

# THE IMPACT OF FAMILY AND INDIVIDUAL FACTORS ON 4<sup>TH</sup> GRADE STUDENTS' SELF-CONFIDENCE IN READING LITERACY: RESULTS FROM PIRLS 2016

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**Abstract.** *The self-confidence of a child and an adult is associated with performance and achievement results. It is well-studied, and the correlation has been proved that higher self-efficacy leads to higher achievements and performance, including better performance in reading literacy. It is also known that both a family and a home environment have a tremendous impact on the child's development and academic performance. This article focuses on the 4<sup>th</sup> graders and their family factor impact on the development of a child's self-confidence and concepts related to self-confidence.*

*The purpose of this article is to define concepts that are closely related to self-confidence and to identify family factors that influence students' self-confidence. The research question is as follows: which family and individual factors impact students' self-confidence in reading?*

*Authors of the article used a linear regression and correlation analysis of the data from the IEA's PIRLS 2016 study. The data from Latvia and seven countries of comparison were analysed.*

*The results of data analysis showed that, in general, the 4<sup>th</sup> graders' self-confidence in reading literacy is higher if they come from a household where a computer or a tablet with Internet connection is available and if students like to chat using a mobile device. Parents' attitudes to reading and the students' readiness for 1<sup>st</sup> grade promote higher self-confidence as well.*

**Keywords:** *PIRLS, self-confidence, self-efficacy, self-esteem, students' reading literacy.*

## Introduction

The role of family in the development of a child can never be overestimated, furthermore, a family has a significant impact on child's academic achievement, including reading literacy (Geske & Ozola, 2020). Reading begins with language acquisition and communication, besides, reading, by definition, can be described as a specific type of communication (Tubele & Serova, 2020). The involvement

of family in a child's education, including activities that promote reading, are one of the strongest factors for child's school success, and not only school success (Weiss, Bouffard, Bridglall, & Gordon, 2009; Mullis, Kennedy, Martin, & Sainsbury, 2006), as there is a significant investment of the family into child's emotional, cognitive and social development from birth through adulthood. Numerous studies (Geske & Ozola, 2020; Geske & Zizlāne, 2020; Jarmakoviča, Ozola, & Zizlāne, 2020; Mullis, Martin, Foy, & Hooper, 2017) have shown that if a child has a supportive home environment that provides positive insights into one's reading process, i.e., there are books at home, parents spent time reading books and telling stories to a child, a child tends to spend his/her free time reading books, then the child is more successful in reading than a child who has no supportive environment at home. Often high achievement or high performance is associated with high self-confidence, high self-efficacy and even high self-esteem; some studies have indicated that they have reciprocal effects. For example, Marsh and Craven's (2005) study states that when raising an academic self-concept also academic achievement and other educational outcomes raise, and vice versa. But there is much unknown about a child's sense of self-confidence in reading literacy and the family impact on this concept. This leads to the research question for this article, which family and individual factors impact students' self-confidence in reading?

## **Literature Review**

PIRLS 2016 claims to study motivation and subject-specific self-concept through students' confidence in reading scale, defining self-concept as students' perceived competence (Hooper, Mullis, & Martin, 2015) in reading activity, i.e., for students to engage in reading they have to believe in their competence or the success in reading. Haslam (2007) defines self-concept as a structured set of beliefs, whereas Larson (2009) states that self-concept displays a subjective set of attributes and feelings that are understood and interpreted by a person, evaluating oneself in the given context, as it is viewed in self-efficacy. Understanding of one's efficacy might be one of the fundamental beliefs of the human being. Bandura (2001) states that self-efficacy is a belief of success that produces motivation and persistence. Branden (2011) defines self-efficacy as confidence that helps to gain knowledge and skills and experience success. Therefore, as self-efficacy, confidence is a belief and it is determined by success (Pervin & Cervone, 2010; Shehzad, Lashari, Lashari, & Hasan, 2020). Larson (2009) points out studies where students with higher self-esteem have higher levels of self-confidence. Dweck and Leggett (1988) found that low self-confidence can trigger anxiety and loss of self-esteem; moreover, Mruk (2006) states that individuals with weak or unrealistic self-confidence are prone to low self-esteem and sensitive

to negative feedback or failures. In addition, Branden (2011) declares that self-esteem has two dimensions, one of them is confidence in one's ability to cope with challenges, i.e., self-efficacy, but the other dimension is a belief of worthiness or self-worth. He also emphasises that self-concept indicates the level of self-esteem. Self-esteem, self-concept and self-efficacy all fall under self-system and are viewed in context of self-regulation.

