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33 Child and child-directed speech in North American languages

Abstract: This chapter reviews existing academic literature on the first language (L1) acquisition of the Indigenous languages of North America (NA languages). We begin by highlighting topics and applications that may be of particular interest to Indigenous language communities, especially those engaging in language revitalization and reclamation (§ 2). We also draw connections and discuss patterns from the literature pertaining to how adults speak to children (§ 3) and how children may acquire NA languages as their mother tongues (§ 4). Due to the state of the literature, our review focuses on vocabulary (the *lexicon*), systems of speech sounds (*phonology*), the parts of words (*morphology*), and the structure of sentences (*syntax*)—rather than other aspects of acquisition such as language socialization. We consider ways in which child and child-directed speech exhibits similarities and differences across languages in a geographic area known for linguistic diversity.

33.1 Introduction

A child's first language (L1) is a mother tongue acquired from birth over the first several years of life, from exposure to language during interactions with family members and the community. We use the term "L1 acquisition" in the traditional academic sense (e. g., Ortega 2009), which is distinct from the process of children learning a language after their first few years of age through avenues such as schools. The term "L1" does not assume that monolingualism is a norm, and bilingual and multilingual children can have more than one L1. In this chapter we use the term **North American (NA) languages** to refer to the Indigenous languages of what is now the United States, Canada, and Greenland. According to Mithun (1999), nearly 300 NA languages were spoken prior to European contact. Today just a relatively small number of these languages are still acquired by children as an L1 in a traditional manner, due to the legacy of colonization. However, as communities across the continent engage in language revitalization and reclamation, we must include the voices of children and consider how they have traditionally acquired NA languages.

33.1.1 Why it matters

The L1 acquisition of NA languages demands more dedicated research for a variety of reasons. Many NA languages are known for having particular linguistic characteristics

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such as “polysynthesis”, where verbs can be composed of many meaningful parts (see, e. g., Fortescue et al. 2017). These characteristics can differ greatly from those seen in English, Spanish, German, or Japanese, which tend to receive the bulk of attention in L1 acquisition research. The characteristics of NA languages, for instance, raise important theoretical questions about how children master the linguistic patterns of any mother tongue. This chapter does not delve deeply into theory, but several studies discussed here investigate the roles that factors such as perceptual salience, unanalyzed chunks, frequency of usage, and grammatical complexity play in acquiring seemingly complex word structures (e. g., Peters 1983; Peters 1985; Slobin 1985; see also Kelly et al. 2014). Of course, perhaps the most important reason to study the L1 acquisition of NA languages is to inform community-based initiatives and the hard work to support child language development and foster new generations of speakers (§ 2).

33.1.2 The landscape of literature

NA languages are severely underrepresented in the field of L1 acquisition research (Kelly et al. 2014; Kelly et al. 2015). This gap reflects a lack of Native scholars but more so the results of language loss from colonization: Modern language acquisition research has emerged during a period when fewer and fewer NA languages are acquired as mother tongues. However, this does not mean that NA languages have been ignored in the scientific study of L1 acquisition. In this chapter, we have endeavored to survey all such published research. We also refer readers to Allen’s (2017) review of research with Inuit languages for additional bigger-picture commentary.

Our survey includes approximately 90 studies covering nearly 30 languages and varieties across 13 language families and three language isolates. These studies are listed in the Appendix. To keep in-text citations more streamlined, we cite an individual study only if it is necessary to distinguish that study from others on the same language. For example, when we mention Zuni we do not cite the single study listed in the Appendix, but we do cite individual studies from the larger body of literature on Inuktitut. Within this landscape of literature, Inuktitut has seen the largest number of studies (Allen 2017), followed by East Cree and Navajo. Most other languages tend to be the subject of just one or two studies. This landscape stretches as far back as the late 19th century (Chamberlain 1890) up to the present, which includes several new and ongoing efforts (Allen, Dench & Isakson 2019; Chee 2017; Henke 2020; Hellwig & Jung 2020).

Some important limitations need to be addressed before proceeding. First, the body of scientific research on L1 acquisition involves few studies done by Native scholars. As a result, many of the publications we survey privilege perspectives and priorities from outside language communities. To our knowledge, Chee’s acquisition work on Navajo (2007, 2017) represents the only studies done by a tribal member and speaker of the language. Second, most published research focuses on the acquisition of structural lin-

guistic units. This is reflected in our review, and we acknowledge that there is much more to the process of language acquisition and socialization than acquiring sound systems and the components of words and sentences. Third, compared to the body of L1 acquisition literature available for languages such as English, French, German, and Japanese (Kelly et al. 2015), the literature for NA languages generally involves a small number of languages, a small number of studies per language, and a small number of children represented per study. In other words, even when scientific information exists about how an NA language is acquired as an L1, there is generally not much of this information. This impedes, for example, our ability to draw strong generalizations in this review. Fourth, several studies examine anecdotal, elicited, or otherwise non-primary data—sometimes due to language shift, when children and caretakers could no longer be recorded speaking a language. For instance, Chamberlain (1890; 1893) draws many observations from dictionary sources. Egesdal (1984) analyzes the child-like speech used by characters within Nlaka'pamux narratives, which includes some observations made by Teit (1912) within his own collection of stories. Nonetheless, we believe that such sources still offer some potential to inform the understanding of how children encounter, acquire, and use NA languages. Despite such limitations, the studies reviewed here comprise a unique and important body of knowledge.

