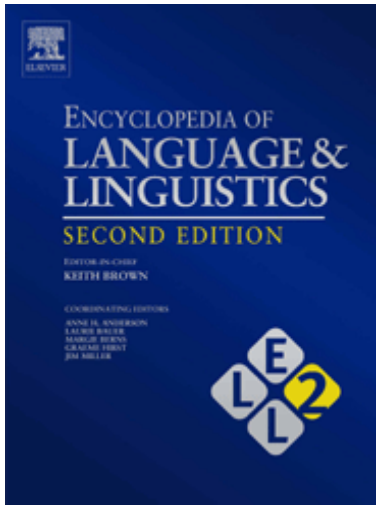

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Sign Language: Acquisition

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Sign languages are expressed with the hands, arms, and face and are understood through the eyes. Sign languages have evolved within communities of individuals who are deaf, and the children of these communities acquire sign as a first language. Like all languages, sign languages have linguistic rules for how words, sentences, and discourse are structured. Thus, all sign languages have a lexicon, grammatical and derivational morphology, phonology, syntax, and semantics. We focus here on sign language acquisition begun in infancy, as is typical for spoken language acquisition.

Sign language acquisition has been studied in several languages, including American Sign Language (ASL), Australian Sign Language (Auslan), British Sign Language (BSL), Danish Sign Language (DSL), French Sign Language (LSF), Italian Sign Language (LIS), Japanese Sign Language (JSL), Sign Language of The Netherlands (SLN), and Quebec Sign Language (LSQ). Research suggests that the developmental path from first words and combinations to sentence structure and discourse is similar across sign languages, although it is important to remember that the linguistic details vary from sign language to sign language (see **Table 1**). Sign language research reveals that the child's discovery of the units and rules of grammar is an abstract process that transcends sensory-motor modality.

Infant-directed sign language attracts and holds babies' attention more than adult-directed sign does, even when babies have never seen sign before. Infant-directed sign is slower, with larger movement trajectories, and tends to have more repetitions, compared to adult-directed sign (Masataka, 1996). Some elements of infant-directed sign are ungrammatical for adult signers but are modified in infant-directed sign to accommodate the visual needs of babies. For example, adults will displace signs away from their bodies to sign within the baby's visual field until the infant is about 20 months old, the time at which infants look automatically at the visual linguistic input source. Children must learn where to look to 'see' language, a task unique to sign language acquisition (Harris and Mohay, 1997; Holzrichter and Meier, 2000). Another modification in infant-directed sign involves facial expression. In adult sign language, facial expression has two functions, the affective function, which is universal to humans, and the linguistic function, which is unique to sign languages. In infant-directed sign, adults use only affective facial expression. When children have acquired signs for some facial linguistic markers, around 24 months of age, adults can begin to add more linguistic facial expressions to their infant-directed sign (Reilly *et al*., 1991; Reilly, 1996).

Infants who experience sign language babble with their hands. Manual babble occurs around the same age as vocal babble, from 6 to 12 months. Manual babble consists of a reduced set of phonological parameters found in the sign language input and follows the syllabic organization of sign languages, especially with respect to rhythmic timing. The handshapes most commonly observed in manual babbling are: [5] (relaxed hand), [A] (fist), [0] (including baby O), and [G] (index point). These handshapes are used with more repetitious movements than they are in the adult model, and movements such as opening and closing the handshape, raising and lowering the hands or arms, and movement toward the body are common. The location (or place) parameter of manual babbling seems to be idiosyncratic; for example, some infants babble in neutral space in front of the body, while others babble mostly on the head or face (Petitto and Marentette, 1991).