It is stated that the concept of self begins to develop in early infancy (Larsen & Buss, 2014). With reference to several studies, Bjorklund (2000) highlights that by the age of 18 months a child can distinguish self from the surrounding environment. By the end of the 3<sup>rd</sup> to 4<sup>th</sup> grade, child's assumptions about own abilities come close to reality. Filippin and Paccagnella (2011) describe numerous studies where it is believed that a child inherits one's belief of self-confidence from the family, thus without a proper intervention one can maintain a wrong belief even when the impact of family becomes less important.

According to Bowlby's (1988) theory of attachment, one of the most important tasks of family is to create a secure attachment that can serve as a socioemotional basis throughout a child's life. Landy (2009) mentions a research where a low parental self-efficacy has shown correlation with child's lower socioemotional skills. The research has found that children who have a secure attachment also have a more adequate self-esteem and a more precise self-concept (Cassidy, 1988). Other studies, described in Houser-Carm & Howell (2003), show that highly controlling parents can reduce opportunities for a child to develop an adequate self-efficacy, what is more, that the quality of relationships between mother and child will impact the child's cognitive, socioemotional development and the regulation of behaviours. The feedback provided by parents and first caregivers builds the child's understanding of one's effectiveness (Bjorklund, 2000) and understanding of one's capabilities, i.e., judgement of own self-efficacy (Harwood, Miller, & Vasta, 2008). Above all, Mullis, Kennedy, Martin and Sainsbury (2006) stress that the parental involvement is crucial throughout the child's development.

## **Methodology**

In this article the authors analysed the data from PIRLS 2016 Student and Home Questionnaire from Latvia and seven other countries of comparison in the Baltic Sea Region, i.e., Denmark, Finland, Germany, Lithuania, Poland, Russian Federation and Sweden. A linear regression and correlation analysis of the data was used.

PIRLS gathers data about students' confidence in reading using "Students Confident in Reading Scale", further in the article referenced as "Self-confidence

Scale". Students' answers are measured based on the degree of agreement, i.e. in the Likert scale from *agree a lot* to *disagree a lot* on six statements. These six statements are as follows (Mullis & Martin, 2015):

1. I usually do well in reading;
2. Reading is easy for me;
3. I have trouble reading stories with difficult words;
4. Reading is harder for me than for many of my classmates;
5. Reading is harder for me than any other subject;
6. I am just not good at reading.

Answers to the third to sixth statements were inverse coded, i.e., the answers marked with *agree a lot* to the statement would get 1 point, whereas the answers marked with the same choice on the first statement would get 4 points. As it is described in the document "Methods and Procedures in PIRLS 2016" (Martin, Mullis, & Hooper, 2017), the values varied from around 3 to 13 for every student in this scale. From this scale an index of student's self-confidence was created. Student's self-confidence was the dependent variable in the linear regression analysis.

The independent variables were created from the following scales:

1) "Could Do Early Literacy Tasks When Beginning Primary School Scale", further in this article referenced as "Early Literacy Skills Scale";

2) "Parents Like Reading Scale";

3) "Students Like Reading Scale";

4) students' answers to the question "How much time do you spend each day using a computer or tablet for any of the following activities?" and the activity "Chatting", which was measured in the range from 1 to 5 with the following options: "No time" (1 point), "30 minutes or less" (2 points), "30 minutes up to 1 hour" (3 points), "From 1 hour up to 2 hours" (4 points), "2 hours or more" (5 points), further in this article referenced as "Time Students Spent Chatting";

5) students' answers to the question "Do you have any of these things at your home?" and its two statements "A computer or tablet" and "Internet connection", from which a dichotomous variable was created. If a student indicated that one had both, i.e., both statements were marked as "yes" – a computer or tablet and Internet connection, then the value for this variable was 1, otherwise, the value was set to 0; further in this article referenced as "Has PC/tablet and Internet".

