# A GRAMMATICAL SKETCH OF SIVIA SIGN LANGUAGE

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# ABSTRACT

This sketch grammar presents what is currently known about Sivia Sign Language (LSSiv). It is a language native to Sivia, Peru, used by a small population of deaf and hearing people in the region. Data collected in 2015 and 2016 from native signers is used to describe the language's phonology, morphology, and syntax. Findings align well with the expectations for sign languages, and generational variations indicate ongoing development.

LSSiv uses relatively few distinctions in handshape and handedness, placing more importance on locative and non-manual features. Some free variation patterns lead to the proposal of an 'open' feature for handshapes, and orientations are considered to be largely morphological. Both of these are presented as topics for further investigation.

LSSiv's lexicon has a flexible class system in which many signs may be used as more than one part of speech, and only one derivational process has been found. Inflection takes the form of location-based agreement for most constituents, as well as shape or directional agreement for verbs with direct or indirect objects.

A number of meaningful handshapes are identified, which exhibit some features of 'classifiers'. Simultaneous morphemes which modify signs for size, shape, and intensity marking are also prevalent. Morpho-syntactic patterns relating to role shifts, focus, and phrasing need to be examined more closely.

The basic sign order for LSSiv is SOV, with final negation and question signs. A few potential serial verb constructions are also identified. Variations relate to pro-drop, levels of transitivity, and fronting. Observations about contrastive, resultative, and topicalized structures, as well as prosodic patterns, are introduced as areas for future research.

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# ABBREVIATIONS

| | |
|---|---|
| ASL | American Sign Language |
| Auslan | Australian Sign Language |
| BSL | British Sign Language |
| Libras | Brazilian Sign Language |
| LSF | French Sign Language |
| LSIn | Inmaculada Sign Language |
| LSSiv | Sivia Sign Language |
| LSP | Peruvian Sign Language |
| Sp | Spanish |
| SVC | serial verb construction |
| VRAEM | Apurimac, Mantaro and Ene Valley (region) |

# TRANSCRIPTION CONVENTIONS

The following symbols and abbreviations are used in the transcription of polymorphemic signs and longer utterances. Small caps are used for sign glosses and capitalized abbreviations are used for location and shape morphemes (see Appendix C2 for the full list).

| | |
|---|---|
| SIGN | translation (small caps) |
| . | multiple-word translation |
| + | simultaneous morpheme |
| - | sequentially-connected signs/morphemes |
| -- | interruption |
| / | prosodic break |
| ( ) | notes |
| " " | mouthing |
| 1/2/3 | first/second/third person pronouns |
| $_{1/3}$SIGN | first/third-person subject |
| SIGN$_{1/3}$ | first/third-person object |
| CONT | continuous aspect |
| excm | exclamation |
| HI | high location |
| LOC | meaningful location |
| loc | location agreement |
| LOW | low location |
| ND | non-dominant hand |
| NM | non-manual |
| rep | repeated/reduplicated |
| sho | shape/object incorporation |
| TRANS | transitivity marker |
| YN | *yes-no* question marker |

# INTRODUCTION

This dissertation presents a descriptive sketch grammar of Sivia Sign Language (LSSiv). It is intended as a contribution to sign linguistics and as a 'proof of concept' for the identification and description of indigenous sign languages used in smaller regions of Peru. The exercise of documentation in the community is aimed at empowerment as well as the collection of linguistic data. The description of the language's structure shows LSSiv's complexity, as well as its independence from and equality to signed and spoken languages such as Peruvian Sign Language, American Sign Language, and Spanish.

Comprehensive grammars are available for very few sign languages (ASL: Baker-Shenk & Cokely 1991; Liddell 2003; BSL: Deuchar 1984; Aulslan: Johnston & Schembri 2007; Adamorobe: Nyst 2007; Mexican: Aldrete 2008). Sign linguistics is growing as a sub-field, and a substantial number of known sign languages all over the world have been studied. However, most publications focus on comparison, variation, acquisition, or specific grammatical aspects of the language(s) in question. This grammar covers the basics of LSSiv's phonetics, phonology, morphology, and syntax, as well as information on the language's history and development.

The initial three chapters focus on background information, starting with an overview of previous work on sign languages. This is a good place to start for those who are unfamiliar with sign linguistics. After a general overview in Chapter 1, Chapter 2 discusses work on sign languages in South America and Chapter 3 focuses on specific information about Sivia and LSSiv. Methodology for this study, from initial contact to elicitation and transcription, is covered in Chapter 4.

The remaining sections discuss LSSiv's structure and proceed from smallest (phonetic) to largest (syntactic and prosodic) aspects. Chapters 5 and 6 cover phonetics,

phonology, and the transcription and orthographic system used in this dissertation. Chapter 7 describes how lexical categories can be defined, then Chapter 8 discusses general morphological aspects and Chapter 9 describes morpho-syntactic patterns which help define syntactic roles and contribute to prosodic information. Chapter 10 describes basic syntactic structures, variation, and simple components of prosody. As this is an initial description of the language, a number of observations are also included as topics that need to be investigated in future research.

Video clips which are hyperlinked throughout the text can be found at https://bleegiimuusclark.com/lssiv-grammar-examples/. These are also archived at https://scholarspace.manoa.hawaii.edu/handle/10125/49885 and searchable using the labels given in the text (e.g. BC2-001). Links starting with the code BC1 give the file name and timestamp for a longer archived video from which an example is taken. These videos can be found at https://scholarspace.manoa.hawaii.edu/handle/10125/34525.

# CHAPTER 1. PREVIOUS WORK ON SIGN LANGUAGES

The following section is an overview of descriptive work on sign languages, starting with

Stokoe's *Sign language structure* in 1960. Changing trends in research topics show the

development of sign linguistics over time, from the recognition of signing as a linguistic

phenomenon to the description of different sign languages all over the world.

## 1.1 Sign language versus spoken language

### 1.1.1 Legitimacy and complexity

Early work on sign languages, in the 1960s and 1970s, sought to emphasize that, unlike

gestures, they are composed of the same kind of structures as spoken languages (Stokoe

1960, 1978a; Bellugi 1979), in contrast to commonly-held beliefs (Stokoe 1970; Markowicz

1972; Woodward 1972, 1973b; Schein 1973). Publications show that signs are pieces of a

complex linguistic system which is arbitrary, buildable, and constrained by rules (Stokoe

1970; Harry Markowicz 1972; Woodward 1972; 1973a; 1973b; Schein 1973; Cicourel 1974;

Greenlee 1974; Abbott 1975; Hoemann 1975; Ullastres 1981).

Sign linguists have also had to compete with theories that signs were building blocks

in the evolution of language rather than the end result (Sarles 1976; Petrinovich 1976; Hill

1977; Hewes 1977) and differentiate natural languages from signed versions of spoken

languages which contained the elements 'missing' from natural sign language (Sallop 1973;

Anthony & Shawver 1977; Reich & Bick 1977). While the usefulness of these constructed

languages as tools for learning has been examined, the rest of this review focuses on

natural sign languages to better relate to the language at hand.

### 1.1.2 Structure

Sign languages can be analyzed at the same linguistic levels as spoken languages. Today, spoken language terminology is used to draw parallels between the smallest units of sound and the building blocks of signs, between morphology and the use of space, between the syntactic arrangement of words and signs into phrases and sentences, and between artistic devices in the auditory and visual modes. Metaphorical and poetic uses of American Sign Language were actually described quite early (Klima & Bellugi 1975). Dictionaries were also published for several sign languages (Bornstein & Hamilton 1972) before much was known about their structure.

Early grammatical work on sign languages described phonological processes (Covington 1973a, 1973b; Battison 1974), morphological aspects (Fischer 1973; Dyer 1976), and syntactic patterns (Sørensen 1975; Ingram 1978; Chinchor 1978; Maxwell 1983b) which were already acknowledged in spoken languages, as part of the effort to prove the complexity of sign languages. Though a few descriptions of individual signing communities were published around the same time, the focus was often on visual language as a phenomenon rather than unique sign languages.

Descriptive work on American Sign Language in particular took off in the 1980s, including topics such as the establishment of phonotactic and phonological rules (Mandel 1981; Green 1984; Rimor et. al. 1984; Sandler 1986; Liddell & Johnson 1986), word-formation (Bellugi & Newkirk 1981; Liddell & Johnson 1986), use of non-manuals (Stokoe 1981; Liddell 1986); syntax (Padden 1981; McIntire 1982; Maxwell 1983b), and even discourse (Hall 1983; Cohn 1986). At this point, research began to shift from the identification of spoken language structures in signed language to the description of individual sign languages.

By the 1990s, studies also focused on sonority (Perlmutter 1992; Brentari 1993), nominal and verbal morphology (Adamo 1993; Liddell 1996; Pizzuto & Corazza 1996; Dominguez 1998; Quintela et. al. 1999), the use of space (Emmorey & Casey 1995; Adamo et. al. 1999), constituent order (Veinberg 1993; Penn & Reagan 1994; Bouchard 1996; Fischer 1996; Mintz 1996; Massone & Curiel 2004), and prosody (Reilly et. al. 1992; Ormsby 1995; Massone 1996) in a variety of sign languages. The compilation of texts, dictionaries, and grammars also became more frequent (Supalla 1991; Carmel 1992, 1994; Stokoe 1993a, 1993b; Massone & Machado 1994; Zeshan 1996; Felipe 1997).

These trends have only expanded into the 21st century, as an increasingly diverse selection of sign languages and types of features are explored. Dictionaries are now available for a relatively large number of national sign languages (INES 2008; ESLC 2012; Schmaling 2012), and grammars, or statements of intent to write grammars, have slowly begun to emerge as well. National sign languages like ASL (Stokoe 1960, 1978a, 1978b; Bellugi 1979; Valli & Lucas 2001), BSL (Brennan & Colville 1979; Deuchar 1984), Argentinian (Massone & Machado 1994), Libras (Felipe 1997; Brito 2011), Colombian (Oviedo 2001), Indo-Pakistani (Zeshan 2003), Auslan (Johnston & Schembri 2007), and Mexican (Aldrete 2008) sign languages are often represented. A few sign languages used in smaller regions, such as Warlpiri (Kendon 1980) and Adamorobe (Nyst 2007) are also described, as is Indo-Pakistani (Zeshan 2003), which is used in a larger multi-national area. There is now increasing interest in the tools and methodology behind sign language description as well (Johnston 2003; Van Cleve 2003; Lucas et. al. 2013; Quer & Cecchetto 2013; Wallang 2015).

Now that certain universal tendencies of signed languages have been established, research on new languages has sought to find these properties in new languages. This includes the use of certain phonetic features (Crasborn et. al. 2000; van der Kooij & Crasborn 2007; Cates et. al. 2013), conventions for word formation (Felipe 2006; Healy

2011), spatial and directional morphology (Todd 2009; Barberà 2014; Perniss et. al. 2015), classifiers (Felipe 2002; Aarons & Morgan 2003; Eccarius & Brentari 2007), numeral incorporation (Ktejik 2013), clause construction (Janzen et. al. 2001; de Quadros 2003; Massone & Curiel 2004; Zeshan 2004; De Bin et. al. 2011; Morales-Lopez et. al. 2012; Kimmelman 2012; Sprenger & Mathur 2012; Hodge 2013), and non-manual prosodic markers (Torigoe & Takei 2002; Ormel & Crasborn 2012).

Some studies have found the apparent absence of some of these features in certain languages (Rarrick 2015). Senghas' work on Nicaraguan Sign Language (2003) provides evidence that these features emerge at a certain point in the development of a sign language. Theoretical questions about the representation of sign phonetics (Whitworth. 2011; Johnson & Liddell 2010, 2011a, 2011b, 2012; Jantunen 2013; Witkin et. al. 2013) and syntactic constructions (Taub & Galvan 2000; Cecchetto et. al. 2009; Wilkinson 2013; Barberà & Zwets 2013) are increasingly popular.

### 1.1.3 Socio-cultural aspects

Attitudes toward sign languages are similar to those directed at many minority languages: they are often seen as inferior and insufficient. They also carry the additional stigma of association with a 'disabled' population and the obstacle of a dispersed population (since sign languages are rarely passed down through the nuclear family). Sign linguists have had to prove, not only the legitimacy of sign languages, but also the legitimacy of associating deafness with social identity. Stokoe et. al. 1976 argues for a unique culture among deaf people, Covington 1980 describes the acculturation process, and a multiple researchers use name signs as concrete markers of identity (Meadow 1977; Shun-chiu & Jingxian 1989; Mindess 1990; Supalla 1990).

Resistance to treating deaf identity as valuable can also be seen in early acquisition research on sign languages, which did not describe the process of a deaf child learning a sign language as the end goal, rather as a means to learning a spoken language. Around 1980, studies began to treat sign languages as the end-goal, with specific reference to structural elements and the development of an acquisition timeline (Kantor 1980, 1982; Livingston 1983). These findings were also used to encourage and evaluate the use of sign language and other techniques like Simultaneous Communication in education (Kyle et. al. 1981; Kluwin 1981; Stewart 1983; Maxwell 1983a; Luetke-Stahlman 1984; Lane 1988; Smith 1988). It is now well-established in linguistics that sign language is the best option for deaf children to naturally acquire a first language, and therefore a necessary foundation for learning a spoken or written language.

By the 1990s, deafness was also treated as a (part of) culture, ethnicity, and identity in the field of sign linguistics. Many publications began to describe the culture of deaf communities in the US (Hall 1991; Monaghan 1991; Page 1993), South Africa (Penn, et. al. 1991), Australia (Kwek 1991; Hyde & Power 1992), Nepal (Joshi 1991), India (Jepson 1991b), Mexico (Johnson 1991), and Japan (Torigoe et. al. 1995). Carmel & Monaghan 1991 even provides guidelines for this kind of ethnographic work. Similar research is common in recent years in increasingly diverse locations, such as Mumbai (Kusters 2009), Estonia (Hein 2010; Paales 2010), Ghana (Kusters 2014), and Mali (Nyst 2015).

### 1.1.4 Transmission

The fact that misconceptions about the complexity and value of sign languages have been able to persist is partially due to the structure of deaf communities. The composition of a signing community is somewhat different from a community that shares a spoken

language. While the family provides a vital initial introduction to language for hearing children, deaf children are not often born into a family of signers (Karchmer & Mitchell 2004). This means that the earliest and most influential exposure to their native language usually occurs through education or a peer group. Without the stability of families which will continue to pass the language on to many future generations, sign languages are transmitted through a more 'horizontal' network of connections between peers or mentor-mentee relationships. With more flexible membership in signing communities, some have observed seemingly rapid intergenerational changes, and contact relationships may affect signed languages in different ways or at a different rate than spoken languages (Woodward 1976; Padden & Humphries 1988; Fischer & Lane 1993; Lupton & Salmons 1996; Sutton-Spence & Woll 1999; Johnston & Schembri 2007; McKee & McKee 2011).

Nicaraguan Sign Language (NSL) is the most famous and clearly-documented case of changes between generations of signers. Senghas 2003 describes significant morpho-logical differences that emerged in a 16-year time span. A cohort of deaf children who learned NSL from their older peers at the same school developed spatial morphology, which the older cohort did not use, simply by acquiring the language at a younger age. These findings are reminiscent of changes that occur in the development of creoles (Winford 2003; Mufwene 2007), though differing definitions and lack of a well-established typology for sign languages cause some to argue against this comparison (Kegl 2008). Whatever terminology is used, however, the rapid and well-documented changes in this case have fascinating implications for how we understand the inter-generational transmission and development of sign languages.

## 1.2 Typology

Like spoken languages, there are multiple ways of classifying sign languages. The sections below discuss the ways that sign languages have been described and grouped according to their development and use (1.2.1), variation (1.2.2), history (1.2.3), and typology (1.2.4).

### 1.2.1 Creation

Sign languages and other forms of manual communication develop wherever there are deaf people. The scope and complexity of signing depends on the number of signers, ease of contact, attitudes toward deafness, and educational policies. Several 'types' have been established which take into account a language's history and current context, including homesigns, institutional sign languages, original sign languages, village sign languages, and constructed sign languages. See section 3.2 for more on LSSiv's history and classification in this typology.

The most basic forms of signing are 'homesigns',  which are created by children to communicate with their families when they are not exposed to another sign language. Research indicates that these systems seem to share traits like constituent order and deictic components with each other (Takei & Torigoe 2002; Coppola & So 2005; Goldin-Meadow et. al. 2015). Mylander & Goldin-Meadow 1991 find fewer morpho-phonological distinctions in a homesigning system than in ASL, and Morford 2002 points out that homesigns do not make use of as many simultaneous morphemes as ASL. On the other hand, homesigns are clearly more complex than the gestures that serve as the original input (Morford & Goldin-Meadow 1997; Coppola & Newport 2005; Franklin, et. al. 2011; Hunsicker & Goldin-Meadow 2012).

Deaf schools are another frequent domain for the creation of sign languages. Again, the most famous case of a language with this history is Nicaraguan Sign Language, and Inmaculada Sign Language is mentioned below (2.2.2). In many cases, it is theorized that students bring individual homesigning systems together when they go to school, and over time, a unified system develops. Senghas (2003) shows that these 'pidgin' systems can continue to evolve with each new cohort. According to Padden 2010, the school system also played a role in the development of ASL. In this case, as in many, the language used by instructors is also an influence. Depending on educational policies, these school-based sign languages may continue to develop and eventually become a standardized national language. This is the history of ASL and Peruvian Sign Language (see 2.2.1), as well as several others (Padden 2010).

In locations where there are no deaf schools, deaf people may still meet and form a community, and a language. This type of 'original' sign language has been found in Costa Rica, Thailand, and Vietnam (Woodward 1991, 1996, 2003). In most known cases, these languages now exist alongside a younger variety, which often shows influence from a more dominant language, such as ASL. The potential for similar languages in other locations is abundant, the main barrier to research being a lack of awareness of the existence and location of these communities.

In some communities, a sign language is used alongside a spoken language with no stigma. Both hearing and deaf people use these 'village' sign languages, which develop as a necessity for communication and for inclusion of deaf people in local culture. The typical prerequisites are a slightly high rate of hereditary deafness and a non-negative attitude toward deafness in a relatively small and isolated community (Zeshan & De Vos 2012), as famously described in Groce's book on Martha's Vineyard (1985). Similar situations have

been described in Mexico (Johnson 1991), Thailand (Woodward 2003; Nonaka 2007), Bali (Marsaja 2008), and Ghana (Nyst 2007; Kusters 2014).

International Sign and Signed Exact English fall into the final category of constructed sign languages. International Sign is an artificial language, modeled lexically and grammatically after existing natural sign languages (Rosenstock & Napier 2015), to be used as a worldwide lingua franca between signers. Signed Exact English and other visual translations of spoken languages, on the other hand, are usually based on the grammar of the spoken language. These are codes created as a transition between visual and verbal language, which are often encouraged in education to help deaf children learn a spoken language and avoid the 'bad habits' of sign grammar (Reagan 1995). Some versions of national sign languages exhibit elements of this type of design when misinformed authorities decide that every spoken word and morpheme needs its own sign. Needless to say, constructed languages are not natural human languages and will not be used for comparison in this grammar.

### 1.2.2 Variation and change

Some descriptions of sign languages and different types of deaf communities were published with the emergence of sign linguistics. Kakumasu 1968 describes Urubu Sign Language in Brazil and Sallagoity 1975 discusses the sign language used in Southern France. Kuschel 1973 describes a signing system used by one person and Meissner et. al. 1975 describes a sign language used by a group of workers. A few studies also addressed variation and historical change in ASL (Woodward 1973a, 1976; Frishberg 1975; Woodward et. al. 1976), as well as Danish Sign Language (Hansen 1975) and different groups of Cistercian monks (Barakat 1975). Other publications argued for deafness as an ethnicity,

an identity, and a community (Stokoe et. al. 1976; Meadow 1977; Washabaugh 1979). According to Bornstein & Hamilton 1972, several dictionaries of national sign languages had already been created at that time.

Researchers continued to describe 'new' sign languages and varieties into the 1980s and 1990s, in Brazil (Brito 1984), Jamaica (Dolman 1986), India (Jepson 1991a) Russia (Grenoble 1992), and Thailand (Woodward 1993). They also described variation in the United States (Rudner & Butowsky 1981), Costa Rica (Woodward 1991), Mexico (Bickford 1991), and Britain (Turner 1996). This allowed theories about universals (Woodward 1982, 1985, 1987; Bouchard 1996), more dictionaries (Stokoe 1989), and even a few grammars (Washabaugh 1980; Kendon 1980; Deuchar 1984; Massone & Machado 1994; Felipe 1997) to emerge.

Variation remains an important topic today as sign linguistics moves away from the 'one sign language per nation' assumption and comparative methodology develops (Brentari 2001; Aldersson & McEntee-Atalianis, 2008; Geraci et. al. 2011; Ebling et. al 2015). Recent studies address regional variation (Quinn 2010; Eichmann & Rosenstock 2014), historical change (McKee & McKee 2011; Stamp et. al. 2014, Stamp et. al. 2015), phonetic variation (Lucas et. al. 2002), fingerspelling (Schembri & Johnston 2007), and numerals (McKee et. al. 2011).

### 1.2.3 Classification

Sign languages are classified into 'families' (or one large family according to Ethnologue). However, this term often describes a contact relationship rather than shared ancestry. American Sign Language (ASL), for example, is often cited as being part of the French Sign Language (LSF) family, but ASL is not simply a descendant of Old French Sign Language.

It is the result of mixing in the first American deaf schools of indigenous signs brought in by students with foreign French signs brought in by instructors (Woodward 1978; Padden 2010). It is a history often repeated for members of 'colonial' sign language families like French or British, which include languages all over the world that have been heavily influenced by these more prestigious foreign languages through education.

Regional families leave more room for speculation about genetic inheritance, but it is not often documented[1] that a group of signers has settled in a new area and over time their language has become distinct from their ancestors'. In part, this is due to the relatively recent organization of larger deaf communities, and the lack of historical documentation of sign languages. It is encouraging that, for the largest and most well-established languages, such as British Sign Language (BSL), regional variation is now a fruitful area of study (Stamp et. al. 2014, 2015; Eichmann & Rosenstock 2014). Woodward 2003 even identifies three families among eight sign languages native to Vietnam and Thailand. Perhaps in a few hundred years, more examples of typical genetic relationships will be clear.

The term 'family' is used to describe both inherited and contact-based relationships[2], likely due to the difficulty of distinguishing between the two. The criteria for establishing any kind of relationship between two sign languages is not well defined, as the historical method is not practical until a longer history of these languages is recorded. Many comparisons focus on lexical items, perhaps because grammatical features are often described as belonging to 'sign language' generally. In the following chapters, the type of relationship being described is specified, if known.

### 1.2.4 Shared Traits

Several grammatical tendencies have been identified for sign languages as a whole, such as the use of spatial morphology to express constituent roles, classifiers for certain objects, SOV order, and certain facial expressions for questions (cf. Sandler & Lilo-Martin 2006). Just like early universals for spoken languages, it is likely that some of these will need to be modified as research continues on a more diverse range of sign languages, and it will become easier to classify them according to shared traits (as terms like 'isolating' or 'ergative' are commonly used for spoken languages). Specific traits, and their relevance to LSSiv, will be discussed in more detail in the following chapters.

### 1.3 Summary

Sign language research has come a long way in the past 60 years. Initial work firmly established parallels between visual and audible language to prove the complexity of signed languages. Descriptions of signing communities, and even variation in known sign languages, were published around the same time. The topic of intergenerational transmission and acquisition was (and still is) important as a way to inform educational and medical decisions.

Research began to describe the structure and history of well-known sign languages such as ASL, eventually expanding to explore the existence of hitherto unknown sign languages. These topics have led to an expected typological template for sign languages, and a way to classify them according to their origins. The way that LSSiv aligns (or does not align) with these expectations is explored throughout.

Chapter 1 endnotes

[1] Some of the relationships described in Woodward 2003 are candidates for genetic inheritance of this type. Martha's Vineyard Sign Language is said to have possible origins in Britain (Groce 1985). It is suspected that such relationships may exist among sign languages used in the Pacific as well, including Hawai'i Sign Language.

[2] This differs from typical classification of spoken languages. English, for example is declared part of the Germanic family due to its descendance from a Germanic language. It is not considered a Romance language, despite quite a bit of contact influence from French.

# CHAPTER 2. SIGN LANGUAGES OF SOUTH AMERICA AND PERU

This chapter gives an overview of the type of information available on other sign languages in South America. Section 2.1 discusses the region surrounding Peru, and section 2.2 focuses on what is known about sign languages and deaf communities in Peru. Note that research outside of Peru thus far follows the assumption of 'one sign language per nation', though some level of variation is discussed for Libras and Chilean Sign Language. This 'national sign language' assumption also contributes to a lack of research on the origins of and relationships between these languages.

## 2.1 Brazil, Chile, Argentina, Colombia, Ecuador, and Bolivia

Brazilian Sign Language, or Libras, is probably the most well-researched and documented sign language in South America. It is also recognized and used in education nation-wide (de Quadros 2012). Libras is said to be an isolate (Wittmann 1991; Hammarström 2017) with little influence from or relationship to any other sign languages. It has been able to retain this status and spread all over the country because the initiative to conduct research and establish the language in education was internal to Brazil, rather than beginning with a foreign organization (e.g. missionaries who start deaf education programs).

These internal efforts have meant the creation of many resources on the language, such an interactive dictionary, which includes an impressive degree of variation (INES 2008), and a corpus which is completely bilingual in Portuguese and Libras (Corpus Libras 2016). Publications since the 1980s cover aspects of phonology (Felipe 2006; Xavier 2011), morphology (Felipe 2002), syntax (de Quadros 2003; de Almeida & Almeida 2013; Felipe 2013), discourse (Leite 2008; McCleary & Viotti 2009), variation (Brito 1984), acquisition (Bernardino 2007; Karnopp 2002), pedagogy (Dorziat & Figueiredo 2003; Gesser 2010;

Lemos & Chaves 2012; Sell 2015), and even some sketch grammars (Felipe 1997; Brito 2011). This momentum has also led to the development of impressive technology for translation (Goebel & Cordenonsi 2001; Coradine et. al. 2004; Tavares et. al. 2005; Agosti & Brandão 2010), as well as a tool for trilingual communication with deaf quadriplegics (Capovilla et. al. 2003).

Chilean Sign Language has a healthy amount of work on higher-level aspects of the language such as metaphor and narrative structure (Becerra 2008; Robertson et. al. 2012), cognition (Puente et. al. 2006; Alvarado et. al. 2008), socio-cultural aspects (Fernández 2010; Becerra-Sepúlveda 2013), and educational issues (Quiniela et. a1. 2006; Lissi et. al. 2012), along with a small amount of work on traditional grammatical structure (Adamo et. al. 1999; Quintela et. al. 1999) and acquisition (Castro 2003; Gongora & Farkas 2009). There is also an online dictionary (Departamento de Educación Diferencial n.d.) linked to the department of special education, indicating institutional recognition of the language.

For Argentinean Sign Language, a few researchers have contributed descriptions of grammatical aspects (Massone & Curiel 1993, 2004; Veinberg 1993; Massone & Machado 1994; De Bin et. al. 2011), as well as social and educational aspects (Massone 1996; Veinberg 1996; Druetta 2008; Massone & Fojo 2011). A modest dictionary is available online (Manos Que Hablan 2016), and some information is also available on the use of iconicity (de Bergantes & Usandivaras 2013) and discourse structure (Massone et. al. 2000). As of 2008, use of Argentinean Sign Language in education was still developing, after a complicated history of Spanish-only policies and influence from foreign sign languages (Druetta 2008). According to Druetta 2008, the language appears to have been dramatically affected in some groups by the influence of signed Spanish.

Work on the other sign languages in this region is limited. The Colombian Ministry of Education has produced a Columbian Sign Language dictionary (INSOR 2006) and a few

other preliminary articles on grammar and education (Mejía 1996; Ramírez 1998; Ovideo 1998, 2000, 2001). The Instituto Nacional Para Sordos (INSOR) indicates that there is a call for interpreters and interpreter training, however descriptive efforts seem to have stopped in recent years.

In Ecuador, three dictionaries have been published by governmental organizations (SFPL & Mano a Mano 1987; Garcés 2012; CNID 2014) and courses are being offered in Ecuadorian Sign Language. However, these appear to be separate from the few existing grammatical studies on the language (Vásquez 2011; Acosta Reyes 2015; Santillán & Carolina 2015).

Publications mentioning Bolivian Sign Language focus on the deaf population (Holbrook 2009; Secretaria Técnica del CNCRD 2014) or technology (Martínez Severich & López Monje 2015). Courses are offered through different organizations (Linarez 2014), though the online version is essentially a small video dictionary (Sobre Todo Personas 2011). The exact relationships of South American sign languages to one another have not been established, though Libras has been called an isolate (Wittmann 1991; Hammarström 2017). Based on my own comparisons of existing dictionaries, the national sign languages of Colombia, Ecuador, Bolivia, and Peru may have significant lexical similarities to each other. All four of these also seem to contain a certain degree of lexical influence from ASL. Chilean and Argentinean sign language exhibit some similarities to this group as well, but to a lesser extent. This is a topic for future research. The possibility of regional, rather than national, sign languages in this area also needs to be investigated.

## 2.2 Sign languages of Peru

The government of Peru, and many deaf people in Peru, recognize a single national sign language. However, studies of the language(s) that signers actually use are lacking, and most of the work that has been done is focused on the capital city of Lima alone. Signers often note variation in different regions, and some nation-wide surveys hint at mutually unintelligible varieties (Parks & Parks 2010; Vílchez Jiménez 2013). In my own work, I have identified two additional sign languages, one of which is used in Lima along with the national language (Inmaculada Sign Language; see 2.2.2). The other, the focus of this grammar, is used in a small town with no strong affiliation to a major deaf association. There are countless towns and villages all over the country in similar situations where deaf communities may have formed and developed their own languages. This includes a known multi-generational deaf family in the mountains near Carhuahuaran, a Quechua-speaking region (Yulber Santiago Romero, personal communication, October 8, 2016).

