

Late Language Emergence

A literature review

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ABSTRACT: Infants usually say their first word at the age of 12 months; subsequently, within the next 6–12 months, they develop a vocabulary of approximately 50 words, along with the ability to make two-word combinations. However, late talkers (LTs) demonstrate delayed speech in the absence of hearing impairments, cognitive developmental issues or relevant birth history. The prevalence of late language emergence (LLE) in toddlers is reported to be 10–15%. Studies of LTs are both theoretically and clinically significant. Early diagnosis and clinical intervention may result in relatively stable speech capabilities by the early school years. The present article aimed to review both theoretical and empirical studies regarding LLE within the process of first language acquisition, as well as methods for the early diagnosis of delayed speech in children and the authors' own clinical and theoretical recommendations.

Keywords: Infants; Speech; Language Development; Speech-Language Pathology; Language Development Disorders; Rehabilitation of Speech and Language Disorders.

THE PREVALENCE OF LANGUAGE PROBLEMS in children has increased rapidly in recent years.¹ In general, such problems usually appear at the age of 2–3 years; however, it is not always easy to distinguish whether a child has a language development disorder or is simply slightly delayed in comparison to their peers.² At this age, children often demonstrate wide variations in communicative development.³ As such, while many so-called late talkers (LTs) speak fewer words at the age of 24 months compared to most other children of the same age, approximately half will catch-up to their typically developing peers by their third birthday.^{2–4}

However, while delays in language development may indicate specific language difficulties, they may alternatively be early indicators of a more general problem such as global developmental delay (GDD), intellectual disability or autism spectrum disorder (ASD).^{5–7} Early screening is therefore paramount to determine the need for further evaluation and treatment so as to prevent the development of more significant problems. This review article aimed to summarise current knowledge regarding the evaluation, diagnosis and correlates of late language emergence (LLE) in children aged 24–30 months. In addition, the article presents methods for the early diagnosis of delayed speech and the authors' recommendations for future research and clinical practice.

Approaches to the Study of Language

Until the 1950s, the theory of behaviourism, developed by Burrhus Frederic Skinner, dominated psychological

approaches to learning with the focus being on observed behaviours and the external factors believed to determine these behaviours.⁸ Behaviourism offers a view of how agents respond to different types of stimuli, with individual behaviours acquired through conditioning resulting from the reinforcement and repetition of a stimulus-response sequence. Noam Chomsky was one of the first linguists to dispute this theory, demonstrating that attempts to explain linguistic competence in terms of learning through conditioning were inadequate.⁹ He pointed out that it is necessary to understand the object of linguistics as the linguistic competence of the agent in question (i.e. psychic reality) and not solely observed behaviour.⁹

Two important elements support this argument. First, the data that linguists need cannot be reduced to spontaneous linguistic products, but primarily consist of the linguistic intuition of speakers, to which the latter have access through introspection and which can be questioned by linguists. The second, developed by Chomsky in his criticism of Skinner's theory of verbal behaviour, is that the linguistic competence of speakers goes far beyond what could be obtained through a simple preparation process of stimulus-response sequences, with language learning presupposing an already complex linguistic understanding in newborns.^{8–9}

Normal Language Emergence

Typically, language development follows a fixed course, although variation does occur in terms of the timing of specific stages.¹⁰ The speed with which

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individual children acquire first languages depends both on their innate neurocognitive abilities, probably determined genetically, and on their environment and previous encounters with human speech.¹¹ Language development is an active process in which the child experiences the language spoken by other humans in their surroundings and is strongly affected by the incentive to communicate with others.