The Early Literacy Skills Scale included a question "How well could your child do the following when he/she began the first grade of primary/elementary school?" with the following statements, measured in the Likert scale from *very well*, *moderately well*, *not very well* and *not at all* (Mullis & Martin, 2015):

- 1) Recognize most of the letters of the alphabet;
- 2) Read some words;
- 3) Read sentences;

- 4) Read a story;
- 5) Write letters of the alphabet;
- 6) Write some words.

As it is described in the document “Methods and Procedures in PIRLS 2016” (Martin et al., 2017), the values varied from 5 to 14 for every student in this scale.

The Parents Like Reading Scale included two questions (Mullis & Martin, 2015):

1) “When you are at home, how often do you read for your own enjoyment?” The answers to this question were evaluated according to the Likert scale and included such options as “Every day or almost every day”, “Once or twice a week”, “Once or twice a month”, “Never or almost never”;

2) “Please indicate how much you agree with the following statements about reading.” The answers were measured based on the degree of agreement, i.e., in the Likert scale from *agree a lot* to *disagree a lot*, and included the following statements (Mullis & Martin, 2015):

- 1) I read only if I have to;
- 2) I like talking about what I read with other people;
- 3) I like to spend my spare time reading;
- 4) I read only if I need information;
- 5) Reading is an important activity in my home;
- 6) I would like to have more time for reading;
- 7) I enjoy reading;
- 8) Reading is one of my favourite hobbies.

The answers to the first statement were reverse coded. With reference to the document “Methods and Procedures in PIRLS 2016” (Martin et al., 2017), the values varied from 3 to 14 for every student in this scale.

The Students Like Reading Scale was designed from the question in student questionnaire “What do you think about reading? Tell how much you agree with each of these statements” (Mullis & Martin, 2015). The answers to this question were evaluated in the Likert scale based on the degree of agreement from *agree a lot* to *disagree a lot*. A student had to indicate his/her level of agreement for the following statements:

- 1) I like talking about what I read with other people;
- 2) I would be happy if someone gave me a book as a present;
- 3) I think reading is boring;
- 4) I would like to have more time for reading;
- 5) I enjoy reading;
- 6) I learn a lot from reading;
- 7) I like to read things that make me think;
- 8) I like it when a book helps me imagine other worlds.

According to “Methods and Procedures in PIRLS 2016” (Martin et al., 2017), the values varied from 2 to 15 for every student in this scale.

The Cronbach’s Alpha reliability coefficients were gathered for all variables (see Table 1).

*Table 1 The Cronbach’s Alpha Reliability Coefficients for Dependent and Independent Variables*

Name of the scale and CA	Country							
	Latvia	Denmark	Finland	Germany	Lithuania	Poland	Russian Federation	Sweden
Students Confident in Reading Scale	0.8	0.83	0.8	0.82	0.8	0.83	0.79	0.82
Early Literacy Skills Scale	0.91	0.91	0.92	0.89	0.91	0.92	0.91	0.92
Parents Like Reading Scale	0.87	0.9	0.91	0.89	0.89	0.88	0.86	0.89
Students Like Reading Scale	0.89	0.85	0.89	0.88	0.86	0.9	0.85	0.88

\* CA - Cronbach’s Alpha Reliability Coefficient

As it is seen in Table 1, all the created scales are well-designed, and their internal consistency is good or even excellent.

## Research Results

Before the chosen linear regression and correlation data analysis was performed, the authors analysed the data from PIRLS 2016 reports (Martin et al., 2017; Mullis et al., 2017). In Table 2, there are gathered values for the coefficient of determination ( $R^2$ ) of two linear regression models: one for the Students Confident in Reading (self-confidence) Scale with reading achievement as independent variable and the other for self-confidence explained by all independent variables of this research mentioned earlier.

