Stratification in Parents' Selection of Developmentally Appropriate Books for Children: Register-based Evidence from Danish Public Libraries

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Abstract

This paper studies socioeconomic gradients in selecting developmentally appropriate children's books from public libraries. I draw on research on developmental gradients in parental inputs to hypothesize that families with high socioeconomic status (SES) are more likely to select books that match children's developmental stage in order to best improve children's learning environments. In contrast to previous survey-based research, I use behavioral data on the actual books families have selected from libraries. Based on Danish registry data that cover all books borrowed from public libraries in 2020, I find that highly educated families are more likely to use libraries and borrow more books when they use libraries, but they do not select a larger share of developmentally appropriate books; in fact, they select a slightly lower share. In contrast, I find only a weak positive income gradient for the amount of books borrowed and the share of developmentally appropriate books. The supplementary analyses show that results are robust across families with children of different ages and to account for nonrandom selection into the sample of library users, socioeconomic differences in children's reading skills, and the impact of library lockdowns due to Covid-19. I conclude that stratification in library book selection is more prominent concerning the voraciousness with which highly educated parents provide reading inputs (more books) than how discriminating they are in terms of selecting developmentally appropriate books.

Keywords:

Developmental gradient, Parents' reading inputs, Library books, Stratification, Registry data.

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Introduction

Research has robustly shown that reading is more prominent in families with high socioeconomic status (SES; Griswold *et al.* 2005; Notten *et al.* 2012; Gracia 2015; O'Flaherty and Baxter 2020). Despite this, we do not know much about variation in the types of reading inputs parents from different socioeconomic backgrounds provide. In this paper, I draw on research on developmental gradients in parental inputs to hypothesize that when parents select which books to borrow from libraries, high-SES families are more likely to select books that match their children's developmental stage (Kalil *et al.* 2012; Blaurock and Kluczniok 2019; O'Flaherty and Baxter 2020). Literature on developmental gradients has argued that high-SES parents provide more cognitively stimulating home environments. Additionally, high-SES parents are more likely to tailor the amount of time they spend on activities to what is developmentally most appropriate for children at given stages of their lives (e.g., focus on basic care for infants, playtime for preschoolers, and teaching for children in primary school; Kalil *et al.* 2012; Blaurock and Kluczniok 2019; O'Flaherty and Baxter 2020). In this paper, I use borrowing of books from libraries as a case for studying SES gradients in the reading inputs parents provide – both in terms of the amount of books parents borrow and the extent to which they select developmentally appropriate books in particular.

The main contribution of this paper is robust empirical descriptive research based on high-quality data. First, this paper adds to research by showing that stratification in the reading inputs that parents provide is stronger concerning the amount of books parents borrow

(i.e. the voraciousness with which they provide reading inputs) compared to the share of books that are developmentally appropriate for children. Second, all previous research on developmental gradients in parental inputs is based on self-reported data (surveys and time-use diaries), whereas this paper uses behavioral data on the actual books parents' have borrowed from Danish public libraries. Supplementing previous research with behavioral evidence is important because it mitigates potential concerns over (nonrandom) social desirability bias in parents' self-reports (Baumeister *et al.* 2007; Jerolmack and Khan 2014; Engzell 2021).

This paper uses unique registry data on children's books borrowed from Danish public libraries in 2020. These data offer the opportunity to study how many children's books parents borrow, and detailed information on each book borrowed also allows studying stratification in the types of books families select. In this paper, I focus on education and income gradients in the share of books parents select that match children's developmental stage – measured via (a) librarian age categorizations and (b) LIX counts (readability index that measures textual complexity, length of words and sentences, etc.). I study SES gradients in the share of developmentally appropriate books rather than the simple amount to (a) focus on how parents prioritize between selecting different books and (b) separate SES associations with selecting a lot of books from associations with selecting developmentally appropriate books in particular.

The results show that parents with higher education are more likely to use libraries and that they borrow more books when they use libraries. In contrast, among those who use libraries, parents with higher education do not select a higher share of books that match their

children's developmental stage; in actuality, they select a slightly lower share. The income gradient in the amount of books borrowed is smaller than the educational gradient, but, conversely, high-income families do to a small extent select a higher share of developmentally appropriate books. These results are robust to accounting for (a) nonrandom selection into the sample of library borrowers via a Heckman selection model and (b) for the impact of the Covid-19 lockdown of libraries. I use information on families' average reading skills to account for measurement error in assigning books as developmentally appropriate; for children with very high or low reading skills, what is on average developmentally appropriate does not match their actual skill level. The results are robust to controlling for SES gradients in children's reading skills. Finally, I use only-child families to account for measurement error in determining which book is intended for which child in a family and to analyze heterogeneity across age groups. Overall, the results are robust across one-child families with children of different ages, but I find that the educational gradient in the amount of books borrowed is largest in families with (more) children just before or in early primary school. This finding is in line with previous research on developmental gradients in parental inputs that has similarly found SES gradients in providing reading inputs to be largest just prior to or in the early years of schooling (Kalil *et al.* 2012; Blaurock and Kluczniok 2019). The implication of this paper's findings is then *not* that previous studies are faulty in finding developmental gradients in parental inputs. The results more likely imply that while highly educated parents might select an input (e.g., books) that is developmentally appropriate at a particular age, they in-

vest in providing more of this input rather than in providing the very most developmentally appropriate variant of the input.

Socioeconomic gradients in reading

The following two sections present the theoretical framework and motivate this paper's hypotheses. A large tradition within sociology, with roots in the works of Bourdieu (1977, 1986), has studied the cultural socialization that takes place within families and how this relates to broader patterns of inequality in society. On a very broad level, studies have consistently shown that high-SES individuals engage in more culture and transmit their cultural preferences to their children (Georg 2004; van Hek and Kraaykamp 2015; Falk and Katz-Gerro 2016; Jæger and Breen 2016; Kraaykamp and Notten 2016). More specifically, empirical research has also suggested that reading is more prominent in high-SES families (Gracia 2015; Macmillan and Tominey 2020; O'Flaherty and Baxter 2020) and that high-SES families actively invest in transmitting reading preferences to children as a part of engaging children in a culture of reading (Kraaykamp 2003; Notten *et al.* 2012; Kraaykamp and Notten 2016; Sikora *et al.* 2019). Similarly, research on library usage has found that high-SES individuals use libraries more (Hawkins *et al.* 2001; Kraaykamp 2003; Soria *et al.* 2015). Cultural capital theory and empirical research then lead to the first hypothesis of the study:

H1: High-SES families borrow more children's books from libraries.

What is less clear based on current research is whether stratification in reading only implies variation in the amount of time spent reading or whether this also implies more fine-grained distinction in terms of the books different families provide for their children. Research on cultural consumption has long been interested in many forms of differentiation in cultural consumption. Traditionally, research has studied cultural participation by analyzing participation in highbrow vs. lowbrow cultural activities (De Graaf *et al.* 2000; van Hek and Kraaykamp 2015; Hanquinet 2017). A rather extensive literature has also studied the concept of omnivore cultural consumption, which argues that stratification concerning the breadth of cultural consumption has replaced stratification with respect to highbrow cultural participation (Peterson and Kern 1996; Tampubulon 2010; Katz-Gerro and Jæger 2013). As a spin-off of the omnivore thesis, Katz-Gerro and Sullivan (2010, 2022) propose the concept of voracious cultural consumption to focus on the sheer amount or extensiveness with which people engage in culture (i.e., a focus on the amount rather than the breadth of cultural participation). Research, specifically on parents' reading inputs, has studies this primarily in a quantitative dimension (e.g. how many books/how much time). In this paper, I take a different approach and additionally study variation in the types of books that parents provide for children. However, rather than focus on the distinction between high- vs. lowbrow or omnivore vs. univore preferences, which have dominated research on cultural consumption, I study the extent to which families select books that match children's developmental stage. To this end, I take inspiration from research

on developmental gradients in parental inputs that has argued that high-SES families tailor the inputs they provide more to what is developmentally appropriate for children at a particular stage in their life. I choose this focus because selecting developmentally appropriate books is empirically important in this context. Research has shown that children learn more when reading and engaging with books that match the skill level they are currently at (Rog and Burton 2001; Fry 2002; O'Connor *et al.* 2002; Allington 2013; Schwarz 2015). In the next section, I review current research on developmental gradients in parental inputs.