### 2.2.1 Peruvian Sign Language

Peruvian Sign Language (LSP) is the one nationally-recognized language of Peru's deaf communities. LSP started gaining momentum in 1958 with the establishment of Peru's national deaf association, Asociación de Sordos del Perú (ASP). The language was given official status in 2010, and it is now used in the few deaf schools in Lima. LSP has spread to other major cities as well, through the network of deaf associations. In many cases, the leaders of these associations learned to sign by attending school in Lima, as the use of any sign language in education outside of Lima is rare.

LSP shows some influence from American Sign Language (up to about 30 percent of a Swadesh list according to Clark 2017b) and possibly from Spanish Sign Language (up to

12 percent). Depending on the region and the individual signer, there may be some influence from Brazilian, British, and Portuguese sign languages as well. Lexical similarities can also be identified between LSP and other sign languages of South America, such as Ecuadorian (54%), Bolivian (53%), Colombian (47%), Chilean (41%), and Argentinean (33%)[1]. This relationship is perhaps evident in the respective fingerspelling systems as well, which are essentially variants of the French system (also used in ASL), with a distinctive South American P and U.

Different cities, and even different regions and generations in Lima, use different varieties of the language, and show varying levels of foreign influence. Schools also affect variation, as they have different linguistic affiliations. CEBE La Inmaculada de Barranco (opened in 1939) was run by Spanish nuns; the school run by Efata Ministries (opened in 1970) has an association with ASL; and Colegio Ludwig van Beethoven (opened in 2010) uses modern LSP (see discussion in 2.2.2).

Spanish-to-LSP dictionaries produced by deaf associations in a few different cities[2] and my own video recordings from 2014-2015 are the main sources of information on the language. However, LSP is currently undergoing documentation and description through Pontificia Universidad Católica del Perú, and opportunities to learn the language or become an interpreter are growing. Associations in different cities are working to create programs for parents of deaf children, to use sign languages in schools, and to establish work programs for deaf adults.

### 2.2.2 Inmaculada

Another language, known as Inmaculada Sign Language (LSIn), is used in Lima by older signers who attended CEBE La Inmaculada before 1960 (Clark 2017b). It is clearly related

to LSP, but lexicostatistics indicate that it is a separate language rather than a dialect (56-75% shared Swadesh vocabulary). A small degree of influence from ASL can be seen in these signers as well (up to 16%), though it is less than the ASL influence in LSP (up to 30%). Even the fingerspelling system contains a larger number of unique signs compared to the largely ASL system of LSP (Clark 2017b p.244).

With the establishment of the national Deaf Association (ASP) in 1958, LSP began to take over as the national sign language, and the most prestigious variety of signing in Lima (Clark 2017b). Signers who attended school between the time of LSIn and the establishment of ASP are on a continuum between the two languages. Clark 2017b identifies a dialect chain from, approximately, the oldest to youngest signers in Lima. Each consecutive link in the chain shares over 80 percent of their Swadesh vocabulary with both neighbors, but only 56 percent Swadesh vocabulary is shared between the signers at either end of the chain. The oldest and youngest signers also attended different schools (Inmaculada and Efata, respectively). Signers' current associations with different schools, organizations, or even individuals also affect their dialect (see Clark 2017b).

LSIn is an example of the importance of education, governmental support, and social aspects in general for the transmission of sign languages. In just a few decades, the dominant language among deaf people in Lima changed dramatically because of a change in authority. In 1958, the official, government-supported, Asociación de Sordos del Perú (Deaf Association of Peru) took over from the foreign-run Inmaculada school as the local authority on sign language and deafness in Lima and in the entire nation. The result is that the older language (LSIn) is not even recognized by its users. Rather, the dialect continuum allows for the misconception that LSIn users simply know a less developed version of LSP, which is the only 'real' and officially-recognized sign language in Peru.

### 2.2.3 Other communities

Peru is by no means a homogenous nation. Many unique cultures are scattered across a landscape of different environments. Some Peruvians live in major cities with an urban lifestyle, and others are in smaller agricultural centers, or in secluded villages high in the mountains or deep in the jungle. Some of these groups are largely disconnected from the network of major cities, organizations, and businesses, by choice or by circumstance. Given the typical means of transmission for national sign languages (education; see 1.1.4) and the lack of educational opportunities for deaf people outside of major cities, it is unlikely that the deaf community is as homogeneous as a single national sign language seems to imply.

If two sign languages exist in Lima alone, and another has formed in a more secluded town, others may exist all over the country. Several homesigners[3] have been identified in the Iquitos region (Sara Goico, personal communication, July 2014), and signers with limited exposure to LSP exist in other regions, such as Yarinacocha, Huanta, Quinua, and Pichari. They are known as marginal members of the deaf associations in Pucallpa and Ayacucho. Occasional visits from members of these urban organizations to more rural areas explain knowledge of some LSP by rural signers. The extent of this knowledge, and the possibility of more than a 'semi-signing' system among these signers needs to be investigated further.

Rumors of separate sign languages persist among many LSP users, but their locations remain a mystery. Some point to mountainous Quechua-speaking regions, and others to isolated tribes in the jungle. The reality may be that both, or neither, of these rumors are true. At this point, however, we do know that one such community lives in the valley town of Sivia (as discussed in Chapter 3).

## 2.3 Summary

The status of sign languages in the region surrounding Peru varies greatly from country to country. Libras (Brazil) is relatively well-known, is used and encouraged in education and technology, and has a decent amount of ongoing research. On the other extreme, publications on the deaf population that uses Bolivian Sign Language often say nothing about their language. Most work also assumes a single sign language for each country (again, Brazil is the exception with Brito 1984).

In Peru, documentation of the one government-recognized sign language (LSP) is ongoing. This language is used in schools for the deaf in Lima, and continues to spread to major cities through deaf associations. The existence of other sign languages is more controversial (in an official capacity), though my own research clearly establishes more than dialect-level differences between two varieties in Lima alone. The history and diversity of Peru, and observations by deaf people in major cities, predict the existence of unique sign languages in other regions as well. One of these, Sivia Sign Language, is the topic of this dissertation.

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Chapter 2 endnotes

[1] Percentages are based on a comparison of available signs from the Swadesh list: 71 for Ecuadorian, 70 for Chilean, 63 for Colombian, 36 for Argentinean, and 16 for Bolivian.

[2] Asociación de Sordos del Peru, ca. 1958; Asociación de Sordos de Lima, 2004; Ministerio de Educación, 2010; Gobierno Regional Loreto, ca. 2010.

[3] 'Homesigners' are individuals who have developed a signed system of communication with their immediate family. These systems are not usually considered to be full languages, as they are prototypically created systematically from poor or no linguistic input.

# CHAPTER 3. SIVIA AND LSSIV

This chapter gives an overview of the environment in which Sivia Sign Language developed and examines the way it is used today. Section 3.1 includes background information on Sivia's history and culture, while section 3.2 focuses on the language itself.

## 3.1 The town of Sivia

### 3.1.1 Location, history, and development

Sivia is a small town of about 3500 people located the valley region known as VRA(EM), or 'Valle de río(s) Apurimac (Mantaro y Ene)'. Sivia sits on the western side of the Apurimac river in the Ayacucho province (Huanta region). It is a short ferry ride across the river to Pichari, a more developed 'sister' city in the Cuzco province. From there, ground transportation to larger cities, such as Huanta and Ayacucho, is available.

The VRAEM region is known as the 'selva alta' or one of the higher altitude jungle regions. As such, it is rich ground for a variety of crops and was once inhabited by a variety of native peoples, animals, and plants. Though the region was invaded by Spanish and evangelical forces throughout Peru's history of colonization and independence, real modernization did not begin until the twentieth century (A. Quispe Huashuayo, personal communication, November 28, 2016). This is when trade routes and roads were constructed, and the region could truly be incorporated into the national economy.

Around the 1960s, the government began to develop the region through the construction of housing, churches, schools, and roads. Cacao and coffee quickly became important crops, and the population began to move toward these opportunities for work. This also meant the gradual dispersal of animals and indigenous groups who did not want

to participate in this new way of life to the outskirts of the region, and the current

populations of more central towns like Sivia began to form.

Development was put on hold in the 1980s and 90s when violent groups referred to

as 'guerrillas' and 'terrorists' moved into the region and many families were forced out or

killed (A. Quispe Huashuayo, personal communication, September 27, 2016). Fortunately, a

period of rebuilding and further development followed, and the main towns in the region

today are safe and complete with basic infrastructure and governance. This does not mean,

however, that there is not room for improvement, or that Sivia is up to the educational,

economic, or healthcare standards of larger cities. Recent budget cuts and attempts to

reorganize the government mean that development will continue to progress slowly at best.

Because of an economy based on agriculture, many families survive by harvesting

and selling the crops produced on their *chakra* (land used for collecting food or farming) or

by working on other plantations. Other businesses include restaurants; shops selling food,

clothes, and home goods; cacao and coffee distributers; internet and cell phone companies;

*motocarro* (short-range three-wheeled taxi) and taxi services; and the zoo. Some also work

as teachers, ministers, doctors, police or military officers, and government employees.

However, these jobs tend to be held by people from outside of the region who have had

access to better education. Some are even persuaded into such positions temporarily as a

prerequisite for a more desirable job. Due to its relative isolation (and conflicts over the

legality of coca, one of the region's most profitable crops), the VRAEM region is not a

priority for government funding.

### 3.1.2 General culture

One of the most prevalent influences on Sivian culture is the history of the Quechua culture and language in the region. Many in the older generations (approximately over the age of 50) still speak a variety of Quechua as their primary language, and (particularly women) dress in traditional clothing. Much smaller groups of Ashénika and Aymara speakers are also present. As in many locations, this influence is waning in younger generations, and schools are monolingual in Spanish with English as the only foreign language class.

Though the importance of speaking Spanish and learning English to be part of the modern world is emphasized, schools do dedicate time to the preparation of traditional dance shows. Classes perform traditional dances used for certain occasions and in different regions or groups all over the country. These are typically very popular events, which sometimes charge a fee for entry, and are often judged to find the best performance. Pride in the diversity of Peru and the specific characteristics of one's hometown is also demonstrated by the prevalence of festivals all over VRAEM that showcase traditional food, clothing, crafts, and other activities of nearby indigenous and colonial groups.

### 3.1.3 Deaf population and culture

The (audiologically) deaf and hard of hearing population in the main town of Sivia consists of five women: a mother (age 44), two of her daughters (age 19 and 14), her sister (age 32), and an unrelated friend (age 36). There are rumors that other deaf people exist on the outskirts of the town or in nearby villages, but they are kept isolated by their parents or families. The signing community, however, is significantly larger. It includes the sisters' mother and other siblings (6), their other children (4), the other woman's family (7), and

26

many hearing friends (approx. 30-40). Note that these other family members and friends do include several males as well.

Sivia signers can even be found in the neighboring town of Llochegua, due to the year that one member of the deaf community spent working there. A few deaf people from the sister town of Pichari (across the river) are frequent visitors as well. However, since they learned to sign through the deaf association in Ayacucho, they use more LSP signs. Members of both groups note communicative difficulties.

This situation is quite different from the separation between hearing and deaf people seen in large cities. It also indicates a larger and more varied network than a typical homesigning system. There are no official deaf associations, clubs, or resources, but friends (deaf/deaf or deaf/hearing) meet often and sign with each other. Sivia Sign Language has spread from one generation to the next (see 3.2.1), outside of a single family, and even to families with no deaf members.

Additionally, conversations with several individuals in Sivia indicate that attitudes toward deafness are more positive (or simply neutral) in comparison to attitudes in larger cities. Though signing is still referred to as 'gestures', there is no push to make deaf people speak nor a negative association with using the hands to communicate. Deaf people are able to find jobs, and employers and co-workers will find ways to communicate (i.e. learn basic signs). Teachers and other parents are friendly with deaf parents, and again, learn basic signs or use gestures as necessary. Oralization along with signs or gestures (though not pure lip-reading) is often used with acquaintances.

## 3.2 Sivia Sign Language

### 3.2.1 Development and current use

Sivia Sign Language (LSSiv) is used among the deaf population in Sivia, as well as a network of relatives and friends in Sivia and Llochegua. According to my own observations, and interviews with users in 2015 and 2016, user numbers are estimated to be approximately 50 to 62. This includes anyone from fluent native signers (12), to proficient (15-18) or intermediate (8-12) learners, to learners who only use a few basic phrases (15-20). User ages range from children as young as three years to adults in their seventies.

According to user interviews, this language seems to have begun with a deaf child born in 1972. This little girl began to develop a signing system with her parents and siblings. In 1984, her deaf sister was born, and learned the system as her native language. These sisters also grew up with a deaf friend (a few years older than the younger sister) from another family in Sivia,. These three women (along with their parents, siblings, and friends to a certain extent) formed the first generation of Sivia signers.

In 1996, the second generation began with the birth of the older sister's first child (also deaf). Her other three children (one hard of hearing, two hearing) and her sister's two children (both hearing) have been added since, all using LSSiv as their first language (along with Spanish in the case of the hearing children). Some of their cousins (all hearing) are also being raised with significant exposure to LSSiv. The friend is also a mother at this point, raising a hearing child who signs natively. The network of friends and neighbors has expanded gradually to include many people of various ages in and around Sivia.

It is also worth noting that some signs are used by the hearing population as co-speech gestures, meaning *container*, *leave*, *make change*, and *perfume/cologne*. This is true among both friends of the deaf community and other residents of Sivia. They have been

observed in hearing-deaf conversations, hearing-hearing conversations, and even when hearing people talked to me. Perhaps this indicates that gesture is the origin of these signs. Or perhaps communicating with signers has influenced gestures. This would be an interesting area for future research in Sivia and in the surrounding areas.

According to the 'creation typology' discussed in section 1.2.1, Sivia Sign Language can be classified as an 'original' sign language. It has developed beyond homesigning, but has not been institutionalized. Language attitudes and the small percentage of the community who are proficient users indicate that it does not quite fit the criteria for a village sign language either. LSSiv is, however, an indigenous language developed by a community of deaf people with little, if any, influence from outsiders.


### 3.2.2 External influence and endangerment

Due to the relative isolation of Sivia and the lack of educational resources for deaf children, LSSiv developed independently from the nationally-recognized Peruvian Sign Language (LSP) used in major cities. More recently, however, perhaps due in part to its recognition as a national language in 2010 (Congreso de la República 2010), LSP is exerting more of an influence on LSSiv.

Signing visitors from Huanta, Ayacucho, and even the neighboring town of Pichari often come with the intent of teaching 'real' (LSP) signs to deaf people in Sivia. One signer native to the LSSiv community (the friend mentioned above from the first generation) also spent about two years in Lima and studied at Efata, a deaf school which uses an ASL-influenced version of LSP (see 2.2.1). Certain LSP signs are often mixed in with her LSSiv signing (even more so when talking to someone from outside of Sivia). However, she says

she feels more comfortable using LSSiv, and that communicative difficulties influenced her decision to return to Sivia.

While it is encouraging that LSSiv is being passed on to some children (one deaf, one hard-of-hearing, several hearing), younger users are also more easily influenced by visits from users of Peruvian Sign Language. It is also unlikely that the hearing members of the second generation will continue to pass on any sign language to another generation unless they have deaf children themselves. Additionally, if future deaf children have the opportunity to attend a school that uses any sign language, current policies and efforts indicate that it will be LSP.

Spoken (and to a lesser extent, written) Spanish and Quechua have also had a small impact on LSSiv. This can be seen mostly in the use of mouthing, which sometimes simply accompanies signs, and in other cases distinguishes minimal pairs (see 8.4.2.3). Writing has influenced the way larger numbers are expressed, as well as some 'formal' namesigns, though fingerspelling and initialization are rarely used at all (see 5.2).

### 3.2.3 Comparison to LSP

LSSiv is certainly a distinct language from LSP. The strongest indication of the distinctness of the two languages is their lack of mutual intelligibility. In addition to communicative difficulties, LSP users claim that signers in Sivia do not use 'real' signs, and LSSiv users comment that other deaf people sign differently. One Sivia signer who briefly studied in Lima frequently serves as an interpreter between LSSiv users and LSP users, and in her absence, I was occasionally asked to fill this role as well.

The lexicostatistical comparison of 86 Swadesh signs in Table 1 shows that only 17 signs (19.8 percent) are similar enough to be potentially related. If the ten iconic signs

which may be similar by coincidence are removed (see chart in Appendix A), this percentage goes down to 9.2 (7 out of 76 signs). According to lexicostatistical conventions (Crowley 1992 p.139), these percentages put LSSiv and LSP in the range for 'related languages in different sub-families' (12-36%) or unrelated languages (0-12%). The history of the LSP and LSSiv indicates that they are independent languages which share some cultural and physical references.[1] In recent years, contact has also allowed LSP to exert an influence on LSSiv.

Terms in Table 1 are marked as 'yes' if the signs are similar enough to be potentially related (via contact or cultural influence) and 'no' if distinct. Asterisks (*) indicate that the LSP sign is used, but not as frequently, or not by all LSSiv signers as a native sign. (Images of all shared and distinct signs in each language are given in Appendix A.)

**Table 1. LSSiv and LSP basic vocabulary comparison.**

| Sign | Y/N | Sign | Y/N | Sign | Y/N | Sign | Y/N | Sign | Y/N |
|---|---|---|---|---|---|---|---|---|---|
| all | no | feather | no | louse | -- | rope | -- | warm | yes |
| animal | N/A | fire | no | man | no | salt | no | water | yes |
| bad | no | fish | yes | meat | N/A | sea | no | wet | no |
| bird | yes | flower | yes | moon | no | sharp | -- | what | no |
| black* | no | full | no | mother | no | short | yes | when | no |
| blood | no | good | no | mountain | no | sibling* | no | where | no |
| cat | no | grass | no | name* | no | sing* | no | white* | no |
| child* | no | grease/oil | no | narrow | yes | sit* | no | who* | no |
| correct | no | green | no | new | no | small | no | why | no |
| count | -- | heavy | no | night | yes | snake | no | wide | yes |
| dance | no | how | no | no | yes | snow | -- | wind | no |
| day | yes | ice | no | old | yes | spouse | no | with | no |
| die | no | if | N/A | other | no | stand | no | woman | no |
| dirty | no | kill | -- | person | no | star | no | wood | no |
| dog | no | laugh | no | pig | no | sun | yes | work* | no |
| dry | no | leaf | no | play | no | tail | no | world | yes |
| dull | -- | lie | no | rain | yes | thin* | no | worm | yes |
| dust | -- | live | no | red* | no | tree | no | year* | no |
| egg | no | long | no | river | no | vomit | -- | yellow | no |
| father | no | look.for | no | rock | yes | | | | |

Along with a distinct lexicon, LSSiv and LSP exhibit unique characteristics at the phonetic, phonological, and morphological levels. LSSiv has a relatively small handshape

inventory (see Table 38), which does not exhibit influence from fingerspelling and initiali-

zation as in LSP, and LSSiv uses more varied and more frequent non-manuals (see 5.1.5).

These phonetic differences are exaggerated by underspecification and lenition in LSSiv

phonology (see 6.6). Morphological differences can be seen in the number system (5.2.2). It

is likely that even more distinctions will be identified as more information becomes

available on LSP's structure.

## 3.3 Summary

At this point in research on the sign languages of Peru, Sivia Sign Language is unique. The

language is used by a developing community of both deaf and hearing people in a small

town. With the true beginning of the town's establishment in the 1960s and the origin of

LSSiv in 1972, it is also quite young. The available information indicates that the language

is an expansion of a homesigning or familial signing system, which is now used by 50-62

deaf and hearing people across two generations. Both history and a lexicostatistical com-

parison show that LSSiv is not closely related to LSP, with no more than approximately 20

percent of basic vocabulary potentially shared.

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Chapter 3 endnotes

[1] Some see a resemblance in some of these signs to the older signs used in Lima. However, given the reported histories of both groups (cf. Clark 2017b), contact between older signers in Lima and the first generation of Sivia signers is not a logical explanation. More likely, these signs are related by a cultural or gestural reference. This is, nevertheless, a potential topic for future research.

# CHAPTER 4. METHODOLOGY

This chapter describes the methodology used to collect and analyze the data used in this study. Initial contact (section 4.1), data collection (section 4.2), corpus organization (section 4.3), and challenges (section 4.4) are discussed.

## 4.1 Contact with the community

I first began to work with the deaf communities of Peru in the summer of 2014. I was able to establish contacts in Lima and in other cities through the network of deaf associations. The Deaf Association of Peru, located in Lima, serves as a center for training and testing new programs and for hosting country-wide efforts and celebrations. It has been very helpful in connecting me to associations in other cities (specifically Pucallpa, Iquitos, Cuzco, and Ayacucho). Through this network, I have met community leaders, participants in previous work, interpreters, and teachers. I have even had educators and community leaders in other cities reach out to me.

Once I arrived in Ayacucho in the summer of 2015 and began inquiring about users of another sign language, the members of the association there helped lead me to Sivia, where I was welcomed as an unusual visitor. I returned to Sivia one year later (August 2016) to gather the majority of the data used in this study. After an initial period of trials and explanation, a few main consultants were eager to participate several times per week, and others less frequently. For some, it was a much-appreciated source of additional income and a chance for cultural exchange.

I have also met with Drs. Miguel Mondoñedo and Sonia Maruenda (of Pontificia Universidad Católica del Perú), who are working on the description of Peruvian Sign Language as it is used in Lima, as well as Sara Goico, a graduate student working on

developing educational materials for parents and children to learn the variety of LSP used

in Iquitos.

I found most consultants in Sivia (and many elsewhere) to be curious and even

enthusiastic about my efforts, especially once it was clear that I wanted to discuss their

unique language and their concerns about educational and occupational prospects for deaf

Peruvians. Participants of different ages, social groups, and educational backgrounds were

happy to help and eager to stay in contact. After this initial documentation and description,

I hope to start community-run programs to create pedagogical or documentary materials,

especially in regions like Sivia where the language used is not officially recognized.


## 4.2 Data collection

Data for this study consists of video recordings of eight native users of LSSiv, recorded

during two field trips. This includes all five deaf or hard of hearing users and consists of

approximately 28 percent of fluent users (cf. 12 native signers and 15-18 'proficient signers'

mentioned in section 3.2.1). Four hours of preliminary data was recorded in July 2015 in

order to provide evidence of a distinction between the signs used in Sivia and those used in

major cities. Six signers briefly respond to and discuss images of basic vocabulary in a

series of group recordings made at the home of some of the consultants. Three of the signers

use LSSiv, two (from the neighboring city of Pichari) use LSP, and the final signer (who

spent time in Lima learning LSP) uses predominantly LSP with some codeswitching to

LSSiv. They are all deaf signers, ranging from 19 to 44 years old.

Over 88 more hours of signing were recorded in August through November of 2016.

Signers include the four LSSiv users mentioned above, as well as four younger users, ages

eight to 14. In some of the later sessions, I was invited to participate as well. All eight

participants happen to be female, as the few living male native signers were not in Sivia at the time of recording or were too young for the study. It should be noted, however, that several men in Sivia do use LSSiv as a non-native language. Recording sessions include one to four signers in various combinations and last up to two hours. Signers are asked to respond to images and videos, tell or re-tell stories from videos and books, answer questions, discuss a topic, or engage in free conversation (see Appendix B for a list of elicitation materials). Activities are intentionally mixed to avoid boredom, and consultants are often given more than one option for a particular session. The majority of the videos are recorded at one of the signers' homes, and some are recorded during nature hikes or trips to local attractions such as the zoo.

Two deaf users (age 19 and 36) and one hard of hearing user (age 14) were asked for grammaticality judgments about various word orders, as well as morphological patterns and phonemic distinctions. These judgments were elicited through responses to sequences of images, videos of myself signing various options, and in-person interviews. Signers were also interviewed about their language background and asked about social aspects of LSSiv and LSP use, such as variation, prestige, and language attitudes.

### 4.2.1 Consent and compensation

Prior to recording, participants were informed of the purpose and duration of the study, as well as what was expected of them and how they would be compensated for their time. Each signer received 20 Peruvian nuevos soles (PEN) per session, paid immediately after recording or held as 'credit' until requested. Activities were mixed from day to day and signers were always given a choice of whether or not to participate in any activity on any day. They were also free to stop at any time or to ask that anything be deleted from a

recording. These terms were explained with the help of a written consent form (see appendix B3), which was translated by a hearing participant to the rest of the group, along with my clarifications.

A main translator (age 13, hearing daughter of a deaf woman) was given a laptop with the previously recorded videos and the terms and instructions for translation work. Instructions state that translations can be a collaborative or individual effort, and can be written or spoken. Translators are encouraged, but not required, to work on conversation sessions first, since these are the most difficult for me, as a non-native user, to translate and transcribe accurately. Each translator is compensated five PEN per minute of translated video.

I currently have a small collection of completed translations, and efforts are ongoing in Sivia. This is also the beginning of efforts to make materials available to the signing community. Books and videos used for elicitation are left with participants as well. However, at least for the time being, videos are not to be shared outside of the group of participants in that recording. A future goal is to create 'official' translations of these and materials such as dictionaries to be made available to a wider population.

### 4.2.2 Equipment and staging

Initial data recorded in 2015 for lexical comparison was recorded with a Sony HDR-PJ200 camcorder and Sony VCT-R100 tripod. Videos are 1920 x 1080 px at up to 30 frames per second. In the first session, all six signers sit in a wide arc and take turns giving individual signs or short descriptions. The camera turns to focus on three signers at a time. The laptop displaying elicitation images sits in the center, visible to all participants. The second (and

final) session includes four signers in a similar format, this time with the camera further back to include all four signers in a single frame.

Data recorded in 2016 is more varied. It is recorded with two Seree HDV-501 camcorders on the same tripod as above, on a small flexible tripod used to record in non-ideal circumstances, or simply handheld for more interactive sessions. Videos are also 1920 x 1080 at a consistent 30 frames per second. For individual sessions, the signer is positioned (seated) directly in front of the camera in the middle of the frame. If elicitation materials are used, these are positioned out of frame if possible, and always out of the signing space. The camera is placed at a distance aiming to include all of, but no more than, the user's signing space. For some videos, an off-screen participant (myself or a community member) provides stimuli (questions or topics).

For videos with more than one participant, the goal is to position signers to be as front-facing as possible, without interfering with conversational flow. For two people, this means (approximately) a 45-degree angle to the camera and to each other. If a third person is added, this person sits in the middle at a more forward angle. Four people are positioned in an arc, as in the first sets of videos, but this configuration is avoided when possible. Again, elicitation materials are positioned to interfere as little as possible with the frame, but with the goal of making them easily visible to all participants.

Recording circumstances mean that signers are not always facing straight forward, which has advantages and disadvantages. In some cases, signs can be seen more clearly from a side angle, but some signs or facial expressions may be obstructed. At the current stage of analysis, there is enough overlap and variation in recording sessions that these factors do not seem to negate the usefulness of the data. The same goes for subpar lighting situations, which are occasionally unavoidable, but generally recoverable with editing.

On one occasion, a four-person session includes a child facing away from the camera. This means that the second camera is employed to directly face her. Other sessions include two separate groups of signers recorded simultaneously on the two cameras. During hikes and other 'walking' sessions, the camera is handheld and participants generally initiate recordings when a topic they want to discuss comes up in conversation or in the environment. Again, the goal is generally to include the only the user's (or users') entire signing space in each video. However, 'walking videos' also include visual information from the environment. For example, a signer may give a sign for or information about a particular plant, then indicate where it is so the camera can record it.

Videos are generally stopped and re-started at each change in topic (with the exception of free conversation sessions), but on-screen participants are ultimately in charge of when the camera is on or off. Videos used as examples in this dissertation are also edited to eliminate any faces of non-participants, and anyone else who did not explicitly agree to be on camera for that particular session. Video locations were frequently chosen according to the availability of light along with other weather conditions. Archived versions of videos and clips used in this grammar are adjusted for lighting as necessary. A few videos were also recorded in 'night mode' on particularly dark days, and thus appear in black and white in the archive (Clark 2017a; see 4.3).

### 4.2.3 Elicitation materials

Materials used for elicitation include slideshows of images, written Spanish words and phrases, short videos, illustrated books, the surrounding environment, and signed questions and topics. Slideshows of individual images are intended to elicit short responses, such as a single sign or simple sentence. Many are organized into thematic groups of simple

images such as types of food, animals, hobbies, geography, etc. These are used to build a lexicon. More complex images and short comic strips are used to elicit verbs, simple phrases and sentences, and short sequences of events. Many are archived along with the videos they helped create (see Clark 2017a), and others are cited in Appendix B. Elicitation sessions are generally recorded as individual sessions, but occasionally include two signers.

Written Spanish words and phrases are used to elicit more abstract vocabulary and necessary discourse items such as greetings and commands. Some of these topics or questions are also used to provoke short discussions or gather background information about signers and Sivia. Hearing relatives translate these items and elicit them from deaf signers. This process is often recorded as well as the response. The stimulus for each video is recorded in metadata and available if possible in the archive (Clark 2017a).

Illustrated books, comic books (*Condorito de oro* series), and *Frog, Where are You?* are used to elicit narratives. Signers are given a chance to look through the materials, and are then recorded telling the story as they look through the pages. These are also recorded individually, though often several signers are present during the session and discuss the materials off camera.

Several short animated videos (approximately 1-10 minutes in length), and the 'Pear Film' are used in two ways in this study. Participants are often recorded describing each video as they watch it for the first time. Later that day, or up to a few days later at the next recording session, they are asked to re-tell the story. This provides two types of narrative data and reveals different types of organization and emphasis depending on story-telling context. In some cases (generally with the shorter videos or with younger signers), only the latter recording is completed; signers watch an entire video without being recorded and tell the story on camera a few minutes later. Again, these are listed in Appendix B, and the stimulus for each video is noted in archived data.

Another method of elicitation uses the natural environment as stimuli. Participants are recorded identifying, describing, and discussing the uses of various plants and animals during hikes. Signers also discuss animals at the local zoo or events occurring in the area. Some of these occur more-or-less spontaneously, and others are elicited by asking questions or bringing up topics (introduced topics are noted in video metadata).