*Table 2 Coefficient of Determination ( $R^2$ ) for Dependent Variable and Reading Achievement and Coefficient of Determination ( $R^2$ ) for Dependent Variable and Independent Variables*

Country	Latvia	Denmark	Finland	Germany	Lithuania	Poland	Russian Federation	Sweden
	Coefficient of determination ( $R^2$ ) for self-confidence scale with reading achievement	0.17	0.25	0.18	0.16	0.22	0.16	0.17
Coefficient of determination ( $R^2$ ) for self-confidence scale with all independent variables in linear regression models	0.26	0.32	0.24	0.20	0.29	0.24	0.27	0.24

As it is shown in Table 2, reading achievement is closely related to students' confidence in reading. For all the countries of comparison, reading achievement explained around 20% of the variance of self-confidence with the highest value of 25% in Denmark. Adding other independent variables to the linear regression model, the authors found that for Latvia, Poland and Russian Federation they explain for around 10% more of students' self-confidence than achievements alone.

Analysing the data with linear regression models, the authors discovered that for all the countries of comparison students' self-confidence was significantly influenced by reading achievement, "Students Like Reading" and "Early Literacy Skills", the impact from these and other factors are illustrated in Table 3.

**Table 3 Linear Regression Coefficients of Six Regression Equations Representing How Students' Self-Confidence Is Affected by the Selected Factor and the Average (Mean) Values for the Students' Self-Confidence Scale**

		Latvia	Denmark	Finland	Germany	Lithuania	Poland	Russian Federation	Sweden
CHT	Beta	0.06*	0.05*	0.02	0.01	0.05*	0.05	0.06*	0.06*
	Mean	2.05	2.07	1.81	1.85	2.22	2.06	2.28	2.11
SLR	Beta	0.25*	0.19*	0.20*	0.23*	0.17*	0.22*	0.23*	0.22*
	Mean	9.62	9.13	9.41	9.55	10.02	9.55	10.24	8.97
ELT	Beta	0.14*	0.16*	0.18*	0.06*	0.22*	0.16*	0.20*	0.12*
	Mean	11.14	10.48	10.31	9.01	10.51	10.93	10.14	10.42
PLR	Beta	0.03*	0.02	0.03	0.05	0	0.03	0.03*	0.04*
	Mean	9.34	10.08	10.03	9.75	9.33	9.89	9.42	10.11
CPR	Beta	0.04*	0.1	0.02	0.03	-0.02	0.02	0.04*	0.04*
	Mean	0.93	0.99	0.95	0.66	0.92	0.96	0.88	0.98
RA	Beta	0.34*	0.40*	0.29*	0.30*	0.37*	0.33*	0.32*	0.31*
	Mean	558	547	566	537	548	565	581	555
SSC	Mean	9.3	10.3	10.6	10.5	10.0	10.7	9.9	10.8

\* Standardized regression coefficient statistically significant for confidence interval of 95%

CHT – factor "Time Students Spent Chatting"

SLR – factor "Students Like Reading"

ELT – factor "Early Literacy Skills"

PLR – factor "Parents Like Reading"

CPR – factor "Has PC/tablet and Internet"

RA – Reading Achievement

SSC – Students Self-Confidence Scale

As it can be seen in Table 3, the factor “Time Students Spent Chatting” was significant for Latvia, Lithuania, Russian Federation, Denmark and Sweden. The factor “Students Like Reading”, which was the second strongest factor after reading achievement that impacted students’ self-confidence, was significant for all the countries and for the 4<sup>th</sup> grade students in Latvia. Analysing the gained results among the countries of comparison, it was identified that Latvian students did not like reading as much as students in Lithuania and Russian Federation, although they liked reading more than students in Sweden, Finland, Denmark, Germany and Poland. The same can be seen by looking at the average values of scale. Dividing the results by the average values of scale in the PIRLS 2016 “Students Like Reading”, all the countries of comparison fell under the category of “Somewhat Like Reading” that was made by the IEA PIRLS 2016 (Mullis et al., 2017). “Early Literacy Skills” was the third factor that was significant for all the countries of comparison and, also, the third most significant factor for Latvian students, having the highest mean value in Latvia and the lowest in Germany. Latvian children began school as the most prepared among the countries of comparison, followed by Lithuania, Denmark, Sweden, Finland, Russian Federation and Germany (see Table 3). The “Parents Like Reading” factor was significant only in Latvia, Russian Federation and Sweden, having the highest mean value for Sweden. Examining the scale mean values, it can be noted that Latvian parents were inactive readers. Only Lithuanian parents liked reading even less among the countries of comparison. Parents in Denmark and Sweden liked reading the most. Although having a computer or tablet with Internet connection at home could be associated more with students’ socioeconomic situation, it was a significant factor only for Latvian, Swedish and Russian students’ self-confidence with a relatively small impact.