33.1.3 The path ahead

This chapter examines findings from the literature on the L1 acquisition of NA languages, paying particular attention to patterns across languages related to: vocabulary (also called the *lexicon*), systems of speech sounds (*phonology*), the parts of words (*morphology*), and the structure of sentences (*syntax*). We begin by discussing implications and applications for NA language communities (§ 2) before summarizing and synthesizing findings related to child-directed speech (§ 3) and child speech (§ 4). Our conclusion (§ 5) expresses hope for the application of CDS and child speech studies to Indigenous language work.

33.2 Applications for community language efforts

Recent years have seen increased attention to the need for documenting and analyzing child and child-directed speech, particularly within communities undergoing language shift and loss (e. g., Eisenbeiß 2005; Kelly & Nordlinger 2014; Kelly et al. 2015; Hellwig & Jung 2020; Pye 2020). Such admonitions do not just call for documentation for the sake of language science, but they also highlight the value of documentation for language communities. The kinds of L1 acquisition research reviewed in §§ 3–4, particularly those involving naturalistic speech data (e. g., Brittain et al. 2007; Chee 2017), can help meet

this need. Furthermore, the studies we survey can be used to create, measure, develop, and improve resources tailored to a specific language or related languages.

In this section, we discuss some of the contributions that such research can make toward community-centered efforts to maintain, sustain, revitalize, and reclaim NA languages. We do not lay out specific strategies, recommendations, and practices for implementation in homes and schools, as that is beyond the scope of this particular chapter. Furthermore, much more work needs to be done to connect L1 acquisition research to language revitalization and reclamation (e. g., Child Language Research and Revitalization Working Group 2017)—we hope this chapter contributes to building this foundation.

33.2.1 Informing language revitalization and reclamation

The study of L1 acquisition can inform efforts to create new generations of speakers, such as immersion schools, master/mentor-apprentice programs, and language curricula across all ages and levels. These kinds of programs continually endeavor to gauge and improve the transmission of NA languages, when science still knows relatively little about how such languages are acquired by children or older learners (see, e. g., reports from Lokosh (Joshua D. Hinson) 2019; Morgan 2017; Pease-Pretty On Top 2004; Peter & Hirata-Edds 2006; Peter et al., 2008).

L1 acquisition research can contribute knowledge about how members of NA language communities speak, and have customarily spoken, to children. This can be especially valuable in contexts where current generations of Elders, parents, and language teachers did not grow up speaking their traditional language and are seeking information about how to raise children in the language. For example, the kinds of research surveyed in § 3 can help identify patterns to use with children, such as particular vocabulary items and phrases, strategies for repetitions and intonational modifications, as well as specific types of linguistic structures—especially for languages with rich methods of building words.

Research on L1 acquisition can also inform expectations for children on their journeys to become speakers of their NA languages. Relatively little scientific information is available on the stages and milestones that children may pass in acquiring the characteristic phonological, morphological, and syntactic facets of most NA languages. The findings we survey below can guide parents and teachers to learn more about what to look for in child speech, where particular types of reinforcement may be needed, and more. For communities who have not had child speakers of their traditional languages for many years, findings from related or linguistically similar languages could be adapted to establish guidelines and resources. For communities that are home to language isolates or languages with no relatives represented in this chapter, we hope the general crosslinguistic patterns discussed here can also help inform language work.

As a final example, the study of L1 acquisition can inform pedagogy and curriculum development. Grounding pedagogical strategies in language-specific acquisition findings allows those strategies to be rooted in the language being taught. This approach Indigenizes teaching strategies, theories, methods, and materials rather than basing them on non-Indigenous language-learning approaches. Upper (1993) and Chee (2017), for instance, not only discuss stages of child development but also the application of such findings to language instruction in Anishininimowin and Navajo (respectively).

33.2.2 Redressing majority-language influence

L1 acquisition research can also help language communities better understand and remediate the influence of majority languages, such as English and French, on the speech of younger generations (see, e. g., Allen et al. 2006; Saville-Troike 1996). For example, Drapeau (1995) finds that children in a community are still acquiring Innu as their mother tongue. However, she also points out that adults will often use French noun phrases with children because they believe the Innu analogues are difficult for children: "In their view the difficulty with [Innu] thus seems to lie in its lexicon and not in its grammar" (1995: 160). Drapeau reports that the ensuing lack of Innu nouns in the linguistic environment has led to an erosion in core Innu vocabulary for children. Multiple L1 acquisition studies of an East Cree corpus (Brittain et al. 2007) have revealed a large English presence in child and child-directed speech (Bryant 2013; Pile 2018; Henke 2020). However, this usage of English seems mostly restricted to nouns rather than verbs, and children seem to retain a primarily Cree-only grammar while applying Cree sound patterns and word building to English borrowings. In both the Innu and East Cree cases, for instance, parents and educators could increase the usage of Indigenous-language nouns when speaking to children to help target this facet of language shift.

33.2.3 Supporting L1 development

L1 acquisition research can also contribute to efforts creating linguistically and culturally appropriate methods and resources to assess child language and provide appropriate support to children who may have language delays or disorders (e. g., Anderson 2015; Ball 2009; Foster et al. 1989; Kidd 2014; Peltier 2011). These tools can be applied in communities where children still learn their traditional language from birth as well as in communities creating new generations of speakers through immersion in language nests and schools. This can include the creation of more Indigenized benchmarks and milestones for typical L1 acquisition, diagnostics and tools for early intervention, and more. For example, Thorburn (2012) distills her research into a guide intended for use in speech-language pathology (SLP), which outlines the L1 acquisition of East Cree speech sounds and syllable structures. Multiple Inuktitut projects have contributed in such

areas (e. g., Allen et al., 2019; Crago & Allen 2001; Crago et al. 1991). Crago (1990) offers recommendations for improving Inuktitut-tailored SLP services by helping non-Inuit providers better understand cultural aspects of language socialization. Allen and Dench (2015) analyze 10 different metrics to identify the most useful and practical method of measuring Inuktitut language development. They recommend calculating the length of children's utterances not in terms of morphemes—the typical standard in English-language assessment—but in terms of syllables. Allen and Dench explain that this method suits Inuktitut linguistic structure, is easy to calculate, and provides a reliable assessment of language level.

