

**Editorial**

Untying the Gordian Knot of Early Language Screening and Improved Developmental Outcomes

Ann P. Kaiser, PhD; Jason C. Chow, PhD; Jennifer E. Baumingham, PhD

Early language development is the foundation for communication, social relationships, reading, academic accomplishments, job performance, and other life-long indicators of positive social development and economic success. Early detection of significant delays in language development and effective intervention, when needed, are essential to ensuring optimal developmental outcomes. Estimates of primary language delays in children younger than 5 years vary widely, ranging from less than 5% to nearly 20%, depending on the age of the child, the inclusion of speech and/or language criteria, the specific measures used, and the criteria for identification of significant delays.¹⁻⁴ Given that only 30% of children younger than 5 years are screened when their primary caregivers or teachers do not express concerns about their speech or language development and only 50% of children eligible for intervention are reported to receive interventions, there is a need for contemporary evidence-based guidance on the potential positive and negative outcomes of screening.

Although there are documented associations of early speech and language delays with subsequent poor academic, social, and behavioral outcomes,^{5,6} evidence linking screening to effective interventions and subsequent improvements in long-term developmental outcomes is limited. The US Preventive Services Task Force (USPSTF) recommendation statement concluded that "the current evidence is insufficient to assess the balance of benefits and harms of screening for speech and language delay and disorders in children age 5 years or younger" (I statement).^{7,8} No studies specifically examining the risks and benefits of screening vs no screening were identified.^{7,8} The reports by the USPSTF⁷ and Feltner et al⁸ reviewed a total of 38 studies of screening and intervention meeting stringent inclusion criteria for methodological quality and outcomes. In this editorial, we highlight several secondary contributions of the USPSTF recommendations,^{7,8} suggest additions that might enhance the impact of the recommendations, and make suggestions for research and policy, with particular emphasis on the role of parents as collaborators in screening and intervention.

+ Related article at [jama.com](#)

Author affiliations and article information are listed at the end of this article.

Contributions of the Report

In addition to the overall recommendation,^{7,8} the USPSTF makes several important contributions to understanding the "Gordian knot" linking speech and language screening to improved long-term developmental outcomes. First, the mean incidence of primary speech and language delays was 16% across 21 studies enrolling 7489 children younger than 5 years.^{7,8} There was considerable variability in reported incidence by study, screening measure, language constructs (eg, specific vs global language skills), and informant (eg, parent vs clinician). This variability is important; however, the mean incidence level reported across studies suggests early screening would detect a significant number of children. Second, overall sensitivity and specificity data indicated that early delays in specific language skills and articulation can be detected with available screening instruments used by parents or clinicians.^{7,8} Again, variability across screening instruments, speech and language constructs, and informants was noted; however, several screening tools appeared promising for immediate practice and candidates for future research studies. Third, across all components of the synthesis, there was evidence that parents were essential partners in screening and effective

Open Access. This is an open access article distributed under the terms of the CC-BY License.

intervention delivery.^{7,8} For example, parent reports of specific child language skills were precise, with high levels of sensitivity and specificity similar to examiner levels but with less variability. Most studies in which parents were trained to deliver interventions to their children reported positive outcomes for some measures. Positive outcomes were associated with longer parent implementation. These results,^{7,8} when paired with meta-analysis of parent-implemented interventions across populations of young children with language impairment,⁹⁻¹¹ support the use of parent-implemented interventions to improve language outcomes. In the USPSTF analysis of contextual factors impacting screening,^{7,8} parent characteristics (eg, socioeconomic status, single parent status, social isolation, primary language other than English) were associated with participation in screening and intervention. These findings suggest that parents may be gatekeepers for their children's access to a range of supports for language development.¹² The associations between these indicated parent characteristics and expected disparities in health care access deserve notice, since this may be the mediating association between parent characteristics and participating in screening and intervention.

