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Published on: 01 Jan 2017 - Educational Review (Routledge)

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DOI

[10.1080/00131911.2016.1164667](https://doi.org/10.1080/00131911.2016.1164667)

Publication date

2017

Document Version

Final published version

Published in

Educational Review

License

Article 25fa Dutch Copyright Act

[Link to publication](#)

Citation for published version (APA):

Hemmerechts, K., Agirdag, O., & Kavadias, D. (2017). The relationship between parental literacy involvement, socio-economic status and reading literacy. *Educational Review*, 69(1), 85-101. <https://doi.org/10.1080/00131911.2016.1164667>

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The relationship between parental literacy involvement, socio-economic status and reading literacy

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ABSTRACT

In this article, we explore the relationship between parental literacy activities with the child, socio-economic status (SES) and reading literacy. We draw upon the Bourdieusian theory of habitus development to explore this relationship. Multilevel analyses of a survey of 43,870 pupils (with an average age of 10 years) in 10 Western European regions reveal a positive relation between early parental involvement in literacy activities (before primary school) and an increasing level of reading literacy and parental education. Students with a lower SES also have lower reading literacy and reading attitudes than students with a higher SES. We also find that children with a lower SES experience more late parental involvement in literacy activities (during the fourth year of formal schooling) than children with a higher SES. We also show that late parental involvement in literacy activities is an adjustment for worse or better reading literacy during primary school.

ARTICLE HISTORY

Received 16 December 2015
Accepted 8 March 2016

KEYWORDS

Bourdieu; habitus; reading literacy; parental literacy involvement

Introduction

Parental involvement in children's education is one of the claimed keys to success at school (Hattie 2009; Hornby and Lafaele 2011). Scholars accordingly declare social class differences in parental involvement and child-rearing practices to be an important element contributing to the perpetuation of social inequalities from one generation to the next (Bourdieu and Passeron 1977; Lareau 2002, 2003; Horvat, Weininger, and Lareau 2003). This reflects the importance of the socialization process through which children begin to learn different ideas, skills and develop an identity. This socialization process is initiated in the early childhood in the family environment (i.e. primary socialization) and continues in the school environment (i.e. secondary socialization) (Corsaro 2010). When children start school, these two different types of socialization begin to coexist and possibly interrelate (Bourdieu 1984, 1990; Durkheim [1925] 1961).

A specific form of socialization that occurs in both environments and that is relevant for children's academic development is literacy activities with the child (including for example

shared book reading and learning the alphabet or to write). Previous studies have shown that parental literacy activities are a crucial predictor of academic success, including reading literacy among children (Melhuish et al. 2008; Kloosterman et al. 2010), but they also made clear that this type of parental involvement is unequally distributed among the parents' socio-economic levels (van Steensel 2006).

However, in most previous studies, the relationship between socio-economic status (SES), parental literacy activities with the child and reading literacy is regarded as *static* (e.g. Park 2008). They do not study whether and how the relationship between these three elements might be different before and during primary school. This static view does not correspond to the theoretical understanding of socialization as a dynamic process. Hence, the aim of this study is to explore the relationship between these three elements. For this purpose, we will largely draw upon the Bourdieusian theory of habitus development (Wacquant 2014; Bourdieu 1984, 1990; Bourdieu and Passeron 1977). This theory is particularly relevant because it conceptualizes both processes of socialization: that of the family and that of the school environment.

According to Bourdieu, children enter the school environment after they have already experienced a specific family upbringing conditioned by the family's SES (Bourdieu 1984). This upbringing entails the development of deeply ingrained skills and attitudes (the primary habitus). Children then enter the school environment where they are also socialized: they are taught specific skills and attitudes. This socialization at school depends on the primary habitus or the skills and attitudes of the child that were already learned before the formal entry into school. The socialization at school can thus be seen as an additional development of skills and attitudes. It is the period of the formation of the secondary habitus of the child.

Using this conceptual framework, we hypothesize the following relations between SES, parental literacy activities and reading literacy. Firstly, we theorize that the relationship between SES and the extent of literacy activities is not static. Corresponding to the theoretical difference between "primary habitus" and "secondary habitus", we make a distinction between *early* and *late* parental literacy activities. Early literacy activities are here defined as those happening at home before pupils are enrolled in primary school, whereas late parental literacy activities are conceptualized as the home-based involvement during primary school age. We expect that higher SES parents will invest more in early literacy activities than lower SES parents do, because higher SES parents tend to spend more time instilling skills and attitudes before primary school begins, which then later help children to be more successful in school.

Secondly, we expect that early parental literacy involvement is related to pupils' reading literacy skills and attitudes towards reading. Studies have investigated and reported a positive association between reading literacy in primary school and literacy activities at home before the start of primary school (e.g. Hoff 2003; Kloosterman et al. 2010; Melhuish et al. 2008; Roberts, Jurgens, and Burchinal 2005). Parents or caregivers who are/were more involved in literacy activities also transmit to their children the value of reading (e.g. Rowe 1991; Lutz Klauda 2009; Baker 2003; Mullis et al. 2009).

