European Journal of Education Studies
ISSN: 2501 - 1111
ISSN-L: 2501 - 1111
Available online at: www.oapub.org/edu

DOI: 10.46827/ejes.v11i12.5622 Volume 11 | Issue 12 | 2024

EARLY COMMUNICATION INDICATOR-PORTUGAL: EVIDENCE FOR ITS USE IN ASSESSING AND MONITORING COMMUNICATION IN YOUNG CHILDREN

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Abstract:
The need for effective, globally validated tools to assess and monitor communication in early childhood has led different populations to explore and adapt tools that have already been validated in other countries and languages. A promising tool to support the assessment and monitoring of early communication is the Early Communication Indicator (ECI), developed in the USA. The ECI has recently been adapted for the Portuguese population, and the aim of this paper is to describe its characteristics and report the results obtained with Portuguese children aged between 6 and 42 months, presenting evidence for its use in assessing and monitoring communication in Portuguese children at an early age. This evidence shows the sensitivity of the ECI-Portugal in capturing the changes that occur throughout the communicative development of Portuguese children in the early years, and in identifying differences between children with and without communication disorders. Further research is needed to advance the development of the ECI in the Portuguese context. Consequently, a discussion of the research and practical steps needed to move this project forward is presented.

Keywords: assessment; monitoring; early communication; communication disorders

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1. Introduction

The growing evidence on the importance of early childhood development has led to a progressive attention of the experiences of children from birth to 8 years of age. Increasingly, concerted and coordinated action is essential to ensure that all children have the necessary conditions to reach their full developmental potential. A crucial component of this infrastructure is the ability to assess and monitor children's skills. Only through assessment and monitoring is it possible to discern patterns of success and inequity, which will enable capacity building for developmental science at the global level (Raikes et al., 2014, 2017).

One of the child's competencies that is particularly important to assess and monitor from an early age is communication. The development of communicative competence is progressive and gradual, evolving in comprehension and expression. Mastery of expressive communication will allow the child to express their needs and desires and to interact appropriately in their environment (Levey, 2024; Owens, 2016).

Thus, when communication problems arise at an early age, it can have a significantly negative impact on the child's behavioural, socio-emotional, and cognitive development (Levey, 2024; Owens & Farinella, 2023; Paul & Roth, 2011; Prelock & Hutchins, 2018; Reed, 2018; Whitehouse et al., 2011). For example, children identified with language delays at two years of age may later, in adolescence and youth, show difficulties in tasks related to language, reading, and writing (Rescorla, 2002, 2005, 2009). These children may thus face challenges throughout their academic development up to adulthood (Roos & Weismer, 2008). The challenge remains in the early identification of emerging problems and in the development of adequate early intervention programmes to improve children's communication performance.

In the complex process of communication development, it is possible to identify a continuum between prelinguistic skills and linguistic skills (Greenwood, et al., 2013). The progressive development of expressive communication initially involves the acquisition of prelinguistic skills (e.g., gaze, gestures, vocalizations), which subsequently evolved into the acquisition of linguistic skills (e.g., words, word combinations, sentences) (Brady et al., 2004). It means that before a child expresses his/her first words, much has happened.

In the first months of age, the child already responds to the language of others, produces sounds, uses eye gaze and vocalizes (Levey, 2024; Owens, 2016). Between 8 and 10 months, a child should start showing communicative intent through the production of intentional gestures (Clark & Kelly, 2022; Crais et al., 2004). At this stage, the child produces gestures alongside vocalizations, though they are not always coordinated. As the child approaches the first birthday, he/she starts to produce the first words to complement or substitute gestures. By the age of 24 months, a child is expected to show an expressive vocabulary of around 50 words and should begin to produce the first word combinations (Clark & Kelly, 2022; Frank et al., 2021; Levey, 2024; Owens, 2016; Sheldrick et al., 2019). Between 24 and 36 months, children develop the ability to form more

complete and complex sentences. By age 3, their speech becomes clearer, their vocabulary expands significantly, and they also start to adapt their language to different situations and contexts (Levey, 2024; Owens, 2016).

