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CHILD LANGUAGE DEVELOPMENT: QUESTIONS AND ANSWERS FOR INDIGENOUS LANGUAGE NESTS

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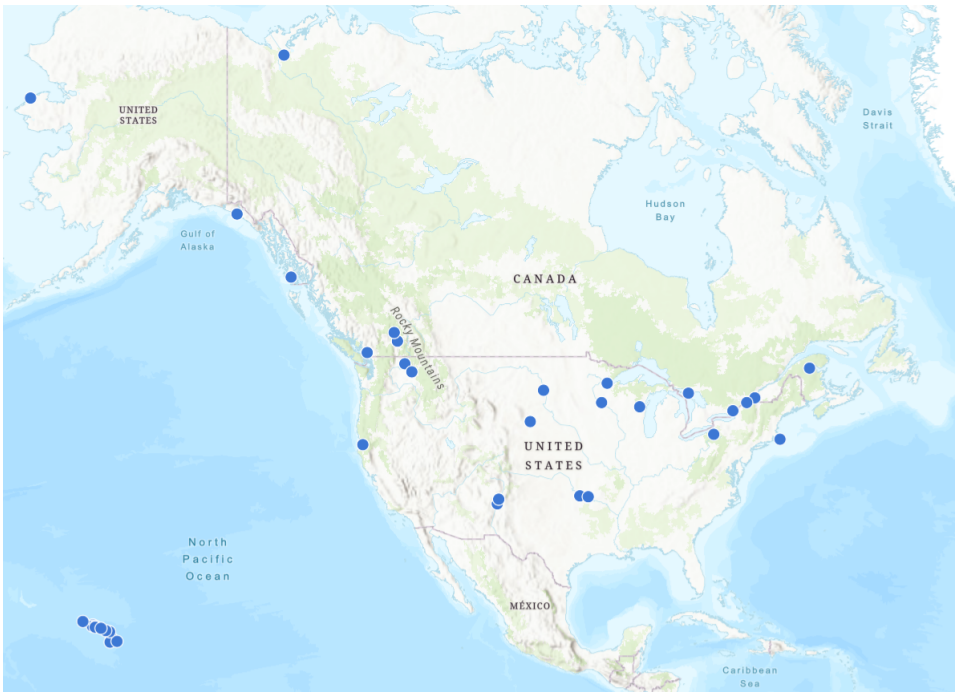
This paper discusses foundational aspects of child language development for the benefit of language nests, which are immersion-based Indigenous language revitalization programs for children from birth through around age five. Our review of child language development research is guided by eight key questions that focus on: 1) when children begin to learn their first language(s), 2) the importance of amount of language input, 3) whether the type of language input matters, 4) milestones in language development, 5) variation among children, 6) if speaking another language is a problem, 7) bilingual language development, and 8) children with speech and language difficulties. Our responses draw from the scientific literature across fields such as child language development, linguistics, early childhood education, cognitive science, and psychology. After summarizing the research, we offer some suggestions and considerations for language nests based on the research. Ultimately, the goal of the article is to provide a useful resource that identifies key findings in child language development research in order to support families, educators, researchers, and communities working to establish and sustain language nests.

1 Introduction

Many Indigenous communities and tribal members in North America are working tirelessly to maintain their traditional languages. Some of these efforts include identifying ways to effec-

Figure 1. Indigenous Language Nests in the U.S. and Canada (Chew 2024)



tively teach their languages to their youth. Although there are numerous ways Indigenous communities work with their traditional languages, we focus here on one approach to Indigenous language use and transmission: language nests where infants, babies and toddlers are immersed in their traditional language. The primary purpose of the current article is to review language development research that may inform language nests serving children from birth through age five.

While the first modern language nests were started in 1973 in Samoa and the Cook Islands, the language nest model is most commonly associated with Māori in Aotearoa New Zealand, who established Te Kōhanga Reo language nests in 1982 (Rei & Hamon 1993: p. 40). Subsequently, the first Pūnana Leo Hawaiian language nest opened in Kekaha, Kauaʻi in 1984 (Wilson & Kamanā 2001). Some of the first language nests on mainland North America are those at Kahnawá:ke, Québec, for Mohawk and in the Secwepemc community of Adams Lake, British Columbia. Both opened in the 1980s (McIvor & Parker 2016). Figure 1 shows a map of some current language nests throughout the U.S. and Canada.

While language nests are not new, there are very few studies about how Indigenous children learn language within them. Responding to the need for increased attention to community-led Indigenous child language development, the Indigenous Child Language Research Center at the University of New Mexico held the inaugural Child Language Acquisition Symposium for Indigenous Communities (CLASIC) in May 2024 (Yazzie et al. 2024). CLASIC brought together language nest practitioners, families whose children attend language nests, and Indigenous child language development researchers. The goal was to learn from each other and work together to

foster and sustain Indigenous child language use.

After CLASIC, a group of child language researchers, including some who are involved in language nests, convened to discuss some of the themes that emerged from the conference. Several of us decided to write an article building off Shanley Allen's keynote address, which summarized key points of child language development research in a way that audience members found accessible and helpful (see Yazzie et al. 2024: pp. 11–14). We identified numerous questions and ultimately chose eight that we felt we could address in a way that would be useful for the Indigenous child language practitioner's toolkit. Ultimately, nine authors contributed to this article. Our areas of expertise include linguistics, education, and speech and hearing sciences, and some of us work closely with Indigenous language nests.

While we draw on research that focuses specifically on Indigenous child language development as much as possible, there are still very few studies on this topic (Christiansen, Contreras Kallens & Trecca 2022, Kidd & Garcia 2022). As such, we also draw on research that focuses on other languages, including widely spoken ones such as English and Spanish. It is still an open question whether findings from that research also apply to Indigenous child language development. For example, question four focuses on the ages at which children tend to reach language development milestones. While it is commonly reported that children tend to start combining words at two years of age, some of the Indigenous languages mentioned in the current article have very complex words made up of many parts. Thus, it is more appropriate to talk about the ability to combine two parts within a word, rather than two separate words. Nevertheless, studies on a variety of languages remain helpful for providing insights into language learning in general. This, in turn, may inform efforts to transmit traditional languages to Indigenous children.

In sum, our review covers some key findings from child language development research to date. While we highlight Indigenous child language development where possible, we also note that more research is needed to fully understand how child language develops similarly or differently across communities.

2 Eight questions and answers for language nests

We structure our review of child language research around eight key questions. The responses to the eight questions are meant to support families, educators, researchers, and communities working to establish and sustain Indigenous language nests.

Question 1 addresses when babies begin to learn a language.

Question 2 focuses on how much language input is needed for children to learn a language. Note that we vary between the terms *language input* and *language exposure* to refer to the language use that children experience. This includes both the language used to directly communicate with children and the language used around children.

Question 3 is about whether the type of language input/exposure matters.

Question 4 focuses on key milestones for language development.

Question 5 is about whether children learn languages at the same speed.

Question 6 addresses concerns about whether children speaking the dominant language is problematic for learning the traditional language.

Question 7 addresses whether learning the traditional language impedes children's abilities to learn English, French, or other societally dominant languages.

Question 8 addresses concerns about children with speech and language difficulties and debunks the common idea that they might be better off being raised to speak only one language.

The answers to each of the eight questions include three components. First, we summarize relevant research, highlighting research on Indigenous child language development where possible. Second, we provide some considerations and suggestions for nest practitioners and families based on the research. These considerations are intended to help inform decision making, program design, and planning for language learning. Third, we provide a short summary of the main research findings in lists that we call *key takeaways*.

2.1 When do babies start to learn language?

Language development begins before birth. Between weeks 25 and 29 of pregnancy, the fetus's sensory system for hearing becomes functional, and between weeks 30 and 40, this system further develops with the stimulation of speech, music, and other sounds (Graven & Browne 2008).[1] Research demonstrates that babies not only hear language before they are born but also develop preferences for particular voices, languages, and even stories (DeCasper & Fifer 1980, Kisilevsky et al. 2009). For example, by measuring fetuses' heart rates, researchers can detect changes in attention. An increased heart rate indicates an arousal of attention while a decreased rate indicates a recognition of something familiar. By measuring the heart rate of fetuses between weeks 33 and 41 of development, one study (Kisilevsky et al. 2009) found that fetuses can distinguish between familiar and unfamiliar voices as well as languages. Additional research affirms that, shortly after birth, newborns pay more attention to their own mother's voice than to other women's voices, and they pay more attention to the languages they have been exposed to in the womb as compared to languages they have not been exposed to (DeCasper & Fifer 1980, Mehler et al. 1988, DeCasper et al. 1994).