Thirdly, due to their primary habitus and their development up to this point, children of parents with a higher SES are more likely to have a successful passage through primary school. Children of higher SES parents are more likely to have a high level of reading literacy in primary school, and the reading attitudes of the children of these parents tend to be more in line with the academic goals of the school. Children of higher SES parents tend to like

reading. We therefore claim that for pupils with the “correct” primary habitus and thus skills and attitudes, less parental involvement in reading literacy might be needed during primary school, because their primary habitus is better suited to the primary school environment and its academic goals. Higher SES parents thus have to interfere less in reading literacy. The reverse might be true for pupils with the “wrong” primary habitus, as they tend to lack the skills and attitudes necessary for primary school. The relationship between SES and *late* parental literacy activities is thus hypothesized to be negative.

Finally, as a corollary of the previous hypothesis, we theorize that parents adapt the extent of their *late* literacy involvement at home to the reading literacy of their children in primary school. Indeed, parents of poor performing pupils might react by doing more parental literacy activities in order to help the child. Parents of well performing pupils might react by doing less late parental literacy activities when they notice that their child does not really need their involvement in literacy activities (e.g. Sénéchal and LeFevre 2002; Silinskas et al. 2010). We expect that this adaptation of parental involvement to the reading literacy of the child exists for all SES groups. However, the primary habitus (skills and attitudes) of lower SES children tends to fit worse with the academic goals of school. They tend to have worse reading literacy than higher SES children. We therefore hypothesize that the transition of a low level of early parental literacy involvement to a high level of late parental literacy involvement (from *before* to *during* primary school) will be more likely for lower SES children and less so for higher SES children.

The theoretical rationales of these four points are further elaborated in the following sections. We will then describe the data and methodology of the empirical study used for this article and end with a discussion and conclusion.

Theory and hypotheses

Socio-economic status and early parental literacy involvement

Parental involvement can be more generally described as the “dedication of resources by the parent to the child within a given domain” (Grolnick & Slowiaczek 1994, 238; Grolnick et al. 1997, 538). An important distinction can be drawn between parental involvement in education and parental involvement in other matters unrelated to education. Moreover, parental involvement in the educational sphere can be directed to the school (e.g. contact/meetings with teachers, participating in school meetings) and/or to the home environment (e.g. helping with homework and discussing topics with the child) (Pomerantz, Moorman, and Litwack 2007).

Compared to school-based parental involvement, parental involvement at home is a more intimate or private type of involvement making it possibly appear devoid of broader social influence. This appearance can, however, be deceiving, as will be argued in the following sections, since this type of parental involvement is likely to be influenced by patterns of social stratification. It is not independent from seemingly external influences.

According to Bourdieu, children enter the school environment after they have been instilled with specific skills and attitudes by their family upbringing until that point. This upbringing produces a primary habitus that contains deeply ingrained dispositions that endure and influence later practices. It is a structure embodied in the actor that is used to perceive and classify social life. Moreover, it includes skills and attitudes and is also generative of actions (Bourdieu 1984, 1990; Lizardo 2004).

The upbringing in the family and thus the habitus are conditioned by SES. Scholars have also shown that parental involvement at home is unequally distributed by SES (Grolnick et al. 1997; Bradley & Corwyn 2002; Arnold and Doctoroff 2003; Guryan, Hurst, and Kearney 2008; Gershenson 2013; Buckingham, Beaman, and Wheldall 2014).

Studies on the *early home literacy environment* of children (i.e. involvement before primary school) also show the importance of socio-economic stratification. Van Steensel (2006) followed a sample of children in the Netherlands from the end of kindergarten until second grade. Although variance in home literacy characteristics existed within families with the same socio-economic background, Van Steensel observed a tendency towards a “rich home literacy environment” as the educational level of the mother increased (2006, 374). Sénéchal (2006) studied the home literacy in Canadian families whose children were around six years old (in total 90 children). She followed 65 of these children until grade four. The educational level of the parents was positively related with storybook exposure and parental teaching of the alphabet, reading and printing words at home when these children were in kindergarten (Sénéchal 2006, 72).

On the basis of the discussed literature on the relation between SES and the early home literacy environment of children, we hypothesize that

H1: Early parental literacy involvement at home (before primary school) is positively related to SES.

Early parental literacy involvement, reading attitudes and reading literacy

The primary habitus constitutes “the basis for the subsequent formation of any other habitus” (Bourdieu and Passeron 1977, 45) and is constructed by parental literacy activities. The upbringing of children instills deeply ingrained attitudes and skills that influences later life. In the early years, children with a higher SES tend to develop a habitus that helps them to be more successful in school and therefore have a higher “scholastic profitability” (Bourdieu and Passeron 1979, 17).

A crucial element of the deeply ingrained attitudes that are first instilled in the primary habitus and further developed at school are attitudes towards reading (see Lutz Klauda 2009; Rowe 1991). Parents or caregivers who are/were more involved in literacy activities transmit to their children the value of reading (Baker 2003; Mullis et al. 2009). In line with our previous hypothesis, we expect that these attitudes are socio-economically stratified. This is because early parental literacy involvement seems a bigger part of the upbringing at home of higher SES children (for example as a way of spending time with their parents). Children with positive attitudes towards reading are more likely in higher SES families because children in higher SES families experience more literacy activities. We therefore hypothesize that

H2: Attitudes towards reading (in primary school) are positively related to SES and early literacy involvement.