From birth, newborns show interest in human voices and are able to produce perceptually distinct units of sound. Known as phonemes, these sounds represent the child's first vocal productions and can be distinguished from the very first weeks of life depending on the child's state of being (i.e. hunger, pain, appeal, well-being, etc.).¹² The mother is often able to attribute meanings to these sounds, thus allowing for the development of the first system of communication. During the second month, these vocalisations diversify into babble and lallation.¹³ Although these sounds appear to initially represent a sensorimotor game (i.e. a source of pleasure for the child), they gradually transform into an interactive game, especially after 5–6 months.¹⁴

Toddlers use many vocalisations and referential symbolic gestures (i.e. gestures that have meaning) to develop common ground with the individuals with whom they attempt to communicate.⁸ These communicative gestures—refined through reciprocal social interaction and regulatory behaviours—presage the emergence of language abilities.¹⁵ The production of well-articulated syllables begins at 6–8 months.¹² From 8–10 months, the child's vocal productions change according to the language of their surrounding environment. This evolution is associated with the development of non-verbal communication, first by looking, then by smiling (i.e. mimicry).¹²

Finally, around 8–9 months, the child seeks to attract the attention of others, focuses their gaze on what is shown to them and points their finger in the direction of an object.¹² At 8–12 months, the child can point to items, shake their head to express “no”, wave goodbye, make sounds that resemble words and imitate an adult's voice.¹²

Most children speak their first words at 10–12 months.¹² These words are usually systematically associated with certain objects and/or situations (i.e. a request or designation). At around 18 months of age, the child begins to progress in their individualisation. The very first sentences—defined as an association of two words, mainly to designate an action—appear between the ages of 20–24 months.¹² Towards the end of the second year, the child has amassed a vocabulary

of 250–300 words. From 26–36 months, the child begins to utter three-word sentences. In the meantime, sentences increase in length and grammar becomes more accurate and complex, including the ability to use prepositions, add ‘ing’ endings to verb stems, affix the plural marker ‘s’ to nouns, use auxiliary verbs, use articles ‘a’ and ‘the’ and negate verbs.¹²

From 3–5 years, children understand most of what others say to them and their sentences and stories gradually become more complex as their conversational skills improve. The child is able to understand how to start a conversation to get the attention of others and how to take turns listening and speaking during the conversation. By the age of three years, a child's vocabulary is around 1,000 words, increasing to >5,000 words by five years.¹²

Late Language Emergence

Nevertheless, some infants aged 18–24 months may show delayed speech or a limited vocabulary in the absence of any significant hearing issues, cognitive development issues or relevant birth history.^{2–4} These infants are commonly referred to as late talkers (LTs). In most cases, late talking is diagnosed at the age of 24 months based on a productive vocabulary of <50 words and an inability or unwillingness to combine two words together.^{15–18} In some instances, all stages of language development are delayed, with first words not appearing by two years of age and first sentences not occurring until after the child's third birthday.¹⁸

Various studies have reported the prevalence of early language delays to be 10–15%.^{19–23} Other researchers have more specifically reported the prevalence of late talking to be 13% among toddlers.^{24–26} However, the question as to whether late talking represents a significant problem remains controversial. Some studies have shown that approximately 17–26% of LTs may demonstrate language impairments up until the age of 6 years.^{27,28} This delay in language development might result in specific language impairment (SLI), also known as developmental language disorder.²⁹

Research in LLE has both theoretical and clinical significance. From a theoretical perspective, such research may help improve our understanding and knowledge of the developmental pathways leading to language disorders.³⁰ In addition, these studies shed light upon the evolution of linguistic competence over various stages of life, as well as the reliability of linguistic assessment in toddlers and the conceptual distinction between measurements of knowledge

and information processing.^{30,31} It is also important to understand the various processes involved in the speech development of LTs, as well as any existing gaps and potential solutions. For instance, while it is widely accepted that comprehension occurs prior to language production in toddlers, significant gaps between comprehension and production have been reported in LTs.³

From a clinical viewpoint, LLE research is also critical to aid clinicians in distinguishing between late bloomers (i.e. children who would eventually catch up to their peers) and those at high risk of learning or language disorders.³⁰ A search of the literature indicates that early identification of late talking and delayed speech may have prognostic value.³² A recent study reported that 31% of LTs were diagnosed with ASD as well as GDD, thus highlighting the importance of early diagnosis, clinical consultation and special education.⁷ Indeed, some studies have shown that the speech capability of 5-year-old LTs can remain relatively stable throughout their school years as a result of early diagnosis and clinical interventions.^{33,34}

