

Supporting Early Language by Supporting Systemic Solutions

Policy Insights from the
Behavioral and Brain Sciences
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DOI: 10.1177/23727322241268909
journals.sagepub.com/home/bbs



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Abstract

A large body of research shows connections between infants' and toddlers' home language input and a wide range of receptive and expressive early language skills. Some facets of caretaker input and early language skills are associated with socioeconomic status (SES), though not all. Given the complexity of language learning, language use, and its many pathways of connection to SES, testing causal links between these dimensions is difficult at best. Interventions aimed at changing parent language use have seen mixed success, in part because "language infusions" generally fail to target underlying challenges facing underresourced families, and perhaps because parent language is the wrong target. System-level interventions such as paid parental leave and expansion and enrichment of childcare and early education options hold greater promise for improving families' lives, with positive repercussions for a broad range of family and child outcomes, including linguistic ones.

Keywords

language development, socioeconomic status, child outcomes, early childhood policy

Tweet

The early home language input is tied to language skills in babies and toddlers, which are tied to school readiness and attainment. Interventions bolstering support systems rather than individuals hold the most promise for supporting families and nurturing early child language

- Interventions aimed at increasing aspects of parent talk are still in their early stages; a deeper evaluation of their efficacy and links to school readiness is warranted.
- System-level rather than individual-level changes hold more promise for supporting families, given current evidence.
- Paid parental leave, accessible high-quality childcare and preschool, and well-funded early education are strong targets for supporting underresourced families, which in turn support children's early language learning and school readiness.

Key Points

- Understanding the complexity of both socioeconomic status (SES; income, education, identity) and language (exposure, learning, use) will better support children and families.
- Abundant evidence links language input to language abilities in young children, but a causal understanding of what underlies these links, and their connections to SES, is limited; this needs to be more squarely addressed.

Social, cognitive, and linguistic skills improve dramatically over the first few years of life, as children bond with caretakers, learn to play with peers, hone common sense, and learn language. Children quickly grow from cooing and babbling to understanding and producing increasingly complex utterances. Early language skills in particular predict later academic success, social skills, and behavior regulation (Bleses et al., 2016; Bornstein et al., 2013; Duff et

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al., 2015; Duncan et al., 2007). Indeed, language is uniquely powerful for nurturing relationships, asserting independence, clarifying needs, and sharing emotions. But without understanding the determinants of early language skills, we remain limited in our ability to identify and help children who struggle with this fundamental aspect of development, whether through structural or individual-level policy.

Language is a complex target of study with interlocking subcomponents (e.g., phonetic, lexical, syntactic), and its use depends greatly on social circumstances within interactions. Moreover, the mechanisms supporting language skills take routes both distal and proximal. Put trivially, children won't learn the sounds, words, or grammar of language if they're not exposed to it, but they will also struggle to learn language (and much else) if their basic needs for food, safety, and shelter aren't met. These routes invite diverse approaches for supporting children's language; interventions include giving children books, training "best practices" for parent-child interaction, and providing material and social support to families (Gennetian et al., 2022; Greenwood et al., 2017; Szumlas et al., 2021; Zuckerman & Needlman, 2020).

Upbringing context also contributes to language. In fact, the received wisdom in psychology, education, and public policy is that socioeconomic status or context (SES hereafter)¹ in particular exerts an influence on children's language abilities (Hart & Risley, 1995; Kuchirko, 2019). But "exerting an influence" is far beyond what the data show: there's a vast chasm between SES links to aspects of children's language input or skills and claims that such links are causal or changeable via intervention. This is partly because SES too is a complex construct, with components including education, occupation, financial standing, percepts of social standing, poverty and its concomitant stressors, etc.²

But even a more scientifically supported claim that SES is associated with aspects of children's early language leaves open questions regarding how children are supported, when, and by whom. The data are clear that disadvantaged children face substantially more challenges in their path to and through formal education (Brito, 2017; Greenwood et al., 2017; Head Zauche et al., 2016; Vernon-Feagans et al., 2020). But it is less clear whether the most effective route to improving early language skills (and their follow-on academic skills) is to train parents to infuse children's early environments with high "language nutrition." The evidence that such infusions are effective in early childhood is mixed (e.g., Huber et al., 2023; McGillion, Herbert, et al., 2017; McGillion, Pine, et al. 2017; Suskind et al., 2016).

