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# Joint book reading, library visits and letter teaching in families: relations to parent education and children’s reading behavior

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## Abstract

In line with the Matthew-effect in reading, reading comprehension and leisure time reading tend to be reciprocally related. Whereas prior research invested much efforts in the identification and description of variables explaining individual differences in reading comprehension, less efforts were spend on the exploration of variables important for the development of leisure time reading. This study focuses on family literacy activities in preschool age – joint book reading, joint library visits, and the teaching of letters – and how these relate to the children’s later leisure time reading and reading comprehension. Furthermore, the role of parents’ education is considered. Empirical findings are based on a sample of  $N=1.242$  children from the National Education Panel Study (NEPS). Joint book reading and joint library visits in families, both aspects of informal literacy activities, predicted leisure time reading of children in Grade 4, which was related to their reading comprehension. In addition, disparities with regard to parents’ education were found. The results are discussed against the background of ways to promote children’s leisure time reading and practical implications are derived.

**Keywords** Family literacy activities · Joint book reading · Joint library visits · Reading behavior · Reading comprehension

Learning to read and comprehend written text is at the core of our educational efforts. This is well expressed by Chall (1983, p. 3) in her pivotal work “Stages of reading development”, describing reading development as process in which at first chil-

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dren learn to read and subsequently read to learn. Increasingly, the acquisition of knowledge in all disciplines relies on efficient reading skills. However, even in well-developed countries such as Germany, a substantial number of students have severe difficulties in reading (Weis et al., 2019). This problem is intensified by the well documented fact that today more and more students are not reading for enjoyment (Diedrich et al., 2019), which has shown to be important for the development of students' reading skills, inter alia word reading and reading comprehension (Locher & Pfost, 2020; Martin-Chang et al., 2020; Pfost et al., 2013; Torppa et al., 2020). In consequence, analyzing variables that can promote respectively hinder the development of a lifestyle that includes a regular autonomous engagement in various reading activities must be given high priority. In this article, we analyzed the relation between different facets of family literacy activities and later leisure time reading using data from the National Education Panel Study (NEPS), one of the largest longitudinal studies in the field of education in Germany. Embedded in a theoretical introduction on the role of family literacy activities for reading development, our findings show that foremost informal family literacy activities (joint book reading, joint library visits) relate to children's later leisure time reading. Practical implications are derived.

## Formal and informal family literacy activities

A large majority of parents start reading to their children before the age of two and continue to do so over the preschool years (Niklas et al., 2016; Price & Kalil, 2019). Therefore, most children become early familiarized with the act of reading. These joint book reading activities in preschool age showed to be important predictors not just for the development of oral language (Mol & Bus, 2011; Price & Kalil, 2019), but also for emergent literacy and later reading skills (Burgess, 1997; Bus et al., 1995; Price & Kalil, 2019). Furthermore, higher engagement in joint book reading activities has shown to be related to increased neural activation in left-sided parietal-temporal-occipital association cortex, which is important for semantic language processing (Hutton et al., 2015). Therefore, even within preschoolers neurobiological correlates for joint book reading are present. The total trend seems clear: the more parents are engaged in joint book reading with their children, the more competent their children tend to be in oral language and later reading.

In early education research, the activity of joint book reading is often subsumed within the broader concept of home literacy environment (HLE), describing the environment provided by the family to support the development of children's oral language, emergent literacy and basic reading skills (Niklas & Schneider, 2013). Thereby, two dimensions of the home literacy environment are typically differentiated, namely informal and formal literacy activities (Hood et al., 2008; Sénéchal, 2011; Sénéchal & LeFevre, 2002). Informal literacy activities focus on the message of the printed words. Parent-child joint book reading activities, as discussed above, are the primary example. Such reading activities predominantly aim on understanding a written story, which is often accompanied by illustrations, and the pleasure it provides. Formal literacy activities, on the other side, focus on the form of the printed word and encompass activities such as parents teaching letter names and sounds or

reading words. During such activities, the attention is primarily on knowledge transmission about reading. Analyses on the dimensional structure clearly support the distinction of these types of activities (Hood et al., 2008), and the frequency of formal literacy activities has shown to be widely unrelated to the frequency parents are engaged in informal literacy activities (Hood et al., 2008; Lehl et al., 2013; Sénéchal et al., 1998). This distinction is also reflected in different relations of parents' education – a common indicator of parents' socioeconomic status – with these activities: While parents education/socioeconomic status typically relates positively to parents' engagement in informal literacy activities, such positive relation tends to be uncommon for formal literacy activities (Hartas, 2011; Sénéchal, 2006; Sénéchal & LeFevre, 2002). This seems to be an expression of two broadly different perspectives of parents on literacy acquisition and reading. Whereas on the one hand better educated parents often tend to read with their children with an entertainment perspective in mind, parents with a lower socioeconomic status tend to stress more often a drill and practice perspective and skill orientation towards reading (Baker & Scher, 2002; Baker et al., 1997). However, this relation may be moderated by variables such as the cultural context and language (e.g., Ergül et al., 2017; Liu et al., 2018).

Finally, both dimensions of the home literacy environment are assumed to foster different skills with regard to reading (Sénéchal, 2011): Formal literacy activities (directly) promote children's basic reading skills such letter knowledge and word decoding. Informal literacy activities mainly contribute to children's oral language skills including vocabulary and therefore indirectly contribute to children's reading comprehension. Furthermore, informal literacy activities tend to affect directly children's leisure time reading. Empirical studies have provided evidence in favor of most of the assumed effects (Farmer et al., 2021; Hood et al., 2008; Lehl et al., 2013; Sénéchal, 2006; Sénéchal & LeFevre, 2002; Sénéchal et al., 1998).