The knowledge of these milestones provides significant information about typical communication and language acquisition that can help professionals and the children's families support their development (Prelock & Hutchins, 2018). And, despite the range of what can be considered "typical" is vast, it is important to pay attention to deviations or delays manifested by the child.

In these cases, it is important to assess and monitor the child's communication with valid and effective instruments to ensure that all children have the necessary conditions to reach their full developmental potential. In this demand and based on social interactionist theories of language development, structured or semi-structured naturalistic observations of caregiver-child communication within a play-based, supportive environment aim to capture the dynamic nature of language in a more realistic way (King et al., 2021).

One promising naturalistic instrument to support early language assessment and monitoring is the Early Communication Indicator (ECI) (Greenwood et al., 2010, 2013; Luze et al., 2001). While not designed to be used as a standalone assessing tool, the ECI has been successfully employed to identify children at risk for language delays and to support diagnostic decisions across children from diverse special needs conditions and racial, ethnic, and linguistic backgrounds (Bavin et al., 2020; Buzhardt et al., 2019, 2022; Greenwood et al., 2010; King et al., 2021).

The ECI has recently been translated, adapted and validated in Portugal (Ferreira, 2022; Ferreira, Cruz-Santos et al., 2023), and with this work, we want to describe its characteristics, report some of its results in the Portuguese population and present some evidence of its validity for assessing and monitoring the communication of Portuguese children at an early age.

2. Material and Methods

2.1 Measure

The Early Communication Indicator (ECI) was developed in USA and was created to meet the need for monitoring the development of expressive language in children between the ages of 6 and 42 months. The ECI measures the rate of growth in four foundational communication skills that represent the prelinguistic and linguistic sequence of language: gestures, vocalizations, and single and multiple-word utterances (Greenwood et al., 2010; Luze et al., 2001).

The ECI is a 6 minute, play-based assessment usually conducted in the child's home, childcare centre, or another setting like a pediatric clinic. A practitioner observes the child interacting with a familiar adult partner (e.g. parents) using a specific set of toys (the Fisher-Price® House or Farm, see Figure 1 below). It is recommended that the two

sets of toys are alternated between sessions to maintain the child's interest in the toys over time (Walker & Carta, 2010).

Frequency counts of the child's production of the key skills are coded by a trained observer, and it can be done during the interaction, or then through a video recording of the session. The frequency of the occurrence of the four key skill elements must be registered on a score sheet designed for this purpose or can be directly inserted in an app. Gestures are registered when the child uses any movement to communicate with the play partner (e.g., showing, offering a toy, refusing or reaching for a toy, pointing, shrugging the shoulders). Vocalizations are registered when the child makes non-word or unintelligible sounds to the play partner (e.g., laughing, making animal sounds, babbling, cooing, sounds like 'mm' or 'huh', or other unintelligible sounds). Single words are registered when the child produces a clear utterance used by the child alone that is easily understood by the observer (e.g., naming objects/persons/animals, etc., repeating words, producing words in sign language). Multiple-word utterances are registered when the child produces intelligible phrases of two or more spoken or signed words that fit together meaningfully, whether grammatically correct or not, and are recognized by the observer. After all the communication skills are registered, their frequency should be summed, with each element weighted (e.g., gestures and vocalizations counted as one, single words as two, and multiple words as three). This total is then divided by the number of minutes of observation (usually 6 minutes) to calculate a weighted communication rate for the child's expressive communication, known as Total Communication. This measure will help us assess the child's expressive, communicative abilities. When the occurrences are directly entered into the web application (https://igdi-ds.ku.edu), it produces progress monitoring graphs that display the child's score in comparison to the benchmark for his/her age. As more assessments are completed over time, the application calculates and charts the child's growth pattern, illustrating his/her progress (Walker & Carta, 2010).

