaro/Carolina will get very good grades in math this year.	1	2	3	4
10. I think Álvaro/Carolina will get very good grades in science this year.	1	2	3	4
11. I think for Álvaro/Carolina is difficult to understand complex texts.	1	2	3	4
12. I think Alvaro/Carolina reads aloud well.	1	2	3	4
13. I think Álvaro/Carolina easily understands scientific texts.	1	2	3	4
14. I think Álvaro/Carolina can use what he reads to solve problems.	1	2	3	4
15. I think Álvaro/Carolina easily understands novels and stories.	1	2	3	4
16. I think Álvaro/Carolina easily understands complex texts.	1	2	3	4
17. I think Álvaro/Carolina is smart.	1	2	3	4
18. I think Álvaro/Carolina will be one of the best students of his/her course this year.	1	2	3	4
19. I think Álvaro/Carolina will get the best marks of his/her course in the language course this year.	1	2	3	4
20. I think Álvaro/Carolina attends workshops or activities outside of school related to reading.	1	2	3	4
21. I think that Álvaro/Carolina in the future is going to choose a job where reading will be an important requirement.	1	2	3	4
22. I think Álvaro/Carolina is a good reader.	1	2	3	4
23. I think that reading will be very important in Álvaro's/Carolina's future.	1	2	3	4

24. I think Álvaro/Carolina is bored of reading.	1	2	3	4
25. I think for Álvaro/Carolina is important to be a good a reader.	1	2	3	4
26. I think Álvaro/Carolina reads scientific texts.	1	2	3	4
27. I think Álvaro/Carolina reads novels.	1	2	3	4
28. I think Álvaro/Carolina reads news and/or newspapers.	1	2	3	4
29. I think Álvaro/Carolina reads encyclopedias.	1	2	3	4
30. I think Alvaro/Carolina reads on his/her cell phone or electronic devices.	1	2	3	4
31. I think Álvaro/Carolina reads printed texts.	1	2	3	4
32. I think Álvaro/Carolina is sensitive.	1	2	3	4
33. I think Álvaro/Carolina cares about others.	1	2	3	4
34. I think Álvaro/Carolina is cute.	1	2	3	4
35. I think Álvaro/Carolina is undecided.	1	2	3	4
36. I think Álvaro/Carolina is trying hard.	1	2	3	4
37. I think Álvaro/Carolina is tidy.	1	2	3	4
38. I think Álvaro/Carolina is understanding.	1	2	3	4
39. I think Álvaro/Carolina is affectionate.	1	2	3	4
40. I think Álvaro/Carolina is scary.	1	2	3	4
41. I think Álvaro/Carolina is helpful.	1	2	3	4
42. I think Álvaro/Carolina is competitive.	1	2	3	4
43. I think Álvaro/Carolina is aggressive.	1	2	3	4
44. I think Álvaro/Carolina is independent.	1	2	3	4
45. I think Álvaro/Carolina is productive.	1	2	3	4
46. I think Álvaro/Carolina is a leader in his/her group of friends.	1	2	3	4
47. I think Álvaro/Carolina is problematic.	1	2	3	4
48. I think Álvaro/Carolina is objective.	1	2	3	4
49. I think Álvaro/Carolina is thoughtful.	1	2	3	4

50. I think Álvaro/Carolina is dominant in his/her relationships.	1	2	3	4
51. I think Álvaro is risky.	1	2	3	4
52. I think Álvaro/Carolina seems interesting to his/her classmates.	1	2	3	4
53. I think making friends is a hard task for Álvaro/Carolina.	1	2	3	4
54. I think Álvaro's/Carolina's classmates like to join him/her.	1	2	3	4
55. I think Álvaro's/Carolina's classmates have fun with him/her.	1	2	3	4
56. I think Álvaro/Carolina has many friends.	1	2	3	4
57. I think Álvaro/Carolina likes most of his/her classmates.	1	2	3	4
58. I think Álvaro/Carolina is very feminine.	1	2	3	4
59. I think Álvaro/Carolina looks like a woman/looks like other women	1	2	3	4
60. I think Álvaro/Carolina is very masculine.	1	2	3	4
61. I think Álvaro/Carolina looks like other men/ looks like a man.	1	2	3	4

62. On a scale between 0 and 10, where **0 is a very feminine person** and **10 is a very masculine person**, ¿at what point on the scale would you place Álvaro/Carolina? Mark with an X where applicable:

Very feminine	0	1	2	3	4	5	6	7	8	9	10	Very masculine
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Appendix 2. Correlations Matrix variables Study 1 (students' sample)

	Expectations in Math and Sciences	Reading Achievement and Behavior	Good student traits	Negative masculine traits	Feminine traits	General femininity	General masculinity	Popularity	Likeability	Uni- dimensional femininity- masculinity question
Expectations in Math and Sciences	-	.042	.204**	.124*	.130*	.054	.027	.304**	.222**	.032
Reading Achievement and Behavior	.042	-	.599**	-.299**	.074	.091	-.152**	.013	.142*	-.108
Good student traits	.204**	.599**	-	-.071	.413**	.190**	-.116*	.233**	.248**	-.143*
Negative masculine traits	.124*	-.299**	-.071	-	.069	.120*	.110	.357**	.034	.041
Feminine traits	.130*	.074	.413**	.069	-	.217**	-.006	.174**	.103	-.134*
General femininity	.054	.091	.190**	.120*	.217**	-	-.445**	.209**	.070	-.592**
General masculinity	.027	-.152**	-.116*	.110	-.006	-.445**	-	-.058	-.025	.594**
Popularity	.304**	.013	.233**	.357**	.174**	.209**	-.058	-	.333**	-.070
Likeability	.222**	.142*	.248**	.034	.103	.070	-.025	.333**	-	-.053
Unidimensional femininity- masculinity question	.032	-.108	-.143*	.041	-.134*	-.592**	.594**	-.070	-.053	-

*p<.005

**p<.001

Appendix 3. Teachers Questionnaire.

In each of the four experimental conditions, the teachers answered the following questionnaire:

Think about the story you just read and respond by marking with an X where applicable:
What is the sex of the character?:
Man:
Woman:

The character's liking for reading is:
High :
Low :

Now we would like to know your degree of agreement with different statements about Álvaro/Carolina. Although you have little information about him/her, try to base your answer on the idea or impression that has been formed of him/her and how you think his/her life is. Remember that there are no right or wrong answers, the best answer is the most immediate and sincere.

Mark with a cross (X) or enclose in a circle the number that best represents s or degree of agreement with the following statements: 1: Strongly disagree 2: Disagreement 3: Agree 4: Strongly agree	Strongly disagree	disagree	Agree	Strongly agree
1. I think Álvaro/Carolina has good grades in language.	1	2	3	4
2. I think Álvaro/Carolina will get very good grades at school this year.	1	2	3	4
3. I think Álvaro/Carolina will get very good grades in math this year.	1	2	3	4
4. I think Álvaro/Carolina will get very good grades in science this year.	1	2	3	4

5. I think for Álvaro/Carolina is difficult to understand complex texts.	1	2	3	4
6. I think Alvaro/Carolina reads aloud well.	1	2	3	4
7. I think Álvaro/Carolina easily understands scientific texts.	1	2	3	4
8. I think Álvaro/Carolina can use what he reads to solve problems.	1	2	3	4
9. I think Álvaro/Carolina easily understands novels and stories.	1	2	3	4
10. I think Álvaro/Carolina easily understands complex texts.	1	2	3	4
11. I think Álvaro/Carolina is smart.	1	2	3	4
12. I think Álvaro/Carolina will be one of the best students of his/her course this year.	1	2	3	4
13. I think Álvaro/Carolina will get the best marks of his/her course in the language course this year.	1	2	3	4
14. I think Álvaro/Carolina attends workshops or activities outside of school related to reading.	1	2	3	4
15. I think that Álvaro/Carolina in the future is going to choose a job where reading will be an important requirement.	1	2	3	4
16. I think Álvaro/Carolina is a good reader.	1	2	3	4
17. I think that reading will be very important in Álvaro's/Carolina's future.	1	2	3	4
18. I think Álvaro/Carolina is bored of reading.	1	2	3	4
19. I think for Álvaro/Carolina is important to be a good a reader	1	2	3	4
20. I think Álvaro/Carolina reads scientific texts.	1	2	3	4
21. I think Álvaro/Carolina reads novels.	1	2	3	4

22. I think Álvaro/Carolina reads news and/or newspapers.	1	2	3	4
23. I think Álvaro/Carolina reads encyclopedias.	1	2	3	4
24. I think Álvaro/Carolina reads on his/her cell phone or electronic devices.	1	2	3	4
25. I think Álvaro/Carolina reads printed texts.	1	2	3	4

26. I think Álvaro/Carolina is sensitive.	1	2	3	4
27. I think Álvaro/Carolina cares about others.	1	2	3	4
28. I think Álvaro/Carolina is cute.	1	2	3	4
29. I think Álvaro/Carolina is undecided.	1	2	3	4
30. I think Álvaro/Carolina is trying hard.	1	2	3	4
31. I think Álvaro/Carolina is tidy.	1	2	3	4
32. I think Álvaro/Carolina is understanding.	1	2	3	4
33. I think Álvaro/Carolina is affectionate.	1	2	3	4
34. I think Álvaro/Carolina is scary.	1	2	3	4
35. I think Álvaro/Carolina is helpful.	1	2	3	4
36. I think Álvaro/Carolina is competitive.	1	2	3	4
37. I think Álvaro/Carolina is aggressive.	1	2	3	4
38. I think Álvaro/Carolina is independent.	1	2	3	4
39. I think Álvaro/Carolina is productive.	1	2	3	4
40. I think Álvaro/Carolina is a leader in his group of friends.	1	2	3	4
41. I think Álvaro/Carolina is problematic.	1	2	3	4

42. I think Álvaro/Carolina is objective.	1	2	3	4
43. I think Álvaro/Carolina is thoughtful.	1	2	3	4
44. I think Álvaro/Carolina is dominant in his relationships.	1	2	3	4
45. I think Álvaro/Carolina is risky.	1	2	3	4