## Students' leisure time reading

Besides formal reading instruction, for example within schools, children need substantial practice in reading in order to become proficient readers. In line with practice engagement theory (Reder, 1994; Reder et al., 2020), reading skills develop as a by-product of everyday engagement in reading and writing. Furthermore, reading skills and reading behavior are assumed to be reciprocally related, a mechanism that is important due to its cumulative effect (the Matthew-effect; Pfof et al., 2014; Stanovich, 1986). Consequently, measures of leisure time reading and reading skills are hypothesized to be closely related, which has found sound empirical support within children and young adults (Mol & Bus, 2011; but see Locher & Pfof, 2020, for different results within adults). However, there is also evidence showing that it is especially the amount of reading fiction books that contributes to the development of children's reading skills, whereas reading of newspapers or nonfiction books are just of subordinate importance as are (social) online reading activities (Jerrim et al., 2020; Jerrim & Moss, 2019; Pfof et al., 2013; Torppa et al., 2020). Consequently, identifying variables and conditions in preschool age that predict or even affect indi-

viduals reading behavior, especially the reading of fiction books, is of high practical importance.

Parents are an important source on the development of their children's reading behavior and preferences (Pfost et al., 2016). At least three broad mechanisms seem crucial: First, and perhaps most important, parents directly affect children's reading behavior by means of communication about reading and direct reading interactions. Therefore, joint book reading activities in preschool age might be a good breeding ground for the development of own reading habits and motivation, at least under the assumption that the reading interaction is of high affective quality and enjoyable (Baker & Scher, 2002; Baker et al., 1997; Sonnenschein & Munsterman, 2002). Gottfried et al. (2015), for example, reported a significant relation between time spent with joint reading activities in preschool age and intrinsic reading motivation in older children (age 9 to 10) and even adolescents (age 13 to 17), finally contributing to the overall educational attainment of the child. Teaching letters or how to read words might be considered as a further type of direct reading interaction, although its effect on children's leisure time reading were less often explored in empirical research or showed not to be significant (Sénéchal, 2006). Second, parents affect children's reading behavior by providing opportunities for further interactions in relation to reading, such as joint library visits. Although the role of libraries has seldom explicitly addressed within empirical education research, a study by Bhatt (2010) has shown that library users are more often engaged in joint reading activities with their children. In addition, Celano and Neuman (2001) provided first evidence that children participating in a library program know more book authors within an author recognition test, which is an indicator for their reading exposure, in comparison to children participating in an alternative program. And Payne et al. (1994) as well as Mann et al. (2021) report minor positive relations between library use and children's vocabulary and reading skills. Third, parents might affect their children's reading behavior by acting as a role model. Although there is just indirect evidence on these assumptions, research has found at least weak positive correlations between parents and children's attitudes towards reading and reading behavior (Baker & Scher, 2002; Mullan, 2010; Pfost et al., 2016).

## Summary and research questions

Reading activities of children are important for their reading skill development and parents seem to have substantial impact on the development of children's leisure time reading behavior. When children are in preschool age, already important early literacy skills develop as do aspects of reading motivation and reading behavior. Sources of parental influence are mainly expected from joint book reading, joint library visits – both aspects of informal literacy activities – and letter teaching (one aspect of formal literacy activities). However, empirical studies so far concentrated on the effects of such family literacy activities for skill development (e.g., oral language, emergent literacy skills), whereas later leisure time reading and preferences were considered less. Furthermore, previous studies often were based on small sample (e.g., 90 children within the study by Sénéchal, 2006) or applied just a cross-sectional design with

retrospective measures (e.g., Farmer et al., 2021). In the present study, we addressed the following research questions:

1. Is there a relation between family literacy activities (joint book reading, joint library visits, letter teaching) and children's later leisure time reading? We expected to find a positive relation between joint book reading and joint library visits (informal family literacy activities) and later leisure time reading. Concerning letter teaching (one facet of formal family literacy activities), no expectations were derived based on prior research.
2. Is there a relation between family literacy activities and later reading comprehension, partially mediated by students' leisure time reading? In line with the assumptions of the first research question, we expected to find a mediation by which joint book reading and library visits relate to later leisure time reading, which is related to students' reading comprehension.
3. How are family literacy activities related to parents' level of education? We expected to find positive relations of parents' level of education with joint book reading and joint library visits (informal literacy activities), whereas no such relation was expected for the teaching of letters (one facet of formal literacy activities). In addition, further direct and indirect relations between parents' education and students' leisure time reading and reading comprehension were explored.

Besides the analysis of zero-order relations, our research questions are analyzed controlling for children's migration background, vocabulary and sex, as these variables have shown to be important characteristics for children's educational success (e.g., Kluczniok & Mudiappa, 2019; Logan & Johnston, 2009; Verhoeven & van Leeuwe, 2008).

## Methods

### Design and participants

This paper uses data from the Starting Cohort Kindergarten (SC2) of the National Educational Panel Study (NEPS; see Blossfeld & Rossbach, 2019). The NEPS is carried out by the Leibniz Institute for Educational Trajectories (LIfBi, Germany) in cooperation with a nationwide network. Data collection in SC2 (data version 9.0.0; NEPS Network, 2020) was initiated in winter 2010/2011 throughout Germany. The target sample were children aged about 4 to 5 years attending kindergarten and who were expected to enroll in primary school in the 2012/2013 school year. In advance of the first wave of measurement, 3007 children respectively their parents provided positive panel consent. Sampling was designed to provide a random sample of Kindergarten (and later primary school) children using a multi-stage indirect sampling approach (see Aßmann et al., 2019, for details). As not all kindergarten children transitioned to one of the advanced sampled and participating NEPS schools and due to a data augmentation sample, three samples within the cohort were present. In this

study, we rely on data from the kindergarten panel sample as well as the individual tracked kindergarten sample (see Zinn et al., 2020, for data on panel attrition and selectivity). Finally, children whose parents did not participate in the first wave of measurement as well as children who did not participate in the sixth wave of measurement were not considered. Consequently, the present analyses rely on a sample of  $N=1.242$  children and their families. Of these children, 605 (48.7%) were male, 628 (50.6%) were female. In April 2011, children were on average 5.07 years old. Concerning the education background, 474 (38.2%) children lived in households at which at least one parent had completed university education. Measures used for data analyses in the present study were assessed either in wave 1 (year 2010/2011, age 4–5) or in wave 6 (year 2015/2016, age 9–10).