Not only attitudes are instilled by the upbringing at home. From a Bourdieusian perspective, we also expect that early parental literacy activities will have a positive effect on reading literacy skills. Early parental involvement is generally considered to have a major influence on later academic skills (see Hattie 2009; Wilder 2014). Studies have investigated and reported a positive association between academic skills (including reading literacy) in primary school and literacy activities at home before the start of primary school (e.g. Hoff 2003; Kloosterman

et al. 2010; Melhuish et al. 2008; Roberts, Jurgens, and Burchinal 2005). On the basis of this discussion, we hypothesize that

H3: Early parental literacy involvement is positively related to reading literacy.

Socio-economic status (SES) and late parental literacy involvement

As noted in the introduction, there is an important distinction between early parental involvement (before primary school) and late parental involvement (during primary school). This distinction echoes the difference between socialization in the family and at school. When a child starts in primary school, these two different types of socialization begin to coexist and possibly interrelate (Durkheim [1925] 1961).

Bourdieu also makes the distinction between a primary and secondary socialization of children and a corresponding primary and secondary habitus. According to Bourdieu, children enter the school environment with a specific primary habitus moulded by a previous upbringing in the family (Bourdieu 1984, 1990; Lizardo 2004). The primary habitus is thus the foundation for further socialization at school or the development of a secondary habitus. The habitus and its construction and development imply that there are chronological versions of the habitus through time. The first chronological version of the habitus has an impact on the later version of the habitus and so on:

the habitus acquired in the family is at the basis of the structuring of school experiences ...; the habitus transformed by the action of the school, itself diversified, is in turn at the basis of all subsequent experiences ... and so on, from restructuring to restructuring. (Bourdieu 1992, 134)

This socialization in school therefore depends on what was learned before the formal entry of school and can be interpreted as a further development of the habitus (Bourdieu 1984, 1990; Bourdieu and Passeron 1977).

Before primary school, parents with a higher SES tend to focus more on shaping skills and instilling specific attitudes that are more in line with the academic goals of school (for example by doing early literacy activities together). Children of parents with a more privileged background are thus more likely to experience a successful passage through primary school due to their development beforehand (Bourdieu and Passeron 1979). Their habitus tends to fit better with the school environment (Hanson 1994).

We claim that the involvement in activities that directly pertain to reading literacy will be performed to a lesser extent by higher SES parents *during primary school*. This is because children of higher SES parents are more likely to have a high level of reading literacy in primary school. This is also because, on average, the reading attitudes of the children of these parents are more in line with the academic goals of the school. Children of higher SES parents tend to like reading. Their habitus is more in line with the academic goals of school that are focused on reading. Higher SES parents thus have to interfere less in skills related to reading literacy. The reverse would be true for children of lower SES parents. This is an idea that Bourdieu himself later entertained regarding explicit or what he called “visible” activities that directly relate to academic matters: he remarked that “support provided by the family takes on different forms in different milieus: the amount of explicit support (advice, explanations, etc.) perceived as such increases as social level increases (...), although it appears to decrease with a student’s increased success” (Bourdieu 1998, 21). We therefore

expect that parents with a higher SES are less likely to perceive home intervention in reading literacy as being necessary.

We therefore hypothesize with regards to home-based parental involvement in children's literacy activities that

H4: Late parental literacy involvement at home (in primary school) is negatively related to SES.

As a corollary of this hypothesis, we theorize that parents adapt the extent of their late literacy involvement at home to the reading literacy of their children in primary school. Indeed, parents of poorly performing pupils might react by doing more parental literacy activities in order to help their child(ren). Parents of well performing pupils might react by doing fewer parental literacy activities when they notice that their child does not really need their involvement in literacy activities. Studies that specifically focus on the distribution of home-based literacy activities found a relation between the home and school environment with regards to parental involvement and academic skills. Sénéchal and LeFevre (2002) and Silinskas et al. (2010) found that children's academic skills at school seemed to have an effect on the level of involvement in literacy activities at home. Both followed a group of children before and during primary school. Sénéchal and LeFevre (2002, 1555) followed 117 children from kindergarten until the end of Grade 2 in Canada. Silinskas et al. (2010, 64) followed 207 children from kindergarten until Grade 1 in Finland. In both studies, children who did poorly at school seemed to trigger more involvement in literacy activities at home. We formulate the following hypothesis:

H5: Late parental literacy involvement is related to the reading literacy of children: it is more likely when children have poor reading literacy and less likely when children have good reading literacy.

We expect that this adaptation of parental involvement to the reading literacy of the child exists for all SES groups. However, the primary habitus (skills and attitudes) of lower SES children tends to fit worse with the academic goals of school (including those focused on reading literacy). Lower SES children tend to have worse reading literacy than higher SES children (see OECD 2010). We therefore hypothesize that the transition of a low level of early parental literacy involvement to a high level of late parental literacy involvement (from *before* to *during* primary school) will be more likely for lower SES children. We expect that that kind of transition will happen less frequently among higher SES children. We formulate the following hypothesis:

H6: The transition of a low early parental literacy involvement to a high late parental literacy involvement is more likely for children with a lower SES than for children with a higher SES.