33.3 Child-directed speech

We use the term *child-directed speech* (CDS) to signify the language spoken by adults to children. CDS is often called "the input" in the field of L1 acquisition research and has also been referred to as "caretaker speech", "motherese", "parentese", "baby talk", and more. CDS receives special attention across the theoretical landscape for the particular role its characteristics may (or may not) play for a child in the process of acquiring an L1. For example, academic studies have focused on whether CDS shows modifications from adult-level speech and whether CDS in languages throughout the world exhibits universal linguistic characteristics (e. g., Snow & Ferguson 1977; Ferguson 1978; Gallaway & Richards 1994; Saint-Georges et al. 2013).

The literature on NA languages shows that CDS often uses special varieties of speech (called *registers*) that are part of the socialization process for children. For example, Thompson (1985) argues that CDS in the Skokomish dialect of Twana is a register of honor and respect that is related to the register used in women's speech. Crago (1988) details two registers of CDS in Inuktitut and the role they play in teaching children not only their native tongue but also their place in society. This includes routines of repetition and teasing as well as excluding children from adult conversation. Findings from Cocopah, Comanche, and Inuktitut (Crago & Allen 1997) indicate that adults may ease away from using CDS when children are as young as 3;0 and at most when they grow to 5;0 or 6;0[1].

In this section we offer some general observations related to the characteristic of CDS across NA languages. We pay special attention to how adults modify their speech for children in the areas of the lexicon, phonology, morphology, and syntax. Within this body of literature, Inuktitut and East Cree are the most frequently represented, but we also discuss findings from more than ten other NA languages.

1 Children's ages are given using the standard format year;month. For example, the notation 3;0 indicates an age of three years and zero months.

33.3.1 Modifications in CDS

A recurring theme throughout the literature is the modification of speech to children as a way to help them acquire the language. As one Inuktitut-speaking mother explained to Crago (1988: 162), “I talk in a way not meant for an adult. The language would be too heavy if I talked to [children] as I would to an adult. When they are first learning to understand we should not talk in such a way to them”.

3.1.1 The lexicon

The usage of specialized vocabulary has been reported for CDS in several languages, including Acoma, Comanche, East Cree (Jones 1986; 1988; Terry 2010), Inuktitut (Crago 1988; Crago & Allen 1997), Nuu-chah-nulth, Sahaptin, and Twana. Often this child-directed vocabulary derives from words in the adult-level lexicon, typically through reduction, sound substitution, or some other kind of change. For example, Kess and Kess (1986: 209) point out that the CDS forms in Table 1 retain only the first few speech sounds from adult forms.

Tab. 1: Words derived from adult-level forms in Nuu-chah-nulth (Ahousaht)

Adult form	CDS form	Meaning
tu·x^{w}ši	tu·x^{w}	‘jump!’
t’i·qši	t’i·q	‘sit down!’
ta·qyiči	ta·q	‘stand up!’
ya·cči	ya·c	‘walk!’

Source: Kess and Kess (1986: 209).

However, words in CDS may also be completely unrelated to adult-level words. Table 2 presents such examples from Kess and Kess (1986: 205).

Tab. 2: Words not derived from adult-level forms in Nuu-chah-nulth (Ahousaht)

Adult form	CDS form	Meaning
naqši	ma·h	‘drink!’
haʔuk^{w}’i	pa·paš	‘eat!’
waʔiču ʔi	hu·š	‘go to sleep!’
hu·	ʔi·x	‘watch out!’

Source: Kess and Kess (1986: 209).

Descriptions of vocabulary indicate that different NA languages use words belonging to similar categories. Evidence from Comanche, East Cree (Jones 1986; 1988), Nuu-chah-nulth, and Twana shows that common categories for vocabulary in CDS may include kinship terms, body parts and bodily functions, along with everyday actions, animals, and objects. Miller (1965: 112) reports collecting about 30 words from Acoma CDS, with examples all fitting into these categories, such as: *yáay'aa* 'mother', *dyáady'aa* 'daddy', *gâəgə́* 'rabbit', *háəy'aa* 'bite', *ʔák'aʔák'a* 'drink', and *babáu* 'sleep'.

Another noteworthy component of the child-directed vocabulary is that individual words may be flexible across categories such as nouns and verbs. Miller (1965: 112) says Acoma *ʔák'aʔák'a* can mean 'drink'; 'you drink!'; 'did you drink?'; 'I want a drink'; 'I had a drink'; and more. The child-directed root *aahaaq-* in Inuktitut can mean 'to hurt'; 'thing that causes hurt'; 'thing that hurts'; and 'ouch' (Crago & Allen 1997: 93).

33.3.1.2 Speech sounds and sound structures

Common modifications observed in CDS pertain to elements throughout the sound systems of languages. This includes a reduction in the number of speech sounds, often the elimination or substitution of sounds that observers deem more "difficult" or "complex".

Modifications through reductions in speech sounds and syllables have been reported for Comanche, East Cree (Jones 1986; 1988), Inuktitut (Crago & Allen 1997), Nuu-chah-nulth (Kess & Kess 1986), and Twana. Crawford (1970; 1978) reports for Cocopah CDS an extensive system of replacing consonants at the beginning of syllables. The replacement of a given sound depends upon the place and manner of articulation of the consonant in the adult-level word form.