Expanding on Important Information From the Synthesis

All syntheses of empirical studies are limited by the quantity and quality of the studies under review; the USPSTF evidence review and recommendation statement are no exception.^{7,8} However, 2 additions to the synthesis of the available studies could have contributed important information. First, age is a critical variable in understanding language development and delay. The use of the broad age umbrella, younger than 5 years, for synthesizing studies may have masked important differences associated with age at screening. Accuracy in identification of speech and language delays generally increases with age; assessments after age 36 months are likely to be more reliable than those prior to age 30 months.^{2,13,14} Child age may also impact the accuracy and sensitivity of parent reports of their children's language development. Parents are likely to be more reliable informants about their children's early development of specific skills (eg, vocabulary) than later development of more complex skills (eg, morphology, syntax) that may be indicative of a developmental language delay. Analysis of the screening studies to characterize age-related precision in screening could provide preliminary guidance about when to screen and when parents are most valuable as informants.

Second, characterizing the outcomes of intervention studies in terms of measures with statistically significant outcomes may have masked important information about the magnitude of the changes observed across measures and studies. A meta-analysis of the speech and language outcomes would be constrained in the small sample of language intervention studies and even smaller sample of speech studies. However, including the effect sizes in the USPSTF synthesis^{7,8} would have added important information about the relative benefits of intervention, consistent with contemporary standards for reporting the outcomes of intervention research.

Recommendations for Research

The evidence report by Feltner et al⁸ and the USPSTF recommendation statement⁷ highlight gaps in evidence related to screening and treatment studies with short-term and long-term follow-up addressing key academic, behavioral, and well-being outcomes. There is a particular absence of studies including young children and families for whom disparities in health care and limited resources are also barriers to accessing screening and intervention. This recommendation again draws attention to the difficulties in resolving the Gordian knot linking screening to functional long-term outcomes. At the center of the knot is the need for funding for inclusive research at scale and with sufficient replication to provide evidence to guide practice and policy recommendations.

Funding is needed for 4 key areas with representative populations of children and families. First, we need screening research that describes trajectories of speech and language development over

the first 5 years with follow-up through the transition to reading. Second, validation must be performed for promising, pragmatic screening measures across critical periods in language development in early childhood, including assessing the validity for valued language, academic, and social outcomes. Third, we need intervention research based on contextualized, promising interventions. Such interventions would be calibrated for intensity and dosage associated with optimal developmental outcomes and responsive to the cultural, linguistic, and caregiving contexts of families. Particular attention should be given to caregiver-implemented interventions and interventions provided by teachers in childcare and prekindergarten classrooms. Fourth, there is a need for implementation-level and systems-level research that places screening at the nexus of the health care, community, and education systems. The goal is to understand how to link and supplement existing systems to ensure sustainable delivery of early language screening that leads to effective and timely intervention. This research should also address preparing systems to implement the methods, practices, and policies based on evidence from the research recommended.

Public Education Initiatives to Support Parents

Parents and caregivers of young children are not likely to have extensive knowledge about early language development and how it relates to children's long-term academic and social outcomes. Parents need information about language development, why screening is important, and the potential of early intervention to support their child's development. This information should be accessible and timely, provided in parents' primary language, and presented without the stigma of labeling children at risk due to poverty, neighborhood, race, ethnicity, home language, or family structure. Without culturally and linguistically accessible, unbiased information, it is unlikely parents will choose to participate in screening their children's emerging speech and language. Many families need more than information; they need active assistance to access follow-up assessments and opportunities to participate in interventions that reflect their language and culture as well as addressing their children's needs. Innovative family-centered approaches to providing information, screening, and intervention in communities are needed to support parents as well as children. Health care practitioners, particularly pediatricians, play a critical role in language screenings for all children and in facilitating access to comprehensive assessment and intervention when indicated. Collaboration between health care and educational systems is essential.

Conclusions

There is a critical need for research on screening for early language delays, including evaluating measures that are sensitive and specific in detecting delays in all young children and testing a range of culturally and linguistically contextualized early interventions to effectively address children's delays. Given the lifelong importance of language related skills, the USPSTF recommendation^{7,8} must be construed as a challenge rather than a conclusion.

ARTICLE INFORMATION

Published: January 23, 2024. doi:10.1001/jamanetworkopen.2023.54529

Open Access: This is an open access article distributed under the terms of the [CC-BY License](#). © 2024 Kaiser AP et al. *JAMA Network Open*.

