

# What can parents do? The causal mediating role of parenting in explaining SES differences in children's language development

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## Abstract

**Objective:** This study estimates how much of the differences by socioeconomic status (SES) in children's language development are mediated by parenting styles, parenting practices, and parental investments.

**Background:** There are large differences in children's language development by parental socioeconomic status (SES). According to some studies, SES gaps in language skills among preschoolers could be reduced substantially by intervening in the parenting styles, practices, and parental investments of low-SES parents. However, the extent to which parenting mediates the effects on language skills of growing up in low-SES contexts is still unknown.

**Method:** This paper uses data from the National Educational Panel Study starting cohort 1, a random sample of children born between 2012 and 2013 in Germany and employs interventional causal mediation analysis to estimate the mediated share of the total effect of SES on children's language that goes through parenting, broadly understood.

**Results:** Parenting explains around one-third of the total effect of SES on early language skills, but close to nothing of the effect on later language skills.

**Conclusion:** Although a share of the SES effect operates through parenting, and all parenting dimensions affect children's language skills, interventions in parenting would be limited in their ability to reduce the gap in substantial ways. Alternative pathways, through which inequality in language skills is reproduced, could potentially explain a larger share of this effect.

**Key words:** parenting, language skills, causal mediation, social inequality



## 1. Introduction

There is a strong association between low parental socioeconomic status (SES) and many adverse outcomes in childhood (Greg J. Duncan et al. 1998). Some of those adverse outcomes are said to carry on into adulthood (J. J. Heckman 2006). One of the most consistently investigated child development markers affected by low SES is children's language development (Romeo et al. 2018). Research in Germany has shown that SES differences in cognitive development, of which language development is an important part of, emerge well before children enter school and tend to remain stable throughout children's school careers (Skopek and Passaretta 2020). Substantial inequalities in children's developmental trajectories have been observed in other countries as well. In the US, for example, where differences in children's language development by parental SES have been long investigated (Greg J. Duncan, ZiolGuest, and Kalil 2010), researchers have begun to narrow in on one salient mechanism: the differences in how low-SES and high-SES parents care for and rear their children (Fomby and Musick 2018). However, parental SES influences children's wellbeing both directly and indirectly.

Concerns over children's wellbeing have led researchers to closely examine internal family dynamics and in particular caregiver-child interactions (Mayer et al. 2019), as these might mediate, or indirectly explain, the effects of parental SES. The literature on parenting often distinguishes between three general types of behaviors parents engage in with their children (Spera 2005): parenting styles, parenting practices or daily activities, and parental investments (Doepke, Sorrenti, and Zilibotti 2019; Mayer et al. 2019). Although these overlap to some extent, these activities belong to different dimensions of parenting (Maccoby 1994). Parenting style describes the type of parent-child interaction that occurs on a regular basis, and it has been classified into five general types: authoritative, emotional, sensitive, detached, or authoritarian (Baumrind 2005; Kuppens and Ceulemans 2019). Parenting practices, instead, refer to the daily activities done with the child, such as attending to the child's basic needs or promoting the language and reading skills of the child, and their socio-emotional development (Cobb-Clark, Salamanca, and Zhu 2019; Kalil, Ryan, and Chor 2014), as well as the cultivation of literacy at home (Melhuish et al. 2008). Parental investments, although often fused together with parenting styles and practices, refer more to the time and financial resources parents invest in their children in the form of goods/services such as childcare, books for children, or other cognitively stimulating activities (Doepke, Sorrenti, and Zilibotti 2019; Miller et al. 2020).

Parenting covers a broad range of practices and activities that parents do with their children, which makes it difficult to exactly differentiate them. Hoff (2013) and Romeo et al. (2018) trace parental SES differences in children's language skills to gaps in some parenting dimensions. For example, the effects of authoritarian or detached parenting styles (Chan and Koo 2011), as well as the effects of the differences in reading-time with children (Kalil, Ryan, and Corey 2012), and the effects of low or insufficient parental investments (Doepke, Sorrenti, and Zilibotti 2019) do explain to some extent inequalities by SES. In fact, such types of parenting are more characteristic of low-SES families. This is one reason behind the focus of parenting interventions and early childhood programs on teaching low-SES mothers the parenting skills deemed necessary for effective child development (Ayoub, Vallotton, and Mastergeorge 2011; J. J. Heckman, Humphries, and Kautz 2014; Price 2010). However, and even though specific types of parenting can affect children, little is known as to what share of the total effect of SES is mediated through parenting, a quantity of relevance for early childhood public policy.

Whatever that quantity may be, previous studies suggest the link between SES and children's cognitive development cannot be fully accounted for by parenting (Sullivan, Ketende, and Joshi 2013), which is itself suggestive of alternative pathways through which SES effects may appear. In this study, I explore and estimate the mediated share of the SES effect on language skills that *goes through* parenting, broadly understood (Berendes et al. 2013). To achieve this, I follow the suggestion of previous research and use a broader conception of parenting when estimating these effects, instead of focusing on a single parenting dimension (Fomby and Musick 2018; Mollborn 2016) – an approach that is riddled with identification problems, as I explain in the paper. I estimate the share of the SES effect that is jointly mediated through multiple parenting mediators employing interventional mediation analysis, as explained and developed in T. J. VanderWeele and Tchetgen Tchetgen (2017), to best meet the multiple assumptions on which causal mediation analysis depends on (Nguyen, Schmid, and Stuart 2021).

## 2. Background

Studies have shown that various later child wellbeing and development indicators, such as memory skills, literacy, and general school performance, heavily depend on early language development (Shonkoff 2011). In the German context, there are comparatively large and persistent SES-related gaps in reading, mathematics, and science competencies between children from advantaged and disadvantaged educational backgrounds (Davoli and Entorf 2018), especially in comparison to other OECD countries. Research shows these educational differences, however, largely occur before children enter school (Skopek and Passaretta 2020), in particular during early childhood (Lehrl et al. 2012), a time when substantial differences in the language skills of children from different socioeconomic backgrounds have been observed (T. Linberg et al. 2019). Therefore, to narrow social inequality in school performance and academic achievement (T. Schneider and Linberg 2021), researchers and policy makers want to understand which mechanisms could generate such early differences in language skills by SES.

Studies show parenting is, without a doubt, an active force in children's developmental trajectories (Grusec 2011; Maccoby 2000). Two recent studies estimate the association between SES and language development in the German context (Skopek and Passaretta 2020; Attig and Weinert 2020). These studies employed the same data used in this paper and find a long-lasting impact of SES – parents' education – on language, and on cognitive development more generally, as well as strong differences in parenting practices or joint activities by SES.

Parenting is thought to constitute one of the most salient processes through which social inequalities are reproduced from one generation to the next (Guo and Harris 2000). Among these processes, family influences like parenting are but one important social determinant of children's development (Maggi et al. 2010). Although the overview of Hoff and Laursen (2019) discuss parenting as a moderating factor in the association between SES and children's language development, it might be more appropriate to consider parenting as a general mediating mechanism explaining SES-related differences in child development (Weininger and Lareau 2009). For example, both the family stress model and the family investment model suggest parenting is, however, if not the main, certainly one important mechanism linking children's development trajectories and SES (Conger, Conger, and Martin 2010; Greg J. Duncan et al. 1998). Although parenting dimensions are conceptualized as different though related aspects in the rearing of children, recent research suggests that these are not independent of one another, and, therefore, the effects of different parenting dimensions on children's development should perhaps be considered jointly (Elliott and Bowen 2018; Mayer et al. 2019).

### 2.1 Parenting and the development of language skills

In addition to the SES and parenting association, there are several pathways linking parenting and various aspects of language development in early childhood (Pace et al. 2017). The effect of the different parenting dimensions on the cognitive development of children has been recently summarized by Ulferts (2020), an overview referencing multiple studies and meta-analyses on the topic. A recent meta-analysis of studies evaluating the linkages between parenting and language development suggests that sensitive parenting facilitates language and learning in children in a myriad of ways (Madigan et al. 2019). In particular, evidence from randomized controlled trials show that the effect of interventions on parental sensitive responsiveness on children's language in economically disadvantaged families is stronger than what is found in high-SES families (Madigan et al. 2019). Moreover, Perkins, Finegood, and Swain (2013)'s review of basic brain functions and areas related to language development further suggest that these are directly and indirectly affected by exposure to low SES contexts and parenting (Merz et al. 2019; Kuhl 2004).

In this respect, word variety, a higher complexity of language, as well as more frequently asking children questions eliciting a response from them, which are more characteristic of high SES parents and are linked to specific parenting behaviors (Vernon-Feagans et al. 2012; Ochs and Kremer-Sadlik 2015), would be more beneficial for early language skills. Early word learning, for example, is often the outcome of children's engagement in joint activities with their caregivers (Hart and Risley 1995; Kuchirko 2019), an effect that is enhanced when caregivers are responsive to children's needs and solicitations (Hoff 2003). There is evidence that low educated mothers display a less responsive type of communication with their children, which suggests this may be one explanation of the lower verbal abilities found among children from low-SES backgrounds (Dollaghan et al. 1999). Similar findings have been observed in Germany. Attig

and Weinert (2020) show that various characteristics of the home learning environment of children vary by SES, with negative impacts on children's language skills.

Other research suggests the effects of parenting might be heterogeneous as a consequence of families being embedded within specific contexts around which family life is organized (Manstead 2018). The effects of certain parenting styles may depend on broader cultural and local contexts in which parenting is embedded. The effects of the same parenting practice of, for example, reading a book to a child, might depend on the expectations that peer-groups or families have for this child, and a myriad of additional effects that might enhance, reinforce or suppress, and therefore discourage, the effects of parenting styles, practices, or investments in those contexts.

Regarding specific parenting dimensions, various pioneering works on the child development and parenting literature suggest strong interactions between these different dimensions, which are thought to generate differences in language development. Authoritative styles might be more important in specific environments, particularly those of low SES families (Sorkhabi and Mandara 2013). The effectiveness of parenting practices for the promotion of language development, on the other hand, may depend on the type of parenting style (Darling and Steinberg 1993). Moreover, parenting styles could be an underlying cause of specific parenting practices and parental investments, causing parents to engage in more activities with their child and invest more time and resources in them (Doepke, Sorrenti, and Zilibotti 2019).