This article first describes links between early-language input and skills, and their associations with SES. It then describes some missing links between SES and early language, and summarizes recent interventions. It concludes by advocating for supporting children through systemic

rather than individual-level efforts (Chater & Loewenstein, 2023), highlighting the promise of paid parental leave during infancy, access to high-quality early childcare, and a greater investment in early education. Such changes are critical for ensuring all children are well-supported as their language skills initially blossom, and throughout their schooling.

Here is my central thesis: It may be possible to change aspects of how parents talk to and with very young children through interventions in a way that shapes early language skills. But structural interventions that support underresourced families by reducing psychosocial and financial strain are a more effective target for improving a host of early skills, language included. Such system-level supports, and the early skills they facilitate, can in turn, promote school readiness and academic and economic opportunities more broadly. While it is always good to empower caretakers with knowledge regarding early language development, supporting families' broader needs is critical.

Links Between Early Language Input, Early Language Skills, and SES

The quantity of speech that children hear has been tied to their vocabulary size, spontaneous speech production, and real-time word comprehension over infancy and toddlerhood (Bergelson et al., 2023; Brito, 2017; Hurtado et al., 2008; Huttenlocher et al., 2010; Weisleder & Fernald, 2013). There are also finer-grained connections between the range and complexity of words and grammatical structures in the input, its narrative-like properties, and children's own vocabulary and utterance complexity (Cartmill et al., 2013; Hoff, 2003; Rowe, 2012; Song et al., 2014). There is evidence for unique roles for interactivity and shared focus in predicting child language, alongside simpler quantity metrics (Cartmill et al., 2013; Golinkoff et al., 2015; Masek et al., 2021). Meta-analysis reveals a moderate-to-large association between several language measures (vocabulary diversity, grammatical complexity, and overall amount of speech) in parents' input, and children's language development (Anderson et al., 2021). In short, the properties of the home language environment and aspects of children's linguistic abilities are systematically linked.

Researchers have also considered input-output connections relative to SES. Across studies (based primarily in the United States), primary caretakers with higher SES tend to produce more speech than caretakers with lower SES (Bergelson et al., 2018; Huttenlocher et al., 2010; Rowe, 2012). More speech, in turn, correlates with wider vocabulary, more and higher-complexity sentences, more conversational back-and-forth, and more conversations that go beyond the hear-and-now; thus, these too tend to be increased in higher- versus lower-SES households (Hoff-

Ginsberg, 1991; Huttenlocher et al., 2010; Romeo et al., 2018; Rowe, 2012; Vernon-Feagans et al., 2008).³ Of course, causal connections here are fraught: what parents say is both a function of speaker traits and of communication opportunities, for example, the topics that arise given the situations families find themselves in (Huang et al., 2023).

SES has also been linked to children's receptive and expressive language skills. Within speech perception, SES has been associated with children's phonetic representations in particular (Gonzalez-Gomez et al., 2021); SES too is increasingly linked to phonological awareness (a literacy precursor) over age 2–5 (McDowell et al., 2007). For word comprehension, toddlers from lower-SES households show slower or less-accurate real-time noun understanding than their higher-SES peers (Fernald et al., 2013; Weisleder & Fernald, 2013). Three to seven year olds in lower- versus higher-SES households also exhibit differences in real-time grammatical parsing for particular constructions, for example, passives (Huang et al., 2017).

For early expressive language, there are limited SES effects on babbling (McGillion, Herbert, et al., 2017; Oller et al., 1995; but cf. Vanormelingen et al., 2020). In contrast, for early word production, lower-SES children are consistently reported to have smaller expressive vocabularies than higher-SES peers (e.g., Frank et al., 2021; Hoff, 2003), though this may in part reflect measurement challenges. Beyond single words, children tend to produce language that mirrors parental input in terms of for example, lexical diversity, grammatical constructions, conversational back-and-forth and displaced language, reflecting similar links to SES as those in parent language (Golinkoff et al., 2015; Hoff, 2003). This interacts with the communicative pressures noted above (Huang et al., 2023).