46. I think Álvaro/Carolina seems interesting to his/her classmates.	1	2	3	4
47. I think making friends is a hard task for Álvaro/Carolina.	1	2	3	4
48. I think Álvaro's/Carolina's classmates like to join him/her.	1	2	3	4
49. I think Álvaro's/Carolina's classmates have fun with him/her.	1	2	3	4
50. I think Álvaro/Carolina has many friends.	1	2	3	4
51. I think Álvaro/Carolina likes most of his/her classmates.	1	2	3	4
52. I think Álvaro/Carolina is very feminine.	1	2	3	4
53. I think Álvaro/Carolina looks like a woman/ looks like other women.	1	2	3	4
54. I think Álvaro/Carolina is very masculine.	1	2	3	4
55. I think Álvaro/Carolina looks like other men/ looks like a man.	1	2	3	4

56. On a scale between 0 and 10 where **0 is a very feminine person** and **10 is a very masculine person**, ¿at what point on the scale would you place Álvaro/Carolina? Mark with an X where applicable:

Very feminine	0	1	2	3	4	5	6	7	8	9	10	Very masculine
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Appendix 4. Correlations Matrix variables Study 2 (teachers' sample)

	General School Achievement	Reading Ability	Reading Motivation	Out-of-school reading motivation	Good student traits	General negative traits	Feminine traits	General femininity	General masculinity	Popularity	Uni-dimensional femininity-masculinity question
General School Achievement	-	.697**	.627**	.628**	.566**	-.168	.246**	-.037	-.028	.056	-.062
Reading Ability	.697**	-	.714**	.588**	.337**	-.344**	.163	-.121	-.104	-.036	-.110
Reading Motivation	.627**	.714**	-	.649**	.421**	-.180*	.103	-.122	-.024	-.160	-.039
Out-of-school reading motivation	.628**	.588**	.649**	-	.562**	.101	.298**	-.014	.050	.070	-.065
Good student traits	.566**	.337**	.421**	.562**	-	-.010	.602**	.152	.111	.427**	.018
General negative traits	-.168	-.344**	-.180*	.101	-.010	-	.191*	.301**	.266**	.111	-.050
Feminine traits	.246**	.163	.103	.298**	.602**	.191*	-	.265**	.175*	.475**	.021
General femininity	-.037	-.121	-.122	-.014	.152	.301**	.265**	-	.090	.212*	-.344**
General masculinity	-.028	-.104	-.024	.050	.111	.266**	.175*	.090	-	.101	.436**
Popularity	.056	-.036	-.160	.070	.427**	.111	.475**	.212*	.101	-	-.071
Unidimensional femininity-masculinity question	-.062	-.110	-.039	-.065	.018	-.050	.021	-.344**	.436**	-.071	-

*p<.005

**p<.001

Study 3
**Direct and Indirect effects of Sex, Gender Stereotypes and Gender Identity in Male
and Female Students' Reading Motivation**

Ana María Espinoza, Katherine Strasser & Héctor Carvacho

Abstract

The wide sex gaps in favor of females in reading academic achievement in different countries are very well documented. Reading motivation has been one of the most studied psychosocial variables, since it has been shown to have a significant effect on reading achievement. The present study sought to contribute to the understanding of sex gap in reading, focusing on the role of reading gender stereotypes, as well as students' gender identity in their reading self-concept and the value they attribute to reading. 303 Chilean secondary school students (51% female) were evaluated through self-report questionnaires. Structural equation models were carried out to evaluate whether student' gender identity mediated the relation between sex and reading motivation, as well as to evaluate the differential effect of reading gender stereotypes and gender identity on the motivation of males and females. The results reveal only direct effects of sex, in favor of female students, in both measures of reading motivation. The multigroup analysis shows a differential effect of reading gender stereotypes in the sample of females and males. While for female students, adherence to the reading=females stereotype has a positive effect on their reading self-concept, for males it has a negative effect on the value they attribute to reading. The results are discussed regarding the implications for the reading teaching-learning processes in secondary education, as well as for initiatives that seek greater gender equity in literacy processes.

Key words: gender stereotypes, gender identity, reading motivation, sex-gaps

1. Introduction and literature overview

Achieving equality in education is a current concern in most of the world's countries (Organization for Economic Co-operation and Development [OECD], 2016), given the wide gaps in students' academic achievement and in their attitudes towards learning (Educational Quality Agency, 2019a, 2019b; Mullis, Martin, Foy, & Hooper, 2016). Socio-economic status (SES) and sex⁴ are the most relevant variables when it comes to explaining the lack of equality in learning that currently exists in different disciplines (OECD, 2016). In relation to students' sex, the results of standardized academic achievement tests have shown a clear trend of gaps in favor of males in mathematics in recent decades, and in favor of females in reading (OECD, 2016).

However, in recent years we have seen how the gap between males and females in mathematics has been diminishing in several countries, such as the United States and Chile (Educational Quality Agency 2019b; Hyde et al., 2008). The latest results report from the Chilean "*System for Measuring the Quality of Education*" (SIMCE) show no significant sex differences in any of the evaluated courses (Educational Quality Agency, 2019b). This would indicate that females are increasing their performance and involvement in an area traditionally associated with males, an advance in terms of equity. The scenario of sex gaps in reading, on the other hand, has not changed. In Chile, as in other countries in the world, females consistently obtain better results than males in primary and secondary school. This gap has been detected through international standardized achievement tests such as *Progress in International Reading Literacy Study* (PIRLS) (Mullis, Martin, Foy, & Hooper, 2017) and *Program for International Student Assessment* (PISA) (OECD, 2019).

In particular, the PIRLS results for 2016 reveal that in 48 of the 50 participating countries, fourth-grade girls perform better in reading than boys. In none of the countries assessed boys get higher achievement than girls. The sex gap in performances has been

⁴ We used the term sex to refer to the biological difference between men and women, and the term gender, to refer to socially constructed characteristic, expectations and roles for femininity and masculinity (Lips, 2020).

presented since this assessment began and has not been reduced in recent years (Mullis, et al., 2017). On the other hand, the latest results report from the *Third Regional Comparative and Explanatory Study in Latin America and the Caribbean* (TERCE) for 2013, which evaluated third and sixth grade students in reading and writing, reveals that in third grade female students perform significantly better than male students in the 15 participating countries. In sixth grade, only in two countries (Ecuador and Guatemala) boys have a slight advantage over girls (Gelber, Treviño, & Inostroza, 2016). Consistently, the latest PISA results revealed that in the 79 countries evaluated there is a gap in favor of female 15-year-olds in reading (OECD, 2019).

Something that draws much attention in the case of Chile, is that the sex gap in reading has increased significantly over recent years, especially towards the end of the school trajectory. The main reason for this phenomenon is the decrease in the reading achievement of high-SES male in secondary school (Educational Quality Agency, 2019b).

Evidence indicates that reading comprehension is a fundamental requirement for learning in any domain of knowledge (Connor et al., 2011; Snow, 2002; Snow, Burns, & Griffin, 1998). Given this, the sex gap in reading is concerning, as it may be detrimental to the personal development and academic potential of male students. So, what factors may explain male students' lower reading achievement?

One possible explanation is that males have lower language skills than females, because language skills underlie reading achievement. However, research reveals no substantive sex differences in verbal skills (Hedges & Nowell 1995; Hyde & Linn 1988). Reading motivation, on the other hand, exhibits large differences in favor of females (e.g., Heyder, Kessels, & Steinmayr, 2017; McGeown, 2015). This is a key factor in achievement, since motivation is associated with learning and engagement behaviors which in turn predict learning outcomes (e.g., Durik, Vida, & Eccles, 2006). International evidence also shows the existence of widespread stereotypes that link certain domains of knowledge -such as mathematics and science- with masculinity (e.g., Cvencek et al., 2011), and others -especially reading- with femininity (e.g., Espinoza & Strasser, 2020; Nowicki & Lopata, 2017). According to these stereotypes, mathematics and science would

be for males because they require traditionally masculine traits such as rationality, objectivity and method; while reading would be for females because it requires traits that have been viewed as traditionally feminine, such as sensitivity, calm and emotionality. The presence of these stereotypes, together with the observed gaps in reading motivation between males and females, suggests that sex gaps in reading achievement could be to a large extent the result of socialization processes, rather than biological factors.

A better understanding of the socio-cognitive factors that influence sex gaps in academic achievement is crucial for the development of initiatives that promote greater equality in learning and development for all students. The present study sought to contribute to this direction, focusing on the role that Reading Gender Stereotypes (RGS) and gender identity play in the reading motivation of Chilean high school students. So far, few studies in the context of Latin America have delved into the factors affecting the sex gap in favor of females in reading, with a focus on secondary education. Most research on this subject in Chile, has focused on academic disadvantage of females in areas such as mathematics (e.g., del Río, Strasser, & Susperreguy; del Río, Strasser, Cvencek, Susperreguy, & Meltzoff, 2018; Espinoza & Taut, 2020), as well as in primary school (e.g., Huepe, Salas, & Manzi, 2016).

2. Factors influencing sex differences in academic achievement in reading

2.1 Differences between males and females in verbal skills

The results of various meta-analyses reveal that there are very few substantive differences in the verbal skills between males and females (Hedges & Nowell, 1995; Hyde & Linn, 1988; Wallentin, 2009). Specifically, a meta-analysis of 165 studies on sex differences in verbal skills in various countries, with people of a wide age range (from preschoolers to adults), revealed no sex differences in *vocabulary* ($d = 0.02$) nor *essay writing* ($d = 0.09$). In *speech production*, a slight difference was found in favor of females ($d = 0.33$); and in *analogies*, a small difference in favor of men ($d = -0.16$). In general verbal ability the effect size of differences is within a low range ($d = 0.20$). Another the meta-analysis by Hedges & Nowell (1995), with adolescents from the United States, revealed

that differences in *vocabulary* between boys and girls ranged between -0.06 and 0.25, with an average of zero.