In another study, researchers asked pregnant women to read a specific children's story out loud during the last six weeks of their pregnancy. After the babies were born, they were read that same story as well as an unfamiliar one, and they paid more attention to the familiar story (DeCasper & Spence 1986). This recognition of familiar sounds happens so soon after birth that we can conclude that babies start paying attention to the language they hear even before they

[1]The research reviewed in this section focuses only on hearing babies. Among deaf infants, the development of vision is crucial for sensing signed language input. If deaf babies are exposed to abundant signed language, their language development milestones tend to be similar to those identified for hearing children (Lillo-Martin & Henner 2021). Although language nests are designed to immerse Indigenous hearing children in Indigenous spoken languages, Indigenous deaf children can also benefit from learning about Indigenous languages, including Indigenous signed languages such as Hand Talk (Farrell et al. 2025).

are born. Importantly, babies who are exposed to two languages before birth show a preference for both of those languages right after they are born (Byers-Heinlein, Burns & Werker 2010).

Language development continues after birth, with the first three months being an especially sensitive time. The first things infants notice are the intonation and rhythm of their language as well as the unique qualities of their mother's voice (Nazzi, Bertoncini & Mehler 1998). The same applies to babies regularly exposed to two languages, who may develop even more sensitivity to between-language rhythm differences as compared to babies exposed to just one language (Molnar, Gervain & Carreiras 2014). By four months of age, babies can distinguish between sounds that make meaningful differences in human languages, including languages that they have never heard (Eimas et al. 1971, Werker & Tees 1983, 1984, Kuhl 2004). For example, Japanese-speaking adults may not detect the difference between *r* and *l*, so for them, *rode* and *load* sound the same. But unlike Japanese-speaking adults, babies who are learning Japanese can distinguish between *r* and *l*, even if they have never heard a language in which these two sounds can result in a meaningful difference in words. Similarly, babies exposed to English can hear the difference between sounds in Hindi that adult English speakers cannot detect. This is why newborns have been called universal listeners (Chládková & Paillereau 2020).

Starting at around 8–10 months old, however, babies begin to zero in on the important sounds in the languages they are learning. For instance, by 10-12 months of age, infants who are learning Japanese can no longer detect the contrast between *r* and *l* in word pairs like *rode* vs. *load* (Kuhl et al. 2006) because that contrast does not change the meaning of a word in Japanese. Importantly, babies learning one or more than one language also go through this transition from being universal to language-specific learners at around the same ages (Burns et al. 2007, Sundara, Polka & Molnar 2008, Albareda-Castellot, Pons & Sebastián-Gallés 2011, Paradis, Genesee & Crago 2021). Although none of the research discussed above has included babies learning Indigenous languages, the main findings still tell us that babies are born ready to find language patterns.

Based on the research discussed above, we offer some potential considerations for families thinking about participating in a language nest. Families may wish to expose a child to their Indigenous language as soon as possible, which could be as early as when they find out they are expecting a child. This could be accomplished through a variety of ways – depending on the community – including speaking the language, listening to recordings of songs and stories, spending time with speakers of the language, or visiting spaces in which the language is used. Taking such early steps may not only provide important language exposure for their child, but it could also allow families to develop relationships and tap into support networks as soon as possible. Language nests themselves may want to consider how to incorporate programs for expecting families.

Key takeaways

- Babies begin to learn about their languages before they are even born. This includes being able to distinguish and recognize different voices and languages.

- The first few months are a crucial time for language learning, when infants are universal listeners and especially adept at distinguishing between meaningful speech sounds.
- After the first several months, babies lose their universal listening abilities as they focus on learning the sounds specific to their languages.

2.2 How much language input do children need to learn the language?

For children to learn any language, they must have exposure to the language used and also have opportunities to interact with other people in the language. Researchers have long been interested in the question of how much and what kind of exposure children require to their languages during development (e.g., Weisleder & Fernald 2013, Gilkerson et al. 2017). For example, Bergelson et al. (2023) conducted a large-scale study of 1,001 children between 2 and 48 months old, who represented a diverse range of social and economic backgrounds, including 10 different languages across 12 countries. The authors found that language exposure was a significant predictor of language production: children who heard more speech from adults produced more speech themselves. In contrast, the amount of child speech did not depend on factors such as the child's socioeconomic status, sex, or whether they were exposed to more than one language.

While language exposure is a key element for language development, the kind of exposure that infants and toddlers receive varies dramatically across communities (Gilkerson et al. 2017, Cristia et al. 2019, Christiansen, Contreras Kallens & Trecca 2022, Cristia 2023, Bunce et al. 2025). For example, a recent study measured the amount of language exposure received by children growing up in a Tseltal Mayan community (Casillas, Brown & Levinson 2020). These children heard much less speech directed to them from adults than children growing up in more-studied English-speaking communities, yet the Mayan children still reached language development milestones at similar ages, such as the onset of speech-like babbling between 6-12 months of age, first words at around one year of age, and first word combinations emerging shortly thereafter. And – as Shneidman & Goldin-Meadow (2012) observe for Yucatec Maya – Mayan children grow up to become fully fluent speakers of their language despite the differences in language exposure. One possible explanation for the fact that these Mayan children learn their language without hearing much direct speech from adults is that perhaps they learn from overheard speech –- that is, by listening to adults talking to other people (Christiansen, Contreras Kallens & Trecca 2022, Bunce et al. 2025). Another possibility is that the babies learn from bursts of high-intensity exposure to language that occur in regular and predictable interactions, then use the time between these bursts to process the information (Casillas, Brown & Levinson 2020). In general, studies across different languages and cultures show that babies can learn language in several different conditions of language exposure, including being spoken to directly and overhearing language (Fibla et al. 2022).

Some studies have specifically examined how much language exposure children require in order to become bilingual. For example, research on Spanish-English bilingual children has argued that if input in Spanish is less than approximately 20% of the total language input, a child will not develop fluency in Spanish, although they will still develop some Spanish-language skills

(Pearson et al. 1997, Hoff & Core 2013, Silva-Corvalán 2014).

Research has yet to show how much language input children need in language nest programs specifically. One study by O'Grady et al. (2021) analyzed language input in three school-based language immersion programs for pre-adolescent children. The languages involved were Kaqchikel (Guatemala), Western Subanon (Philippines), and Māori (Aotearoa New Zealand). The researchers outfitted language teachers with audio recorders and analyzed the quantity and quality of language input received by the children in their classrooms. They found that children within the three programs all received different quantities of speech, whether speech was measured in terms of speaking time or words per hour. However, these quantities were still within the range of what has been reported for studies of children learning English as their first language. This study did not analyze the effect the amount of input had on learning, but it suggests that children can receive abundant input in immersion schools. Nevertheless, because immersion programs have limited opportunities to expose children to the Indigenous language, O'Grady et al. (2021: pp. 451–452) offer some specific recommendations. This includes targeting essential vocabulary in the classroom, regularly assessing children's vocabulary development, and designing curricula and materials to optimize children's opportunities to learn essential vocabulary.

The studies discussed above demonstrate that language input is essential for language learning. Language output – that is, the child's own use of the language – is also a central component of language learning (Hopman & MacDonald 2018). For example, Ribot, Hoff & Burridge (2018) studied the relationship between Spanish-English bilingual children's language output at 30 months of age and their comprehension and production abilities in English at 30, 36, and 42 months of age. They found that children who produced more English at 30 months had higher English production abilities across the older ages studied. By contrast, English language production at 30 months did not predict the children's comprehension abilities at older ages. In other words, practicing speaking a language promotes the ability to speak that language (see also Hurtado & Vega 2004, Swain 2005, De Houwer 2007).

Building off existing research, we can again offer some potential recommendations for families considering participating in a language nest. Language nests and participating families should think carefully about how to provide exposure to the Indigenous language for their children, aiming to provide as much exposure as possible and creating opportunities for children to interact in the language as well. Important considerations include how much intentional language exposure children in the nest will receive; the quality of the language exposure; and how the exposure will be maintained. For programs focusing on providing adult speech directed toward children, rather than overheard speech, the ratio of caregivers to children is a crucial factor. For example, in the state of New Mexico, the legal maximum number of children per caregiver in early preschools is 8:1. By contrast, in Saad K'idilyé, a Navajo language nest in Albuquerque, New Mexico, the child-to-caregiver ratio is typically 1:1 or 2:1. This allows the caregivers to provide much more input to each individual child. Another important consideration for parents is to find ways to reinforce the Indigenous language outside children's time in the nest, perhaps

by using the language at home and making learning of the Indigenous language a family and community commitment.

Key takeaways

- Children require exposure to a language in order to learn it.
- Language communities across the globe differ in how they provide this language exposure to children.
- Language nest programs have limited opportunities to expose children to their Indigenous languages, so some researchers recommend careful planning to maximize these opportunities.

2.3 Does the type of language input matter?

While §2.2 considers the role of quantity of language exposure in language development, §2.3 focuses on the importance of the quality of this input (Masek et al. 2021). In their systematic review of the research literature, Rowe & Snow (2020) argue that children benefit from language exposure that is interactional, adapted to their developmental level, and appropriately challenging.