## Instruments

**Family literacy activities.** Family literacy activities were assessed in the first wave of measurement. In the present analyses, three facets of families literacy activities were differentiated. First, parents were asked on the frequency of engagement in *joint reading activities* (“Now we would like to look at things which you or someone else, do at home with [target child’s name]. I am interested in how often you do things like this together. You or someone else, read aloud to [target child’s name] at home.” English translation; see FDZ-LIfBi, 2020, p. 2564). Frequency of engagement was rated on an 8-point scale (1=never; 2=rarely; 3=once in a month; 4=several times a month; 5=once in a week; 6=several times a week; 7=once in a day; 8=several times in a day). Second, parents were asked on the frequency of *joint library visits* (“You or someone else, go to a library with [target child’s name]”. English translation; see FDZ-LIfBi, 2020, p. 2487). Frequency of engagement was rated using the same 8-point scale as elaborated above. Finally, parents rated their engagement in introducing and *teaching letters or the ABC* (“You or someone else, show [target child’s name] individual letters or the ABC, for example when looking at picture books.”. English translation; see FDZ-LIfBi, 2020, p. 2484) using the above illustrated 8-point frequency scale.

**Leisure time reading.** We used two scales to estimate students leisure time reading. Both scales were administered in the sixth wave of measurement (age 9–10). At first, students were asked to rate the *time they regularly spend reading* a day outside school. Two items were used, one referring to a normal school day and one referring to a day free of school (“How much time do you usually spend reading outside of school? Please consider all possible opportunities you have for reading, in other words not only books or magazines, but also e-mails or the Internet. a) On a normal school day I read... / b) On a normal non-school day I read ...”. English translation; see FDZ-LIfBi, 2020, pp. 4157–4158). Response options were 1=not at all; 2=up to half an hour; 3=between half an hour and one hour; 4=between one and two hours; 5=more than two hours. Children’s time spend reading was estimated by taking the mean of the two items (Cronbach’s  $\alpha=0.81$ ). Second, students were asked to indicate whether they have ever read, heard, or seen something about nine children and youth book titles or book series (e.g., *Das kleine Gespenst*; *Jim Knopf*; *Pünktchen und Anton*; etc.) that were presented (“Have you ever read, heard or seen the follow-

ing stories?” English translation; see FDZ-LifBi, 2020, pp. 4194–4202 for all book titles). Students provided a *yes* or *no* answer. All books represent fiction literature. They cover a broad heterogeneity in terms of topics (e.g., stories on a ghost, stories on a child attending school), popularity (between 3.1% and 81.9% recognition rate by the children in the analyzed sample) and date of first publication (between 1931 and 2008). The children’s number of yes responses were added together, yielding a reading exposure score with a theoretical scale range between zero (=no book title recognized) and nine (=all book title recognized; Cronbachs  $\alpha=0.51$ ). Common title recognition tests in general apply more book titles and in parts include foils (Mol & Bus, 2011). Since neither of the two aspects is realized here, the estimated short scale may just be treated as a *reading exposure* proxy. Recent research has shown that both types of scales – self-report measures of reading frequency as well as recognition tests – tend to be satisfying measures of reading behaviour (e.g., Locher & Pfost, 2019; Schroeder et al., 2016). However, the construct overlap seems to be limited (Mol & Bus, 2011; Wimmer & Ferguson, 2022). Therefore, we decided to consider both types of measures as relevant reading behavior outcomes.

**Reading comprehension.** Reading comprehension was assessed at the sixth wave of measurement (age 9–10) by a standardized test encompassing 31 items with different closed response formats. Five different texts – a literary, an information, a commenting, an instruction and an advertising text – were used. By relying on these texts, students had to find information in the text, draw text-related conclusions and to reflect and assess on the text. The test showed good psychometric properties (e.g. EAP/PV reliability=0.82; Rohm et al., 2017). In the present analyses, WLE-scores based on a partial credit model were used (see Rohm et al., 2017, for further information on the reading comprehension test and scaling procedure).

**Vocabulary.** Children’s receptive vocabulary was assessed at the first wave of measurement by means of a standardized test. After an oral presentation of the target word, children had to select one of four presented pictures matching the target. Psychometric properties of this test were good (e.g. EAP/PV reliability=0.89, Fischer & Durda 2020). In the present study, WLE-scores were used (see Fischer & Durda 2020, for further test information).

**Sociodemographic information.** *Parent education* was used as an indicator for the socioeconomic status of the family. Parents were asked about their highest educational certificate (school leaving certificate, vocational training, university degree). Subsequently, the indicated education certificate was transformed into a scale of years of education. When information on both parents was available, the highest education certificate respectively highest number of years in the household was taken. Children’s *migration background* was estimated by relying on the language that was typically spoken at home (0=German/no migration, 1=other language/migration background). Children’s *sex* was dummy coded (0=male, 1=female).