2.2 Differences between males and females in reading motivation

Expectancy-value theory (Eccles, 1983; Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006) provides a useful approach to explain gender differences and their developmental and contextual dynamics in relation to reading motivation. This theory suggests that students' behavior is guided by expectancy beliefs (how competent students think they are in a specific domain), as well as subjective value beliefs (what students are interested in). Students engage in activities they find interesting (value beliefs) and in which they feel competent (expectancy beliefs). Studies on this subject usually operationalize the expectation component as academic self-concept (e.g., "I am a good reader"), and the value component as an interest in a particular domain (e.g., "I can read complex texts well") (e.g., Archambault, Eccles, & Vida, 2010). Both components of motivation drive subsequent academic choices and behavior; the more competent a student feels (expectancy) and the more they value reading (value), the greater their inclination towards reading. Accordingly, both expectancy and value beliefs matter for the academic achievement (e.g., Durik, Vida, & Eccles, 2006; Eccles, 1994).

Consistent with the theory, research has shown that beliefs about one's own competence and the value assigned to the task, do indeed predict academic achievement and choices in language area (Durik et al., 2006; Eccles, 1987, Eccles et al., 1994; Spinath et al., 2004; Watt, 2004). In turn, evidence shows that on average, girls have both a better self-concept in language and report higher values about reading than boys (Eccles, Wigfield, Harold, & Blumenfeld, 1993; Heyder, Kessels, & Steinmayr, 2017; Jacobs et al., 2002; Kelley & Decker, 2009; Marinak & Gambrell, 2010; OECD, 2010; Wigfield et al., 1997), and these differences intensify with age (Kelley & Decker, 2009; McKenna, Conradi, Lawrence, Jang, & Meyer, 2012). These findings suggest that it is very possible that these motivational processes are behind at least some of the differences between male and female students in reading.

2.3 The role of Reading-related Gender Stereotypes (RGS)

Gender stereotypes are shared beliefs about the attributes, roles, likings, and behaviors that are typically associated with men and women (Deaux & LaFrance, 1998; Lips, 2020). In the educational context, there are stereotypes about the abilities and academic motivation of males and females in different areas of knowledge. Studies in primary and secondary education reveal that mathematics and science are associated with a masculine domain by both students (e.g., Cvencek et al., 2011; Cvencek et al., 2014; Guimond & Roussel, 2001; Kessels et al., 2006), and teachers (e.g., Makarova & Herzog, 2015). Other studies have shown that reading is associated with a feminine domain, since both students (e.g., Espinoza & Strasser, 2020; Freedman-Doan et al., 2000; Guimond & Roussel, 2001; Martinot et al., 2011; Nowicki & Lopata, 2017; Steffens & Jelenec, 2011) and teachers attribute more ability and motivation to females than males in reading (Muntoni & Retelsdorf, 2018; Retelsdorf et al., 2015; Wolter, Braun, & Hannover, 2015).

Students' perception that reading is a feminine domain can affect both their beliefs regarding their own ability as readers, and the value they attribute to reading. The way in which this affects their motivation will be different according to student' sex, since according to the Social Identity Theory (Tajfel, 1974; Tajfel & Turner, 1986) the membership in a group provides the basis for self-evaluation, and the intergroup comparisons can also play an important role in that process. Therefore, the stereotype that reading=female would have a positive effect on females' reading self-concept and value, and a negative effect on males' motivation (Retelsdorf et al., 2015).

The differential effects of stereotypes on motivation and performance on different groups has been shown empirically. The phenomenon known as Stereotype Threat (Aronson et al., 1999; Steele, 1997) refers to the negative impact that a stereotype has on the performance of a member of a negatively stereotyped group, when they are reminded or made aware of it. This process is assumed to occur through the pressure that the person feels to disprove the stereotype, which would steal resources away from the task and generates a performance that is not consistent with their true ability (Pennington, Heim, Levy, & Larkin, 2016; Spencer, Steele, & Quinn, 1999). Several studies have shown that

stereotype threat can affect not only students' performance, but also their motivation (e.g., Fogliati & Bussey, 2013; Spencer, Logel, & Davies, 2016; Thoman, Smith, Brown, Chase, & Lee, 2013) and sense of belonging (e.g., Chaffee, Lou, & Noels, 2020; Good et al., 2012) in academic subjects. For example, studies have shown that when girls are reminded of the stereotypes that “math is for boys”, they tend to underperform on math tests and show less motivation and sense of belonging associated with the discipline (e.g., Appel & Kronberger 2012; Keller 2002; Nguyen & Ryan 2008). Although there is less empirical evidence in the language area, a recent study showed a negative effect of the stereotype that females have better language skills than males, on the performance and sense of belonging in language-related domains in male students (Chaffee et al., 2020).

In this study, we test the hypothesis that, consistent with this theory, female students who exhibit the stereotype that reading is for females would suffer a positive impact of the stereotype in their reading motivation (reading self-concept and value), whereas the effects for male students of adhering to this stereotype would be negative.

2.4 Gender identity

Gender identity is defined as the feeling that a person has about being a man or a woman (Egan & Perry, 2001; Wood & Eagly, 2009). It is linked to gender stereotypes, as the degree to which a person identifies with the characteristics and social roles assigned to men and women varies from one person to another (Rocha-Sánchez, 2009).

There are various theoretical perspectives on the development of gender identity (Rocha-Sánchez, 2009). Multifactorial Theory of Gender Identity (Spence, 1993) postulates that gender identity is developed through a continuous process of socialization, in which stereotypes and gender roles prevailing in a society are internalized. This is translated in behaviors and cognitions, as well as in personal identification with different traits. Thus, gender identity would imply differential traits and roles that would give meaning to someone's sense of self in a specific cultural context.

Specifically, according to Multifactorial Theory, gender identity has four interrelated components: 1) masculine and feminine traits, which refer to the identification

of each person with different characteristics aligned with the categories of the instrumental (masculine) versus the expressive (feminine); 2) masculine and feminine gender roles (activities associated with a particular role in society that would be predominant or exclusive of each sex); 3) attitudes towards gender roles; and 4) general gender stereotypes. In a research carried out in Mexico, Rocha-Sánchez and Díaz-Loving (2011) empirically corroborates this theoretical proposal, through a principal component analysis with data from the adult population.

Regarding the influence of gender identity in school achievement, the Interests as Identity Regulation Model (IIRM) (Kessels & Hannover, 2007; Kessels et al., 2014), proposes that individuals are more likely to get involved in those domains that fit with their gender identity, and to abstain from those that they consider different from themselves. Thus, the development of interests regarding a school domain would at least partially respond to the need of students to develop and demonstrate their gender identity. Given the existence of gender stereotypes that associate reading with femininity, the traits that are usually associated with a person who does well in reading would not match those that are usually associated with a typically masculine male. Consistently, a recent investigation with Canadian university students revealed that traditional masculine gender roles may lead some men to avoid feminine-typed domains, such as foreign language, by feeling a “masculinity threat” (Chaffee, Lou, Noels, & Katz, 2019). Additionally, a study by Lagaert, Van Houtte, & Roose (2017) with Flemish 7th graders, shows that among students who report higher levels of gender typicality (identification as a typical male or female), and who also report pressure to conform to gender stereotypes, females present slightly higher levels of interest than males in arts-, theater-, and literature-related activities. These results of male’ students are consistent with the idea that the avoidance of the feminine is a central aspect of the masculine gender role (Bosson & Michniewicz, 2013).

Since it is highly likely that there is variation in the degree to which males and females identify with the traditionally masculine’ and feminine’ traits and roles, gender identity may have a role in reading motivation even within each sex group. In fact, several

studies suggest that gaps in students' attitudes towards reading are explained more widely by gender identity than by their biological sex (McGeown, Goodwin, Henderson, & Wright, 2012; Vantieghem, Vermeersch, & Van Houtte, 2014). Specifically, a recent study shows that the extent to which children (9 to 11 years old) identified with feminine traits was a stronger predictor of their reading and writing motivation than their sex (McGeown & Warhurst, 2019).

Considering these antecedents, it becomes relevant to explore whether part of the effect of the students' sex on their reading motivation is in fact explained by the effect of their gender identity. This could account not only for differences between males and females in reading motivation, but also for differences within each sex group.

2.5 Gender socialization processes and differentiated learning opportunities

So far, the role of stereotypes and gender identity in sex differences in students' reading motivation has been mentioned. However, it is important to also consider the socialization processes by which the students' sex would have an effect on their self-evaluations and involvement in different academic domains. From an early age males and females are socialized differently in both the family and school contexts. Gender stereotypes influence the socialization process and translate into different expectations and practices on the part of both parents (e.g., Muntoni & Retelsdorf, 2019) and teachers, which influences the attitudes, behaviors, and academic achievement of students (e.g., Gunderson, Ramirez, Levine & Beilock, 2012; Hochweber & Vieluf, 2018).

Regarding the role of parents, the classic research by Tiedemann (2000a) in primary schools in Germany revealed that math-related gender stereotypes (math=males) predict the evaluation made by parents regarding the ability in mathematics of their sons and daughters. Parents with higher levels of these stereotypes assigned girls lower math skills than boys. Likewise, the findings revealed a relationship between parents' stereotypes and children's self-perception of math ability. The latter has also been reported by Jacobs (1991) in sixth to eleventh grade students, and by Eccles, Adler, and Kaczala (1982) in fifth to eleventh grade students. On the other hand, parents of high school

students have the expectation that their sons will achieve greater future success in careers that require mathematical skills than their daughters (Eccles et al., 1990).

Based on this, a causal model has been proposed that claims that gender stereotypes influence parents' beliefs regarding the academic abilities of their sons and daughters, which in turn impacts their own motivation (self-concept and value), and subsequently, their level of academic achievement (Gunderson et al., 2011; Muntoni & Retelsdorf, 2019).