Some studies suggest that children learn best from interactive language that directly involves them. For example, Foushee, Horton & Srinivasan (2023) show that children do learn from speech they overhear, but their vocabulary development benefits more from speech that is directed toward them. In a similar vein, in their study of Spanish-speaking families, Weisleder & Fernald (2013) find that speech directed toward children, compared to speech they simply overhear, facilitates larger expressive vocabularies and faster word recognition. Additionally, several studies have shown that when children watch television in a language that they are not otherwise exposed to, they do not learn that language (Krcmar, Grela & Lin 2007, Robb, Richert & Wartella 2009), although carefully designed television shows may bolster vocabulary learning for a language a child is already exposed to in other contexts (Rice 1983, Rice et al. 1990). Recent research suggests that solo screen time can negatively impact language learning, but when adults interact with children during screen time, this can facilitate learning (Alroqi, Serratrice & Cameron-Faulkner 2023, Serratrice 2024).

Although very little research has investigated the quality of language exposure in Indigenous communities, who have their own language practices that are crucial to maintaining culture and passing on their languages to children, studies have shown that many cultures have a specialized way of speaking to babies (Cox et al. 2022). Some commonly reported characteristics of such speech toward infants include higher pitch, exaggerated speech, specialized vocabulary, and repetition (Schick et al. 2022). Studies of speech directed to children in Inuktitut show that caregivers fine-tune the complexity and diversity of certain features of the language according to the child's level of language ability (Johnson & Allen 2022, Lee, Johnson & Allen 2023). However, these characteristics are not universal. For example, Schick et al. (2022) show that

although many cultures use repetition in speech directed toward young children, they differ in their styles of repetition, as well as in how frequently they use repetition. Another study investigated speech directed to children aged 1–4 years across five languages -– Murrinhpatha and Pitjantjatjara (Australia), Qaqet (Papua New Guinea), Tagalog (Philippines), and Inuktitut (Canada). The authors found that child-directed speech in all five communities shared characteristics such as repetition and simplified sentence structures. However, caregivers also differed in the style of their child-directed speech, and in how often they used vocabulary words that are specifically for children or simplified sentences (Kidd et al. 2025). In other words, while many cultures adopt specific ways of talking to babies, not all do, and the specific characteristics of this speech style vary across cultures.

Some studies suggest that modifying speech when talking to infants may facilitate language learning (Thiessen, Hill & Saffran 2005, Golinkoff et al. 2015). At the same time, other researchers argue for caution in assuming that this type of speech necessarily facilitates language development in all areas, such as learning vocabulary and the structure of words and sentences (Kempe, Ota & Schaeffler 2024). Furthermore, in a language revitalization context, a community may not know what infant-directed speech sounds like because babies have not been raised to speak the language for a long time. In the case of Chikashshanompa' (Chickasaw), a type of infant-directed speech was recollected when linguist Pamela Munro brought her young child along to work with speaker Catherine Willmond. Mrs. Willmond shared that phrases using onomatopoeia like *pas pas pas aachi* 'to make a clapping sound' are used in the language to help children learn the full verb form – in this case, *pasa'chi* 'to clap' (Munro 1998). Thus, talking to babies in a particular way may come naturally to many caregivers and might be beneficial to babies.

Typically, children first learn words that are very frequent in the language they are exposed to (Ambridge et al. 2015, Schneider, Yurovsky & Frank 2015). Additionally, starting at around age three, using a larger variety of words in the input has been shown to result in children having larger vocabularies (Rowe 2012). In their study of primary school language immersion programs, O'Grady et al. (2021) analyzed the number of different word types used by teachers. For example, if a teacher says, "Come here, sit down here," the teacher has produced five words, but only four word types, because here is used twice. Across languages, it is common for only a small subset of word types to be used very frequently (e.g., *and* or *the* in English), whereas many word types are used infrequently (Zipf 1949). O'Grady et al. (2021) found that the 25 most frequent words used by the Kaqchikel, Western Subanon, and Māori teachers accounted for about 40–50 percent of the entire set of words they used. O'Grady et al. (2021) offer some recommendations for language immersion programs, especially those who want children to develop a large and diverse vocabulary. The researchers suggest that language immersion programs may want to identify essential vocabulary and "incorporate [words] into the curriculum in a way that maximizes the chances of acquisition" (O'Grady et al. 2021: p. 452). They also note that Wordbank, which is an open database of children's vocabulary growth, could prove useful in identifying some common

words across languages. Wordbank[2] has data from over 92,000 children spanning 42 languages.

We offer some potential considerations and recommendations, given the research we have reviewed. Although this research largely focuses on languages such as English or Spanish, it has implications for Indigenous language nests as well. First, interaction in the Indigenous language is very important for learning it; exposure solely through television or other media is not sufficient. If children also experience the Indigenous language on screens, it is best for someone to interact with the children in the target language during the screen time. Second, some of the common modifications of speech discussed above, like repetition, may be helpful to implement in the nest, especially for the youngest children. Exactly which features will depend on what is typical in the culture, if anything is known about how caregivers traditionally talk or talked to infants, and what caregivers in the nest feel comfortable with. Third, important words will be learned if they are used frequently. As children grow older, they will develop larger vocabularies if they are exposed to a larger range of different types of words. It may be helpful to work out a target vocabulary for children at each age or stage of development, as well as strategies to ensure that children hear those words frequently enough to learn them well. Finally, the information in this section may also help guide curriculum development for second language acquisition, ultimately supporting caregivers and families who are second language learners. High-frequency words can be proficiency indicators for learners, while low-frequency words can be targeted and purposefully incorporated into daily conversation or lessons, ensuring exposure to those words.

Key takeaways

- Children benefit from language exposure that is interactional, adapted to their developmental level, and appropriately challenging.
- If children are exposed to a language only through screens, they will not learn it, because the exposure lacks the interaction they require.
- Speech directed toward children may facilitate vocabulary growth more than overheard speech.
- Young children often learn words that are frequently used with them. Older children also develop larger vocabularies when they hear a diverse range of words.
- Some cultures have specialized ways of speaking to young children, but this is not universal, nor do all cultures modify their speech to children in the same ways.

2.4 What are some key linguistic milestones for language acquisition?

Babies' language development can be expected to proceed along the same general path, starting even before they are born. This path is similar whether babies are exposed to one language or multiple languages. In this section, we focus on some of the milestones in language learning that are commonly found among typically developing children. When babies diverge from typical development, sometimes it is simply due to individual variation, since children can be very dif-

[2] https://wordbank.stanford.edu/

ferent in their pace of language learning (see Question 5). However, if the divergence is severe, it is important to have them screened for possible language learning difficulties (see Question 8).

All hearing babies attend to the intonation of the languages they hear from their mother's voices while they are still in the womb. This is when they begin to be able to recognize the sounds and intonation patterns of the languages spoken around them (Byers-Heinlein, Burns & Werker 2010). For the first year or so after birth, babies are quickly adapting to their environment and learning about language, but not yet producing words. Babies begin making vowel-like vocalizations, a process known as cooing, by 2–3 months (Hoon et al. 1993, Squires & Bricker 2009), and they begin responding to the facial expressions of those around them by 4–6 months (Squires & Bricker 2009). At approximately 6–9 months of age, babies begin recognizing names and objects (Sheldrick & Perrin 2013, Sheldrick et al. 2019) and start babbling (De Houwer 2009). Additionally, babies begin to communicate with gestures around 9 months of age, especially pointing gestures (Liszkowski et al. 2012).

Babbling, which is the process of producing combinations of consonants and vowels, is an important part of this pre-linguistic stage because it allows babies to practice the sounds of language. They begin producing syllables made up of a consonant and a vowel, such as *ba*, and often repeat those syllables to produce something like *ba-ba-ba* or *da-da-da*. Repetition of the same syllable sounds predominates in babies' language production from months 6–7 (De Houwer 2009). By 7–9 months, babbling uses two different consonant-vowel syllables such as *ba-da* (Morgan & Wren 2018). In observations made by caregivers at Saad K'idilyé, a Navajo language nest, children were noticed making vocalizations from the age of 3 months and shifting from vocalizations to babbling over time, with babbling predominating over vocalizations by 13 months (Chee, Lycan & Wyatt 2024).

While babbling emerges around the same age across cultures and babies, the nature of the babbling corresponds to the languages being learned (De Boysson-Bardies et al. 1989, Andruski, Casielles & Nathan 2014, Sundara et al. 2020).[3] In one case study following an infant who was learning Spanish from his mother and English from his father (Andruski, Casielles & Nathan 2014), it was observed that his babbling started to resemble the sounds of the two languages. Moreover, the sounds he produced differed depending on which parent he was interacting with. For example, he used consonants more frequent in English like *p* and *t* when interacting with his English-speaking father, and consonants more frequent in Spanish like *f* and *s* when interacting with his Spanish-speaking mother. Additionally, infants at 10 months have been observed to produce vowels that mirror the frequencies of vowels in adult speech in French, English, Arabic, and Cantonese (De Boysson-Bardies et al. 1989). This means the babbling of babies learning two or more languages may sound different from the babbling of a baby who is only learning one language, because all babies are focusing on learning the sound patterns of their languages.