However, in some cases, early diagnosis of late talking and speech delays in infants can be hampered by sociocultural beliefs.⁷ For instance, in certain cultures, there is a common assumption that boys start to talk later than girls, or that late talking might be due to genetic factors.⁷ Therefore, issues regarding late talking are sometimes underestimated by parents, potentially resulting in more serious consequences. Although LTs can improve by the age of 6–7 years, research shows that such children demonstrate significantly weaker language skills compared to their peers as they get older.³² For instance, a study found that while LTs aged 13 years received average scores for a range of standardised language and reading tasks, they nevertheless scored significantly lower for grammar, vocabulary, reading comprehension and verbal memory compared to their peers.³⁵ As such, it has been suggested that LTs aged 18–35 months should undergo screening.³²

Late Language Emergence Versus Language Disorders

Language disorders should not be confused with LLE as the latter is not necessarily pathological, but a part of progressive learning of linguistic code.^{15–17} The Diagnostic and Statistical Manual of Mental Disorders (DSM-V) classifies language disorders as a diagnostic category.³⁶ According to the DSM-V, language disorders refer to conditions wherein children have difficulty acquiring and using language that is not attributable to motor, sensory, cognitive, genetic or other factors.^{36–38}

The family of language disorders covers many different linguistic realities including anarthria/dysarthria, dysglossia, verbal auditory agnosia, asemia and asymbolia. Such disorders are usually caused by neuropathy, muscle paralysis, weakened contractility or uncoordinated movements related to speech.³⁶

A diagnosis of delayed speech before the age of four years is not easy, as children undergo several language development variations up until this time. However, there is a high risk that LTs will eventually develop language disorders or remain late bloomers by elementary school age.^{39,40} Language disorders can have severe implications on the life of the child and their family and may necessitate involvement of the care system. Collaborative efforts are needed to ensure the early detection and timely correction of speech disorders in children by various stakeholders including doctors, speech therapists, psychologists, teachers and the parents of the child in question. The main approaches to the correction of delayed speech in children includes speech therapy, psychological and pedagogical correctional measures, psychotherapeutic assistance for the child and their family, as well as medical treatment.

Measuring Late Language Emergence

Various structured assessment tools have been developed to evaluate the expressive phonology abilities of toddlers under the age of 36 months including the Toddler Phonology Test and Profiles of Early Expressive Phonological Skills tool.³⁹ In general, parents have much more experience with their children than professionals and are better able to assess their child's impressions and interests. As such, parental word checklists and related questions have proven to be valuable metrics for assessing early language development.⁴¹

According to parental reports, the development of expressive vocabulary in bilingual children is comparable to monolingual children when both languages are combined.⁴² In addition, the age at which such children begin to combine words is identical to that of monolingual children, provided that the bilingual child is considered capable of combining words if they do so in at least one language.⁴² For the purposes of screening, there are two methods for combining vocabulary data, namely a generalised conceptual dictionary approach which combines words with similar meanings (e.g. English *cat* and Spanish *gato*) or a generalised vocabulary approach which includes all words from each language, regardless of possible intersections of meaning. For toddlers, the latter

approach is recommended because it is easier to calculate and allows for the size of the vocabulary to be scaled to calculate growth rates for young bilingual children.⁴²

Eye-tracking refers to a process in which the subject's gaze is monitored through a video camera. This technology is widely used in toddler and infant research as it can provide useful data regarding moment-by-moment cognitive and lexical processing.^{43,44} In particular, researchers have used eye-tracking tools to study the relationship between the speed of anticipatory looking in LTs and other variables such as age, language input and socioeconomic status (SES).^{45,46} Despite potential errors reported with eye-tracking tools, they are a significant contributor to clinical research.⁴⁷⁻⁴⁹

The Wait-and-See Approach

A common approach in dealing with LTs is referred to as the *wait-and-see* approach. In this approach, LTs are not referred immediately after they fail in language screening for further evaluation and diagnosis.⁵⁰ This delay might be due to several reasons. For instance, caregivers' poor understanding of language development may lead to delayed referral of LTs for early clinical intervention.⁵¹