Methods

The sample

We use survey data from the 2006 wave of the Progress in International Reading Literacy Study (PIRLS). These data contain information on the process of learning to read as well as the reading comprehension of children in 40 countries and five Canadian provinces (see Martin, Mullis, and Kennedy 2007). This includes data on reading skills and demographic information as well as on parental involvement in literacy activities at home. Unfortunately, specific questions in PIRLS 2006 on parental involvement were excluded from later PIRLS

surveys. We therefore focus on the latest wave of PIRLS (2006) that has information on the early and the late forms of parental literacy activities at home.

We use a data-set of Western European countries. Within the group of available Western European countries in the PIRLS data-set, we selected those with a reasonably high response (80% or higher) on the home (or parent/primary caregiver) questionnaire of the PIRLS 2006 wave. This questionnaire includes questions on the home literacy environment of children. We excluded data on the Netherlands, Britain and Spain because of a non-response of respectively 31.3, 53.2 and 37.4% on the home questionnaire.¹

This leaves us with data collected in schools in Belgium (the Flemish and French school system), Austria, Denmark, France, Germany, Italy, Luxembourg, Norway and Sweden. Pupils in the fourth year of formal schooling were sampled (with an average age of 10.3 years). These students are expected to be “at the transition from learning to read to reading to learn” with four years of formal education in reading behind them (Martin, Mullis, and Kennedy 2007, 36). These pupils thus tend to be of the same age.

The survey used a stratified cluster design that included two stages (Appendix B in Martin, Mullis, and Kennedy 2007).² The PIRLS team selected schools (in total, 1774) with a probability proportional to size (i.e. the selection probability of large schools is higher than for small schools). Only schools with very few students were selected with an equal probability. Within these schools, 2653 classes in the fourth year of formal schooling were selected at random with an equal selection probability. In Luxembourg, all schools and classrooms were sampled. In total, the sample includes 47,315 students. We excluded those students without a home questionnaire providing information on the literacy activities at home (7.3% or 3445 respondents). The resulting sample, including missing values, comprises 43,870 cases.

We use multiple imputation (MI) to deal with missing values. In MI, the interrelations between the variables and the available information of cases are used to fill in (i.e. impute) the missing data. It does this with Bayesian estimation techniques (see Enders 2010). We entered all variables described in the next section into the imputation phase (including the separate involvement variables and the distinction between countries, schools and classes). We calculated 10 different imputed datasets. MI has the advantage that it can deal with item-level non-response. This is advantageous because we have different early and late involvement items with missingness that we want to combine into two separate indices (an early and late involvement index). In total, 35,993 of the remaining students, or 82% of our sample, have no missing values on any of the independent variables (gender, parental educational level, non-native background and language at home). Thus, 39,597 of 43,870 students, or 90.3%, have no missing value on any outcome variable (early or late involvement in literacy activities at home and attitudes towards reading). The data on reading literacy have no missing values. With the use of multiple imputation, we get a sample of 43,870 students in 2639 classes and 1770 schools.

Variables

We use four outcome variables in this article (see Table 1 for all variables). The first outcome variable is *early parental literacy involvement*, measured as parents’ involvement in literacy activities with children before first grade (ISCED level 1). It measures whether a parent or a caregiver that takes up that role by doing literacy activities with the child is involved in different activities. Respondents were asked the following question in the parent/primary

Table 1. Descriptive statistics: frequency, range, percentages, pooled means, standard deviations and percentage imputed.

Variables	N	Range	Pooled mean or % (standard deviation)	% imputed
1. Female gender of the child	43,870	0–1	50%	0.7%
2. Parental education				7.8%
Some primary, lower-secondary (finished or not) or no schooling	43,870	0–1	19.56%	7.8%
Finished upper-secondary	43,870	0–1	31.22%	7.8%
Finished post-secondary or university or higher	43,870	0–1	49.22%	7.8%
3. Instruction language as home language	43,870	0–1	65%	8.5%
4. Non-native background of the child	43,870	0–1	30.7%	4.9%
5. Attitudes towards reading				
High attitudes	43,870	0–1	49.56%	2.6%
Medium attitudes	43,870	0–1	40.81%	2.6%
Low attitudes	43,870	0–1	9.63%	2.6%
6. Early literacy involvement				
Reading books	43,870	0–2	1.50 (0.6)	1.6%
Telling stories	43,870	0–2	1.41 (0.6)	1.4%
Singing songs	43,870	0–2	1.34 (0.7)	1.9%
Playing with ABC toys	43,870	0–2	1.04 (0.7)	1.7%
Playing word games	43,870	0–2	1.02 (0.7)	2.1%
Writing letters or words	43,870	0–2	1.23 (0.7)	1.7%
Reading aloud signs and labels	43,870	0–2	1.20 (0.7)	2%
7. Early literacy involvement scale ($Z\text{-score}_{\text{early}}$)	43,870	–3.15–1.89	0 (1)	5.2%
8. Late literacy involvement				
Listening to the child reading aloud	43,870	0–3	2.00 (0.9)	1.3%
Talking on his/her reading	43,870	0–3	2.04 (0.8)	1.6%
Discussing classroom reading	43,870	0–3	2.04 (0.9)	1.5%
Helping with reading for school	43,870	0–3	1.92 (1.1)	1.5%
9. Late literacy involvement scale ($Z\text{-score}_{\text{late}}$)	43,870	–2.95–1.47	0 (1)	3.2%
10. Difference between late and early involvement ($Z\text{-score}_{\text{late}}$ – $Z\text{-score}_{\text{early}}$)	43,870	–4.84–4.62	0 (1.18)	7.4%
11. Reading literacy achievement				
PV1	43,870	226.2–780.7	539.9 (67.5)	0%
PV2	43,870	261.6–780.1	539.6 (68)	0%
PV3	43,870	208.4–787.1	539.5 (67.6)	0%
PV4	43,870	195.6–788.3	539.4 (67.8)	0%
PV5	43,870	115.7–797.2	539.8 (67.7)	0%