Another striking finding from research on babbling is that it does not take a large amount of

[3]Here we focus on hearing babies, but there is also evidence that babies exposed to signed languages produce hand movements that can be considered a form of babbling (Petitto et al. 2004).

exposure to a new language before babies pick up on its sounds. Sundara et al. (2020) compared the babbling of three groups of 12-month-old infants as they interacted with Spanish-speaking and English-speaking adults: 1) bilingual babies growing up with both Spanish and English in the home; 2) monolingual babies exposed only to English, with no prior exposure to Spanish; and 3) monolingual English babies who had received five hours of exposure to Spanish. The study showed that even five hours of language exposure can make a difference for infants. The bilingual babies and the monolingual babies with exposure to Spanish adjusted the intonation and rhythm of their babbling when interacting with Spanish-speaking and English-speaking adults. But the monolingual babies who had never heard Spanish were not so flexible and babbled in the same way with adults, whether they spoke English or Spanish. This research helps demonstrate how quickly babies can pick up on some of the sound characteristics in the languages they are exposed to.

By one year of age, most infants have entered the one-word stage, where they have produced their first word and are able to respond to simple phrases from caregivers. A study using data from over 2000 children learning English, gathered through surveys of parents and information from WordBank, found that over 75 percent of the children produced their first word before 12 months (Schneider, Yurovsky & Frank 2015). The Saad K'idilyé language nest observed the very earliest word from an infant occurring at 8 months, and a great number of words emerging at 13 months. For these infants learning Navajo, their early words reflected the kinds of words that predominated in the speech of the caregivers in the nest, such as *náánáá* 'again' and *na'* 'here' (Saad K'idilyé and the Indigenous Child Language Research Center 2023). First words in Inuktitut, an Indigenous language of Canada, also emerge around 12 months, with early vocabulary including kinship terms (*anaana* 'mother', *ataata* 'father'), interactive terms (*aaa* 'yes,' *auka* 'no'), deictic terms (*maani* 'here,' *una* 'this one'), child-relevant terms (*piipi* 'baby,' *pattaq* 'ball'), and culturally relevant terms (*kamik* 'boot,' *tuttu* 'caribou') (Allen in press).

Once the first-word milestone has been achieved, children steadily build their expressive vocabularies. For some children, months 18–24 are marked by a vocabulary growth spurt (Goldfield & Reznick 1990, De Houwer 2009). Children usually produce their first 50 words during this time (Hoon et al. 1993). For children learning two languages, vocabulary measures that include words from both their languages show that they learn as fast as, or faster than, their monolingual peers (De Houwer 2009, Hoff et al. 2012, De Houwer, Bornstein & Putnick 2014, Paradis, Genesee & Crago 2021).

As children's vocabularies continue to grow, they begin to put words together, entering what is commonly known as the *two-word stage.* At approximately two years of age, it is common for children to start producing two-word combinations such as *Daddy play* and *Mama eat* (Hoon et al. 1993, De Houwer 2009, Squires & Bricker 2009: p. 89. In line with the research, the Saad K'idilyé nest observed children producing two-word combinations in Navajo at 22–24 months (Chee, Lycan & Wyatt 2024).

Many Indigenous languages use complex word structure, where words often consist of several parts, each with their own meaning. In such languages, one word can be equivalent to a full

sentence in a language like English. To illustrate, (1) shows the word *annraaqsimalukatsitipaujaalukumijuq* in Inuktitut, an Indigenous language spoken in Canada, which corresponds to the multi-word English sentence 'She/he also often dresses up very unusually.' The Inuktitut word is composed of multiple meaningful parts, which are broken down in (1).

(1) annraaq-sima-lukat-siti-paujaaluk-u-mi-juq
dress-PFV-unusually-well-EMPHATIC-be-also-3SG
'S/he also often dresses up very unusually.' (Crago, Allen & Pesco 1998: p. 38)

For children learning languages with such complex word structures, the so-called two-word stage is often better characterized by the ability to combine two parts within a word rather than two separate words. (2-5) illustrate some patterns from research on Inuktitut (Allen in press; Allen et al. 2002: p. 176; Lee & Allen 2023: pp. 167–200). In (2), a four-month-old child named Jini produces just the verb root *palla* 'fall,' which an adult would use with a suffix such as *-tuq*, which means 'he/she/it.' In (3), a child named Sarah produces a verb root with a suffix *-git* 'you' when she is one month shy of her second birthday, which illustrates a two-part combination. Older children add more parts within their words. In (4), a child named Lizzie produces a three-part word at age three years two months, and a child named AI also produces a three-part word at age three years eight months in (5).

(2) palla
fall

=palla-tuq
fall-3SG

'He/she/it fell.'

(3) qai-**git**
come-**2SG**
'Come!'

(4) astungi-langa-jara
lock-FUT-1SG>3SG
'I will lock it.'

(5) ikaju-nngi-tuq
help-NEG-3SG
'He's not helping.'

A similar pattern is seen in language development in Navajo, which also often uses single, complex words instead of multi-word sentences. Between 12–24 months, infants at Saad K'idilyé began producing forms of the word eat that contained important word-building parts (Chee, Lycan & Wyatt 2024). Children learning Dëne Sųłiné, spoken in northern Saskatchewan, have also been observed to begin producing sentences using the language's highly complex system

of verbs at about 27–36 months, starting with the bare root and progressing to more complex forms up until four years of age (Jung et al. 2024).

By 30 months, children typically enter the stage of producing multi-word combinations, which are sentences longer than just two words. Squires & Bricker (2009) note that, at this age, children who speak English, Spanish, and Korean can be expected to produce sentences that are three to four words long. Notably, children typically follow the word order rules of the language they are learning from the time when they first begin putting two words together (Meisel 1989, Montanari 2009). For children learning languages with complex word structure, the main changes with age are in the number of parts per word, rather than the number of words per sentence (Allen & Dench 2015, Lee & Allen 2023).

When it comes to language milestones, research on early bilingual language development shows that bilingual and monolingual babies share more similarities than differences (Bosch et al. 2013, De Houwer 2009, Paradis, Genesee & Crago 2021). Children tend to reach major language milestones at the same time, whether they are learning one or two languages (e.g., De Houwer 2009). In fact, in a study of children learning Polish, Muszyńska et al. (2025) found evidence that there was no difference between bilinguals and monolinguals in reaching language milestones such as babbling, first word, tenth word, and first multi-word combinations. Furthermore, monolingual and bilingual children's development continues to proceed at an equal pace when it comes to sentence length. Measurements with children aged 24–36 months showed that bilingual toddlers' sentences were of similar length to those of their monolingual peers (e.g., De Houwer 2009).

Determining whether children are meeting language milestones is often accomplished by using some form of language assessment, whether an informal assessment done by a knowledgeable language expert, a standardized language test, or something in between. One question that arises is which assessment to use and how to adapt it for a specific community. Rousseau et al. (2021) report 37 cultural adaptations of the Ages and Stages Questionnaire (Squires & Bricker 2009), which involve 29 different languages across 27 countries. Some assessment tools have been created by and for Indigenous communities. For example, Allen (2024) describes the successful creation of an Indigenized assessment tool for Inuktitut based on past observations of children's learning trajectories, and Tagalik, Dench & Allen (2025) describe creating a set of language development milestones for Inuktitut based on combining Inuit knowledge and information from Eurocentric research. Importantly, creating or adapting language assessments and developmental milestones for Indigenous communities requires considering the values and worldviews of these communities, as well as the linguistic characteristics of their languages (Yukon First Nation Education Directorate 2021). For many Indigenous languages, creating a standardized assessment is not possible due to the relatively small number of speakers.

The field of child language development has developed a strong framework of expected milestones for babies learning well-studied languages. But many Indigenous languages build words and sentences quite differently from more-studied languages such as English, Spanish, German, and Japanese. A comparatively small body of research has shown broadly similar mile-

stones for children learning Indigenous languages, but more research is needed on developmental pathways for such languages. Altogether, little evidence-based information is available on the stages and milestones in language acquisition for most Indigenous languages (Chee & Henke 2024). To address this gap in the research, Chee & Henke (2024: p. 745) call for "the creation of more Indigenized benchmarks and milestones for typical [child language] acquisition, diagnostics and tools for early intervention." Establishing milestones in child acquisition of Indigenous languages may involve mastering certain patterns for building words or reaching particular sentence lengths.