In some cases, parents opt for the wait-and-see approach, which might originate from fear of harms, including extra time, increased effort, and anxiety associated with further testing of the child.⁵⁰ In other words, parents prefer to wait for and see (as the name suggests) their children to catch up to typical peers as they grow older. Another delaying factor in reporting early diagnosis of late talking is diagnostic labeling, i.e. being labeled as children who require special education.⁵⁰ Diagnostic labeling may also lead into parents' stress and anxiety.⁵²

Correlates of Late Language Emergence

Research shows that LTs encounter significant barriers with regards to lexical-phonological aspects of word processing, learning and representation.^{8,53} This means that words in the lexicons of LTs are not as well-specified compared to those of their peers and they require additional speech signals to recognise and analyse words during speech processing.^{54,55} Children with SLI in general, and LTs in particular, have shown significantly reduced phonological working memory.⁸ In order to show a similar level of performance, LTs and children with SLI require at least twice as much

practice and training compared to their peers.⁵⁶ Another difficulty faced by LTs is their inability to hold non-words in their memory and use them in repetition tasks.⁵⁷ Another deficit is their inability to utilise lexical and/or sub-lexical information in order to facilitate the repetition of non-words similar to words they already know.^{58,59}

According to eye-tracking data, LTs are significantly less accurate and slower while looking at pictures of familiar words compared to their peers.⁶⁰ Several studies have revealed differences in the gaze patterns of LTs (both infants and children) compared to their peers when performing tasks related to word learning and language processing.⁶¹⁻⁶³ In addition, some variations have been reported in the number of fixations made by children with different reading comprehension abilities while trying to comprehend a sentence.⁶⁴ Other studies have reported that adolescents demonstrate a greater number of fixations to the target picture and that children with SLI demonstrate slower spoken word recognition compared to age-matched controls.^{65,66} This highlights the significant contribution of eye-tracking technologies when researching childhood speech delays.

A number of external factors may also place children at risk for late talking by the age of 2 years. Variables that appear to be predictive of delayed speech include parental anxiety regarding possible childhood speech, language or hearing problems, a family history of language impairment or dyslexia (especially in immediate family members such as parents and siblings), delays in pretend-play activities involving object substitution, sociodemographic factors, a family history of learning problems and variations in parenting, child care and early behavioural functioning.⁶⁷⁻⁶⁹

There are often similarities between the language characteristics of LTs and those of their parents.⁷⁰ While some researchers report no difference between what parents say to typically developing children and what they say to LTs, others have reported the opposite.^{4,71} One study found that the parents of children with delayed vocabulary used longer statements when talking to their children, which may reduce the effectiveness of language learning stimulation.⁷² In addition, the parents of LTs indicated that their child's willingness to communicate was lower compared to normally developing children, which in turn may have a negative impact on the child's language development. Language stimulation is generally considered to be important for language development in children, including the use of short utterances and tactile and repetitive words which engage the interests of the child.⁷²

Developmental games and social skills also affect the development of normal language.⁷³ In communication, the child's gestures and play abilities are related to symbolic representation and therefore provide information regarding cognitive function.⁷⁴ Games and languages are interrelated and developed in parallel. However, among LTs, there is very little spontaneous imitation of behaviour and a lack of object-related or symbolic play, resulting in limited gestural or sound-based communication.⁷⁴

In turn, research regarding the relationship between communication and social skills among children with normal language development ability shows that the number of words a child uses is related to the range of communication intentions they can express, with these intentions affecting the child's vocabulary and interaction skills.⁷⁴ Thus, there appears to be a connection between language delay and limited social ability.⁷⁵ One possible explanation for these findings is that delays in language expression are caused by factors that induce children to communicate with others and promote communication development. Therefore, children who lack social motivation do not learn language skills even when the opportunity to do so arises. As such, limited social skills may cause language difficulties.^{76,77}

Certain socioeconomic indicators such as maternal education and familial SES have been linked to delayed language acquisition in children, likely due to their role as proxy measures of environmental support for language learning.⁷⁸ In particular, maternal education predicts the vocabulary development of children as women with lower levels of education usually talk to their children in fewer ways and use limited vocabularies. Similarly, other activities that may promote or weaken learning, such as reading or watching television, can also affect language development.⁷⁹ With regards to SES, growing up in an economically disadvantaged family puts children at high risk for delays in the development of social, cognitive and language skills; such children demonstrating a smaller vocabulary compared to their middle-class peers.⁸⁰ Although SES does not directly affect the quality of language stimulation, it does affect parental availability and therefore the quality of parent-child interaction.⁸¹