However, modification in CDS does not always entail reduction. Voegelin and Robinett (1954) attest that adult speakers of Hidatsa will slow and emphasize speech, lengthen and exaggerate particular speech sounds, and carefully pronounce clusters of speech sounds that would typically be reduced—all as ways of clarifying structures for children. CDS in Anishininimowin (also called Severn Ojibwe or Oji-Cree) and Nuu-chah-nulth has also been reported to use pitch/intonation modification and exaggeration (Kess & Kess 1986: 203; Upper 1993: 121). Processes of pronunciation in Dëne Sųłiné can obscure the forms of morphemes and words, so CDS employs repetition, variation, and careful speech articulations to clarify these forms for children (Hellwig & Jung 2020).

In speech communities around the world, adults speaking to children will often systematically repeat words or parts of words (a process known as *reduplication*). Reduplication features prominently in CDS across many languages and varieties such as Acoma, Algonquin (a dialect of Ojibwe), Cocopah, Comanche, East Cree, Nuu-chah-nulth, and Sahaptin (Chamberlain 1890; Chamberlain 1893; Jones 1986; Jones 1988; Kess & Kess 1986). This can include the usage of reduplication more frequently or distinctly from patterns in adult speech. For example, Crago and Allen (1997) note the prominence of

reduplication in Inuktitut forms that are used with children compared to those used with adults (Table 3).

Tab. 3: Reduplication in Inuktitut child-directed forms

Adult form	CDS form	Translation
ipiq	aaqqaaq	'dirt'
niqi	apaapa	'food'
qimmiq	lulu	'dog'
umajuq	uquuqu	'animal'
nunakkuujuuq	vuvu	'vehicle'

Source: Crago & Allen 1997: 96–97

33.3.1.3 Morphology and syntax

Many NA languages are well known for their rich word- and sentence-building characteristics, which also may be modified in CDS. For example, East Cree has a diminutive suffix *-(i)sh*, which creates a meaning of smallness, cuteness, and/or affection (Cunningham 2008). Forms using this suffix pervade East Cree CDS (Jones 1986; 1988; Terry 2010), and the diminutive noun *pîpîsh* 'little baby, little doll' from *pîpî* 'baby' is one of the most common word forms used with children (Henke 2020).

Accounts detail some reductions with the parts of words in CDS for languages such as Inuktitut (Crago 1988) and Nuu-chah-nulth (Kess & Kess 1986). Thompson (1985) reports that Twana CDS reduces the overall number of affixes from the adult grammar. Jones (1986; 1988) posits that reduction within words is a crucial part of the path of East Cree CDS over time: She surmises that as children grow older, adults move from using uninflected child forms to simply inflected forms to fully inflected adult forms. This does not mean that CDS in NA languages necessarily lacks rich word-building elements. Inuktitut CDS, for instance, contains very few uninflected verb roots (Crago & Allen 2001) and employs much more affixation than found in English CDS (Crago, Allen & Pesco 1998). For example, the child-directed verb in (1) uses six suffixes compared to the single verbal suffix *-ing* that appears in the English translation (1998: 40).

(1) Inuktitut (Crago, Allen & Pesco 1998: 40)[2]
Aataartaulangasijualunga.
aataaq-jauluruna-si-juq-aluk-una
hurt-PASS-FUT-PRS-PTCP.3SG.SBJ-EMPH-this.one
'That guy is going to get hurt.'

2 Abbreviations follow the Leipzig Glossing Rules. Exceptions are: EMPH = emphastic; INAN = inanimate; INT = interrogative.

In some NA languages, CDS can entail reductions in sentence structures or a prevalence of a limited number of sentence types. This includes reports of grammatical but short utterances in Anishininimowin, and Upper (1993: 122) provides an example of CDS to a child age 1;0 that employs repetition and short structures in succession (2). Descriptions of CDS in Comanche (Casagrande 1948: 13) and Twana (Thompson 1985: 175–176) point out even shorter structures of single "baby words" as stand-alone sentences.

(2) Anishininimowin (Upper 1993: 122)

Ohowe kiniin na.	*Awanen aha.*	*Awanen aha.*	*Aacic?*
'Look at this!'	'Who's that, eh?'	'Who is that?'	'Baby?'

Anishininimowin CDS also frequently uses commands as well as yes-no questions (Upper 1993). Terry (2010) reports that questions and commands together represent the majority of utterance types in East Cree CDS as well.

Research on argument structure in CDS has come primarily in Inuktitut, which exhibits ergative-absolutive marking in morphology but nominative-accusative alignment in syntax. Allen (2013: 89) explains that CDS almost exclusively employs structures such as antipassives, passives, and noun incorporation that avoid the usage of ergative-absolutive marking. In other words, adults use intransitive structures that nonetheless convey to children propositions involving two arguments. Furthermore, passive constructions occupy a prominent place in Inuktitut CDS and occur almost three times more frequently than in English CDS (Allen & Crago 1996). Johansson (2012a; 2012b) finds even higher rates of passives in East Cree CDS, although her small sample size likely skews the number.

33.3.2 CDS without modifications

The modifications outlined above are not universal to CDS in NA languages, nor do reductions and simplifications necessarily persist throughout all levels of a given language.

For example, Fee and Shaw's (1998) study finds no significant difference in pitch between child- and adult-directed speech in Mi'kmaq. They speculate that perhaps CDS may not contain such modifications because children in the community "are expected to be independent and are treated very much as equals with adults" (1998: 54). In a similar vein, Terry (2010) anecdotally observes that CDS in East Cree does not contain special modifications in pitch.