Testing links between input, early language skills, and SES, in a representative U.S. sample of >1,000 children (wherein race was dissociable from SES), recent research found that maternal education and maternal language (e.g., wh-questions and lexical diversity) predicted variance in later child language at school age, and no input differences by race within education level (Vernon-Feagans et al., 2020).⁴

Collectively, the literature reports links between SES and language input, and children's early language skills. The size and prevalence of these links varies depending on which aspects of language are considered, and the complex, interlocking causes of SES differences are not directly isolated. Underscoring this complexity, economic distress increases stress and mental health concerns, which have trickle-down effects on parent–child interactions (Masarik & Conger, 2017; Newland et al., 2013). Stress has been linked not only to a host of cognitive outcomes like memory and executive function (Merz et al., 2019) but more directly to vocabulary across childhood as well (Noel et al., 2008; Vallotton et al.,

2012). Parent knowledge too connects SES to child outcomes (Rowe, 2022). In short, linguistic manifestations of SES are deeply tied to external structural factors facing families (Brito, 2017; Rowe, 2022).

Missing Links Between SES and Everyday Language

For naturalistic measures of speech from daily life, the association between language and SES is less robust (Bergelson et al., 2023; Dailey & Bergelson, 2022; Piot et al., 2022). One recent paper examined speech in everyday interactions in 1,001 0–4 year old children and their families, sampled from daylong child-centered audiorecordings from 12 countries (Bergelson et al., 2023). The results revealed three key predictors of how much children vocalized: their age, whether they were typically developing, and how much adult speech they heard. However, they found no evidence for SES effects (operationalized as maternal education in various ways). Indeed, SES did not predict how much either adults or children spoke in these recordings. This suggests that, as measured in everyday interactions happening with and around young children, SES does not play a prominent role in predicting the quantity of everyday speech.

While at first these results seem divergent from the work summarized above, they are consistent with two recent metaanalyses (Dailey & Bergelson, 2022; Piot et al., 2022). One finds that after correcting for publication bias, only a small SES effect remains on measures of everyday language input; the child production SES effect was smaller still (Piot et al., 2022). The second meta-analysis finds an SES effect on language input when considering speech directed to the child, but not when considering all speech around the child (Dailey & Bergelson, 2022). In samples computable in words/hour, this difference translated to ~350 words/hr between low- and mid-to-high-SES households, and was not statistically significant. As points of comparison, adult conversation averages 8,000 words/hr,⁵ and the highly cited (but small-n) study by Hart and Risley (1995) found that children in their six low-SES households heard on average ~1500 fewer words/hour than children in their 13 high-SES households; these findings merit cautious interpretation given their approach (cf., e.g., Sperry et al., 2019).

In terms of child speech, the research just highlighted suggests SES does not have large, robust links to spontaneously produced babble, words, and utterances by young children, coarsely measured. This contrasts with work showing SES effects on real-time lexical and syntactic processing (Fernald et al., 2013; Huang et al., 2017) and others mentioned above. A better understanding of which

early child language measures predict school readiness, literacy, and academic achievement, and why, is needed.

The same question can be centered regarding early language input (Rowe & Snow, 2020). Whether child-surrounding or child-directed speech is measured makes a difference in whether SES effects are observed. The potentially unique role of parent–child give-and-take is an active area of research and debate (Golinkoff et al., 2019; Schwab & Lew-Williams, 2016; Sperry et al., 2019). On one hand, children prefer speech directed to them (vs. adults) from infancy onward (Dunst et al., 2012), and preferentially learn from such input in some contexts (Foushee et al., 2021; Ma et al., 2011). On the other, many aspects of language are learned via overheard speech, for example, phonetic patterns, sociocommunicative skills, pronoun structure (Hoff, 2006; Oshima-Takane et al., 1996), and words parents likely intend not to say in front of their children which children nevertheless acquire. Notably, over half of young children’s input is speech to others across a broad variety of sociocultural contexts (Bunce et al., in press); not incidentally, family-size covaries with SES.