## Procedure

At first, we estimated zero-order correlations. Second, path models including mediator variables were estimated with Mplus (Muthén & Muthén, 1998–2017). In the first model, family literacy activities predicted both variables of students’ leisure time

reading. Students reading comprehension was predicted by students' leisure time reading as well as the family literacy activities, which allowed to estimate direct and indirect effects. Family literacy activities were allowed to correlate as were the both indicators of students' leisure time reading. In the second model, migration background, vocabulary, and sex were added as control variables, predicting all further variables within the model. In the third model, parents' education was considered. Parents' education was allowed to predict family literacy activities, students' leisure time reading and reading comprehension. Therefore, direct and indirect effects were again estimated. Model three was estimated without further controls, whereas in model four all control variables (migration background, vocabulary, sex) were considered. All path models were formulated without structural restrictions, perfectly fitting to the empirical data ( $df=0$ ). Significance of direct and indirect paths were estimated using bias corrected bootstrap standard errors based on 10.000 replications. We report standardized regression coefficients. Using the type=complex function, the clustering of children within kindergartens was considered.

## Results

### Descriptive data

Means, standard deviations and correlations of the considered variables are presented in Table 1. Concerning family literacy activities, results show that most parents were quite engaged in joint book reading as indicated by a mean score of  $M=6.95$ . In particular, 80.8% of the parents in the analyzed sample indicated of being engaged in joint reading activities with their children at least once a day or even several times a day, whereas just 3.9% of the parents were engaged in joint reading activities once a week or less and a further 15.4% of the parents reported of joint reading activities several times a week. In comparison to joint book reading, less engagement was reported for the teaching of letters ( $M=5.94$ ). Therefore, 39.0% of the parents reported to show letters or the ABC once a day or several times a day to their children and a further 33.1% of the parents reported of such activities several times a week. 27.9% of the parents reported of letter teaching activities once a week or less often. Joint library visits were the least frequent literacy activity ( $M=2.34$ ). In other words, 40.5% of the parents indicated of never visiting a library with their child and a further 14.6% reported of joint library visits less often than once in a month. Nevertheless, still 35.4% of the parents reported joint library visits once or several times in a month and 9.5% of the parents reported of joint library visits at least once in a week or even more often.

Concerning relations to later leisure time reading (reading time, reading exposure) and reading comprehension of children in Grade 4, positive correlations were found for joint book reading and joint library visits in their families. Letter teaching was neither related to later leisure time reading nor to reading comprehension. The children's reading time and reading exposure were positively related, although the size of the correlation ( $r=.21$ ) was just small to moderate. Parents' education was positively related to joint book reading and library visits in families. The teaching

**Table 1** Zero-order correlations

	<i>N</i>	<i>M (SD)</i>	1	2	3	4	5	6	7	8	9	10
<b>Family literacy activities</b>												
1 Joint book reading (W1)	1242	6.95 (0.86)	(-)	0.18**	0.18**	0.16**	0.08**	0.17**	0.18**	0.19**	-0.15**	0.04
2 Library visits (W1)	1242	2.34 (1.37)	0.18**	(-)	0.07*	0.13**	0.12**	0.12**	0.11**	0.19**	-0.03	0.02
3 Teaching letters (W1)	1242	5.94 (1.64)	0.18**	0.07*	(-)	0.01	0.01	0.01	-0.01	-0.06	0.00	0.04
<b>Leisure time reading</b>												
4 Reading time (W6)	1218	2.84 (1.02)	0.16**	0.13**	0.01	(-)	0.21**	0.19**	0.29**	.21**	-0.07*	0.09**
5 Reading exposure (W6)	1127	3.45 (1.56)	0.07*	0.11**	0.01	0.21**	(-)	0.24**	0.20**	0.27**	-0.14**	0.08**
<b>Cognitive competences</b>												
6 Vocabulary (W1)	1209	0.30 (1.00)	0.17**	0.11**	0.00	0.19**	0.23**	(-)	0.46**	0.40**	-0.46**	0.03
7 Reading comprehension (W6)	1175	-0.42 (1.32)	0.19**	0.11**	0.00	0.29**	0.21**	0.45**	(-)	0.36**	-0.18**	0.13**
<b>Sociodemographics</b>												
8 Parent education - years	1233	14.82 (2.46)	0.18**	0.19**	-0.06*	0.21**	0.26**	0.39**	0.36**	(-)	-0.27**	-0.03
9 Migration (1=yes)	1239	0.09 (0.29)	-0.15**	-0.03	0.00	-0.07*	-0.13**	-0.45**	-0.18**	-0.26**	(-)	-0.02
10 Sex (1=female)	1233	0.51 (0.50)	0.04	0.02	0.04	0.09**	0.08**	0.03	0.12**	-0.03	-0.02	(-)

Note: Below the diagonal, Pearson-correlations and phi-coefficient with pairwise deletion are depicted. Above the diagonal, correlations are estimated via a bootstrapping procedure and taking nested data-structure into account.