## 2.2 Differences in parenting behavior by SES

There are multiple mechanisms linking SES and parenting, making SES differences in parenting a potential explanation of the SES language skill differences. Most of these mechanisms operate through the stress associated with raising a child in low-resource contexts (Bradley and Corwyn 2002). Economic insecurities associated with low SES, added to the diffusion of the ideology of intensive parenting, are major sources of stress affecting parental wellbeing and parenting (Nomaguchi and Milkie 2020), particularly that of mothers. Moreover, Doepke and Zilibotti (2017) show important differences in parenting by the overall socioeconomic status of the country, and substantial differences in time involved in parenting by parents' educational level. Hoff and Laursen (2019) conclude that evidence suggest multiple causal pathways are at work between these two factors (Merz et al. 2020). The variables involved in these pathways - which include external factors, such as circumstances in which parents live, and internal ones, such as parents' socio-demographic characteristics - act jointly to generate differences in parenting (Hoff and Laursen 2019).

The main theoretical perspectives explaining the connection between SES, parenting, and children's cognitive development rely on a set of complex interactions between multiple parenting mechanisms (Hoff and Laursen 2019). The family investment model, for instance, considers that differences in resources and parental investments explain differences in children's cognitive development (Greg J. Duncan et al. 1998). The family stress model, in turn, is centered on the stress that is caused by raising a child in a context of low financial resources, and on how this form of stress negatively affects parents' behaviors when rearing and educating their children (Conger, Conger, and Martin 2010). Moreover, research on the parenting package (Fomby and Musick 2018), as well as on the effects of developmental ecologies (Mollborn 2016), suggest the mediating linkages between SES and parenting might be far more complex than currently understood. In Bronfenbrenner and Morris (2007)'s bio-ecological model, parenting is a proximal process within the family that influences children's development through multiple pathways. However, the effects of these pathways are embedded in networks of peers, neighborhoods, and larger institutions, thus hypothesizing a much less mechanistic role for parenting in child development. For example, low-SES parents might have a heavier workload and receive lower wages, which implies higher levels of tiredness, stress, and, perhaps, less leisure time to spend with their children, all of which may produce a less effective type of parenting (Milkie, Raley, and Bianchi 2009). In contrast, high-SES parents are able to hire or pay for extra parenting provided by others in the form of cognitively stimulating activities with care professionals, even from early on (Schober and Schmitt 2017); these additional forms of care and parenting may improve the parent-child relationship by taking away some of the burden of care work from parents' shoulders.

In other words, parenting is something done by unequal parents and in unequal circumstances (Lahire 2019). Parents are not only unequally endowed with resources and skills for child rearing, they are also unequally constrained by factors such as time and working conditions that equally impact their parenting (Bradley and Corwyn 2002). For example, studies have shown that middle-class parents engage in parenting practices that have been characterized as *concerted cultivation*, positively reinforcing middle-class children's

skills, whereas working-class and working-poor-class families' parenting is more similar to the *accomplishment of natural growth*, a different kind of parent-child interaction that may not provide these same benefits (Lareau 2011: pp. 238-239). On top of that, other qualitative research suggests that social inequalities in children's language skills result from the interaction between social class origins and teachers' or caregivers' differential expectations about children's behavior and language (Millet and Croizet 2016). Given the overly complex interactions between parenting mediators, and the many confounding factors affecting them, there is reason to doubt parenting could mediate close to the full share of the SES total effect as theoretically expected (Milkie, Nomaguchi, and Denny 2015; Sullivan, Ketende, and Joshi 2013), in fact, it is more likely that this share is rather small.

### 2.3 SES as a causal factor in parenting and children's language development

Most studies in the parenting literature reduce parental SES to one of the child's parents educational attainment (Kalil, Ryan, and Corey 2012), often that of the mother's. This reductionist approach, although encouraged by some highly popular research (Hoff and Laursen 2019; Cunha, Heckman, and Schennach 2010; Goldthorpe 2010), obscures rather than clarifies many of the ways in which parental SES through parenting actually operates as a proximal process. The reductionist approach is not universally accepted by all research on parenting (Thaning and Hällsten 2020; Savage et al. 2013; Sullivan, Ketende, and Joshi 2013; Goldfeld et al. 2018). Other approaches that consider additional SES related variables, such as income, wealth, occupational attainment, welfare dependency, etc., and that combine them in theoretical and empirical ways, have also received attention in the parenting literature (Ishizuka 2019), and in explaining gaps by SES in other child wellbeing measures (Berge et al. 2010).

In socio-linguistic research, it was early recognized that families use of language is fundamentally a function of their SES or social class (Bernstein 1964; Bourdieu 1991). Children from different SES backgrounds acquire different communicative abilities, but these are not a simple additive function of SES as assumed by the reductionist approach. As suggested by previous research, it is necessary to include both parents' resources in understanding the effects of family SES, as it has been recently discussed when studying siblings correlations on educational outcomes (Thaning and Hällsten 2020).

There are important disadvantages in the reductionist approach vis-à-vis its alternative – that of combining the different parenting dimensions (Hauser and Warren 1997; Goldthorpe 2021; Hollingshead et al. 1975) – which I address in this paper. Mother's educational attainment correlates strongly with other SES dimensions – and with those of the father – and it has been found to be the most predictive of SES factors for children's language (Kalil, Ryan, and Corey 2012). However, that approach does not correspond with the many nuances I have reviewed above, and which complicate the idea of parenting as a function of SES. For example, occupation, income, and wealth, are fundamentally functions of educational attainment, which would make these SES dimensions mediating mechanisms affecting parenting. These factors may also moderate the effects of education, with differences in their impact. There is some research on the effect of socio-occupational class, but household income has been shown to be of little relevance (Berger, Paxson, and Waldfogel 2009), and recent studies suggest wealth may have an important independent, additive effect (Dräger 2022). However, when children are born, they experience all the dimensions of their mother and father's SES simultaneously, not just one dimension at a time, so it is difficult to try to separate them (Bihagen and Lambert 2018). Each SES dimension affects what parents know or are able to do with their children (e.g., networks, learning from peers, etc.) and, therefore, may affect the functioning of the educational attainment dimension, even in systematic ways (Heinrich 2014; D. Schneider, Hastings, and LaBriola 2018). Moreover, given that not one single dimension can have the same effects, the combined approach has the advantage of acknowledging important differences caused by families' divergent class backgrounds (Gillies 2005; Lahire 2019), in the direction of the individuation of social class.

Notwithstanding these nuances, the major disadvantage of the reductionist perspective is that employing mother's educational level to approximate SES ignores potential measurement error in this variable. Educational attainment of the mother does not fully capture the construct of SES and it does so with systematic error, for example, by ignoring father's educational level or assuming that different educational degrees, such as doctor versus schoolteacher, at the same educational level, are entirely comparable. For example, the occupation of both parents may be relevant for language development when parents work in fields such as education or health versus manual occupations with little involvement of verbal abilities, beyond parents' educational levels. Equally so, parents with high financial resources, but

low educational attainment, may compensate for lacking educational credentials through private tutoring, by engaging in cultural activities themselves, or by enrolling their children into verbally intensive activities or social networks. Therefore, and although the SES-related individual variables may be used in place of a latent construct, these do not fully represent, nor override, the construct of SES.

One SES dimension does not replace another one and cannot solely stand for the other ones either (Thaning and Hällsten 2020). The literature on parenting so far offers no answers to these critical issues because underlying the suggestion of using only mother’s education there is no causal model being hypothesized, or only one following a conception of education as human capital (G. S. Becker 2009), supposedly uniform and exchangeable. In contrast to the reductionist approach, and considering that SES is an unobservable and theoretical construct (Lahire 2019; Savage et al. 2013; Goldthorpe 2021), an inductive or formative methodology seems more appropriate. The debates around the measurement of SES do suggest that a measurement model could incorporate all the dimensions and address the limitations of the reductionist approach – of which no advantage has been shown (Thaning and Hällsten 2020).

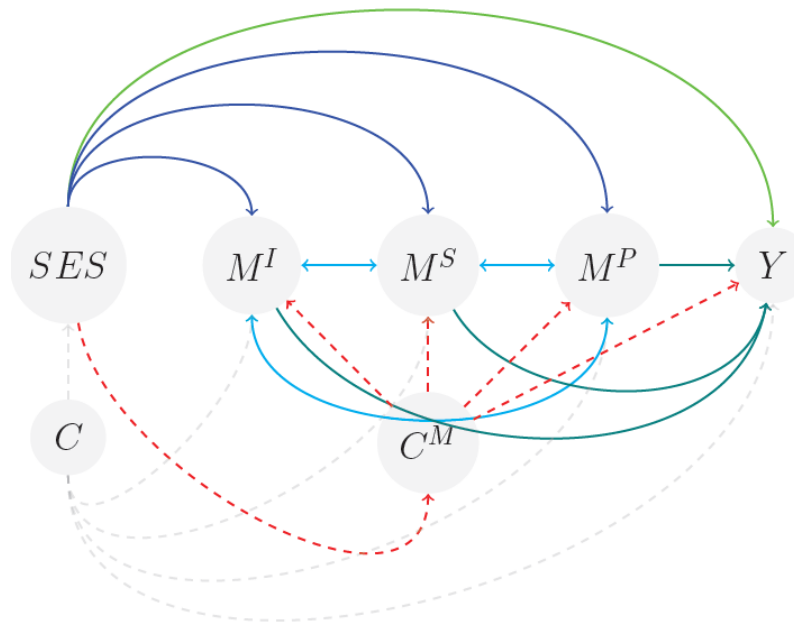
### 3. Data and methods

#### 3.1 Causal interventional direct and indirect effects

In previous research, the estimation of direct and indirect effects of specific parenting dimensions has been based on so-called “third variable analyses” (Attig and Weinert 2020; T. Linberg et al. 2019), also known as statistical mediation or statistical decomposition methods – in contrast to causal mediation analysis – such as structural equation models or Oaxaca-Blinder decomposition methods (Nguyen, Schmid, and Stuart 2021; Guo and Harris 2000). However, recent advances in causal mediation analysis stress that the identification of mediating pathways relies upon various assumptions that often go untested in empirical studies (T. VanderWeele 2015), and that are unrealistic in almost all empirical applications. Statistical decomposition methods provide descriptive analyses of the exposure-mediator-outcome associations, but these decompositions do not warrant a causal interpretation. Furthermore, these methods only consider the case of a single exposure, only one mediator at a time, and assume independence among all possible individual mediating mechanisms, which is the reason why the sum of all “indirect” effects obtained with such methods can sometimes exceed the total effect under investigation. One reason for this is that statistical decomposition analyses do not explicitly address the problems of confounding, which bias the magnitude of the mediating pathways, and which should be addressed by estimating counterfactual mediators and outcomes.