In some specific cases, the administration of ECI should follow adaptations, namely in the case of children with physical limitations or in the case of bilingual children. For children with physical limitations, the adult should bring the toys as close as possible to the child. For example, in the case of children who speak two languages, the adult interacting with the child and the evaluator should also speak or at least understand both languages (Walker & Buzhardt, 2010).

Figure 1: Toys that are used in the ECI assessment

For certification in the administration and coding of ECI, professionals must complete a specific training, provided by the Juniper Gardens Children's Project team (Buzhardt & Walker, 2010). This training lasts approximately one day, and is divided into two parts. The first part is directed towards the presentation of the ECI, and its objectives, addressing the main guidelines for its administration, and functionalities of the IGDIs/ECI website. The second part of the training involves viewing and coding two ECI administration videos. The results of the professionals in training are then compared to the results of the training team, and must obtain at least 85% agreement. When the percentage of agreement achieved is not as desired, the training team provides feedback on disagreements. The professionals must repeat the coding of the videos until they obtain 85% agreement (Buzhardt & Walker, 2010). The trainings can be conducted in person or online. All the resources needed for certification are available on the IGDIs/ECI website.

This certification plays a very important role in the use of the ECI, because incorrectly performed coding may result in a misinterpretation of the child's communicative performance. Poor coding can cause the child to be misidentified as being above or below what is expected, leading to ineffective assessment and monitoring that does not benefit the intervention with the child.

For the adaptation of the ECI for Portugal, we followed the International Test Commission's (ITC, 2017) guidelines for translating and adapting instruments, the procedures outlined by Carter (2005) for developing cross-cultural speech and language assessment tools for children, and the steps suggested by Almeida and Freire (2017) for instrument validation. The following steps have been completed: a) obtaining authorization for the translation and adaptation of the ECI from the original authors; b) receiving training and certification on the ECI from the Juniper Gardens Children's Project team; c) translating all ECI-related materials into European Portuguese by experts in special education and early childhood education; d) applying the 'thinking aloud' method to review instructions, response formats, setup, materials, duration, etc.; e) conducting a pilot study; f) assessing reliability (with intraclass correlation coefficients between .964 and .998 for interobserver agreement) and validity (differences were

observed between age groups and between children with and without communication disorders) (Ferreira, Sapage, et al., 2023).

3. Results, Discussion and Conclusion

3.1 Studies conducted with ECI in Portugal

In Portugal, some studies have been conducted with the ECI, providing preliminary evidence of its accuracy and validity for the Portuguese population.

Antunes and Cruz-Santos (2017) conducted an exploratory study (which served as a pilot study) in the northern region of Portugal. The study included a sample of 40 children, aged between 6 and 41 months, of both sexes, with and without developmental disabilities. Each child was assessed with the preadapted ECI at three different times, resulting in a total of 120 assessments. Reliability was assessed by interobserver agreement, with percentages of agreement ranging from 81.8% to 88.1% for all communicative elements assessed by the ECI (gestures, vocalizations, isolated words, sentences, and total communication). Validity was analyzed through inferential studies, which showed significant differences for all communicative elements in relation to age, but not in relation to gender. This study found that between the ages of 6 and 12 months, the children's communication consisted of producing gestures and vocalizations. At 12 months, the children began to produce words and continued to produce gestures and vocalizations. At 18 months of age, the children began to introduce their first sentences into their conversations in accordance with the words, gestures, and vocalizations. Over time, there was a decrease in the use of gestures and vocalizations and a gradual increase in the number of words and sentences. There was also an increase in the children's communicative competence over time, reflected in an increase in total communication. All the results obtained in these studies were consistent with the results of the ECI validation studies in the USA (Greenwood et al., 2006, 2010, 2013) and were also in line with the literature (Frank et al., 2021; Levey, 2024; Clark & Kelly, 2022; Owens, 2016; Prelock & Hutchins, 2018).