Note: PV, plausible value; unweighted data; imputed values.

caregiver questionnaire: “Before your child began the first grade, how often did you or someone else in your family do the following activities with him or her?” Seven of the following activities deal with language and literacy activities at home: “read books, tell stories, sing songs, play with alphabet toys (for example, blocks with letters of the alphabet), play word games, write letters or words and read aloud signs and labels” (Foy and Kennedy 2008, 27). Answer categories are often, sometimes and never or almost never. The questions were combined into one index going from 0 to 2 (from never or almost never to often) by summing the scores of the items and dividing by the number of items (7). The mean of this scale was 1.25 (standard deviation = 0.4). We standardized the scale on the student level.³ The range of Cronbach alpha values calculated in a categorical principal component analysis with the variables analysed as ordinal for each country separately is 0.66 (Germany)–0.73 (Sweden).⁴

The second outcome variable is *late parental literacy involvement*, which measures parental involvement in literacy activities with children in the fourth year of formal schooling. The following questions of the parent/primary caregiver questionnaire measure this type of home-based involvement: “how often do you or someone else in your home ... listen to your child read aloud?”, “(...) talk with your child about what he/she is reading on his/her own?”, “(...) discuss your child’s classroom reading work with him/her?”, “(...) help your child with reading for school?” (Foy and Kennedy 2008, 34). Answer categories were every day or almost every day; once or twice a week; once or twice a month; never or almost never. These questions were also combined into one index ranging from 0 to 3 (from never to every day or almost every day) by summing the scores of the items and dividing by the number of items (4). We standardized the scale on the student level. The mean of this scale was 2 (standard deviation = 0.7). The range of Cronbach alpha values calculated in a categorical principal component analysis with the variables analysed as ordinal for each country separately is 0.69 (Norway)–0.79 (Belgium (Flanders)) with four items.⁵ We use a compository logic to construct the involvement scales. In this compository logic, the researcher summarizes different variables because they complement each other conceptually, not because they overlap empirically. As Welzel notes: “elements are seen in this perspective as “components” that cover separate domains in the definitional range of an overarching construct. (...) Unique variation among elements is not defined as measurement error but simply as complementary parts of variation, each of which contributes to the completion of the construct” (2014: 60).

The third outcome variable is the reading literacy test of PIRLS. The children were not overburdened and only completed a limited set of test blocks. PIRLS uses item response theory and multiple imputation to produce five plausible values for the whole reading literacy test (see Mullis et al. 2007, 306). We also standardized the five plausible variables on the student level in the multivariate analysis so they have a mean of zero and a standard deviation of one. Analyses that use these variables were repeated for each plausible value (five times) and for each imputation. Results were then pooled: the parameter estimates were averaged and the significances were checked.

The reading literacy test of PIRLS 2006 is not directly measuring previous academic achievement. It measures a general ability for reading literacy with the use of item response theory that classifies children into higher- or lower-ability students; however, we argue that the reading literacy test information can be interpreted as a proxy variable for previous achievement. Although reading literacy ability is definitely not stable, it does not change radically but *tends* to grow cumulatively. On average (with the exception of children with reading problems), children who have a high (or low) ability in reading literacy do not suddenly and abruptly digress or advance to a *radically* lower or higher ability. On average, they *tend* to stay in the same ability range.

The last outcome variable is the index on attitudes of students toward reading. We use an index that was made by the PIRLS 2006 team and that is used in their reports. The use of this index increases the comparability of this study with other research using the PIRLS reading attitude index (e.g. Mullis et al. 2007). PIRLS calculated this index based on the following questions: “I read only if I have to”, “I like talking about books with other people”, “I would be happy if someone gave me a book as a present”, “I think reading is boring” and “I enjoy reading”. The PIRLS team averaged the question scores. An average score greater than

three is a high score (0). An average score of two to three is a medium score (1). An average score of one to less than two is a low score (2).

We also calculated a variable that measures the extent that children tend to experience less or more late involvement than early involvement. We subtracted the standardized values of the early parental involvement variable from the standardized values of the late parental involvement variable.⁶ A positive score indicates that the standardized score of the late involvement variable is *higher* than the standardized score of the early involvement variable. A negative score indicates that the standardized score of the late involvement variable is *lower* than the standardized score of the early involvement variable. A score of zero indicates that the standardized scores of the early and late involvement variable are the same.