Parenting as a mediating mechanism, as discussed in the background section, is hypothesized to be a mediating process involving multiple, distinct mediators that interact with one other, and which follow multiple pathways. Therefore, studies of parenting should reconsider the various dependencies and pathways involved in the SES, parenting, and language associations. As an example, Figure 1 displays many of the complex hypothesized interactions that I have discussed in the Background section. The different parenting mediators (here simply denoted as parenting practices  $M^P$ , parenting styles  $M^S$ , and parental investments  $M^I$ ), interact with one another in ways that are largely unknown, and probably context dependent. Although these parenting dimensions can be thought of as mediators, studies suggest strong interactions with one another, something which should be considered in estimations of the mediated share. Not only that, but parenting is itself a function of multiple factors beyond SES, which should be considered simultaneously when estimating indirect effects. These are factors which are affected by SES, the exposure of interest, but which also have direct and indirect effects on the language development indicators,  $Y$ . In Figure 1, there are two major sources of confounding: a general confounding mechanism  $C$ , such as parents’ ages, and an exposure-induced confounding mechanism  $C^M$ , such as smoking during pregnancy, low birthweight, parental working hours or use of childcare arrangements. The existence of exposure-induced confounders has been neglected by most previous research, yet it is especially problematic given that these confounders are affected by SES, affecting equally all parenting mediators and children’s language development.

Figure 1: DAG representation of the theoretical associations between parenting mediators and exposure-induced confounding



Note: This diagram shows the parenting mediated share (blue lines) of the total effect of SES. The green line shows the direct effect. Interventional analysis decomposes the total effect of *SES* going through the different parenting mediators by properly adjusting for the confounders *C* and *C<sup>M</sup>* which are affected by *SES* (i.e., exposure-induced confounding). The edges between mediators are shown as going in both directions, suggesting that relations could go both ways. However, no single pathway can be identified without making strong assumptions.

In contrast to statistical decomposition methods, causal mediation analysis addresses these issues, and emphasizes the problems of identification. Four main assumptions underlie a causal interpretation of mediation analyses. The first assumption is that there is no unmeasured confounding of the exposure-outcome association  $Z \rightarrow Y$ , where  $Z$  stands for SES and  $Y$  for children's language skills. In mathematical notation, this assumption can be written as  $Y(z, m) \perp Z|C, \forall z, m$  with  $z$  being the observed level of SES and  $m$  the values taken by the mediators (e.g., a family SES is affected by the child's grandparents' SES which also affects their verbal skills). Second, we need to assume there is no unmeasured confounding of the mediator-outcome association,  $M \rightarrow Y$ , or that  $M(z) \perp Z|C, \forall z$ , where  $M(z)$  is the counterfactual value of the mediators – the parenting styles, practices and parental investments – had the exposure been set to  $z$  possibly contrary to fact (i.e., a highly sensitive mother that attends to her child's needs although from a low-SES background). The third assumption is that no unmeasured confounding factors exists between the exposure-mediator association,  $Z \rightarrow M$ , or that  $Y(z, m) \perp M|Z = z, C, \forall z, z^*, m$ , with  $z^*$  being the counterfactual level of exposure SES different to one actually observed  $z$  (e.g., problem behavior in children may affect parenting and also language development) Finally, the fourth assumption states that there are no confounders of the mediator-outcome association,  $M \rightarrow Y$ , that are affected by the exposure, that is, that they are also caused by  $Z$ :  $Y(z, m) \perp M|Z = z, C, \forall z, z^*, m$  (i.e., smoking or drinking during pregnancy is associated with low-SES families, it may affect the type of parenting needed, and it also affects children's development).

Once explicitly stated, it becomes clear that meeting any one of these assumptions in the context of parenting as a mediating mechanism between SES and children's language skills is rather difficult. As discussed above, the fourth of these assumptions is particularly problematic. We can be fairly sure that the no exposure-induced mediator-outcome confounding assumption does not hold for the mediating

mechanisms we have in mind. Here two examples: a) Smoking during pregnancy or a premature birth are affected by maternal education, but both smoking and having had a premature child may affect the type of parenting done by caregivers and the children's language or cognitive development; b) Dual-earner families, in which both parents work full-time, may have less time to engage in highly intensive parenting practices, but full-time work, especially in high paying occupations, may also allow families to purchase time-intensive activities for their children or higher quality childcare. Moreover, all major surveyed theories in the parenting literature – the family stress model (Conger, Conger, and Martin 2010), the family investment model (Cobb-Clark, Salamanca, and Zhu 2019), and the bio-ecological model (Bronfenbrenner and Morris 2007) – describe many more potential mediating pathways.

If SES affects a parenting dimension, say parental investments, that in turn affects another one, such as parenting practices, then the fourth assumption required for causal mediation does not hold for these single mediating pathways. For example, research has shown sensitive mothers perform more time-intensive parenting practices with their children, and that high-SES mothers adjust their parenting to fit their children's needs (A. Linberg 2018; Kalil, Ryan, and Corey 2012). Children from low-SES backgrounds may spend more time with their mothers - who are more likely to be unemployed, out of the labor force, or working part-time. But the time-intensive parenting with low-educated mothers may not be as effective in the teaching of language skills if the mother-child interaction does not correspond to a sensitive parenting style. Also, parental investments in the form of books or cognitively stimulating toys may affect how often children are exposed to literary content and stimulating activities (Greg J. Duncan et al. 1998), and through such pathways to more or less frequent reading or less time with sensitive mothers. Therefore, parenting is akin to a causal sequential chain that lacks a clear specification because it is unclear what is causing what, amid the different parenting mediating mechanisms. However, the identification of individual pathways is troublesome and, following causal mediation analysis, this sequential chain may not be empirically testable.

An estimation of the mediated share of the SES effect that goes through parenting requires a particular kind of causal mediation analysis that accounts for exposure induced mediator-outcome confounding and mediator-mediator effects (T. VanderWeele and Vansteelandt 2014; T. J. VanderWeele and Tchetgen Tchetgen 2017). An alternative approach to the mediating effects of parenting – broadly understood – is to take on a so-called “interventional perspective” that considers a joint version of the individual mediating pathways (Nguyen, Schmid, and Stuart 2021; T. J. VanderWeele and Tchetgen Tchetgen 2017), and which provides a solution to the exposure-induced mediator-outcome confounder issue. We let  $\bar{M} = (M^I, M^P, M^S)$  be a vector containing all the different mediators of parental investment, joint practices, and parenting style, and define  $G^{\bar{M}}$  as the conditional distribution of the mediating vector, which is conditional on the common factors that confound the association between SES and children's language skills. What would be the effect of intervening or modifying the overall distribution of the mediators,  $G^{\bar{M}}$ ? The interventional effect is of relevance for understanding ideal or hypothetical interventions on parenting, such as the interventions proposed in the work of Mayer et al. (2019), which are aimed at reducing the differences between the parenting of low-SES and high-SES mothers. One plausible research question that practitioners and researchers would be equally interested in is: what *would* happen to the average low-SES children language skills if we were to replace the parenting experiences these children normally obtain in their family for a randomly selected experience from the distribution of parenting vector  $G^{\bar{M}}$  observed among high-SES parents? An answer to such a counterfactual type of question – involving a sustained intervention on parenting – could tell us what benefits we could expect from parenting interventions that equalize the parenting done in families of different SES, especially as these are being considered or implemented in Germany as well (Walper 2021; Cina et al. 2006).

In causal mediation notation, and as fully explained and developed in T. J. VanderWeele and Tchetgen Tchetgen (2017), the total effect ( $TE$ ) of the exposure of SES can be decomposed into a Pure Natural Direct Effect  $PNDE = E[Y(z, \bar{M}(z^*))] - E[Y(z^*, \bar{M}(z))]$  and a Total Natural Indirect Effect  $TNIE = E[Y(z, \bar{M}(z))] - E[Y(z, \bar{M}(z^*))]$ . Therefore,  $TE = PNDE + TNIE$ . Here  $z$  denotes a value taken by the exposure  $Z$ , which in this case would correspond to a given SES level, and  $\bar{M}(z)$  is the value the mediators take for that given SES level (i.e., the values taken along the parenting pathway for a low-SES parent, such as insensitive parenting, few joint activities, and low parental investments). The counterfactual quantity  $Y(z, \bar{M}(z))$  can be interpreted as the child's language score after growing up in a given SES context  $z$  (e.g., very low SES), had the child have had the mediators  $\bar{M}$  taken the actual value  $\bar{m}$  corresponding to that context. However, these are not identifiable quantities as explained above (Nguyen, Schmid, and Stuart 2021). Other approaches, such as ‘en bloc’ mediation (T. VanderWeele and Vansteelandt 2014), have the advantage of



identifying natural direct and indirect effects, but they do not allow us to separate the part of the total effect that goes through other mediating mechanisms not involving parenting (i.e., the exposure-induced confounders of the mediator-outcome association), and instead mix the mediated share going through parenting with the mediated share going through these other pathways.