The transition from manual babbling to first words occurs around 10 months of age (with large individual variation). Manual babble and communicative pointing decline just before the appearance of the first sign (Petitto, 1987). First signs have been reported from as early as 8 months to as late as 16 months. The first 10 signs are produced around 12 months of age, and the first 50 signs emerge at 24 months and older (Anderson and Reilly, 2002). Children inevitably make signing errors; the phonological parameters used most frequently in manual babble tend to be the most common substitution errors in early sign (see **Figure 1**). The sign parameters

Table 1 Summary of acquisition of grammatical structures in sign language

Structures	*Age*[a]		*Sign languages*[b]
	Of first appearance	*First mastered*	
Babbling	0;7–0;10	—	ASL, JSL, LSQ
First words	—	0;8–0;12	ASL, JSL, LIS, LSQ
Word combinations			
Two words	1;2–1;6	—	ASL, JSL
Basic word order	2;4–2;6	—	ASL, SLN
Pronouns			
First person	1;8	2;2	ASL
Second person	1;10–2;0	2;2	ASL
Third person	2;0	3;6	ASL
Possessives	2;0	2;4–2;9	ASL
Negation			
Negative signs	1;6	—	ASL
Negative-incorporated verbs	1;6	—	ASL
Negative sign with headshake	1;8	4;0	ASL
Negative-incorporated verb with headshake	2;0	4;0	ASL
Negative predicate with headshake	1;8–2;2	4;0	ASL
Questions			
Yes/no facial grammar	1;0	—	ASL
Question signs	1;6–2;4	—	ASL
Non-manual markers over question signs	3;6	6;0	ASL
Facial adverbials	1;10–2;0	5;0	ASL
Topics	2;9	3;0	ASL
Conditionals			
Conditional signs	3;0	4;0	ASL
Non-manual markers over signs	5;0	7;0–8;0	ASL
Verb agreement			
Agreement verbs without inflection	2;6	—	ASL
Agreement verbs with inflection	3;0	6;0	ASL
AB verbs	6;0	11;0–12;0	ASL, BSL
Perspective shift			
Shift roles with eye gaze	3;0	—	ASL, BSL
Direct quote	3;6	6;0–8;0	ASL, BSL
Non-manual markers	3;6	13;0	ASL, BSL
Classifiers			
Figure (handshapes)	3;0	8;0–9;0	ASL, BSL, SLN
Use of space	3;0	9;0–10;0	ASL, BSL, SLN
Ground	4;0	11;0–12;0	ASL, BSL, SLN

[a]Given in years;months.
[b]ASL, American Sign Language; JSL, Japanese Sign Language; LSQ, Quebec Sign Language; LIS, Italian Sign Language; SLN, Sign Language of The Netherlands; BSL, British Sign Language.

most frequently misarticulated are handshape, followed by movement, with location being the most accurate (Marentette and Mayberry, 2002). Development of motor control is evident in early signs, with movements made by proximal joints, such as the shoulders and elbows, being substituted for movements made by distal joints, such as wrists and fingers (Meier *et al.*, 1998).

Less than a third of children's first signs are composed of vocabulary with iconic qualities. Instead, children's first signs are semantically similar to those of children learning spoken languages. Words closely related to the child's experience appear first, such as words for people, animals, and food. The acquisition of more abstract words is related to the size of the lexicon. Question words, cognitive verbs, and negation all appear after 100 words have been learned, around 18 to 24 months of age (Anderson and Reilly, 2002). Pointing is present in infants' communicative repertoires starting at 10 months of age, but does not lead smoothly into the use of sign pronouns, which are produced using the same form. Until 20 months of age, children use nominals instead of pronouns/possessives to refer to people, and begin using pronouns with errors just before 2 years. The first-person pronoun is acquired first, followed by second person; pointing to a third person who is present precedes the use of abstract locations in space to refer to people