Nevertheless, although children from families with low SES appear to have a slightly higher risk of language impairment, there is concern that the excessive detection of LLE among children from families of lower SES may be due to selection bias with regards to the availability of parenting report tools, given that 10th percentile subsamples include two to

three times as many children from families of lower SES.⁸² Moreover, research has shown that children from ethnic minorities also have lower mean scores, raising similar questions about the validity of parenting reporting tools in culturally diverse populations.^{83–85} Finally, with the use of standard criteria consisting of expressive vocabulary and word combination, LLE was found to be more frequent in two-year-old boys compared to girls, which raises the question of whether different criteria might be needed based on gender.^{86–88}

Emotional variables on the part of the parents can also affect the child's language development by affecting the quality and quantity of communication stimuli. For example, research indicates an association between parental stress and vocabulary delay, with increased parental stress potentially related to delayed vocabulary in 18–39-month-old children.²⁴ Similarly, high levels of parental pressure have been linked to reductions in the availability and quality of language stimulation activities, which may be because stressed parents are more sensitive to parental pressure.²⁴ In terms of genetic influences, language delay appears to be more frequent in monozygotic compared to dizygotic twins; however, analysis of the influence of genetics and environmental factors on constant language delay indicates that the latter are more important.^{89,90}

Theoretical and Clinical Recommendations

Monolingual children whose first language is not English should be referred to a specialist if they demonstrate delays in developing expressive vocabulary and combining words in their native language. Since the development of expressive vocabulary is comparable in both monolingual and bilingual children, bilingual children with a limited expressive vocabulary and those who do not combine words into phrases should be monitored and/or referred to a specialist for further screening.⁴²

A genealogical study is recommended to clarify the child's family history in terms of a hereditary predisposition to peculiarities in language development. However, as the establishment of speech is linked to the development of sensory, psyche and motor functions, it is not necessary to prescribe neuropsychiatric development activities to all children, especially at an early age. In order to obtain optimal, objective and comparable results, this estimate must be verified with regards to the correct age, since psychomotor functions in premature infants develop at different times.⁹¹

As even moderate and gradual hearing loss can cause delays in speech development, LTs should be screened for hearing impairments.⁹² Deafness should be considered for children in whom there is a total absence of language (i.e. mutism). If partial or complete hearing loss is suspected in a child with an isolated speech delay, an audiological examination is necessary, ideally including an electroencephalogram assessment of auditory evoked potential. The sooner hearing defects are discovered, the sooner it will be possible to begin appropriate corrective work or to equip a hearing aid. An in-depth neuropsychiatric examination is indicated in cases in which delays in the development of speech are associated with general delays in mental development. Early diagnosis is particularly critical for children aged <1 year in whom there is extinction of babble, or even later in the face of language regression or major phonetic disorders.

In order to inform and validate models for predicting persistent language impairments in children with LLE, it is necessary that both practitioners and researchers take part in large-scale research programmes in which screening is combined with longitudinal tracking and additional information about the child and their family. These collaborative efforts should also include work to adapt, implement and validate interventions for children from non-native language families and lower SES backgrounds. Despite its difficulties and lack of rapid progress, speech therapy should be undertaken as soon as possible from the age of ≥ 3 years after an in-depth assessment and continued over the long-term at regular intervals (i.e. at least two sessions per week).⁹²

Conclusion

Although it is difficult to diagnose delayed speech before the age of four years due to natural variations in language development, early clinical interventions can significantly improve the linguistic abilities of LTs as they grow older. One potential method of dealing with late talking is the wait-and-see approach wherein no clinical intervention is applied in the hope that the child will eventually catch-up to their typically developing peers. The benefits of this approach include reduced stress and anxiety on the part of the caregiver, particularly in terms of fear of unnecessary diagnostic labelling. However, some researchers argue that this approach is outdated, citing the need for early diagnosis and clinical intervention in order to screen for more serious issues such as GDD or ASD, as well as minimise any further adverse effects.

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