Instead, the interventional or randomized counterparts of these causal mediation parameters can be estimated despite the presence of exposure-induced confounders of the mediator-outcome association, and, importantly, in the presence of more than one single mediator, as in  $\bar{M}$ . The interventional analogue of these parameters is based on the idea of randomly drawing the values of the mediators from the counterfactual distribution – that of the comparison group and are defined as follows. The  $rPNDE = E[Y(z, G_z^M)] - E[Y(z^*, G_z^{M*})]$  is the effect of the exposure that does not involve the mediators (the randomized/interventional analogue of  $PNDE$ ); whereas  $rTNIE = E[Y(z, G_z^M)] - E[Y(z, G_z^{M*})]$ , the effect involving a change in the mediators, is the randomized/interventional version of the Total Natural Indirect Effect. The sum of these two quantities provides again the Total Effect, which makes sense for a decomposition. With the decomposition into a direct and indirect effect, one can then obtain the proportion mediated by these randomized/interventional quantities, defined as

$$rPM = \frac{rTNIE}{TE}.$$

The counterfactual distributions, from which  $rPNDE$  and  $rTNIE$  are computed, are obtained through the imputation approach. These imputations, in turn, are based on a set of statistical models fitted to each variable in the mediating set, in this case, each parenting indicator, regressed on the exposure, the exposure-induced confounders, and other confounders, as well as a model for the outcome (children's language skills), and, importantly, a model for the exposure-induced confounders. Predictions from these models are used to compute the g-formula (Robins 1986). Standard errors and confidence intervals are obtained by means of bootstrapped results and its percentiles, respectively.

One drawback of the randomized/interventional approach, as well as of the traditional statistical decomposition methods, is that identifying individual pathways is no longer possible without making strong assumptions – unlikely to hold for the case of parenting. However, this is currently the best we can possibly do when trying to decompose a total effect into its direct and indirect pathways (Nguyen, Schmid, and Stuart 2021). Notwithstanding, an advantage of interventional mediation over joint mediation analysis and, especially, over statistical decomposition methods, is that we are able to exclude the share of the effect of SES that operates through observed confounders of the mediator-outcome association affected by exposure (e.g., working hours, childcare arrangements, behavior problems, premature birth, smoking during pregnancy, etc.), which do not correspond to the effect of interest. To estimate the  $rPNDE$ ,  $rTNIE$  and the  $rPM$  I employ the mediational g-formula proposed in T. J. VanderWeele and Tchetgen Tchetgen (2017), and as implemented in the R package *CMAverse* (Shi et al. 2021). This method uses the imputation approach with 200 bootstraps samples for estimating standard errors of the interventional/randomized quantities.

### 3.1.1 Missing data and panel attrition

Missing data and systematic panel attrition may generate bias in the estimates of interest in this paper. To deal with these two issues, multiple imputation by chained equations with 56 imputed data sets was performed (Young and Johnson 2015). The method CART was used to impute missing values because it has been shown to ensure good predictive ability within the observed value range of each variable (Burgette and Reiter 2010). All analytical variables were used in the multiple imputation procedure. After converting the data into wide format, all variables observed at time point  $t - 1$  served as predictors for the missing values at  $t$ , and subsequently those from  $t - 1$  and  $t$  were used as predictors for the missing values at  $t + 1$ , excluding observations lost to follow-up did not affect the findings. No noticeable convergence issues were observed in the resulting multiply imputed values.

## 3.2 Data

This study uses data from the National Education Panel Study (doi:10.5157/NEPS:SC1:6.0.0), a random sample of Germany-born children, a cohort of newborns in Germany that has been followed for over seven consecutive years. The data sampling was based on official register data on births that occurred between

2011 and 2012 in Germany (NEPS-SC1, Blossfeld, Roßbach, and Maurice 2011). NEPS data was collected as part of the Framework Program for the Promotion of Empirical Educational Research funded by the German Federal Ministry of Education and Research (BMBF). As of 2014, NEPS is carried out by the Leibniz Institute for Educational Trajectories (LifBi) at the University of Bamberg in cooperation with a nationwide network. The sample was generated using a complex random study design and in each follow-up survey, children's characteristics, and performance in standardized tests were recorded along with parents' characteristics and their parenting. The analytical sample was established as follows. From the original sample of NEPS-SC1  $N = 3418$ , I excluded all children with a migration background (i.e., being second or third generation,  $N = 1589$ ) to arrive at a final sample of  $n = 1892$  children for which both parents have no migration background.

Although this exclusion prevents me from exploring the topic of parenting among the Germany-born children of migrants, standardized language assessments, such as the ones used in this study, have been shown to be biased against children from minority-language homes (Leśniewska, Pichette, and Béland 2018). The language assessments used in this study are based on the German language, the inclusion of children with a migration background from a minority-language home may understate the effects of parenting, as understood in this paper, because for this population group parenting may not appear to readily translate into language development as measured in German (i.e., although, if language skills were measured in the minority-language of the home the child grows up, the effects might be comparable). Therefore, in order not to confuse the minority-language background with low-skills in language, this exclusion is necessary.

### 3.2.1 Exposure: Latent class analysis to measure SES

One can think of approaches to the measurement of SES such as Latent Class Analysis (LCA, Berge et al. 2010), in which both parents characteristics can be combined. LCA could also be considered as a form of measurement model of the construct of parental education, or, alternatively, as a more appropriately way of capturing the highly complex and nonlinear interactions among the different factors making up the SES construct. I employ LCA to obtain a less error-prone measure of the family SES (Hagenaars and McCutcheon 2002). LCA is convenient because we can combine multiple dimensions of SES that are interrelated in complex ways (Conger, Conger, and Martin 2010), and because I can employ the information on both the father and mother. The underlying assumption in LCA is that the individual SES indicators – mothers and fathers' educational attainment, socio-occupational class, income and wealth levels, and welfare recipient status – are assumed to be conditionally independent given the hypothesized latent class. In this sense, each latent class, a categorical variable, would be what makes those indicators correlate with one another, a correlation that could be interpreted as SES or as a refined measure of children's parents' educational background. If the social position of a family is what creates an association between markers of SES – as theoretically developed in the perspective of Bourdieu (1984), then it seems plausible to argue and interpret the latent classes as the socioeconomic position occupied by parents, the unobservable latent SES. The number of latent classes was chosen inductively, according to statistical fit criteria using the Bayesian Information Criteria (BIC), which gave four latent classes providing the best statistical fit (Hagenaars and McCutcheon 2002).

The following parental socioeconomic indicators were used in this analysis: the educational levels of both the child's mother and father; the occupations of the child's mother and father following the occupational class structure of Eriksson and Goldthorpe (see Evans 1992); a categorized version of the monthly household adjusted income level by the quartiles of the household income distribution in the sample; a categorized version of the level of net-wealth in the household by quartiles of the distribution as well; and, finally, an indicator of whether mother or father received welfare benefits. Although I interpret these latent classes as the "position" each family occupies in the social structure, another interpretation of them is as more "refined" measures of an underlying construct for which maternal education stands for (e.g., human capital, cultural capital, etc.).

### 3.2.2 Outcome: language skills

Two standardized language assessments for children are used to quantify language development in this sample of children. First, the Parent's Questionnaire for the Early Diagnostic of Children at Risk 2 (*Elternfragebogen für die Früherkennung von Risikokindern 2*; ELFRA-2) was given to the child's parents when

children were between 25-27 months of age. This is a standardized questionnaire containing a list of words that a child is likely utter given they have reached a certain age – a list of words that is highly sensitive to specific socio-cultural contexts. The scale has been shown to have adequate reliability values according to the standards but is sensitive to the language spoken at home (Sachse and Von Suchodoletz 2007). This questionnaire is filled in by the child's main caregiver and consists of three sub-scales that assess productive vocabulary, syntax, and grammar abilities in German. The ELFRA-2 is used as a screening test for diagnosing delays in language development in German children aged 24 months (see for an overview of the test Grimm and Doil 2006), but it may serve as a first indirect assessment of language skills in early childhood. I make use of the sub-scale on productive language (**ELFRA-2P**), which is only focused on vocabulary knowledge. Although the ELFRA-2 may be affected by response desirability bias, the scale may still serve as a rough measure of the child's vocabulary size for such an early age (e.g., it resembles and has a high correlation with other more standard language assessments that can only be tested on older children).

The second assessment was the Peabody Picture Vocabulary Test Fourth Edition (**PPVT-4**), which was applied at waves four and six when children were between 37-39 months of age and again when they reached five years of age, respectively. The PPVT-4 assesses receptive vocabulary or verbal/language skills in children and adolescents in the German norm-referenced sample (Roßbach, Tietze, and Weinert 2005). The test contains 228 items divided into 19 sets, each containing 12 items. These items were presented on a tablet displaying four different images, only one of which corresponded to the word. During the test, the child listens to each word and must then select the image corresponding to the word heard. The total number of correct responses is often used to establish the stage of children's language development, but the test is also used as a general measure of cognitive development.

### 3.2.3 Mediators: Parenting

Given that parenting involves multiple factors and processes, this study tries to encompass the broadest possible available set of things that parents can do with their children. There are three main parenting dimensions I explore in this paper, these are described in Table 1, which documents at greater detail the construction of each indicator, the rationale behind it, and the parenting dimension each indicator corresponds to.

The approximation to the construct of *parenting style* was based on the ratings given to a recorded and standardized mother-child play situation interaction (A. Linberg et al. 2019; Sommer and Mann 2015). This interaction was videotaped and coded by independent raters according to how much characteristic or uncharacteristic certain statements describing the interaction seen in the video were. These statements concern the sensitivity to distress and non-distress present in the child, intrusiveness and detachment from the part of the mother as well as stimulation, positive regard, and emotionality. Given that this is an interaction situation, within this paradigm, both mother and child's behavior were rated because multiple reciprocal interactions might take place (A. Linberg 2018). However, only the mother's behaviors were used to approach parenting style. Different strategies have been proposed to classify parenting styles, and although I explored whether these indicators could fit the theoretical expected typology of mothering (Spera 2005; Darling and Steinberg 1993; Baumrind 2005), the results were not satisfactory, with the large majority of mothers falling in an "average" category. For this reason, I included each of these indicators as a binary variable, re-coding individual items.

*Parental investments* were captured through three different types of questions. First, I employed parents' reports of spending on activities such as participation in toddler or play groups, baby swimming, music groups, or parent-child programs. Second, I considered that another form of parental investment could be to borrow time from work to spend with the child, as in parental leave. I included a binary indicator for whether the mother and father took parental leave during the first two years after the child's birth. Third, yet another form of parental investment corresponds to parents buying or organizing childcare by other means, for example, through grandparents, childcare, hiring a nanny or an au-pair, or organizing time with friends, etc. Therefore, a binary indicator of whether the child spends some time in any of these childcare arrangements was included.