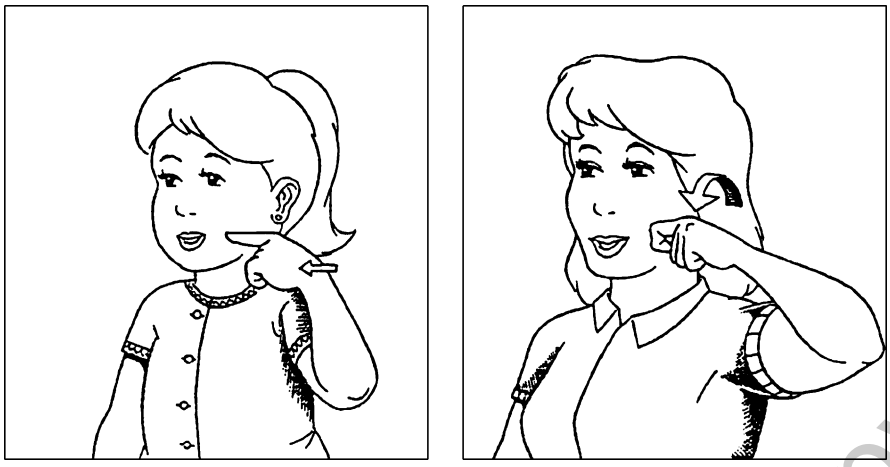

Figure 1 A child's sign error: the child signs 'APPLE' by using the handshape [I] instead of [Ih] and the movement [contact] instead of [twist], in comparison to the mother's correct target sign. Illustration by Michael Shang. Reprinted with permission from Marentette P F & Mayberry R I (2000). 'Principles for an emerging phonological system: a case study of early ASL acquisition.' In Chamberlain C, Morford J & Mayberry R (eds.) *Language acquisition by eye*. Mahway, NJ: Lawrence Erlbaum Assoc. 71–90.

and objects not present, which is acquired after 3½ years (Hoffmeister, 1987; Petitto, 1987).

In the transition from single words to the two-word stage, children begin by combining a gesture, usually a point, with a single word (as is the case for babies acquiring spoken language). This development, around 12 months of age, is called the semantic one-sign stage because the gesture and sign both refer to the same meaning. The semantic two-sign stage follows, at around 16 months, with the point and the sign referring to two distinct meanings. For example, the child may point at an object and sign a verb such as 'EAT', or make a request, such as 'MORE' (Capirci *et al*., 2002; Torigoe and Takei, 2001). Children combine lexical signs once they have a vocabulary of 100 signs, from 18 to 24 months of age. These combinations generally consist of uninflected nouns and verbs such as 'MOMMY EAT' or 'WANT DRINK' or may include quantifiers such as 'MORE CRACKER' (Anderson and Reilly, 2002). After the two-word stage, children begin to acquire the more complex elements of sign languages, such as morphology, that depend on non-manual markers and the linguistic use of space with signs. In general, non-manual markers, or linguistic facial expressions, are neither comprehended nor produced by children until they have acquired the corresponding manual signs. Children begin to use non-manual markers around the age of 2 years, but cannot produce them comparable to the adult model until after 12 years of age. Although children communicate negation using a non-linguistic headshake by 12 months, their first negative signs at 18 months are produced without the obligatory linguistic headshake. They integrate the headshake (with errors in timing and scope) a few months later and use both sign and non-manual negation correctly between 26 and 28 months of age. Similar to the acquisition of negation, facial adverbials, such as 'puff' (puffing the cheeks out, meaning 'very big/fat'), are not acquired until children can express these meanings in signs. Dozens of facial adverbials are acquired much like lexical items are acquired, from the age of 22 months to 4 years and older (Anderson and Reilly, 1997, 1998).

The acquisition of yes/no questions occurs early because there are no signs to be mastered first. Babies use the necessary non-manual marker, generally raised eyebrows, over a single sign as early as 12 to 16 months of age. Questions requesting information require the acquisition of both signs and non-manual markers (such as lowered eyebrows and eye squint). Question signs appear first at 18 months and gradually increase in variety and use until 3 years of age, but non-manual markers are not added consistently or appropriately until 3½ years of age (Anderson and Reilly, 2002). The adult model has a variety of acceptable word orders in questions, and children start using these orders, also adding a redundant question word in sentence-final position, after the age of 4½ years (Lillo-Martin, 2000). Although topicalization uses non-manual markers that are similar to those used in yes/no questions, non-manual markers are not used for topics until the age of 3 years. However, there is some evidence that children can express topicalization using a prosodic break by the age of 2 years (Pichler, 2002).