### 4.2.4 Narrative and conversational data collection

Much of the narrative data comes from re-tellings of videos and books (users look through a book or watch a video and are then recorded telling the story). Excerpts from some of the other elicitation sessions or from free conversation sessions also include narratives. Other stories are elicited through a 'tell me about this topic' format, or occur naturally in other videos. One of the most fruitful topics for narrative and descriptive data was the 'old days' of Sivia, when the oldest signers were growing up and before the town was modernized (see section 3.1). Many recorded narratives include listener responses as well.

Recording sessions for conversational data include some natural and some 'constructed' discussions. In many early conversational videos, topics are introduced by me or by one of the signers, leading to a brief discussion. (Introduced topics are noted in each video's metadata). In later videos, the camera is left on as signers engage in their own, more naturally-occurring conversation. Shorter exchanges naturally occur in all types of sessions with more than one participant. Conversational videos usually include two or three participants, and rarely expand to four. Where possible, four willing participants are split into two groups of two participants each and recorded as two separate videos.

### 4.2.5 Linguistic interviews and negative evidence

During the second half of the data collection process, I began conducting interviews with three of the consultants to answer specific questions about phonology, morphology, and syntax. For phonological data, signers view images of handshapes and confirm that certain signs use those shapes. They are sometimes asked if other shapes can be used for that sign, or to provide more examples of signs which use certain rare shapes. Signers are also asked to judge certain changes in orientation, movement, and non-manual aspects as okay, wrong, or two different signs or meanings.

Syntactic and morphological interviews are conducted via the use of sequences of images depicting signs (stills from videos and line drawings of those stills) or videos of myself signing. Note that different formats are created for much of the same material to accommodate different signers and ensure that the intended form and meaning of each example is understood. Sets of related sentences or phrases are presented in one session to address a particular structure, and signers are asked whether a particular sequence is 'good' or 'bad'. These sets include aspects which are known to be grammatical, suspected to be ungrammatical, and of unknown status.

In some cases (generally when the given answer is surprising) interviewees are also asked to clarify a meaning or to confirm that they would sign it that way. Sometimes they are also asked whether certain options mean the same thing or to rank different options as 'better' or 'worse' than each other. For some examples, interviewees provide their own advice on what signs to move where in order to improve the sentence or phrase. They may also explain a specific context in which the example can be used.

The opportunity to conduct these interviews directly with native signers provides negative evidence (judgments that confirm *un*acceptability) for certain aspects of the language's structure. These interviews have also given a deeper insight into the individual

tendencies and mental grammar of different signers, and different generations of signers. In some cases, as discussed in the following sections, interviews contradict what is seen in video data, indicating what might be levels of formality or rules which are flexible in context. In addition, (mis)interpretations of a sequences of still signs with frozen expressions are revealing as to the importance of movement, non-manual components, and prosody. They also reveal the awkwardness of sequences in which no context is given and frequently-omitted aspects like a first-person subject are explicitly stated instead of implied by context.

## 4.3 Corpus

The data collected in 2015 and 2016 from Sivia signers is archived in the University of Hawai'i at Mānoa's Kaipuleohone language archive (Brenda Clark Collection, available at https://scholarspace.manoa.hawaii.edu/handle/10125/34525). This includes approximately 88 hours of video, along with the currently-available transcriptions, translations, and elicitation materials. In order to make recordings accessible to members of the community and linguists in Peru, I hope to share my findings with PUCP. I also hope this research inspires the Ministry of Education to support the creation of pedagogical materials in sign languages native to Peru.

### 4.3.1 Annotation

Twelve hours of video are transcribed with sign-by-sign glosses, three of these hours also have free translations into English, and one additional hour is translated into Spanish. Annotation and transcription is an ongoing process. Current time-coded transcriptions and translations are a step toward detailed time-aligned glosses with tiers for individual hands,

non-manual components, gestures, phonetic transcription, code-switching, and translation. Leipzig glossing conventions (Comrie, Haspelmath, & Bickel 2015) are used where possible, and other symbols and abbreviations are given in Appendix C2.

These transcriptions and translations are completed mainly by me, and as such, any gaps in my knowledge of LSSiv are indicated. Signs with unknown or unsure meanings are marked as such. One hour of video has also been translated into Spanish by one of the participants (a hearing native signer). The transcriber and translator for each video is included in the metadata for each file, along with the date of the recording, the participants, the context, and references to any related material (such as elicitation materials, other parts of a session, etc.).

### 4.3.2 Clips, images, and drawings

Along with links to archived videos, this grammar uses clips of individual signs, phrases, sentences, and other structures which are extracted from full videos (using the free software Avidemux). These are available at [https://bleegiimuusclark.com/lssiv-grammar-examples/](https://bleegiimuusclark.com/lssiv-grammar-examples/), and are linked as necessary throughout the text with tags relating to chapter and table or example number (e.g. the video of BEFORE in section 4.3.3 is 'ch2t4'). Clips are also archived at [https://scholarspace.manoa.hawaii.edu/handle/10125/49885](https://scholarspace.manoa.hawaii.edu/handle/10125/49885) and can be found using labels beginning with 'BC2' (e.g. the video of BEFORE is 'BC2-001').

Images of signs are created through video stills, which are then traced on a touchscreen tablet to create line drawings (see Table 2, p.45). These images, along with the transcription system briefly described in 4.3.3 (full list of alphanumeric codes in Appendix C), are used mainly for lexical comparison and to show examples of phonetic or morphological details. Longer examples which are used to show syntactic or discursive elements

are usually written in the orthography outlined in 4.3.3 and further described in section 5.3. Both are based on [SiLOrB](#) (see [https://bleegiimuusclark.com/home/silorb-sign-language-writing/](https://bleegiimuusclark.com/home/silorb-sign-language-writing/)).

### 4.3.3 Transcription and orthography

The transcription system in this text uses a set of the alphanumeric codes established in SiLOrB (see [https://bleegiimuusclark.com/home/silorb-sign-language-writing/](https://bleegiimuusclark.com/home/silorb-sign-language-writing/) for the full system) to describe a sign's phonetic features. Capital letter codes divide a transcription into five aspects: dominant hand (D), non-dominant hand (ND), location (L), movement (M), and non-manuals (NM). These are followed by numbers, letters, and symbols which describe the features of that aspect. All codes used for LSSiv are given in Appendix C.

Hand codes begin with two-part alphabetic codes corresponding to palm and finger orientation (e.g. 'di' for palm down, fingers in), followed by numbers for each finger (e.g. '1' for the index) and symbols for their position (e.g. '+' for extension). Locations are composed of a specification of proximity (e.g. 'N' for near) and the code for the starting location of the sign (e.g. 'zero hi' for hi zero space around the torso). Movement uses alphabetic codes and abbreviations for directions (e.g. 'ub' for diagonally upward and toward the body), types of paths (e.g. 'arc' for an arced pathway), etc. Locations and movements may also use the codes 'D' and 'ND' to individually describe each hand in an asymmetrical sign. Non-manuals begin with a capitalized code for the body part affected (e.g. 'B' for brow or E for eye), followed by a code for its position (e.g. 'r' for raised or 'sq' for squint).

The parameters described by these codes are used to turn transcriptions into ortho-graphic representations. The SiLOrB system writes signs with pictographic symbols of a sign's articulatory features, arranged to represent a 'signer' facing the reader. A symbol

depicting location takes a central position, usually representing the torso and zero space (as in Table 2) or the head of the 'signer' with a symbol indicating proximity to the location (e.g. a circle for 'near' the location and an X for contact). Symbols for the hands are placed to the immediate left (dominant hand) and right (non-dominant hand). These are composites of all orientation and finger position features. Movement follows to the outside of each hand, and non-manual features are placed to the far right. Table 2 shows the process of turning a video of the one-handed sign BEFORE (video ch4t2, BC2-001[1]) into an image, a line drawing, a transcription, and an orthographic representation.

**Table 2. Video to orthographic representation.**
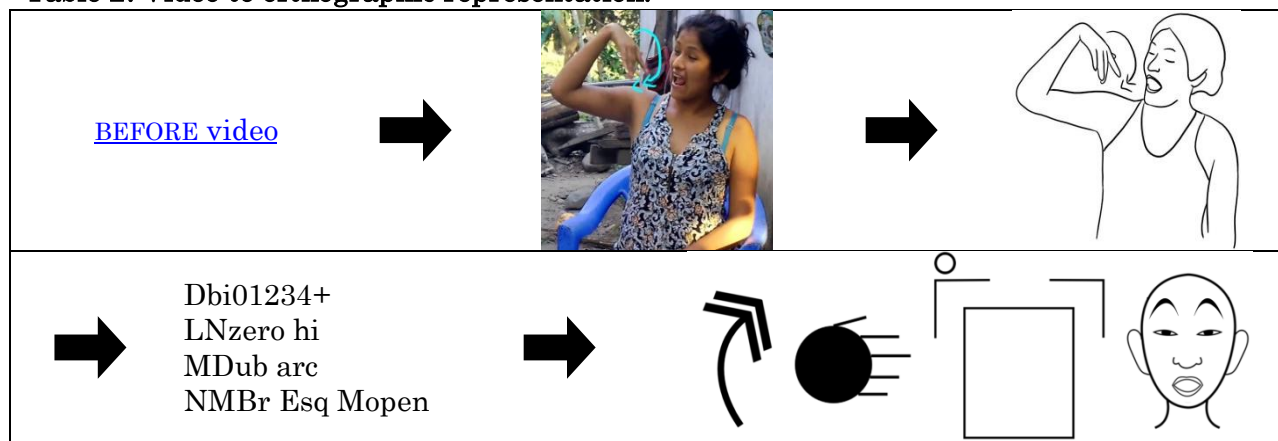


The majority of the symbols, codes, and conventions used in this grammar for LSSiv writing and transcription are introduced in Chapter 5, along with the phonetic features to which they correspond. Sign-by-sign glosses utilize '.' to separate words which are part of a single morpheme's translation (e.g. PICK.UP), '+' to separate simultaneous morphemes (usually on two different articulators; e.g. RUN+TIRED, where TIRED is non-manual), and '-' to separate sequential morphemes such as reduplicated movement. A large '-' is also placed in orthographic representations which can be separated easily into multiple morphemes

(e.g. manual and non-manual components). All such transcription conventions are listed in Appendix C2.

## 4.4 Methodological challenges

As with any research endeavor, I encountered certain challenges specific to this area of research and to this region of the world. The first challenge, after finding the community of signers, was explaining why I was there and what I wanted. This actually turned out to be a gradual process. Initially, it was obvious I wanted to record, and through the consent forms, they knew I was studying at a university, but the concept of linguistic documentation is somewhat harder to portray with limited language skills and no local work to use as a basis for comparison. I learned it was easier to explain through examples. So, as I found out more about the language, I showed users charts of handshapes, morphological patterns, differences between their language and other sign languages like Peruvian Sign Language or Hawai'i Sign Language, translations of videos, and eventually a presentation I had prepared for a conference about Sivia Sign Language. Each of these helped clarify my intentions, and was an opportunity for discussion of my work as a whole and some of the specific results I was getting.

Another initial (and enduring) hurdle was the lack of facilities in Sivia. This includes spaces in which to work, equipment, repairs, storage, and information. Rainy weather and unreliable power also caused delays in recording and transcription. These problems were mostly mitigated by preparation and flexibility. Backups for equipment, power, and elicitation (or tasks to be recorded) were essential. Consulting community members and establishing a network for support and advice in these circumstances early on was also important.

On days when recording sessions were possible, interruptions (such as children and animals), and varying numbers of participants (ranging from not enough for conversation to too many for two cameras) were the main issues. Because of a relaxed attitude toward time and keeping appointments, plans are made to be changed in Sivia. Meetings for recordings were loosely scheduled, but no one was entirely committed, and similar circumstances determined the presence of children. (The necessity of recording at a participant's house made this a frequent occurrence.) Once my recording sessions became a known source of income, there was no shortage of participants, and this made it difficult to convince some people to work with me alone (for grammaticality judgments, for example), or even in groups of two rather than three or four for conversation. Eventually, I learned the proper balance of persistence and flexibility. In some ways, these varied circumstances actually led to more varied data.

Since knowledge of Spanish and school experience varies from signer to signer, trial and error was necessary to determine the most reliable method of testing grammaticality judgments. My initial attempt at signing in person from notes was ineffective because I was not a skilled enough signer to clearly establish the goal of the activity. Thus, I moved on to images of signs, with mixed results. For some users, still images did not portray a sequence of signs, and sometimes did not even portray the correct signs due to lack of movement and context. One user had little preference for reading the sequence left-to-right or right-to-left. Another user often asked me to sign the sequence for clarification, which led to the final and most effective method: videos of myself signing each item.

It also took months of immersion to sort out the effects of LSP's influence on LSSiv. This is likely because my initial encounter with Sivia signers was through LSP signers from Pichari. For those sessions (and during other visits with non-local signers), LSSiv users tend to use the LSP signs they know, as well as potentially learning some new ones. Some

LSSiv signers use LSP signs interchangeably with their LSSiv equivalents in other contexts as well. One signer often codeswitches from LSSiv with her friends in Sivia to LSP with out-of-town visitors and with me (another outsider). However, thanks to a lack of frequent visits from outsiders, the percentage of original LSSiv signs used in recordings grows with the passage of time. Seeing this variation also sheds light on the contrast between the two languages, and the extent of LSP's influence on LSSiv.

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Chapter 4 endnotes

[1] Clips referenced in this chapter are available at https://bleegiimuusclark.com/lssiv-grammar-examples/ and https://scholarspace.manoa.hawaii.edu/handle/10125/34525, BC2-001.

# CHAPTER 5. PHONETICS

This chapter is a description of the phonetic features used in Sivia Sign Language. Section 5.1 discusses what is possible in the majority of LSSiv signs, and section 5.2 briefly looks at additional features which occur in fingerspelling and numerals. Section 5.3 describes the notation system used in this grammar, which utilizes the symbols and alphanumeric codes given along with phonetic aspects in section 5.1. A transcription system developed by the author is introduced as a way to quickly describe handshapes and other phonetic features throughout this chapter and the rest of the grammar. A corresponding orthography, part of the Sign Language Orthography Builder (SiLOrB; see https://bleegiimuusclark.com/home/silorb-sign-language-writing/), also being developed by the author, is used for the transcription of longer texts. (See Appendix C for a list of all notation conventions and abbreviations used in this dissertation.[1])

## 5.1 Possible features and segments

LSSiv signs are broken down according to the typical categories of handshape (5.1.1), orientation (5.1.2), location (5.1.3), movement (5.1.4), and non-manuals (5.1.5). Note that this chapter is a description of what is possible, not what is significant. The section on phonology (Chapter 6) examines which features are distinctive.

### 5.1.1 Handshape

Signs may use one or both hands, and two-handed signs can be symmetrical or asymmetrical. In a symmetrical sign, both hands use the same shape and participate in the same movement. In an asymmetrical sign, only one hand moves, and the hands often use two

different shapes (see Table 3). The 'dominant' hand, which a signer will use for almost all one-handed signs (exceptions are rare and only in specific contexts, see sections 9.5 and 10.7.2) is also the active hand in an asymmetrical sign.

**Table 3. Use of the hands.**

| One-handed | Symmetrical | Asymmetrical |
|---|---|---|
|  |  |  |
| ANGRY | MONKEY | CACAO |

### 5.1.1.1 Extended fingers

Table 4 below shows the observed values for finger extension. A finger is considered to be extended when it no longer makes contact with the palm (or the backs of other unextended fingers in the case of the thumb). This section makes no reference to the shape of any extended finger, simply listing observed combinations. I also follow the convention of treating the thumb as separate from the fingers, so it is not included in the 'finger' count (only the 'digit' count). Orthographic representations are all presented with the palm forward and fingers up for consistency (orientations will be discussed in section 5.1.2). Symbols indicate that a certain combination is used rarely (*) or only in numbers (#). This is further discussed in Chapter 6.

Table 4. Observed combinations of extended digits.
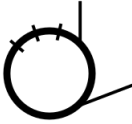
| Number of Extended Fingers | Extended Digits | Example | Orthographic Representation |
|---|---|---|---|
| zero | -- | STRONG/HEALTHY | 01234- |
| | 0<br>thumb | GOOD | 0s |
| one | 1<br>index | CRY | 1+ |
| | 01<br>thumb<br>index | DRINK | 01s |
| | 4*<br>pinky | SIX | 4+ |

Table 4. (Continued) Observed combinations of extended digits.
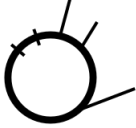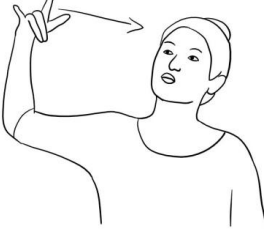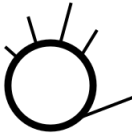
| Number of Extended Fingers | Extended Digits | Example | Orthographic Representation |
|---|---|---|---|
| one (cont) | 04*<br>thumb<br>pinky | TELEPHONE | 04s |
| two | 12<br>index<br>middle | BOYFRIEND | 12+ |
|  | 012<br>thumb<br>index<br>middle | CUT(SCISSORS) | 012s |
|  | 014*<br>thumb<br>index<br>pinky | AIRPLANE | 014s |
|  | 34#<br>ring<br>pinky | SEVEN (non-dominant hand) | (ND)34s |
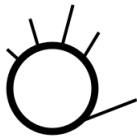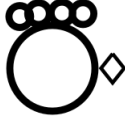
Table 4. (Continued) Observed combinations of extended digits.

| Number of Extended Fingers | Extended Digits | Example | Orthographic Representation |
|---|---|---|---|
| three | 123#<br>index<br>middle<br>ring | THREE | 123s |
| | 124*<br>index<br>middle<br>pinky | LOOK.AT | 124s |
| | 234#<br>middle<br>ring<br>pinky | THREE | 234s |
| four | 1234*<br>index<br>middle<br>ring<br>pinky | FOUR | 1234s |
| | 01234<br>thumb<br>index<br>middle<br>ring<br>pinky | WATER | 01234s |

### 5.1.1.2 Finger flexion

Flexion describes the position of the fingers. Straight fingers, as well as the three types of bending, are well-represented in LSSiv. Examples are shown in Table 5. A finger is 'bent' if the far knuckles (which do not attach to the palm) are bent. 'Tapered' fingers are bent at the first knuckle (attached to the palm) and straight at the other two, making an approximately 90-degree angle to the palm. If a finger bends at all three knuckles, it is 'rounded'. For the thumb, tapered and rounded positions indicate that it is rotated inward to sit in front of the palm rather than beside it.
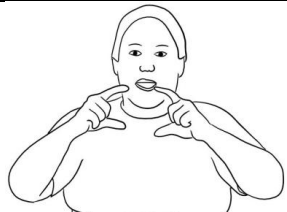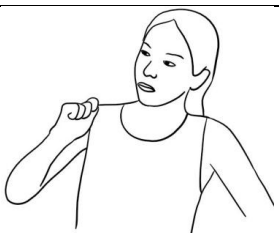
**Table 5. Flexion of the fingers.**

| Position | Hand | LSSiv Example | Orthographic Representation |
|---|---|---|---|
| straight | | ONE.HUNDRED | 01234s |
| bent | | SHARK | 0x1234b |
| tapered | | ANIMAL(FLOPPY.EARS) | 0s1234t |
| rounded | | USE.TELESCOPE | 0t1234r |

### 5.1.1.3 Finger contact
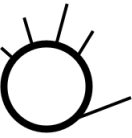
Fingers on a single hand may touch in two different ways. 'Contact' refers to the fingertips, and usually means that one or more fingertips is touching the tip of the thumb. Note that only tapered and rounded shapes may include this type of contact (with the exception of the index finger, which may contact the thumb while bent). Table 6 compares rounded and bent shapes in LSSiv that do and do not involve contact.

Table 6. Finger contact.

| Position | Hand | LSSiv Example | Orthographic Representation |
|---|---|---|---|
| no contact | | A.LOT(MONEY) | 01r |
| contact | | BEAN | 01rc |
| bent contact (index only) | | SCHOOL | 0x1bc |

'Spreading' describes the other type of contact. Fingers are 'spread' if the sides of the fingers do not touch and 'non-spread' if they do touch at the sides. Table 7 shows this difference in two signs with all fingers extended.

Table 7. Finger spreading.

| Position | Hand | LSSiv Example | Orthographic Representation |
|---|---|---|---|
| non-spread | | ANIMAL(EARS) | 01234+ |
| spread | | WAIT | 01234s |

### 5.1.1.4 Selected Fingers

Fingers are considered to be 'selected' when they are not only extended, but also participate in movement or contact performed during a sign. Again, 'fingers' does not include the thumb, which can be in a different position than the other digits (as in the third sign in Table 8). For all the examples in Tables 5-7 above, extended fingers are also selected. The majority of signs are configured this way. Table 8 gives examples of signs in which all extended fingers are also selected (bent, rounded, and tapered).

Table 8. Signs where all extended fingers are selected.

| Bent (012b) | Round (01234r) | Tapered (0s1234t) |
|---|---|---|
| CAMERA | BIG.EYES | ANIMAL(FLOPPY.EARS) |

The extended versus selected distinction is important, however, in signs where some extended fingers are in different positions than others. In LSSiv, this only occurs when all fingers and the thumb are extended, and selected fingers are involved in contact or movement. Shapes with this type of configuration are listed in Table 9 below.

Table 9. Selected fingers.
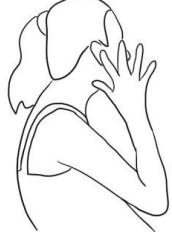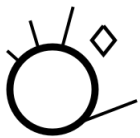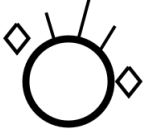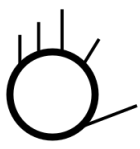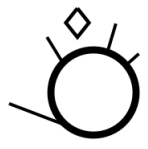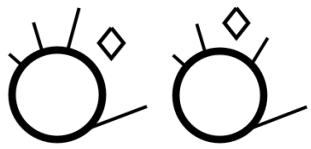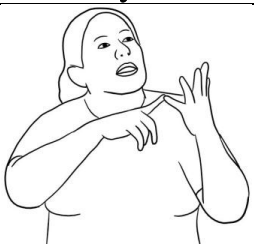
| Distinction | Selected Fingers | LSSiv Example | Orthographic Representation |
|---|---|---|---|
| contact with the thumb | 01<br>thumb<br>index | PICK.UP | 01tc(234s) |
| | 0123<br>thumb<br>index<br>middle<br>ring | PICK.UP (2-handed) | 01234rc(4+) |
| makes contact with location | 1<br>index | HEARING | 1t(0234s) |
| | 04<br>thumb<br>pinky | HAT | 04t(123s) |

Table 9. (Continued) Selected fingers.

| Distinction | Selected Fingers | LSSiv Example | Orthographic Representation |
|---|---|---|---|
| makes contact with location (cont) | 2 middle | SOMEONE | 01s234+ |
| is contact location | 2 middle | REMOVE.BARB (non-dominant) | (ND)2t0134s |
| participates in movement | 12 index middle | WALK(PERSON) | 1t0234s - 2t0234s |

Selected fingers are also used for lists. In Table 10, the pinky, ring, then middle fingers on the non-dominant hand taper individually to make contact with the dominant index finger. This can also continue to the index finger and thumb, and onto a second hand for longer lists.

Table 10. Selected fingers in lists.

| Pinky (ND)4t(0123s) | Ring (ND)3t(0124s) | Middle (ND)2t(0134s) |
|---|---|---|
| FIRST(IN.LIST) | SECOND(IN.LIST) | THIRD(IN.LIST) |

### 5.1.2 Orientation

Orientations are described in two parts: which way the palm faces (5.1.2.1) and which way the fingers point (5.1.2.2). To avoid confusion, descriptions are always given in that order (the palm, then the fingers). The same six values are used to describe both aspects; an orientation can be 1) *forward*, away from the signer, 2) *body*, toward the signer, 3) *up*, 4) *down*, 5) *in*, toward the middle or opposite side of the body, and 6) *out*, toward the periphery or same side of the body.
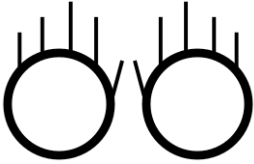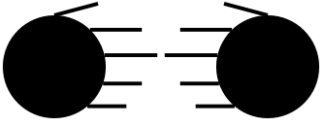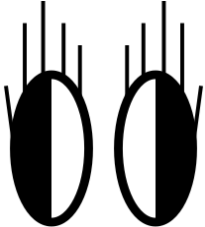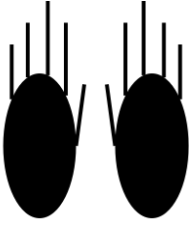
This system slightly diverges from many descriptions which use *in* and *out* for toward and away from the signer, respectively (here called *forward* and *body*). It is used to unify and simplify the description of signs where both hands face in or out (elsewhere described as one hand facing the dominant side of the body and the other facing the non-dominant side, or toward the same or opposite side of the body). In LSSiv, it is rare that both palms face left or right, but they do frequently face toward each other (in) or away from each other (out).

The tables below show that every palm, finger, and combined orientation (for a single hand) is used in LSSiv.

### *5.1.2.1 The palm and the fingers*

Table 11 shows signs with a simple 01234+ (all digits extended) shape using each palm orientation. (Note that white represents the palm and black represents the back of the hand in orthographic representations.)

Table 11. Palm orientations.

| Orientation | LSSiv Example | Orthographic Representation |
|---|---|---|
| palm forward | DOG.EARS | |
| palm body | BATHE | |
| palm in | COCONUT | |
| palm out | DEER | |
| palm up | BIRTHDAY | |
| palm down | CHILDREN | |

Finger orientations are always given as if the fingers are fully extended. For example, in a tapered shape with a *palm forward, fingers up* orientation, the fingertips actually point forward (see Table 12). Because the first knuckles (where the fingers join to the palm) are oriented upward (i.e. if the fingers were extended, they would point up), this is described as an *up* finger orientation. Table 12 gives examples of hands in different configurations with a *fingers up* orientation.

Table 12. Fingers up orientation with different handshapes.
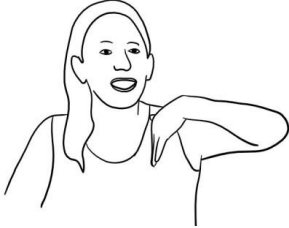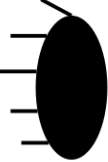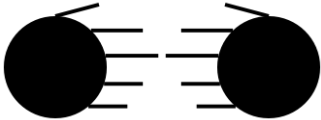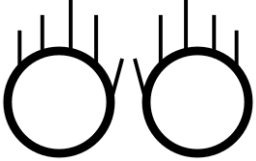
| Extended | Unextended | Bent | Tapered |
|---|---|---|---|
|  |  |  |  |

Table 13 on the following page shows that all six orientations are also possible for the fingers as well.

Table 13. Finger orientations.

| Orientation | LSSiv Example | Orthographic Representation |
|---|---|---|
| fingers forward | BIRTHDAY | |
| fingers body | NEIGHBOR | |
| fingers in | FATHER | |
| fingers out | BIG.BIRD | |
| fingers up | ANIMAL(EARS) | |
| fingers down | LONG.TIME.AGO | |

### 5.1.2.2 Combined orientations

Individual orientations combine into 24 physically possible complete orientations (palm + fingers). These are shown in Table 14 with their orthographic representations. All orientations are shown in a 01234s shape (all digits extended and spread), and the palms (P) along the vertical axis combine with the fingers (F) along the horizontal axis.

Table 14. Possible orientations.

| | F up | F down | F in | F out | F forw | F body |
|---|---|---|---|---|---|---|
| P forward | | | | | | |
| P body | | | | | | |
| P in | | | | | | |
| P out | | | | | | |
| P up | | | | | | |
| P down | | | | | | |

Every possible orientation is used in LSSiv, though some are much more common than others (see section 6.2). Table 15 gives examples of signs each orientation. Rare combinations are marked with an asterisk (*).

Table 15. Orientations in LSSiv.
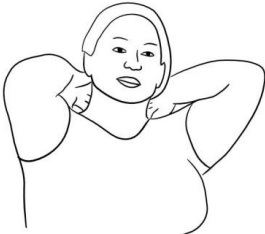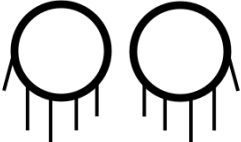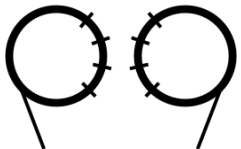
| Orientation | Example 1 | Orthographic Representation |
|---|---|---|
| **fu**<br>palm forward<br>fingers up | ANIMAL.EARS | |
| **fd***<br>palm forward<br>fingers down | PILLOW | |
| **fi***<br>palm forward<br>fingers in | BAD | |
| **fo***<br>palm forward<br>fingers out | DANCE (hands alternate) | |
| **bu**<br>palm body<br>fingers up | BOYFRIEND | |
| **bd**<br>palm body<br>fingers down | LONG.TIME.AGO | |

Table 15. (Continued) Orientations in LSSiv.
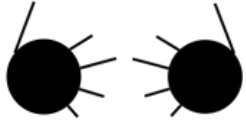
| Orientation | Example 1 | Orthographic Representation |
|---|---|---|
| **bi**<br>palm body<br>fingers in | BATHE | |
| **bo***<br>palm body<br>fingers out | SWIM(TURTLE) (hands alternate) | |
| **uf**<br>palm up<br>fingers<br>forward | BIRTHDAY | |
| **ub***<br>palm up<br>fingers body | HOLD.UP | |
| **ui**<br>palm up,<br>fingers in | FATHER | |
| **uo***<br>palm up<br>fingers out | CAT (loan) | |

Table 15. (Continued) Orientations in LSSiv.
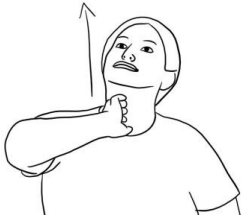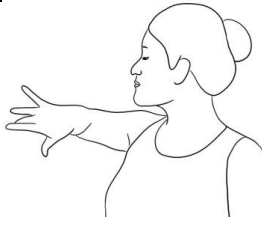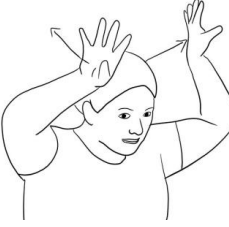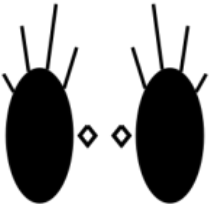
| Orientation | Example 1 | Orthographic Representation |
|---|---|---|
| **df**<br>palm down<br>fingers<br>forward | BUTTERFLY | |
| **db**<br>palm down<br>fingers body | PRETTY (after movement) | |
| **di**<br>palm down<br>fingers in | NICE(PLACE) (before movement) | |
| **do***<br>palm down<br>fingers out | BIG.BIRD | |
| **if**<br>palm in<br>fingers<br>forward | AFRAID | |
| **ib***<br>palm in<br>fingers body | LONG.NECK | |

Table 15. (Continued) Orientations in LSSiv.

| Orientation | Example 1 | Orthographic Representation |
|---|---|---|
| **iu**<br>palm in<br>fingers up | PRETTY | |
| **id***<br>palm in<br>fingers down | LAY.EGG | |
| **of***<br>palm out<br>fingers<br>forward | STEAL | |
| **ob***<br>palm out<br>fingers body | NO.MONEY | |
| **ou**<br>palm out<br>fingers up | DEER | |
| **od***<br>palm out<br>fingers down | DROWN (hands alternate) | |

### 5.1.3 Location and signing space

The signing space for LSSiv is relatively large, including essentially anywhere the arms can reach. As well as many points on the body, it extends in front of, above, and around the torso. Frequent use of the legs also expands the typical range. Specific locations (points of contact and approach) are described below. Additionally, any part of the body being referenced can be incorporated into a sign, or simply indexed (by pointing).