For the dimension of *parenting practices*, I make use of an extensive list of joint activities that are performed with the child. These are based on the list of items detailed in Table 3 and refer to the frequency of joint activities with the child. Among these items, I included all information on activities such as reading to the child, dealing with literacy and numeracy activities, such as recognition of words, playing with the

child in cognitively stimulating activities, teaching rhymes or songs, etc. These activities could have been performed by the parents themselves or by any other person in the household providing childcare. This simple index was calculated for each wave. Although these are simple additive and standardized scores, they may serve as rough approximations to the frequency with which early literacy activities take place and do not affect the overall results of the mediation analysis (e.g., the mediation analysis including each individual item, as its own mediator, did not differ from the ones here presented). Related to this dimension, I further included another set of indicators of parents' *cultural capital* activities which included things like buying books, visiting museums, going to the theater, and other cultural activities (all described in Table 1).

*Table 1:* Description of variables used in the study

Category	Indicator	Operationalization	Waves
Parenting style	Sensitive to non-distress	The original scale of this individual items was on 1 (=not at all characteristic) to 5 (=very characteristic) scale. I created a binary indicator for each parenting marker if mother's behavior was coded as partly, rather, or very characteristic, with zero otherwise for the not at all and rather no characteristic.	1st
	Intrusiveness	"	1st
	Detached	"	1st
	Stimulating	"	1st
	Positive Regard	"	1st
Parental Investments	Emotionality	"	1st
	Set of care givers who care for one or more children outside of the parents' household. This includes nursery, day care, au-pair, grandparents, other relatives or friends, or other care.	I created a binary indicator capturing whether there was any care provided by people different than the mother or father of the child. For each type of external care, a yes or no answer was available.	2nd, 3th, 4th, 5th and 6th
	Have you taken parental leave for the child since child's birth?	This question is asked for both parents of the child and at two points in time, and the response options were yes or no. These were coded as a binary indicator	2nd and 4th
	Child's participation in courses or groups such as toddler or play groups, baby swimming, music groups, etc.	The response options were yes or no and were coded into a binary indicator.	1st and 3rd
Parenting activities	Looked at picture books together; Playing together with an object which child can pull, push or purposefully grab and hold onto; Played together in or even with water; Playing together with dolls, stuffed animals, animal figurines or similar items; Playing together with building blocks or other things for inserting, stacking or building; Playing together with an item that makes noise; Interacting with child, singing, telling or showing something; Romping, cuddling or simply fooling around with child; Gone out together to enjoy the fresh air	Each of these activities was evaluated on a scale from 1 (=Several times a day) to 5 (=Not at all) and ask whether parents or anyone in the household engage with the child in any of these activities. I added them up to create a sum indicator of the intensity or frequency with which all these practices are performed with the child. The scale was then inverted so that higher values convey a higher frequency of activities and then standardized.	1st

Table 1: Description of variables used in the study (continued)

Category	Indicator	Operationalization	Waves
Parenting activities	Reading to child or looking at picture books; Show letters to child when looking at picture books or something similar; Practicing individual numbers or counting with child; Teaching child poems, children's rhymes or songs; Painting, drawing, or crafting with child; Reenacting something together with child; Go to a book shop together with child; Looking at picture books about nature with child; Talking with child about nature; Attend a museum or an art exhibition; Watch a movie at the movie theater; Attend an opera, ballet or classical music concert; Go to the theater; Attend a rock or pop concert	"	3rd
	Reading to child or looking at picture books; Show letters to child when looking at picture books or something similar; Practicing individual numbers or counting with child; Teaching child short poems, children's rhymes or songs; Painting, drawing, or crafting with child; Reenacting something together with child; Go to a book shop together with child; Looking at picture books about nature with child; Talking with child about nature	"	4th
	Reading to child or looking at picture books; Show letters to child when looking at picture books or something similar; Practicing individual numbers or counting with child; Teaching child short poems, children's rhymes or songs; Painting, drawing, or crafting with child; Reenacting something together with child; Go to a book shop together with child; Looking at picture books about nature with child; Talking with child about nature; Attend a museum or an art exhibition; Watch a movie at the movie theater; Attend an opera, ballet or classical music concert; Go to the theater; attend a rock or pop concert	"	5th
	Child engage in picture books, letter games and the like; Comparing, sorting and collecting things and the like; Playing number games, dice and the like; Doing puzzles and the like; Building and construction games; Doing handicrafts, painting, pottery and the like; Roleplaying, puppet plays, and the like; Practice sports activities, motoric games and the like; Make music, singing, dancing and the like; Experiences nature, gardening and the like; Read aloud to child at home; Tell child stories at home or look at picture books together; Show child individual letters or the ABC, for example when looking at picture books; Practicing numbers or counting with child; Teach child little poems, nursery rhymes or songs; Paints, draws or does arts and crafts with child at home; Go to a library with child	"	6th
Parents' Cultural capital activities	Parents read on a normal work day in your spare time; Number of books at home ; Books of classical literature at home; A dictionary at home; A book with poems at home; A library card at home; Works of art such as paintings at home	Each of these items were binary indicators. I added them up to create a simple additive measure of parents' cultural capital which may influence children's behavior, although not directly "parenting," it may work in indirect ways with the child observing their parents behavior and the things around them.	3rd, 4th and 5th

Table 1: Description of variables used in the study (continued)

Category	Indicator	Operationalization	Waves	
Confounders of parenting - language affected by SES	Premature birth	This is a binary indicator of whether the child was born before the ninth month of pregnancy.	1st	
	Smoke during pregnancy	A binary indicator based on mother's self-report of whether she smoked at all during pregnancy.	1st	
	Drank during pregnancy	A binary indicator based on mother's self-report of whether she drank alcohol at all during pregnancy.	1st	
	Low birthweight (<2500g)	A binary indicator of whether the child was born with low birthweight, meaning less than 2500 grams.	1st	
	Number of months the mother breastfed	The number of months that the mother self-reported to have breastfed her child during first year of life.	1st	
	Postpartum depression	This was captured by a question on how often the mother felt depressed or sad in the last four weeks. The options given were never, seldom, sometimes, often, and always. I created a binary indicator taking the value of one when the mother responded that sometimes, often or always, with zero otherwise.	1st	
	Working hours of mother and father	At each wave, the survey captured the number of working hours of both father and mother. I included an adjustment for these	1st, 3rd, 4th, 5th, and 6th	
	Children's behavioral problems	This is measured by the Strength and Difficulties Questionnaire (SDQ), a standardized assessment of children's behavior. It consists of parental reports of varying degrees of problematic behavior. I standardized the score in each wave.	4th and 6th	
	Confounders	Place of residence in Germany: East vs. West Germany	Location of the household where survey was conducted. Only this geographical division is available.	1st
		Parents own the house they live in	I created this binary indicator of whether parents own the house they currently live in.	1st
Mother's age at childbirth		Age of the mother when child was born computed from the difference between the birthdate of the child and birthdate of the mother.	1st	
First born		An indicator whether this was a first or higher order child.	1st	

Note: NEPS-SC1. Own elaboration.

### 3.2.4 Exposure-induced confounders of the mediator-outcome association

One substantial advantage of the interventional mediation approach – over statistical mediation or joint mediation – is that we can separate the effects of the parenting dimensions from other factors that simultaneously affect parenting dimensions and also children's language abilities (i.e., the confounders of the mediator-outcome association affected which are affected by SES). Exposure-induced confounders considered here are factors like whether the child was premature birth, whether the mother smoke tobacco or drank alcohol during pregnancy, the number of months she breastfed the child, whether child born with a low birth-weight (< 2500g.), whether the mother experienced postpartum depression, the working hours of mother and father, and, importantly, children's behavioral problems, measured by the Strength and Difficulties Questionnaire (SDQ; Goodman et al. (2000)). These are all factors affected by SES that may

further affect children’s language skills. For each factor in this list – which is far from exhaustive but limited by what is captured by the NEPS SC1 study, however, the decomposition of effects is not as straightforward when we consider the “intermediate” effects of parenting.

For example, if early language skills are affected by SES and parenting, and if they have an independent direct effect of later language skills ( $Y_t \rightarrow Y_{t+1}$ ), then early language becomes an exposure-induced confounder when examining the mediating effects of parenting. Although the effects of parenting can operate through the effects on early language, they may not necessarily affect language skills later on to the same extent. However, early language skills are also a confounder of the later parenting and later language skills in the sense that parents would tend to adjust to their child’s development, further enhancing what they perceive is important for their child or refraining from certain practices or investments they deemed to be inappropriate (Brandone et al. 2006). Hence, it is important to make a clarification regarding intermediate outcomes of children’s language, and the exposure-induced confounders.

The interventional approach cannot distinguish between the different intermediate outcomes or mediator-mediator interactions, and therefore, for a decomposition of these effects, we are left with at least three possibilities: we can either include early language skills within the mediating pathway corresponding to parenting, or exclude it and adjust for early language as yet another exposure-induced confounder of the mediator-outcome association, the third alternative being to simply ignore this issue. Here I present results for the former alternative and exclude early language from the parenting mediator set, while including it amid the exposure-induced confounder set. I do this because the interventional approach asks a specific question regarding what the mediated effects on some outcome would be, excluding other potentially indirect pathways. By including the language skills within the mediator set, we would be considering a hypothetical intervention that affects language skills directly, for example, asking that all these pre-school children attend some language stimulating course, and therefore not involving or intervening on parenting necessarily. This hypothetical intervention, though plausible, would be different to one that affects parenting styles and practices, and parental investments directly. However, further analysis reveals that results do not change in any substantial way by the inclusion or exclusion of the intermediate language skills already affected by previous parenting.

Finally, the interventional mediation analyses adjust for place of residence in Germany (i.e., East vs. West Germany); whether parents own the house they live in; mother’s age at childbirth; and whether child is the first child of the mother. Finally, Table S1 in [Supplementary Online Materials](#) presents descriptive statistics for all adjustment variables and confounders of the exposure-outcome and mediator-outcome associations.