The development of conditional sentences further demonstrates the dichotomy between the acquisition of the signed and non-manual markers of many syntactic structures. Non-manual conditional markers

are obligatory but conditional signs are not in ASL. From ages 3 to 4 years, children can comprehend the conditional structure in signs, but not in non-manual markers, and they can express some conditionals in signs without the obligatory non-manual markers. By the age of 5 years, children can comprehend non-manual markers but are inconsistent in their production of these structures. The timing and scope of non-manual markers with signing are not fully mastered until the age of 8 years (Reilly *et al*., 1990).

In many sign languages, verb agreement is marked with the linguistic use of space. Acquiring spatial morphology is a gradual process in which children actively attempt to identify morphological components; this is apparent in the errors they make, which are productive as opposed to being iconic. In general, around the age of 3 years, children can comprehend the use of locations in space for verb agreement before they can produce it. At the same time, they are able to inflect verbs using people, places, and objects that are present. The period from age 4 to 5 years is the time in which they comprehend verb agreement but produce it with errors, such as overgeneralizations to verbs that cannot take agreement. Correct production of basic verb agreement is acquired by the age of 6 years (Meier, 1987, 2002). Shifting directional verb agreement, involving what are known as AB verbs, is a kind of verb agreement that takes children longer to grasp. In this case, three thematic roles are mapped onto two-argument verbs. In English, this could be expressed as *John hit Peter on the head*. In many sign languages, this is expressed using two parts, A and B. In A, the verb agrees with person X and person Y. In B, the verb agrees with person Y and the part of the body being affected (in this case the head). Children can comprehend AB verbs (ages 3 to 5 years) long before they can produce them. Usually, children will attempt to produce these verbs using only the B part, omitting the subject information. Between the ages of 6 and 8 years, they will sometimes produce only one part, and usually omit the obligatory perspective shift. Production of AB verbs is mostly correct by 9 years of age, although it takes a few more years for the non-manual markers to become fully adultlike (Morgan *et al*., 2002).

The acquisition of sign language structures referred to as classifier constructions is protracted, because full mastery requires the adept combination of several linguistic skills. Children must be able to use an array of signs alongside classifier handshapes, must coordinate both hands so that they can work together to track figure and ground, and must know when to introduce a referent with an identifying sign versus a classifier. Before they start using classifiers, children first use the bare form of the verb to describe an action. Also, children focus entirely on the action involved, do not focus on the figure, and generally omit the ground. By 5 or 6 years of age, children can select appropriate semantic classifier handshapes without specifying all of the relevant dimensions, and they start to distinguish the beginning and end of the action. Children are able to show facial affect with classifier constructions and change the orientation of the non-dominant hand to represent the ground by the age of 8 years. By age 9½ years, their classifier constructions are mostly correct. Nonetheless, children do not properly specify the ground in classifier constructions until 11 or 12 years of age. In mastering classifier constructions, children tend to focus first on the action and then begin to add information about the figure; finally, they are able to specify the ground (Engberg-Pedersen, 2003; Slobin *et al*., 2003).