Key takeaways

- Babies tend to reach developmental language milestones around the same general times, with some variability between individual children.
  - Before one year old: Cooing and responding to facial expressions, then babbling, recognizing names and objects, and pointing gestures.
  - Around one year old: The one-word stage, which involves first words and responding to simple phrases.
  - Around age two: A two-word/two-part stage, where children combine two words and/or produce words containing two parts.
  - Around 30 months old: A multi-word/multi-part stage, which involves combining more than two words and/or combining more than two parts within one word.
- Children learning more than one language reach language milestones at approximately the same ages as their monolingual peers.
- More research is needed to establish the language learning milestones for children learning Indigenous languages.

2.5 Do all children learn languages at the same speed?

This section reviews research about how much children may differ from each other in the speed at which they learn language. This information can help caregivers who have questions about their child's learning pace. Although there are general milestones that children achieve (see §2.4), research has established that not all children learn language at the same speed. In fact, the creators of Wordbank, a cross-linguistic repository of child vocabulary acquisition, have shown that variability between children is the norm, and that the age of producing and understanding first words is even more variable than the age of taking a first step (Frank et al. 2021). Learning speed will also sometimes differ over time for the same child: some children will go through spurts, during which their vocabulary increases dramatically, while other children learn words at a steadier, slower pace (Frank et al. 2021, Clark 2024). Variation in language learning, which is known in the field as *individual differences*, is normal and driven by a multitude of factors.

Research has shown large differences among children in building their vocabularies. For example, one investigation of English-learning children aged 15–30 months found extreme dif-

ferences among individuals, with many children producing only a few words at age two, while others used close to 700 words at the same age (Frank et al. 2021). Furthermore, the researchers observed this degree of variability consistently across many different languages. When a baby is acquiring two languages at once, the process involves even more variables that impact the speed of learning. This can increase observable individual differences. Furthermore, development may proceed differently for each of the child's two languages (Hammer & Rodríguez 2010).

Studies have also examined the factors behind such variability among children. The many factors driving individual differences in children can be internal or external, with internal factors including such things as cognitive abilities and emotional well-being, and external factors including quality and quantity of language input and age of exposure to each language. However, far and away the most consistent external factor across studies is language input (Pearson 2007, Hurtado, Marchman & Fernald 2008, Shneidman & Goldin-Meadow 2012, Dale et al. 2015, Peter et al. 2019, Lauro, Core & Hoff 2020, Rowe & Snow 2020, Masek et al. 2021, Paradis 2023). As Pearson (2007: p. 400) succinctly comments, "Of all the relevant factors that parents or communities have some control over, quantity of input is the largest." Greater input has even been linked to increases in children's processing efficiency. Hurtado, Marchman & Fernald (2008) studied Spanish-speaking infants with more versus less language exposure at 18 months of age and tested how quickly these same children recognized words six months later. Children who were exposed to more language input recognized words significantly faster than those with less exposure.

Language nests intrinsically deal with situations where another language, such as English or French, is culturally dominant. In situations where one language is culturally dominant, some studies have indicated that different factors play a role in determining individual language development. Sun et al. (2018) investigated the language acquisition of very young bilinguals in Singapore who were learning the societally dominant language, English, as well as one of three mother-tongue languages: Tamil, Mandarin, or Malay. They found that acquisition of English was more impacted by child-internal factors like memory, while acquisition of the mother-tongue language was more impacted by external factors like the quantity of input. The authors conclude that this was most likely due to the difference in support for each of these languages. While children received consistent input in English (in school, media, and often in the home), they received much more limited support for their mother-tongue language, which was usually only spoken in the home. These results were mirrored in research by Lauro, Core & Hoff (2020) and Pham & Tipton (2018), who studied Spanish-English and Vietnamese-English bilingualism, respectively. Both studies observed child-internal factors having more effect on vocabulary skills in the majority language, while child-external factors had more effect on vocabulary skills in the minority language.

Another related factor that helps determine individual differences in the speed of learning language is language output–how much the child uses the target language to communicate. Some children will simply be more talkative than others and therefore get more practice speaking (Dale et al. 2015). Meanwhile, some children learning two or more languages may tend to choose

one language over the other when talking. In examining the language development of Spanish-English bilingual children, who sometimes responded in a different language from the one in which they were addressed, Ribot, Hoff & Burridge (2018) found that children who tended to use one language over the other gained more proficiency in that language (see §2.2 for more information about language output).

With respect to childhood bilingualism, timing of first exposure to the language is an additional factor in the speed of language development. Children are classified as simultaneous bilinguals if they learn two languages at the same time. On the other hand, if children learn one language before the other, then they are considered sequential bilinguals. For sequential bilinguals, age of acquisition of the second language can affect the speed of acquisition of that language (Hammer et al. 2014, Paradis 2023). Additionally, bilingual children often experience increases or decreases in exposure to one of their languages. These shifts in language exposure can advance development in one language and/or temporarily hold back development in the other (Hammer & Rodríguez 2010).

When it comes to internal factors, researchers have investigated the impact of cognitive abilities by examining measures such as nonverbal IQ, processing speed, and memory as they relate to language acquisition outcomes and trajectories. Higher processing speed has been shown to be correlated with faster vocabulary acquisition during early language learning, but as children's vocabularies increase, processing speed becomes less implicated in predicting individual development (Fernald, Perfors & Marchman 2006, Peter et al. 2019).

As a final example of internal factors related to how quickly children learn language, research has explored the role of a child's socioemotional state, which is their emotional well-being and ability to interact with other people. One's socioemotional state includes considerations such as "self-regulation, social competence, social cognition, and problem or prosocial behaviors" (Paradis 2023: p. 800). Socioemotional difficulties can negatively impact language learning, while positive connections between language and culture and a child's identity can correlate with greater proficiency in a child's heritage or traditional language (Oh & Fuligni 2010, Sun et al. 2021). Much of the research on how socioemotional factors impact bilingual language development has been conducted with immigrant and refugee families, however, and not Indigenous families seeking to revitalize their traditional language.

Building off this body of research, we offer the following considerations regarding language nests. It is quite typical for children to learn languages at different rates, while also proceeding through similar general milestones. A child with a slower pace of learning is not a cause for concern unless there is a substantial delay suggesting possible language disorders (see §2.8). Caregivers can be aware of various internal and external factors that may be underlying the differences. Development in the Indigenous language is likely to be faster and stronger with earlier first exposure (see §2.1, and with a higher quantity of interactive input in the Indigenous language (see §§2.2-2.3). The socioemotional state of children is important for language learning, so caregivers may wish to find ways to make learning fun and tie positive connections, rather than pressure or guilt, to language usage. Doing fun, joyful things in the language may

be important for building positive socioemotional connections to the language. In general, caregivers should carefully consider how they want to foster and expose children to the Indigenous language while also keeping in mind that children do not learn languages at the same speed for a variety of reasons.

Key takeaways

- Differences between children's speed of learning language are completely normal and are known in the field as individual differences. Individual differences come from many factors.
- The biggest factor driving individual differences in children's language learning is input—how much exposure they get to the target language.
- Individual differences also come from other factors, including the child's socioemotional well-being and how much the child uses the language.
- Learning more than one language in early childhood means there are more variables that can result in individual differences. These include the timing of learning each language, as well as the child's relative amounts of exposure to each language.

2.6 Is my child speaking another language, such as English, problematic for learning the Indigenous language in the nest?

At the Child Language Acquisition Symposium for Indigenous Communities, many caregivers reported that when they address their child in the Indigenous language, the child sometimes responds in English. Consider the following two examples in which a child named Ani, who is learning Northern East Cree and English, responds in English when spoken to in Cree. These examples come from publicly available transcripts from the Chisasibi Child Language Acquisition Study (Brittain et al. 2007). Ani is learning Cree as her first language but is also exposed to English. In (6), Ani is two years and one month old. The adult holds up a toy puppy and asks Ani to label it.

(6) a. Adult: Uu maak wii awaan?
'Who is this one?'

b. Ani: Puppy … puppy.

c. Adult: Oh, achimushish!
'Oh, a puppy!'

d. Ani: Puppy.

e. Adult: Atim!
'Dog!'

f. Adult: Chiiyi.
'You (say it now).'

In (7), Ani is three years and five months old. She is referring to a toy she is holding. Ani repeats the English word *mine* and the adult tries to get her to say 'this is mine' in Cree. Ani and the adult playfully go back-and-forth. The verbal form *chiki iyin* literally translates to 'you will say.' The adult will commonly use such a future tense form to issue a softer command to the child.

(7) a. Ani: Mine!
b. Adult: Niiyi uu chiki iyin.
"'This is mine", you say.'
c. Ani: Mine!
d. Adult: Nimui chiki iyin "mine".
'You don't say "mine."'
e. Adult: Niiyi uu.
'This is mine.'
f. Ani: Mine!