Ferreira et al. (2021) conducted a longitudinal case study in which the ECI was administered to a typically developing male child at 14, 17, 24, 30, and 36 months. The results showed that up to 17 months there was a predominance of vocalizations and gestures with the appearance of the first words. From 24 months, there was a predominance of words and later sentences. The total communication achieved by the child reflected an increasing mastery of expressive communication skills as the age group increased. All the results were again in line with the theory of communicative development (Frank et al., 2021; Levey, 2024; Clark & Kelly, 2022; Owens, 2016; Prelock & Hutchins, 2018). The aspects analyzed and discussed in this study showed that the ECI is sensitive to the changes and progression of communicative elements (gestures, vocalizations, words and phrases) and the overall communicative development of a Portuguese child over time.

Ferreira, Cruz-Santos et al. (2023) conducted a study in which the ECI was used in a one-year longitudinal study of three children with differences in communicative performance (two children with communicative performance considered typical and another child at risk for communication disorders). These children were assessed with the ECI at 17, 24, and 30 months of age and showed clear differences both in total communication and in the four communicative elements analyzed (gestures, vocalizations, isolated words, and word combinations). In the results obtained through the use of the ECI, typically developing children increased their production of isolated words and word combinations over time and also appeared to increase their proficiency in total communication over time. The child at risk for communication disorders did not make significant progress in the communicative elements over time, and therefore, his overall communicative performance was always lower than that of the other children. These results were in line with their developmental history and communicative performance, as well as with their scores on other assessment instruments (e.g., PT-CDI: WS - long forms inventories). According to the literature, given the importance of communication in early childhood, it is expected that the results of the communicative and total communication elements will be different when obtained with an instrument that distinguishes the performance of typically developing children from those with identified delays (Luze et al., 2001). The differences found in the results of the ECI in the communicative trajectories of the two typically developing children and the child at risk of communication disorders are evidence of how the ECI can support the early identification of Portuguese children at risk of communication delays or disorders.

Ferreira et al. (2024) conducted a study of 480 children from all regions of Portugal, aged 6 to 42 months, of whom 40 were identified as having communication disorders. The results of this analysis showed that the communication score on the ECI evolved with increasing age in both typically developing children and children with communication disorders. However, children with communication disorders always had lower total communication scores than typically developing children. Some of the most obvious differences between the two groups are seen especially in vocalizations, which children with communication disorders initially produce less of, but then produce more of and for longer than typically developing children; in words, which appear around 5 months later in children with communication disorders; and in sentences, which appear around 8 months later in children with communication disorders. These results are also found in other studies where the ECI was used as an assessment tool (Buzhardt et al., 2022; Greenwood et al., 2006, 2010, 2013). These results are also in line with the literature, which identifies as characteristics of children at risk of developing communication disorders few vocalizations in the first few months, absence or very few words at 20 months; absence or very few word combinations at 24 months; their speech intelligibility is always lower than that of typically developing children, and their oral productions are therefore classified as vocalizations (Crais, 2011; Morgan & Wren, 2018; Owens & Farinella, 2023; Paul & Roth, 2011; Prelock & Hutchins, 2018; Reed, 2018).

Overall, the results obtained in the various studies have made it possible to increase knowledge about the communicative development of Portuguese children in the early years and have shown that the ECI-Portugal is sensitive to the changes and progression of communicative development over time and is able to support the identification of differences between children with typical development and children who do not follow a typical pattern in terms of communicative development. All these results suggest its usefulness for identifying Portuguese children at risk of developing communication disorders. The ECI-Portugal could, therefore, in conjunction with other instruments, become a relevant tool for assessing, diagnosing and monitoring communication problems in Portuguese children at an early age.

4. Recommendations

One of the main objectives of the ECI is to monitor the results of interventions over time to see if they have the expected results or if changes need to be made (Walker & Carta, 2010). In this sense, there is an urgent need for future studies to demonstrate the sensitivity of the ECI-Portugal for this purpose in the Portuguese population. Studies in this area should analyze the clinical and educational usefulness of the ECI-Portugal in decision-making regarding communication and language interventions for children at an early age.