Selecting developmentally appropriate parental inputs

In their seminal paper, Kalil *et al.* (2012) define the concept of developmental gradients to capture that high-SES parents are more likely to prioritize activities that are developmentally appropriate for their children. Kalil *et al.* (2012) draw on Lareau's (2003) work on concerted cultivation, which outlined that middle-class parents are more likely to focus on activities that actively develop children's learning and growth. Most empirical literature on concerted cultivation, cultural capital, and reading inputs has focused on activities in a quantitative dimension – that is, how much of a given input do parents provide? (Bodovski and Farkas 2008; Cheadle and Amato 2011; Jæger and Breen 2016; Mikus *et al.* 2021; Blaabæk 2022). The idea of developmental gradients expands on this literature by focusing on not just who provide most inputs, but whether SES gradients are larger when particular inputs are most appropriate to advancing children's children's development (Kalil *et al.* 2012). Work on developmental

gradients then explicitly draws on developmental psychology to argue that (a) children go through developmental stages where they face particular challenges and develop particular skills and (b) that effective parenting means being sensitive to the challenges relevant at a given developmental stage (Kalil *et al.* 2012). Several empirical papers have drawn on the concept of developmental gradients in parental inputs and found (based on survey and time diary data) that high-SES mothers are more likely to prioritize particular inputs when they are developmentally appropriate for their children (e.g., focusing on basic care for infants, playtime for toddlers, teaching for preschoolers and time management for school-age children; Kalil *et al.* 2012; Gracia 2014; Rebane 2014; O'Flaherty and Baxter 2020). Kalil *et al* argue that reading inputs (as part of teaching activities) are most developmentally appropriate when children are in preschool (ages 3-5) as it aids in the early development of reading and other cognitive skills.

Building on the literature on developmental gradients, I expect that high-SES families, in addition to borrowing more books from libraries, are also more likely to select books are developmentally appropriate in that they match children's developmental stage. In contrast to previous work, I then do not focus on *when* parents provide books, but on whether parents in particular select books that match children's developmental stages – for example, tactile and sensory books for infants, picture books for toddlers, easy-to-read books for primary school children, and more complicated texts for children in middle school. In order to focus on parents prioritizing developmentally appropriate books over other books, I study the share of de-

velopmentally appropriate books parents borrow rather than the amount. To exemplify, if a parent randomly borrows many books, they will also, by chance, borrow many developmentally appropriate books. In contrast, I would only the parent to borrow a higher *share* of developmentally appropriate books, if they actively seek out and select these books in particular. I use two indicators to capture which developmental stage a book is appropriate for – that is, an age range assigned by librarians and the LIX score that captures the readability or difficulty of the text. The age range assigned by librarians has the advantage of taking more features of books into account and being relevant for a larger age group; in contrast, LIX is mostly for books for beginning readers. LIX is relevant because it schools and librarians use this as a tool to assign which books are appropriate for children to read depending on their reading skills. This leads to the second, and main, hypothesis of this paper:

H2: High-SES parents select a higher share of developmentally appropriate books than low-SES parents.

The context: Danish public libraries

In Denmark, all municipalities are by law required to make library services available for all members of the public and to provide library services for both adults and children. It is free to borrow both physical and online materials from the libraries, which has the important implication that families can expose their children to more (and a more varied selection of) books

than they would be able to if they had to buy the books themselves. Library users use their social security card (or school ID) to borrow books, but they have to register as borrowers at a local library to use its services. Becoming a library user is free and can be done easily either online or at the library with the help of librarians. There are fines for overdue books (20-230 DKK or 3-31 EUR depending on how late the book is returned), but books can easily and freely be renewed online or at the library unless there is a waiting list for the particular item. There is no limit on the number of physical books one can borrow, but digital borrowings are usually limited to around five items per month, and limits vary across municipalities. A substantial number of free online books are however always available that everyone can borrow regardless of local limits or monthly borrowings.

Data and research design

Data

The main dataset used in this paper comes from the Danish public libraries and contains information on each item borrowed from a public library in 2020. I use data from 2020 as this is the only year for which relevant information on library borrowings, age-range, and LIX information is available. In supplementary analyses, I restrict the analyses to either only count books borrowed when libraries were *not* under Covid-19 lockdown or books borrowed before the first Covid-19 lockdown (March–May 2020). Through person identifiers, these data can be linked to data from the administrative registries containing information on families, de-

mographics, income, education, and so on. The library data contain information on all transactions in libraries and include metadata on each item – for example, type of material (e.g., books, music CDs, and games), adult or child material, appropriate age range, and so on. Given that the topic of this paper is children and reading, I only retain observations of books from the children's book selection (including physical and digital books, but not audiobooks).[1]

In the main analysis, I restrict the sample to households that include at least one child aged 0 to 16 (children in or before primary school) living with a legal parent and households where parents had borrowed at least one children's book in 2020. 34% of households with children had borrowed a children's book from the library in 2020. I implement these sample restrictions so that I can compare SES gradients in the amount of books borrowed and in selecting developmentally appropriate books for the same population. The main analyses then focus on variation in library books borrowed within the population of library users. Before the main analyses, I discuss SES gradients in selecting into the sample of library users, and in the supplementary analyses, I use information from the full population of families with children to correct for nonrandom selection into the sample of library users.

The data used in this paper are of considerably higher quality than the survey data most previous research has used because they (a) contain population-level information, making potential nonrandom survey participation irrelevant; (b) provide unprecedented granular

[1] I exclude audiobooks because one of the main indicators capturing developmentally appropriate books (LIX count) relates to children's ability to read written text and hence is not relevant for audiobooks.

information on book selection (via book ID for each book borrowed); and (c) reduce nonrandom measurement error due to self-reporting. Self-reported data might contain bias if people do not report correctly on their actual behavior (Baumeister *et al.* 2007; Jerolmack and Khan 2014). This is particularly problematic in this context if high-SES parents are more likely to over-report on providing developmentally appropriate activities. In line with this, Engzell (2021) shows evidence of socioeconomic gradients in misreporting books in the home. The tradeoff of using data from administrative registries is the lack of information about how often and in what ways families use the books they borrow, how they perceive their motivations for borrowing books, and information about other sources of reading materials (e.g., book purchases or a home library). That said, the data provide information that is rarely obtained through surveys (e.g., information on the age range and LIX count of each book borrowed) and provide important new information about how families select reading inputs for their children.

Variables

Amount of books borrowed: The number of books (including e-books) categorized as children's material that either the identifying person in the family or their partner (i.e., legal or stepparents) has borrowed. Families are defined as households that include at least one child aged 0–16 as of December 31, 2019, living with a legal parent. For each child, I use information on the family where they have a registered address. The variable is zero-truncated

(i.e., contains counts only for those who have borrowed at least one children's library book within the year). The exception to this is Model 1 in Table 2, where I run the first analyses on the entire population of families with children (i.e., including zeroes). To reduce the weight attributed to the tail of the distribution, I cap all sum variables at 400 books (equivalent to the 99.9th percentile).

Selecting developmentally appropriate books: I measure the extent to which parents select particularly developmentally appropriate books as the share of developmentally appropriate books out of the total amount of books borrowed. I focus on the share of developmentally appropriate books rather than the amount to focus on parents prioritizing developmentally appropriate books over other books. I define developmentally appropriate books as those that are marked as appropriate for a given child's age or grade because research has shown that children learn more (reading skills and content learning) when they read and engage with books that are at the right level of difficulty (Rog and Burton 2001; Fry 2002; O'Connor *et al.* 2002; Allington 2013; Schwarz 2015). If books are too difficult or too easy, children learn less, partly because they lose interest and stop reading. I use two indicators to capture whom books are developmentally appropriate for.

The first is the age-appropriate indicator, which is based on librarians' assessment of the age range a book is appropriate for; on average, an age range covers 2.5 years. Librarians categorize books as appropriate for a particular age range based on a wide array of infor-

mation about, for example, the complexity of the text (length and familiarity of words), the topic, the style of writing, and visual supports (font size and pictures).[2] Second, the LIX-appropriate indicator is based on LIX count, which measures textual complexity (number of words, number of periods, and number of long words; Björnsson 1968; Anderson 1983). LIX count simply captures how complex a text is and does not consider the content of the text or the familiarity of words. Using an indicator based on LIX count is ideal to capture parents' selection of developmentally appropriate books because schools and librarians rely heavily on LIX counts to help parents (and children) select books that are appropriate to progress children's reading development. To ascertain whether a book is LIX appropriate, I use the conversion table between LIX count and grade level, which is used in the online portal that schools utilize to suggest e-texts for home reading in grades 0–6 (see Online appendix Table A1). For each grade, 4 to 6 LIX counts are assigned as appropriate, which leaves some room for readers within grades to be more or less advanced. I assign a book as being LIX appropriate if any child in the household per spring 2020 is within the grade range for which a book with a given LIX count is assigned as appropriate.

The data contain information on librarians' age assessments for most children's books in the study (82%), but considerable information on LIX count (19% have LIX count) is missing because it is usually only calculated for books for beginning readers and is not collected

[2] The appropriate age range of books is shown when ordering or searching for books online or if books are borrowed as e-books. Often, the information will also be printed on the back of books and/or be indicated by their physical placement in the library.

systematically. Therefore, in the analyses on the share of LIX-appropriate books, I restrict the population to families with at least one child in grades 0–6 (ages 6–12).