Table 16 gives the symbols for proximity, which indicate how close a sign comes to making contact with its location. In many cases, how far a sign moves toward or away from the body is also morphologically significant (see 8.3.2). This means that some of the locations below can include a range of space near the given, or pictured, point.

Table 16. Proximity symbols.

| Fingertip Contact (T) | Hand Contact (C) | Near (N) | Far (F) |
|:---:|:---:|:---:|:---:|
| ✳ | ✕ | ◯ | ◌ |

Table 17 shows the locations that are used in LSSiv, from the top down. Rare locations are marked with an asterisk (*).

Table 17. Locations.
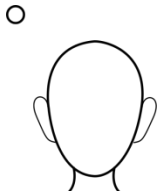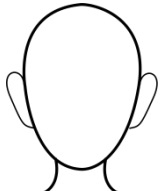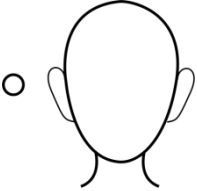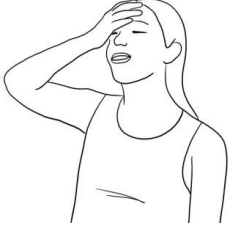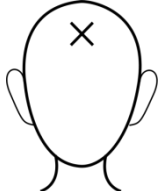
| Location | Example | Orthographic Representation |
|---|---|---|
| **high** <br> over the head | AIRPLANE | LNh high D |
| **h top** <br> top of head | CUT.HAIR | LNh top D |
| **f** <br> in front of face | BLACK/DARK | Lf |
| **h mid\*** <br> beside head | EGG | LNh mid D |
| **fh\*** <br> forehead | HEADACHE | LCfh |
| **temp** <br> temple | COW | LCtemp D/ND |

Table 17. (Continued) Locations.
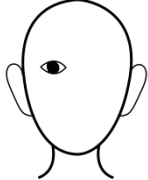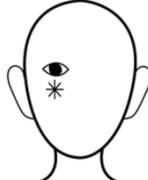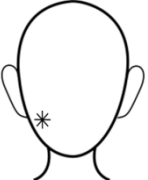
| Location | Example | Orthographic Representation |
|---|---|---|
| **eye\*** | BIG.EYES | LNeye D/ND |
| **eye under** <br> cheek under eye | ONION | LTeye under D |
| **n** <br> nose | GUERRILLA | LCn |
| **chk** <br> cheek | COCA | LTchk D |
| **ear\*** | DEAF | LTear D |
| **lip\*** <br> upper lip | MOUSTACHE | LTlip D/ND |

Table 17. (Continued) Locations.
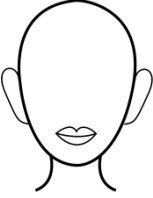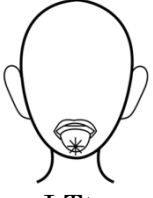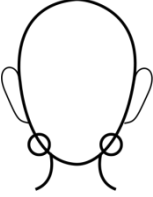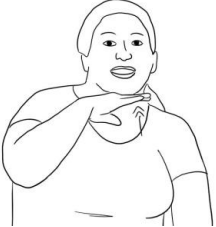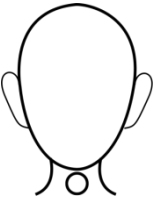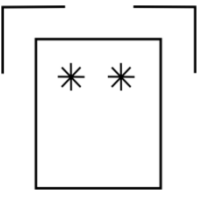
| Location | Example | Orthographic Representation |
|---|---|---|
| **m**<br>mouth | BRUSH.TEETH | LNm |
| **to\***<br>tongue | SALT | LTto |
| **j**<br>jaw | CRAB | LNj D/ND |
| **chin\*** | FATHER | LCchin |
| **neck** | DIE | LNneck |
| **zero high**<br>chest | MONKEY | LTzero high D/ND |

Table 17. (Continued) Locations.
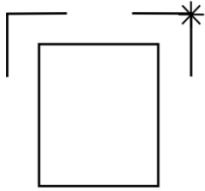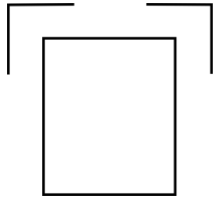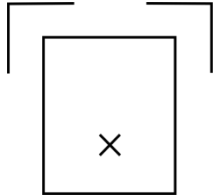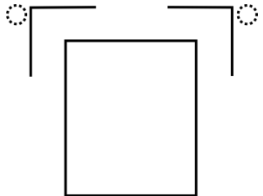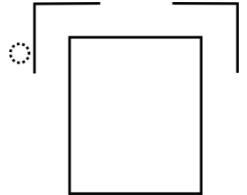
| Location | Example | Orthographic Representation |
|---|---|---|
| **sh** <br> shoulder (cross) | DOCTOR | LTsh ND |
| **zero** <br> in front of the chest / torso | GRADUATION | Lzero |
| **zero low** <br> stomach | STOMACHACHE | LCzero low |
| **zero out** <br> wide zero space | BIG.BIRD | LFzero high D/NDout |
| **zero far** <br> far in front of the signer | LONG.TIME.AGO | LFzero Dout |
| **elbow\*** <br> non-dominant elbow | POOR (loan) | LCelbow |

Table 17. (Continued) Locations.
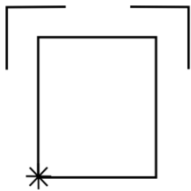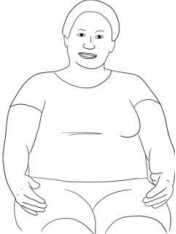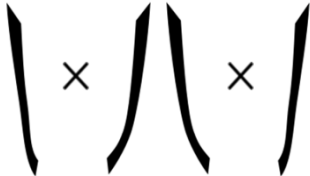
| Location | Example | Orthographic Representation |
|---|---|---|
| **arm*** non-dominant arm | SHAVE.BODY | LCarm |
| **ND** non-dominant hand | PAINT | LTnd |
| **hip** | SHOT/VACCINE | LThip D |
| **thigh*** | SHORTS | LCthigh D/ND |
| **knee*** | PAIN | LCknee D/ND |
| **calf*** | FLY | LCcalf ND |

Table 17. (Continued) Locations.

| Location | Example | Orthographic Representation |
|---|---|---|
| foot* | HIGH.HEEL | LNfoot ND |
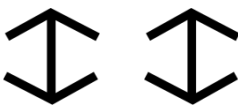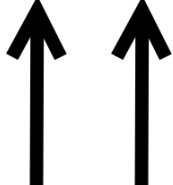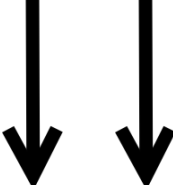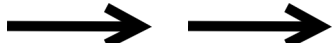
### 5.1.4 Movement

Some signs are stationary, but many involve movement of one or more types. Movement can be broken down into direction, 'type', and a few other features. Some signs use simple movement which can be described with one feature, and some signs use movements that combine one or more features from each of these categories. (Note that this section discusses movement of the hands only. The use of the face and other body parts is discussed in section 5.1.5.)

#### *5.1.4.1 Direction*

Simple directional movement is described using the same six terms as orientation: forward, body, up, down, in, and out (remember that *in* and *out* describe side-to-side movement). For two-handed signs, 'left', and 'right' are added, distinct from *in* and *out*. *In* and *out* describe both hands moving inward (toward each other) or both hands moving outward (away from each other). For a right-handed signer, a sign in which both hands move 'left' is moving *in* for the dominant hand and *out* for the non-dominant hand. Combinations of these terms can create diagonal paths. Table 18 gives examples of signs using each direction (videos ch5t18, BC2-002 through BC2-006[2]). (Note that wide arrows representing forward and bodyward movement are distinct from narrow arrows for upward and downward.)

Table 18. Directional movement.

| Direction | Example | Orthographic Representation |
|---|---|---|
| forward body | HARVEST(COCA) | Mfb alt |
| up | INCREASE | Mu |
| down | BACKPACK | Md |
| in | BELT | Mi |
| out | DEER | Mo |
| left | GO.TOGETHER | Ml |
| right | SIDE.BY.SIDE | Mr |

## 5.1.4.2 Type

A movement's type gives more information about its path, such as an arced, zigzagged, or repeated motion. LSSiv signs can be described using eight types, which are described with examples in Table 19 (videos ch5t19, BC2-007 through BC2-0142).

Table 19. Types of movement.
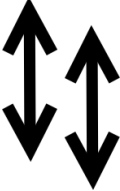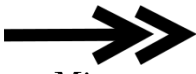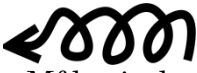
| Movement Type | Example | Orthographic Representation |
|---|---|---|
| **alt**<br>alternate<br>hands move back and forth<br>in opposite directions | DRIVE | Mud alt |
| **arc**<br>movement path with an<br>arced shape | BOWL | Mob arc |
| **bounce**<br>small repeated arcs | FROG | Mi bounce |
| **circle**<br>circular path | BLACK/DARK | Mid circle |
| **rep**<br>repeat<br>moves on given path more<br>than once | MACHETE | Mi rep |

Table 19. (Continued)  Types of movement.

| Movement Type | Example | Orthographic Representation |
|---|---|---|
| **spiral** <br> continuous circular movement | CONTINUE | Mfd spiral |
| **wiggle** <br> smooth alternation along a path | FISH | Mi wiggle |
| **zigzag** <br> sharp alternation along a path | DRAW | Mdo zigzag |

### *5.1.4.3 Other aspects*

Other aspects of movement, those which are not directly related to a path, involve contact or small movements of the wrists and fingers. These additional features, and the symbols that represent them, are shown by the signs in Table 20 (videos ch5t20, BC2-015 through BC2-018[2]).
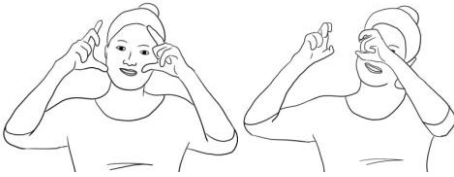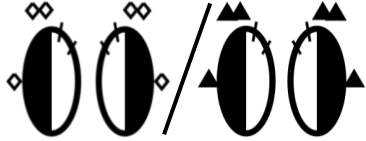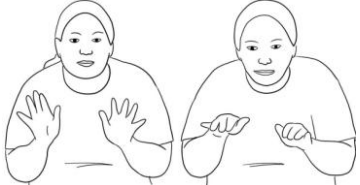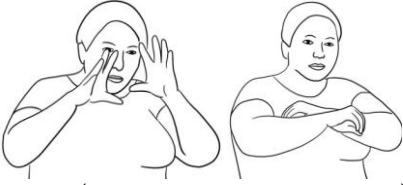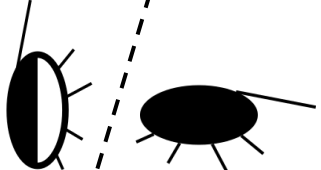
Table 20. Other movement features.

| Movement Type | Example | Orthographic Symbol |
|---|---|---|
| **contact**<br>the end point of movement is contact with a location | PLUG.IN | Mi contact |
| **tap**<br>quick repeated contact on a given point | BREAD | M tap |
| **shake**<br>small, repeated rotation | COCONUT | M shake |
| **wiggle fingers**<br>fingers move individually | COMPUTER | M wf |

### *5.1.4.4 Handshape and orientation changes*

Many movements involve a change in handshape or orientation from the beginning to the

end of a sign. Phonologically, these are still considered to be movements, and will be

discussed as such in Chapter 6, hence the use of the movement terminology introduced

below. For orthographic purposes, however, these movements are described as a starting (s)

and ending (e) handshape and orientation rather than using an additional movement

symbol. Repetition is marked by a dashed rather than solid line between beginning and

ending shapes. Types of handshape and orientation changes used in LSSiv are given in

Table 21 (videos ch5t21, BC2-019 through BC2-025[2]).

Table 21. Movements that change handshape and orientation.

| Movement Type | Example | Orthographic Representation |
|---|---|---|
| **bend**<br>finger(s) move from straight to bent position | CAMERA | Ds iu012t De b<br>NDs iu012t NDe b |
| **bend wrist**<br>wrist joint bends | GIVE.ME | D/NDs uf01234+<br>D/NDe bu |
| **taper**<br>fingers move from straight to tapered | HOP | D/NDs fu01234+<br>D/NDe 1234t |
| **close**<br>fingers move from extended to fist or to tapered/rounded with contact | NIGHT (also orientation change) | D/NDs iu01234s<br>D/NDe dit |
| **open**<br>fingers extend from fist or straighten from tapered/rounded | BEAUTIFUL | D/NDs bu 01234-<br>D/NDe s |
| **rotate**<br>wrist rotates | KIND.OF (repeated movement) | Ds if 01234s<br>De df |
| **spread/unspread**<br>fingers alternate between spread and unspread position | CRAB (repeated movement) | D/NDs fu12+<br>D/NDe fus rep |

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### 5.1.5 Non-manuals

LSSiv uses a large variety of non-manuals, aspects which are not expressed on the hands. The majority of these appear on the face, but several other body parts may also be used (see section 5.1.5.3). Paying attention to non-manuals is often necessary in order to understand a sign or sentence. They may be the only factor which distinguishes two signs (see section 6.5.2), indicate that a sentence is a question (9.4.1), act as an adjective or adverb (8.4.2.1), negate a statement (8.6.2), or even act alone as a completely non-manual sign (6.5.1).

Non-manual features are often compared to tone and intonation in spoken languages (Dachkovsky & Sandler 2009). They may act as 'tone' when they are part of a lexical sign, required to distinguish one lexeme or morpheme from another. They can also act as 'floating tones', which are independently meaningful and can attach to other morphemes, or as 'intonation' at a phrasal level. They are necessary to create questions, emphasis, topicalization, and quotatives (see Chapter 9).

This section discusses the non-manual features which are used in LSSiv, and gives some signs as examples. The following chapters give more information on the function and use of specific forms.

### *5.1.5.1 Facial expression*

The eyebrows, eyes, nose, cheeks, and mouth are all used in LSSiv, often in combination with each other. Tables 22-25 below list the observed forms of each feature, excluding the neutral position. Images rather than line drawings are used here for clarity. Note that facial expressions often use more than one facial feature at a time. Descriptions in these examples focus on the identified feature only (e.g. only the eyebrows are described in the eyebrow table even when the mouth is also in a non-neutral position).

Table 22. Eyebrows.

| Position | Example | Orthographic Representation |
|---|---|---|
| **raised** | YN (yes-no question) | NMBr |
| **furrowed** | in Q (content question) | NMBf+ |
| **raised toward center** 'worried' | in SNAKE | NMBrc |

Table 23. Eyes.[3]
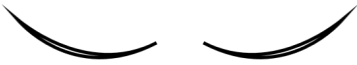
| Position | Example | Orthographic Representation |
|---|---|---|
| closed | FORGET | NMEcl |
| squinted | in FAR | NMEsq |
| wide<br>eyes open wide | SEE+SURPRISE | NMEwide |
| upward gaze | HEAVEN | NMGu |
| downward gaze | in CUT | NMGd |

Table 24. Nose and cheeks.
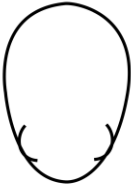
| Position | Example | Orthographic Representation |
|---|---|---|
| wrinkled nose | in DIRTY | NMnw |
| puffed cheek | COCA | NMCHK out D |
| puffed cheeks | BIG | NMCHK out |

Table 25. Mouth.
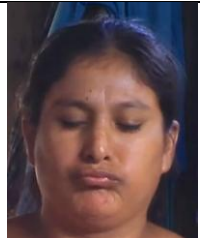
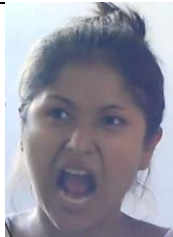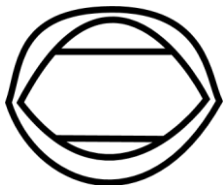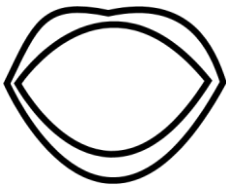| Position | Example | Orthographic Symbol |
|---|---|---|
| **inverted**<br>lips closed and turned inward | HOLD.IN.MOUTH | NMMinv |
| **frown** | DIE | NMMfr |
| **tongue out** | negation | NMMto |
| **grin**<br>small smile | in CONTENT | NMMgrin |
| **smile** | SMILE | NMMsm |
| **rounded lips** | in (BUILD)FIRE | NMMrnd |

Table 25. (Continued) Mouth.

| Position | Example | Orthographic Symbol |
|---|---|---|
| **pursed lips (rounded)** lips pushed forward and rounded | in ELEPHANT | NMMpurse |
| **purse lips (closed)** lips pushed forward and closed | USE (verbalizer) | NMMpurse+ |
| **purse lips (open)** lips pushed forward and slightly open | SMALL | NMMpurse open |
| **wince** lips pulled back to show teeth clenched | in KILL.PIG | NMMwince |
| **grimace** mouth wide open to show teeth | in CROCODILE | NMMgr |
| **open** | in FAR | NMMopen+ |

### 5.1.5.2 Mouthing and sounds

The mouthing of Spanish and Quechua words is another important non-manual component of several LSSiv signs. In some cases, this is the only, or the most prominent, distinction between similar items. It is frequently used for proper nouns, and its functions resemble the way that initialization (use of the handshape of a fingerspelled letter) is used in more institutionalized sign languages which more frequently use fingerspelling. For example, the ASL signs for FAMILY, GROUP and TEAM, are identical except for the use of 'F', 'G', or 'T' handshapes (see Appendix D; see 5.2.1 for LSP examples). Mouthing in LSSiv distinguishes between pairs like FRIEND and SIBLING or ORANGE and TOMATO (see 8.4.2.3).

A small number of sounds are also part of LSSiv. Though this is seen in other sign languages as well, one reason for their use in LSSiv could be the large proportion of hearing people in the signing community. Sounds are certainly used as a way to get a hearing person's attention, and since the young children currently in the community are hearing, sounds are also more prevalent in child-directed signing. Sounds used in signs like the buzzing lips of DRIVE (see 8.4.2.3) or the sighing sounds used in certain exclamations may have morphological significance. This is an aspect that can be explored more in the future.

### 5.1.5.3 Other non-manuals

Frequently, other parts of the body are used in individual signs and morphemes, as well as for syntactic or prosodic distinctions. Frequency of use seems to decrease as features move away from the head, which is a rather common occurrence, down to the feet, which are used quite rarely. Table 26a and Table 26b give examples of signs using more (a) and less (b) frequent parts of the body (videos ch5t26, BC2-026 through BC2-030[2]). These will be discussed more in depth as they are relevant to the following sections.

Table 26a. Additional non-manuals (frequent).

| Body Part | Example(s) | |
|---|---|---|
| head | ROOT.AROUND | DREAM |
| | OTTER | HEAVY |
| torso | DRAGONFLY | SIT |

Table 26b. Additional non-manuals (rare).

| Elbows | Knees | Foot |
|---|---|---|
| CHICKEN | MARCH | KICK |

## 5.2 Exceptional features

It has been noted in sign linguistics (Klima and Bellugi 1979; Wilcox 1992; Keane 2014)
that the phonetics of fingerspelling and numbers differs from other signs. They often utilize
a larger variety of handshapes and less movement than natural signs, likely in no small

part due to the fact that fingerspelling is at its core a tool to express spoken language manually rather than an essential part of a sign language's vocabulary.

### 5.2.1 Fingerspelling

In the case of LSSiv, fingerspelling is rarely used, as deaf members of the Sivia signing community know little Spanish, and do not usually write. The LSP alphabet has been introduced by visitors from larger cities, but its use among Sivia signers is infrequent and unfamiliar (see ch5fs, BC2-031[2]). Certain words, usually proper nouns like place names, are often conveyed by drawing the first few letters in the air, on the palm, on the thigh, or on the ground (see ch5num, BC2-032[2]). This system is also used for larger numbers, years, and clarification, especially between deaf and hearing individuals. Another common method for clarification is the use of mouthing, in many cases an exaggerated version of the spoken word or name.

Initialization is also rare. Mouthings of proper nouns are sometimes, but not always, accompanied by the first fingerspelled letter of the word. Initialization is seen in some loans from LSP, such as *red* (though the shape (12X) is usually changed to the uncrossed version (12+), which is a naturally-occurring LSSiv handshape. This is one of the ways that the two languages are distinct. Table 27 shows four handshapes that LSSiv does not use with examples of initialized LSP signs. The handshapes for 'U' and 'M/W' are also used in unrelated LSP signs like BULLY and PASTA.

Table 27. Initialized LSP signs using handshapes not used in LSSiv.[4]

| M/W (123s) | P (0t1+2b) | R (12X) | U (14+) |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |
| SEA (Sp. *mar*) | FATHER (Sp. *papá*) | RAT | UNIVERSE |

Another frequent use for initialization is in namesigns. While there are several LSSiv namesigns which are initialized, these signs are rarely used. They may be the way someone is formally introduced, but in most cases, they are not how signers refer to community members. Most people also have a namesign which is based on their appearance or personality with no reference to a written name. These second (or third, in some cases) namesigns are the ones that are actually used. (Even my B-shaped namesign given by LSP signers was quickly changed in Sivia to a reference to my unusual blue eyes.)

### 5.2.2 Numbers

Numbers make use of each finger individually, so more handshapes are needed to express them. There are three combinations of extended fingers listed above which are used exclusively for numbers (34+, 123+, 234+), seen in Table 28a. Two more of the identified handshapes are extremely rare outside of the number system, used in only one or two additional signs. These are termed 'predominately' number shapes, seen in Table 28b.

Table 28a. Exclusive number shapes.
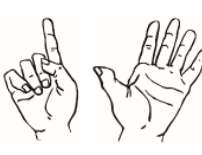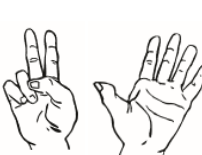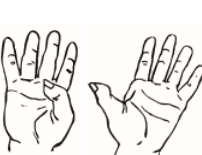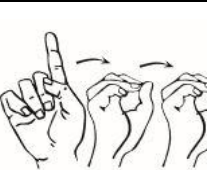
| 34s (ring, pinky) | 123s (index, middle, ring) | 234s (middle, ring, pinky) |
|---|---|---|
|  SEVEN |  THREE |  THREE |

Table 28b. Predominately number shapes.

| 4+ (pinky) | 1234s (index, middle, ring, pinky) |
|---|---|
|  SIX |  FOUR |

This is another area where LSP and LSSiv differ. Aside from lexical differences in basic numbers (THREE, SIX, SEVEN, and EIGHT), multiples of ten in LSSiv are expressed through repetition (and facial expression in the case of 10 versus 100; see 8.4.2.3) rather than individual digits as in LSP. These signs are compared in Table 29. Numbers marked with an asterisk are sometimes expressed the same way in both languages (NINE and TEN more often than THREE).

Table 29. Numerals in LSSiv and LSP.[5]

| Number | LSSiv | | LSP | |
|---|---|---|---|---|
| THREE* | 234s | 123s | 012s | 123s |
| SIX | D4+ ND01234s | 4+ | 123s | D1+ ND01234s |
| SEVEN | D34s ND01234s | | 124+ (03rc124s) | D12s ND01234s |
| EIGHT | D234s ND01234s | | 134s (02rc134s) | D123s ND01234s |
| NINE* | D1234s ND01234s | | 234s (01rc234s) | D1234s ND01234s |
| TEN* | D01234s ND01234s | | 0+ Mshake | D01234s ND01234s |
| ONE.HUNDRED | D1234s ND01234s NMnw Mgr | | 1+, 01234rc, 01234rc | |

Lists also utilize hand configurations which do not appear elsewhere in the lexicon. Lists are made by touching the dominant index finger to individual fingers on the non-dominant hand. The non-dominant hand is (usually) in an open (01234s) shape with all fingers extended. Each finger that the dominant index touches becomes a selected finger on the non-dominant hand. This means that in lists, any finger can be selected, as opposed to what is found in the rest of the lexicon where only the index and (rarely) middle finger may be selected on an open hand. Table 30 shows this process. (Lists start with the pinky in LSSiv rather than the thumb as in LSP.)

**Table 30. List using selected fingers on the non-dominant hand.**

| FIRST(IN.LIST) | SECOND(IN.LIST) | THIRD(IN.LIST) |
|---|---|---|
| ND4t (0123s) | ND3t (0124s) | ND2t (0134s) |

## 5.3 Transcription and Orthographic Structure

All of the features, codes, and symbols given in this chapter are used to describe and depict signs throughout the rest of this dissertation. The full system is explained on SiLOrB's website (https://bleegiimuusclark.com/home/silorb-sign-language-writing/), but this section provides an overview of how to read the phonetic details in a transcription and how these details are organized into an orthographic representation of an entire sign. Note that the conventions for LSSiv at this point represent a somewhat narrow phonetic view of the language' s structure.

### 5.3.1 Transcription

The number and letter codes that accompany the symbols provided above are used to transcribe phonetic details. These codes are arranged into several ordered categories and subcategories which correspond to the features described above. In general, higher level categories (e.g. hands, location, movement) are identified by capital letters, then lowercase codes describe the configuration of that category (e.g. all fingers extended, forward movement). The order for each category is given below, with step-by-step transcriptions of a few examples. A full list of codes and conventions is available in Appendix C.
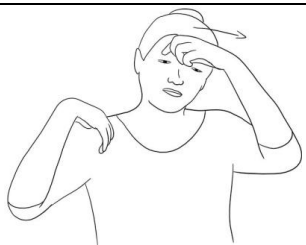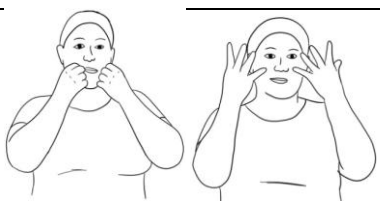
#### *5.3.1.1 Hands*

The hands are the first aspect to be described. There are up to six parts to a hand transcription, which must be used in the order presented below. The last two steps (digits and configuration) can be repeated to describe fingers in different positions. For ending shapes, only changes are coded, and when all digits (the fingers and the thumb) are in the same position, they do not need to be listed (e.g. all digits extended and spread can be coded as 's' instead of '01234s'). Table 31 shows how the phonetic details of the hands of four signs are transcribed in this system.

**Hand Descriptors**
1. dominant (D) or non-dominant (ND)
(2. if shape or orientation changes during the sign, starting (s) or ending (e) shape)
3. palm orientation
4. finger orientation
5. digits
6. configuration

Table 31. Hand transcription examples.

| Sign | Description | Code |
|---|---|---|
| COFFEE | 1/2. dominant hand (D)<br>3. palm forward (f)<br>4. fingers up (u)<br>5. thumb and index (01)<br>6. tapered (1) | Dfu01t |
| SWEAT | 1/2. dominant / non-dominant hand (D / ND)<br>3. palm down (d)<br>4. fingers in (i)<br>5. index (1)<br>6. bent (b) | Ddi1b<br>NDdi1b |
| CACAO | 1/2. dominant hand (D)<br>3. palm down (d)<br>4. fingers in (i)<br>5/6. all fingers bent (b)<br><br>1/2. non-dominant hand (ND)<br>3. palm up (u)<br>4. fingers in (i)<br>5. thumb (0)<br>6. spread (s)<br>5. other fingers (1234)<br>6. extended (+) | Ddib<br><br><br><br>NDui0s1234+ |
| BEAUTIFUL | 1. dominant / non-dominant hand (D / ND)<br>2. starting shape (s)<br>3. palm body (b)<br>4. fingers up (u)<br>5/6. fist (-, Ø)<br><br>1. dominant / non-dominant hand (D / ND)<br>2. ending shape (e)<br>5/6. all fingers spread (s) | Dsbu-<br>NDsbu-<br><br><br><br>Des<br>NDes |

### 5.3.1.2 Location

Table 32 describes the same signs from Table 31 in terms of location. A mid-central location

on the same side of the body as the hand (ipsilateral zero space) is the default (Ø), so

location descriptions can be thought of as modifications to that position. (Note that in

SWEAT, the alternating position of the hands is described in movement; see 5.3.1.3.)