## 4. Findings

Table 2 shows the classification of SES into four strata, which was chosen as providing the best fit based on the lowest BIC, classifying most households into the high-SES class. The NEPS-SC1 sample, from its onset, suffers from selection bias towards children from highly educated parents (Zinn et al. 2020), which is a considerable limitation of the data for this type of study. Nevertheless, the four LCA categories do suggest a good fit with the concept of SES. For example, the high-SES class is composed of fathers and mothers with high educational level and occupational attainment, most of them in the highest two categories of the EGP scheme. These high SES parents are also in the highest income and net-wealth categories, and none of them receives welfare. The very low-SES group, at the other extreme, is composed of parents with the lowest educational and worst occupational attainments – mostly occupational categories IIIb, V, VI, VIIa, and VIIb for fathers, and IIIa, IIIb, V, VI, VIIa, and VIIb for mothers. These very low-SES parents are mostly in the lower income and lower net-wealth brackets (e.g., including negative net-wealth or debt), and a majority of them are welfare recipients, although they are a relatively small group of the sample.

Table 2: Description of variables used in the study

	All	Socioeconomic Status Latent Classes			
	n (%)	Very Low (N = 221)	Low (N = 553)	Medium (N = 261)	High (N = 857)
<b>Mother's educational level</b>					
No degree or vocational/voluntary degree	116 (6)	93 (42)	22 (4)	0 (0)	1 (0)
Technical/applied or Civil Servant	448 (24)	101 (46)	263 (48)	21 (8)	63 (7)
Technical Degree (Fachhochschulreife)	528 (28)	25 (11)	247 (45)	61 (23)	195 (23)
University Education	800 (42)	2 (1)	21 (4)	179 (69)	598 (70)
<b>Father's educational level</b>					
No degree or vocational/voluntary degree	107 (6)	80 (36)	23 (4)	0 (0)	4 (0)
Technical/applied or Civil Servant	550 (29)	110 (50)	343 (62)	38 (15)	59 (7)
Technical Degree	401 (21)	23 (10)	171 (31)	39 (15)	168 (20)
University Education	834 (44)	8 (4)	16 (3)	184 (70)	626 (73)
<b>Mother's EGP occupational class</b>					
I	463 (24)	5 (2)	39 (7)	89 (34)	330 (39)
II	692 (37)	21 (10)	168 (30)	119 (46)	384 (45)
IIIa	210 (11)	78 (35)	87 (16)	12 (5)	33 (4)
IVa and IVb	37 (2)	8 (4)	13 (2)	7 (3)	9 (1)
IIIb, V, VI, VIIa and VIIb	168 (9)	70 (32)	80 (14)	4 (2)	14 (2)
Unemployed/OLF	322 (17)	39 (18)	166 (30)	30 (11)	87 (10)
<b>Father's EGP occupational class</b>					
I	700 (37)	7 (3)	43 (8)	103 (39)	547 (64)
II	505 (27)	18 (8)	123 (22)	101 (39)	263 (31)
IIIa	76 (4)	12 (5)	42 (8)	8 (3)	14 (2)
IVa and IVb	65 (3)	5 (2)	30 (5)	13 (5)	17 (2)
IIIb, V, VI, VIIa and VIIb	531 (28)	172 (78)	312 (56)	31 (12)	16 (2)
Unemployed/OLF	15 (1)	7 (3)	3 (1)	5 (2)	0 (0)



Table 2: Description of variables used in the study (continued)

	All	Socioeconomic Status Latent Classes			
	n (%)	Very Low (N = 221)	Low (N = 553)	Medium (N = 261)	High (N = 857)
<b>Household monthly income</b>					
(100,1.100]	362 (19)	210 (95)	76 (14)	74 (28)	2 (0)
(1.100, 1.550]	435 (23)	11 (5)	276 (50)	124 (48)	24 (3)
(1.550,2.080]	552 (29)	0 (0)	178 (32)	63 (24)	311 (36)
(2.080,16.200]	543 (29)	0 (0)	23 (4)	0 (0)	520 (61)
<b>Welfare Recipient</b>					
Yes	180 (10)	164 (74)	3 (1)	12 (5)	1 (0)
No	1,712 (90)	57 (26)	550 (99)	249 (95)	856 (100)
<b>Household net-wealth Categories in Euros</b>					
(-400000,500]	444 (23)	176 (80)	139 (25)	91 (35)	38 (4)
(500,50'000]	530 (28)	32 (14)	207 (37)	139 (53)	152 (18)
(50000,170'000]	442 (23)	10 (5)	119 (22)	21 (8)	292 (34)
(170'000,150'000.000]	476 (25)	3 (1)	88 (16)	10 (4)	375 (44)

Note: NEPS-SC1. Own elaborations.

On the middle range, the categories low- and medium-SES are also distinguished from the two extremes and are different from one another. Although the medium-SES category also has high educational and occupational attainments, of a similar level to the high-SES class, their income and net-wealth levels are, on average, lower than the levels of the high-SES parents, but higher than those of the low-SES class. This suggests that LCA managed to separate the group of highly educated parents with high economic and financial resources – high SES – from the highly educated parents with lower financial resources – medium SES, something that would have been neglected had we looked at the single education or occupational dimensions.

Regarding the low-SES latent class, this one differs from both the very low- and the medium-SES groups by their relatively higher income levels, but generally lower educational levels, respectively. In terms of occupational attainment, the low-SES group is composed of a large group of technical/applied or civil servant workers, especially fathers, but a higher percentage of mothers who are out of the labor force compared to any of the other socioeconomic groups. LCA, therefore, yielded a gradual stratification of the child's parental socioeconomic background that combines the information of mothers and fathers' most relevant SES dimensions, and in a theoretically plausible direction. For example, a similar gradient in the language gap is also observed when considering these four latent classes, as with the reductionist approach considering only mother's educational level (see Figure 1 in [Supplementary Online Material](#)).

Table 3 shows the distribution of all mediators considered in this paper. In accordance with previous studies (Attig and Weinert 2020; T. Linberg et al. 2019), parents in the high-SES group have, on average, higher levels of parental investment, more frequent parenting practices, and a slightly higher presence of sensitive mothers than parents in the very low- and low-SES groups, though the differences is rather small in terms of the indicators of parenting style. Keeping in mind those differences, Figure 2 shows the size of the *TE*, the *rPNDE* and the *rTNIE* for the counterfactual reference group of being from a high-SES background, at three different time points: when children were between 25-27 months of age - ELFRA-2P

score –, when children were between 37-39 months of age – PPVT-4 score, and when children were 5 years of age – PPVT-4 score. Results show the well-known finding that children from very low-SES and low-SES families are the furthest away from the high-SES peers in terms of language skills at these three time points (the *TE*). These are all substantial, large effects, as found by Skopek and Passaretta (2020). The gaps are largest when children were between 25-27 months of age, smaller though persisting still when children were 37-39 months, and slightly increasing when children are five years of age. There are also similar gaps for the contrast between low-SES and high-SES groups, though these are notoriously smaller than those against the most economically disadvantaged group in this sample. There are no differences in language skills when comparing the medium and high-SES groups, which speaks to the little importance of the further economic resources of the high-SES parents, and in particular the higher occupational achievement of high-SES fathers – though, again, these effects cannot be empirically distinguished.

Table 3: Parenting mediators and exposure-induced confounders by SES, NEPS SC1

	All	Socioeconomic Status Latent Classes				P-value
	n (%)	Very Low (N = 221)	Low (N = 553)	Medium (N = 261)	High (N = 857)	
<b>Parenting practices score wave 1</b>						
Mean (sd)	0.00 (1.00)	-0.21 (1.05)	-0.03 (0.98)	-0.03 (0.98)	0.15 (0.97)	
Median	0	-0.3	0.0	0.0	0.3	1.7e-11
<b>Parenting practices score wave 3</b>						
Mean (sd)	0.00 (1.00)	-0.18 (1.08)	0.00 (0.99)	0.03 (1.00)	0.08 (0.95)	
Median	0.1	-0.1	0.1	0.1	0.1	9.0e-04
<b>Parenting practices score wave 4</b>						
Mean (sd)	0.00 (1.00)	-0.29 (1.12)	-0.04 (1.00)	0.16 (0.93)	0.13 (0.92)	
Median	0.1	-0.1	0.0	0.1	0.1	3.8e-13
<b>Parenting practices score wave 5</b>						
Mean (sd)	-0.00 (1.00)	-0.21 (1.05)	-0.01 (0.99)	0.11 (0.96)	0.08 (0.98)	
Median	0	-0.2	0.0	0.1	0.1	3.9e-04
<b>Parenting practices score wave 6</b>						
Mean (sd)	0.00 (1.00)	-0.43 (1.16)	-0.06 (0.98)	0.20 (0.92)	0.21 (0.86)	
Median	0.1	-0.4	0.1	0.3	0.2	7.9e-17
<b>Parents' cultural practices wave 3</b>						
Mean (sd)	8.47 (2.98)	7.19 (2.38)	7.98 (2.59)	9.24 (3.23)	9.33 (3.16)	
Median	21	19	21	22	22	3.2e-34

Table 3: Parenting mediators and exposure-induced confounders by SES, NEPS SC1 (continued)

	All	Socioeconomic Status Latent Classes				P-value
	n (%)	Very Low (N = 221)	Low (N = 553)	Medium (N = 261)	High (N = 857)	
<b>Parents' cultural practices wave 4</b>						
Mean (sd)	11.48 (3.14)	10.40 (3.53)	10.87 (3.03)	12.51 (2.96)	12.24 (2.74)	
Median	11.3	10.0	10.5	12.0	12.0	2.7e-32
<b>Parents' cultural practices wave 5</b>						
Mean (sd)	20.62 (3.60)	18.76 (3.62)	20.37 (3.43)	21.36 (3.39)	21.59 (3.38)	
Median	21	19	21	22	22	3.2e-34
<b>Parenting style: sensitive to nondistress at wave 1</b>						
Characteristic	3,348 (98)	627 (95)	1,093 (99)	456 (98)	1,172 (99)	
Not Characteristic	70 (2)	31 (5)	16 (1)	8 (2)	15 (1)	1.9e-28
<b>Parenting style: intrusiveness at wave 1</b>						
Characteristic	142 (4)	43 (7)	54 (5)	18 (4)	27 (2)	
Not Characteristic	3,276 (96)	615 (93)	1,055 (95)	446 (96)	1,160 (98)	7.4e-14
<b>Parenting style: detachment at wave 1</b>						
Characteristic	31 (1)	11 (2)	10 (1)	2 (0)	8 (1)	
Not Characteristic	3,387 (99)	647 (98)	1,099 (99)	462 (100)	1,179 (99)	2.6e-03
<b>Parenting style: stimulating at wave 1</b>						
Characteristic	2,037 (60)	317 (48)	647 (58)	290 (62)	783 (66)	
Not Characteristic	1,381 (40)	341 (52)	462 (42)	174 (38)	404 (34)	3.0e-10
<b>Parenting style: positive Regard at wave 1</b>						
Characteristic	2,641 (77)	428 (65)	855 (77)	374 (81)	984 (83)	
Not Characteristic	777 (23)	230 (35)	254 (23)	90 (19)	203 (17)	4.4e-13
<b>Parenting style: emotionality at wave 1</b>						
Characteristic	1,799 (53)	265 (40)	571 (51)	265 (57)	698 (59)	
Not Characteristic	1,619 (47)	393 (60)	538 (49)	199 (43)	489 (41)	3.9e-15
<b>Parental investments wave 1</b>						
Yes	1,903 (56)	124 (19)	603 (54)	284 (61)	892 (75)	
No	1,515 (44)	534 (81)	506 (46)	180 (39)	295 (25)	9.3e-105