Socioeconomic status (SES): I use information on the total disposable household income (post public transfers and tax) in 2019 and years of education for the adult residing in the household with the highest education; supplementary analyses, available upon request, show similar results by either averaging over parents' educational level or using both the father's and mother's education. To reduce the weight attributed to the very large tails of the income distribution, I used a percentile ranked score (1–100; ranked within the full population of families with children).

Family reading skills: In the supplementary analyses, I use information on the reading skills of children in the family to analyze whether SES gradients in selecting developmentally appropriate books depend on gradients in children's reading skills. I construct an indicator of the average reading skills in the family based on test scores from mandatory national reading tests implemented in primary school. I also construct a variable capturing the squared term of reading skills to account for families potentially taking out fewer age-appropriate books for both very weak readers (who require easier than average texts) and very strong readers (who require more difficult texts). All children in public schools are required to take reading tests in the second, fourth, sixth, and eighth grades. I have test score information from three school

years (2016/2017, 2017/2018, and 2018/2019). Test scores are standardized within year and grade level, which means they are comparable across children of different ages. I use the most recently available test score for each child before averaging over all children in a family. Due to data availability, conditioning on children's reading skills also implies conditioning on families with at least one child in second grade or above in the 2018/2019 school year (i.e., about 9–10 years old in 2020).

Distance to the library: Straight-line distance in KM from household address to address of the closest library branch.

Control variables: I control for the age and sex composition of children aged 0 to 16 in the family (number of boys, number of girls, number of children ages 0–2; 3–5; 6–8; 9–10; 11–13; and 14–16) and use a dummy variable indicating whether at least one child in the family is a first- or second-generation immigrant.

Descriptive statistics

Table 1 shows descriptive statistics for (a) the entire population of families with children and (b) the selected sample who used libraries in 2020 and have no missing information on relevant variables. In about a third of all families with children, parents borrowed at least one children's book from public libraries in 2020 (and 43% in families with children in grades 0–6).

On average, families who used libraries in 2020 took out about 25 books each, of which about 52% were age appropriate for a child in the household based on the librarian's age assessments. Comparing the full and selected samples, it is clear that those who use libraries have, on average, higher education and income and are less likely to have an immigrant background. The sample of library users then consists of more advantaged families who likely have more resources (in financial and nonfinancial terms). The sample is also likely to be selected on reading preferences in the household as parents who themselves read and enjoy reading are probably more likely to also invest in using libraries to borrow books for their children. In the supplementary analyses, I control for this nonrandom selection into the sample using a Heckman selection model (using distance to the closest library as exclusion restriction). It is important to point out that the main results are based on variation in library book preferences among library users.

TABLE 1. Descriptive statistics

	Population: Families w. children				Population: Families w. children who borrowed a book in 2020			
Variable	Mean	SD	N	Min; Max	Mean	SD	N	Min; Max
Any children's books borrowed	0.34	0.47	632,354	0; 1				
Any children's books borrowed (families with children grades 0-6)	0.43	0.50	325,795	0; 1				
Number of children's books	8.35	26.87	632,354	0; 400	24.46	41.48	215,615	1; 400
Percent of age-appropriate books					52.11	33.88	215,615	0; 100
Percent of LIX-appropriate books					8.37	15.64	140,409	0; 100
Parent highest years of education	15.72	2.42	629,583	2; 22	16.61	2.05	629,583	7; 22
Family income (percentile rank)	50.50	28.87	632,354	1; 100	58.13	27.15	629,583	1; 100
Number of boys	.87	.76	632,354	0; 7	0.96	0.79	629,583	0; 7
Number of girls	.83	.75	632,354	0; 8	0.93	0.77	629,583	0; 6
Children age 0-2	.29	.50	632,354	0; 4	0.26	0.48	629,583	0; 3
Children age 3-5	.29	.50	632,354	0; 4	0.36	0.54	629,583	0; 4
Children age 6-8	.28	.50	632,354	0; 4	0.40	0.56	629,583	0; 4
Children age 9-10	.21	.43	632,354	0; 4	0.28	0.47	629,583	0; 3
Children age 11-13	.32	.53	632,354	0; 4	0.35	0.55	629,583	0; 4
Children age 14-16	.21	.45	632,354	0; 4	0.16	0.40	629,583	0; 4
Family immigration status	.13	.33	632,354	0; 1	0.07	0.25	629,583	0; 1

Research design

First, I present a figure summarizing the raw averages in terms of (a) who uses libraries and how many books library users borrow and (b) the share of developmentally appropriate books families select depending on parents' income and education. Second, I run ordinary least squares (OLS) regressions on both the amount (in the total population and among users) and type (developmentally appropriate) of books parents borrow. Third, I present several explora-

tory analyses probing the robustness of the findings in terms of (a) nonrandom sample selection, (b) SES gradients in children's reading skills causing measurement error in assigning books as developmentally appropriate, (c) the impact of library closures due to the Covid-19 lockdown, and (d) age heterogeneity and measurement error due to multiple children in the family. A replication package containing the files used to recode variables and run analyses is available on the journal website.

Results

Fig. 1a shows the share of families with children who have used libraries in 2020 (gray bars) and how many books those who used libraries on average borrowed. The figure shows that families with more education and income are more likely to use libraries and borrow more books from libraries when they use them. The gradients in the share that uses libraries again suggest that it is a nonrandom sample of the population that borrows books from libraries. The following analyses focus on variation among families who use libraries, which means gradients in, for example, the amount of books borrowed are only part of the overall inequality in children's access to library books. Following the main analyses, I use a Heckman selection model to estimate and correct for nonrandom selection into the sample of library users. The main conclusions are robust to controlling for sample selection.

Fig. 1b shows the average share of developmentally appropriate books across parents' income and education. In contrast to what was expected, this figure indicates that highly edu-

cated families do not select a higher share of developmentally appropriate books, whereas high-income families mainly seem to select more developmentally appropriate books in terms of the librarian's age recommendations and less so in terms of the LIX score.

Figure 1a. Educational and income gradients in using libraries and the amount of books borrowed

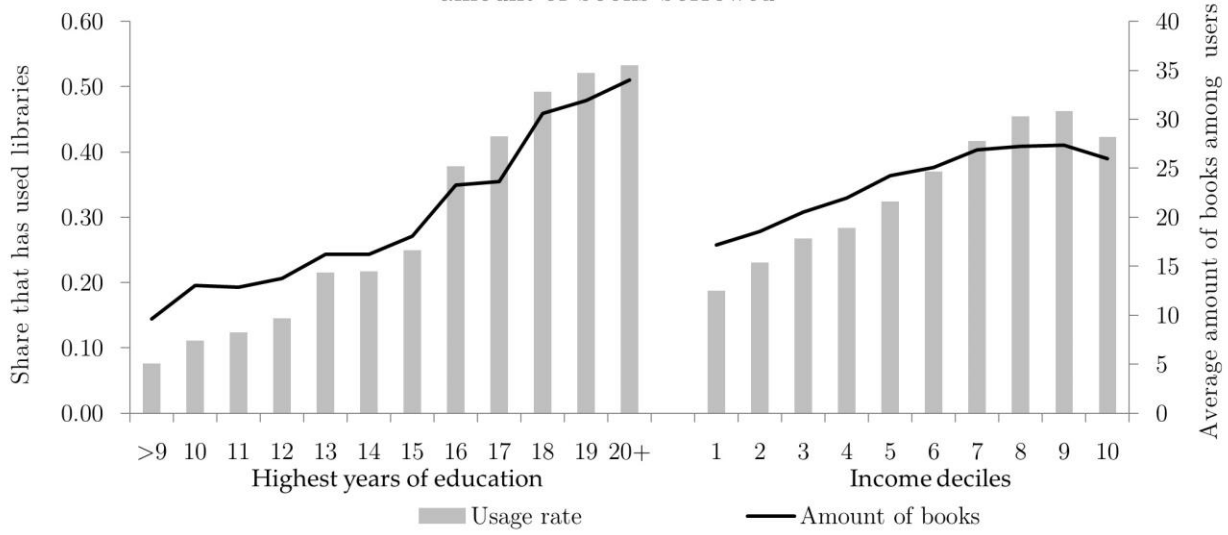
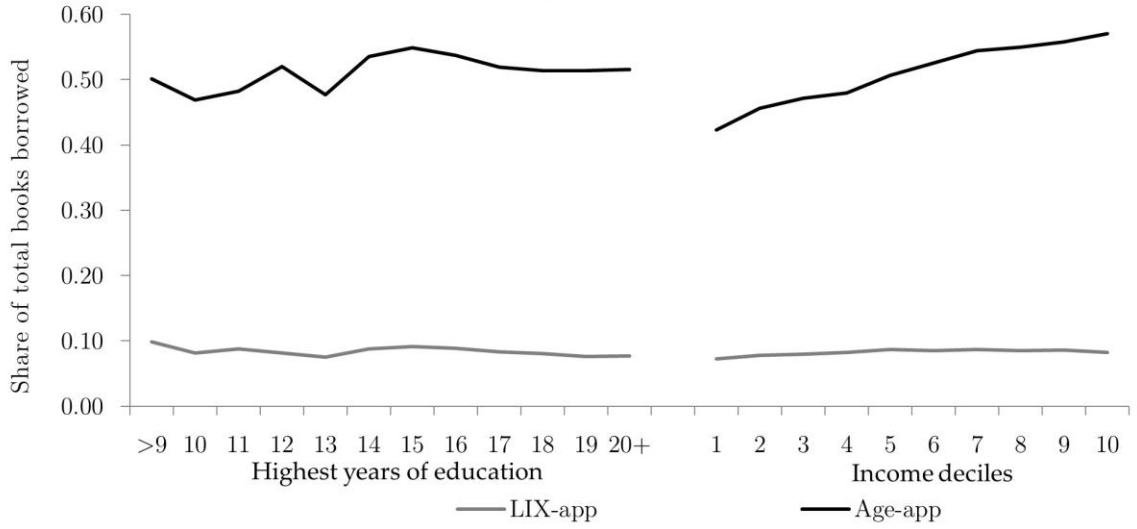