Location descriptions begin with L, then specify up to four parameters, listed below.

If necessary, D and ND are used for each hand and e and s are used for starting and ending

locations, as in hand transcription.

**Location Descriptors**
1. proximity
2. region
3. vertical position
4. horizontal position

**Table 32. Location transcription examples.**

| Sign | Description | Transcription |
|---|---|---|
| COFFEE | 1. near (N)<br>2. zero space (zero)<br>3. high (hi) | LNzero hi |
| SWEAT | 1. contact (C)<br>2. forehead (fh) | LCfh |
| CACAO | 1. fingertip contact (T)<br>2. non-dominant hand (nd) | LTnd |
| BEAUTIFUL | 1. near (N)<br>2. mouth (m) | LNm |
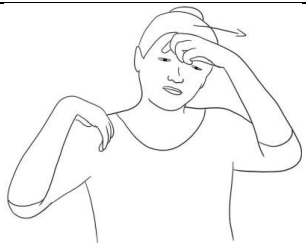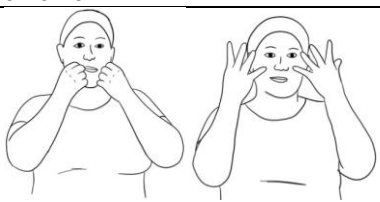
## 5.3.1.3 Movement

Movements begin with M, then proceed with up to four types of codes, listed below. Table 33 shows how these codes are used to continue transcribing the same four signs.

**Movement Descriptors**
1. hand being described (if only one in a two handed sign, or if the hands move differently)
2. direction
3. type
4. other aspects

**Table 33. Movement transcription examples.**

| Sign | Description | Transcription |
|---|---|---|
| COFFEE | no movement | Ø |
| SWEAT | 1/2. outward (o)<br>4. alternate (alt) | Mo alt |
| CACAO | 1. dominant hand (D)<br>2. outward (o)<br>4. repeated (rep) | MDo rep |
| BEAUTIFUL | 1/2. forward (f)<br>3. short (short) | Mf short |

### 5.3.1.4 Non-manuals

Non-manual aspects are generally described from the top down. After the NM code, a capital letter feature (e.g. B for eyebrow) is specified, followed by its position in lowercase. (If the feature is only used on one side, D or ND is used after the position.) This can be repeated indefinitely until every aspect is coded. Features in a neutral position do not need to be included. Because the four signs used in Tables 31-33 do not use many non-manuals, three unrelated expressions are described in Table 34.

**Table 34. Non-manual transcription examples.**

| Example | Description | Transcription |
|---|---|---|
|  | 1. brow (B)<br>2. (very) furrowed (f+)<br>1. eyes (E)<br>2. squinted (sq)<br>1. mouth (M)<br>2. rounded (rnd) | NMBf+ Esq Mrnd |
|  | 1. cheek (CHK)<br>2. out<br>3. D | NMCHKout D |
|  | 1. brow (B)<br>2. raised (r)<br>1. mouth (M)<br>2. tongue out (to) | NMBr Mto |
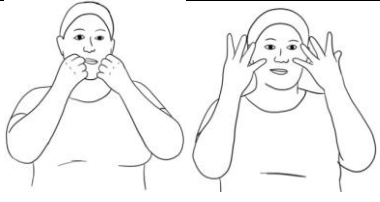
### 5.3.1.5 Full transcription

To put the transcription together, simply write out all pieces in the order they have been presented above. Table 35 gives full transcriptions of the signs from Tables 31-33 with hand, location, and movement codes.

## Sign Descriptors
1. Hands
2. Location
3. Movement
4. Non-manuals

**Table 35. Full transcriptions.**

| Sign | Description | Transcription |
|---|---|---|
| COFFEE | 1. dominant hand (D): palm forward (f), fingers up (u), thumb (0) and index (1) tapered (t)<br><br>2. location (L): zero space (zero) | Dfu01t<br><br>Lzero |
| SWEAT | 1. dominant / non-dominant hand (D/ND): palm down (d), fingers in (i), index (1) bent (b)<br><br>2. location (L): contact (C) on forehead (fh)<br><br>3. movement (M): outward (o) alternating (alt) | Ddi1b<br>NDdi1b<br><br>LCfh<br><br>Mo alt |
| CACAO | 1.1 dominant hand (D): palm down (d), fingers in (i), all bent (b)<br><br>1.2 non-dominant hand (ND): palm up (u), fingers in (i), thumb (0) spread (s), fingers (1234) extended (+)<br><br>2. location (L): fingertips contact (T) non-dominant hand (nd)<br><br>3. movement (M): dominant hand (D) outward (o) repeated (rep) | Ddib<br><br>NDui0s1234+<br><br>LTnd<br><br>MDo rep |
| BEAUTIFUL | 1.1 dominant / non-dominant hand (D/ND) starting shape (s): palm body (b), fingers up (u), fist (-)<br><br>1.2 dominant / non-dominant (D/ND) ending shape (e): all spread (s)<br><br>2. location (L): near (N) mouth (m)<br><br>3. movement (M): forward (f) short (short) | Dsbu-<br>NDbu-<br><br>Des<br>NDes<br><br>LNm<br><br>Mf short |

### 5.3.2 Orthography
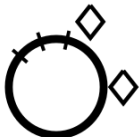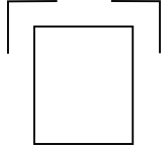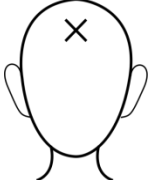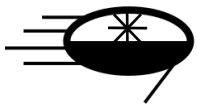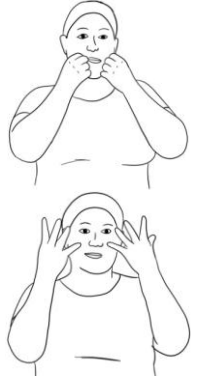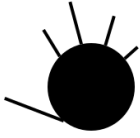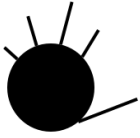
The orthographic representation of a sign is built using a grid of symbols (full list at

https://bleegiimuusclark.com/home/silorb-sign-language-writing/) that represent combina-

tions of phonetic features (see figure 1). Signs are built outward from a center location box

(L), to the hands on either side (D and ND), and movement on either side of the hands (MD

and MND). Non-manuals (NM) are placed in boxes on the right edge. The orthography

depicts signs as if a right-handed signer were facing the reader, so the dominant hand is on

the left and the non-dominant hand is on the right. When hand features change during a

sign, the hand box is split diagonally, with the starting shape in the top left, and the ending

shape in the bottom right. A solid line indicates one movement and a dashed line means

repeated movement (a more detailed explanation of each box is available on SiLOrB's basic

structure page).

**Figure 1. Orthography grid.**

| MD(cont) | MD | D | L | ND | MND | MND(cont) | NM | NM(cont) |
|---|---|---|---|---|---|---|---|---|
| movement (extras) | movement (direction/path) | dominant hand | location | non-dominant hand | movement (direction/path) | movement (extras) | non-manuals | non-manuals |
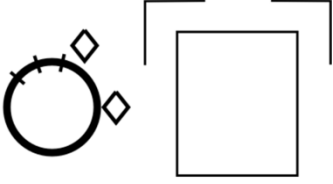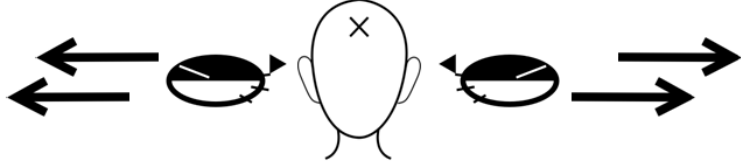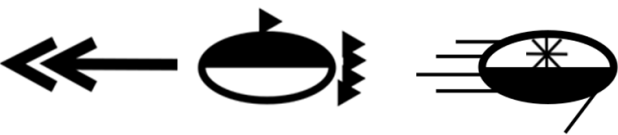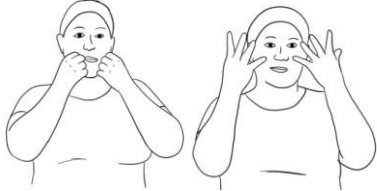
The same examples that have been transcribed above (Table 35) can now be turned

into their orthographic forms. First, each part of the transcription is turned into a

corresponding symbol, as shown in Table 36.

**Table 36. Transcriptions to orthographic symbols.**

| Sign | Movement | Dominant Hand | Location | Non-dominant Hand | Movement |
|---|---|---|---|---|---|
| COFFEE | Ø | Dfu01t | zero | Ø | Ø |
| SWEAT | Mo alt | Ddi1b | LCfh | NDdi1b | Mo alt |
| CACAO | Mo rep | Ddi 01234b | LTnd NDui0s1234+ | | Ø |
| BEAUTIFUL | Mf short | Ds bu-  Des | LNm | NDs bu-  NDes | Mf short |

The final step is to put the symbols together for the finished orthographic form of each sign, as shown in Table 37.

Table 37. Completed orthographic representations.

| Line Drawing | Orthographic Representation |
|---|---|
| COFFEE | Dfu01t Lzero |
| SWEAT | Ddi1b NDdi1b LCfh Mo alt |
| CACAO | Ddib NDui0s1234+ LTnd MDo rep |
| BEAUTIFUL | Dsbu- NDbu- Des NDes LNm Mf short |

## 5.4 Summary

In this chapter, the features used to describe the phonetic form of LSSiv signs are described, and corresponding transcription and orthographic systems are introduced. Signs can be broken down into handshape, orientation, location, movement, and non-manual aspects. LSSiv has a varied inventory of possibilities for each of these categories, but non-manual aspects are particularly abundant. As in many sign languages, there is a difference between the phonetics of general lexical signs and numerical signs. The use of numbers and fingerspelling also show distinctions between LSSiv and LSP.

The notation and transcription system presented here is a way to quickly give details about a sign, and allows the user to focus on only relevant features rather than treating the sign as a (spatial) whole, as in an image or video. The orthography allows a sign to be represented as a lexeme (including any of its variants, for example), rather than a translation or a specific realization that an image or line drawing captures. Though not an entirely new concept, I hope that the revised version presented here will be useful to sign language description and analysis.

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Chapter 5 endnotes

[1] At this point in the SiLOrB's development, it is intended to accurately depict LSSiv. Phonetic or phonological aspects of other sign languages may not be represented. There is room for expansion and improvement in the future (see https://bleegiimuusclark.com/home/silorb-sign-language-writing).

[2] Clips referenced in this chapter are available at https://bleegiimuusclark.com/lssiv-grammar-examples/ and https://scholarspace.manoa.hawaii.edu/handle/10125/34525, BC2-002 through BC2-032.

[3] See 10.7.3 for more on eye gaze.

[4] Images from Ministerio de Educación 2010.

[5] LSP images from Ministerio de Educación 2010.

# CHAPTER 6. PHONOLOGY

The goal of this section on phonology is to begin to identify the features necessary to describe an LSSiv sign at the most basic underlying phonological level. This set of features differs from the surface descriptions given in Phonetics (Chapter 5) because it examines the conditions under which each characteristic can be predicted by other aspects of a sign. Where there is variation, an underlying form is identified with an explanation for any observed variants.

Sections 6.1 through 6.5 discuss distinctive handshapes, orientations, locations, movements, and non-manuals, based on minimal pairs, grammaticality, and variation patterns. The distinctive elements identified below are considered to be phonemic (in the sense that they can make a meaningful difference). However, the methodology for grouping these features into phonemes is not yet well established (cf. descriptions in Jepsen, et. al. 2015). The most well-understood parameter in this regard is handshape, and thus LSSiv's handshape phonemes are listed in Table 38. Location, movement, and non-manuals are more difficult to clearly segment and group, and in many cases the line between phono-logical and morphological or prosodic elements is blurred. Creative language use also gives these parameters seemingly endless possibilities (e.g. a location involving a prop or a movement depicting a real-world path). The status of orientation as a phonemic element of LSSiv is discussed in section 6.2. Conditioned variation which eliminates the need to specify certain handshape features underlyingly is discussed in section 6.6. Section 6.7 presents a preliminary list of underlying features for handshape, location, and movement, including a brief discussion of their combinability as a basis for establishing phonemes in the future.

## 6.1 Handshape distinctions

Relatively few distinct handshapes are used in Sivia Sign Language, as the language places more importance on movement, location, and especially non-manual components. Handshapes which are considered to be phonemic are given in Table 38a and Table 38b. Features given in the initial column are considered to be distinctive, but, as described in the following sections, do not constitute a complete list of LSSiv's distinctive handshape features. Shapes in Table 38a are frequent throughout the lexicon, while those in Table 38b occur in only one or two signs each. Pound signs (#) indicate that the handshape is only used in numerals and lists. (See 6.1.1.4 for more information on rare shapes.) Allophonic variation for each phoneme is discussed throughout the following sections.

Table 38a. Handshape phonemes in LSSiv (productive).

|  | 0 fingers | 1 finger | 2 fingers | 4 fingers |
|---|---|---|---|---|
|  | 01234- | 1+ | 12+ | 01234+ |
| +bent |  | 1b |  | 01234b |
| +taper |  | 01t |  | 01234t |
| +contact |  | 01c |  |  |

Table 38b. Handshape phonemes in LSSiv (rare).

| | 0 fingers | 1 finger | 2 fingers (ring, pinky) | 2 fingers (index, pinky) | 3 fingers | 4 fingers |
|---|---|---|---|---|---|---|
| -thumb | | 4+ | 34+ | | 234+ | 1234+ |
| +thumb | 0+ | | | 014+ | | |

Most underlying shapes can be described using three characteristics: 1) extension or selection, 2) flexion, and 3) contact. A fourth characteristic, referred to here as 'openness' is needed to describe a handful of allophonic relationships (see 6.1.1.3). Note that because spreading is not phonologically distinctive, it is not listed here as a feature of underlying phonological description. Surface differences are likely freely varying allophones or morphological in nature (see section 8.2.2).

## 6.1.1 Extension and selection
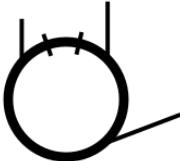
A finger is described as 'extended' when it is not closed into a fist. In LSSiv, the extension of the thumb, index, middle finger, and pinky can be significant. The middle finger is only extended in combination with the index, and the ring finger is only extended with all other fingers. The most common configurations involve a simple distinction between zero (01234-), one (1+), two (12+), and all (01234+) fingers, shown in Table 39a.

Table 39a. Distinct values for finger extension (common).

| Underlying Phoneme | Realizations (Allophones) | Orthographic Representation |
|---|---|---|
| (0)1234-<br>no fingers extended (fist) | (-/x0) | |
| 1+<br>index extended | (-/x/+0, -/+4) | |
| 12+<br>index and middle extended | (-/+s, -/+0, -/+4) | |
| (0)1234+<br>all fingers extended | (-/+s, x/+0) | |

The use of the thumb (0+, 014+) and the pinky (4+, 014+) in an underlying shape is less frequent. These forms are shown in Table39b. Each of these has been identified in a maximum of two signs, and 014+ is suspected to exist only in loans.

Table 39b. Distinct values for finger extension (rare).

| Underlying Phoneme | Realizations (Allophones) | Orthographic Representation |
|---|---|---|
| 0+<br>thumb extended | (-/+4) | |
| 4+<br>pinky extended | (-/+0) | |
| 014+<br>thumb, index, pinky extended | (loan vs native shape) | |

### 6.1.1.1 Distinctiveness and variation in common extension combinations

True minimal pairs are rare, and likely do not exist for all combinations. Minimal pairs

which distinguish three of the four frequent types of extension from each other (1+, 12+,

and 01234+) are given in Table 40. Differences in spreading and orientation (see 6.2) are

considered to be free variation, and facial expressions are related to the context in which

signing occurred.

Table 40. Minimal pairs for finger extension.

| Shape 1 | Example 1 | Shape 2 | Example 2 |
|---|---|---|---|
| 1+ | D/NDbi**1+** LTchk Mo<br>NATIVE | 12+ | D/NDbi**12+** LTchk Mo<br>JUNGLE |
| 1+ | Dbi**1+** LTchk Mo<br>NATIVE | 01234+ | Dbi**01234+** LTchk Mo<br>WHITE (loan) |
| 12+ | Dbu**12+** LTm<br>BOYFRIEND | 01234+ | Dbu**01234+** LTm<br>KISS |

Distinctions between the fist (01234-) and 1+ or 12+ are shown by articulatory consistency. None of the examples in Table 40 are ever signed with a fist, and signs like YOUNG/HEALTHY (example 1) are never signed with a 1+ or 12+ shape.

(1)

D/NDbi**01234-** Lzero mid in
YOUNG/HEALTHY

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As indicated in Table 39, signs with a 12+ and 01234+ shape may be realized with the fingers spread or together (+/-spread). Variations of SEE and FATHER in **Table 41** show that this is allophonic. These signs are considered to be unspecified for spreading phonologically, though section 8.2.2 discusses its morphological implications.

**Table 41. Spreading as free variation.**

| Underlying Shape | Not Spread | Spread |
|---|---|---|
| 12+<br><br>(spreading unspecified) | Dbu**12+** LNeye Mf<br>SEE | Dbu**12+s** LNeye Mf<br>SEE |
| 01234+<br><br>(spreading unspecified) | Dbi**01234+** LTchin<br>FATHER | Dbi**01234+s** LTchin<br>FATHER |
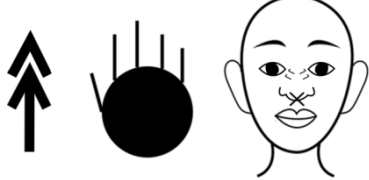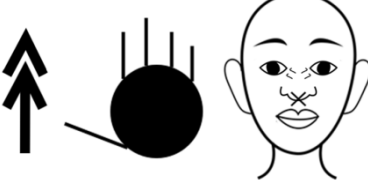
Thumb position is the other major form of variation in these three shapes. It has been observed folded in (-) or extended (+) in 1+ and 12+ signs such as COW and SEE (Table 42a). This is another feature that is evidently unspecified in some shapes.

**Table 42a. Free variation in thumb position (1+ and 12+).**

| Underlying Shape | -thumb | +thumb |
|---|---|---|
| 1+<br><br>(thumb unspecified) | D/NDfu**1+** LCtemp<br>COW | D/NDfu**01+** LCtemp<br>COW |
| 12+<br><br>(thumb unspecified) | Dbu**12+s** LNeye Mf<br>SEE | Dbu**012+s** LNeye Mf<br>SEE |

Signers also judge 01234+ signs as equally well-formed when articulated with a parallel (x)

or extended (+) thumb. Table 42b shows this variation in PIG.

**Table 42b. Free variation in thumb position (01234+).**

| Underlying Shape | xthumb | +thumb |
|---|---|---|
| 01234+<br><br>(thumb x/+) | Dbu**0x1234+** LCnose Mu rep<br>PIG | Dbu**01234+** LCnose Mu rep<br>PIG |

Signs with a fist shape (and no contact or approach), such as DRIVE in Table 42c,

vary freely between -thumb and xthumb. (Again, orientation differences are not significant;

see 6.2.) The following sections (6.1.1.2 and 6.1.1.3) addresses the issue of why the signs in

Table 42b-c do not vary freely between all three thumb positions.
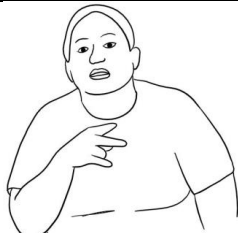
**Table 42c. Free variation in thumb position (01234-).**

| Underlying Shape | -thumb | xthumb |
|---|---|---|
| 01234-<br><br>(thumb -/x) | Dbi**01234-** Lzero Mud alt<br>DRIVE | Dbu**0x1234-** Lzero Mud alt<br>DRIVE |

In common or repeated 1+ and 12+ signs, the pinky may also come out of the fist.
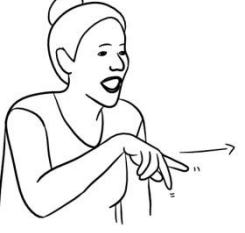
Table 43a shows this variation in REMEMBER and SEE. Because these variations are not as

common as the thumb variations in Table 42a-c, the pinky is considered to be simply not

distinctive rather than underspecified or unspecified. In other words, the underlying form

of the sign specifies that the shape is -4, but lenited forms that violate this do not interfere

with meaning.

**Table 43a. Pinky lenition in 1+ and 12+ signs.**

| Underlying Shape | -pinky | +pinky |
|---|---|---|
| 1+<br><br>(pinky not distinctive) | Diu**01+** LTtemp<br>REMEMBER | Diu**014+** LTtemp<br>REMEMBER |
| 12+<br><br>(pinky not distinctive) | Dbu**12+s** LNeye Mf<br>SEE | Dbi**124+s** LNface Mf<br>SEE |

More lenition allows all fingers to come out of the fist in signs like NATIVE and WALK, where the selected fingers are involved in contact or movement (Table 43b). See section 6.6.3 for further discussion of this variation.

Table 43b. Further lenition of 1+ and 12+ signs.

| Underlying Shape | Citation Form | Lenited |
|---|---|---|
| 1+ <br><br> (contact allows lenition) | Diu**01+** LTtemp Mo <br> NATIVE | Diu**014+** LTtemp Mo <br> NATIVE |
| 12+ <br><br> (movement allows lenition) | Dbu**12+s** Lzero Mfi wf <br> WALK | Dbi**12ts034+s** Lzero Mfi wf <br> WALK |

### 6.1.1.2 Selection

In most cases, extension also marks a finger as selected. One surface shape, however, necessitates a distinction: 01c234+. Example 2 shows a sign in which all fingers are extended, but only the thumb and index are involved in contact. This means that the index and thumb are selected, while the other fingers are not.

(2)

NDdf**01c234+** Lzero Mu
*pick up a worm*

Signs with this shape can be executed with the unselected fingers (234) extended, as in example 2, or unextended. Essentially, unselected fingers are also unspecified for extension. Example 3 is a 234- realization of the sign in example 2 (*pick up a worm*). (See section 6.1.1.3 for more on this type of variation.)



(3)

Ddi**01c** Lzero Mu
*pick up a worm*

### 6.1.1.3 Openness

The distinction between a fist (01234-), and an open hand (01234+) is confirmed by grammaticality judgments, as in Table 44. The sign BIRTHDAY is well-formed when all fingers are extended, and ill-formed when signed with no fingers extended. The reverse is true of HARD.

Table 44. 01234- versus 01234+.

| Typical Sign Shape | Grammatical | Ungrammatical |
|---|---|---|
| 01234+  |  Duf **01234+** LNjaw <br> BIRTHDAY |  *Duf **01234-** LNjaw <br> *BIRTHDAY |
| 01234-  |  Ddf**01234-** Lnd Mtap <br> HARD |  *Ddf**01234+** Lnd Mtap <br> *HARD |

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For the majority of signs, the 01234-/+ distinction is firm, as shown in Table 44. However, a small group of signs varies between these two forms. Table 45 shows such variants of MONKEY and LOVE.

Table 45. Variation between 01234- and 01234+.

| Meaning | 01234- | 01234+ |
|---------|--------|--------|
| MONKEY | D/NDbi**01234-** LCchest Mtap alt | D/NDbi**01234+** LCchest Mtap alt |
| LOVE | D/NDbi**01234-** LCchest cross | D/NDbi**01234+** LCchest cross |

It is estimated that both forms of each sign appear at equal frequencies. Though individual signers sometimes have a preference, grammaticality judgments and variation in citation forms indicate that they are equivalent. Another notable feature is that all of these signs have a torso location.

To explain this phenomenon, the feature 'open' is proposed. In a +open sign, unselected fingers are extended, while in a -open sign, unselected fingers are unextended. Signs that always use a fist (01234-) shape are specified as -open. For these signs, all fingers are unselected and invariably unextended. Signs which always use a flat hand (01234+) are described as having all fingers selected, and their value for openness is moot given that there are no unselected fingers to be affected. (Note that such a sign could also be described as having zero selected fingers with a +open specification.) Signs that vary

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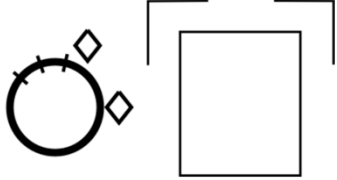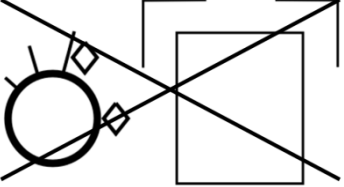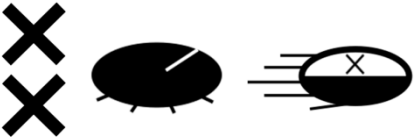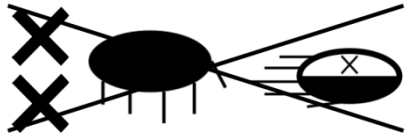
between 01234- and 01234+ are described as having no selected fingers (01234-) and an

unspecified value for 'open'. Table 46 shows the interaction of selected fingers and openness.

Table 46. The effect of the open feature.

| | 01234- | | 01234+ |
|---|---|---|---|
| -open | 01234- | | 01234+ |
| +open | 01234+ | | 01234+ |
| -/+open | 01234- | 01234+ | 01234+ |

Openness can explain variation in the 01c signs described in section 6.1.1.2 as well.

These also allow unselected fingers (234) to appear in an extended or unextended position

(see examples 2 and 3, p.112), and thus these signs can be described as underlyingly

unspecified for openness. Another set of signs with a slightly different handshape (01t) do

not allow the unselected fingers to be extended, meaning that they are underlyingly

specified as -open. The sign COFFEE, for instance, is ungrammatical when signed as

01t234+ rather than 01t. Table 47 gives examples of -open and unspecified -/+open signs.

Table 47. Signs with different values for openness.

| Selection Features | -open | +open |
|---|---|---|
| 01 selected<br>234 unselected<br>-open | Dfu**01t** Lzero<br>COFFEE | *Dfu**01t234+** Lzero<br>*COFFEE |
| 01 selected<br>234 unselected<br>unspecified for open | NDdf**01c** Lzero Mu<br>*pick up a worm* | NDdf**01c234+** Lzero Mu<br>*pick up a worm* |
| 01234 unselected<br>-open | Ddf**01234-** Lnd Mtap<br>HARD | *Ddf**01234+** Lnd Mtap<br>*HARD |
| 01234 unselected<br>unspecified for open | D/NDbi**01234-** LCchest Mtap alt<br>MONKEY | D/NDbi**01234+** LCchest Mtap alt<br>MONKEY |

Possible thumb positions in fist and flat hand shapes (given in Table 42b and c) may

be described in terms of openness as well. It may be that the default thumb position for

-open signs like DRIVE (01234-) is folded into the fist (-), while the default position for +open

signs like PIG (01234+) is fully extended (+). A parallel thumb (x), rather than a distinct

position, is the middle of a gradient between + and -, and the end of the grammatical range
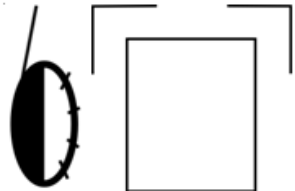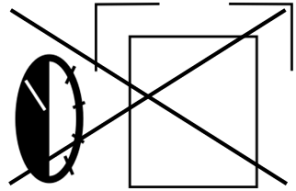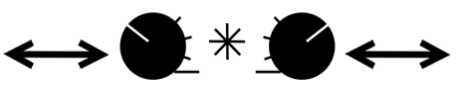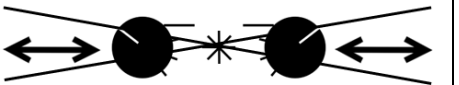
of articulation for either underlying specification. This leaves the possibility of -/xthumb in
-open signs (01234-; Table 42b) and x/+thumb in +open signs (01234+; Table 42c).

A few other signs can be articulated with all fingers extended in extremely lenited
forms (e.g. WALK in Table 43b). These are distinct from signs which are -/+open
underlyingly. In citation form, signs like WALK are consistently -open, and users prefer this
form in grammaticality judgments. 01c signs and those that vary between a fist and a flat
hand (Table 47) are +/-open because they vary in citation form and are accepted as equally
well-formed with either articulation.


### 6.1.1.4 Rare extension combinations

Table 39b above lists 0+, 4+, and 014+ as rare possibilities in LSSiv. Grammaticality
judgments indicate that for the few signs that use them, lone extension of the thumb and
pinky are distinctive. Table 48 shows that GOOD and MARRIED cannot be articulated with
common related shapes that replace an extended thumb with a closed fist or the pinky with
the index finger.

**Table 48. Distinctive use of the thumb and pinky.**

| Typical Sign Shape | Grammatical | Ungrammatical |
|---|---|---|
| 0+  |  Dif**0s** Lzero<br>GOOD |  *Dif0- Lzero<br>*GOOD |
| 4+  |  D/NDbi**4+** LTnd Mlr<br>MARRIED |  *D/NDbi**1+** LTnd Mlr<br>*MARRIED |

Nor are other signs ever performed with these shapes instead of their citation form. Thus, despite patterns of free variation and lenition given in 6.1.1.1, extension of the thumb must be considered distinctive in signs with no fingers extended, and the pinky in signs with one finger extended. Variation in these signs, however, provides more evidence that it is only under these limited conditions that these features are distinctive. Both of the signs in Table 48 have been observed with a 04+ shape (examples 4 and 5).