Regarding socialization in the school context, some studies show that teachers expect different things from male and female students, and that these expectations are consistent with the dominant gender stereotypes in society (Eccles, 1989; Jussim & Eccles, 1992; Li, 1999; Muntoni & Retelsdorf, 2018; Retelsdorf, Schwartz, & Asbrock, 2015; Tiedemann, 2000b, 2002; Wolter., et al., 2015) and are expressed in different beliefs about the ability and causal attributions regarding achievements and failures of males and females (Fennema, Peterson, Carpenter & Lubinski, 1990; Tiedemann, 2000b, 2002). Furthermore, the literature reveals that teachers tend to act in classrooms according to their beliefs (Auwarter & Aruguete, 2008; Espinoza & Taut, 2016; Palardy, 1998; Palardy & Rumberger, 2008), and that the way in which they interact with their students can influence their academic self-concept and learning expectations (Kuklinski & Weinstein, 2001). In the end, this amounts to teachers offering boys and girls different learning opportunities in stereotyped domains such as reading, which could -with the passing of time- create actual ability gaps between male and female students. These family and school processes are another plausible explanation for the observed effect of students' sex on the levels of reading motivation which this study aims to evaluate, together with the differential effect of RGS and gender identity in secondary school students in Chile.

3. Goals and hypotheses

The present study seeks to identify if social constructions around gender have a differential effect on the reading motivation of males and females. Specifically, the study

evaluates whether gender identity and Reading Gender Stereotypes (RGS) have an effect on the relation between students' sex and their reading motivation.

3.1 Specific goals

- 1) Test whether students' gender identity (roles and traits) has a mediating effect on the relationship between student's sex and reading motivation (reading self-concept and value).
- 2) Test whether RGS and gender identity have a differential effect on reading motivation of male and female students (reading self-concept and value).

3.2 Hypotheses

Consistent with extant literature, we expect sex differences in favor of females in reading self-concept and value associated with reading (hypothesis 1). This direct effect of sex on reading motivation is expected to be mediated by the students' gender identity (their identification with gender roles and traits) (hypothesis 2).

Finally, we hypothesize differential effects for male and female students of their adherence to RGS and of their gender identity. For females we expect their adherence to RGS (reading=female) to have a positive effect on their reading motivation, while we expect the opposite effect for males (hypothesis 3). In relation to gender identity, we expected a similar effect to that of sex. In the first place, feminine gender roles and expressive traits are expected to be positively associated with reading motivation, but this positive effect is expected to be stronger for females. Conversely, masculine gender roles and instrumental traits are expected to have a negative effect on the two motivational variables, and this effect should be more pronounced for males than females (hypothesis 4).

4. Methodology

4.1 Design

We have both a mediational and a moderation hypothesis regarding sex, and in order to increase the clarity of the analysis and interpretation of results, we tested two separate models, one for the mediation hypotheses and one for the moderation hypotheses. In the mediation model, student sex was used as a predictor, while the moderation hypothesis was tested using a multigroup model with student sex as a grouping variable (Balluerka & Vergara, 2002). Student SES was controlled by design, since all participants belong to medium-low SES schools. The Chilean educational system is one of the most socioeconomically segregated school systems in the world, and therefore there is very little SES variability within each type of school (Valenzuela, Bellei, & de los Ríos, 2013).

4.2 Participants

Participants were 303 9th to 12th grade students (51% female) from three urban schools in the Metropolitan Region of Chile. The schools were selected through personal contacts with teachers and schools' administrators. Average age of students was 15.72 years ($SD= 1.17$), with a range of 14 to 19 years. Individual students' socio-economic status (SES) was not available, but the schools were very homogeneous in their SES composition since they were all voucher schools⁵ serving a medium-low SES population.

4.3 Instruments

4.3.1 Reading motivation

We used an adaptation of the Motivation to Read Profile (Gambrell, Palmer, Coding & Mazzoni, 1996), adding modifications from revised version of the original instrument (Malloy, Marinak, Gambrell, & Mazzoni, 2013), validated version in Chile (Navarro, Orellana, & Baldwin, 2018) as well as from adolescents' version (Pitcher et al., 2007). The final self-report questionnaire contains 20 four-point items that measure two dimensions of the expectancy-value theory (Eccles, 1983; Wigfield et al., 2006). The first scale "Reading self-concept" contains 10 items about the student's perception of his/her

⁵ Voucher schools are private administrators to receive state funding. Vouchers are not directly given to the families but are transferred to schools according to their enrollment rates.

reading skills and how he/she thinks is perceived by significant others. The second scale “Value associated with reading” contains 10 items regarding the importance that students attribute to reading, as well as their commitment to this activity. A detailed description of this instrument and the items that compose it can be found in Espinoza and Strasser (2020).

4.3.2 Reading-gender stereotypes (RGS)

We measured explicit gender stereotypes regarding reading using a questionnaire created for a previous study (Espinoza & Strasser, 2020) which contains two scales. The first scale, “Gender Stereotypes about Reading Skills” (9 items), asks participants to indicate which group –men or women- have more skills necessary to engage in different reading activities. The second scale, “Gender Stereotypes about Reading Motivation” (9 items), asks participants to indicate which group –men or women- are more inclined to have reading preferences and values. Each item is scored in a seven-point scale: 1: men much more than women; 2: men more than women; 3: men a little more than women; 4: men and women alike; 5: women a little more than men; 6: women more than men; 7: women much more than men (see details in Espinoza & Strasser, 2020).

4.3.3 Gender identity

We used an adaptation of the scales of feminine and masculine gender roles as well as expressive (feminine) and instrumental (masculine) traits’ scales of the Gender Identity Inventory developed by Rocha-Sánchez and Díaz-Loving (2011) with an adult Mexican population. In this inventory, different aspects of this construct are measured, in accordance with Multifactorial Theory of Gender Identity proposal by Spencer (1993). The two gender roles scales include five statements about how often traditionally feminine behaviors are performed and four items referring to traditionally masculine behaviors in the relationship with others, which are answered in a five-point Likert format (1: never/almost never; 5: always/almost always). The two traits’ scales include a total of 12 items, each of which consist of a trait. For each trait, participants are asked to evaluate the degree to which that trait is an attribute of themselves, in a five-point Likert scale. For the

present study, we used the six instrumental (masculine) traits and the six expressive (feminine) traits outlined in the proposal of the short form of the Bem Sex Role Inventory (BSRI; Bem, 1974). That version of the questionnaire has demonstrated strong psychometric properties, in some cases better than the original BSRI (for a review see Vafaei et al., 2014), and there is also a validated version in Spanish (Mateo & Fernandez, 1999). Instrumental traits were: Aggressive, Competitive, Strong, Bossy, Dominant and Assertive. The expressive traits were: Warm, Affectionate, Tender, Gentle, Sensitive to others need, Emotional.

4.4 Procedure

Principals were invited to participate in the study through personal contact, as well as email and were asked to sign a letter of authorization. Subsequently, the students were invited to participate, emphasizing the voluntary nature of participation and confidentiality of information. Students who agreed to participate signed an assent for minors and received a letter of informed consent for parents. Data collection was conducted during the school day in the students' classrooms. The surveys took about one hour to complete. All procedures were in accordance with ethical standards and approved by the Social Sciences and Humanities Ethics review board at the Pontificia Universidad Católica de Chile.

4.5 Data Analysis

First, the measurement model was tested including the eight latent variables derived from the instruments used (1: Reading self-concept; 2: Value associated with reading; 3: Feminine gender roles; 4: Masculine gender roles; 5: Expressive traits; 6: Instrumental traits; 7: Gender Stereotypes about Reading Skills; and 8: Gender Stereotypes about Reading Motivation). A Confirmatory Factor Analysis (CFA) was performed using Mplus 8.3 (Muthén & Muthén, 1998-2017).

We then performed structural equation models using the latent variables derived from the measurement model. Because we have both a mediational and a moderation

hypothesis regarding sex, and we could not test both hypotheses in the same model, we tested two separate models, one for the mediation hypotheses and one for the moderation hypotheses.

The mediation model included the variables sex, the four gender identity variables (masculine and feminine roles as well as instrumental and expressive traits), and the two motivational variables (reading self-concept and value).

To test the moderation hypothesis, we carried out a multigroup structural model, restricting the measurement model to be invariant between a males' and females' sample, in order to evaluate the differential effect of gender identity (masculine and feminine roles as well as instrumental and expressive traits) and the RGS (RGS about skills and RGS about motivation) in students' reading motivation.

In all models we used a Maximum Likelihood [ML] estimator. To test the goodness of fit of the model four indices were used (Hu & Bentler, 1999): Chi square statistics, standardized root-mean-square residual (SRMR), root-mean-square error of approximation (RMSEA), and comparative fit indexes (CFI and TLI).

5. Results

5.1 Preliminary Analyses

Before testing the measurement model with the eight latent variables corresponding to the scales of the instruments used, we analyzed the adequacy and adjustment of each latent variable separately. For this purpose, we performed Confirmatory Factor Analysis (CFA) for each latent variable, in order to assess the extent to which each latent variable was represented by the observed variables. We retained the items that had equal or greater 0.4 factor loadings (Tinsley & Brown, 2000), to ensure that items were representative of the latent variable. For both reading self-concept and value associated with reading, 6 items were retained (see Appendix 1). The CFA model with both latent variables of reading motivation showed good fit indices ($\chi^2_{(76)} = 193.498$, $p < .000$; $SRMR = .054$; $CFI = .934$; $TLI = .921$; $RMSEA = .071$, $p = .003$ [90 CI: .059–.084]).

For the latent variable Feminine Gender Roles and Masculine Gender Roles 3 items per each variable were retained. Expressive Traits variable, meanwhile, was constructed with 6 items, while for Instrumental Traits variable, 4 items were retained (following the theoretical proposal of the BSRI-12) (see Appendix 1). The CFA model with 4 gender identity latent variables present good fit indices ($\chi^2_{(98)} = 244.202$, $p < .000$; $SRMR = .074$; $CFI = .911$; $TLI = .891$; $RMSEA = .070$, $p = .002$ [90 CI: .059–.081]).

Finally, for both the Gender Stereotypes about Reading Skills latent variable and Gender Stereotypes about Reading Motivation latent variable, 6 items were retained per each variable (see Appendix 1). The CFA model with both RGS latent variables present good fit indices ($\chi^2_{(53)} = 122.653$, $p < .000$; $SRMR = .047$; $CFI = .944$; $TLI = .930$; $RMSEA = .066$, $p = .043$ [90 CI: .051–.081]).