Figure 1b. Educational and income gradients in the share of developmentally appropriate books



Amount of library books

The following sections presents results from the OLS regressions. Compared to Fig. 1a, the regression analyses offer the opportunity to separate the educational and income associations and control for simple compositional differences (children's age, sex, and immigrant status). Model 1 presents a regression model on the amount of library books borrowed among the full population of families with children (including zeroes) and shows that highly educated and high-income families are more likely to borrow (more) books from libraries. In Model 2, I restrict the sample to families who have taken out at least one book in 2020. This allows me to compare, for same the sample, gradients in the amount of books borrowed and the propensity to select developmentally appropriate books. Model 2 shows that among those who use libraries, highly educated and high-income families borrow more books.[3] The fully standardized estimates in brackets allows me to compare the relative magnitude of the income and educational associations. The standardized estimates suggest that stratification in the amount of books borrowed is stronger with respect to education than income; for example, one standard deviation change in education is associated with an almost 10 times higher amount of books borrowed than one standard deviation change in income. Hence, although the association is statistically significant, high-income families only to a limited extent borrow more books from

[3] Figs. 1a and 1b indicate that nonlinear associations between the amount of books borrowed and education/income might be relevant. In Online appendix Figs. A1 and A2, I estimate the gradients, including a squared term for income and education, and test a model using educational categories rather than years of education. Overall, these specifications support the main findings.

libraries (conditional on them using libraries). The results thus so far support the first hypothesis that high-SES families invest more in children's reading by borrowing more books (and being more likely to use libraries).[4] In the following section, I move to the second hypothesis: Are there socioeconomic gradients in selecting specifically developmentally appropriate books?

TABLE 2. Results from OLS regressions on amount of books borrowed and share of developmentally appropriate books.

	Amount of books		Share age-app.	Share LIX-app.
	Model 1	Model 2	Model 3	Model 4
Parent highest years of education	1.571 ***	2.254 ***	-.680 ***	-.338 ***
	[.142]	[.132]	[-.049]	[-.052]
	(.015)	(.046)	(.037)	(.021)
Family income (percentile)	.027 ***	.020 ***	.085 ***	.021 ***
	[.029]	[.014]	[.072]	[.038]
	(.001)	(.004)	(.003)	(.002)
Condition on any library usage:		X	X	X
N (households)	629,583	215,615	215,615	140,409

NOTE. Two-tailed tests. *P<.05, **P<.01, ***P<.001. Control variables: number of boys, number of girls, number of children age 0-2; 3-5; 6-8; 9-10; 11-13; 14-16 and immigrant status. Standard errors in parenthesis. Estimates from models with standardized variables in brackets.

[4] In the supplementary analyses (see Online appendix Table A2), I additionally control for the most used library branch to control for differences in selection patterns driven by what is available at local libraries or how they present (developmentally appropriate) books to families. The results are robust to this specification. I do not implement this approach in the main analyses, as this would mean conditioning on a collider to the extent that families might self-select into areas with particular book preferences or library facilities.

Selecting developmentally appropriate books

In this section, I analyze results related to the second hypothesis of this paper. In the regression on selecting LIX-appropriate books (Model 4), the sample size is lower because it only includes families with at least one child in grades 0–6. Results from Model 3 show that parents' education has a negative association with the share of age-appropriate books. Despite this, as families with higher education borrow substantially more books in total, they also borrow more developmentally appropriate books in numerical terms (see Online appendix Table A2). As mentioned, I focus on the share rather than the amount to study parents' preferences for selecting developmentally appropriate books in particular. The negative educational gradient is the opposite of the expectation expressed in the second hypothesis. Results from Model 3 on borrowing LIX-appropriate books show similar results as those presented for age-appropriate books. In contrast, the association with income is positive and statistically significant for both age-appropriate and LIX-appropriate books (in line with the developmental gradient hypothesis). When interpreting these statistically significant income gradient results, it is important to keep the large sample size in mind. Even though all associations are statistically significant, the fully standardized income associations in Models 3 and 4 are rather small (respectively, 7% and 4% of 1 standard deviation change).

In summary, results support positive SES gradients in the number of library books borrowed, whereas the results do not support a positive educational gradient in selecting de-

velopmentally appropriate books and only to a limited extent a positive gradient in selecting developmentally appropriate books for family income.

Testing the robustness of results

The following sections present four exploratory analyses tackling issues that might affect the interpretation of the findings. The first analysis discusses nonrandom selection into the sample of library users, and the second discusses the potential implications of skill differentials between children from different socioeconomic groups. Third, I discuss the implications of the Covid-19 lockdown, and, fourth, I analyze the results' robustness to restricting the sample to only-child families and studying heterogeneity across children's ages.

Are the results due to sample selection?

A limitation of focusing on books borrowed among families who use libraries is that this is likely a nonrandom sample of the population. Fig. 1a shows this as well. This then raises the question of whether the unexpected lack of a positive educational gradient in selecting developmentally appropriate books could be due to sample selection. For example, if the type of low-SES families who use libraries are particularly likely to also select a high share of developmentally appropriate books (perhaps because they are selected on having a preference for books or learning), this could explain the results. Addressing this issue is tough as book selection is, obviously, not observed for those who do not use libraries.

In a supplementary analysis below (Table 3), I attempt to tackle the issue by using a Heckman selection model to control for nonrandom sample selection (Heckman 1979; Bushway *et al.* 2007). The logic of this approach is to conceptualize sample selection as an omitted variable bias problem. The solution is then to first run a regression that estimates the propensity to select into the sample (selection part) and then, based on this, calculate a parameter (the inverse Mills ratio) that can be used as a control variable in the main regression (outcome part) to account for sample selection. It is possible to implement this approach in this paper, as the registry data provide information not only on library users but also on the characteristics of those who do not use libraries. To ensure identification of the model, an exclusion restriction is needed (i.e., something that predicts selection into the sample, but conditioning on selection into the sample does not affect the outcome of interest) (Heckman 1979; Bushway *et al.* 2007). The logic here is similar to that of an instrumental variable model. Including an exclusion restriction in the model ensures that one does not simply weigh up the proportion of low-income library users, for example, but also corrects for the fact that the type of low-income families who have self-selected into the sample is likely different in unmeasured ways from the low-income families who did not select into the sample. In the application below, I use distance to the closest library (in KM) as an exclusion restriction because prior research has shown that a longer distance decreases library usage (Bhatt 2010). Further, distance itself is unlikely to affect the amount of books borrowed or the share of developmentally appropriate books conditional on having used the library. The table below also shows a version of the

model where I additionally add municipality fixed effects to account for some areas generally being closer and farther from libraries.

First, the results presented in Table 3[5] in the selection part show that highly educated families are more likely to use libraries, whereas there is less selection in terms of income. Second, results from the selection-corrected model (outcome part) suggest larger SES gradients in the amount of books families borrow. Third, in terms of selecting developmentally appropriate books, the already small income gradient shrinks considerably while the negative educational gradient grows. This suggests that the positive income gradient is to an extent due to sample selection (i.e., higher preference for developmentally appropriate books among high-income library users) rather than a general tendency for high-income families to have a preference for developmentally appropriate books. In contrast, the larger negative educational gradients in the selection corrected models could indicate that it might be the low-education families who do not currently use libraries (e.g. due to limited reading preferences) who are most likely to borrow books instrumentally to improve children's reading skills by selecting developmentally appropriate books in particular. Perhaps highly educated families with a strong home reading culture select both books that are good for learning to read and books that are simply for children's enjoyment, whereas low-educated families with a weaker home reading culture may

[5] The sample size is higher in Table 3 because the sample selection model use information on the full population, including those who have not used libraries. The sample size is lower in the LIX-appropriate analysis as this is conditional on families with at least one child in grades 0–6.

only go to the library to select books (teachers might have suggested) to help children learn to read. This would be in direct opposition to the second hypothesis presented in this paper.