(4)

Dif **04+** Lzero
GOOD

(5)
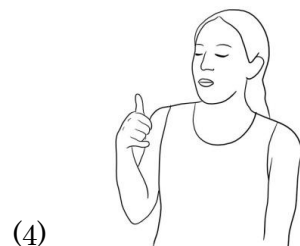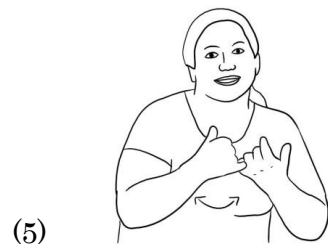
D/NDbi**04+** LT Mlr
MARRIED

The final value for finger extension is 014+. It was almost certainly introduced through loans from LSP, and the two signs that do use it alternate with a 01234+ form, as seen in Table 49. This combination is therefore seen as an exception rather than a native part of LSSiv's phonology.
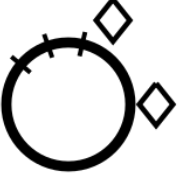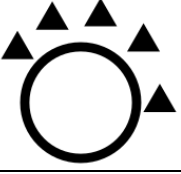
Table 49. Variation in 014+ signs.

| Meaning | 014+ | 01234+ |
|---|---|---|
| PLAY | <br>D/NDbi**014+** Lzero Mud rep | <br>D/NDbi**01234+** Lzero Mud rep |
| AIRPLANE | <br>Ddf**014+** Lhigh Mfu | <br>Ddf**01234+** Lhigh Mfu |

### 6.1.2 Flexion

LSSiv uses two distinct types of flexion: 1) simple bending of the far knuckles and 2) rounded or tapered bending that involves the primary knuckles connected to the palm. Note that the flexion described here is an unchanging feature of a sign; bent shapes that result from movement are discussed in 6.3. Only two combinations of extended fingers (1+ and 01234+) may also be specified for bending, shown in the four shapes in Table 50. Note that the use of the thumb is also necessary in the 1t shape. The rare 1b shape is another suspected borrowing.

Table 50. Finger extension and flexion.

| Underlying Phoneme | Realizations (Allophones) | Orthographic Representation |
|---|---|---|
| 1b<br>index extended and bent |  |  |
| (0)1t<br>index and thumb tapered |  |  |
| 01234b<br>all fingers bent |  |  |
| 01234r/t<br>all fingers rounded or tapered | <br>(-/+r, -/+t, -/+c, -/+s) |  |
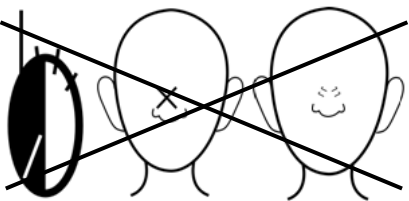
Tables 51-53 show distinctions in signs with all fingers extended. (Because 1b is rare and no straight signs are (underlyingly) 01+, no signs have been found to directly contrast 1+ shapes with and without flexion.)

Table 51. The distinction between straight, bent, and round.

| Shape 1 | Example 1 | Shape 2 | Example 2 |
|---|---|---|---|
| 01234+ <br><br> | Ddi**01234+** NDuf Lnd Mdc <br> SMASH | 01234b <br><br> | Ddf**01234b** NDuf Lnd Mdc <br> SHARK |
| 01234+ <br><br> | Dbu**01234+** LCm <br> KISS | 01234r <br><br> | Dbu**01234r** LCm <br> EAT(ROUND.FOOD) |
| 01234r <br><br> | D/ND**01234r** Lzero Mud alt <br> WALK(OCTOPUS) | 01234b <br><br> | D/ND**01234b** Lzero Mud alt <br> TIGER |

According to the grammaticality judgment in Table 52, bending is also phonemic in

GUERRILLA, with a 1b shape. Signers judge it as ill-formed with straight articulation.

Table 52. Distinctive use of index finger bending.

| Underlying Shape | Grammatical | Ungrammatical |
|---|---|---|
| 1b <br><br> | Diu**1b** Ln NMnw <br> GUERRILLA | *Diu **1+** Ln NMnw <br> *GUERRILLA |

Though sign language description often makes the distinction between tapered and rounded shapes as well, these positions appear to be in free variation at the phonological level in LSSiv. These variants for two signs are shown in Table 53. Differences in flexion types and degrees of flexion are more often morphological in nature (see 8.2.2). The same is true of contact (discussed in 6.1.3).

Table 53. Free variation between rounded and tapered.

| Meaning | Rounded | Tapered |
|---------|---------|---------|
| KISS.CHEEK | Diu01234**rc** LTchk | Diu01234**tc** LTchk |
| SUN | Ddi01234**r** Lhigh Md | Ddi01234**t** Lhigh Md |

## 6.1.3 Contact

The final component of handshape is contact. Only one shape is phonemically specified as +contact (01c), shown in Table 54. (Rounded shapes may be articulated with or without contact, but this is more of a morphological distinction; see 8.2.2.)

Table 54. Finger contact.

| Underlying Phoneme | Realizations (Allophones) | Orthographic Representation |
|--------------------|---------------------------|----------------------------|
| 01c<br>index and thumb touch | (-/+234) | |

No minimal pairs have been identified between 01t and 01c shapes. However, consistent articulation, as well as the openness distinction discussed in 6.1.1.3, distinguishes these shapes. While 01t signs are specified as -open (all unselected fingers must remain in the fist), 01c signs vary between -open and +open realizations. Note that the unselected fingers also vary in terms of flexion. Table 56 gives near-minimal pairs for contact of the thumb and index finger.

Table 55. The distinction between contact an no contact.

| Shape 1 | Example 1 | Shape 2 | Example 2 |
|---------|-----------|---------|-----------|
| 01c  |  Diu**01c234b** NDiu**01c** LNnd Mbounce iu SEW | 01t  |  Diu**01t** Lzero TINY |
| 01c  |  D/NDiu**01c234b** Lm corner (MOUSE)EAT | 01t  |  D/ND**01t** Lzero Mo sm THIN.FLAT |

## 6.2 Orientation

Orientation is rarely distinctive in LSSiv. Few minimal pairs exist, and variation often includes a range of unpredictable realizations (6.2.1). Other orientations are dependent on factors such as movement (6.2.2), interaction with a location (6.2.3), or morphology (6.2.4). These factors need to be investigated further, but examples of these are given in the fol-

lowing sections as evidence that orientation as it is described phonetically does not have true phonemic status in LSSiv.

The only identified minimal pair that cannot be explained by other factors is given in Table 56. Even here, twisting movement in both signs means that the distinction is between one range of palm orientations (in-down) and another (body-forward). This, and some of the distinctions below, indicate that planes may be more important than actual orientations. In this case, KIND.OF is on the horizontal plane parallel to the ground, and NOT.EXIST is on the vertical plane parallel to the body.

Table 56. A minimal pair for orientation.

| Palm In-Down, Fingers Forward | Palm Body-Forward, Fingers Up |
|---|---|
|  |  |
| D/NDs **if**01234+ D/NDe **df** Lzero Mrep KIND.OF | D/NDs **bu**01234+ D/NDe **fu** Lzero Mrep NOT.EXIST |

### 6.2.1 Unpredictable variation

Table 57a-d give examples of signs which vary between two or three different orientations. Many other signs with these orientations do not vary in the same ways, and these varia-tions involve the direction of the palm (a), the fingers (b), or both (c-d).

Table 57a. Orientation variation in FATHER.
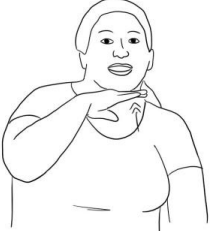
| Palm Down | Palm Up | Palm Body |
|---|---|---|
|  |  |  |

Table 57b. Orientation variation in BABY.

| Fingers In | Fingers Forward |
|---|---|
|  |  |

Table 57c. Orientation variation in SMOKE.

| Palm Body, Fingers Up | Palm Forward, Fingers In |
|---|---|
|  |  |

Table 57d. Orientation variation in DRIVE.

| Palm Body, Fingers Up/In | Palm Up/In, Fingers Forward/Up | Palm In, Fingers Forward |
|---|---|---|
|  |  |  |

### 6.2.2 Movement

Simple directional movements affect orientation for signs on the face and in zero space. Signs that move on the face tend to have finger orientations in the opposite direction of movement. Table 58a illustrates this interaction. Two variants of WHITE in the last two rows show a simultaneous change in orientation and movement that corresponds with this pattern as well.

Table 58a. Interaction of movement and orientation on the face.

| Movement | Finger Orientation | Example |
|---|---|---|
| outward | in | D/NDd**i**1b LCfh M**o** alt<br>SWEAT |
| downward | up | Db**u**1+ LTeye under M**d**<br>CRY |
| upward | down<br>(underlying Dod) | Do**d**01234+ LCchk M**u**<br>BLUSH |
| outward/bodyward | in/forward | Db**i**01234+ LTchk M**o**<br>WHITE |
| downward | up | Db**u**01234+ LTchk M**d**<br>WHITE |

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Signs that move in zero space tend to face the direction of movement with the palm (though these are often affected by more specific locative or morphological factors; see 6.2.3-4). Table 58b gives some examples of this interaction.

Table 58b. Interaction of movement and orientation in zero space.
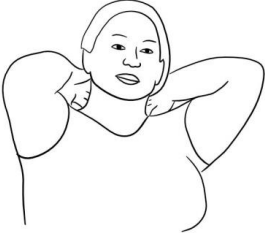
| Movement | Palm Orientation | Example |
|---|---|---|
| outward | out | D/NDou01234t Lzero Muo<br>DEER |
| upward | up | D/NDuf01234r Lzero Mu<br>COOK |
| downward | down | D/NDdf01234- Lzero Mfd arc alt<br>BICYCLE |

### 6.2.3 Location

Especially for signs with contact, location has a large influence on orientation. When signs make contact with or approach the body, orientation is more accurately interpreted in relation to this location rather than empty space.

Orientations change predictably as a sign moves from the center to the periphery of the body, and from the top to the bottom. In order to maintain a palm orientation *toward the location*, central signs face phonetically 'bodyward' and peripheral signs face phonetically 'inward' (toward the center of the signing space). This extends to signs on top of the head that face 'downward' and signs behind the back that face 'forward' as well. These are all illustrated in Table 59.

Table 59. Palms orientated toward a location on the signer.

| Central | Peripheral | Top of Head | Back |
|---|---|---|---|
|  |  |  |  |
| D/ND**b**i+ LCchest Mud alt <br> BATHE | D**i**u+ LCchk Md <br> PRETTY | D**d**i LNh top Mtap <br> BALD | D/ND**f**d LCneck <br> PILLOW |

The orientation of the fingers is predictable in a similar way. Central signs tend to point inward, while peripheral signs point upward when above the waist or downward when below the waist. This pattern is evident in Table 59, and Table 60 provides some additional examples.

Table 60. Predictable finger orientations on the body.

| Central (High) | Central (Low) | Peripheral (High) | Peripheral (Low) |
|---|---|---|---|
|  |  |  |  |
| D**b**i+ LCfh <br> HEADACHE | D/ND**b**i+ LCzero low in <br> FULL | D**i**u+ LCtemp <br> FORGET | D**i**d+ LChip <br> POCKET |

### 6.2.4 Morphological factors

Deviations from the above tendencies and apparent minimal pairs for orientations are often related to morphological implications in signs. Morphology (section 8.3) gives more information on the use of certain shapes in the signing space and on different planes. This section shows how two apparent minimal pairs can be explained morphologically rather than necessitating the specification of an orientation at the underlying phonological level.

Table 61 shows BABY and GRADUATION, which differ only by palm orientation. Both also correspond to a real-world activity associated with each lexical item. A baby is often supported from the bottom as it is rocked. The sign for GRADUATION alludes to a dance that students attend when they graduate. The hands in the sign correspond to the position of the hands while dancing. A literal morphological interpretation of these signs could be 'hold *up* and rock back and forth' as opposed to 'hold *toward the body* and rock back and forth'. Thus, the orientation is built into the meaning of both signs.

**Table 61. Comparison of BABY and GRADUATION.**

| Palm Up | Palm Body |
|---|---|
|  |  |
| D/ND**u**i01234+ Lzero Mlr arc rep<br>BABY (*lit. hold up and rock*) | D/ND**b**i01234+ Lzero Mlr arc rep<br>GRADUATION (*lit. hold toward body and rock*) |

Table 62 compares KEY, and CRUSH.CIGARETTE, two more signs that are related to real-world activities. For these signs, the non-dominant hand acts as a surface on which the dominant hand acts (see 8.4.1.1). In KEY, the non-dominant hand is in the vertical position of a door on which a key is turned, and in CRUSH.CIGARETTE, it is in the horizontal position of an ashtray or other surface on which a cigarette would be extinguished. The distinction is

between 'twist on a vertical surface' and 'twist on a horizontal surface'. The same kind of change in signs like PAINT or WASH is described as morphological inflection for a wall or table (see 9.1.2).

Table 62. Comparison of KEY and CRUSH.CIGARETTE.

| Palm In, Fingers Forward (non-dominant) | Palm Up, Fingers In (non-dominant) |
|---|---|
|  |  |
| Dsdf01234- Debi ND**if**01234+ Lnd Mrep<br>KEY (*lit. turn on vertical surface*) | Dsfi01234- Dedf ND**ui**01234+ Lnd Mrep<br>CRUSH.CIGARETTE (*lit. turn on horiz. surface*) |

## 6.3 Location

There is no reason to suspect that surface locations differ from their underlying form, apart from underspecified locations that change for morphological reasons (see 8.3 and 9.1). A good number of minimal pairs establish several distinct locations for LSSiv signs. For the most part, signs can be described on a 3D grid (see 6.7.2), according to height, horizontal 'width', and 'proximity' from the signer's body forward.

Most locations are established by the following minimal pairs, though a few additional locations also exist with no minimal pairs in the data: above the head, in front of the face, ear, shoulder, elbow, arm, thigh, knee, calf, and foot. Many of these are rare and are used mainly for morphological reasons. Table 17 in Phonetics gives the full list of locations with examples. Some examples below are also examples of location incorporation or agreement, particularly those in the head and torso region (6.3.2-3). This means that the non-dominant hand is used as a separate morpheme in some cases. Readers are asked to use the dominant hand only (left side of the image), unless otherwise specified, when examining

asymmetrical images below. As described in section 6.2, differences in orientation are not considered to be phonemic.

### 6.3.1 Zero space

The space in front of the signer is divided into three phonemic levels: high (above the shoulders), mid (zero space), and low (below the waist). Table 63 shows minimal pairs for these three locations.

**Table 63. Vertical distinctions in zero space.**

| Location 1 | Sign 1 | Location 2 | Sign 2 |
|---|---|---|---|
| high |  D/ND01234- **Lhigh** Mo ELECTRIC.WIRE | zero |  D/ND01234- **Lzero** Mo ROPE |
| zero |  D1+ **Lzero** Mfi wiggle NMtg SNAKE | low |  D1+ **Llow** Mfi wiggle NMtg RAT |

### 6.3.2 Head and face

Several locations on the head are also distinctive. Forehead, temple, eye, under eye, nose, cheek, mouth, tongue, jaw, and chin are pictured in Tables 63a-b. It is divided into, approximately, horizontal distinctions, such as the temple versus the forehead in Table 64a, and vertical distinctions such as the eyes versus the mouth in Table 64b.

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Table 64a. Horizontal distinctions on the head.
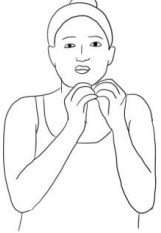
| Location 1 | Sign 1 | Location 2 | Sign 2 |
|---|---|---|---|
| temple | D01234+ LC**temp**<br>FORGET | forehead | D01234+ LC**fh**<br>HEADACHE |
| under eye | D1+ LT**eye under**<br>RECOGNIZE | tongue | D1+ LT**tg**<br>SALT |
| under eye | D1+ LT**eye under** Md<br>CRY | mouth | D1+ LT**m** Md<br>SAD |
| nose | D1b LC**nose** Md rep<br>GUERRILLA | jaw | ND1b LC**jaw** Md rep<br>SHAVE[1] |
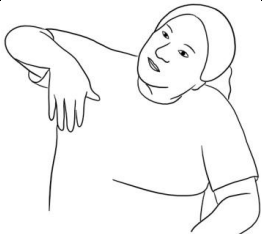
Table 64b. Vertical distinctions on the head.

| Location 1 | Sign 1 | Location 2 | Sign 2 |
|---|---|---|---|
| temple | D1+ LTtemp<br>THINK | under eye | D1+ LTeye under<br>RECOGNIZE |
| under eye | D/ND1+ LTeye under Mo<br>NATIVE | upper lip | D/ND1+ LTlip Mo<br>MOUSTACHE |
| cheek | D01234+ LTchk<br>KISS.CHEEK | chin | D01234+ LTchin<br>FATHER |
| eye | D/ND01234r LTeye<br>BIG.EYES | mouth | D/ND01234r LTm<br>KISS.PL |
| mouth | D/ND01234r LTm<br>KISS.PL | zero | D/ND01234r LTnd<br>KISS.3P.PL |

### 6.3.3 Head and torso

Locations on the head, neck and torso are also clearly distinct. Table 65 shows top of head, head, neck, chest, zero space, and non-dominant hand.

**Table 65. Distinctive locations on the head and torso.**

| Location 1 | Sign 1 | Location 2 | Sign 2 |
|---|---|---|---|
| top of head | Ds12+ Des LNh top Mi rep CUT(HAIR) | neck | Ds12+ Des LNneck Mi rep CUT(LONG.HAIR) |
| neck | Ds12+ Des LNneck Mi rep CUT(LONG.HAIR) | zero | Ds12+ Des Lzero Mi rep CUT(FABRIC) |
| neck | D1+ LTneck HAVE.NO.MONEY | chest | D1+ LTchest 1 |
| zero | D01234+ Lzero Mu PAINT(WALL) | non-dominant hand | D01234+ Lnd Mbu PAINT |

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### 6.3.4 Proximity

Another type of location distinction in LSSiv is proximity. Signs can make contact with the fingertips or with the palm or back of the hand. Signs that do not make contact may be near the body, out to the side (wide), or out in front (far). No exact minimal pairs have been found for these parameters, and handshape or morphology make them predictable in some cases. Signs with a 1+ or tapered shape, for example, are much more likely to make contact with the fingertips rather than the palm. Signs in wide or far locations often involve size, degree, and time morphology (see 8.3.2). More research is needed to determine whether any signs are phonologically specified for these features.

## 6.4 Movement

In order to most simply and accurately describe the types of movement and movement combinations in LSSiv, features are divided into five categories: 1) direction, 2) path, 3) hand, 4) contact, and 5) timing. Each category and the features it contains are listed in Table 66. See Phonetics (section 5.1.4) for detailed descriptions of these features.

**Table 66. Movement features.**

| Type | Feature | Description |
|---|---|---|
| **direction** relationship between starting and ending location | forward | away from the signer |
| | body | toward the signer |
| | up | away from the ground |
| | down | toward the ground |
| | in | toward center on a horizontal plane |
| | out | away from center on a horizontal plane |
| | left | toward the non-dominant side[2] |
| | right | toward the dominant side |
| **path** how directional movement is achieved | short | path is noticeably small |
| | arc | curved path |
| | bounce | short continuous arcs |
| | circle | round path |
| | spiral | short continuous circles |
| | wiggle | smooth alternation |
| | zigzag | sharp alternation |
| **hand** movements that influence handshape or orientation | bend | fingers move from extended or tapered to bent |
| | taper | fingers move from extended to tapered |
| | spread fingers | fingers move apart and together at the sides |
| | wiggle fingers | fingers move individually |
| | close | shape changes from open to fist |
| | open | shape changes from fist to open |
| | rotate | rotation at the wrist |
| | shake | quick continuous wrist rotation |
| | bend wrist | wrist joint bends |
| **contact** how and when hands touch each other or the location | start | sign starts with contact |
| | end | sign ends with contact |
| | tap | quick contact during movement (sign begins and ends without contact) |
| | continuous | contact is maintained throughout sign ('rub') |
| | cross | hands overlap or cross |
| **timing** repetition and alternation | repeat | all aspects of movement performed at least twice |
| | alternate | hands move in opposite directions (with opposite hand and contact features) |

Exact minimal pairs for movement are difficult to find. However, a few near-minimal pairs with non-manual differences are listed in Table 67. Directional, contact, and timing features are included.

**Table 67. Near-minimal pairs for movement.**

| Movement 1 | Sign 1 | Movement 2 | Sign 2 |
|---|---|---|---|
| inward | D/NDif+ Lzero M**i**<br>SMALL | outward | D/NDif+ Lzero M**o**<br>BIG |
| none (contact) | Dbi+ L**C**fh<br>HEADACHE | tap | Ddi+ Lhead top M**tap**<br>BALD |
| simultaneous | D/NDufr Lzero M**u**<br>BOIL | alternating | D/NDufr L**zero** M**ud alt**<br>COOK |
| one movement | D01+ LNm M**rotate**<br>WATER | repeated | D01+ LNm M**rotate rep**<br>CHICHA |

Aside from the pairs above, three factors give evidence that the features in Table 66 are specified in the underlying phonological form. First, articulation of movement is consistent. Signs do not vary from their typical movement without morphological cause (see 8.3.2, 8.5, and 8.6). Second, movement is not predictable based on any other phonological characteristics. Third, movement is not (always) morphological in nature. Table 68a-c give

examples of signs which consistently use directional (a), path (b), and hand (c) movement with no other cause. (See Table 67 for contact and timing examples.)

Table 68a. Signs with consistent directional movement.

| No movement | Downward | Outward |
|---|---|---|
|  |  |  |
| D1+ LCm | D01234+ Lchk Md | D/ND01234+ Mo |
| QUIET | PRETTY | NO.MORE |

Table 68b. Signs with consistent path movement.

| Wiggle | Bounce | Arc |
|---|---|---|
|  |  |  |
| D0if+ Lzero M**fio wiggle** | D/NDif+ Lzero M**r bounce** | D/NDbi+ Lchest M**uo arc** |
| FISH | SIDE.BY.SIDE | HAPPY |

Table 68c. Signs with consistent hand movement.

| Shake | Open | Rotate |
|---|---|---|
|  |  |  |
| D/NDiur LNchin **Mshake** | Dsfu**rc** Des Lzero M**rep** | D/NDsbu+ D/NDefu+ **Mrep** |
| COCONUT | MANY | NOT.EXIST |
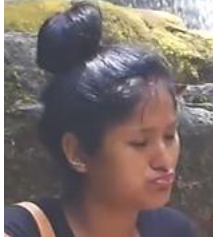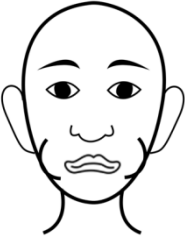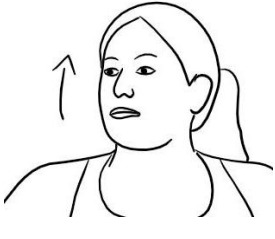
## 6.5 Non-manuals

As in most sign languages, LSSiv uses a great variety of non-manual aspects. The exact line between features which are phonologically part of a sign and those which are gestural, intonational, or morphological modifications is not clear. However, the existence of completely non-manual signs, a few minimal pairs, consistent citation forms, and lack of predictability indicate that some non-manuals must be phonemically specified. (See 8.4.2 for information on morphological use.) A preliminary analysis is given below based on available evidence.

### 6.5.1 Completely non-manual signs
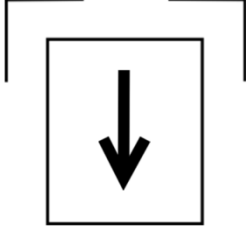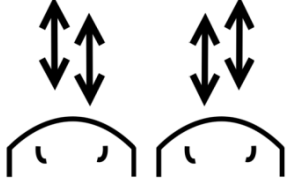
There are almost a dozen signs which have no manual components at all, or have a common completely non-manual allophone. These signs involve everything from mouthing and facial expressions to movements of the head, torso, and legs. Independent mouthing is most frequently observed as a non-manual version of MOTHER or LET'S.GO. Table 69a shows the other six known signs that use only the face and head, and Table 69b shows signs that do not use the head or the hands. See videos ch6t69, BC2-033 through BC2-038[3], for signs which involve movement. All of these signs have been used without manual accompaniment, meaning that they are not bound morphemes and do not merely function as modifiers for other signs. Signs which never have manual components are marked as such (NM).

**Table 69a. Signs that use only the face and head.**

| Sign 1 | Non-manuals 1 | Sign 2 | Non-manuals 2 |
|---|---|---|---|
|  BIG | cheeks puffed out, lips pursed (wide) | SING(NM) | mouth open wide, head tilt side to side |
| ROOT.AROUND(NM) | head tilt down, arc forward and up | DIE | head tilt side, eyes closed, frown |
| WHAT | head tilt up | NOT.UNDERSTAND(NM) | head tilt up, squint, nose wrinkle, grimace |

It can be argued that mouthing and some of the examples in Table 69a are gestural, especially items like WHAT and NOT.UNDERSTAND, which resemble expressions that may be used in spoken language. The evidence at this point does not argue either way. BIG and DIE may appear to fit into this category as well. However, because these are consistently used with the manual signs for *die* and *big*, this is less likely. They more closely resemble lenited forms of signs that have manual and non-manual components (or even non-manual signs that are often used with manual gestures). Because SING and ROOT.AROUND are always non-manual and there is no other sign for either of these meanings, the features used here are also considered to be phonemic.

**Table 69b. Signs that do not use the head or hands.**

| Sign | | | |
|---|---|---|---|
| | SIT (NM) | MARCH/WALK | KICK (NM) |
| Non-manuals | torso downward | knees up and down | foot kick |
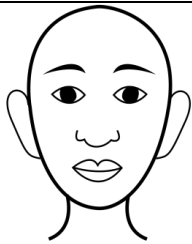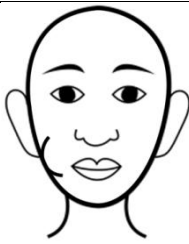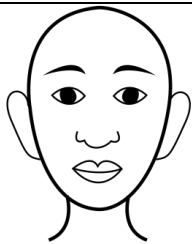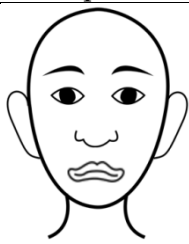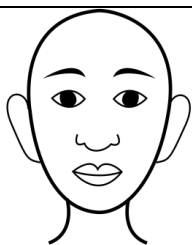
There are manual signs which are similar in meaning to all the signs in Table 69b, which suggests that these non-manual signs could be gestural alternatives. There is no reason to think otherwise for MARCH/WALK or KICK. The manual sign for *sit*, however, is clearly a loan (some users use the ASL sign, borrowed from LSP). Like SING and ROOT.AROUND, the LSSiv sign for *sit* happens to be non-manual.

So far there are at least five non-manual specifications in LSSiv phonology. Changes to the cheeks, mouth, head, and torso are included. The sections below describe further evidence for phonemic non-manuals.

### 6.5.2 Minimal pairs

There are also a few minimal pairs for non-manuals, shown in Table 70. The forms seen here are consistently used in citation and in a natural context.

Table 70. Minimal pairs for non-manuals.

| Non-manual 1 | Sign 1 | Non-manual 2 | Sign 2 |
|---|---|---|---|
| neutral | BEE | cheek puffed out | COCA |
| neutral | CAR | lips pursed (wide) | *drive* (CAR+USE[4]) |
| neutral | FISH | squint, tongue out | SNAKE |

Signs with non-manuals in Table 70 share features with some of the completely non-manual signs in Table 69a. Pursed lips and puffed cheeks are used separately in DRIVE and COCA. These signs are unrelated to BIG, which uses both (Table 69a). These features are therefore considered to be individually phonemic. Use of the tongue is the clear and consistent distinguishing feature between the signs for FISH and SNAKE. The face used in SNAKE is therefore another item on the list of phonemic non-manuals.

### 6.5.3 Other consistent uses

Several other non-manuals are used consistently in LSSiv signs. Some of these are intonation-level changes, such as the faces for *yes-no* and content questions (see 9.4.1).

Others are morphologically related to size, intensity, and quantity (see 8.4.2). Adjectives are frequently non-manual as well. The line between phonology and morphology is blurred here, but it is unusual to propose morphemes which are composed of entirely non-phonemic pieces. Due to the large range of meaning in these facial expressions, with no manual equivalent, it is also dismissive to define all of them as gestures. Table 71 shows seven of the most salient and consistent faces in LSSiv.

**Table 71. More non-manual adjectives and morphemes.**

| Meaning | Description | Example |
|---|---|---|
| dangerous (animal) | furrowed brows, wrinkled nose, open grimace | TIGER |
| dirty/gross | furrowed brows, wrinkled nose | DIRTY.CLOTHES |
| nice/fancy/clean | raised brows, pursed lips | NICE.CLOTHES |
| small | squinted eyes, pursed lips | SMALL.FROG |

Table 71. (Continued) More non-manual adjectives and morphemes.

| Meaning | Description | Example |
|---|---|---|
| tired | squinted eyes, exposed tongue, head tilted down | WALK+TIRED |
| USE (verbalizer; see 7.2.1 and 8.4.2.3) | wide pursed lips, optional lip buzzing | DRIVE (lit. CAR+USE) |
| very/many | squinted eyes, open mouth | FAR |

The examples in Table 71 again use some unique features and some that overlap with what is used in the signs from Table 69a and Table 70. Squinted eyes, lip pursing (a few realizations), an open mouth, use of the tongue, and a downward tilt of the head are all repeated here in combination with other non-manuals. This repeated consistent use, and specific use in various configurations, provides more evidence that these are phonemic aspects of LSSiv.

### 6.5.4 Likely phonemic non-manuals

Fifteen individual non-manual components are used in the data above. Three are used alone (puffed cheeks, pursed lips, and downward torso movement), and four are the only

difference between two of the full specifications shown in the above examples (raised brow, squinted eyes, grimace, and downward head tilt). Table 72 shows these internal minimal pairs. (At this point, different realizations of lip pursing and using the tongue are not considered to be separate features.) Composite non-manuals use the eight remaining features (closed eyes, furrowed brow, wrinkled nose, frown, open mouth, exposed tongue, sideways head tilt, and forward head arc). These are shown in Table 73.