East Cree CDS also does not necessarily reduce all forms of word building throughout the grammar. CDS employs the full range of inflection for nouns, including in sentences without verbs such as (3), where the noun *spitun* 'arm' has one prefix and two suffixes. Nouns in CDS frequently include possessive forms bearing multiple affixes, but some particular meanings and parts of words are much more frequently used than others with children (Henke 2019; 2020).

(3) East Cree (Henke 2020: 225)
Mâuhî mîn chispituniniuh.
mâu-hî *mîn* *chi-spitun-iniu-h*
DEM-INAN.PL again 2-arm-1PL.INCL-INAN.PL
'And here are our arms.'

Within the child-directed lexicon in Inuktitut, "baby roots" are heavily outnumbered by adult-level roots, so children do not necessarily encounter simplification there (Crago & Allen 1997: 101). Furthermore, the usage of CDS-specific roots may actually complicate the acquisitional task for children by essentially doubling their word-learning workload: "Baby words must be learned and then discarded in favor of a supplementary adult lexicon, and all within the first three years of a child's life" (1997: 101). The usage of baby words in Inuktitut also does not always necessarily simplify word structure for children either. Crago reports that adults inflect child-directed words with "quite complex" forms on occasion (1988: 161), and Crago and Allen (1997: 101) make a similar observation.

33.4 Child speech

In this section we turn the lens toward speech produced by children acquiring NA languages. Inuktitut, East Cree, and Navajo are the most frequently studied languages in existing literature. We also discuss reports from 17 other language varieties that represent nine language families and three language isolates. Again, we consider findings pertaining to the development of sounds and sound structures, vocabulary, parts of words, and structure of sentences.

33.4.1 Sound and sound structures

Children acquiring any language must build up their mastery of speech sounds over time, and all children can be expected to change, substitute, or delete individual sounds during this process. A handful of studies mention the presence and acquisition of individual consonantal sounds by children in NA languages. Table 4 lists some of the categories of speech sounds observed in child speech.

Stops (such as the bolded sounds in English words ***b**us*, ***t**oy*, and ***k**itten*) are the most frequently reported segments, followed by nasals (as in ***m**o**mm**y* and ***n**o*) and then affricates (as in ***ch**ur**ch*** and ***j**uice*) and fricatives (as in ***th**ink*, ***s**top*, and ***z**ipper*). Kroeber (1916: 534), for example, observes a Zuni-speaking child producing stops /p, t, m, n, ʔ/ at age 1;11 and by age 2;0 uses the affricate /ts/, but not "the fricatives s or c, surd L, nor any glottalized consonant." Cook (2006) surmises that the order of acquisition for consonantal segments in Dëne Sųłiné children is stops > affricates > fricatives.

Tab. 4: Consonant sounds used in NA child speech

Language	Stops	Nasals	Affricates	Fricatives
Zuni	✓	✓		
Comanche	✓	✓		
Pomo	✓		✓	✓
Dëne Sųłiné	✓	✓	✓	✓
East Cree	✓	✓	✓	✓

Sources: Kroeber 1916; Casagrande 1948; Oswalt 1976; Cook 2006; Thorburn 2010; 2012; 2014; Bryant 2013

Children attempt to produce sounds they hear as they learn to speak their native language. During this process native children may use a variety of speech sounds that they have learned until they are able to produce the adult form. In the acquisition of individual speech sounds, various substitutions have been reported for Comanche, East Cree (Bryant 2013; Thorburn 2010; 2012; 2014), and Navajo (Saville-Troike 1996; Chee 2017). Although Indigenous languages employ different sound systems, children tend to produce certain sounds before using other sounds available to them. One common pattern is the usage of stops in place of consonants that are considered to be difficult to articulate. Cook (2006: 243) found similar patterns in one child's Dëne Sųłiné speech. At age 2;03, the Dëne Sųłiné child substitutes the stops [t] for /ɬ/, [d] for /t'/, and [g] for both /k'/ /ɣ/. Another example is found in Cocopah, Nlaka'pamux, and Pomo where children are reported to replace /q/ with [k], another stop consonant.

Regarding syllable structure, some of the earliest child vocalizations around the world are one-syllable consonant-vowel (CV) combinations. The early emergence of these syllables for very young children has also been reported for Anishininimowin, Mohawk (Mithun 1989), Navajo (Saville-Troike 1996), Quileute, and Zuni. CV syllables are the most commonly used structures in NA child speech for Algonquian, Anishininimowin, Comanche, Dakota, Dëne Sųłiné (Cook 2006), Hopi, Kutenai, Mohawk (Feurer 1980; Mithun 1989), Pomo, and Quileute. Upon further analysis of Chee's child language data, this is also true for Navajo. Children combine units of consonants and vowels to produce their first words and to begin building longer words.

Thorburn (2010; 2012; 2014) says the CV syllable is the default syllable structure for one East Cree child, age 2;01. This child used CV syllables in place of other syllable types available in East Cree which led Thorburn to conclude that the CV syllable type is acquired before all other syllable types.

A different pattern emerges from Chee's data where Navajo children syllabify nasal consonants in CV sequences, using *n* for *ni* and *ń* for *ní*. In fact, Navajo children tend to delete vowels from CV syllables and produce consonant clusters uncommon in adult speech. For example, the youngest child, age 4;07, produced *ńł'į́* which is closer to CDS *níł'į́* rather than the full form, *nínił'į́* 'you look at it'. In production, the *ńł'*- constitutes a single consonant resulting in a monosyllabic unit. Native children have been reported to

change, replace, simplify, or delete syllables in their attempts to speak their languages. Table 5 lists a few examples of sound changes.