5.2 Measurement Model

After modeling each latent variable, we evaluate the measurement model with the eight latent variables for the complete students' sample, namely, 1) Reading self-concept (7 items); 2) Value associated with reading (7 items); 3) Feminine Gender Roles (3 items); 4) Masculine Gender Roles (3 items); 5) Expressive Traits (6 items); 6) Instrumental Traits (4 items); 7) Gender Stereotypes about Reading Skills (6 items); and 8) Gender Stereotypes about Reading Motivation (6 items). The measurement model consists thus in 8 latent factors and 42 observed variables (see Appendix 1). The initial measurement model reveals that, according to the criteria established in the literature (Hu & Bentler, 1999), there are adequate levels of adjustment of the proposed model to the data ($\chi^2_{(791)} = 1250.395$, $p < .000$; $SRMR = .064$; $CFI = .904$; $TLI = .896$; $RMSEA = .044$, $p = .989$ [90 CI: .039–.048]). All the factor loadings for the indicators on the latent variables were significant ($p < .005$), indicating that all the latent variables were well represented by their respective observed variables. The factorial loads of the items of each latent variable are high and balanced, and in all the factors there is some item with a load greater than 0.7. Table 1 shown averages, standard deviations, sex differences and correlations between all latent variables of the model.

Table 1. Descriptive statistics and Pearson's correlation of the latent variables

	Males Mean (SD)	Females Mean (SD)	Total Mean (SD)	1	2	3	4	5	6	7	8
1. Reading self-concept	2.788 (.543)	2.932* (.550)	2.860 (.550)	1							
2. Value associated with reading	2.623 (.614)	2.975** (.619)	2.799 (.640)	.600* *	1						
3. Expressive traits	3.543 (.826)	3.662 (.857)	3.603 (.842)	.113	.102	1					
4. Instrumental traits	2.398 (.821)	2.178* (.743)	2.288 (.789)	.041	-.094	-.001	1				
5. Feminine gender roles	3.987 (.868)	4.477 (.593)	4.233 (.781)	.147*	.144*	.494**	-.023	1			
6. Masculine gender roles	2.638 (.780)	2.459* (.769)	2.549 (.778)	.120*	-.029	.157**	.362**	.239**	1		
7. RGS about Skills	4.291 (.410)	4.280 (.445)	4.286 (.427)	.132*	-.007	.055	.136*	.069	.032	1	
8. RGS about Motivation	4.458 (.510)	4.470 (.517)	4.464 (.513)	.063	-.085	.039	.066	.009	-.073	.640**	1

* $p < .001$

** $p < .005$

Variables 1, 2: range 1-4.

Variables 3, 4, 5 and 6: range 1-5.

Variables 7, 8: range 1-7.

5.3 Test of the Mediation Model

The results of the structural model with which we evaluated the mediation effect of students' gender identity (roles and traits) on the relationship between sex and reading motivation (reading self-concept and value), reveal that the model proposed presents acceptable fit indices ($\chi^2_{(418)} = 828.269$, $p < .000$; $CFI = .886$; $TLI = .873$; $RMSEA = .057$, $p = .023$ [CI 90%: .051- .063]; $SRMR = .073$).

The results of the direct effects reveal that the students' sex has a significant positive effect in favor of females in both reading self-concept ($\beta = .172$, $p = .011$), and in value associated with the reading ($\beta = .264$, $p < .000$). However, no indirect effects of students' sex were observed through any of the gender identity latent variables included

(see Table 2). Therefore, it is possible to conclude that for the sample of students evaluated, the hypothesis of indirect effects of sex on the levels of reading self-concept ($\beta = .004, p = .905$) and value associated with reading ($\beta = .014, p = .651$), through the effect of gender identity (roles and traits) is rejected (hypothesis 2).

Table 2. Total, indirect, and direct effects from sex to Reading Motivation

Effects from Student' sex to Reading self-concept				
	Estimate	S.E.	Est./S.E.	P-Value
Total	0.176	0.060	2.924	0.003
Total indirect	0.004	0.033	0.119	0.905
Specific indirect 1 Reading self-concept				
Expressive traits				
Student' sex	0.003	0.005	0.529	0.597
Specific indirect 2 Reading self-concept				
Instrumental traits				
Student' sex	-0.007	0.017	-0.394	0.694
Specific indirect 3 Reading self-concept				
Feminine gender roles				
Student' sex	0.016	0.029	0.562	0.574
Specific indirect 4 Reading self-concept				
Masculine gender roles				
Student' sex	-0.009	0.020	-0.437	0.662
Direct Reading self-concept				
Student' sex	0.172	0.068	2.532	0.011
Effects from Sex to Value associated with reading				
Total	0.278	0.056	4.939	0.000
Total indirect	0.014	0.031	0.453	0.651
Specific indirect 1 Value associated with reading				
Expressive traits				
Student' sex	0.002	0.004	0.402	0.688
Specific indirect 2 Value associated with reading				
Instrumental traits				
Student' sex	0.009	0.016	0.574	0.566

Specific indirect 3 Value associated with reading				
Feminine gender roles				
Student' sex	0.002	0.028	0.077	0.938
Specific indirect 4 Value associated with reading				
Masculine gender roles				
Student' sex	0.001	0.018	0.058	0.954
Direct Value associated with reading				
Student' sex	0.264	0.064	4.100	0.000

5.4 Sex Differences

A restricted multi-group analysis was carried out to identify whether the path coefficients differ significantly between males and females (see Appendix 2). To carried out the model in Mplus, it was restricted to the measurement model being invariant between a sample of males and females, in order to test differences in the structural model (Muthén & Muthén, 1998-2017). The multi-group model has acceptable levels of fit indices to the data ($\chi^2_{(1568)} = 2329.669$, $p < .000$; $CFI = .892$; $TLI = .889$; $RMSEA = .057$, $p = .013$ [CI 90%: .052- .061]; $SRMR = .079$).

The results reveal that in the structural model for the males' sample, none of the predictors has a significant effect on reading self-concept. However, for the variable value associated with reading, a significant negative effect of the RGS about Motivation was observed ($\beta = -.424$, $p = .023$). That is, the greater adherence of male students to the stereotype that relates reading motivation with females, the lower value they place on reading. The other predictors do not show significant effects (see Table 3). The model explains 9.06 % of the variance of reading self-concept ($R^2 = .096$) and 12.9% of the variance of value associated with the reading ($R^2 = .129$).

On the other hand, the results of the structural model for the females' sample show that for reading self-concept, the RGS about Skills present a significant positive effect ($\beta = .428$, $p = .008$). That is, the greater adherence of female students to the stereotype that women have greater reading skills, the greater their self-concept in this discipline. The

other predictors do not present significant effects. For the dependent variable value associated with reading, no significant effects of the predictors included in the model were observed (see Table 3). The full model explained 11.4 % of the variance of reading self-concept ($R^2 = .114$) and 5.8 % of the variance of the value associated with the reading ($R^2 = .058$).

Table 3. Standardized Multi-group Model Results

	Structural Model Group Males				Structural Model Group Females			
	Estimate	S.E.	Est./S.E.	P-Value	Estimate	S.E.	Est./S.E.	P-Value
	Males	Males	Males	Males	Females	Females	Females	Females
Reading self-concept ON								
Expressive traits	0.084	0.129	0.649	0.516	-0.011	0.106	-0.108	0.914
Instrumental traits	-0.196	0.172	-1.140	0.254	0.085	0.206	0.412	0.680
Feminine gender roles	-0.125	0.139	-0.895	0.371	0.199	0.112	1.779	0.075
Masculine gender roles	0.384	0.190	2.025	0.073	-0.167	0.191	-0.875	0.382
RGS about Skills	0.094	0.195	0.482	0.630	0.428	0.160	2.672	0.008
RGS about Motivation	-0.013	0.196	-0.066	0.947	-0.173	0.166	-1.038	0.299
Value associated with reading ON								
Expressive traits	-0.015	0.126	-0.116	0.907	0.021	0.109	0.194	0.847
Instrumental traits	-0.251	0.164	-1.526	0.127	0.163	0.213	0.767	0.443
Feminine gender roles	-0.036	0.137	-0.264	0.792	0.045	0.116	0.384	0.701
Masculine gender roles	0.204	0.186	1.094	0.274	-0.314	0.199	-1.578	0.114
RGS about Skills	0.342	0.191	1.771	0.093	0.084	0.186	0.453	0.651
RGS about Motivation	-0.424	0.189	-2.271	0.023	-0.061	0.170	-0.361	0.718

6. Discussion and Conclusions

This study sought to contribute to the knowledge of the psychosocial factors that explain the wide gender gaps in favor of females in reading, which occur both in Chile and in different parts of the world. In line with those reported by international priors' studies, we found a direct effect of student' sex in their reading self-concept and value associated with reading (Eccles et al., 1993; Espinoza & Strasser, 2020; Heyder et al., 2017; Jacobs et al., 2002; Kelley & Decker, 2009; Marinak & Gambrell, 2010; OECD, 2010; Wigfield et al., 1997). Females present significantly higher levels than male in their

beliefs about their reading ability and in their value of this activity, supporting our hypothesis 1 (sex differences). However, the data do not support our hypothesis 2 (mediation), since there are no indirect effects of student' sex on reading motivation that go through student' gender identity. This indicates that, for our sample, within-group differences are not explained by identification with expressive or instrumental traits, or by adherence to feminine or masculine gender roles, but differences between males and females are. These results can be understood considering that males and females from the moment of birth are socialized in different ways because they belong to one or other sex, and this may create different learning opportunities for each throughout their life cycle, both in family and school context (e.g., Gunderson et al., 2011; Muntoni & Retelsdorf, 2019). This supports the idea that gender-differentiated socialization in relation to academic skills and learning from different disciplines, regardless of how much males and females identify with traditionally masculine and feminine traits and roles, may have an effect on their level of involvement and interest by an area stereotyped as feminine such as reading.