These examples illustrate a common experience reported by caregivers at the symposium, whose children are growing up multilingual in a context where a societally dominant language is encroaching more and more on the space of the societally non-dominant Indigenous language. For some caregivers, such interactions can be cause for concern. But the goal of most language nests is not necessarily raising a monolingual speaker of the Indigenous language. Instead, most nests contribute to raising a multilingual child who is proficient in the Indigenous language as well as English (or another dominant language) and possibly other languages. One helpful framework to support children and their language development is harmonious bilingualism—an experience of well-being associated with speaking multiple languages (De Houwer 2020). This framework, in which a child's multiple languages are considered a resource and not a problem (Ruiz 2010), sets the stage for analyzing children's language mixing, as well as the ways in which some caregivers prompt children to use the nest or home language. We cover these topics in the rest of this section.

Children learning more than one language may sometimes mix their languages. This phenomenon, which is typically called *code-mixing* or *code-switching*, is often the result of not knowing a word or phrase in one of their languages, which prompts children to switch to their other language (Nicoladis & Secco 2000, Smolak et al. 2020, Tulloch & Hoff 2023). Other reasons for switching between languages, which are more common among older children and adults, include conveying particular meanings that are more easily expressed in the other language, adding emphasis, and quoting other people (Zentella 1997). Code-mixing can occur within words, between words within sentences, or from one sentence to another. When it occurs within words or sentences, such language mixing is not a haphazard selection of words or word parts from each language; instead, it is constrained by grammatical rules (Poplack 1980, Zentella 1997, Allen et al. 2009, MacSwan 2022).

In (8), from Allen et al. (2002), a child who was almost two years old inserted the English word *cookie* into a question that was otherwise produced entirely in Inuktitut. This child may not have known the Inuktitut word for 'cookie,' or she may typically use the English word. Cookies are not traditionally Inuit, so the Inuktitut word is less frequent. In (9), also from Allen et al. (2002), a child who was three years old and eight months produced a sentence that started in Inuktitut, ended in English, and included more than one word from each language. Here, the child started the sentence in Inuktitut, but may have switched to English for the second phrase because everyone in the community uses the English word *daycare* to express that concept. This child almost certainly knew how to express 'running in the' in Inuktitut, so this is not a situation of switching because of not knowing the vocabulary.

(8) atausimik cookieliurtuq?

atausi-mik cookie-liur-tuq?
one-MOD.SG cookie-make-PAR.3SG.SBJ

'Is he making one cookie?'
please provide an unabbreviated gloss for MOD and PAR

(9) pinngua allaa running in the daycare

pinngua allaa running in the daycare
play and

'playing and running in the daycare'

Another example of code-mixing is (10), taken from data collected from an ongoing study at the Saad K'idilyé language nest where children are immersed in Navajo all day long. In this interaction, a group of children are playing outside, and an airplane engine can be heard flying overhead. A couple of the children notice and look up at the airplane. The caregivers verbally acknowledge that there is an airplane flying above by asking 'Where is the airplane?' in Navajo. The children look up, pointing in the direction of where the sound of the airplane is coming from. A two-year-old child, Tóńbaa', produces the word *bye* in both English and Navajo (*áneee'*). The other child, Ábii', who is one year and six months old, produces only one word: *bye*. He uses this word when the airplane flies away. Note that his pronunciation of *bye* shows Navajo features, as he adds a glottal stop to the word. The adult responds to Ábii' with the full Navajo word for 'goodbye'.

(10) a. Adult 1: Háadi chidí naat'a'í.
'Where is the airplane?'

b. Adult 2: Háadi béésh[4] naat'a'í.
'Where is the airplane?'

[4]Note that the caregivers use two different words for 'airplane' in Navajo: *chidí* means 'car' and *béésh* means 'metal,' so *chidí naat'a'í* literally means 'flying car,' whereas *béésh naat'a'í* literally means 'flying metal.'

c. Adult 1: Woap!

d. Adult 2: Béésh naat'a'í.
'Airplane'

e. Adult 1: Háadi chidí naat'a'í.
'Where is the airplane?'

f. Adult 1: Níléí.
'There.'

g. Adult 3: Kojí, kojí, kojí, kojí, kojí. Níł'į́ shoo, níł'į́ shoo, níł'į́ shoo, níł'į́ shoo. Níléidi níł'į́ shoo.
'Over here, over here, over here, over here, over here. Look, look, look, look. Over there, look.'

h. Tónbaa': Goh.
'Go'

i. Tónbaa': Der.
'There'

j. Adult 1: Hagoónee'. Hagoónee'
'Goodbye. Goodbye' [saying bye to the airplane]

k. Tónbaa': Bye!

l. Tónbaa': Áneee'[5]
'Goodbye.'

m. Adult 1: Hagoónee'.
'Goodbye'

n. Adult 1: Ni shą'.
'How about you?'

o. Adult 2: Hagoónee' jiní.
'Goodbye it is said.'

p. Ábii': Baii'
'Goodbye.'

q. Adult 1: Hagoónee' aoo' aoo' hagoónee'.
'Goodbye, yes, yes, goodbye.'

These Inuktitut and Navajo examples help illustrate that if young children do not know a word in the Indigenous language, or if the Indigenous language does not express precisely what they want to convey, they might use a word or phrase from their other language. Children also may produce the same word in both languages, which demonstrates that language mixing is

[5]In addition to showing how children may respond in English when spoken to in Navajo, (10) also illustrates the nature of early words. Tónbaa' first produces a shortened form of the word in English (*bye* vs. *goodbye*) and then a shortened form of it in Navajo (*áneee'* vs. *hagoónee'*). Given his young age (two years), it is not surprising that he would not produce the full form of the word in either language.

not always due to not knowing a word. Importantly, De Houwer (2024: p. 47) notes that "so far no bilingual child has been found to use only or mainly mixed sentences – they represent at most about a third of some children's language use; for most children mixed sentences are an exception."

Even though children sometimes respond in a different language than the one they are addressed in, as in (6) and (7), and they sometimes mix their languages, as in examples ((8)-(10)), research shows that children are adept at distinguishing between languages. In fact, studies have found that even two-year-olds possess a keen sensitivity to what languages other people know best (Lanza 1992, Genesee, Nicoladis & Paradis 1995, Genesee, Boivin & Nicoladis 1996, Nicoladis & Genesee 1996, Paradis, Genesee & Crago 2021). Young children seem to figure out what the other person's dominant language is, and then they strive to use that language with that person. For example, French-English bilingual toddlers who were dominant in French used more English when speaking to an English-dominant speaker than when speaking to a French-dominant speaker (Genesee, Nicoladis & Paradis 1995, Genesee, Boivin & Nicoladis 1996, Nicoladis & Genesee 1996, Paradis, Genesee & Crago 2021). This differential use of languages shows that children's language choice is not random. It also indicates that, in addition to learning sounds, words, and the rules of their language based on language input, children connect language usage patterns to specific people at a very young age (Weatherhead & White 2021).

Considering issues such as code-switching, published research and reports also address strategies for encouraging children to use their Indigenous language. One such example comes from the Grounds family, who describe strategies that they used to get their children to speak Yuchi at home (Grounds & Grounds 2013). For example, if the children wanted something, they had to ask for it in Yuchi. Another family strategy was to identify specific phrases that were commonly used in English, such as *Where are your shoes?* and to replace them with Yuchi phrases (Grounds & Grounds 2013: p. 45). This way, specific phrases in Yuchi were used frequently. This strategy aligns with a key takeaway from the language development research discussed in §2.2, which was that frequent use of particular words or phrases promotes learning.

Another strategy discussed in the literature on childhood bilingualism is called the *minimal grasp strategy* (Taeschner 1983, Ochs 1988, Lanza 1992), in which the adult pretends not to understand the child when he uses the non-target language. Juan-Garau & Pérez-Vidal (2001) analyzed parental strategies used with one Catalan-English bilingual child from age one year three months to four years two months. The boy was being raised in Catalonia, and Catalan was his dominant language. His Catalan-speaking mother tended to accept switches into English when they were speaking in Catalan and thus established a bilingual rapport in which the child did not feel compelled to rely on one language. When the boy turned three, the English-speaking father adopted strategies that were aimed at promoting monolingual English discourse. This included the minimal grasp strategy. The authors write that "the child respond[ed] to his father's higher linguistic and communicative demands [for English] with a spectacular progression in his productive use of English" (Juan-Garau & Pérez-Vidal 2001: p. 82).