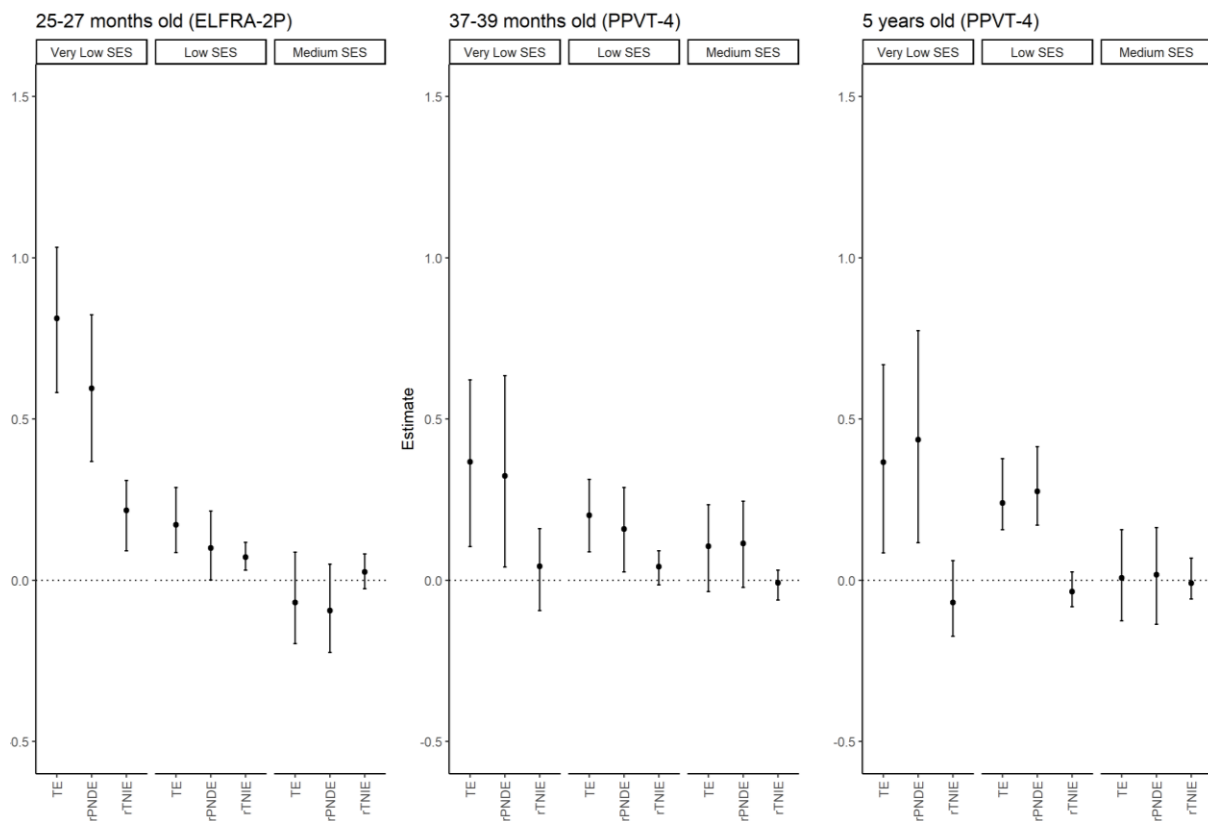
Table 3: Parenting mediators and exposure-induced confounders by SES, NEPS SC1 (continued)

	All	Socioeconomic Status Latent Classes				P-value
	n (%)	Very Low (N = 221)	Low (N = 553)	Medium (N = 261)	High (N = 857)	
<b>Parental investments wave 3</b>						
Yes	2,400 (70)	267 (41)	782 (71)	340 (73)	1,011 (85)	
No	1,018 (30)	391 (59)	327 (29)	124 (27)	176 (15)	1.4e-55
<b>Mother took parental leave during first year</b>						
Yes	2,619 (77)	322 (49)	892 (80)	365 (79)	1,040 (88)	
No	799 (23)	336 (51)	217 (20)	99 (21)	147 (12)	2.2e-42
<b>Father took parental leave during first year</b>						
Yes	1,263 (37)	67 (10)	356 (32)	231 (50)	609 (51)	
No	2,155 (63)	591 (90)	753 (68)	233 (50)	578 (49)	2.3e-43
<b>Mother took parental leave during first two years</b>						
Yes	781 (23)	169 (26)	273 (25)	103 (22)	236 (20)	
No	2,637 (77)	489 (74)	836 (75)	361 (78)	951 (80)	4.2e-01
<b>Father took parental leave during first two years</b>						
Yes	355 (10)	31 (5)	108 (10)	60 (13)	156 (13)	
No	3,063 (90)	627 (95)	1,001 (90)	404 (87)	1,031 (87)	8.0e-04
<b>Child was cared for by others wave 2</b>						
Yes	1,240 (36)	119 (18)	377 (34)	199 (43)	545 (46)	
No	2,178 (64)	539 (82)	732 (66)	265 (57)	642 (54)	2.7e-11
<b>Child was cared for by others wave 3</b>						
Yes	2,054 (60)	205 (31)	637 (57)	330 (71)	882 (74)	
No	1,364 (40)	453 (69)	472 (43)	134 (29)	305 (26)	4.7e-29
<b>Child was cared for by others wave 4</b>						
Yes	2,273 (67)	263 (40)	723 (65)	353 (76)	934 (79)	
No	1,145 (33)	395 (60)	386 (35)	111 (24)	253 (21)	4.9e-11
<b>Child was cared for by others wave 5</b>						
Yes	2,324 (68)	269 (41)	732 (66)	341 (73)	982 (83)	
No	1,094 (32)	389 (59)	377 (34)	123 (27)	205 (17)	4.1e-04

Note: NEPS-SC1. Own elaborations.

The main empirical findings refer to the decomposition of the total effect of SES into the direct and indirect components, also shown in Figure 2. First, the sizes of the indirect effects, measured by the  $rTNIE$  estimates, are always smaller than the estimates of the direct effect – the  $rPNDE$  – regardless of the time point, which suggest most of the SES effect operates through other pathways not involving parenting. In other words, if we were to equalize the parenting of families from different SES, we would reduce the differences in children’s language skills, but these would still remain highly stratified. This effect, however, depends on the group we are comparing the high-SES children to, and on the age of the child at which we evaluate the mediating share. For the gaps against children of very low SES parents, the size of the indirect effect is small, and thus a small share of the SES is being mediated by parenting – when children are 25-27 months this share is  $rPM = 0.27$  with  $CI: [0.10 - 0.44]$ ; when they are 37-39 months old, the share is  $rPM = 0.18$  with  $CI: [-0.28; 0.67]$ ; and when they are 5 years the decomposition is not applicable anymore because indirect and direct effects go in opposite directions, though these are very small and cannot be distinguished from zero. For the Low-SES, the mediated share is slightly higher than for the very low SES parents – the share is  $rPM = 0.42$  with  $CI: [0.15; 0.98]$  when low SES children are 25-27 months; and, when children are 37-39 months old, the share is  $rPM = 0.21$  with  $CI: [-0.07; 0.66]$ . For the medium SES, given that the gap is rather small or non-existent, the mediated effect is null or not applicable. Thus, when children reach 37-39 months of age and even later still at five years of age, the mediated effect would be substantially smaller for all comparison groups, despite some smaller gaps being present. Therefore, these results suggest the mediated share tends to become smaller over time.

Figure 1: Interventional/Randomized mediation effects by SES on language skills at three time points with respect to High SES parents



Note: NEPS-SC1. Own elaborations.

## 5. Discussion

Overall, results suggest parenting mediates a rather small share of the effect of SES on the language skills of preschool children, especially of the later gaps when children are 5 years old. The fact that the share explained by parenting mediators reaches at most approximately one-third of the total effect of SES on children's language skills strongly suggests that, though other pathways might be causing these inequalities, parenting could play an important though limited role in reducing inequalities in early childhood, to some extent. Although children from very low-SES families are the furthest away in terms of language skills from their high-SES peers, a comprehensive population parenting intervention – one that would equal the distribution of parenting done by these two groups of parents – would have a rather narrow and limited effect on reducing these gaps.

This paper contributes to the increasing breadth of evidence documenting social inequalities in language skills among pre-school children by parents' SES. Although some of the SES effect on children's early language skills is mediated, in one way or another, through parenting, the largest part of the SES effect operates through alternative pathways. Seemingly though, these alternative mechanisms do not operate through parenting and therefore would not be subject to "improvements" in the parenting skills, styles, practices, or parental investments of low-SES parents, as could be expected from previous findings too (Milkie, Nomaguchi, and Denny 2015; Sullivan, Ketende, and Joshi 2013). Therefore, language skills in children would continue to be stratified by SES, despite a hypothetical narrowing of parenting gaps achieved through parenting interventions. In other words, the differences observed in the different parenting dimensions are not being directly transmitted to their children as much as the literature believes this is happening, and as it is assumed by child development interventions on parents (Shonkoff and McCoy 2021; Mayer et al. 2019).