TABLE 3. Results from Heckman selection regression models controlling for non-random selection into the sample of library users. Exclusion restriction: distance to closes library

	Amount of books		Share age-app.		Share LIX-app.	
Outcome part						
Parent highest	4.085 ***	4.275 ***	-2.511***	-2.653 ***	-.677 ***	-.710 ***
years of education	[.239]	[.250]	[-.180]	[-.190]	[-.105]	[-.110]
	(.156)	(.154)	(.125)	(.124)	(.073)	(.073)
Family income	.042 ***	.032 ***	.063 ***	.058 ***	.012 ***	.009 ***
	[.029]	[.022]	[.054]	[.050]	[.023]	[.016]
	(.004)	(.004)	(.003)	(.003)	(.002)	(.002)
Selection Part						
Parent highest	.141 ***	.143 ***	.141 ***	.143 ***	.144 ***	.145 ***
years of education	[.343]	[.346]	[.343]	[.346]	[.348]	[.350]
	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
Family income	.002 ***	.002 ***	.002 ***	.002 ***	.004 ***	.003 ***
	[.051]	[.044]	[.051]	[.044]	[.106]	[.098]
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
Distance to closest library	-.032 ***	-.037 ***	-.032 ***	-.037 ***	-.033 ***	-.036 ***
	[-.081]	[-.091]	[-.081]	[-.091]	[-.082]	[-.089]
	(.000)	(.001)	(.000)	(.001)	(.001)	(.001)
Municipal dummies		X		X		X
N (households)	629,524	629,524	629,524	629,524	324,522	324,522

NOTE. Two-tailed tests. *P<.05, **P<.01, ***P<.001. Control variables: number of boys, number of girls, number of children age 0-2; 3-5; 6-8; 9-10; 11-13; 14-16, immigrant status. Standard errors in parenthesis. Estimates from models with standardized variables in brackets.

Are the results due to social gradients in children's reading skills?

The following exploratory analyses zoom in on the extent to which differences across educational groups in children's reading skills might explain the unexpected negative educational gradient in selecting developmentally appropriate books. In Table 4,[6] I present analyses where I add controls for the average reading skills of children in the family. I do not include information on reading skills in the main analyses because this is only available for a subset of families (those with at least one child in grade 2 or above in 2018 who had taken a reading test in school).[7] The logic behind this approach is attempting to control for measurement error in which books are developmentally appropriate for a particular child (who might be more or less skilled than the typical child their age). *Not* controlling for children's reading skills might downwardly bias the estimates of families' preferences for developmentally appropriate books. If children have higher or lower skills than typical for their age/grade, parents *should* select books that are not appropriate for what is common for their age/grade. To incorporate that, I expect both children with very low and very high reading skills to select fewer books that are developmentally appropriate for their age, and I add a squared term for reading skills to the regressions. If children have very high reading skills, families would likely select books that are

[6] The sample size is lower in the first three models in Table 4 compared to Table 2 due to conditioning on (having information on) reading skills. In the fourth and sixth models, the sample size is similar to the main analyses, whereas the sample size is again lower in the fifth and seventh models due to conditioning on reading skills.

[7] In the supplementary analyses (Online appendix Table A4a-A4c), I restrict the sample to only-child families, which incurs further sample selection, but ensures that the child taking the reading test and receiving the book is the same. The results are similar to those presented in Table 4.

above what is typically recommended for the child's age/grade, and if children have very low reading skills, they would likely select books that are below what is typically recommended. Table 4 shows that controlling for children's reading skills makes little difference to the results about selecting developmentally appropriate books.[8] Hence, SES differences in children's reading skills are not likely a major explanation as to why highly educated families select a lower share of age-appropriate books.

The surprising finding of a negative educational gradient in selecting developmentally appropriate books warrants further inspection into which books highly educated families then select more of. The supplementary analyses presented in Table 4 show that highly educated families select more books that are "too old" for children in their household and less that are "too young" (though the standardized estimates of around .05 suggest that the differences are not large).[9] This could indicate that highly educated families are "overambitious" and end up selecting books that are too difficult for their children. However, when I control for the average reading skills of children in the family, there is no longer evidence of "over ambitiousness" (standardized estimate: .007). Hence, results suggest that highly educated parents select de-

[8] The estimate of the educational gradient in the amount of books drops when controlling for children's reading skills. However, this is largely due to changes in sample selection. Conditioning on knowing children's reading skills also means conditioning on families having older children (who have taken the tests), and the supplementary analyses (Online appendix Table A3) show that educational gradients in the amount of books borrowed are smaller in families with older children.

[9] In the models on the share of books that are "too old/young" for children in the family, I did not include the squared term for reading skills, as we would here expect families with skilled children to borrow more books that are "too old" and fewer that are "too young," and we would expect the opposite for families with less skilled children.

velopmentally appropriate books for their (skilled) children. But, conditional on reading skills, not substantially more or less so than less-educated parents. Of course, a dynamic interplay between children's reading skills and borrowing library books complicates interpreting these results, which suggests there is a need for further research.

TABLE 4. Results from regressions controlling for children's reading skills and using share of books "too young/old" as the outcome.

	Amount of books	Share age-app.	Share LIX-app.	Share "too young" for any child		Share "too old" for any child	
Years of education	1.362 ***	-.455 ***	-.173 ***	-.385 ***	-.172 ***	.663 ***	.077 *
	[.080]	[-.033]	[-.027]	[-.049]	[-.022]	[.057]	[.007]
	(.062)	(.060)	(.027)	(.021)	(.040)	(.028)	(.031)
Family income	.030 ***	.091 ***	.016 ***	-.015 ***	-.032 ***	-.034 ***	-.014 ***
	[.021]	[.077]	[.030]	[-.022]	[-.048]	[-.035]	[-.015]
	(.005)	(.005)	(.002)	(.002)	(.003)	(.002)	(.002)
Fam. reading score	3.008 ***	-.496 ***	-.701 ***		-2.289 ***		1.311 ***
	[.068]	[-.014]	[-.042]		[-.112]		[.044]
	(.133)	(.129)	(.059)		(.087)		(.067)
Fam. reading score^2	.951 ***	-.601 ***	-.153 ***				
	[.042]	[-.033]	[-.018]				
	(.074)	(.072)	(.034)				
N (households)	98,365	98,365	79,836	215,615	98,368	215,615	98,365

NOTE. Two-tailed tests. *P<.05, **P<.01, ***P<.001. Control variables: number of boys, number of girls, number of children age 0-2; 3-5; 6-8; 9-10; 11-13; 14-16, immigrant status. Standard errors in parenthesis. Estimates from models with standardized variables in brackets.

What are the implications of the Covid-19 lockdown?

One concern with the data used in this paper is that trends might be affected by the lockdown due to Covid-19 (Jæger and Blaabæk 2020), and hence they might be less representative of past and future associations. Table 5 shows results where I only count books taken out before the lockdowns occurred (i.e. January and February) or count books taken out in all months where libraries were physically open (i.e., January–February and June–November). The sample size is smaller in Table 5 compared to Table 2 as the supplementary analyses restrict on families having taken out at least one book within the relevant periods. The results are robust to either of these specifications.

TABLE 5. Results from regression only including books taken out outside of Covid-19 Lockdown

	Amount of books		Share age-app.		Share LIX-app.	
	Prior to lockdown	Prior and post	Prior to lockdown	Prior and post	Prior to lockdown	Prior and post
Years of education	.501 ***	1.917 ***	-.005 ***	-.669 ***	-.005 ***	-.379 ***
	[.092]	[.129]	[-.031]	[-.048]	[-.031]	[-.058]
	(.021)	(.042)	(.001)	(.038)	(.001)	(.023)
Family income	.000	.013 ***	.001 ***	.083 ***	.001 ***	.024 ***
	[.000]	[.011]	[.068]	[.070]	[.068]	[.043]
	(.002)	(.003)	(.000)	(.003)	(.000)	(.002)
N (households)	117,569	198,968	117,569	198,968	78,248	129,952

NOTE. Two-tailed tests. *P<.05, **P<.01, ***P<.001. Control variables: number of boys, number of girls, number of children age 0-2; 3-5; 6-8; 9-10; 11-13; 14-16, immigrant status. Standard errors in parenthesis. Estimates from models with standardized variables in brackets.

How do the results vary by age? Are the results due to measurement error in assigning which book is for which child in a family?