Corresponding Author: Ann P. Kaiser, PhD, Vanderbilt Kennedy Center, 110 Magnolia Cir, Ste 314, Nashville, TN 37232 (ann.kaiser@vanderbilt.edu).

Author Affiliations: Vanderbilt Kennedy Center, Nashville, Tennessee (Kaiser, Chow); University of Washington, Seattle (Baumingham).

Conflict of Interest Disclosures: None reported.

REFERENCES

1. Law J, Boyle J, Harris F, Harkness A, Nye C. Prevalence and natural history of primary speech and language delay: findings from a systematic review of the literature. *Int J Lang Commun Disord*. 2000;35(2):165-188. doi:10.1111/j.1460-6984.2000.tb00001.x
2. Klee T, Pearce K, Carson DK. Improving the positive predictive value of screening for developmental language disorder. *J Speech Lang Hear Res*. 2000;43(4):821-833. doi:10.1044/jslhr.4304.821
3. Norbury CF, Gooch D, Wray C, et al. The impact of nonverbal ability on prevalence and clinical presentation of language disorder: evidence from a population study. *J Child Psychol Psychiatry*. 2016;57(11):1247-1257. doi:10.1111/jcpp.12573
4. Tomblin JB, Records NL, Buckwalter P, Zhang X, Smith E, O'Brien M. Prevalence of specific language impairment in kindergarten children. *J Speech Lang Hear Res*. 1997;40(6):1245-1260. doi:10.1044/jslhr.4006.1245
5. Chow JC, Ekholm E, Coleman H. Does oral language underpin the development of later behavior problems: a longitudinal meta-analysis. *Sch Psychol Q*. 2018;33(3):337-349. doi:10.1037/spq0000255
6. Yew SGK, O'Kearney R. Emotional and behavioural outcomes later in childhood and adolescence for children with specific language impairments: meta-analyses of controlled prospective studies. *J Child Psychol Psychiatry*. 2013;54(5):516-524. doi:10.1111/jcpp.12009
7. US Preventive Services Task Force. Screening for speech and language delay and disorders in children: US Preventive Services Task Force recommendation statement. *JAMA*. Published online January 23, 2024. doi:10.1001/jama.2023.26952
8. Feltner C, Wallace IF, Nowell SW. Screening for speech and language delay and disorders in children 5 years or younger: an evidence report for the US Preventive Services Task Force. *JAMA*. Published online January 23, 2024. doi:10.1001/jama.2023.24647
9. Heidlage JK, Cunningham JE, Kaiser AP, et al. The effects of parent-implemented language interventions on child linguistic outcomes: a meta-analysis. *Early Child Res Q*. 2020;50(1):6-23. doi:10.1016/j.ecresq.2018.12.006
10. Roberts MY, Curtis PR, Sone BJ, Hampton LH. Association of parent training with child language development: a systematic review and meta-analysis. *JAMA Pediatr*. 2019;173(7):671-680. doi:10.1001/jamapediatrics.2019.1197
11. Pak NS, Chow JC, Dillehay KM, Kaiser AP. Long-term effects of early communication interventions: a systematic review and meta-analysis. *J Speech Lang Hear Res*. 2023;66(8):2884-2899. doi:10.1044/2023_JSLHR-22-00711
12. Adamson LB, Kaiser AP, Tamis-LaMonda CS, Owen MT, Dimitrova N. The developmental landscape of early parent-focused language intervention. *Early Child Res Q*. 2020;50(1):59-67. doi:10.1016/j.ecresq.2018.11.005
13. Klee T, Carson DK, Gavin WJ, Hall L, Kent A, Reece S. Concurrent and predictive validity of an early language screening program. *J Speech Lang Hear Res*. 1998;41(3):627-641. doi:10.1044/jslhr.4103.627
14. Sachse S, Von Suchodoletz W. Early identification of language delay by direct language assessment or parent report? *J Dev Behav Pediatr*. 2008;29(1):34-41. doi:10.1097/DBP.0b013e318146902a