Tab. 5: Syllable and sound changes in NA child speech

Language	Child speech	Target form	Meaning
Algonquin	kakac	ki kakaciki	'dirt, filth, uncleanliness'
Quileute	ā'ā'	kā'ayo'	'crow'
Hopi	kwaʔa	ikwaʔa	'my grandfather'
Dakota	kóka	ŝũkắ	'horse'
Navajo	kaya	ayą́	'he is eating'
Navajo	zhiní	jiní	'one said'

Sources: Chamberlain 1890; Frachtenberg 1920; Titiev 1946; Nokony 1977; Saville-Troike 1996; Chee 2017

Reduplication is a common strategy found in child speech around the world, and it is also a prominent pattern found in Indigenous child speech. Table 6 lists examples of reduplication from several NA languages. Researchers of Algonquian, Anishininimowin, Dakota, and Navajo (Saville-Troike 1996) also mention the use of reduplication. Reduplication may be present in many other NA languages which do not yet have extensive child speech studies conducted on them.

Tab. 6: Reduplication in NA child speech

Language	Child speech	Target form	Meaning
Mohawk	tata	kanà:taro	'bread'
Zuni	we'we	wa'tsita	'dog'
Quileute	dī'di'	yi'sdak'	'clothes'
Hopi	táta	itáʔa	'my father'
Comanche	ʔeroró·ʔ	táivo·ʔ	'white man'
Cocopah	vánván	xasán^{y}	'little girl'
Inuktitut	piupuu	piu-	'be nice'
East Cree	kiikii	aahkuhiiwaau	'it causes hurt'

Sources: Chamberlain 1890; Kroeber 1916; Frachtenberg 1920; Titiev 1946; Casagrande 1948; Crawford 1970; Crawford 1978; Crago & Allen 1997; Terry 2010

Many NA languages, and other languages across the world, tend to use words that have a primary stress, an emphasized part of a word, or an accented syllable. Compare the following examples in English: "I bought you a ***pre****sent*," versus "I *pre****sent*** you with a gift." The study of stress in NA child languages has received dedicated attention solely in East Cree (Swain 2008; Rose et al. 2010; Rose & Brittain 2011). The speech of one East Cree child, age 2;01 to 4;01, featured stress on the last syllable of every word they

produced in their earliest production. The child applied word-final stress to words that should not have it. Over time, they begin to correctly use words that require a stress on the second to the last syllable, before moving on to master words with stress on the third from the last syllable. In East Cree child speech, final-syllable stress is the default stress.

Other literature indicates that stressed or emphasized syllables, whether at the beginning, middle, or end of words, play a special role in L1 acquisition. Studies from Anishininimowin (Upper 1993), East Cree (Terry 2010), and Navajo (Saville-Troike 1996; Chee 2017) indicate that children begin by producing syllables that are word-final and stressed when used by adults in these languages. Children acquiring Mohawk (Feurer 1980; Mithun 1989) use stressed syllables that occur in the middle of a Mohawk word. In adult Mohawk speech, words usually have stress in the second or third to the last syllable, and these are the syllables children tend to produce early on. According to Kroeber (1916), Zuni words tend to stress the first syllable. The Zuni-speaking child in this study produced the first syllables of words while deleting unstressed and final syllables. Stressed syllables in NA languages are one feature that guides children in learning their heritage language.

33.4.2 The lexicon

Studies of young children's speech in Anishininimowin and Dakota indicate that gestures and non-word vocalizations play an important role as pre-word elements. After the pre-word stage, children begin to produce meaningful syllables and then words. Evidence from different NA languages also show differences in early word category development. The earliest word forms in Dakota child speech typically refer to familiar people and objects as well as events, situations, and actions.

One study of Navajo claims that the earliest word forms for children tend to be nouns, despite the fact that verbs predominate in CDS (Gentner & Boroditsky 2009). Chee, however, makes two interesting observations regarding the younger children in her 2017 study, ages 4;07 and 5;10. When these children asked for assistance in how to say Navajo words, they more often asked their caretakers about nouns than verbs. For example, one child asked how to say the Navajo word for tree, but never asked how to say verb words and instead made attempts at producing them. At age 4;11 one child attempted the following words: *tsooskaa* for *deesk'aaz* 'it is cold' and *as'ts'ánałk'aaz* for *bits'ániłk'aaz* 'cold is coming from it'. This child used their own knowledge of Navajo to piece together verb words without requesting assistance.

The usage of words that imitate the sounds they describe, known as *onomatopoeia*, also plays a prominent role in child vocabulary for many NA languages. Table 7 lists a few examples, which includes several words for animals based on their perceived vocalizations.

Tab. 7: Onomatopoeic word forms in child speech

Language	Child form	Meaning
Comanche	*ʔumó·ʔ*	'cattle, cow, bull'
Dakota	*ʔʌʔím*	'horse'
Anishininimowin	*maow*	'cat'
Inuktitut	vuvu-	'vehicle'
Navajo	gaa	'crow'

Sources: Casagrande 1948; Nokony 1977; Nokony 1978; Upper & McKay 1987; Crago & Allen 1997; Courtney & Saville-Troike 2002

It is well established in L1 acquisition research that children will often use one-word units in place of larger, multi-word utterances. Such one-word units are known as *holophrases*, and several studies report the use of these type of utterances by children acquiring NA languages. Table 8 provides a few examples.