A concern related to the main analyses might be that these effects are highly dependent on children's ages. In the supplementary analyses (see Online appendix Table A3), I run an analysis similar to those reported in previous research (i.e., including an interaction between income and education and the number of children at different ages). In line with previous research, this analysis shows that the educational gradient in the amount of books borrowed is largest when there are more children aged 3–5 and 6–8, whereas the pattern is less clear for the income gradient and for selecting developmentally books. A further concern might be that it is difficult to ascertain which child in a family a book is actually for, which is particularly an issue in terms of studying effects by age but could also be a problem more generally. For example, in families with more children, a book is more likely to be appropriate for some child in the family, although it is not developmentally appropriate for the child actually reading the book. To deal with this, I run supplementary analyses with only-child families, where books can then only be intended for a particular child. Online appendix Table A4a-4c shows that results are robust in families with only one child and across all three age groups (0–5, 6–10, and 11–16). These results also suggest that the educational gradient in the amount of books borrowed is larger in families with younger children.

Discussion and conclusion

This paper asks whether families with more income and education are more likely to select developmentally appropriate books for their children from public libraries. Addressing this question is important because it provides greater insights into the more qualitative socioeconomic differences in the inputs parents provide to children's learning environments. Based on analyses of Danish registry data, I find that highly educated families are more likely to use libraries, borrow more children's books when they do use libraries, but do not select a higher share of developmentally appropriate books. In contrast, high-income families do not borrow many more books than low-income families, but high-income families do select a (little) higher share of developmentally appropriate books.

The results show that preferences for taking out many and/or developmentally appropriate books differ between the two SES indicators used in this paper, which was not initially expected. The weak income gradient in the amount of books borrowed suggests that it is not financial means which restrict families' use of libraries, which makes sense as borrowing books from libraries is free. The finding that the educational gradient is stronger than the income gradient in the amount of books borrowed could reflect the fact that there is considerably more educational inequality than income inequality in Denmark (due to extensive income redistribution via taxes; Heckman and Landersø 2021; Landersø and Heckman 2017).

A remaining puzzle relates to the finding of a negative educational gradient in selecting developmentally appropriate books, although, with a standardized estimate of about .05, the

differences are not large. An explanation for the negative educational gradient could be that children in highly educated families have higher reading skills, which leads families to select books that are more difficult than is typical for the children's ages. In line with this explanation, supplementary analyses showed that families with more education select more books that are "too old" for their children because their children have higher reading skills (and hence require more complicated texts). However, even conditional on the average reading skills of children in the family, a small negative association (standardized estimate of about .03) between education and the share of developmentally appropriate books remains. The negative educational gradient could also reflect that families with less education might acquire more help from librarians in selecting developmentally appropriate books. This would be in contrast to the developmental gradient hypothesis as it, at the very least, implies that low-SES families are invested enough in securing developmentally appropriate inputs to ask for help from librarians. Alternatively, the negative educational gradient could reflect that the more instrumental approach to books associated with selecting particularly developmentally appropriate books might be more prominent in low-SES families, who previous research suggests read less generally (i.e. the exact opposite of what is expected from the developmental gradient hypothesis). This could also suggest that highly educated families simply prioritize something different in their book selection than whether books are developmentally appropriate. If highly educated families, for example, have a stronger home reading culture, they might give children more leeway in selecting books themselves (which may or may not be developmentally appro-

priate). If this is the case, it could suggest that highly educated families invest more in children's reading as a cultural and leisure practice than as a tool for developing children's skills, leading to a preference for voracity in the amount of books borrowed over selecting specifically developmentally appropriate books (Katz-Gerro and Sullivan 2010, 2022; Sikora *et al.* 2019). Along similar lines, the negative educational gradient could imply that highly educated parents select a broader variety of books, including books from a wider age range, than families with less-educated parents. This would, again, be in contrast to the developmental gradient hypothesis, but could speak to the literature on the omnivore thesis, which predicts more diversity in cultural preferences among high-SES individuals (Peterson and Kern 1996). However, additional analyses do not support the hypothesis that high-SES families are generally more omnivorous in their selection of children's library books. In Online appendix Table A2, I run regressions on the share of non-fiction books and diversity in terms of author selection (number of books per author), and these results do not indicate that highly educated families generally have broader or different book preferences. Hence it seems that, mostly, highly educated families just select more of the same type of books as families with less education, suggesting more voraciousness than omnivorousness in book selection (Katz-Gerro and Sullivan 2010, 2022).

The results presented in this paper suggest overall that stratification in parents' book selection has more to do with the amount of books families borrow than with more qualitative differences in selecting developmentally appropriate books. Do the results then imply that

previous research is flawed since it documents socioeconomic developmental gradients in parental inputs? This is likely not the case. As the results presented in Online appendix Table A3 and A4a show, the educational gradient in the amount of books borrowed is largest when children are just before or in the early grades of school. This is in line with the argument from previous research that high-SES families are more likely to target reading inputs at the age when this is most appropriate to children's reading skill development (Kalil *et al.* 2012; Blaurock and Kluczniok 2019). Based on this supplementary finding, the primary results should likely be interpreted to reflect that, while highly educated parents might be more likely to select activities when these are appropriate to their children's developmental stage, they seem to prioritize providing a lot of a particular input (e.g., library books) more than they prioritize selecting the most developmentally appropriate variant hereof.

This paper studies, descriptively, socioeconomic gradients in the selection of developmentally appropriate books from libraries. I find this to be important because we know very little about more fine-grained variations in the types of reading inputs parents provide for their children. However, to fully understand how and why families choose to invest in, for example, children's reading, we need more knowledge about the motivations that lead families to select one input over another (e.g., borrowing many books rather than primarily developmentally appropriate books). These motivational aspects are something the data used in this paper cannot ever directly study, as it requires exactly what the data lack: in-depth information about why a parent chooses one book over another and what this means to the person. Re-

search on scholarly culture theory suggests that one motivation for parents to provide reading inputs for children is to invest in a family culture of reading (Sikora *et al.* 2019). Hence, one interpretation of this paper's results could be that highly educated families have a stronger reading culture and borrow a lot of books for children, not for learning, but to support a culture of reading. Other research suggests that differences in the extent to which parents believe in their ability to enhance children's cognitive skills explain SES gradients in parental inputs (Hoff and Laursen 2019). In contrast to perspectives that emphasize information or self-efficacy deficiencies, Kalil and Ryan (2020) argue that many low-SES families share a commitment to providing stimulating learning environments, but find that they are constrained in acting on this motivation by financial problems and family stress. These contrasting perspectives imply that we still have a long way to go in understanding how and why parents parent differently and provide different (reading) inputs for their children.

Understanding preferences and constraints behind parenting behavior better is important if one, for example, wants to target policies to reduce developmental gradients in parental inputs. Is it, for example, information, motivation, or structural constraints (or a combination of these) that should be the target of policy interventions? More research is then needed on families' motivations and constraints in providing reading inputs, but also on how institutional features play into socioeconomic gradients. Research that directly measures families' motivations for investing in home learning environments, for example, could improve our understanding of how, when, and why parents provide developmentally appropriate inputs.

Such research might also shine more light on studies that indicate that low-SES parents are increasingly mirroring a high-SES pattern of intensive parenting (Altintas 2016; Prickett and Augustine 2021). Is this change due to low-SES parents having a stronger preference for providing developmentally appropriate inputs or due to changes in the structural constraints for doing so (Jackson and Schneider 2022)? Concerning the libraries that are at the center of this study, research should explore more how their organization plays into maintaining or reducing socioeconomic gradients in children's access to books. For example, are the weak gradients in selecting developmentally appropriate books related to the role of (school) librarians? How does the physical organization of libraries matter (e.g., children being able to navigate libraries on their own)? Do the offerings available at the library (books, events, social spaces etc.) cater more to some groups than others? While the answers to these questions are, in some sense, very local and particular to the context of libraries, they would at the same time speak to our broader sociological understanding of how socioeconomic groups navigate and interact with institutions around them when providing inputs for their children.

References

Altintas, Evrim. (2016) 'The widening education gap in developmental child care activities in the United States, 1965-2013', *Journal of Marriage and Family* 78(1): 26–42.

Allington, Richard L. (2013) 'What really matters when working with struggling readers', *The Reading Teacher* 66(7): 520–530.

Anderson, Jonathan. (1983) 'Lix and Rix: variations on a little-known readability index',

Journal of Reading 26(6): 490–96.

Baumeister, Roy F., Vohs, Kathleen D. and Funder, David C. (2007) 'Psychology as the science of self-reports and finger movements. Whatever happened to actual behavior?' *Perspectives on Psychological Science* 2(4): 396–403.

Bhatt, Rachana. (2010) 'The impact of public library use on reading, television, and academic outcomes', *Journal of Urban Economics* 68(2): 148–166.

Björnsson, Carl Hugo. (1968) *Läsbarhet*, Stockholm: Liber.