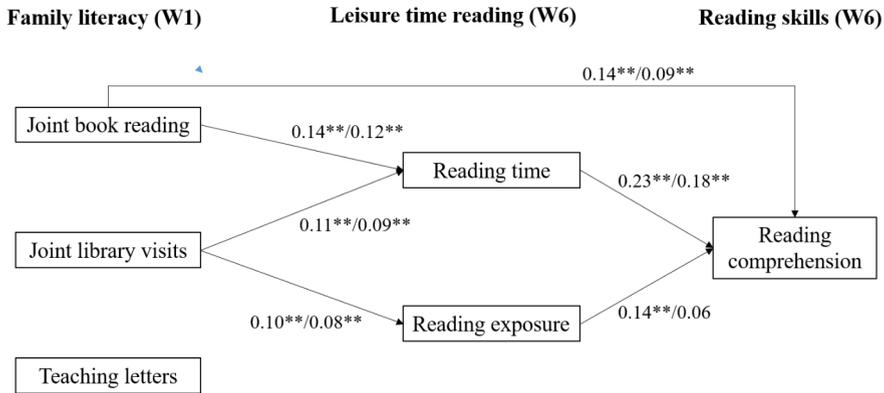
\*  $p < .05$ ; \*\*  $p < .01$

of letters was slightly negatively related to parents' education ( $r = -.06$ ), although when considering the nested data structure and applying a bootstrapping procedure, the correlation missed the 5% significance level. Interestingly – but not in focus of the present analyses – there were no differences between girls and boys in the family literacy activities, whereas in Grade four female students reported higher leisure time reading and gained higher scores in reading comprehension.

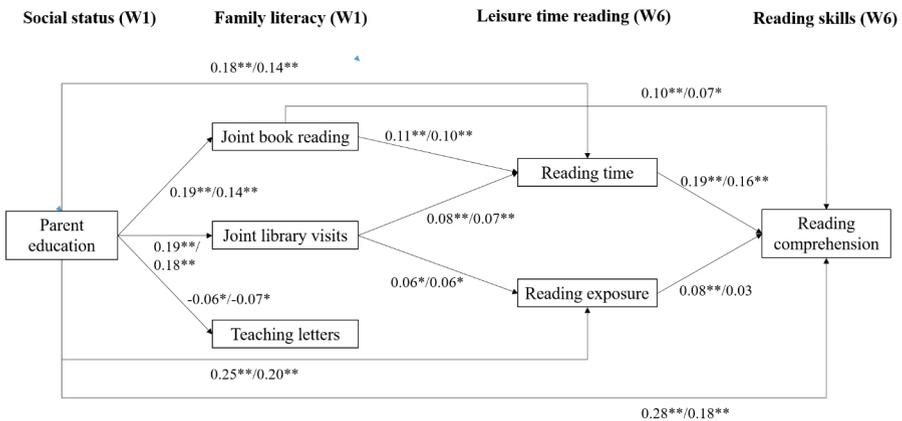
### Path models and mediator analyses

In the first path model, family literacy activities (joint book reading, joint library visits, letter teaching) were assumed to predict students' later leisure time reading (time spend reading, reading exposure) as well as students' reading comprehension. In addition, indirect effects of family literacy activities on reading comprehension via leisure time reading were explored. Empirical findings are summarized in Fig. 1 (covariances and non-significant regression paths were not plotted for the sake of clarity; see Appendix for further data). Joint book reading as well as joint library visits both predicted students' later time spend reading whereas no such relation was found for letter teaching (Model 1). Joint library visits also predicted students' reading exposure. Students' time spend reading as well as reading exposure both predicted reading comprehension. Concerning mediation effects, several specific indirect effects reached significance: First, there was an indirect effect of joint book reading on reading comprehension via students' time spend reading ( $\beta=0.032$ ,  $p<.01$ ; 17.6% of the total effect of joint book reading). Second, library visits indirectly predicted reading comprehension via students' time spend reading ( $\beta=0.025$ ,  $p<.01$ ; 30.9% of the total effect of library visits), as well as via students' reading exposure ( $\beta=0.015$ ,  $p<.01$ ; 18.5% of the total effect of library visits). Finally, in addition to the indirect effects, joint book reading also directly predicted reading comprehension. When additionally controlling for children's migration background, sex and vocabulary (Model 2), the size of most relations slightly reduced. With the exception of the relation between reading exposure and reading comprehension that turned to non-significance, the found relations of the first model remained significant. However, the indirect effect of joint library visits on reading comprehension via reading exposure diminished to a non-significant level ( $\beta=0.005$ , *n.s.*).

In the second path model (Fig. 2), parents' education was added as a further predictor variable. In line with the theoretical assumptions, parents' education positively predicted joint reading activities and joint library visits, whereas a slight negative relation to letter teaching was found (Model 3). Concerning indirect effects, parents' education predicted students' time spend reading via joint book reading ( $\beta=0.021$ ,  $p<.01$ ; 10.0% of the total effect of parent education) as well as joint library visits ( $\beta=0.015$ ,  $p<.01$ ; 7.1% of the total effect of parent education). In addition, parents' education predicted students' reading exposure via joint library visits ( $\beta=0.012$ ,  $p<.05$ ; 4.5% of the total effect of parent education). Finally, in addition to direct relations, parents' education indirectly predicted students' reading comprehension via students' time spend reading ( $\beta=0.034$ ,  $p<.01$ ; 9.4% of the total effect), students' reading exposure ( $\beta=0.020$ ,  $p<.01$ ; 5.5% of the total effect), joint book reading ( $\beta=0.018$ ,  $p<.01$ ; 5.0% of the total effect), as well as the dual mediator



**Fig. 1** Path model with standardized regression coefficients (Model 1). Behind the backslash, standardized regression coefficients while controlling for childrens’ vocabulary, migration background and sex are shown (Model 2). Paths with regression coefficients that did not reach significance within at least one model are not depicted (see Appendix, Table A1, for further regression coefficients within the model). For the sake of clarity, covariances are not plotted either  
 \*  $p < .05$ ; \*\*  $p < .01$



**Fig. 2** Path model with standardized regression coefficients (Model 3). Behind the backslash, standardized regression coefficients while controlling for childrens’ vocabulary, migration background and sex are shown (Model 4). Paths with regression coefficients that did not reach significance at least within one model are not depicted (see Appendix, Table A2, for further regression coefficients within the model). For the sake of clarity, covariances are not plotted either. \*  $p < .05$ ; \*\*  $p < .01$

relations of time spend reading predicted by joint book reading ( $\beta = 0.004$ ,  $p < .01$ ; 1.1% of the total effect) and time spend reading predicted by library visits ( $\beta = 0.003$ ,  $p < .01$ ; 0.8% of the total effect). Taking controls into account (Model 4), most predictions remained significant, but were again slightly reduced in size. However, reading exposure no longer predicted reading comprehension. In addition, the indirect effect

of parents' education on reading comprehension via reading exposure did not reach significance anymore.