Given the body of research we have reviewed above, we now turn to offering recommen-

dations regarding the use of multiple languages. Caregivers and language nest programs should think carefully about how to approach and deal with the use of the non-Indigenous language. This is important when considering the child's learning process for the Indigenous language, too. There are reasons to remain calm about use of the non-Indigenous language. If children sometimes use the non-Indigenous language, it does not necessarily indicate a problem with their learning of the Indigenous language. For example, it is normal behavior for people who speak more than one language to use these languages in the same conversation, or even in the same sentence. And using the non-Indigenous language does not necessarily mean that the child is not also learning the Indigenous language – understanding the Indigenous language is also an indicator of language learning. At the same time, because research shows that speaking the language more now predicts speaking it more in future, it can also be helpful to encourage children to produce as much of the Indigenous language as possible. Caregivers and language nests can use numerous strategies to encourage the child to speak the Indigenous language, including repetition of frequent words and phrases, playful and positive interaction with the child around using particular words and phrases, having the child use particular phrases in the Indigenous language to get things they want, and perhaps using the minimal grasp strategy.

Surrounding children with people whose dominant language is the Indigenous language could also prompt more use of that language. Some communities incorporate Elders into their language nests for this purpose and for many other, very important reasons (Dauenhauer & Dauenhauer 1998, Albers & Albers 2013, Grounds & Grounds 2013, King 2001, Rouvier 2017, Peters & Peters 2013, among many others). Elders can help informally teach vocabulary and knowledge of cultural topics to the children, and they can serve as language models or possibly surrogate grandparents for the children. Involving Elder speakers in the nest is likely to be most effective if their experience, suggestions, and needs are included in the planning of curricula and language nest organization from the outset (Rouvier 2017). Lastly, while some strategies aimed at getting children to speak in the Indigenous language may be more effective than others, strategies that make children feel badly about language use may have the opposite of the intended effect. As one reviewer of this manuscript pointed out, children may refrain from using the Indigenous language if they associate it with pressure, punishment, guilt, or negative feelings. Ultimately, a realistic goal for many language nests will be striving for bilingualism that contributes to rather than detracts from well-being (De Houwer 2020).

Key takeaways

- People who speak more than one language will commonly mix these languages in their words and sentences – a phenomenon known as code-mixing or code-switching.
- Like adult speakers, children code-mix for many reasons, including the fact that they can perceive which languages other people know best.
- At the same time, learners must practice using language, because language output is an important component of language learning.
- Many language nest practitioners and families report observing code-switching and com-

ing up with methods to encourage children to use their Indigenous language more.

2.7 Will being in the nest make it harder for children to learn English, French, or other widely spoken languages?

Being in the nest will not cause any issues for learning other languages. Research on non-Indigenous children who speak a minority language indicates that, as children age, more widely spoken languages tend to take over and exposure to the minority language tends to decrease (De Houwer 2007, Gathercole & Thomas 2009, Castilla-Earls et al. 2019, Hiebert & Rojas 2021). In her study of 1,899 families with bilingual children in Belgium, De Houwer (2007: p. 419) writes, "The findings from this family-based survey of language use confirm what all studies looking at intergenerational language transmission have found. Children growing up with two languages invariably learn to speak the majority (societally dominant) language. The minority language is the one that is at risk of not being spoken."

The fact that multilingual children learn majority languages has been illustrated by several studies comparing bilingual and monolingual children across age groups. For example, in a large study of Spanish-English bilingual children in Miami, second-graders had lower vocabulary scores in English as compared to monolingual English-speaking children; however, by fifth grade the gap between the bilinguals' and monolinguals' English scores had closed (Oller & Eilers 2002). This closing of the gap with age has also been found for bilinguals' developing grammar in both the societally dominant and the minority language (Gathercole 2007, N. L. Shin 2023). Overall, the research suggests that, even if children who are monolingual in the societally dominant language outperform bilingual children in the early stages of development, bilingual children tend to catch up.

Despite myths that bilingual children end up lagging behind monolingual children in their language development, research has established that bilingual children fare just as well as monolingual children on language measurements. Studies that suggest that bilingual children lag behind monolingual children in the early years usually only focus on one of the bilingual children's languages. For example, Hoff et al. (2012) compared Spanish-English bilingual and monolingual English-speaking two-year-olds. Measurements of the children's developing vocabulary and grammatical abilities were taken at ages one year ten months, two years one month, and two years six months. The monolingual children outperformed the bilingual children across ages when only the measurements in English were taken into account. However, when both languages were included, the bilinguals performed on par with the monolinguals. For example, imagine that a Spanish-English bilingual girl knows the Spanish word for 'grandma,' *abuela*, but not the English word. If this child's vocabulary knowledge is only measured according to what she knows in English, and her Spanish vocabulary does not count, then her knowledge of the word *abuela* will not figure into her vocabulary score. To get a full picture of a bilingual child's language development, it is imperative that both languages are taken into account. Once that is done, the picture that emerges is one where bilingual children do not lag behind monolingual children (De Houwer 2009).

Moreover, even when studies zero in on children's language abilities in the majority language, research indicates that they catch up to monolingual children, and the majority language tends to become their dominant language. Studies also find that minority-language knowledge boosts bilingual children's learning of the majority language (Lindholm-Leary & Borsato 2006, Lindholm-Leary 2016, De Houwer 2021). For example, studies of children in Indigenous-language immersion schools demonstrate that children not only show increased abilities in the Indigenous language, but also in the majority language (Mccarty & Watahomigie 1998, Crawford 2004, S. J. Shin 2017).

Although some caregivers are concerned that their children will not learn other languages such as English or French if they attend a language nest, the research is quite clear. Children will almost certainly go on to master the majority language and even become dominant in it.

We believe these findings have the following implications for language nests. On the one hand, children in nests will end up with the linguistic skills necessary to function well in the majority society. But on the other hand, the language that needs the most nurturing and protection is the Indigenous language, because the majority language creeps in and takes over very quickly. Since research shows that bilinguals will eventually shift toward the majority language, language nests, families, and communities may want to consider a plan for the future of their child speakers. Such plans could include considering how communities and language nests can maintain harmonious bilingualism. They can also consider how their Indigenous language can be more present outside of the nest and in communities, in order to provide children with more exposure to the language and opportunities to interact in it.

Key takeaways

- The idea that the bilingual children lag behind monolingual children in language development is a myth. It is not supported by research.
- If the linguistic skills of bilingual children are holistically assessed for both of their languages, rather than just one, then they perform on par with their monolingual peers.
- Bilingual children may initially lag behind their monolingual peers when it comes to a majority (societally dominant) language, but they catch up over time.
- Even bilingual children who are dominant in the minority language tend to shift to becoming dominant in the majority language, often somewhere between ages six and twelve.

2.8 Are children with speech and language difficulties better off being raised monolingually?

All children, including children with language disorders, can become multilingual. Children with language disorders have difficulty learning languages in general. This is applicable to all of their languages, not just one. These children often present as speaking in shorter sentences and having difficulty organizing their ideas (Gutiérrez-Clellen 2004, Kohnert, Ebert & Pham 2022). They may be slower to acquire new vocabulary and may have other developmental delays as well. For languages with complex word structure, like many Indigenous languages, they may

have difficulty building words in an adult-like way (Crago & Allen 2001). In some cases, there may be a clear cause for the language delay, such as a traumatic event or a genetic condition like Down's Syndrome. In other cases, there may be no explanation for the child's delay. In these situations, the difficulties may be due to what is called a developmental language disorder (DLD). DLD is thought to occur because children struggle to process information at the same speed as their peers (Hayiou-Thomas, Bishop & Plunkett 2004). In addition to difficulty communicating, a language delay or disorder may result in academic and social-emotional difficulties as well (Langbecker et al. 2020). Importantly, some children with DLD may not be able to obtain a diagnosis for their DLD because they lack access to knowledgeable pediatric professionals. As such, caregivers and educators should be aware of the characteristics of children with language disorders, such as speaking in short sentences and having difficulties organizing ideas and learning new words in not just one but all their languages.

Research has shown that children with language disorders (regardless of type) are capable of being bilingual. Bilingual children with language disorders who are exposed to multiple languages from birth show similar levels of vocabulary and grammar skills to their monolingual peers with language disorders (Kay-Raining Bird, Genesee & Verhoeven 2016). Similar levels of grammar skills have also been observed in large-scale studies with up to 600 children (Peña et al. 2020). That is, there is no negative effect of bilingualism on children with speech and language difficulties. However, when language input in one language is delayed or reduced, these children will show lower skills than their peers in that language. This effect, however, comes from the children receiving less language exposure than their peers (see §2.2), not from their language difficulties.

Language input is very important for the development of language in general, and bilingual children must be compared to peers with similar amounts of language input. When bilingual children are compared only to their monolingual peers, they may be incorrectly identified as having speech or language disorders. This can occur when professionals administer tests designed for monolingual children to bilingual children and compare the results to those of monolingual children. Similarly, bilingual children with language learning difficulties may not be identified if their challenges are incorrectly attributed to the bilingual environment. Teachers or professionals may then fail to refer families for help when a bilingual child is struggling to learn language across their environments.