Blaabæk, Ea Hoppe. (2022) 'Cultural inputs and accumulating inequality in children's reading: a dynamic approach', *European Sociological Review* 38(3): 425-439.

Blaurock, Sabine and Kluczniok, Katharina. (2019) 'Basic care, play, and teaching: the home learning environment and the "developmental gradient" in time use with children', *Early Child Development and Care* 189(13): 2099-2112.

Bodovski, Katerina and Farkas, George. (2008) '"Concerted cultivation" and unequal achievement in elementary school', *Social Science Research* 37(3): 903–19.

Bourdieu, Pierre. (1977) 'Cultural reproduction and social reproduction', in Jerome Karabel and Albert H. Halsey (ed.), *Power and Ideology in Education*, New York: Oxford University Press, pp. 487–511.

Bourdieu, Pierre. (1986) 'The forms of capital', in John G. Richardson (ed.), *Handbook of Theory and Research in the Sociology of Education*, New York: Greenwood, pp. 241–58.

Bushway, Shawn, Johnson, Brian D. and Slocum, Lee Ann. (2007) 'Is the magic still there? The use of the Heckman two-step correction for selection bias in criminology', *Journal of Quantitative Criminology* 23(2): 151–78.

Cheadle, Jacob E. and Amato, Paul R. (2011) 'A quantitative assessment of Lareau's qualitative conclusions about class, race, and parenting', *Journal of Family Issues* 32(5): 679–706.

De Graaf, Nan Dirk, De Graaf, Paul and Kraaykamp, Gerbert. (2000) 'Parental cultural capital and educational attainment in the Netherlands: a refinement of the cultural capital perspective', *Sociology of Education* 73(2): 92–111.

Engzell, Per. (2021) 'What do books in the home proxy for? A cautionary tale', *Sociological*

Methods and Research, 50(4): 1487-1514.

Falk, Martin and Katz-Gerro, Tally. (2016) 'Cultural participation in Europe: can we identify common determinants?' *Journal of Cultural Economics* 40: 127–62.

Fry, Edward. (2002) 'Readability versus leveling', *The Reading Teacher* 56(3): 286–291.

Georg, Werner. (2004) 'Cultural capital and social inequality in the life course', *European Sociological Review* 20(4): 333–44.

Gracia, Pablo. (2014) 'Fathers' child care involvement and children's age in Spain: a time use study on differences by education and mothers' employment', *European Sociological Review* 30(2): 137-150.

Gracia, Pablo. (2015) 'Parent-child leisure activities and cultural capital in the United Kingdom: the gendered effects of education and social class', *Social Science Research* 52: 290–302.

Griswold, Wendy, McDonnell, Terry and Wright, Nathan. (2005) 'Reading and the reading class in the twenty-first century', *Annual Review of Sociology* 31(1): 127–41.

Hanquinet, Laurie. (2017) 'Inequalities: when culture becomes a capital', in Dave O'Brien, Toby Miller, and Victoria Durrer (ed.), *The Routledge Handbook of Global Cultural Policy*, New York: Routledge: 327–340.

Hawkins, Margaret, Morris, Anne and Sumsion, John. (2001) 'Socio-economic features of UK public library users', *Library Management* 22: 258–65.

Heckman, James J. (1979) 'Sample selection bias as a specification', *Econometrica* 47(1): 153–61.

Heckman, James J. and Landersø, Rasmus. (2021) 'Lessons for Americans from Denmark about inequality and social mobility', *Labour Economics* (101999).

Hoff, Erika and Laursen, Brett. (2019) 'Socioeconomic status and parenting', in Marc H. Bornstein (ed.), *Handbook of Parenting. Biology and Ecology of Parenting,* New York: Routledge: 421–447.

Jackson, Margot I. and Schneider, Daniel. (2022) 'Public investments and class gaps in parents' developmental expenditures', *American Sociological Review* 87(1): 105–42.

Jerolmack, Colin and Khan, Shamis. (2014) 'Talk is cheap: ethnography and the attitudinal

fallacy', *Sociological Methods & Research* 43(2): 178–209.

Jæger, Mads Meier and Blaabæk, Ea Hoppe. (2020) 'Inequality in learning opportunities during Covid-19: evidence from library takeout', *Research in Social Stratification and Mobility* 68 (August): 100524.

Jæger, Mads Meier and Breen, Richard. (2016) 'A dynamic model of cultural reproduction', *American Journal of Sociology* 121(4): 1079–1115.

Kalil, Ariel, Ryan, Rebecca and Corey, Michael. (2012) 'Diverging destinies: maternal education and the developmental gradient in time with children', *Demography* 49(4): 1361–83.

Kalil, Ariel and Ryan, Rebecca. (2020) 'Parenting practices and socioeconomic gaps in childhood outcomes', *The Future of Children* 30(1): 29–54.

Katz-Gerro, Tally and Sullivan, Oriel. (2010) 'Voracious cultural consumption: the intertwining of gender and social status', *Time and Society* 19(2): 193–219.

Katz-Gerro, Tally and Sullivan, Oriel. (2022) 'Cultural stratification in the UK: persistent gender and class differences in cultural voraciousness', *Journal of Consumer Culture*.

Katz-Gerro, Tally and Jæger, Mads Meier. (2013) 'Top of the pops, ascend of the omnivores, defeat of the couch potatoes: cultural consumption profiles in Denmark 1975-2004', *European Sociological Review* 29(2): 243–260.

Kraaykamp, Gerbert. (2003) 'Literary socialization and reading preferences. Effects of parents, the library, and the school', *Poetics* 31(3–4): 235–57.

Kraaykamp, Gerbert and Notten, Natascha. (2016) 'Parental cultural socialization and educational attainment. Trend effects of traditional cultural capital and media involvement', *Research in Social Stratification and Mobility* 45: 63–71.

Landersø, Rasmus and Heckman, James J. (2017) 'The Scandinavian fantasy: the sources of intergenerational mobility in Denmark and the US', *Scandinavian Journal of Economics* 119(1): 178–230.

Lareau, Annette. (2003) *Unequal Childhoods: Class, Race, and Family Life*, University of California Press, second edition, Berkeley: University of California Press.

Macmillan, Lindsey and Tominey, Emma. (2020) 'Parental inputs and socio-economic gaps in early child development', *CEPEO Working Paper Series*, no. 20-04, https://repec-

cepeo.ucl.ac.uk/cepeow/cepeowp20-04.pdf

Matsuoka, Ryoji. (2019) 'Concerted cultivation developed in a standardized education system', *Social Science Research* 77(July 2017): 161–78.

Mikus, Karoline, Tieben, Nicole and Schober, Pia S. (2021) 'Concerted cultivation in early childhood and social inequalities in cognitive skills: evidence from a German panel study', *Research in Social Stratification and Mobility 72*, 100547.

Notten, Natascha, Kraaykamp, Gerbert and Konig, Ruben P. (2012) 'Family media matters: unraveling the intergenerational transmission of reading and television tastes', *Sociological Perspectives* 55(4): 683–706.

O'Connor, Rollanda E., Bell, Kathryn M., Harty, Kristin R., Larkin, Louise K., Sackor, Sharry M. and Zigmond, Naomi. (2002) 'Teaching reading to poor readers in the intermediate grades: a comparison of text difficulty', *Journal of Educational Psychology* 94(3): 474-485.

O'Flaherty, Martin and Baxter, Janeen. (2020) 'The "developmental gradient" revisited: Australian children's time with adult caregivers from infancy to middle childhood', *Social Science Research* 86: 102397.

Peterson, Richard A. and Kern, Roger M. (1996) 'Changing highbrow taste: from snob to omnivore', *American Sociological Review* 61(5): 900–907.

Prickett, Kate C. and Augustine, Jennifer March. (2021) 'Trends in mothers' parenting time by education and work from 2003 to 2017', *Demography* 58(3): 1065–91.

Rebane, Marit. (2014) 'Double advantage or disadvantage? Parental education and children's developmental stages in Italy', *Electronic International Journal of Time Use Research* 12(1): 49–72.

Rog, Lori Jamison and Burton, Wilfred. (2001) 'Matching texts and readers: leveling early reading materials for assessment and instruction', *The Reading Teacher* 55(4): 348–356.

Schwarz, Amy Louise, van Kleeck, Anne, Beaton, Derek, Horne, Erin, MacKenzie, Heather and Abdi, Hervé. (2015) 'A read-aloud storybook selection system for prereaders at the preschool language level: a pilot study', *Journal of Speech, Language, and Hearing Research* 58: 1273–1291.

Sikora, Joanna, Evans, M. D. R. and Kelley, Jonathan. (2019) 'Scholarly culture: how books

in adolescence enhance adult literacy , numeracy and technology skills in 31 societies', *Social Science Research* 77: 1–15.