## Discussion

The present study aimed to explore longitudinal relations between joint book reading, joint library visits (aspects of informal family literacy activities) as well as letter teaching (one aspect of formal family literacy activities) when children were in pre-school age and children's leisure time reading and reading comprehension in Grade four. Furthermore, we explored the role of parents' education background for the initiation of such family literacy activities and later reading behavior and reading comprehension of their children. Based on previous research, assumptions were derived and analyzed using one of the largest longitudinal education studies in Germany, relying on a sample of more than twelve hundred children and their families.

### Family literacy activities, leisure time reading and reading comprehension

Within our first question, we assumed that joint book reading and joint library visits, both informal literacy activities in families, relate to later reading behavior of children, as the potential to perceive reading as a source of pleasure and joy might be a good breeding ground for later intrinsic reading motivation (Baker et al., 1997; Gottfried et al., 2015) and hence self initiated leisure time reading. This assumption found empirical support in our data: Joint book reading predicted students' self-reported time spend in leisure time reading. In addition, joint library visits, a second informal literacy activity, predicted students' self-reported time spend in leisure time reading as well as students' knowledge of specific children's fiction books (reading exposure). The reported relations even remained significant after taking concurrently further control variables such as vocabulary into account.

In comparison to research on the effects of joint book reading experiences for child development, joint library visits have rarely been addressed in empirical education research (e.g., Mann et al., 2021). A further notable exception is the study by Bhatt (2010) who, using an instrumental variable approach, showed that library users spend about 14 min more reading with their child than non-users. Libraries may take several important functions when it comes to engaging young children in reading. For example, they offer a wide selection of books and therefore provide children an opportunity to explore personal book preferences and the option to choose a book to read in line with these preferences. Furthermore, libraries are often highly engaged in summer reading programs or further initiatives that may motivate children – independent of their socioeconomic status – to read (Dyenia et al., 2015). Although our findings may not be interpreted in a causal manner, they nevertheless support the idea that joint library visits have the potential to support children in becoming active readers.

In our second research question, we aimed to explore relations of family literacy activities with leisure time reading and reading comprehension. We assumed leisure time reading to predict reading comprehension, and therefore to find indirect relations between joint book reading as well as library visits and reading comprehension medi-

ated by leisure time reading. These assumptions were widely supported. Correlation analyses showed that both indicators of students' leisure time reading were related to reading comprehension. Furthermore, both variables – students' time spend reading and reading exposure – made a unique contribution in the explanation of individual differences in reading comprehension when analyzed within a joint model but without taking controls such as vocabulary into account (Model 1, Model 3). However, this is just surprising in parts. From a theoretical perspective, the applied reading exposure measure is a more narrow indicator of children's reading of German fiction books, whereas the time spend reading measures grasps all types of reading material, however with an explicit focus on extracurricular reading. From an empirical perspective, prior research has provided evidence that reading exposure checklists and self-report questionnaire items just partially overlap and tend to measure different facets of reading behavior (Spear-Swerling et al., 2010; Wimmer & Ferguson, 2022). Therefore, using both measures jointly tends to better reproduce the reading behavior construct in comparison to the use of just one single measure. However, after taking controls into account (Model 2, Model 4), the relation of the applied reading exposure measure to reading comprehension was further reduced and did not reach significance anymore. Overlapping variance between reading exposure and childrens' vocabulary or migration background may be an explanation for this difference.

Interestingly, letter teaching was neither related to students later leisure time reading nor to students' reading comprehension. Prior research has shown that parents' letter teaching relates to children's emergent literacy skills such as letter knowledge (Lehrl et al., 2013; Sénéchal & LeFevre, 2002), which may indirectly affect later reading comprehension. Furthermore, Sénéchal (2006) reported no relation of formal literacy activities and children's later independent reading behavior and Baker et al. (1997) even cautioned against an overemphasis on didactic aspects in parent-child literacy activities. Nevertheless, the measure of teaching letters and the ABC represents only one aspect of the overall construct of formal literacy activities, which may also include facets such teaching to write one's own name or teaching of how to read words (Hood et al., 2008; Sénéchal, 2006, 2011). In addition, the item applies the verb of showing something (letters, the ABC), implying a more passive role of the learner. This directly leads to a further discussion, the active and passive role of parents and children respectively learners in family literacy activities. For example, a recent study by Silinskas et al. (2020) has emphasized the reciprocal relation between family literacy activities and children's reading skills. In their study, the maternal teaching of reading has shown to be responsive to their children's early literacy and word reading skills, which offers an alternative explanation for the reported findings. In addition, the study by Silinskas et al. (2020) has shown that maternal teaching of reading in preschool was positively related to later leisure time reading, whereas such relation was not observed for maternal teaching of reading in Grade 1. Therefore, further research on the relation between family literacy activities and leisure time reading also by considering the learner as active agent in this relation is needed.