The current trend of globalization and increasing multiculturalism within populations has increased the need for instruments that can assess skills at an early age and that are valid on a global scale in order to make them suitable for all children in all countries, and various efforts are being made in this direction (Raikes et al., 2014, 2017). The ECI, with data from different populations and combined with the potential of the website, represents a fully compatible, appropriate structure with all the necessary criteria for cross-cultural adaptation, allowing a valid and effective assessment at an international level for children at an early age. Since research on early communicative development is often based on empirical data with exclusively monolingual English-speaking children (Frank et al., 2021), the main recommendation of this work is to validate the ECI for languages, countries, and populations other than English and English-speaking countries.

Acknowledgements
The authors thank Dr. Jay Buzhardt and all the staff of Juniper Gardens Children's Project (Kansas, USA) for ongoing support and assistance with this project, and all families and professionals that participated in the study.

Funding Statement
This work was supported by the Portuguese Funding Agency for Science and Technology (FCT) under the reference SFRH/BD/138965/2018, and within the framework of CIEC (Research Centre on Child Studies, Institute of Education, University of Minho), projects

under the references UIDB/00317/2020 and UIDP/00317/2020, through national funds of FCT/MCTES-PT.

Conflict of Interest Statement
The authors declare no conflicts of interest.

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References

Almeida L S, Freire T, 2017. Metodologia da investigação em psicologia e educação, 5th ed, Braga, Portugal. Retrieved from https://www.psiquilibrios.pt/produto/metodologia-de-investigacao-em-psicologia-e-educacao-5a-edicao/

Antunes M C, Cruz-Santos A, 2017. Avaliação da Comunicação Expressiva em Crianças dos 6 aos 41 Meses de Idade na Região Norte de Portugal: Um Estudo Exploratório com o Early Communication Indicator. Revista de Estudios e Investigación en Psicología y Educación (09): 79-84. doi: 10.17979/reipe.2017.0.09.2847. Retrieved from https://repositorium.sdum.uminho.pt/handle/1822/41395

Bavin E L, Sarant J, Hackworth N J, Bennetts S K., Buzhardt J, Jia F, Button E, Busby P, Leigh G, Peterson C, 2020. Modelling the Early Expressive Communicative Trajectories of Infants/Toddlers with Early Cochlear Implants. Journal of Child Language 47(4): 796–816. https://doi.org/10.1017/s0305000919000941

Brady N C, Marquis J, Fleming L, McLean L, 2004. Prelinguistic Predictor of Language Growth in Children with Developmental Disabilities. Journal of Speech, Language, and Hearing Research 47(3): 663–677. https://doi.org/10.1044/1092-4388(2004/051)

Buzhardt J, Greenwood C, Hackworth N, Jia F, Bennetts S, Walker D, Matthews J, 2019. Cross–Cultural Exploration of Growth in Expressive Communication of English – Speaking Infants and Toddlers. Early Childhood Research Quarterly 48(2019): 284–294. https://doi.org/10.1016/j.ecresq.2019.04.002

Buzhardt J, Wallisch A, Irvin D, Boyd B, Salley B, Jia F, 2022. Exploring Growth in Expressive Communication of Infants and Toddlers with Autism Spectrum Disorder. Journal of Early Intervention 44(1): 3–22. https://doi.org/10.1177/1053815121995578

Buzhardt J, Walker D, 2010. Using IGDIs: Monitoring progress and improving intervention for infants and young children, Baltimore, MD, USA, pp 145–158

Carter J A, Lees J A, Murira G M, Gona J, Neville B G R, Newton C R J C, 2005. Issues in the Development of Cross-Cultural Assessments of Speech and Language for Children. International Journal of Language & Communication Disorders 40(4): 385–401. https://doi.org/10.1080/13682820500057301

Clark E V, Kelly B F, 2022. Gesture in language: Development across the lifespan, Berlin, Germany, Boston, MA, USA, pp 137–156

Crais E R, 2011. Testing and Beyond: Strategies and Tools for Evaluating and Assessing Infants and Toddlers. Language Speech and Hearing Services in Schools 42(3): 341–364. https://doi.org/10.1044/0161-1461(2010/09-0061)