Soria, Krista M., Nackerud, Shane and Peterson, Kate. (2015) 'Socioeconomic indicators associated with first-year college students' use of academic libraries', *Journal of Academic Librarianship* 41(5): 636–43.

Tampubolon, Gindo. (2010) 'Social stratification and cultures hierarchy among the omnivores: evidence from the Arts Council England surveys', *The Sociological Review* 58(1): 1–25.

Van Hek, Margriet and Kraaykamp, Gerbert. (2015) 'How do parents affect cultural participation of their children? Testing hypotheses on the importance of parental example and active parental guidance', *Poetics* 52: 124–38.

Appendix Tables

TABLE A1. Appropriate LIX count by grade and age

Grade	Age	LIX
0	6	2-5
1	7	5-10
2	8	10-15
3	9	15-20
4	10	20-25
5	11	25-30
6	12	30-35

Source:
https://frilaesning.dk/artikler/1619991/Vejledning%20til%20for%C3%A6ldre/

TABLE A2. Results from regressions controlling for most used library branch, and using amount of developmentally appropriate books, share non-fiction, and author diversity as outcome variables

	Amount of books	Share age-app.	Share LIX-app.	Amount: Age-app.	Amount: LIX-app.	Share non-fiction	Books per author
Highest years of	2.086 ***	-.597 ***	-.293 ***	1.084 ***	.122 ***	.069 *	.014 ***
education	[.122]	[-.043]	[-.045]	[.096]	[.033]	[.006]	[.037]
	(.047)	(.038)	(.022)	(.030)	(.012)	(.034)	(.001)
Family income	.009 *	.076 ***	.018 ***	.029 ***	.014 ***	-.051 ***	.001 ***
	[.007]	[.064]	[.033]	[.031]	[.046]	[.050]	[.021]
	(.004)	(.003)	(.002)	(.002)	(.001)	(.003)	(.000)
Control: most used lib. branch	X	X	X				
Amount instead of share				X	X		
N (households)	215,615	215,615	140,409	215,615	140,409	215,615	215,615

NOTE. Two-tailed tests. *P<.05, **P<.01, ***P<.001. Control variables: number of boys, number of girls, number of children age 0-2; 3-5; 6-8; 9-10; 11-13; 14-16, immigrant status. Standard errors in parenthesis. Estimates from models with standardized variables in brackets.

TABLE A3. Results from regressions including interactions between parents' education/income and the number of children within different age groups.

		Amount of books	Share age-app.	Share LIX-app.
Education	* Children age 0-2	1.004 ***	.252 **	-.085
		(.109)	(.086)	(.065)
	* Children aged 3-5	1.137 ***	.889 ***	-.074
		(.093)	(.074)	(.048)
	* Children aged 6-8	1.253 ***	.127	-.289 ***
		(.087)	(.069)	(.045)
	* Children age 9-10	.488 ***	.292 ***	-.137 **
		(.103)	(.082)	(.047)
	* Children aged 11-13	-.031	.714 ***	.071
		(.094)	(.075)	(.044)
	* Children aged 14-16	-.530 ***	.423 ***	.046
		(.123)	(.098)	(.060)
Income	* Children age 0-2	-.036 ***	.037 ***	.013 *
		(.009)	(.007)	(.006)
	* Children aged 3-5	.002	-.093 ***	.002
		(.007)	(.007)	(.004)
	* Children aged 6-8	.072 ***	-.045 ***	.021 ***
		(.007)	(.005)	(.004)
	* Children age 9-10	.054 ***	-.015 *	.008 *
		(.008)	(.006)	(.004)
	* Children aged 11-13	.001	.001	-.006
		(.007)	(.006)	(.004)
	* Children aged 14-16	.001	-.022 **	.000
		(.010)	(.008)	(.005)
N (households)		215,615	215,615	140,409

NOTE. Two-tailed tests. *$P<.05$, **$P<.01$, ***$P<.001$. Control variables: number of boys, number of girls, number of children age 0-2; 3-5; 6-8; 9-10; 11-13; 14-16, immigrant status, parents' highest years of education, disposable family income. Standard errors in parenthesis. Only interaction effects showed in table.

TABLE A4A. Results from regressions on only-child families by age of child. Outcome: Amount of books.

	Amount of books				
	Age: 0-5	Age: 6-10	Age: 6-10	Age: 11-16	Age: 11-16
Highest years of education	2.058 ***	1.373 ***	.719 ***	.414 ***	.399 ***
	(.112)	(.128)	(.167)	(.048)	(.054)
Family income	.008	.044 ***	.013	-.009 *	-.011 **
	(.009)	(.010)	(.012)	(.003)	(.004)
Control for reading skills + skills^2			X		X
N (households)	26,503	16,737	4,925	23,739	18,064

NOTE. Two-tailed tests. *P<.05, **P<.01, ***P<.001. Control variables: number of boys, number of girls, number of children age 0-2; 3-5; 6-8; 9-10; 11-13; 14-16, immigrant status. Standard errors in parenthesis. Estimates from models with standardized variables in brackets.

TABLE A4B. Results from regressions on only-child families by age of child. Outcome: Share of age-appropriate books.

	Share age-app.				
	Age: 0-5	Age: 6-10	Age: 6-10	Age: 11-16	Age: 11-16
Highest years of education	-.669 ***	-.665 ***	-.181	-.837 ***	-.733 ***
	(.088)	(.118)	(.244)	(.133)	(.157)
Family income	.060 ***	.041 ***	.028	.084 ***	.088 ***
	(.007)	(.009)	(.018)	(.009)	(.011)
Control for reading skills + skills^2			X		X
N (households)	26,503	16,737	4,925	23,739	18,064

NOTE. Two-tailed tests. *P<.05, **P<.01, ***P<.001. Control variables: number of boys, number of girls, number of children age 0-2; 3-5; 6-8; 9-10; 11-13; 14-16, immigrant status. Standard errors in parenthesis. Estimates from models with standardized variables in brackets.

Table A4c. Results from regressions on only-child families by age of child. Outcome: Share of LIX-appropriate books.

	Share LIX-app.				
	Age: 0-5	Age: 6-10	Age: 6-10	Age: 11-16	Age: 11-16
Highest years of education	-	-.309 ***	-.149	-.007	.060
		(.062)	(.091)	(.044)	(.050)
Family income	-	.020 ***	.016 *	-.006 *	-.006
		(.005)	(.007)	(.003)	(.004)
Control for reading skills + skills^2	-		X		X
N (households)	-	16,389	4,914	7,760	5,943

NOTE. Two-tailed tests. *$P<.05$, **$P<.01$, ***$P<.001$. Control variables: number of boys, number of girls, number of children age 0-2; 3-5; 6-8; 9-10; 11-13; 14-16, immigrant status. Standard errors in parenthesis. Estimates from models with standardized variables in brackets.

Appendix Figures

Fig. A1. Linear predictions from regressions including non-linear educational terms. Outcome: Amount of books borrowed

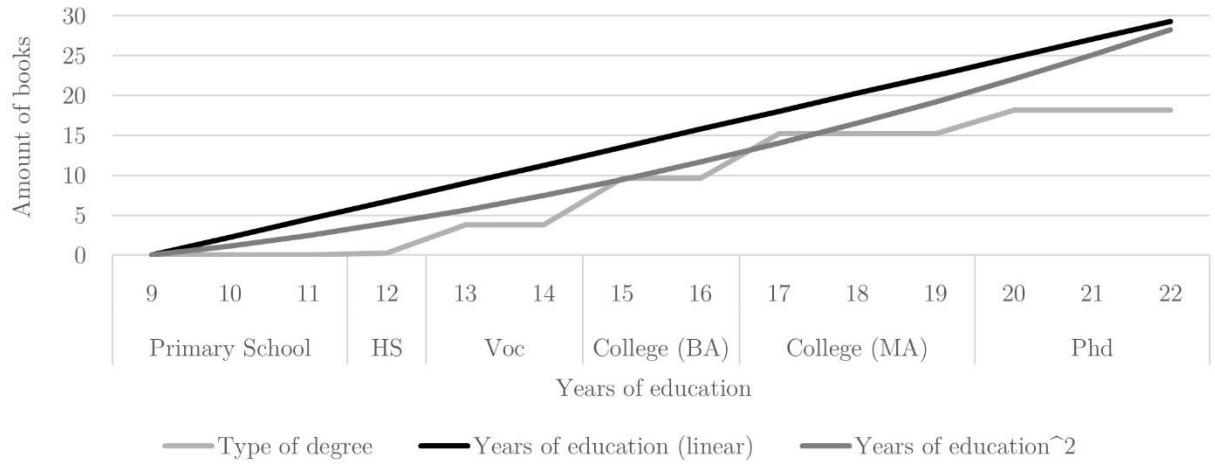


Figure A2. Liniear predictions from regressions including nonlinear income terms. Outcome: Amount of books borrowed