We include the following independent variables in our analysis: gender, non-native background, the language spoken at home, highest level of education of the parent(s) but also reading literacy or early literacy activities. *Gender* is coded as 0 (male) and 1 (female). In the student questionnaire, the students were asked whether the mother and the father were born in the country where the survey was conducted. The PIRLS team used these questions to construct a variable that indicates the *number of parents with a non-native background* (see Foy and Kennedy 2008, 4). Three possibilities exist: neither, either or both of the parents have a non-native background. We dichotomized this variable (0 = native background, 1 = non-native background). We also include a variable that measures how often the *language of instruction* at school is spoken at home (0 = never or sometimes spoken at home, 1 = always spoken at home). SES will be operationalized as the highest educational level of the father (or stepfather/male guardian) and mother (stepmother/female guardian). Both questions were asked in the home questionnaire. The different levels are: “finished post-secondary or university or higher” (2), “finished upper-secondary” (1), “some primary/lower secondary education (finished or not) or no schooling” (0) (Foy and Kennedy 2008, 3). These categories indicate a low, medium and high level of parental education. We use parental education as the measure of SES because it is one of the most stable aspects of SES: “it is typically established at an early age and tends to remain the same over time” (Sirin 2005, 419). The *reading literacy scores* of PIRLS 2006 were also used as an independent variable.⁷

Research procedures

In order to account for the nested character of our data, we use multilevel model specifications (with robust maximum likelihood estimation) (Heck and Thomas 2015).

We estimate five random intercept linear regression models with students (*i*) nested in schools (*j*) in the models on reading literacy, early and late parental involvement with *n* covariates. Country (*k*) is estimated as a fixed effect. We model the fact that students in schools are in different countries as a fixed effect for two reasons: (a) we only have 10 possible values for this variable (see Stegmueller 2013 on this issue). As the selection of countries in the PIRLS study is not random, we do not use random country effects. (b) The unobserved heterogeneity at the country level (for example because of different socio-economic national compositions or educational systems) is taken into account by using country fixed effects (Allison 2009; see also Bol et al. 2014). There are nine country dummies (*D*) in each model. We do not model the school or country level with independent variables because we do not test hypotheses that are specified on those levels. We do, however, take into account the

nesting of students on the country and school levels and have a school level variance u_{0j} and an error term e_{ij} . The form of the equation used is

$$Y_{ij} = \gamma_{00} + \beta_1 x_{1ij} + \dots + \beta_n x_{nij} + \sum_{k=k-1} \beta_x D_k + e_{ij} + u_{0j}$$

We also use a random intercept multinomial logistic regression model to relate class membership in one of the three categories (c) of reading attitudes (low, medium or high) with early parental involvement (Heck and Thomas 2015). In this form of model, the cumulative probabilities of the categories of the outcome are estimated. The sum of these probabilities equals one. Consequently, modelling 3 – 1 categories is sufficient to know all probabilities. The excluded category is the reference category (C). A multilevel multinomial logistic regression models the log odds of outcome c relative to this reference category (C) for individual i in school j (η_{cij}). Because our dependent variable has three categories, two series of log odds coefficients will be estimated. The form of the equations for 2 categories and n covariates (and fixed country effects) is

$$\eta_{cij} = \ln\left(\frac{\pi_{cij}}{\pi_{Cij}}\right) = \beta_{o(c)} + \beta_{1(c)} x_{1ij} + \dots + \beta_{n(c)} x_{nij} + \sum_{k=k-1} \beta_x D_k + u_{j(c)}$$

The data was weighted to account for the school and within school sample design (see Martin, Mullis and Kennedy 2007; Foy and Kennedy 2008, 39). The weight addresses the selection probability of students in schools as well as non-response. We use a weight of which the sums of weights correspond to the sample sizes of each country (called HOUWGT in the PIRLS data-set). The data were analysed with SPSS 21 (for data description and preparation) and Mplus 7.3 (for multilevel analyses).

Results

In this section, we use multilevel model specifications to test our hypotheses.⁸ In Model 1 of Table 2, we examine effects on early parental literacy involvement (as a standardized score). It is clear that parental education is significantly related to early parental involvement (controlling for background variables). When the level of education of parents increases, the level of early parental involvement increases also. For children with parents who finished upper-secondary, the level of early involvement increases on average by 0.16 standard deviation (or an average increase of 0.06 (= multiplying the standard deviation of the early involvement scale (0.4) with (0.16)) compared with children with low-educated parents. For children with parents who finished post-secondary, university or higher, the level of early involvement increases on average by 0.34 standard deviation compared with children with low-educated parents (or an average increase of 0.14 (= 0.4 × 0.34)).

In the multinomial logistic model (with low reading attitude as the reference category and with control variables included) in Table 3, Model 1a and 1b, we notice that the odds for having high reading attitudes over low reading attitudes with an increase of one standard deviation of the level of early literacy involvement is 1.37 ($e^{0.312}$) on average. Thus, the relative probability or odds of having high rather than low reading attitudes is 37% higher with an increase of one standard deviation of the early literacy variable. The odds for having medium reading attitudes over low reading attitudes with an increase of one standard deviation of



Table 2. Two-level linear regression models with fixed country effects: parameters and standard errors (10 imputed datasets).