Reported action in many sign languages requires the mastery of perspective shift, which is important to narration. Children need to understand the concept of shifting viewpoint and must be able to produce several different non-manual markers. From ages 3 to 4 years, the only evidence that children are changing perspective is in their eye gaze shift; some children may use a character facial expression incorrectly. Around 5 years of age, children transition to expressing perspective shift linguistically by first labeling a character and then signing 'SAY' to introduce a direct quote. Most children of this age also correctly take on the facial expression of the character, although they tend to stay fixed in one perspective (whereas adults are capable of changing perspectives rapidly and often). By ages 6 and 7 years, children have mastered the signed and most of the non-manual markers for a direct quote, but they continue to have difficulty with reported action; i.e., whereby the narrator reports a character's actions and takes on the facial expression of that character while remaining in the role of narrator. At this point, children tend to tell narrations solely from a narrator's viewpoint using primarily linguistic, as opposed to paralinguistic, means. They gradually integrate paralinguistic devices with perspective shift after 8 years of age. Finally, as in most structures that use complex non-manual markers, the non-manual markers for character perspective and reported action do not become adultlike in narration and discourse until age 12 years and older (Morgan *et al*., 2001; Reilly, 2001).

Cross-linguistic research shows that linguistic structure remains abstract when it is understood through the eyes and expressed with the hands, arms, and face. Children who are acquiring sign languages face the same challenges that children acquiring spoken languages face. They must discover the

underlying units and rules of the words, sentences, and discourse patterns of the language around them. Like children acquiring spoken languages, children acquiring sign languages are highly analytic and acquire grammatical structure one piece at a time through communicative interactions with the people who care for them.

See also: Cross-Linguistic Comparative Approaches to Language Acquisition; Language Development in Deaf Children with Hearing Parents; Language Development: Morphology; Language Development: Overview; Modality Issues in Signed and Spoken Language; Nonmanual Structures in Sign Language; Sign Language: Discourse and Pragmatics; Sign Language: Morphology; Sign Language: Overview; Sign Language: Phonology; Sign Language: Syntax; Sign Language: Transcription, Notation, and Writing; Sign Languages of the World; Syntactic Development.

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Sign Language: Communities and Cultures

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In Western industrialized societies, sign language-using Deaf people form a small percentage of the population (around 1 in 1000). Their numbers are augmented by the non-Deaf children who have sign language-using parents, and in recent times by growing numbers of non-Deaf people who have taken formal classes to learn the sign languages of those nations. In the UK, the latter number over 100 000 (Woll, 2001), but figures for other countries are not known, although it is estimated that in the United States these numbers exceed 1 million. However, the center of those sign language communities revolves around those (mostly Deaf people) who participate in the daily lives of those communities and have a stake in the ongoing future and their quality of life. They are characterized by intermarriage, and it is estimated that 90% of Deaf people who marry choose Deaf partners.

A History of the Western Concept of Deaf Community

It is probable that Deaf people who communicate by gesture or sign have existed as part of humanity from its inception; in the West, the first written evidence of their existence can be found at the dawn of Western literacy itself, with the rise of the Mediterranean societies in the 5th century B.C. From that time onward, Greek philosophers such as Herodotus, Socrates, Aristotle, and Plato, and their equivalents in Jewish and Roman society, found the existence of signing Deaf people illuminating when considering wider issues concerning human thought and behavior, and philosophized about the nature of Deaf people's existence and their place in society, eventually establishing laws relating to them.

In these discourses, many of which suggest the existence of Deaf communities even then, two contrasting positions can be identified between those who present a positive or negative view of Deaf peoples and their potential.

Deaf 'Emergence' in the Middle Ages

Little is known of Deaf communities until the 15th century, when, for a number of complex reasons, including the impact of the Renaissance with its revival of Greek philosophy, there was a considerable increase in both discourses. One strand concerns the education of Deaf people, while others indicate an emerging recorded respect for Deaf people by lay society; achievements by Deaf individuals and groups in artistic and business domains (Miles, 1988; Mirzoeff, 1995); the existence of Deaf networks (Bulwer, 1648); and communities that incorporated sign language into their everyday lives (Groce, 1985). A further theme considers the importance and status of visual gesture in some societies during these periods (Mirzoeff, 1995); these may have underpinned a more positive view of Deaf people.