Crais E, Douglas D D, Campbell C C, 2004. The Intersection of the Development of Gestures and Intentionality. Journal of Speech, Language, and Hearing Research 47(3): 678-694. https://doi.org/10.1044/1092-4388(2004/052)

Ferreira S, Cruz-Santos A, Almeida L, 2021. Avaliação da Comunicação Expressiva em Idades Precoces: Um Estudo de Caso com o Early Communication Indicator. Atas do XVI Congresso Internacional Galego-Português de Psicopedagogia, Braga, Portugal, pp 2137-21453. Retrieved from https://repositorium.sdum.uminho.pt/handle/1822/84971

Ferreira S, 2022. Assessment of expressive communication in Portuguese children from 6 to 42 months of age: Standardization of the Early Communication Indicator. PhD Thesis, University of Minho. Retrieved from https://repositorium.sdum.uminho.pt/handle/1822/84971

Ferreira S, Cruz-Santos A, Almeida L, 2023. Early Communication Indicator (ECI) – Portuguese version: An Analysis of Three Portuguese Toddlers. Revista de Investigación en Logopedia 13(2): e81142. http://dx.doi.org/10.5209/rlog.81142

Ferreira S, Sapage S, Cruz-Santos A, Almeida S L, 2023. Studies with screening and assessment instruments in communication and language in Portuguese children with and without language difficulties in inclusive contexts. Student on the way to practice VI- International Student Scientific Conference in the Fields of Special Pedagogy, Medical Pedagogy and Social Pedagogy, Prešov, Slovakia, pp. 9-12. Retrieved from http://repositorium.uminho.pt/handle/1822/88788

Ferreira S, Cruz-Santos A, Almeida L, 2024. Avaliação da Comunicação Expressiva em Crianças em Idades Precoces com o Early Communication Indicator-Portugal. Revista de Estudios e Investigación en Psicología y Educación 11(1), https://doi.org/10.17979/reipe.2024.11.1.10029

Frank M C, Braginsky M, Yurovsky D, Marchman V A, 2021. Variability and consistency in early language learning: The Wordbank project. MIT Press. https://langcog.github.io/wordbank-book/. Accessed 14 September 2024

Greenwood C R, Carta J J, Walker D, Hughes K, Weathers M, 2006. Preliminary Investigations of the Application of the Early Communication Indicator (ECI) for Infants and Toddlers. Journal of Early Intervention 28(3): 178–196. doi: 10.1177/105381510602800306. Retrieved from http://dx.doi.org/10.1177/105381510602800306

Greenwood C R, Walker D, Buzhardt J, 2010. The Early Communication Indicator for Infants and Toddlers: Early Head Start Growth Norms from Two States. Journal of Early Intervention 32(5): 310–334. https://doi.org/10.1177/1053815110392335

Greenwood C R, Walker D, Buzhardt J, Howard W, McCune L, Anderson R, 2013. Evidence of a Continuum in Foundational Expressive Communication Skills. Early Childhood Research Quarterly 28(3): 540–554. https://doi.org/10.1016/j.ecresq.2013.02.006

International Test Commission (ITC), 2017. The ITC guidelines for translating and adapting tests, 2nd ed International Test Commission. https://www.intestcom.org/files/guideline_test_adaptation_2ed.pdf. Accessed 14 September 2024

King M, Larson A L, Buzhardt J, 2021. Exploring the Classification Accuracy of the Early Communication Indicator (ECI) with Dual-Language Learners from Latinx Backgrounds. Assessment for Effective Intervention 47(4): 209–219. https://doi.org/10.1177/15345084211027138

Levey S, 2024. Introduction to language development, 3rd ed. San Diego, CA, USA, pp 83-136. Retrieved from https://books.google.ro/books/about/Introduction_to_Language_Development.html?id=_rYnzgEACAAJ&redir_esc=y