	Model 1 (Z-score _{early involvement}) ^a	Model 2 (Z-score _{late involvement}) ^b	Model 3 (Z-score _{late involvement}) ^c	Model 4 (Z-score _{reading literacy}) ^c	Model 5 (Z-score _{late} - Z-score _{early}) ^d
<i>Fixed effects</i>					
Early literacy involvement	–	–	–	0.112 (0.005) ^{***}	–
Parental education (Ref. cat. = some primary, lower-secondary (finished or not) or no schooling)	0.156 (0.019) ^{***}	–0.093 (0.018) ^{***}	–0.032 (0.018)	0.301 (0.015) ^{***}	–0.137 (0.020) ^{***}
Finished upper-secondary	0.340 (0.019) ^{***}	–0.220 (0.017) ^{***}	–0.098 (0.017) ^{***}	0.606 (0.016) ^{***}	–0.334 (0.020) ^{***}
Finished post-secondary, university or higher	0.190 (0.011) ^{***}	0.026 (0.011) [*]	0.048 (0.011) ^{***}	0.101 (0.010) ^{***}	–0.124 (0.013) ^{***}
Female gender of the child	–0.104 (0.015) ^{***}	0.054 (0.014) ^{***}	0.005 (0.014)	–0.244 (0.014) ^{***}	0.069 (0.015) ^{***}
Non-native background of the child	0.030 (0.015) [*]	–0.024 (0.016)	–0.005 (0.016)	0.100 (0.014) ^{***}	–0.020 (0.017)
Instruction language as home language	–	–	–0.178 (0.006) ^{***}	/	–0.313 (0.007) ^{***}
Reading literacy	Yes	Yes	Yes	Yes	Yes
Country fixed effects	–0.637 (0.029) ^{***}	–0.182 (0.033) ^{***}	–0.266 (0.032) ^{***}	–0.375 (0.023) ^{***}	0.308 (0.032) ^{***}
Intercept					
<i>Random effects</i>					
Level-two residual	0.022	0.038	0.036	0.112	0.034
Level-one residual	0.922	0.888	0.865	0.687	1.127

Notes: Weighted coefficients.

Two-tailed significance test.

^aIn an empty model, the first-level residual is 0.05 and the second-level residual is 0.95.

^bIn an empty model, the first-level residual is 0.1 and the second-level residual is 0.9.

^cIn an empty model, the first-level residual is 0.2 and the second-level residual is 0.8.

^dIn an empty model, the first-level residual is 0.1 and the second-level residual is 1.2.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 3. Two-level multinomial logistic regression model with fixed country effects of reading attitudes: log odds and standard errors (10 imputed datasets).

	Model 1a (High versus low reading attitudes)	Model 1b (Medium versus low reading attitudes)
<i>Fixed effects</i>		
Early literacy involvement	0.312 (0.021)***	0.097 (0.020)***
<i>Parental education</i> (Ref. cat. = some primary, lower-secondary (finished or not) or no schooling)		
Finished upper-secondary	0.296 (0.068)***	0.147 (0.068)*
Finished post-secondary, university or higher	0.858 (0.062)***	0.362 (0.060)***
Female gender of the child	1.335 (0.048)***	0.616 (0.046)***
Non-native background of the child	-0.095 (0.053)	0.032 (0.050)
Instruction language as home language	-0.113 (0.060)	-0.072 (0.059)
Reading literacy	-	-
Country fixed effects	Yes	Yes
Intercept	-0.152 (0.094)	0.688 (0.085)***
<i>Random effects</i>		
Level-two residual	0.210	0.040
Level-one residual	-	-

Note: Weighted coefficients.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Two-tailed significance test.

the level of early literacy involvement is 1.10 ($e^{0.097}$) on average. The relative probability of having medium rather than low reading attitudes is 10% higher with an increase of one standard deviation of the early literacy variable. We also focus on the relation between parental educational level and reading attitudes. The odds that a child with parents who finished upper-secondary school has high reading attitudes over low reading attitudes is 1.34 ($e^{0.296}$) times the odds for children with parents with a low educational level, on average. The relative probability of having high rather than a low reading attitude is 34% higher for children with high-educated parents than for children with low-educated parents. The odds that a child with parents who finished post-secondary, university or higher has high reading attitudes over low reading attitudes is 2.36 ($e^{0.858}$) times the odds for children with parents with a low educational level, on average (thus, the relative probability is 136%).

In Model 2 in Table 2, the effect of parental education on the late form of involvement (also standardized) is significant, but *negative*. This means that it is more likely that children with a low-educated parental background experience high levels of late involvement in literacy activities (controlling for background variables). With low parental education as the reference category, the level of late involvement decreases by -0.09 standard deviation for children (or $-0.06 (= -0.09 \times 0.7)$) with parents who finished upper-secondary education, and -0.22 standard deviation (or $-0.15 (= -0.22 \times 0.7)$) for children with parents who finished post-secondary, university or higher.

In Table 2, we see in Model 4 that early parental involvement in literacy activities is positively related to reading literacy (controlling for background variables). An increase of one standard deviation of the early parental involvement variable (namely 0.4) results in an increase of 0.11 standard deviation of reading literacy (or an average increase of 7.5 (68×0.11)). We also see that children with parents with a high SES have higher reading literacy.