## Family literacy activities and parent education

In the present study, we focused on parents' education as primary indicator of the families socioeconomic status. In addition, as a control variable, family migration background was considered. In line with prior research (e.g., Hartas, 2011; Mann et al., 2021; Sénéchal & LeFevre, 2002), we assumed that better educated parents invest more resources in informal literacy activities, whereas no such relation was assumed for letter teaching. This pattern found clearly support in our study. Both activities – joint book reading and library visits – were positively related to parents' education. The teaching of letters was negatively related to parents' education, but effect size was quite modest and, depending on the analysis, not significant. Parents' education was also related to childrens' later leisure time reading and reading comprehension, and mediator analyses showed that this effect was mediated partially by disparities in joint book reading and library visits. Taken together, higher educated parents may not just read more books for their own (Notten et al., 2012). They also seem to be more effective in promoting their childrens' reading behavior and competences by providing more favorable family literacy activities, which may include not just more storybook reading but also a higher affective and interaction quality while being engaged in such activities (Baker & Scher, 2002; Baker et al., 1997; Bingham, 2007; Lehrl et al., 2013).

## Limitations

Based on data of the National Educational Panel Study, Starting Cohort Kindergarten, we conducted longitudinal analyses on more than twelve hundred children and their families over a period of six years. Precise estimates due to low standard errors are a big advantage of this approach. However, on the other side, such large-scale datasets are used to answer a whole series of research questions. Therefore, the number of items available for each of the constructs in focus of our study were restricted, leading to the use of single-item measures (e.g. for joint book reading) or short scales with in parts not satisfying internal consistencies (e.g. reading exposure). Furthermore, response intervals were not equal in size (e.g. once in a month, several times in a month, etc.), complicating interpretability of the findings. However, single-item measures are not necessarily inferior to multi-item scales, especially if the construct tends to be unambiguous and narrow in scope (Allen et al., 2022), which in our study seemed to be the case. Nevertheless, applying larger scales of higher reliability seems a desideratum of future studies. In addition, psychometric quality of the reading exposure measure might be improved by applying an extended book selection procedure and an additional offer of foils. Besides such restrictions in psychometric properties, qualitative aspects of the family literacy activities such as emotions and affect or the type of parent-child communication were not considered in the present study. Nevertheless, prior research has provided first evidence for the importance of such dimensions for literacy development (Haden et al., 1996; Sonnenschein & Munsterman, 2002), which ought to be given more attention in the future. Finally,

due to the non-experimental study design, the reported results may not be interpreted in a causal manner.

## Conclusion and practical implications

The ability to read and to understand written text is of primary importance for economic and cultural participation in our society. Furthermore, reading comprehension is a prerequisite for in depth learning of all academic skills. The development of reading comprehension is closely tied to the activity of reading, as avid readers are assumed to become good readers, which in consequence promotes further regular reading (the Matthew-effect in reading; Pfost et al., 2014; Stanovich, 1986). However, many children struggle on their way of becoming a competent reader and do not read on their own. Therefore, the identification of variables that relate to such an active reading lifestyle is of high importance. Our findings clearly support the view that already in preschool age through the provision of joint book reading activities parents can support children's later leisure time reading. Book Giveaway programs have proven effective in promoting joint book reading activities within families and tend to be, in comparison to other intervention measures, relatively easy to implement (de Bondt et al., 2020). Furthermore, results showed joint library visits to be relevant. As public libraries are typically open to all families independent of their socioeconomic status or migration background, this finding highlights the importance of public libraries within local communities. Besides possibilities of use and borrowing of books and further media, public libraries are engaged in providing further reading opportunities to children such as storytimes or summer reading clubs (Albright et al., 2009; Dynia et al., 2015). In summary, the first foundation for a successful reading career can be laid as early as in preschool age.

## Appendix

**Table A1** Regression coefficients for the path models presented in Fig. 1

	Model 1 B (Beta)	Model 2 B (Beta)
<b>DV: Reading time (W6)</b>		
Joint book reading (W1)	0.167 (0.142)**	0.135 (0.115)**
Joint library visits (W1)	0.080 (0.108)**	0.068 (0.092)**
Teaching letters (W1)	-0.014 (-0.022)	-0.012 (-0.019)
Vocabulary (W1)		0.173 (0.172)**
Migration (W1)		0.115 (0.033)
Sex (W1)		0.171 (0.084)**
<b>DV: Reading exposure (W6)</b>		
Joint book reading (W1)	0.107 (0.059)	0.034 (0.019)
Joint library visits (W1)	0.117 (0.103)**	0.094 (0.082)**
Teaching letters (W1)	-0.003 (-0.003)	0.004 (0.004)
Vocabulary (W1)		0.324 (0.209)**

**Table A1** Regression coefficients for the path models presented in Fig. 1

	Model 1 B (Beta)	Model 2 B (Beta)
Migration (W1)		-0.178 (-0.033)
Sex (W1)		0.225 (0.072)*
<b>DV: Reading comprehension (W6)</b>		
Joint book reading (W1)	0.216 (0.141)**	0.129 (0.085)**
Joint library visits (W1)	0.040 (0.042)	0.015 (0.015)
Teaching letters (W1)	-0.032 (-0.040)	-0.024 (-0.030)
Reading time (W6)	0.298 (0.229)**	0.231 (0.178)**
Reading exposure (W6)	0.120 (0.142)**	0.049 (0.058)
Vocabulary (W1)		0.540 (0.413)**
Migration (W1)		0.215 (0.047)
Sex (W1)		0.246 (0.093)**
<b>DV: Joint book reading (W1)</b>		
Vocabulary (W1)		0.110 (0.129)**
Migration (W1)		-0.276 (-0.093)*
Sex (W1)		0.061 (0.035)
<b>DV: Joint library visits (W1)</b>		
Vocabulary (W1)		0.181 (0.133)**
Migration (W1)		0.145 (0.031)
Sex (W1)		0.053 (0.019)
<b>DV: Teaching letters (W1)</b>		
Vocabulary (W1)		0.010 (0.006)
Migration (W1)		0.036 (0.006)
Sex (W1)		0.131 (0.040)