Table 72. Distinguishing non-manual features.
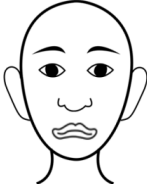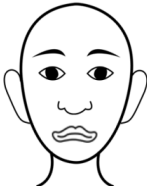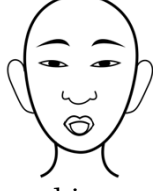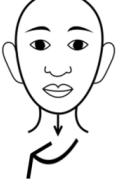
| Non-manual 1 | Features 1 | Non-manual 2 | Features 2 |
|---|---|---|---|
| <br>USE (verbalizer) | pursed lips | <br>NICE/FANCY/CLEAN | **raised brow**<br>pursed lips |
| <br>USE (verbalizer) | pursed lips | <br>SMALL | **squinted eyes**<br>pursed lips |
| <br>DIRTY/GROSS | furrowed brow<br>wrinkled nose | <br>DANGEROUS(ANIMAL) | furrowed brow<br>wrinkled nose<br>**grimace** |
| <br>used in SNAKE | squinted eyes<br>tongue out | <br>TIRED | squinted eyes<br>tongue out<br>**head tilted down** |

Table 73. Features in composite non-manuals.

| Non-manual (1) | Features (1) | Non-manual (2) | Features (2) |
|---|---|---|---|
| DIE | closed eyes<br>frown<br>sideways head tilt | DIRTY/GROSS | furrowed brow<br>wrinkled nose |
| SING | open mouth<br>sideways head tilt | VERY/MANY | (squinted eyes)<br>open mouth |
| used in SNAKE | (squinted eyes)<br>exposed tongue | ROOT.AROUND | (head tilt down)<br>forward head arc |
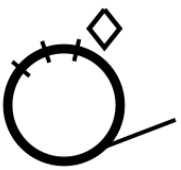
# 6.6 Conditioned variation: predictable features

As in any language, certain phonological changes occur in LSSiv in accordance with the principles of ease of articulation and ease of perception. The sections below examine how these principles influence the way LSSiv signs look and what phonotactic rules contribute to the language's phonology. These rules indicate that certain features or contrasts which appear on the surface are not necessary in the phonemic description of LSSiv signs.

### 6.6.1 Tapering

As frequently noted in sign languages, contact and physical limitations affect handshape. Tapered shapes in which the thumb is excluded (in a 'x' or '+' position) are completely predictable. Table 74 shows that contact with the back of the hand, rotation, and indexing cause these surface forms.

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Table 74. Conditions for finger tapering.

| Underlying Shape | Condition | Surface Shape | Example |
|---|---|---|---|
| 01234+  | contact with top of fingers | 0x/+1234t  |  EMBARRASSED.BLUSH |
| 01234+  | rotation to intended F body orientation | 0x/+1234t  |  CHOP |
| 1+  | downward indexing (intended F down orientation) | 0+1t  |  HERE |
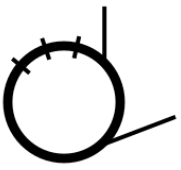
Upward movement in EMBARRASSED.BLUSH (Table 74) indicates an intended literal 'fingers down' orientation (Dod01234+). The same is true of PAINT in example 6, which moves bodyward with the fingers forward, then forward with the fingers bodyward (Dub01234+). Rather than the physically-difficult *palm up, fingers body* orientation with a flat hand, a tapered shape allows for easier articulation. (See section 6.2.2 for more on movement and orientation.)

(6) 

PAINT
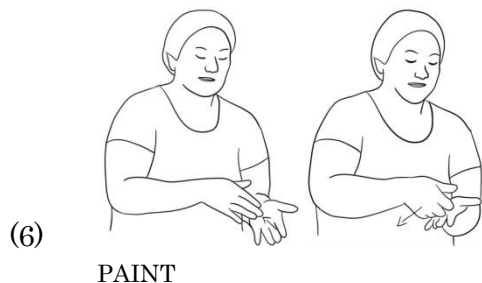
### 6.6.2 Use of the thumb

While the thumb varies freely in most shapes, a 01+ realization is predictable when 1+ signs involve wrist rotation, as seen in Table 75. The few signs that fit these criteria (CHICHA, WATER, BUCK) are always realized as 01+. There are no signs which are consistently 01+ without wrist rotation (or tapering). (See section 6.1.1.4 for more on the rarely-phonemic use of the thumb.)

**Table 75. Predictable use of the thumb.**

| Underlying Shape | Condition | Surface Shape | Example |
|---|---|---|---|
| 1+ <br>  | wrist rotation | 01+ <br>  |  <br> CHICHA |

### 6.6.3 Handshape lenition (extension of additional fingers)

As shown in 6.1.1.1, some 1+ and 12+ signs can be articulated with all fingers extended. This category includes frequent signs as well as signs that have been used repeatedly in the current context. These signs usually involve contact, which allows the index finger to stay identifiable, and many are on the face. Signs like WALK involve movement of the selected fingers. These criteria make it easier to identify the sign (conform to ease of perception), even with all fingers extended. Resulting surface shapes are usually described with selected fingers in a tapered position (e.g. 1t0234+), since contact or movement means that they are in a slightly different position than the others. Table 76 shows that realizations with only some fingers extended or partial extension (bending and tapering) are also possible.

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Table 76. Lenition in 1+ signs with contact.

| Meaning | Citation Form | Lenited Form(s) | |
|---|---|---|---|
| HEARING | 1+ | 1t0234+ | |
| SAD | 1+ | 01+234b | 01+234t |
| 1 (FIRST PERSON) | (0)1+ | 1+24t | 1+234r |

## 6.7 Underlying features

The following section is the culmination of the information given above. The phonemically significant features necessary to describe the distinctions shown in the previous sections are listed, along with a few examples of how they combine to create surface realizations. Features are divided into 'types', which define different aspects. Types that are 'combinable' allow more than one feature from that category to be applied to one sign. This is still a preliminary analysis, but the features posited below help begin to define the underlying phonological form of LSSiv signs, based on what is currently known.

### 6.7.1 Handshape

Handshapes are defined by the nine features listed in Table 77. These are relatively straightforward and correspond to phonetic description, but Table 78 nevertheless shows how three shapes (and their allophones) can be described as combinations of these features.

Table 77. Distinctive handshape features (D/ND)

| Type | Feature | Abbreviation | Notes |
|---|---|---|---|
| Extension/Selection (+) modify the fist combinable | thumb | 0 | rare alone |
| | index | 1 | |
| | middle | 2 | never used alone |
| | ring | 3 | never used alone |
| | pinky | 4 | rare alone |
| | open | op | applies to unselected fingers |
| Flexion/Contact modify selected fingers combinable | bent | b | |
| | taper | t | 'round' is a variation causes thumb extension |
| | contact | c | causes thumb extension |

Table 78. Handshapes as feature combinations.

| Features (1) | Shape (1) | Features (2) | Shape (2) | Features (3) | Shape (3) |
|---|---|---|---|---|---|
| +/-0 | | +/-0 | | +0 | |
| +1 | | +1 | | +1 | |
| -2 | | +2 | | +2 | |
| -3 | 01tc | -3 | 12+ | +3 | 01234b |
| -4 | | -4 | | +4 | |
| +/-op | | -op | | (+op) | |
| -b | | -b | | +b | |
| +t | | -t | | -t | |
| +c | 01tc234+ | -c | 012+ | -c | |

### 6.7.2 Location

The features for locations describe a 3D grid. Figures 2 and 3 show how the head and torso are divided, and Table 79 gives the features that define each space. The list is kept as short as possible while allowing each grid block a unique description. Features for zero space are essentially coordinates, and face features on the more clustered head grid refer to actual facial features. While it is possible to define facial locations with coordinates as well, it is

unlikely that this reflects the reality of any sign language. Signs with morphological

reasons for their location, for example, refer to the eye or the mouth, not a mid side or low

central region of the face. The same is true of locations on the arms and legs. Signs in zero

space, however, may be simply in a high region or out to the side.

Table 79. Distinctive location features (L).

| Type | Feature | Grid Block(s) | Notes |
|---|---|---|---|
| Zero Space combinable | high | 9A-G, 1A/G | |
| | low | 11A-G, 8A/G, 5C/E | |
| | center | 9-11D | |
| | side | 9-11B | |
| | wide | 9-11A | |
| | cross | any | hand(s) on opposite side(s) |
| | head | 1A-8G | |
| | face | 2B-8F | modifies [+head] |
| Face modify [+face] | top | 2C, 2E | |
| | temple | 3B, 3F | |
| | forehead | 3D | |
| | eye | 4C/E | 5C/E= [+eye, +low] |
| | ear | 5B/F | |
| | nose | 5D | |
| | cheek | 6C/E | |
| | mouth | 6D | |
| | jaw | 7C/E | |
| | chin | 7D | |
| | neck | 8D | |
| Other | non-dominant hand | 9B-10F | |
| | elbow | 10B/F | |
| | thigh | 12B/F | |
| | knee | 13B/F | |
| | calf | 14B/F | |
| | foot | 15B/F | |
| Proximity | fingertip contact | 2B-8F, 9B-11F | possibly not determined in phonology (likely +/-contact and morphological specification) |
| | contact | 2B-8F, 9B-11F | |
| | far | any | |

Figures 2 and 3 show how the body is divided vertically and horizontally. Dots

indicate blocks which are phonemic in LSSiv. Solid grey dots on the head grid are part of

the [+face] region, while grey and white dots are [+head, -face]. Certain regions are labeled

to show how features relate to physical space, and how they combine to cover the entire grid. Note that the grid continues downward to the thighs (12B and F), knees (13B and F), calves (14B and F), and feet (15B and F). Unless the sign is [+cross], features for the dominant hand apply to the dominant side of the grid (A-D), and features for the non-dominant hand to apply to the non-dominant side (D-G).

**Figure 2. Head grid**
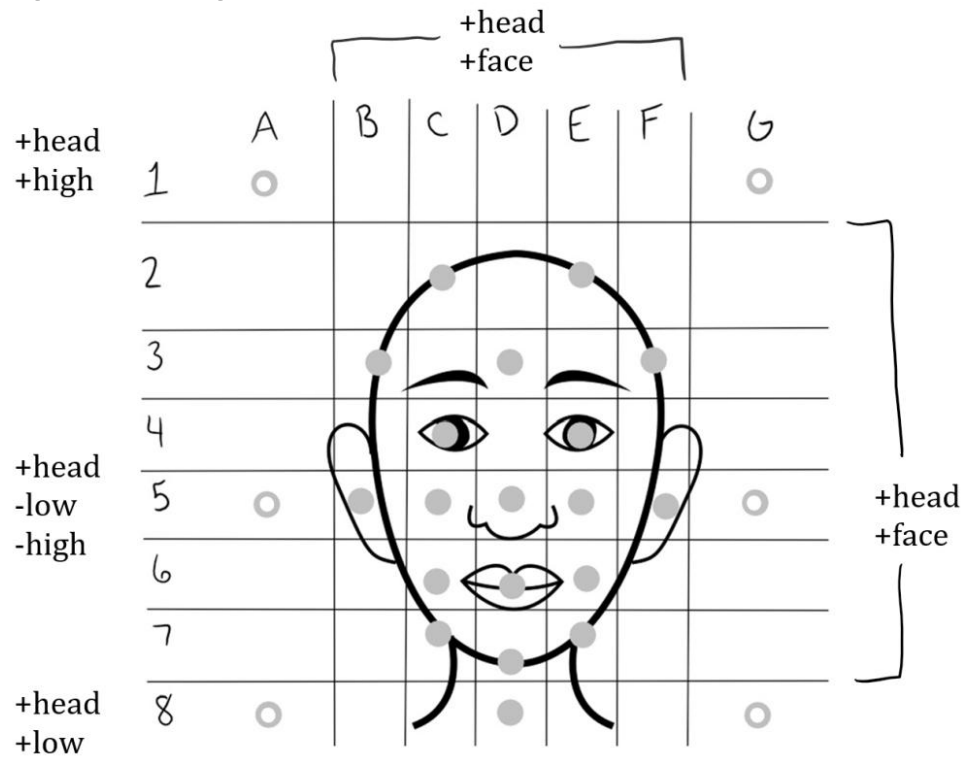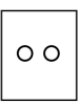
**Figure 3. Torso grid.**
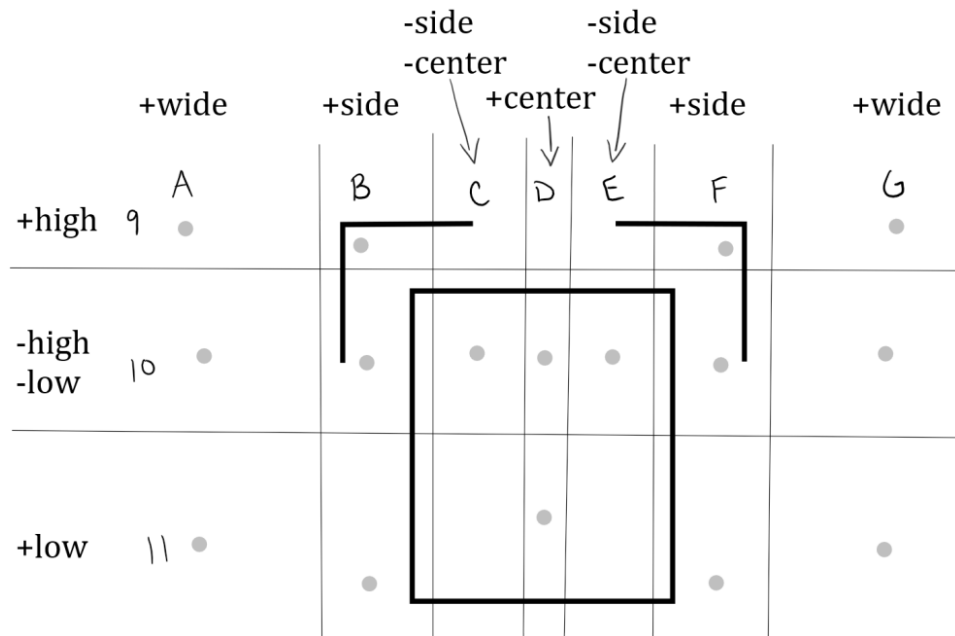


Readers may notice that locations used in phonetics and in some of the examples are not included in these features. The upper lip is described as [+mouth, +high], similar to [+eye, +low] for under the eye. The tongue location is a combination of [+mouth] and a non-manual specification to use the tongue. Table 81 gives three more examples of the way features combine to create specific locations.

**Table 80. Locations as feature combinations.**

| +Features (1) | Location (1) | +Features (2) | Location (2) | +Features (3) | Location (3) |
|---|---|---|---|---|---|
| none | zero 10C/E | +head +face +cheek (+tip contact) | Tchk 6C | +head +low | neck out 8A/G |

### 6.7.3 Movement

At this point, all features used to describe movement are considered to be distinctive. These are listed in Table 81. Rare features are also noted. In the future, smaller features like

paths may be broken down into characteristics like curve, oscillate, etc., but that type of

analysis is beyond the scope of the current study.

Table 81. Distinctive movement features (M).

| Type | Feature | Abbreviation | Notes |
|---|---|---|---|
| **Direction** modify still signs combinable | forward | f | |
| | body | b | |
| | up | u | |
| | down | d | |
| | in | i | |
| | out | o | |
| | left | l | rare, only for two-handed signs |
| | right | r | rare, only for two-handed signs |
| **Path** modify directions | short | short | |
| | arc | arc | |
| | bounce | bounce | |
| | circle | circle | |
| | spiral | spiral | |
| | wiggle | wig | |
| | zigzag | zig | |
| **Hand** modify hands combinable (D/NDs, D/NDe) | bend | b | |
| | taper | t | |
| | spread fingers | s | rare |
| | wiggle fingers | wf | rare |
| | close | cl | |
| | open | op | |
| | rotate | rotate | |
| | shake | shake | |
| | bend wrist | bw | |
| **Contact** modify directions combinable | start | sC | |
| | end | eC | |
| | tap | tap | |
| | continuous | rub | |
| | cross | cross | rare |
| **Timing** modify all combinable | repeat | rep | |
| | alternate | alt | |
| | sequential | seq | rare |

## 6.8 Summary

LSSiv signs can be described as combinations of features. Patterns of variation and co-

occurrence indicate phonemic and non-phonemic aspects among those identified in

Phonetics (Chapter 5). Underspecification and free variation have a large impact on the realization of a sign's handshape, and orientation is largely predictable. Underlying components of location and movement appear to be closer to their surface form, and several non-manuals are shown to be phonemically significant.

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Chapter 6 endnotes

[1] Use of the non-dominant hand is indicative of morphological context rather than phonology.

[2] 'Left' and 'right' are used to describe one-handed movement only when it begins past the center point (on the opposite side of the body).

[3] Clips referenced in this chapter are available at https://bleegiimuusclark.com/lssiv-grammar-examples-2/ and https://scholarspace.manoa.hawaii.edu/handle/10125/34525, BC2-033 through BC2-038.

[4] See section 7.2.1 for more on the USE morpheme.

# CHAPTER 7. LEXICAL CATEGORIES

This chapter examines evidence of how signs in the LSSiv lexicon can be grouped into part-of-speech categories (see Chapter 9 and section 10.1 for more on grammatical relations). Morphological patterns and co-occurrence restrictions are used to identify nouns (7.1), verbs (7.2), and modifiers (7.3). One derivational process, which converts a noun into a verb, has been found as well (7.2.1). Many signs have the ability to be used as more than one class without derivation, as discussed in 7.4. Signs and morphemes that do not fit into any of the three major classes (such as indexing, transitions, grammatical markers, and *wh*-questions) are briefly discussed in 7.5 as a topic that merits further exploration.

Many patterns identified below occur with only a subset of signs in a proposed category. Subclasses with specific morphology are not uncommon in signed or spoken languages. As in other sign languages, many prototypical markers for noun-hood or verb-hood (overt morphological marking of definiteness, case, agreement, tense, aspect, etc.) are not obligatory in LSSiv. When present, such a marker can affirm that the sign belongs to a certain class, but the inability to use that marker may be due to other factors. Schwager and Zeshan (2010, p.10-11) point out that different types of verbs and signs with different phonological structures may be inflected differently, so many typical criteria do not lead to unified classes in ASL, Indo-Pakistani Sign Language, and several others.

The presence, form, and distribution of derivational processes is also frequently discussed as a factor in the identification of parts of speech. Research on verb-noun pairs in sign languages shows that derivation is often specific to a subclass and unrelated to expectations for spoken languages. Some ASL nouns are derived via reduplication of verbs (Valli and Lucas 2000, p.55) and Hunger 2007 finds a length distinction in similar pairs for Austrian Sign Language. Sandler 2013, on the other hand, finds no consistent distinction

between nouns and verbs in the young Al-Sayyid Bedouin Sign Language. McGregor, et. al. 2015 find similar facts in describing Danish Sign Language, where signs function as more than one typical part of speech, and only some pairs are clearly distinguishable by morphology (p.214).

## 7.1 Nouns

The one morphological pattern that is unique to nouns is pluralization via reduplication of movement, a process which is used by only a small subset of nominal signs (7.1.1.1). Co-occurrence patterns are more reliable for identifying nouns. Unbound quantifiers uniquely occur with nouns (7.1.1.2), and the ability to occur with possessors and other modifiers or NOT.EXIST (7.1.2; see also 10.2.6.2; 10.4.1) can also indicate noun-hood.[1] Table 82 gives examples of prototypical nouns in a few categories.

Table 82. Nouns.

| Animals | Food | Objects | People | Vehicles |
|---------|------|---------|--------|----------|
| COW | BEAN | BOOK | CHILD | BICYCLE |
| CRAB | BREAD | CLOTHES | FRIEND | CAR |
| PIG | PAPAYA | MONEY | MAN | MOTORCYCLE |
| SHARK | RICE | TREE | WOMAN | PLANE |

### 7.1.1 Number

#### 7.1.1.1 Pluralization

Reduplication of movement (REP) is associated with plurality for some nouns, though it is a limited process that has only been found to occur in a few signs (see 8.5.1). Reduplication is more commonly used for topicalization (see 9.4.3) and continuous or habitual aspect (see 8.6.1). Table 83 shows that repeated outward movement is used for signs with no movement in the singular form, such as CHILD, and alternating movement is used for signs like BEE,

where the singular form uses a one-handed tap. Note that the phonological form of this plural morpheme limits its ability to occur with signs in which the singular form involves more complex movement.

**Table 83. Pluralization.**

| Meaning | Singular | Plural |
|---|---|---|
| child(ren) | CHILD | CHILD-REP |
| bee(s) | BEE | BEE-REP |

### 7.1.1.2 Co-occurrence with numerals and quantifiers

Independent signs like numbers, MANY, and shapes like STACK quantify nouns (see 10.2.5 and 10.4.1.2 for related syntactic structures). Example 7 shows that MANY and numbers are judged as grammatical with CAR, and example 8 shows that a mass quantifier can be used with MONEY. The possible existence of a distinction between count and mass nouns which may affect co-occurrence with any of these quantifiers is a topic for future research.

(7)    CAR                        MANY                    TEN
       *a lot of cars, ten (cars)*

(8)    MONEY                STACK+BIG(NM)
       *a lot of money* (lit. *a big stack of money*)

While MANY and numerals may be used together (cf. example 7), grammaticality judgments in examples 9a and 9b indicate that pluralization as described in 7.1.1 may not

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be compatible with the use of MANY. Example 10, nevertheless, shows reduplicated BEE with MANY in a narrative context.

(9a)

CHILD                 MANY
*many children*

(9b)

*CHILD.REP            MANY
**many children*

(10)

BEE-REP               MANY               ZIGZAG+SMRO
*many bees fly around* ([BC1-881](#) 01:57[2])
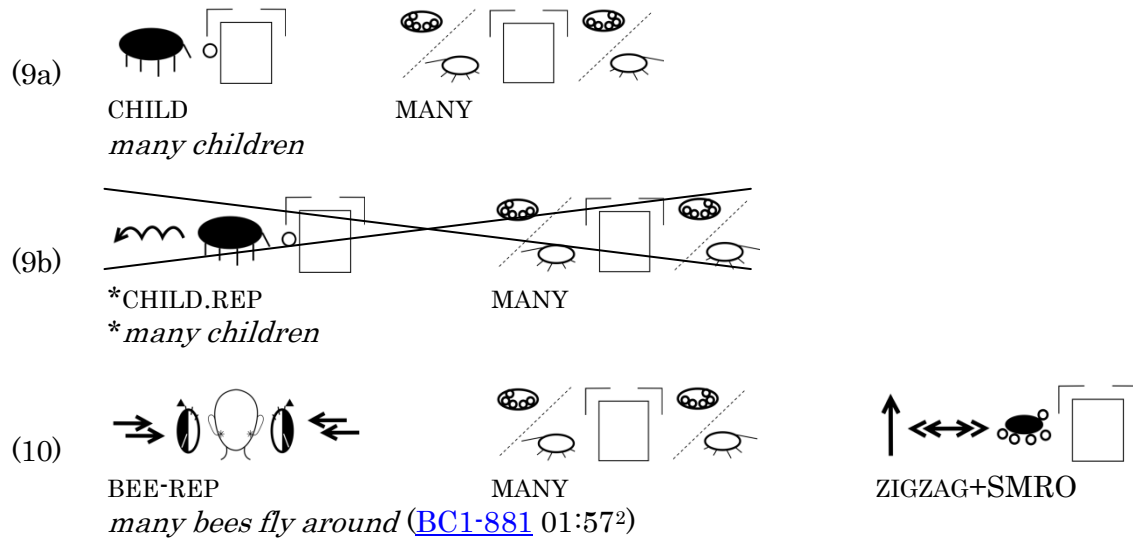
Also of note is use of reduplicated FLOWER with the numeral ONE, meaning *one flower* (example 11). This is added evidence that unbound forms of quantification are more salient than morphological inflections for number. At this point, however, these restrictions fall into a grammatical 'gray area' and need to be investigated further.

(11)

FLOWER-REP            ONE
*one flower*
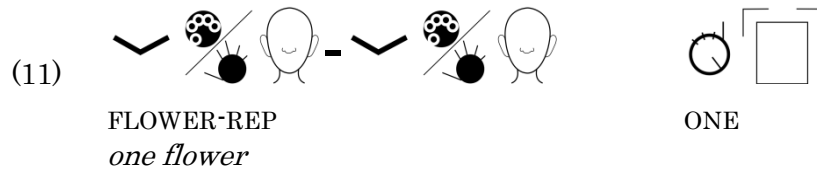
## 7.1.2 Possessors, modifiers, and NOT.EXIST

Nouns also occur with possessors and (independent) adjectives (see 7.3). Examples 12 and 13 show SHIRT with the possessor FATHER, and PAPAYA with the adjective SMALL.

(12)

SHIRT                 FATHER
(*my) father's shirt*

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(13)

PAPAYA　　　　　　　　SMALL

*small papaya*
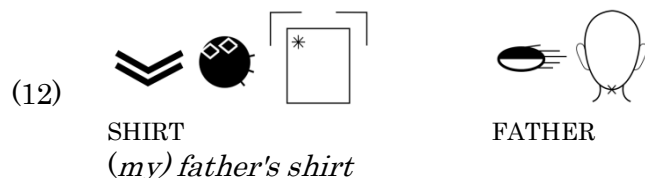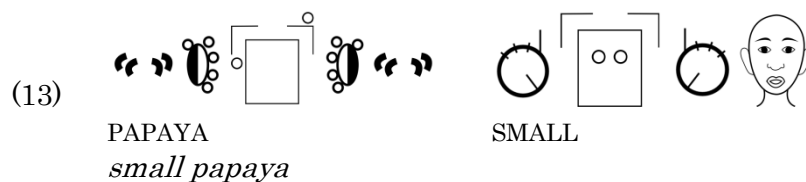
Bound morphemes for size and shape, as described in 8.2 and 8.4.2.1(2), are most typically used with nouns as well. However, these have also been observed with verbs and even modifiers in some cases, so these are not reliable indicators of a sign's class.

Co-occurrence with NOT.EXIST is another characteristic that applies to nouns *almost* exclusively. While NOT.EXIST can evidently be used with specific verbs as well (see 10.2.6.1), typical use is with nominal signs, as depicted in example 14.

(14)

BEAN　　　　　　　　NOT.EXIST

*There aren't any beans.*
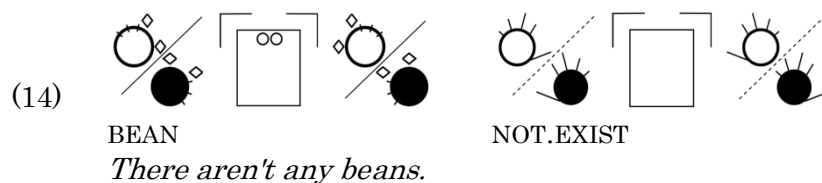
While proper nouns like names and cities do not occur with quantification or possession, they can be used with adjectives and with NOT.EXIST. These are considered to be an inherently specified subgroup of nouns. Pronouns and deictics like *here* or *that* are not included in this group because they are context-dependent (see 7.5).

## 7.2 Verbs

Most verbs can be identified morphologically by their ability to combine with simultaneous manner information (see 8.4.1.2, 8.4.2), and many can be marked for the continuous or completive aspect (see 8.6.1). Table 84 shows WALK with different manners. Table 85 shows SWEAT in its plain form and with a continuous aspect morpheme (lengthened movement; CONT), and example 15 shows FINISH used to mark the completive aspect with SHIVER.

**Table 84. Manner information with WALK.**

| | | |
|---|---|---|
|  |  |  |
| *walk* | *elephant walks ("lumber")* | *rat walks ("scurry")* |

**Table 85. Continuous aspect.**

| SWEAT | SWEAT+CONT |
|---|---|
|  |  |
| *sweat* | *sweat a lot, (still) sweating* |

(15)



SHIVER       FINISH
*(He) stops shivering*

Verbs can also take arguments, combine with location agreement (see Chapter 9) or location and shape incorporation (see 8.3.1; 9.1.2), and occur with other verbs as described in 10.4.2. Section 7.2.1 discusses a subclass of verbs which are derived from nouns, and the following sections describe morphological and co-occurrence patterns which are used with other subclasses. Typically intransitive 'motion' verbs (7.2.2) and typically transitive 'manipulation' verbs (7.2.3) are discussed, as well as smaller subgroups such as verbs which use directional agreement or specific negation or aspect markers (7.2.4).

### 7.2.1 Verbal derivation

Some verbs are derived from nouns with the addition of lip pursing or buzzing, glossed as the bound USE morpheme (see 8.4.2.3). This process creates contrast between "tools", such as a car, bicycle, or saw, and the use of those tools. Pairs distinguished by this morpheme are the clearest examples of a noun-verb contrast and the only instance of derivation currently known in LSSiv. Examples 16a and 16b show the contrast in CAR and DRIVE. Table 86 lists all verbs that are known to be derived this way.



(16a)

CAR (noun)



(16b)

DRIVE (verb; lit. CAR+USE)
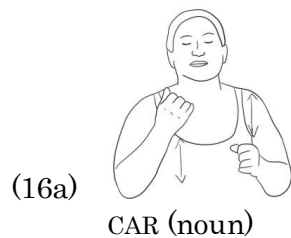
**Table 86. Verbs derived from nouns with USE.**

| | | | |
|---|---|---|---|
| DRIVE/RIDE.CAR | RIDE.BICYCLE | RIDE/DRIVE.BOAT | SCRUB |
| DRIVE/RIDE.MOTORCYCLE | RIDE.HELICOPTER | RIDE/FLY.AIRPLANE | SPRAY |
| PUSH.CART | RIDE.HORSE | SAW | USE.LAWNMOWER |

### 7.2.2 Movement verbs

Movement verbs are used intransitively to show how an actor or object changes from one location to another. Table 87gives examples of signs belonging to this category.

**Table 87. Movement verbs.**

| | | | | |
|---|---|---|---|---|
| CLIMB | FALL | JUMP | ROLL | SWIM |
| DIVE | HOP | MARCH | RUN | WALK |
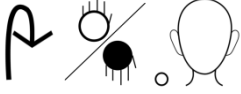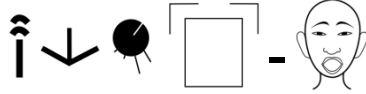
Most signs in this class can be used in either a third-person form or a first-person form depending on the context and the type of manner information the signer wants to convey (see 9.3). Table 88 shows the perspective contrast in WALK and HOP.