I have shown that inequalities in language skills are not simply the product of deficits in parenting. Previous research has criticized the conceptualization of parenting as a simplistic transferring mechanism of socioeconomic inequalities, in particular because of the middle-class assumptions and biases that are embedded in the studies of low-SES parents, all of which are conducted by highly educated researchers - some of them parents themselves (Letiecq 2019; Keller et al. 2006). The results of this paper suggest that low-SES families might not be actively deciding to invest less efficiently in their children or engaging in less "effective" types of parenting. Parents from low resource contexts face crucial time and financial intersecting constraints that limit their ability to provide their children with those extra activities that high-SES parents take for granted (Lahire 2019).

The parenting literature is, therefore, in a constant tension between considering poor families and their parenting as unequally positioned in the social structure, and the embrace of a deficit perspective which takes, as its standard, the parenting done by middle-class families, without acknowledging the conditions that allow for such a standard to exist in the first place (Letiecq 2019). Families, instead, should be considered as *enacting* the parenting practices and styles they received as children from their parents and caregivers, or engaging in the practices that are in accordance with their socioeconomic and cultural circumstances and experiences (Dermott and Pomati 2016).

This paper highlights various avenues for future research on the effects of parenting, the limitations of intervening on the parenting of low-SES parents and provides three main contributions to the literature on SES, parenting, and children's language development. First, the paper presents a more holistic and encompassing measure of SES that attends to the potential for confounding and measurement error in individual, unidimensional indicators, and which appropriately incorporates both parents' characteristics. This helps to reveal the important effects of a complex construct such as SES going beyond individual indicators. Second, it is surprising that the mediated share of the joint effects of parenting is not higher than what was found in this study, especially given the high number of mediators considered, and the number of potential pathways that are being simultaneously examined. However, previous studies had not quantified this share, and, to my knowledge, this is the first study to do so. Attig and Weinert (2020), though focused on the learning environments and parenting behavior as mediators of children's language, and including many of the indicators used in this paper, employ an empirical approach that consider these dimensions as independent of one another. Although it would be useful to know the mediator-specific pathways linking SES and children's language development through specific parenting practices or investments, and even parenting styles, the effects of this highly specific pathways remain unidentifiable under the causal mediation analysis framework. However, given that most applied programs are focused on

intervening on a “parenting package” (and not individual parenting indicators within of that package), the share of SES that is jointly mediated by parenting broadly understood is of practical relevance as well. Third, these findings, though partly inconsistent with the expectations and hypotheses of the parenting literature (Ulferts 2020), highlight that universalistic ideas about parenting do not fit highly individualized developmental processes (Bear and Minke 2006) – which in itself is a reminder of the high selectivity on which most of the child development literature is based on (Nielsen et al. 2017).

Following Bronfenbrenner and Morris (2007), multiple “ecologies” are responsible for children’s developmental trajectory: the individual; the immediate and extended family context, the surrounding neighborhood, and the overall community in which children grow up and are socialized. It is therefore not surprising that the effects of parenting are not as strong as hypothesized. There are many more alternative pathways, not involving parenting, through which the effects could be generated. These pathways – involving, for example, neighborhood effects, school environments, such as student-to-teacher ratio, the quality of teaching and access to resources, as well as extended family and social network effects, etc. – would not be necessarily addressed by interventions on parenting (e.g., J. Heckman et al. 2014).

Despite these findings, some limitations of this paper are worth noticing. In contrast to parenting time-use studies (Milkie, Nomaguchi, and Denny 2015), it was not possible to quantify the exact time that parents normally spent with children because such information was not captured by the NEPS SC1 study. Related to this, I was unable to assess the quality of the time spent in the joint activities that compose the parenting practices score, and the quality of parental investments. Parental language usage was also not directly observed. One partial explanation of the results of this paper, therefore, is that mediators were measured with error, something that should be better addressed in future studies using time-use data and improved measurements that capture quality as well as quantity. The focus was, however, on activities that parents do with their children, as well as their reported frequency. This limits the extent to which parenting is being captured by the indicators in the study, but it may also address some aspects of parenting that are not quantified when employing time use data. Parental expectations on their child’s course of development may also interact with some of these parenting dimensions. Parents’ own childhood experiences of received parenting further influence how they themselves attend to their children, yet this, as well as other potentially relevant confounders (e.g., genetics and epigenetics), remain unobserved. The NEPS SC1 was not able to capture child neglect and abuse (e.g., spanking), which are particularly hard to measure, though it may have strong effects on children’s language development (Widom 2014). All of these factors may further bias the estimates of the mediated share in hard to assess directions. Finally, these analyses should be replicated using a sample that has a larger group of children from very low and low SES households. Especially the very low SES families in the sample were under-represented. My results indicate this is a particularly vulnerable group that requires more attention from research, perhaps employing specialized studies.

A rather unexplored aspect of social inequalities in language development is inequalities by children’s migration background (B. Becker 2011). Studies on US samples show that SES and racial-ethnic background of parents affect parenting and the effects of parenting on language development in early childhood (Pungello et al. 2009; Bornstein 2012; Keller et al. 2006). However, these studies often neglect the bias present in language standardized assessments against children from minority groups (Stockman 2000; Leśniewska, Pichette, and Béland 2018), particularly against children from minority-language homes. Although this topic in the German context certainly deserves more attention (Nauck and Lotter 2015), it is challenging to study potentially culturally sensitive parenting effects on language skills inequalities by children’s SES and migration background when language assessments are sensitive to the language spoken at home. Moreover, even though the effects of parenting on children are not disputed, there is still debate as to the potential for these effects to be heterogeneous, as suggested by qualitative research (Conger, Conger, and Martin 2010). Recent discussions around the effects of mother-time on children’s development have called for alternative explorations of this topic in some or all of these parenting dimensions (Milkie, Nomaguchi, and Denny 2015; Nomaguchi, Milkie, and Denny 2016; Waldfogel 2016; and Kalil and Mayer 2016).

Unless the unmediated share is directly addressed by parenting interventions, the gaps will persist through other indirect pathways not affected by parenting (Manstead 2018). The specific details on how hypothetical parenting interventions could look like in practice should, in any case, depend on sound evidence-based research (Ulferts 2020). Furthermore, not all parenting dimensions are equally important. If not all that parents can do matters equally for children’s language skills, what specifically could make a

difference? Parenting style was one factor thought to have a substantial significance, but, besides the difficulties associated with defining and measuring this concept, it is unclear whether parenting style is something that *emerges together with* different parenting practices or parental investments, therefore a result and not a cause of child development (i.e., endogenous to the child's development). Further research should be devoted to closely examining the child rearing behavior of German parents from different SES, attending to the variability in the range of parenting behaviors, and also inquiring why parents do certain things with their children. As highlighted by Shonkoff and McCoy (2021), elucidating the complex mechanisms generating differences in early language skills, and developing sustainable early childhood interventions, will require tackling the empirical and methodological challenges posed by parenting as a mediating mechanism, some of which have been discussed in this paper.

For the case of language skills, the results of this paper would suggest, in any case, that we should consider the role of the larger context in which children are raised. For example, environmental interventions in combination with interventions in parenting, might be more suited to truly reducing inequalities by SES. This would require public policy to move beyond the deficit perspective on parenting, which seems unaware of the limited impact that psychology-based interventions would have on overcoming social inequalities (Cina et al. 2006). This paper highlights the potential for extending the purview on the mediation of the SES effect beyond parenting, which, although important and consequential for language development as shown here, may not suffice to reduce social inequalities. The results of this paper should hopefully encourage research on those other neglected pathways that do not involve parenting but may hold the promise of overcoming early childhood inequalities.

## Acknowledgments and data availability

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# Information in German

## Deutscher Titel

Was können Eltern tun? Die kausale Mediation der elterlichen Erziehung bei der Erklärung von SES-Unterschieden in der Sprachentwicklung von Kindern

## Zusammenfassung

**Fragestellung:** In dieser Studie wird geschätzt, inwieweit die Unterschiede in der Sprachentwicklung von Kindern je nach sozioökonomischem Status durch die elterliche Erziehungsstile, elterliche Erziehungspraktiken und elterliche Investitionen vermittelt werden.

**Hintergrund:** Es gibt große Unterschiede in der Sprachentwicklung von Kindern je nach sozioökonomischem Status der Eltern. Einige Studien suggerieren, dass die sozioökonomischen Status-Unterschiede bei den Sprachkenntnissen von Vorschulkindern durch Intervention in den elterlichen Erziehungsstil, die elterliche Erziehungspraxis und die elterlichen Investitionen von Eltern mit niedrigem SES erheblich verringert werden. Es ist jedoch noch nicht bekannt, inwieweit die elterliche Erziehung die Auswirkungen des Aufwachsens in einem Umfeld mit niedrigem sozioökonomischem Status auf die Sprachkenntnisse zurückzuführen sind.

**Methode:** In diesem Beitrag werden Daten aus der Startkohorte 1 des Nationalen Bildungspanels verwendet, einer Zufallsstichprobe von Kindern, die zwischen 2012 und 2013 in Deutschland geboren wurden, und es wird eine interventionelle kausale Mediationsanalyse eingesetzt, um den Mediationsanteil des Gesamteffekts von SES auf die Sprachkompetenz von Kindern zu schätzen, der auf die elterliche Erziehung im weitesten Sinne zurückzuführen ist.

**Ergebnisse:** Die elterliche Erziehung erklärt etwa ein Drittel des Gesamteffekts des sozioökonomischen Status auf die frühen Sprachfähigkeiten der Kinder, jedoch sehr wenig des Effektes auf die späteren Sprachfähigkeiten.

**Schlussfolgerung:** Auch wenn elterliche Erziehung einen Teil des sozioökonomischen Status-Effekts beeinflusst, sowie alle Dimensionen der elterlichen Erziehung sich auf die Sprachkenntnisse der Kinder auswirken, würden dennoch elterliche Interventionen nur einen begrenzten Anteil zur Überbrückung der Kluft beitragen. Alternative kausale Mechanismen, über die die Ungleichheit bei den Sprachkenntnissen reproduziert wird, könnten möglicherweise einen größeren Teil dieses Effekts erklären.

**Schlagwörter:** Erziehung, Sprachkenntnisse, kausale Mediationsanalyse, soziale Ungleichheit

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