On the other hand, the results of the multi-group model reveal that when we analyze the samples of male and female students separately, a differential effect of RGS on reading motivation is observed. Specifically, we found that for the females' sample, RGS about Skills have a significant positive effect on their reading self-concept. That is, the greater the adherence of female students to the stereotype that women have greater reading skills than men, the greater their reading self-concept. On the other hand, in the males' sample, we found a negative effect of RGS on the value attributed to reading. This indicates that the more they adhere to the stereotype that females have greater reading motivation than males, the less value they attribute to activities associated with reading. This supports our hypothesis 3 and indicates that RGS have a detrimental effect on male students' motivation, keeping them away from reading, and could be a possible explanatory factor for the reported gender gaps in reading achievement (e.g., Educational Quality Agency, 2019a, 2019b; Mullis et al., 2016). These results, in broad terms, would support the expectancy-value theory proposal regarding that both expectancy and task

value beliefs are influenced by gender stereotypes (Eccles, 1987, 1994; Wigfield et al., 2006). Additionally, these findings can be understood from of the stereotype threat process (Aronson et al., 1999, Steele, 1997). Males belong to a negatively stereotyped group with regards to reading, whereby when the stereotype is present or activated (due to the adherence of students to that stereotype), their reading motivation is reduced. This is consistent with the results of previous studies that reveal that the stereotype threat phenomenon not only influences academic performance, but also levels of motivation (e.g., Fogliati & Bussey, 2013; Spencer et al., 2016; Thoman et al., 2013), with recent evidence supporting this effect in language area (Chaffee et al., 2020). As a whole, these results show us that, as proposed by the Social Identity Theory (Tajfel & Turner, 1986), belonging to a social group influences the evaluation that people make of themselves. While females experience a positive effect of RGS in their self-perception of ability, males probably experience a "social identity threat" (e.g., Logel et al., 2009) that makes them decrease their commitment and involvement with reading. Finally, contrary to hypothesis 4, the results reveal that controlling for adherence to RGS, no effect of gender identity was observed in students' reading motivation, neither males nor females.

The findings of this study stress the importance of moving towards a gender-fair and non-sexist education, without gender stereotypes, to allow males and females to develop their full potential. Increasing reading motivation for the adolescent population in general is necessary, if we consider that various studies show that it declines as the school progresses (e.g., Kelley & Decker, 2009; McKenna et al., 2012). Increasing the number of books, classroom libraries, time devoted to reading, and improving teacher training are highly relevant cross-cutting measures. However, interventions in this area should also include actions to challenge social constructions of gender. It is essential to make stereotypes visible and to question the reading-related gender stereotypes that may be impacting negatively on the academic motivation and achievement of males and females. Offering models of male readers; highlighting the possibilities that reading opens in terms of acquiring knowledge; and promoting high learning expectations towards males and females, in teachers, parents and in society, are some actions that may help and could

be included in initiatives that seeks to promote equal literacy opportunities for males and females. All this can result in reducing the gaps not only in the students' school trajectories, but also in the wide sex differences in the choice of study fields and trades that are observed after the end of the school period (UNESCO, 2012).

The results of this study must be interpreted considering its limitations. One of them is the relatively small size of the comparison groups. Larger samples not only would give more robustness to the results, but also allow an inclusion of other variables of interest. One aspect which is considered very important, is the construction of masculinity and femininity scales that not only include self-identification with traits and roles, but also with the social categories of man and woman and the importance attached to this identification. This is relevant, since in recent years there have been relevant social changes, which have plausibly influenced the gender identity construction of young people, especially women. In particular, the recent feminist movement in Chile and other parts of the world may have contributed to disassociating some traditionally feminine traits from the category of woman, rendering our scales somewhat obsolete to measure gender identity proper. Since it is possible that the contents of identity that traditionally have been associated with male and female are changing, a better measure to assess the effect of gender identity in academic motivation, would be for example, identification with gender category (Tajfel & Turner, 1986), somewhat akin to asking, "how much do you identify with the category of man/woman".

Another limitation of this study corresponds to the fact that all the participants had a similar SES. It is plausible to suppose that in samples with greater SES variability, different results from those reported here will be found. In relation to this, some previous studies show that factors such as SES interact with sex, since in families with lower SES there are higher expectations differentiated by gender, and students are socialized based on more differentiated gender roles in comparison with families with higher SES (Entwisle, Alexander, & Olson, 2007). Therefore, future studies could also evaluate the interaction effect of the SES and students' sex on their reading motivation. In addition, to

increase the robustness of the model it would be relevant to evaluate the direct and indirect effect of the RGS and gender identity on reading academic achievement.

7. References

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Appendices

Study 3

Direct and Indirect effects of Sex, Gender Stereotypes and Gender Identity in Male and Female Students' Reading Motivation

Appendix 1. Standardized Measurement Model Results complete sample (N=303).

Latent variable Reading self-concept		Estimate	S.E.	Est./S.E.	P-Value
ML_AC_1R	My friends believe that I am:	0.773	0.028	27541	0.000
ML_AC_3	I read:	0.609	0.041	14987	0.000
ML_AC_5R	When I read and I find a word that I do not know:	0.505	0.047	10689	0.000
ML_AC_7R	When I read alone, I understand:	0.463	0.050	9275	0.000
ML_AC_9	I am:	0.862	0.022	39669	0.000
ML_AC15R	Reading is:	0.618	0.040	15468	0.000
ML AC 19	When I read aloud, I am a:	0.485	0.048	10081	0.000
Latent variable Value associated with reading					
ML_VA_2	Reading a book is something that I like to do:	0.856	0.020	42679	0.000
ML_VA_6	I tell my friends about good books that I read:	0.594	0.040	14760	0.000
ML_VA_8R	People who read a lot are:	0.546	0.044	12506	0.000
ML_VA10R	I believe that libraries are:	0.690	0.033	20630	0.000
ML_VA_14	I think reading is:	0.840	0.021	39671	0.000
ML_VA_16	When I am an adult:	0.769	0.027	28453	0.000
ML VA20R	If someone gave me a book for my birthday, I would feel:	0.545	0.043	12551	0.000
Latent variable Expressive traits					
ID_II_36	Warm	0.774	0.028	27625	0.000
ID_II_15	Affectionate	0.858	0.022	39293	0.000
ID_II_8	Tender	0.814	0.025	32823	0.000
ID_II_7	Gentle	0.532	0.046	11620	0.000
ID_II_47	Sensitive to others need	0.522	0.047	11042	0.000
ID_II_54	Emotional	0.619	0.040	15611	0.000
Latent variable Instrumental traits					
ID_II_3	Aggressive	0.536	0.055	9708	0.000
ID_II_4	Competitive	0.416	0.059	7014	0.000
ID_II_38	Bossy	0.531	0.054	9795	0.000
ID II 49	Dominant	0.753	0.048	15756	0.000
Latent variable Feminine gender roles					
ID_I_3	I talk to them and listen to their problems to help them.	0.722	0.033	21.916	0.000
ID_I_4	I am always morally with them.	0.875	0.024	36.486	0.000
ID I 5	I give them advice when they have problems.	0.837	0.026	32.471	0.000
Latent variable Masculine gender roles					
ID_I_6	I make the most important decisions in the relationship	0.465	0.059	7.911	0.000
ID_I_7	I have control over them	0.778	0.051	15.116	0.000
ID I 8	I have the last word in the activities we carry out	0.612	0.050	12.135	0.000

Latent variable Gender Stereotypes about Reading Skills					
EGL_EX4	They get better grades in reading	0.607	0.042	14.335	0.000
EGL_EX5R	They are often wrong in reading comprehension tasks	0.786	0.030	26.249	0.000
EGL_EX6R	They need help to under- stand complex text	0.641	0.040	15.957	0.000
EGL_EX7R	They struggle to read well	0.606	0.042	14.330	0.000
EGL_EX8R	They find reading difficult	0.629	0.041	15.438	0.000
EGL_EX9	They have the facility to read complex texts	0.578	0.044	13.129	0.000
Latent variable Gender Stereotypes about Reading Motivation					
EGL_MT10	They like to read	0.669	0.039	17.348	0.000
EGL_MT12	They participate in activities that involve reading	0.567	0.044	12.741	0.000
EGL_MT13	They think that reading is interesting	0.736	0.033	22.602	0.000
EGL_MT14	They worry if they do not do well in reading	0.596	0.043	13.943	0.000
EGL_MT16	They read many books	0.739	0.032	22.827	0.000
EGL_M17R	They find reading boring	0.726	0.033	21.823	0.000

Appendix 2. Standardized Multi-group Model Results: Measurement models
males' and females' sample

	Measurement Model Group Males				Measurement Model Group Females			
Reading self-concept BY	Estimate Males	S.E. Males	Est./S.E. Males	P-Value Males	Estimate Females	S.E. Females	Est./S.E. Females	P-Value Females
ML_AC_1R	0.766	0.036	21.376	0.000	0.778	0.035	22.164	0.000
ML_AC_3	0.569	0.052	10.949	0.000	0.621	0.046	13.608	0.000
ML_AC_5R	0.422	0.051	8.355	0.000	0.550	0.053	10.403	0.000
ML_AC_7R	0.378	0.052	7.303	0.000	0.505	0.055	9.160	0.000
ML_AC_9	0.837	0.030	27.624	0.000	0.886	0.026	34.595	0.000
ML_AC15R	0.566	0.050	11.291	0.000	0.644	0.044	14.503	0.000
ML_AC_19	0.445	0.054	8.260	0.000	0.498	0.053	9.409	0.000
Value associated with reading BY								
ML_VA_2	0.833	0.029	28.326	0.000	0.859	0.025	34.818	0.000
ML_VA_6	0.586	0.049	12.067	0.000	0.579	0.045	12.734	0.000
ML_VA_8R	0.514	0.052	9.869	0.000	0.534	0.048	11.095	0.000
ML_VA10R	0.613	0.043	14.364	0.000	0.757	0.036	21.269	0.000
ML_VA_14	0.817	0.031	26.251	0.000	0.841	0.027	31.639	0.000
ML_VA_16	0.717	0.037	19.506	0.000	0.800	0.032	24.811	0.000
ML_VA20R	0.521	0.048	10.874	0.000	0.543	0.051	10.709	0.000
Expressive traits BY								
ID_II_36	0.767	0.036	21.522	0.000	0.773	0.035	21.810	0.000
ID_II_15	0.838	0.031	27.261	0.000	0.878	0.026	34.092	0.000
ID_II_8	0.796	0.032	25.136	0.000	0.843	0.030	27.837	0.000
ID_II_7	0.538	0.053	10.150	0.000	0.533	0.050	10.604	0.000
ID_II_47	0.557	0.056	9.929	0.000	0.510	0.050	10.245	0.000
ID_II_54	0.641	0.046	13.923	0.000	0.588	0.047	12.413	0.000
Instrumental traits BY								
ID_II_3	0.562	0.065	8.588	0.000	0.526	0.061	8.593	0.000
ID_II_4	0.507	0.070	7.251	0.000	0.378	0.057	6.628	0.000
ID_II_38	0.571	0.063	9.030	0.000	0.439	0.065	6.756	0.000
ID_II_49	0.763	0.055	13.981	0.000	0.693	0.067	10.320	0.000
Feminine gender roles BY								
ID_I_3	0.741	0.038	19.363	0.000	0.647	0.046	14.029	0.000
ID_I_4	0.874	0.030	29.285	0.000	0.850	0.036	23.628	0.000
ID_I_5	0.836	0.032	26.287	0.000	0.761	0.040	19.040	0.000
Masculine gender roles BY								