Tab. 8: Holophrases in early child speech

Language	Child speech	Meaning
Algonquin	numna	'it is sweet'
Pomo	baʔba	'asking for food'
Dakota	póya	'I've cut a piece of paper'
Anishininimowin	kookoochak	'are the monsters outside?'
Inuktitut	apaapa	'I want to eat'
Navajo	t'óólzí	'it is just standing there'

Sources: Chamberlain 1890; Oswalt 1976; Nokony 1977; Upper & McKay 1988; Crago, Allen & Pesco 1998; Chee 2017

Borrowed words from English and French, certainly acquired from CDS, have been reported in child vocabulary from studies dating as far back as the late 19th century (see Appendix). Although borrowings may appear in a child's vocabulary, this does not mean that English or French grammars are necessarily dominant. Drapeau (1995) reports that children use more French-origin nouns than Innu nouns, as the result of patterns in CDS, but that these children are nonetheless monolingual Innu speakers. Pile (2018) and Henke (2020) find high rates of English elements, particularly nouns, in the speech of children acquiring East Cree, but these elements occur within an East Cree grammar.

Tab. 9: Borrowed words in child speech

Language	Child form	Source	Meaning
Algonquin	kakac	French *caca*	'dirty'
Comanche	pikí·ʔ	English *pig*	'pig'
Dakota	háti	English *hockey*	'hockey'
Anishininimowin	bebii	English *baby*	'baby'

Sources: Chamberlain 1890; Casagrande 1948; Nokony 1977; Upper & McKay 1988

33.4.3 Morphology and syntax

Studies also examine the emergence and usage of word-building elements and sentence structures in child speech within several NA languages. Children from around the world learning languages often omit various parts of words in their earliest attempts, but no single pattern of omission clearly predominates across child speech in NA languages. For example, studies have found that Algonquin, Anishininimowin, Comanche, Dakota, East Cree, Hopi, Inuktitut, Mohawk, Navajo, Quileute, and Zuni children leave out parts of words in their speech. Some evidence indicates that NA children tend to omit parts of words that occur away from stressed syllables. Evidence also shows that they tend to retain perceptually salient portions of words, noticeable and relevant sections such as those occurring at word boundaries (e. g., Allen 2017; Chee 2017; Johansson 2012a; Mithun 1989; Terry 2010). Children have been reported to initially use words stripped of inflection in languages such as Anishininimowin (Upper 1993), Inuktitut (Crago & Allen 1998; 2001; Swift 2001), and Navajo (Saville-Troike 1996; Chee 2017).

Cross-linguistic similarities and divergences occur in the acquisition of morphology marking person in verbs. Studies of child speech in East Cree (Terry 2010; Rose & Brittain 2011; Johansson 2012a; Henke 2020), Mohawk (Feurer 1980; Mithun 1989), and some Inuit varieties (Allen 2017; Fortescue & Olsen 1992) found that children acquire the first-person singular marking (meaning 'I') early in development. In Mohawk and Inuit languages, the first- and second-person singular pronominal markings ('I' and 'you') are produced earlier than third-person (as in 'she', 'he', or 'they') markings. Wilman (1988) observed Inuit children frequently using third-person verbs by age 6;0. First-person pronominal marking and the unmarked third-person each tend to be used earlier and more often than second-person marking by East Cree-speaking children. Navajo children use *-sh-*, the first-person singular pronominal marking (20.2 percent) more often than the second-person singular pronominal marking *-ni-* (2.9 percent) in intransitive verbs (Chee 2017). Chee (2017) also found Navajo third-person singular intransitive verbs are highly frequent (68 percent) in child speech. Singular verbs are reported to be acquired before plural verbs and finally, dual-plural verbs are last to be used by children speaking some NA languages (Mithun 1989; Chee 2017).

Evidence from NA languages indicates that certain types of argument structures are particularly prevalent in child speech. Intransitive constructions, for instance, appear earlier than transitive constructions in child speech for Inuktitut (Allen 2013), Navajo (Chee 2017), East Cree (Johansson 2012a; 2012b; Terry 2010), Mohawk (Feurer 1980; Mithun 1989), and West Greenlandic (Fortescue & Olsen 1992). Chee (2017) found that Navajo children used intransitive verbs (77 percent) much more frequently than transitive verbs (22 percent). Ditransitive verbs (1 percent) were rarely represented in the data. Example (4) shows an intransitive verb produced by a Navajo-speaking child.

(4) *Yíkai* (age 4;07, Navajo, Chee 2017)
yí-Ø-d-kai
IPFV-3PL.DISTR-CLF-walk
'They all (three or more) arrived.'

Passive constructions such as, "The book was read (by the girl)," compared to active constructions, "The girl read the book," have long been a central focus of L1 acquisition research, in part because children comprehend and produce passives in English at relatively late ages (Deen 2011). Several studies have explored child usage and comprehension of passive constructions in NA languages. For example, Johansson (2012a; 2012b) found that one child acquired the East Cree passives in three stages, moving from memorized chunks to a phase of errors and self-corrections before attaining full command by age 5;10. Inuktitut children use passive constructions much earlier than children learning English. The use of Inuktitut passive constructions begin as early as age 2;0, due in part to factors such as the frequency of passives in Inuktitut CDS (Allen 1996; 2013; Allen & Crago 1996). The passive verb form in (5) was spoken by an Inuktitut child (Allen & Crago 1996: 139).

(5) Inuktitut (age 2;11, Allen & Crago 1996: 139)
Ilai tuttualuit aijaujuit.

ilai	*tuttu-aluk-it*	*ai-jau-juq-it*
right	caribou-EMPH-ABL.PL	get-PASS-NOM-ABL.PL

'The caribou are being gotten, right?'

Child speech in West Greenlandic also uses passives, but children are increasingly replacing them with pseudo-passives, causative affixes that have a passive interpretation when used (Allen 1996; Fortescue & Olsen 1992).

Studies report the use of causatives in East Cree (Johansson 2012a; 2012b; Pile 2018; Terry 2010), Mohawk (Mithun 1989), West Greenlandic (Fortescue & Olsen 1992), and Inuktitut child speech. Inuktitut children use lexical causatives before causative morphology (Allen 1996; 1998; Crago & Allen 1998).