Luze G J, Linebarger D L, Greenwood C R, Carta J J, Walker D, Leitschuh C, Atwater J B, 2001. Developing a General Outcome Measure of Growth in the Expressive Communication of Infants and Toddlers. School Psychology Review 30(3): 383–407. https://doi.org/10.1080/02796015.2001.12086122

Morgan L, Wren Y E, 2018. A Systematic Review of the Literature on Early Vocalizations and Babbling Patterns in Young Children. Communication Disorders Quarterly *40*(1): 3–14. https://doi.org/10.1177/1525740118760215

Owens R, 2016. Language development: An introduction, 8th ed. Hoboken, NJ, USA. Retrieved from https://books.google.ro/books/about/Language_Development.html?id=WhZFuQEACAAJ&redir_esc=y

Owens R E, Farinella K A, 2023. Introduction to communication disorders: A lifespan evidence-based perspective, 7th ed. New York, USA. Retrieved from https://www.pearson.com/en-us/subject-catalog/p/introduction-to-

communication-disorders-a-lifespan-evidence-based-perspective/P200000001608/9780134801551

Paul R, Roth F, 2011. Characterizing and Predicting Outcomes of Communication Delays in Infants and Toddlers: Implications for Clinical Practice. Language, Speech and Hearing Services in Schools 42(3): 331–340. https://doi.org/10.1044/0161-1461(2010/09-0067)

Prelock P A, Hutchins T L, 2018. Clinical guide to assessment and treatment of communication disorders, Cham, Switzerland. Retrieved from https://link.springer.com/book/10.1007/978-3-319-93203-3

Raikes A, Britto P R, Dua T, 2014. A measurement framework for early childhood: Birth to 8 years of age. https://doi.org/10.31478/201411a. Accessed 14 September 2024

Raikes A, Yoshikawa H, Britto P R, Iruka I, 2017. Children, Youth and Developmental Science in the 2015–2030 Global Sustainable Development Goals. Social Policy Report 30(3): 1–23. https://doi.org/10.1002/j.2379-3988.2017.tb00088.x

Reed V, 2018. An introduction to children with language disorders, 5th ed. Boston, MA, USA. Retrieved from https://www.pearson.com/en-us/subject-catalog/p/introduction-to-children-with-language-disorders-an/P200000001727/9780137982134

Rescorla L, 2002. Language and Reading Outcomes to age 9 in Late-Talking Toddlers. Journal of Speech, Language, and Hearing Research 45(2): 360–371. https://doi.org/10.1044/1092-4388(2002/028)

Rescorla L, 2005. Age 13 Language and Reading Outcomes in Late-Talking Toddlers. Journal of Speech, Language, and Hearing Research 48(2): 459–472. https://doi.org/10.1044/1092-4388(2005/031)

Rescorla L, 2009. Age 17 Language and Reading Outcomes in Late-Talking Toddlers: Support for a Dimensional Perspective on Language Delay. Journal of Speech, Language, and Hearing Research 52(1): 16–30. https://doi.org/10.1044/1092-4388(2008/07-0171)

Roos E M, Weismer S E, 2008. Language Outcomes of Late Talking Toddlers at Preschool and Beyond. Perspectives on Language Learning and Education 15(3): 119–126. https://doi.org/10.1044%2Flle15.3.119

Sheldrick R C, Schlichting L E, Berger B, Clyne A, Ni P, Perrin E C, Vivier P M, 2019. Establishing New Norms for Developmental Milestones. Pediatrics 144(6): e20190374. https://doi.org/10.1542/peds.2019-0374

Walker D, Carta J J, 2010. Using IGDIs: Monitoring progress and improving intervention for infants and young children, Baltimore, MD, USA, pp 23–35.

Walker D, Buzhardt J, 2010. Using IGDIs: Monitoring progress and improving intervention for infants and young children, Baltimore, MD, USA, pp 39–56

Whitehouse A J O, Robinson M, Zubrick S R, 2011. Late Talking and the Risk for Psychosocial Problems During Childhood and Adolescence. Pediatrics 128(2): 324–333. https://doi.org/10.1542/peds.2010-2782