ID_I_6	0.495	0.061	7.995	0.000	0.483	0.053	7.783	0.000
ID_I_7	0.748	0.071	10.460	0.000	0.736	0.069	10.682	0.000
ID_I_8	0.639	0.063	10.208	0.000	0.642	0.070	9.171	0.000
RGS about Skills BY								
EGL_EX4	0.584	0.052	11.222	0.000	0.633	0.048	13.310	0.000
EGL_EX5R	0.738	0.040	18.590	0.000	0.839	0.035	24.117	0.000
EGL_EX6R	0.607	0.051	11.813	0.000	0.662	0.045	14.612	0.000
EGL_EX7R	0.602	0.048	12.539	0.000	0.596	0.053	11.298	0.000
EGL_EX8R	0.629	0.047	13.303	0.000	0.644	0.049	13.253	0.000
EGL_EX9	0.549	0.059	9.335	0.000	0.590	0.048	12.359	0.000
RGS about Motivation BY								
EGL_MT10	0.649	0.049	13.157	0.000	0.689	0.043	15.988	0.000
EGL_MT12	0.518	0.050	10.302	0.000	0.609	0.051	11.975	0.000
EGL_MT13	0.745	0.040	18.526	0.000	0.739	0.040	18.683	0.000
EGL_MT14	0.608	0.049	12.412	0.000	0.587	0.050	11.657	0.000
EGL_MT16	0.699	0.041	17.102	0.000	0.782	0.039	20.246	0.000
EGL_M17R	0.725	0.042	17.257	0.000	0.726	0.040	18.011	0.000

General Discussion

The present dissertation aimed to delve into different gender-related factors that contribute to explain the disadvantage of males compared to females in academic achievement in reading. Specifically, it focused on the explanatory role of gender identity and stereotypes in sex differences in reading motivation. In order to contribute to the scant empirical evidence that exists in relation to this issue, especially in Chile, three studies were carried out with secondary school students and language teachers.

The first study confirms the hypothesis that there are sex differences in favor of female students in both reading self-concept and value associated with reading, controlling for their academic achievement in reading. These results with a sample of Chilean students are like those found in international studies (Eccles, Wigfield, Harold, & Blumenfeld, 1993; Heyder et al., 2017; Jacobs et al., 2002; Kelley & Decker, 2009; Marinak & Gambrell, 2010; Wigfield et al., 1997). This first result allows us to visualize the importance of developing interventions that favor the reading motivation of male adolescents, and therefore their academic achievement in this area. On the other hand, the results of Study 1 show that, according to the hypothesis, both male and female students present gender stereotypes associated with reading (RGS), that is, they attribute more motivation and greater reading skills to women compared to men. These results are also consistent with those found in samples from other countries (e.g., Millard, 1997; Plante, O'Keefe, Aronson, Fréchette-Simard, & Goulet, 2019; Steffens & Jelenec, 2011), revealing that reading is considered a feminine domain, which could create a barrier in the participation and involvement in activities related to reading in some groups of students. In addition, it was observed that, controlling for sex, both gender identity and RGS have an effect on the students' reading motivation. Specifically, it was observed that the greater the belief that the students' own sex is associated with reading, the greater their reading self-concept; and that the more feminine the students perceive themselves to be (identification with traditionally feminine traits such as tender, sentimental, emotional), the greater value they attribute to reading. Strikingly, although it was expected that both expressive and instrumental traits would have an effect on reading self-concept and value

(positive and negative respectively), the results only showed an association with expressive traits. Additionally, although an effect of RGS on self-concept was observed, the small sample of this study did not allow for testing the differential effect in males and females. For this reason, a larger study was later conducted, in Study 3, to test this and other more complex hypotheses.

The second study sought to expand extant knowledge about the stereotypes associated with reading, specifically looking at stereotypes held by students and teachers about students who like reading and are interested in reading. The results support the hypothesis that people with a low liking for reading are perceived by students as more masculine and less feminine, compared to people with a high liking for reading. This finding provides additional support to the hypothesis of this dissertation, that reading is stereotyped as a female domain. In addition, Study 2 revealed that when presented with fictional characters, both students and teachers utilize their liking for reading to make other inferences about their personality and behavior. Of note is the perception, both of students and teachers, that characters who like to read are better students overall. Additionally, teachers who participated in the study associated other traits to the characters based on their enjoyment of reading: reading ability, educational expectations, reading motivation, and out-of-school reading motivation. In relation to social status, both students and teachers perceived characters who liked to read as less popular compared to those who did not like to read. Together, the results of Study 2 contribute to understanding the various ways in which this critical area of knowledge is stereotyped (Connor et al, 2011; Cooper, et al., 2014), and it illuminates the way in which those stereotypes can harm the involvement and motivation of students who do not want to be perceived in some of those ways. Stereotypes that associate liking for reading with personality traits and social skills can be especially threatening for the adolescent student population, who are at a stage of the life cycle in which peer assessment and feedback becomes essential (Havighurst, 1948). Finally, the results of the teachers' sample in Study 2 show the need to advance in the eradication of stereotypes in these socialization agents that are fundamental in the students' lives.

The third study sought to deepen the findings of Study 1 by analyzing not only the direct effect of students' sex in reading motivation, but also the indirect effects. The study evaluated whether students' gender identity and Reading Gender Stereotypes (RGS) have an effect on the relation between students' sex and their reading motivation. A relevant aspect of this study is that unlike Study 1, not only identification with expressive and instrumental traits, but also with traditionally feminine and masculine gender roles, were included as a measure of gender identity, to broaden and strengthen the measurement of this construct. The inclusion of a mediation hypothesis of students' gender identity in the relationship between students' sex and their reading self-concept and value, was especially relevant because it could inform about within-sex differences in reading motivation, allowing for the possibility that it is not students' objective belonging to a sex category, but their subjective identification with that category, what exerts the effect on their motivation. However, the results of Study 3 did not support this mediation hypothesis. On the contrary, direct effects of sex were still present for in favor of female students after introducing the potential mediators (gender identity and RGS), both for reading self-concept and value. This suggests that, whereas students' self-perception as feminine or masculine may influence their reading motivation, the impact of their sex is not exhausted by this mediation.

The larger sample of Study 3 allowed us to analyze the effect of gender-related variables independently for males and females. Although results did not support differential effects of gender identity on reading motivation for the two groups, the effects of RGS were indeed different for females and males, as expected. Specifically, we observe that RGS have a positive effect on the self-concept of female students, while a negative effect on the value associated with reading of male students. A useful paradigm to understand this differential effect is that of the stereotype threat, in the sense that belonging to a negatively stereotyped group in a domain -in this case men in activities related to reading- can negatively impact not only performance in that area, but also the motivation towards it. This is consistent with some existing international studies on this

topic (e.g., Chaffee, Lou, & Noels, 2020; Fogliati & Bussey, 2013; Spencer et al., 2016; Thoman et al., 2013).

Conclusions and implications

Taken together, the results of these three studies contribute to understanding the way in which psychosocial factors such as gender identity and stereotypes related to reading may influence the sex differences that exist, both in Chile as in many other countries, in students' reading motivation (Baker & Wigfield 1999; Coles & Hall, 2002; Kelley & Decker, 2009; McGeown, 2015; McKenna, et al., 2012; Wigfield & Guthrie, 1997). These results show that both students' sex and social constructions around gender play a role in the gender gaps in reading motivation. The direct effect of sex in favor of females on reading motivation observed in studies 1 and 3 pose the question of what effect can sex have on reading motivation, beyond stereotypes and gender identity. One possibility is that, independent of their feelings of masculinity or femininity, girls and boys are treated and socialized differently during their lives (e.g., Hadjar et al., 2014). These processes would translate into different learning opportunities provided by parents, teachers, and other socialization agents. These differentiated socialization processes are of course also influenced by dominant gender stereotypes, but their effect would be independent of the students' own feelings of identification with a given gender; teachers and parents would offer boys and girls different tasks, activities, feedback, and teaching, which could in turn create actual ability and motivation differences (e.g., Espinoza & Taut, 2016; Rodríguez-Planas & Nollenberger, 2018; Nollenberger, et al., 2016).

Beyond these learning trajectory effects, the fact that students who identified more strongly with typically feminine traits valued reading more than the rest (Study 1) is consistent with the Theory of Interests as a Model of Identity Regulation (Kessels, et al., 2014), which posits that students are likely to be motivated in areas that match their gender identity. This is also consistent with previous international studies that have found that gender identity predict reading and writing motivation (McGeown, et al., 2012; McGeown, 2013; Pajares & Valiente, 2001), academic behaviors (Kessels & Steinmayr,

2013), engagement in gender-typed leisure activities (Athenstaedt, Mikula, & Bredt, 2009), as well as career interests (Dinella, Fulcher & Weisgram, 2014).

Study 2 shows that beyond gender, that there are various other stereotypes associated with people who are interested in reading, including school behavior and social traits. These stereotypes are also relevant, because they can positively or negatively influence the involvement and reading motivation of adolescent students, for whom identity formation is a critical developmental task and therefore, who could be very sensitive to any threat to their perceived or desired self-perception.