Children also demonstrate early acquisition of noun incorporation, a compounding process whereby a noun is integrated into a verb, in some NA languages. Basic Inuktitut noun incorporation is utilized as early as age 1;01 (Allen 1996; 2017; Allen & Crago 1992; 1996; Crago & Allen 1998). About a year later, children acquiring West Greenlandic use

noun incorporation productively (Allen & Crago 1989; Fortescue 1984; Fortescue & Olsen 1992). For example, in (6) an Inuktitut-speaking child uses the noun stem *tutu-* 'caribou' outside of the verb, but in (7) he incorporates the same noun stem into the verb.

(6) Inuktitut (age 2;11, Allen 1996: 167–168)
Qukisigakku tuttualu.
qukiq-si-gakku ***tuttu****-aluk-∅*
shoot-PRS-CAUS.1SG.SBJ.3SG.OBJ **caribou**-EMPH-ABS.SG
'I'll shoot the caribou.'

(7) Inuktitut (age 2;11, Allen 1996: 167–168)
Tuttusiulaaqinuk?
tuttu*-siuq-laaq-vinuk*
caribou-look.for-FUT-INT.1DU.SBJ
'Will we go look for caribou?'

Some of the early production of noun incorporation may be due to frequency in CDS as well as the positional salience, or significance due to the location of incorporated elements in the verb (Allen & Crago 1989; 1992). The usage of noun incorporation among Inuit children includes interpreting and processing, as well as using a variety of verbs (Parkinson 1999; Wilman 1988). In contrast, noun incorporation also appears in Mohawk child speech, but it is not used as frequently or productively (Feurer 1980; Mithun 1989) as in Inuit languages.

33.4.4 Summary

Studies across a variety of NA languages provide insight into how NA children learn their mother tongues. Young children begin with simple elements and structures to express themselves and to convey meaning at an early age. As children grow, their language grows allowing them to develop even more elements of their language. They begin to incorporate additional linguistic elements that are useful and manageable to them. Eventually, children start to produce more complicated structures in their sound systems, vocabulary, word forms, and sentences. One particularly noticeable pattern is that children acquiring NA languages use complex grammatical structures at very young ages.

33.5 Conclusion

The literature on CDS and child speech in NA languages offers unique insight into L1 acquisition and exciting contributions for communities interested in assessing, teaching, revitalizing, and reclaiming their Indigenous languages. We look forward to the

findings of existing ongoing efforts as well as the future studies that will develop as more and more children acquire NA languages as their mother tongues. We hope that future efforts in particular can include broader, deeper, and more naturalistic data. This will help communities and researchers better connect findings from various Native American languages to each other and bring insight from past linguistic environments to those of the present and future.

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Appendix

Published research and observations on child, child-directed speech in NA languages

Family	Language Variety	Sources
Algonquian	Algonquin	Chamberlain 1890; 1893
	Anishininimowin (Oji-Cree)	Hack & Mellow 2007; Mellow 2010; Upper 1993; Upper & McKay 1987; 1988
	East Cree	Brittain & Rose forthcoming; Brittain et al. 2007; Bryant 2013; Henke 2019; 2020; forthcoming; Johansson 2012a; 2012b; Jones 1986; 1988; Pile 2018; Rose & Brittain 2011; Rose et al. 2010; Swain 2008; Terry 2010; Thorburn 2010; 2012; 2014
	Innu	Drapeau 1995
	Mi'kmaq	Fee & Shaw 1998
	Myaamia	Leonard 2007
Chimakuan	Quileute	Frachtenberg 1920
Eskimo–Aleut	Inuktitut	Allen 1996; 1998; 2000; 2013; 2017; Allen & Crago 1989; 1992; 1996; Allen & Dench 2015; Allen & Schröder 2003; Allen, Crago & Pesco 2006; Allen, Dench & Isakson 2019; Crago 1988; 1990; Crago & Allen 1997; 1998; 2001; Crago, Allen & Pesco 1998; Crago et al. 1991; Parkinson 1999; Skarabela 2007; Swift 2001; 2003; 2006; 2008; Wilman 1988; Zwanziger, Allen & Genesee 2005
	Greenlandic	Engberg-Pedersen & Trondhjem 2004; Fortescue 1984; Fortescue & Olsen 1992
	Various Inuit languages	Allen 2017
Iroquoian	Mohawk	Chamberlain 1890; 1893; Feurer 1980; Mithun 1989
Isolates	Haida	Boas 1891; Chamberlain 1893
	Kutenai	Chamberlain 1893
	Zuni	Kroeber 1916
Keresan	Acoma	Miller 1965
Na-Dene	Dëne Sųłiné	Cook 2006; Hellwig & Jung 2020
	Navajo	(Chee 2007; Chee 2017; Courtney & Saville-Troike 2000; Courtney & Saville-Troike 2002; Foster et al. 1989; Gentner & Boroditsky 2009; Iris 1981; Iris 1984; Saville-Troike 1996; Young 1971)
Plateau Penutian	Sahaptin	Weeks 1973
Pomoan	Pomo	Oswalt 1976

Family	Language Variety	Sources
Salishan	Nlaka'pamux	Egesdal 1984; Teit 1912
	Twana	Thompson 1985
Siouan	Dakota	Nokony 1977; 1978
	Hidatsa	Voegelin & Robinett 1954
Uto-Aztecan	Comanche	Casagrande 1948
	Hopi	Titiev 1946
Wakashan	Nuu-chah-nulth	(Kess & Kess 1986; Sapir 1915; Sapir 1929)
Yuman	Cocopah	Crawford 1970; 1978