Understanding why parent–child interaction may be particularly potent in facilitating certain language subskills and what children learn from overheard speech are worthwhile queries, relevant for considering how input and child language skills connect to school readiness and success, as a function of SES and overall (Golinkoff et al., 2019; Sperry et al., 2019). That said, the existence of group differences does not itself imply that an intervention could alter caretaker talk, or that doing so would have a measurable, sustained effect on early language outcomes and sequelae. We now consider recent intervention efforts.

Intervention Efforts

Within early language research, parenting interventions (as opposed to child-, school-, or community-level interventions) tend to be most common (though cf. Greenwood et al., 2017), and meta-analyses support their efficacy in altering some aspects of parent knowledge and behavior, and child language outcomes (Heidlage et al., 2020; Jeong et al., 2021). One meta-analysis reports significant moderately sized positive benefits of parenting interventions on language outcomes, with larger effects for low-and-middle-income countries versus high-income countries (Jeong et al., 2021). They also find that interventions that include responsive caregiving content were more effective in increasing parenting knowledge, practice, and parent–child interaction.⁶ Related meta-analyses highlight significant effects of parent intervention on expressive but not receptive language measures (Heidlage et al., 2020).

Interventions focused on increasing turn-taking, contingent talk, and child-directed speech have seen mixed results (Ferjan Ramírez et al., 2020; Huber et al., 2023; McGillion, Pine, et al., 2017; Suskind et al., 2016). Some RCTs find that parent coaching in infancy is tied to initial or early improvements on child language output measures with fadeout by age 2 (McGillion, Pine, et al., 2017); others find more sustained effects into toddlerhood (Ferjan Ramírez et al., 2020; Huber et al., 2023). These studies either include only a low-SES group or fail to find an effect of SES on child outcomes.

One challenge for parent-based language interventions is that it is essentially impossible to mask group assignment (intervention vs. control) given the nature of parent coaching, potentially biasing child outcomes based on parent report. This is mitigated by using direct child outcomes, for example, vocalizations from home recordings. However, there too it is hard to disentangle child speech from adult speech based on interactive measures like conversational back-and-forth between parent and child.

Finally, interventions targeting caretaker language likely have limited efficacy when they fail to incorporate what drives linguistic behavior: the social contexts of conversations, and the communicative needs language addresses (Huang et al., 2023). SES effects do not emerge in a social vacuum, nor are they likely to be erased by optimized language input; poverty affects social experiences, within which language interactions take place. This is a key consideration for the system-level policies suggested below: efforts to increase “high-quality” parent talk are likely to be more efficacious in a context where parents experience less stress, and greater fiscal, educational, and psychosocial resources.

Promising System-Level Policies for Supporting Early Childhood Development

Compelling recent work suggests individual-level change is the wrong policy target; system-level change is more effective (Chater & Loewenstein, 2023). Extending this to the early language development, supporting higher-order policy changes that have clearly positive repercussions for young children is a strong way forward. Such policy changes could improve cognitive, social, and linguistic development, while supporting well-being. This is not to say that parenting language interventions uniformly fail to shift aspects of parent talk and child language; they move the needle in measurable if modest ways. But while interventions targeting parent talk generally aim to support underresourced families and promote school preparedness, it’s unclear whether they achieve this. Moreover, parenting interventions can veer toward the problematically (even if unintentionally) paternalistic, casting blame on struggling parents. A focus on systemlevel changes stands to achieve wider, larger-scale

benefits for families and young children, which are likely to include linguistic benefits because they address some of the root financial, educational, and psychosocial stressors at play.

Chief among the relevant system-level changes are policies regarding paid parental leave, expanded (targeted or universal) pre-K, and increased resources supporting early educators. These are worthwhile policy pursuits because of their clear, broad-reaching, positive consequences for families and children. This lends them more promise for supporting young children's development than targeted interventions aimed at increasing various facets of language input in the home.