Implications of these studies for intervention point towards the modification of social constructions around both reading and gender. Challenging these social constructions that limit the development of students is everyone's job. Teachers and the school institution have a preponderant role as social change agents. A non-sexist education that offers the same learning opportunities to females and males is key to making progress towards equity and reducing sex gaps.

Because they are critical socialization agents, the training of teachers in these topics is key to begin addressing harmful stereotypes around reading, and about gender and specific knowledge domains. Teacher training with a gender perspective may favor the quality of instructional practices in reading in general, and equity in particular (Hochweber & Vieluf, 2018; McTigue, Schwippert, Uppstad, Lundetrae, & Solheim, 2021). For this, it is essential to mainstream the gender approach in the study plans, in the curriculum and in the general policy of teacher training institutions, within the horizon of an inclusive education that respects diversity and promotes equity in learning. Encouraging reflection on gender stereotypes in education -working with case-analysis, learning dilemmas, and video-recordings of classes- could be an effective alternative (e.g., Espinoza & Taut, 2016). It would be important to focus on the stereotypes associated both with the academic domains, as well as with the students' behaviors and attitudes in the school context. The development of classroom observation guidelines with a focus on gender differences in pedagogical interactions, which could be self-applied by pre-service teachers - may help teachers be more aware of challenges and opportunities in their own

practice. In the context of in-service settings, learning communities could be developed among teachers, in which they can benefit from joint reflection on their own beliefs and expectations, as well as peer feedback in relation to the pedagogical practices observed. Disseminating knowledge about the existence and social consequences of these stereotypes through different means such as workshops, talks, study groups aimed at the entire community also constitutes an alternative to advance towards equity. Training and disseminating the use of inclusive and non-sexist language is also essential.

In relation to interventions aimed at students, it is relevant that from the initial cycle the same learning and development opportunities are offered to male and female students; and that gender stereotypes are explicitly questioned. For young children, it may be useful to share stories with counter-stereotypical content that show girls and boys in different roles and displaying different attributes and personal interests. This is relevant considering that from an early age students begin to hold gender stereotypes in relation to academic domains (e.g., del Río & Strasser, 2013). In addition, in all educational cycles, it is especially important to transmit models of males and females working in different areas, professions and trades. Offering models of males who enjoy reading becomes especially relevant during pre-adolescence and adolescence, a stage of the life cycle in which the conformation of identity based on significant references becomes central. Moreover, during mid-adolescence, males and females are highly likely to conform to social norms of gender (Galambos, Almeida, & Petersen, 1990; Martin & Ruble, 2010).

Autonomy in general is good for motivation (De Naeghel, Van Keer, Vansteenkiste, & Rosseel, 2012; Ryan & Deci, 2017), but not necessarily prevalent in reading instruction. Offering all students the opportunity to read what they like will promote everyone's reading motivation, and it may be especially beneficial for boys, who tend to be interested in genres that are under-represented in the school recommended reading lists, such as non-fiction texts, comics and manuals (e.g., Clark, 2012; Harkrader, & Moore, 1997). In order to provide true choice, it is essential to increase the number of books and school libraries and highlighting the possibilities that reading opens in terms of acquiring knowledge.

With regards to stereotypes' effects on child development, both the school and family context must be made aware of the importance of allowing males and females to feel free to identify and express diverse personality traits, without pressure around their biological sex. For example, the idea that females are naturally more responsible, hard-working, and good students than males is very likely harmful to students of both sexes, in different ways. Moreover, it is necessary to encourage males and females to have equal learning opportunities and to choose based on their true liking and vocations, and not on compliance with the social regulations associated with their anatomy. Demystifying the contrast between school achievement and social skills (e.g., popularity) is also necessary.

All these actions could make it possible to advance in reducing the sex gaps in reading motivation and achievement, as well as mitigating the negative consequences of the gaps in both school and post-school trajectories of students (Guerrero, Provoste, & Valdés, 2006; UNESCO, 2012; Voyer & Voyer, 2014).

Finally, in a broad sense, the results and implications of these studies should make us reflect on the role of academia and research, in reducing the different manifestations of gender inequality and sexism in our society. The educational context is only one of the areas in which gaps are expressed, since we can also observe wide gender inequalities in the labor and family context, romantic relationships, public participation, earnings, among many other areas. Nowadays the situation regarding gender is very unfair, and the current socio-sanitary COVID-19 crisis has only increased it even more. The academy has the possibility -and also the social responsibility- to contribute to the visibility of these inequities, generating and disseminating knowledge that allows improving the well-being of people and reducing the human rights violation of the most disadvantaged groups. From my experience conducting this dissertation, I noticed how the action of researching itself became a political and situated act, possessing a social meaning. Therefore, I believe that research in psychology and other social sciences must be closely linked to social demands and needs.

This dissertation has contributed not only to my academic development, but also to my personal one, since it allowed me to be increasingly aware of the prevailing sexism

in our society, its negative consequences, and the importance of educating to eradicate the gender stereotypes that limit to all members of our society. In addition, disseminating the findings of this dissertation in different contexts, has allowed me to reflect together with different audiences, on the importance of moving towards a more just and egalitarian society, mobilizing personal and collective actions. Therefore, it seems highly relevant to me to promote the development of research and general training on this subject, focusing on the transformative role of education and educators. Resources should be directed to expand knowledge on this broad topic, in order to make it visible, as well as to inform management and decision-making in different social areas.

Finally, to synthesize what the process of researching gender differences in the Chilean educational system has meant to me -personally and academically-, I would like to point out: *“I am angry. We should all be angry. Anger has a long history of bringing about positive change. But I am also hopeful, because I believe deeply in the ability of human beings to remake themselves for the better”* (Adichie, 2014, p. 27).

Limitations and future research

The results of these studies must be understood considering their limitations. One of them is that this dissertation did not examine reading achievement directly. Nevertheless, motivation is closely related to learning and therefore motivation gaps are likely to be translated into reading achievement gaps (Becker, et al., 2010; Schwabe, et al., 2015). Moreover, reading skills favor general learning and allow access to cultural content shared by society (Luckner & Handley, 2008). Anyhow, to expand the validity of the model and the understanding of the phenomenon addressed in this dissertation, future research should include the effect of the variables studied here directly on reading achievement.

Another limitation is the socioeconomic homogeneity of the student sample in all studies. This lack of variability prevents the examination of differences between groups of students from different SES, in their reading motivation, stereotypes associated with reading, as well as differential effects of gender-related variables. This is especially

relevant in a country like Chile that has wide socioeconomic gaps, as well as one of the most segregated educational systems in the world (Valenzuela, Bellei, & de los Ríos, 2013). In addition, considering the evidence from international studies that suggest that families with lower SES have more pronounced expectations and differentiated roles according to gender than families with higher SES (e.g., Entwisle, Alexander, & Olson, 2007), the urgency of examining different SES populations becomes even greater. This is also relevant because some recent international research suggests differential effect of family disadvantage on boys and girls. Boys born to more socioeconomically disadvantaged families have lower academic achievement and are less likely to complete secondary education compared to girls from the same SES (Brenøe & Lundberg, 2018; Figlio, Karbownik, Roth, & Wasserman, 2019). These findings, for instance, open the question of whether males with low SES in Chile are at a greater disadvantage to participate, motivate themselves and be successful in reading-related activities compared to males with higher SES. This highlights the importance of including the perspective of intersectionality in research on this topic, to consider how belonging to different social categories can amplify the disadvantage of certain groups (Greenwood & Christian, 2008; Shields, 2008). This could guide in an even more specific way the political and educational interventions that are required on this topic.

Another limitation is that we use only an explicit measure of stereotypes. This is relevant because, although we detect the presence of stereotypes associated with reading in both students and teachers, the effect of social desirability in the explicit measures is known (Nosek & Smyth, 2011). Therefore, it is possible that using an implicit measure, the level of stereotypes may be higher than those reported here, and a more pronounced effect of stereotypes associated with reading may be detected on students' reading motivation. Future research could explore the presence of stereotypes in education using measures such as the Implicit Association Test (IAT) (Greenwald, McGhee, & Schwartz, 1998), both in students and teachers.

Otherwise, an aspect that could be considered a limitation is the sensitivity of the gender identity measure that we use. In studies 1 and 3 we measured this construct based

on the identification with certain stereotypical traits. In other words, we asked students to indicate the degree to which they identified with a series of traits and roles that have traditionally been associated with women and men. However, it is important to consider the significant social changes that have occurred in recent years in relation to questioning the meaning of being a man and a woman in our current society. In Chile and in other countries, feminist movements since 2018 have recognized the importance of diversity in gender expression, demonstrating the relevance of going beyond binary notions of gender and the stereotypes that limit expression of women and men (Ubilla, Pérez, Leibe, López, Arce-Riffo, & Vera, 2019). For this reason, it is likely that the content of the trait and gender role scales that we use -which have their origin in the 1970s (Bem, 1974)- are not necessarily reflecting the way in which, especially adolescent women, are identifying themselves. Future research on this topic could include, in addition to the identification with certain traits and roles, items referring to the identification with the woman and man category, including also the non-binary category. Questions such as "*Being a man/a woman is very important to me*"; "*I look a lot like other men/women*", could contribute to this direction. Evaluating the relationship of these measures of gender identity with variables related to learning could contribute to the understanding of both inter and intra-group differences in reading motivation and academic achievement. This would be in accordance with the theory of social identity (Tajfel, 1974; Tajfel & Turner, 1979), which postulates that this construct refers both to the content of identity, and to the identification with the category of a sexual group. On the other hand, future research should also focus specifically on the development and validation of scales to assess gender identity in Chilean adolescents. This is relevant, since research that uses the variable gender identity to gain a more nuanced understanding of the differences and similarities among males and females in the educational context, is so far very scarce.

Finally, future research on this topic should delve into the gender stereotypes associated with behaviors in the school context. Findings from Study 2 informed us about different stereotypes associated with people who are interested in reading, including the belief that they are better students overall and possess more good students' traits.

Analyzing, for example, the possible effects of toxic masculinity as well as anti-school masculinity on the academic achievement and motivation of male students (Pinkett & Roberts, 2019), could broaden the understanding of this phenomenon that to date has been scarcely explored.

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