What distinguishes children that have underlying difficulties learning languages from those that simply have not had enough exposure is the consistent presence of difficulties across languages and settings. If the child presents with difficulties in only one language, they probably need more learning opportunities in that language to develop their skills. Since children with language disorders have underlying difficulties processing language in general, we expect these challenges to be present in all a child's languages. To the extent possible, families should seek out professionals educated in bilingualism and familiar with typical versus atypical language development.

From this body of research, we offer the following considerations for caregivers and lan-

guage nests. Is it better to raise children with language delays monolingually? If the goal is to be successful at communication across communication partners, then no. Importantly, bilingual children with language disorders who are placed in monolingual environments will still have a language disorder. That is, since bilingualism is not the cause, monolingualism is not the solution. In fact, limiting language exposure, including bilingual exposure, can be detrimental to the children. If children with language disorders need multiple languages in their environment but are restricted to one language, their communication difficulties will only increase. Their environment will demand two or more languages, but the child will only have one (Kohnert & Derr 2012). Therefore, the need for multiple languages for communication success should outweigh other factors (Kohnert, Ebert & Pham 2022).

The case for exposing any child to more than one language goes beyond the need to communicate. Language can connect children to their community and culture. Language knowledge allows children to participate in cultural practices, and in doing so, to begin to identify with that culture and community, which is important in helping to shape their identity (Schroeder, Lam & Marian 2017). Since people have a fundamental right to communicate (National Joint Committee for the Communication Needs of Persons with Severe Disabilities 2024), the right to communicate in multiple languages and access culture(s) applies to children with language delays.

In sum, language nests may include children with known language disorders. There is no reason that they cannot learn more than one language, and doing so will not be detrimental. If a child in the nest is experiencing communication difficulties as the result of a potential language disorder, the best solution is to consult with a speech-language pathologist (SLP) familiar with bilingual and multilingual children. This individual can help to create a learning environment in the nest that will support the child's language acquisition across languages. Information about speech-language pathology resources can be found at the American Speech-Language Hearing Association's website.[6]

Key takeaways

- Exposure to more than one language does not harm children's development, including for children with language learning difficulties.
- All children are capable of learning more than one language at their level of ability to communicate.
- Exposing a child to only one language can be harmful if the child has a need for multiple languages. They may end up not being able to communicate with loved ones who speak another language. They may also be excluded from the cultural and social benefits of speaking that other language.
- Children who have difficulties organizing their ideas, who speak in short sentences, and who are slow to learn new words – in not just one language, but all their languages – may

[6] https://www.asha.org/profind/

be at risk for a developmental language disorder.

- Families and professionals who are concerned about a child's language development may wish to seek guidance from a pediatric Speech-Language Pathologist (SLP); these professionals will be familiar with services for bilingual and multilingual children. Families that cannot access a pediatric SLP may wish to consult with a pediatrician or school professional.

3 Conclusion: A call to action

The primary goal of this article has been to review research on child language development, with an eye towards summarizing findings that are relevant to people working with very young children in language nests. Accessing information about how child language develops, and whether and how that information applies to children in language nests, can be challenging. Those interested in starting or working with a nest–or simply understanding their value–eed reliable resources that summarize child language studies in an accessible way. We hope that our article can be one of these resources.

We addressed eight questions to structure and guide our summary of child language development. We ended each response to the eight questions with some suggestions and considerations for language nest practitioners and families, followed by a list of key takeaways from research findings. For example, the research to date shows overall that in a language nest, children need to experience the language as much as possible and have opportunities to interact in the language as well. Besides this, the research tells us that families can get started with the Indigenous language learning process even before the child is born. We also see that, while all children follow a similar general timeline of language development, there is a great deal of individual variation, and some specific milestones for Indigenous language development look different than those for non-Indigenous language development.

It is important to remember that there are very few studies on Indigenous child language development, and even fewer are authored by Indigenous researchers. Unfortunately, like in most fields that investigate human behavior, the vast majority of language development research has been conducted on non-Indigenous populations, and usually on English-speaking children (Christiansen, Contreras Kallens & Trecca 2022, Kidd & Garcia 2022). In our research summaries, we aimed to include as many studies on Indigenous child language development as possible, highlighting those conducted by Indigenous scholars such as Melvatha R. Chee. Nevertheless, there is an urgent need for more Indigenous-led research on Indigenous child language development.

There are many ways to address this urgent need. For example, families and caregivers can audio and video record children or keep journals documenting their language production. Communities will want to explore multiple ways of collecting language samples, since language use varies depending on location, time, and individual people. Additionally, creating an ethics plan and a method for conducting an informed consent process may be mandated in many cases.

Even if it is not mandated, it may be an important process that helps outline a collaborative, community-oriented approach. One example of a collaborative approach comes from the Indigenous Child Language Research Center at the University of New Mexico. M. R. Chee et al. (2025: p. 31) write:

> We aim to assist communities with their revitalization and sustainability efforts to strengthen the vitality of their languages into the future. We seek to inform these communities about existing child language research, collaborate on linguistic empirical studies of child language, and build bridges that link linguistic research and language pedagogy. … Our primary focus is not to collect data or conduct the research ourselves, but to provide community members with support through training and workshops so they may carry out their own research. Our vision is to maintain linguistic diversity and cultural identity through the nourishment of Indigenous language use by children and their communities.

While documenting how children use language is valuable on its own, data analysis will also be necessary to identify patterns of language use and to understand language development. To achieve this goal, teams of child language researchers, community members and families may wish to co-create a list of research questions, as well as objectives and activities to advance the community's language revitalization goals. For example, the Indigenous Child Language Research Center and their community partner, the Saad K'idilyé Navajo language nest, have chosen to focus on identifying the most frequent words and phrases in child-directed language used by the caregivers in the nest, as well as the first words produced by the children. The collaboration will thus result in a description of child-directed speech in Navajo and how that speech is reflected in children's language production (W. Chee et al. 2025). Ultimately, this work will establish a foundation for understanding Navajo child language development. Other research topics may include tracking children's first sounds and the order in which sounds emerge; characteristics of babbling; children's communicative gestures and when these occur alongside speech; and children's development of grammar. Additionally, given that children in language nests are learning more than one language, understanding how their bilingualism shapes their language development is an important avenue for future research. For example, research on developing vocabulary needs to take into account all languages that the child is learning to determine how much the child knows and can produce. Also, very little research has been done on the nature and function of language mixing in Indigenous child language (see 8-10 above). In sum, there are many potential and fruitful research questions, and teams of community members and researchers can collaborate to choose the ones that are deemed the most important to the community.

The current article has focused on child language development research, but many questions remain that we left unaddressed. For example, while we focused on language nests, the findings from the research we reviewed are likely to be useful to home-based language learning. We also did not discuss the connection between language and culture. While approaches

to language teaching vary among Indigenous communities, a common goal is often to help children make the vital connection between culture, values, and language. Indigenous knowledge is grounded in place, reflecting cultural wisdom handed down through generations. Thus, understanding the parameters of Indigenous knowledge construction and creating spaces for this knowledge is critical (Kirk-Lente 2024). Indeed, one theme that emerged at the CLASIC conference was how language work is rooted in and connected to land and nature. For example, one presenter emphasized that land and nature-based learning developed and strengthened the connection to earth and the natural world (Deer 2024).

Another important topic that we left unaddressed is the relationship between language and wellness. Research has shown that when children are immersed in Indigenous language practices, which are crucial to maintaining cultural continuity, they experience better health and well-being (Chandler & Lalonde 2008, Research & Group 2017, Taff et al. 2018, Lee 2022a,b, Lewis et al. 2022, Whalen et al. 2022). As discussed during the Holistic Benefits panel at CLASIC (see Yazzie et al. 2024: p. 18), language nests can also support wellness by teaching children collaboration over competition and creating emotional awareness. This focus reinforces an Indigenous approach not only to language, but also to resiliency, positive mental health, and intergenerational healing through knowledge transfer.

We conclude this article by reiterating our call to action. We hope that communities and researchers will join forces and create bridges to expand Indigenous-led research on Indigenous child language development. We believe this will advance our understanding of how children learn their Indigenous languages, which in turn will support communities' language revitalization efforts.

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4 Appendix: Other useful resources

- Patricia Kuhl's TED talk "The linguistic genius of babies," 2011.
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- First Peoples' Cultural Council, "Language nest online toolkit," 2023.
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- Chief Atahm School Curriculum Team, "Chief Atahm's First Nations language nests: your guide to operating a successful language immersion program for the very young," 2009.
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- Special issue of the journal *Babylonia* on answering parents' questions about language development, 2024.
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- Office of Head Start, National Center on Cultural and Linguistic Responsiveness (corresponding author: Ruth Rouvier), "A report on tribal language revitalization in Head Start and Early Head Start," 2017.
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