*Note.* DV = Dependent variable; B = Unstandardized regression coefficient; Beta = Standardized regression coefficient. Sex: 0 = male, 1 = female. Significance was tested using a bootstrapping procedure and refers to the standardized regression coefficient. The table exclusively shows regression coefficients. Estimated covariances – unstandardized (standardized) – Model 1 are: Joint book reading – Joint library visits: 0.207 (0.175)\*\*; Joint book reading – Teaching letters: 0.256 (0.181)\*\*; Joint library visits – Teaching letters: 0.147 (0.065)\*; Reading time – Reading exposure: 0.294 (0.190)\*\*. Estimated covariances – unstandardized (standardized) – Model 2 are: Joint book reading – Joint library visits: 0.184 (0.160)\*\*; Joint book reading – Teaching letters: 0.254 (0.183)\*\*; Joint library visits – Teaching letters: 0.144 (0.065)\*; Reading time – Reading exposure: 0.235 (0.159)\*\*; Vocabulary – Migration: -0.135 (-0.459)\*\*; Vocabulary – Sex: 0.013 (0.026); Migration – Sex: -0.003 (-0.021)

\*  $p < .05$

\*\*  $p < .01$

**Table A2** Regression coefficients for the path models presented in Fig. 2

	Model 3 B (Beta)	Model 4 B (Beta)
<b>DV: Reading time (W6)</b>		
Joint book reading (W1)	0.130 (0.110)**	0.116 (0.098)**
Joint library visits (W1)	0.060 (0.080)**	0.054 (0.073)**
Teaching letters (W1)	-0.003 (-0.004)	-0.005 (-0.008)
Vocabulary (W1)		0.127 (0.126)**
Migration (W1)		0.168 (0.048)

**Table A2** Regression coefficients for the path models presented in Fig. 2

	Model 3 B (Beta)	Model 4 B (Beta)
Sex (W1)		0.184 (0.091)**
Parent education (W1)	0.072 (0.175)**	0.059 (0.144)**
<b>DV: Reading exposure (W6)</b>		
Joint book reading (W1)	0.032 (0.018)	-0.004 (-0.002)
Joint library visits (W1)	0.072 (0.063)*	0.065 (0.057)*
Teaching letters (W1)	0.017 (0.018)	0.016 (0.017)
Vocabulary (W1)		0.222 (0.143)**
Migration (W1)		-0.079 (-0.015)
Sex (W1)		0.247 (0.079)**
Parent education (W1)	0.160 (0.252)**	0.127 (0.200)**
<b>DV: Reading comprehension (W6)</b>		
Joint book reading (W1)	0.151 (0.099)**	0.100 (0.065)*
Joint library visits (W1)	0.004 (0.004)	-0.006 (-0.007)
Teaching letters (W1)	-0.010 (-0.012)	-0.012 (-0.015)
Reading time (W6)	0.252 (0.194)**	0.209 (0.161)**
Reading exposure (W6)	0.068 (0.081)**	0.025 (0.029)
Vocabulary (W1)		0.475 (0.363)**
Migration (W1)		0.290 (0.064)*
Sex (W1)		0.274 (0.104)**
Parent education (W1)	0.149 (0.278)**	0.097 (0.182)**
<b>DV: Joint book reading (W1)</b>		
Vocabulary (W1)		0.069 (0.081)*
Migration (W1)		-0.226 (-0.076)*
Sex (W1)		0.070 (0.041)
Parent education (W1)	0.066 (0.187)**	0.050 (0.142)**
<b>DV: Joint library visits (W1)</b>		
Vocabulary (W1)		0.098 (0.073)*
Migration (W1)		0.240 (0.051)
Sex (W1)		0.071 (0.026)
Parent education (W1)	0.105 (0.188)**	0.098 (0.177)**
<b>DV: Teaching letters (W1)</b>		
Vocabulary (W1)		0.052 (0.032)
Migration (W1)		-0.002 (0.000)
Sex (W1)		0.122 (0.037)
Parent education (W1)	-0.039 (-0.058)*	-0.045 (-0.068)*

*Note.* DV=Dependent variable; B=Unstandardized regression coefficient; Beta=Standardized regression coefficient. Sex: 0= male, 1= female. Significance was tested using a bootstrapping procedure and refers to the standardized regression coefficient. The table exclusively shows regression coefficients. Estimated covariances – unstandardized (standardized) – Model 3 are: Joint book reading – Joint library visits: 0.165 (0.144)\*\*; Joint book reading – Teaching letters: 0.272 (0.196)\*\*; Joint library visits – Teaching letters: 0.171 (0.078)\*\*; Reading time – Reading exposure: 0.228 (0.155)\*\*. Estimated covariances – unstandardized (standardized) – Model 4 are: Joint book reading – Joint library visits: 0.159 (0.141)\*\*; Joint book reading – Teaching letters: 0.265 (0.193)\*\*; Joint library visits – Teaching letters: 0.166 (0.076)\*\*; Reading time – Reading exposure: 0.199 (0.138)\*\*. Vocabulary – Migration: -0.135 (-0.459)\*\*; Vocabulary – Sex: 0.013 (0.025); Migration – Sex: -0.003 (-0.021); Parent education – Vocabulary: 0.992 (0.398)\*\*; Parent education – Migration: -0.196 (-0.273)\*\*; Parent education – Sex: -0.033 (-0.026)

\*  $p < .05$

\*\*  $p < .01$

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