In Model 3 of Table 2, we see that the level of late involvement decreases by -0.18 standard deviation when reading literacy (or an average decrease of $-0.13 (= -0.18 \times 0.7)$) increases

with one standard deviation (this means 68). We also see that the effects of SES on late involvement diminish. As hypothesized, reading literacy explains a part of these effects.

In Model 5 in Table 2, we model the difference between the standardized levels of late and early involvement. We see that reading literacy is negatively associated with the difference between the standardized late and early involvement variables: when reading literacy increases by one standard deviation (this means 68), the difference between the standardized values of late and early involvement decreases by -0.31 . A negative parameter indicates that the standardized values of the early involvement variable are higher than the standardized values of the late involvement variable when the level of reading literacy is higher. We also see that a high level of parental education has a negative relation with the difference between the standardized late and early involvement variables (a parameter estimate of -0.14 for children with medium educated parents and -0.33 for children with high-educated parents).

It is noteworthy that parents did not know the (range of the plausible) values of the PIRLS reading literacy test. The questions on literacy involvement were asked in the parent/primary caregiver questionnaire.

Discussion and conclusion

This article focused on home-based parental involvement in children's literacy activities, including its stratification in 10 European educational systems.

We found a positive relation between early involvement in literacy activities (before primary school) and reading literacy and parental education. Children from a family with a low SES experience the late type of involvement in literacy activities more than children with a high SES (hypotheses H1, H3 and H4).

We also saw that positive attitudes towards reading are more likely for children in higher SES families and who experienced a high level of early literacy involvement (H2). Late parental literacy involvement is also related to the reading literacy of children: it is more likely when children have poor reading literacy and less likely when children have good reading literacy (H5). The transition of a low early parental literacy involvement to a high late parental literacy involvement is more likely for children with a lower SES than for children with a higher SES (H6). Those children who experience more late than early involvement also have lower reading literacy. Taking into account that early involvement has a positive relationship with reading literacy, this supports the idea of an adjustment of parental involvement to the level of academic skills of the child.

This article showed that further research should continue to focus on the evolution of the relation between background characteristics of parents and the school setting. Home-based parental involvement in literacy and language activities is socially stratified and not independent from external influences. We have also shown that the level of parental education tends to have an enduring influence on parental involvement.

Besides being of theoretical importance, this article is also relevant from a policy perspective. Research has shown that in educational systems with central examinations (including standardization), the effect of parental education on achievement for students around the age of 15-years-old is less strong (Bol et al. 2014). We argue on the basis of this article that the children's academic achievement in primary school might also be a guide for parents in terms of how involved they become in the educational sphere. The results of tests in

primary school might offer an incentive for more or less parental involvement. We thus argue that especially for children who tend to achieve less at school, a continuing development and implementation of a standardized testing of achievement might be beneficial.

A number of limitations of this article can be identified. The PIRLS data is cross-sectional. Ideally, one would want to use longitudinal data, however, such data do not exist. We used the best European (cross-sectional) data available. Future research should also include more dimensions of SES besides parental educational level. The data is also only focused on parental involvement before primary school and in the fourth grade.

This article showed that further research should focus on the socially stratified evolution of the relation between background characteristics of parents and the school setting.

Notes

1. Non-response of the other countries: 3% in Belgium (Flanders), 9.6% in Belgium (Wallonia), 4% in Austria, 6.2% in Denmark, 7.3% in France, 13% in Germany, 3.7% in Italy, 7.6% in Norway, 7.1% in Luxembourg and 6.4% in Sweden. No data on Switzerland available.
2. Before selecting schools and classes, the research areas in the countries were stratified according to so-called “explicit” stratification variables: school type (in Belgium and Sweden), region (in Austria), state (in Germany), student characteristics (Norway), school size (in France), urbanization (in Luxembourg) and school finance (in Norway). In these “explicit” strata, there was a sorting according to “implicit” strata: region (in Belgium, Austria, Italy and Germany), school type (in France and Germany), urbanization (in Italy), school finance and student characteristics (in Norway). There was no implicit stratification in Luxembourg or explicit stratification in Italy. Within these implicit strata there was a distinction according to a measure of size of the schools. No schools that educate children with special needs, special schools or very small schools were included. Students with a disability and who could not speak the language of instruction were excluded.
3. For each student: (value of the scale – grand mean of the scale)/standard deviation of the scale.
4. Weighted analysis excluding the cells in the data frame with missing data.
5. Idem ditto.
6. Graphical inspections of the early and late involvement variable show resemblances to the normal distribution. We do not report Kolmogorov–Smirnov or Shapiro–Wilk tests of normality: the large sample size would report small deviations from normality as significant departures from normality.
7. A comparison between the listwise and imputed values shows that the mean reading literacy declines for the imputed data-set. Imputing the data includes more children with a relatively low SES and non-native background.
8. Regression diagnostics for the full models of reading literacy, early and late parental involvement and the transition between early and late involvement were good: we plotted the conditional residuals with the conditional predicted values and Q-Q plots of the conditional residuals for each imputed data-set; variance inflation factors were also calculated. We also checked for the multivariate linearity of the relationships between the variables with the transformation plot of non-linear principal components analysis.

Disclosure statement

No potential conflict of interest was reported by the authors.

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