The case for paid parental leave as a viable avenue for supporting early development has already been well-articulated by others (Rowe, 2022; Scott & Brito, 2022). The science is clear and unequivocal: Paid parental leave benefits infants and their caretakers in creating supportive environments well-linked to positive outcomes for all involved, including language outcomes (Kozak et al., 2021).

An expansion of readily available early childhood education options complements paid parental leave. These programs include universal and targeted programs (e.g., universal pre-K, Early Head Start). While the latter are more common in the United States, research from the United States and Europe shows that both can help support disadvantaged children with school readiness, including language and reading measures (Blau, 2021). The largest impediment to expanding and supporting high quality public pre-K is inadequate earmarked funding. While GDP and K-12 spending per child have gone up substantially in recent decades, spending on public pre-K has remained flat (Friedman-Krauss et al., 2024). Moreover, while targeted programs such as Early Head Start provide care from infancy onward, universal programs are broadly available only for 4-year-olds. A reconsideration of funding priorities is warranted, given that high quality preschools support school readiness (Gormley et al., 2008), which feeds academic achievement across various outcomes, in students from low-income backgrounds and more broadly (Bustamante et al., 2023; Duncan et al., 2007; Fitzpatrick et al., 2020; Ricciardi et al., 2021). A variety of specific policy solutions can fill this gap, with pros and cons of universal and targeted alternatives; all require further dedicated spending.

Even as daycare costs have skyrocketed to over \$20k/year per child in some regions of the United States, with monthslong waiting lists and extremely limited parental leave to fill the gap, pay for early childhood educators remains low. The annual mean wage for U.S. childcare workers was \$32k for 2023, or ~\$15/hr (Childcare Workers, 2023). This low wage leads to burnout and a revolving door of early educators, which adds to instability for young children receiving care (Boyd, 2015). Early childcare workers also

suffer from pay inequity, compounded by intersecting race, ethnicity, and gender identities (Liu et al., 2023). While training, professional development opportunities and expectations for early childhood educators have increased, corresponding compensation has not. In turn, high turnover in early education has been linked poorer language outcomes in young children (Markowitz, 2024). This is fixable by concerted investment in early education at city, state, and federal levels.

Expanded parental leave and greater investment in early education access and quality are the types of structural interventions that the scientific evidence confirms lead to improved well-being, reduced stress, and a wider social safety net. Such policy shifts, broadly implemented, would create opportunities for parents to spend time with their children with fewer weighty financial pressures (Ellwood-Lowe et al., 2022), and fewer stressors regarding the availability of high quality childcare when they rejoin the work force after critical bonding time with their infants (Scott & Brito, 2022). Part of the appeal of parenting interventions for policy makers is their low cost, relative to the more expensive structural changes outlined above. But our youngest learners are arguably most deserving of a high level of psychosocial, fiscal, and political investment. Language development readily proceeds across a broad range of upbringing circumstances. But how ready young children are to thrive in school and beyond is not simply a matter of parenting; it is in large part a reflection of the systems society sets up for them.

Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the National Science Foundation, Eunice Kennedy Shriver National Institute of Child Health and Human Development (Grant Nos. BCS-1844710 and R01HD107285).

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Notes

1. I use the term socioeconomic status (SES) due to its prevalence in the literature, but note socioeconomic circumstances or context may better reflect the construct of interest.
2. SES is also linked to myriad aspects of development and behavior, cf. <https://www.apa.org/pi/ses>; it interacts with race, ethnicity, immigration status, and healthcare in ways far beyond this paper's scope.

3. While it is possible to talk more without using a wider range of words, topics, or constructions, this is not what generally happens.
4. Notably, most research cannot disentangle race, ethnicity, or multilingualism from SES; each contributes large within- and between-group variance in language measures.
5. https://www.voices.com/tools/words_to_time_conversion
6. This work flags publication bias in 2/10 areas: child language and parent–child interaction.

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