As the PIRLS scale centerpoint for reading achievement was 500 points, by examining the mean values in Table 3, it can be stated that all the countries of comparison had a relatively high reading achievement, and the mean values of students’ self-confidence scale. One can see that children in all the countries of comparison, except Latvia, had appropriate self-confidence in reading, i.e., the Students Confident in Reading Scale had values around 10 points. Latvia had the lowest average value in students’ self-confidence. However, as it is illustrated in Table 3, Latvia is at the 4<sup>th</sup> place regarding the average in reading achievement scale. Among the countries of comparison, the highest reading achievement is for Russian Federation, followed by Finland, Poland, Sweden, Lithuania, Denmark and Germany, but the most confident students in reading live in Sweden, followed by Poland, Finland, Germany, Denmark, Lithuania and Russian Federation.

Correlation coefficients of students’ self-confidence with independent variables for Latvia were the following: 0.41 with Reading Achievement, 0.28 with Students Like Reading, 0.29 with Early Literacy Skills, 0.17 with Parents



Like Reading, and 0.13 with PC/Tablet and Internet Connection at Home. The correlation coefficient with Chatting was small but significant – 0.07.

### **Conclusions and Discussion**

The PIRLS study gathers data about child's self-confidence in reading at the end of Grade 4; however, it does not obtain any data about self-confidence in general or its development throughout childhood. By the end of Grade 4 children's assumptions about their abilities come close to reality. It means that the data of PIRLS study reflect these children's assumptions about reality or very close to that.

During the research of the PIRLS 2016 data, the authors discovered that self-confidence for Latvian 4<sup>th</sup> grade students was lower than the average, despite the above-average achievements. The linear regression analysis of data showed that the strongest impact factor of students' self-confidence in reading was students' reading achievement for all the countries of comparison. The second strongest impact factor was the fact that students liked reading in all the countries, except Lithuania. The third most important factor for students' self-confidence was Early Literacy Skills, i.e. "Could Do Early Literacy Tasks When Beginning Primary School"; this was an exception in Lithuania where the particular factor was the second strongest.

As it is described in the literature review, the family and the home environment have a significant impact on students' achievement, especially it is very strong on the activities done with children at the preschool age. Parents' attitudes impact child's attitudes, and, to succeed in reading literacy, a home environment is the first place where a child can get positive impressions about books and reading. The research shows directly measurable parents' attitudes towards reading in the Parents Like Reading Scale as significant; however, the analysed factors occurred to be the weakest predictor of students' self-confidence in reading in Latvia, Russian Federation and Sweden, and it was not significant for other countries of comparison. Students' chatting was a significant but less strong impact on students' self-confidence in comparison with the reading achievement and students' attitude towards reading, it was observed in Latvia, Russian Federation, Denmark and Sweden. The more time students spent chatting on digital devices, the more self-confident in reading they were or vice versa. The more confident they were, the more time they spent chatting. Having a computer or tablet at home with Internet connection promotes students' self-confidence in Latvia, Russian Federation and Sweden, and this fact had no significant impact for other counties of comparison. Having a computer or tablet with Internet connection at home correlated significantly with the time students spent chatting,

the correlation coefficients being the highest in Russian Federation (0.30) and the lowest in Denmark (0.04).

Summarising the answers to the research question “Which family and individual factors impact students’ self-confidence in reading?”, the authors discovered that the following factors were significant for Latvian students: individual factors – reading achievement, enjoyment of reading and frequency of chatting; family factors – early literacy skills, a PC/tablet with Internet connection at home and parents’ enjoyment of reading.

In this article the authors discovered individual and family factors, but there is a need for further analysis to discover other factors that have significant impact on students’ self-confidence in reading and to compare whether these factors are domain-general or domain-specific.

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