Table 88. Movement verbs in two perspectives.

| WALK | | HOP | |
|---|---|---|---|
| Third Person | First Person | Third Person | First Person |
| | | | |

Third-person forms often incorporate path and distance information via changes in movement, location, and non-manuals (cf. 8.3.2, 8.4.2.2). This can be seen in HOP in Table 88 as well as a high JUMP (encoded by a location near the head rather than near the torso) and a far WALK (encoded by a non-manual intensifier) in Table 89.

Table 89. Path and distance in movements.

| Path | Distance |
|---|---|
| 3JUMP+HI<br>*jump high* | 3WALK+INTENSE<br>*walk far* |

First-person forms are often followed by independent path signs, as in examples 17 and 18. This is described as a type of serial verb in 10.4.2, with some third-person forms also occurring as paths.

(17)

1RUN+TRY(NM)    ZIGZAG+TRY(NM)
*run away quickly* ([BC1-879](#) 03:21[2])

163

(18)

FLY                                              3WALK+FAR-GO

*fly up and away* ([BC1-355](BC1-355) 02:49²)
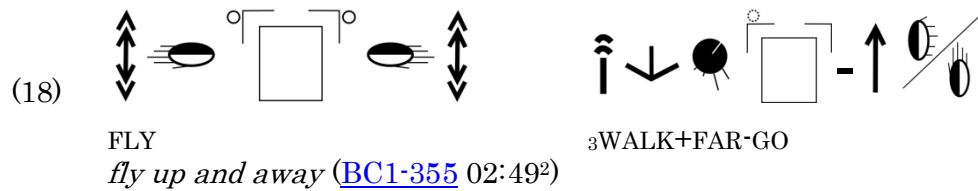

### 7.2.3 Manipulation verbs

Manipulation verbs describe an action that physically affects an object, and are typically transitive. Examples of manipulation verb signs are given in Table 90.

**Table 90. Manipulation verbs.**

| BATHE | CUT | HIT | PUSH | SHAVE |
|-------|------|------|------|-------|
| BREAK | GRAB | PICK | PUT | WASH |

These signs frequently incorporate a direct object via a meaningful handshape (see 8.1; 9.2.2) or a location on the body (see 8.3.1). Table 91 shows morphologically complex forms of CUT and SHAVE.

**Table 91. Modified manipulation signs.**

| Modification | Example 1 | | Example 2 | |
|---|---|---|---|---|
| Meaningful Handshape | ONION+HOLD(ND)<br>*cut onion* | CUT+HOLD(ND) | CACAO<br>*cut cacao* | CUT+FLAT(ND) |
| Body Part | SHAVE+LOC1+FLAT(ND)<br>*shave head (with mirror)* | | SHAVE+LOC2<br>*shave arm/body* | |

### 7.2.4 Other verbal morphology

As stated above, most verbs can be used with repeated or alternating movement as a con-
tinuous aspect marker, and with FINISH for the completive (see 8.6.1). A few other patterns
can also mark a sign as a verb, though they are only possible for a handful of signs. Use of
GO as another completive marker is discussed in 8.6.1, and the verbs LIKE and THINK utilize
simultaneous negation, as described in 8.6.2. A limited form of directionality, in which
movement agrees with the location of a direct or indirect object, is also possible for the five
verbs described in 9.2.1 (BITE, GIVE, PUNCH, STAB, and TALK).

## 7.3 Modifiers

The one morphological pattern that distinguishes signs in the modifier category is their use
with simultaneous degree markers (see 8.3.2 and 8.4.2.2). Table 92 shows that this group
includes quantifiers as well as adjectives.

**Table 92. Modifiers.**

| Adjective | | | Quantity | |
|---|---|---|---|---|
| BAD | GOOD | SHORT | A.LITTLE | NONE |
| BEAUTIFUL | GROSS/UGLY | SMALL | MANY | NOT.EXIST |
| BIG | NICE | TALL/HIGH | MORE | PILE* |
| DIFFERENT | SAME | WIDE | numerals | STACK* |

Table 93 shows degree marking on BEAUTIFUL and MANY. Note the use of a larger
signing space, including the addition of a second hand (glossed as LARGE; see 8.3.2), and the
INTENSE morpheme (an open mouth; see 8.4.2.2) in both intensified forms. Note that this
type of intensification is also used in numerals to differentiate numbers under twenty from
higher numbers (e.g. 10 versus 100; see section 8.4.2.3(2)).

Table 93. Degree marking on modifiers.

| Meaning | Plain | Intensified |
|---|---|---|
| (very) beautiful | BEAUTIFUL | BEAUTIFUL+LARGE+INTENSE |
| (very) many | MANY | MANY+LARGE+INTENSE |

Many modifiers have independent forms and simultaneous forms. (Note that these are called 'simultaneous' and not 'bound' because most one-handed and non-manual forms may also occur independently.) Independent forms of these signs typically occur with nouns, as discussed in 7.1, and simultaneous forms occur with nouns and verbs. Examples 19 and 20 show both independent MANY and simultaneous NICE being used with nouns, and example 21 shows ANGRY being used simultaneously with a verb. In some cases, multiple articulators can express multiple simultaneous modifiers (see 8.4).

(19)
BEE                                    MANY+BIG+LOC
*a whole lot of bees (in the air)* ([BC1-873](#) 01:38[2])

(20)
CLOTHES+NICE
*nice clothes*

166

(21)



RIP(PAPER)+ANGRY
*angrily rip paper*

## 7.4 Multi-functional signs

Many signs belong to more than one of the classes defined above. As opposed to pairs like

CAR and DRIVE (see 7.2.1) in which there is a clear morphological derivation for the verbal

form, many signs have been found to be used with morphological properties, co-occurrence

privileges, and syntactic patterns of more than one category without derivation (cf. English

*read a book* and *booked a flight*). The sections below provide examples of signs that function

as more than one class and discuss their shared features. Several signs have been identified

which frequently function as 1) a noun or a verb, 2) a noun or a modifier, and 3) a verb or a

modifier. The issue of whether these signs are multiple homophonous entries in the lexicon

or single underspecified roots is left for future research.

It is not practical at this point to apply criteria such as those outlined in Evans &

Osada 2005 for 'merged classes' (clear 'semantic compositionality', distribution across the

entire lexicon, and bidirectional applicability of each pattern). Current analyses of sign

classes and functions are based on translations which may or may not reflect the exact

semantic properties of all signs, a relatively small sample of the lexicon is well understood,

and more specific tests relating to morphological and syntactic combinability would be

needed to determine to what extent each pattern is reversible. (Note that these factors also

apply to the analysis of signs in the typical classes defined above, and a more in-depth

examination of the lexicon may reveal that these signs are capable of functions outside of

what has been defined thus far. Alternatively, further analysis may reveal distinctions which have not yet been recognized.) What can be found in the following sections are at least cases of zero derivation and at most evidence for weak distinctions or atypical lexical categorization in LSSiv.


### 7.4.1 Nouns or verbs

Table 94 lists signs with nominal and verbal meanings that are related in different ways. Pairs in parentheses indicate that there is an alternate sign for approximately the same nominal meaning.

Table 94. Nominal/verbal signs.

| The one who... | The thing that you... | The thing you use to... | The place where you... |
|---|---|---|---|
| BARK/DOG | BUILD/BUILDING | (BUY/MONEY) | COOK/KITCHEN |
| (BORN/CHILD) | EAT/FOOD | CUT/KNIFE | DANCE/GRADUATION |
| FLY/BIRD | PLAY.GUITAR/GUITAR | DRINK(STRAW)/STRAW | DANCE2/CLUB |
| GROW/PLANT | TIE/ROPE | LOCK/KEY | SWIM/POOL |
| SELL/VENDOR | WORK/JOB | TAKE.PICTURE/CAMERA | |

Aside from their ability to fill subject, object, or verbal syntactic positions (see 10.2), some of these signs have been observed with verbal and nominal morphology. Examples 22 and 23 show EAT/FOOD being used as a verb with an aspect marker (CONT), and as a noun with quantification (MANY).



(22)

EAT+CONT
*eat a lot, keep eating*

(23)



EAT/FOOD
*a lot of food*

MANY
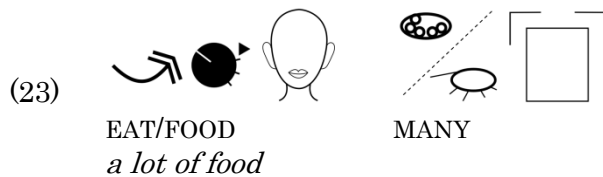
## 7.4.2 Nouns or modifiers

Meaningful handshapes (see 8.1), signs for body parts (usually of animals), and signs

relating to the environment are able to function as nouns or as modifiers. Examples are

given in Table 95.

Table 95. Nominal/modifier signs.

| Environment | | Body Parts | |
|---|---|---|---|
| SUN/SUNNY | FIRE/ON.FIRE | ear | snout |
| RAIN/RAINY | NIGHT/AT.NIGHT | claw | stinger |
| WIND/WINDY | DAY/DURING.DAY | tooth | tail |

Table 96 shows that SUN/SUNNY and DAY can be marked for degree via larger signing

space (additional hand/wider articulation), SQ (squinted eyes; see 8.4.2.2), and INTENSE

when used as modifiers (see 7.3). Both signs can also be quantified when used as nouns

with MANY(MUCH), or even a numeral in the case of DAY.

Table 96. Quantification and intensification of environmental signs.
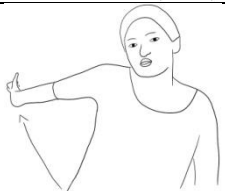
| Intensity (adjectival) | Quantity (nominal) |
|---|---|
| <br>SUN+SQ+INSENSE<br>*very sunny* | <br>SUN     MANY<br>*a lot of sun* |
| <br>DAY+SQ+INTENSE<br>*middle of the day* | <br>DAY     TWO<br>*two days* |

Nominal uses of such signs occur with NOT.EXIST as well. Examples 24 and 25 show this possibility with RAIN and PINCERS.

(24)



RAIN  NOT.EXIST
*there's no rain* ([BC1-354](#) 05:14[2])

(25)



PINCERS  NOT.EXIST
*it doesn't have pincers*
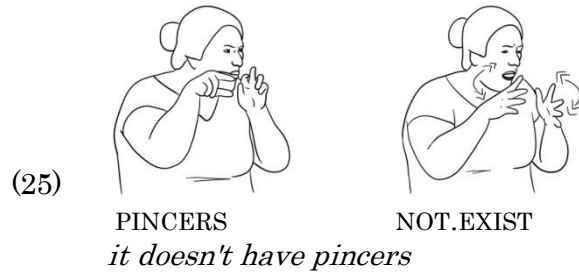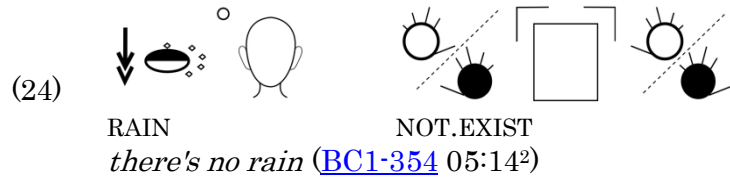
Signers often use several body parts adjectivally to initially describe an animal (e.g. 'ANIMAL(EARS) LONG.SNOUT LONG.TAIL' meaning *an eared, long-snouted, long-tailed animal*) and choose one characteristic to refer to it nominally later (e.g. 'LONG.SNOUT WALK' meaning *the long-snouted animal walks*). (Again, adjectival use of these signs can be modified by spatial and non-manual degrees). This means that many individual signs may be used to refer to the same animal, and most body part descriptors can refer to several animals in addition to the body part itself. Table 97 shows a few of these relationships. This is closely related to the use of meaningful handshapes for other objects (see 8.1). Videos of animal descriptions are available with Chapter 8 videos ([ch8an](#), [BC2-050 through BC2-054](#)[3]).

Table 97. Modifier and nominal use of body part signs.

| Sign | Description (modifier) | Animals (nouns) |
|---|---|---|
| | *big eyes* | baby animals<br>frog<br>rabbit<br>sloth |
| | *big ears* | elephant<br>horse<br>rabbit<br>rat<br>squirrel |
| | *long snout* | armadillo<br>elephant |
| | *long tail* | armadillo<br>rat<br>squirrel |

### 7.4.3 Verbs or modifiers

Table 98 gives examples of signs which may be used as verbs or modifiers. These are

generally stative and perceptive verbs or paths (see 10.4.2.1).

Table 98. Verbal/modifier signs.
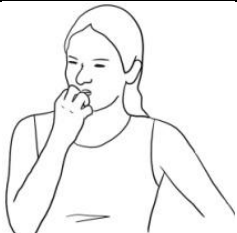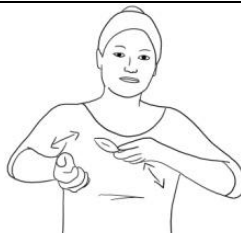
| | | | | |
|---|---|---|---|---|
| DIE/DEAD | IMAGINE | SCOLD | SWEAT/TIRED | WALK |
| GASP/SURPRISE | LIKE | SEE/LOOK | TALK/TALK.TO | YELL |
| HEAR/LISTEN | ANGRY | SLEEP | THINK | ZIGZAG |

As modifiers, non-manual components or one-handed versions of these signs

combine with verbs to provide manner information. The combination of SLEEP and IMAGINE,

for example, creates *dream.* (Note in this and some other combinations, both signs can be

used as either verbs or modifiers, and it is unclear which sign functions as which part of

171

speech). These simultaneous verb+modifier forms often include degree information as well.

Table 99 shows a few more of these structures.

**Table 99. Simultaneous modifiers.**

| Verb | Modifier | Modified Sign |
|------|----------|---------------|
| RIP(PAPER) | ANGRY | *angrily rip paper* |
| HARVEST | SWEAT/TIRED | *harvest a lot (until tired)* |
| HOLD | TALK | *talk with a microphone* |

Verbal usage is indicated syntactically. Example 26 shows SCOLD as a (low) transitive verb following LSSiv's SOV order (see 10.2.2; 10.5.2), and example 27 shows ZIGZAG as the path in a manner-path serial verb construction (see 10.4.2). (Note that in typical intransitive conditions, these signs may be ambiguous as verbs or modifiers.)

(26)

1     CHILD     SCOLD

*I scold the child.*

172

(27)

DRIVE                                    ZIGZAG

*drive on a zigzagged path* ([BC1-364](#) 03:02[2])


## 7.5 Other signs and morphemes

The rest of the signs and morphemes in the lexicon are as-yet unclassified (apart from the fact that they lack the characteristics to fit into any of the classes defined above). This category includes 1) indices, deixis, and other context-dependent references to people, times, and locations, 2) transitions that hold a conversation or narrative together, and 3) grammatical morphemes such as questions, negation, and aspect markers. Examples of each are given in Table 100.

Table 100. Unclassified morphemes.

| Reference Points | | Transitions | Grammatical | |
|---|---|---|---|---|
| BEFORE | pronouns | NO.MORE | GO | negation |
| FUTURE | THERE/THAT | OTHER/THEN | TOP (topic) | wh-questions |
| GROW.UP | THIS | WAIT | USE | |
| HERE/NOW | | WELL | YN | |

Some references can combine with simultaneous modifiers and significant locations or numeral morphology (described in 8.4.2.3). Some grammatical signs/morphemes are used in processes described above or are used at the phrasal or intonational level. There are no morphological processes which have been identified for transitional signs. All of these morphemes tend to mark phrase boundaries, occurring initially, finally, between clauses, or simultaneously with an entire phrase. Further description and classification of these signs is a topic for future research.

## 7.6 Summary

Morphological and co-occurrence patterns can be used to identify noun, verb, and modifier classes among LSSiv signs. Diverse morphological patterns for verbal signs allow division of this category into subclasses, one of which consists of verbs that can be derived from nouns. No other derivational processes have been found, though many signs are used as more than one class (e.g. a noun or a modifier). Signs and morphemes outside of these three main categories are not yet classified.

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Chapter 7 endnotes

[1] Note that deictics are not discussed here because distinctions between indexing deictics and pronouns (e.g. *that* versus *that one*) are established by discursive or syntactic context rather than morphology and co-occurrence alone. E.g. INDEX BOOK may mean *that book*, but it can also mean *That (one) is the/a book*, parallel to the use of INDEX RUN for *That one/he is running/runs.*
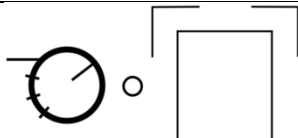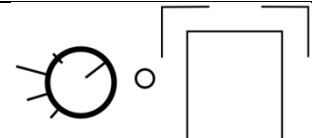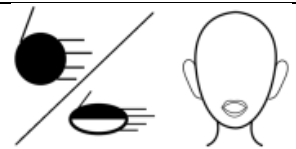
[2] Videos from which examples are taken can be found using the BC1-XXX label at the following address: https://scholarspace.manoa.hawaii.edu/handle/10125/34525.

[3] Clips referenced in this chapter can be found at https://bleegiimuusclark.com/lssiv-grammar-examples-3/#ch6an and https://scholarspace.manoa.hawaii.edu/handle/10125/49885, BC2-050 through BC2-054.

# CHAPTER 8. MORPHOLOGY

Sign languages tend to be quite morphologically complex, making use of many simul‑

taneous and spatial aspects. LSSiv does not diverge from this tendency. As opposed to

prefixes or suffixes, the morphological processes described here function more like infixa‑

tion. Most morphemes take the form of modifications to phonological aspects of a sign and

contain size, shape, degree, and quantitative information. For example, the handshape of a

numeral may be used with a pronominal sign to specify its number (see 8.5), and the WIDE

morpheme combines with nouns via the addition of extended fingers (see 8.2). Both of these

can be seen in Table 101.

Table 101. Morphemes that change a sign's handshape.

| Original Sign | Added Morpheme | Complex Sign |
|---|---|---|
|  3 (third person) |  +THREE |  3+THREE *(the three of them)* |
|  WATER |  +WIDE |  WATER+WIDE *(body of water)* |

The set of meaningful handshapes (8.1) and the set of locations (8.3) described below

function as bound morphemes which can be incorporated into verbs. There are also several

bound morphemes which are articulated non‑manually or on the non‑dominant hand (8.4)

and simultaneously add size, manner, type, degree, emotional, or even derivational infor‑

mation to a variety of independent signs.

This chapter focuses on morphemes which modify a single sign, while Chapter 9

describes patterns that involve more than one sign or affect an entire phrase or clause. The
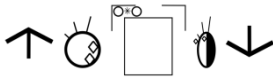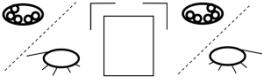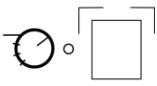
current discussion includes 1) meaningful handshapes, 2) manual modifications for size and shape, 3) use of space, 4) use of multiple articulators, 5) number, and 6) simple verbal morphology. It is a presentation of what is currently known about the language. At this point in research on LSSiv, the division between non-manuals that function on a morphological or gestural level is not clear. The discussion below attempts to be inclusive to point out features that to have explicit or implicit meaning.

## 8.1 Meaningful handshapes

There are several handshapes in LSSiv which are used to indicate the form, but not the exact identity, of a noun, generally used in a verbal predicate (see 9.2.2). These are discussed here as 'meaningful handshapes' since evidence that any of these fit the criteria for sign language 'classifiers' is not strong, and this term has been called into question as appropriate for any sign language (Schembri 2003).

Classifiers in sign languages (and some spoken languages) are said to identify classes of nouns which are participants in a verbal or predicate structure (Schembri 2003). According to Stokoe (1978b), they depict locations and paths of motion. While many handshapes are used in LSSiv location predicates with verbs such as PUT, PICK.UP, and MOVE.OBJECT, use with motion predicates such as *go* or *travel* is rare. Lexical items linked to meaningful handshapes (CUP, ORANGE, BOTTLE, BALL, etc.) were tested with FALL, DROP, and paths like ROLL and ZIGZAG, but each verb was used in its plain form in every case (videos ch8cla, BC2-039 through BC2-049[1]). Three examples from natural signing are the only indication at this point that at least two shapes can be used with motion predicates: an arrow's path forward is shown with the long thin object shape (LOTH; example 28), and the

small round object shape (SMRO) is used with the ZIGZAG path for a group of bees (example

29) and a coconut (example 30).

(28)

SHOOT.ARROW    FORWARD+LOTH
*shoot an arrow straight forward* ([BC1-357](#) 02:03[2])

(29)

BEE-REP     MANY      ZIGZAG+SMRO
*many bees fly around* ([BC1-881](#) 01:57[2])

(30)

ZIGZAG+SMRO    THERE
*(the coconut) floats away* ([BC1-410](#) 03:32[2])

What LSSiv's meaningful handshapes consistently do is take the place of a type or

piece of an object in combination with verbal and locative predicates. Four types are

identified: 1) whole entity, 2) surface, 3) body part, and 4) object manipulation.


### 8.1.1 Whole entity

Table 102 shows the two shapes in LSSiv which represent whole entities. These allow

movement and manipulation of an object as a whole. Because these morphemes represent

the entire object rather than a description of it (as in the surface category; see 8.1.2), they

cannot be manipulated to further define shape or size. Whole entity morphemes are one-

handed, though they may interact with a base morpheme on the non-dominant hand (see

8.4.1.1). They can also function independently with verbal predicates.

Table 102. Whole entity handshapes.

| Shape | | | Meaning | Gloss | Examples |
|---|---|---|---|---|---|
| 1+ | | | long, thin object | LOTH | PENCIL, SKEWER (4), SPINE/STINGER |
| 01234+ | | | small, flat object | SMFL | BOOK (6), PAINT.BRUSH, DVD, FISH, KNIFE (5) |

The examples below show these shapes combined with the verbal predicates FRY (31), EAT (31), CHOP (32), CUT.SELF (32), and PUT (33).

(31)

FIRE    SKEWER-REP    FRY+LOTH    EAT+LOTH

grill skewers over a fire and eat them ([BC1-333](BC1-333) 00:24²)
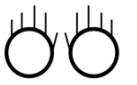
(32)

CHOP    /    OTHER    CUT.HAND

...chopping. Then, (he) cuts (his) hand ([BC1-384](BC1-384) 03:40²)

(33)

BIG.SHELF    BOOK(LSP)-REP    PUT(UPRIGHT)+SMFL-REP

put several books on a big shelf ([BC1-397](BC1-397) 00:35²)

## 8.1.2 Surface (size and shape)

This category includes eight handshapes, pictured in Table 103, that refer to objects of a certain size and shape. Unlike whole entity handshapes, these indicate only the surface of an object, and can be very flexible in their exact configuration to provide a specific description (see section 8.2 for more on size morphology). CYL, for example, ranges from a closed fist to an open hand with spread and barely rounded fingers. Space between the hands and movement in two-handed shapes like FLAT and BOCA also provide room for specification (see 8.3).
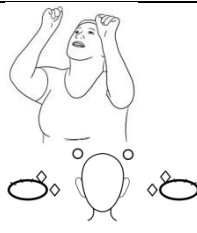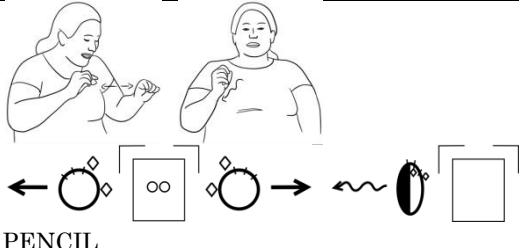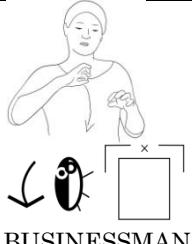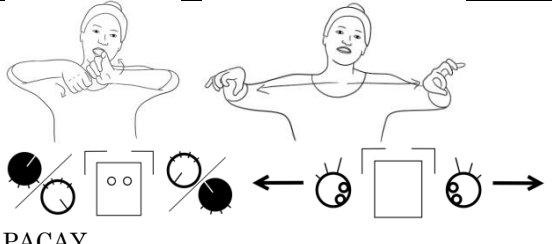
Table 103. Surface handshapes.[3]

| Shape | | | Meaning | Gloss | Examples |
|---|---|---|---|---|---|
| 01t | | | tiny object | TINY | BEE, COFFEE(BEAN), RICE, STAR |
| 01t | | | thin object | THIN | BEAN(POD), CORN.COB, PENCIL, ROPE, SANDWICH, WIRE |
| 01rc(234+) | | | long, round object | LORO | BRANCH, ELEPHANT.TRUNK, PACAY, PIPE, SNOUT, TAIL, TIE |
| 01234+ | | | flat object or surface | FLAT | GROUND, PLATE, TABLE, WALL, WATER.LEVEL |
| 01234s | | | container for liquid, bottle or can | BOCA | BOTTLE, CAN, CHICHA, SODA |
| 01234r | | | cylindrical object | CYL | CUP, DRINK(CUP), POUR, TELESCOPE, VIDEO.CAMERA, |
| 01234rs | | | big, round object | BIRO | (SOCCER)BALL, COCONUT, PAPAYA, SMALL.ANIMAL |
| 01234r(c) | | | small, round object | SMRO | APPLE, BALL, EAT.FRUIT, GAME.PIECE, LIME, ORANGE, PICK.FRUIT, POTATO |
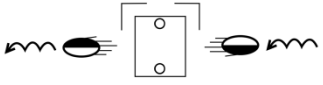
Morphemes in Table 103 are depicted in their typical form in terms of the number of hands used, though some may vary. Frequent shape variants are noted in parentheses in the first column. Because these shapes indicate surfaces, orientation is also important in this category. CYL, for example can be tipped to pour or drink from a 'cup', and the orientation of FLAT narrows its meaning (e.g. GROUND vs. WALL).

This category also varies quite a bit in terms of the types of uses each shape allows. TINY, THIN, and LORO are only used in a few lexicalized items, shown in Table 104. Note the use of two hands with TINY for plural *stars*, addition of fingers when THIN describes a wider object in EAT(SANDWICH), outward movement for a long PENCIL, and a more open shape when LORO is used for a thick *pacay*. (See 8.2 for more on size morphology.)

**Table 104. Surface handshapes used in lexemes.**

| Shape | Parameters | Example 1 | Example 2 |
|-------|-----------|-----------|-----------|
| TINY | **size:** space between index and thumb | COFFEE | STAR.PL |
| THIN | **length:** space between hands<br><br>**width:** number of fingers extended | EAT(SANDWICH) | PENCIL |
| LORO | **length:** movement<br><br>**width:** space between index and thumb | BUSINESSMAN | PACAY |

The majority of the time, BOCA is used as a monomorphemic sign, often part of a phrase or compound describing the contents of the container (*soda*, *shampoo*, etc.). BOCA is less-commonly used to describe several containers in a line, as in example 34, though this is perhaps nothing more than a type of pluralization (see 8.5.1) rather than a true locative predicate. Manipulations like POUR, SQUEEZE, and OPEN(BOTTLE) utilize a neutral verb form or the object manipulation shape HOLD (see 8.1.4).

(34)

BOCA-REP
*several jars (in a line)* ([BC1-333](#) 01:03[2])

FLAT often serves as the location of a verb that follows, as in examples 35 and 36. (It is common that the non-dominant hand retains the FLAT morpheme as an incorporated location for the following verb as well; see 8.3.1.)

(35)

FLAT(HORIZ)    MOVE.PIECE-REP
*move pieces on a game board* ([BC1-402](#) 00:48[2])

(36)

FLAT(HORIZ)-SQUARE(HORIZ)    CHAIR    EAT+LOC
*The table is here with a chair (behind it) and you eat off of it.* ([BC1-360](#) 06:40[2])
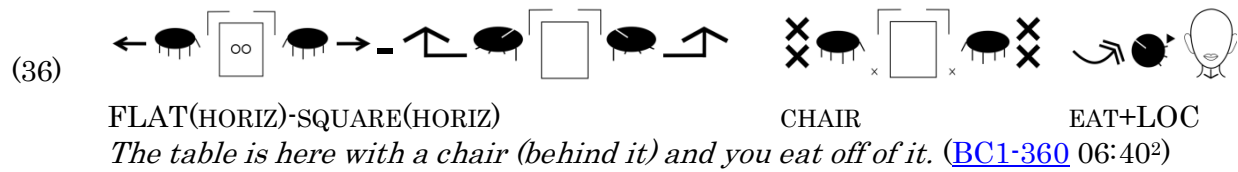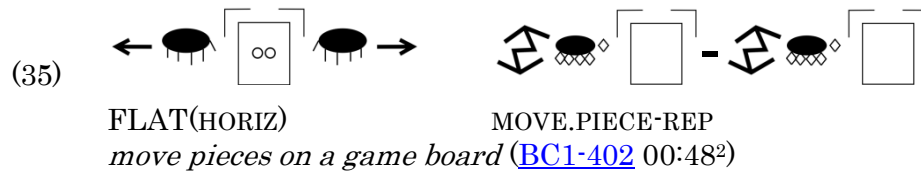
FLAT can also be used as a description (example 37) and with non-manual adjectives like CLEAN/NICE (example 38). (Use of the non-dominant hand in example 38 is related to two-handed morphology; see 8.4.1.)

(37)

CHAIR    FLAT(HORIZ)    BLANKET-LIE.BACK
*cover up and lie back on a sofa* ([BC1-364](#) 02:09[2])

(38)

WIPE  BEAUTIFUL  GOOD  FLAT(VERT)+NICE
*wipe off (the mirror) and it will be clean and beautiful* ([BC1-360](#) 02:40[2])
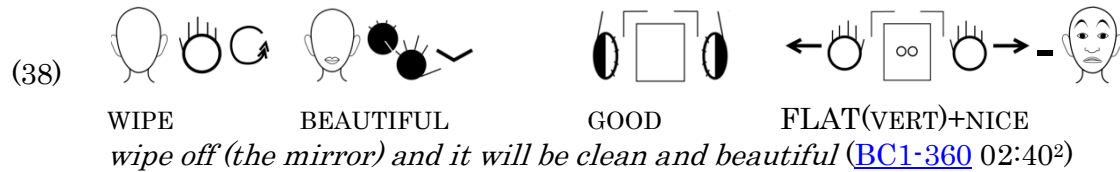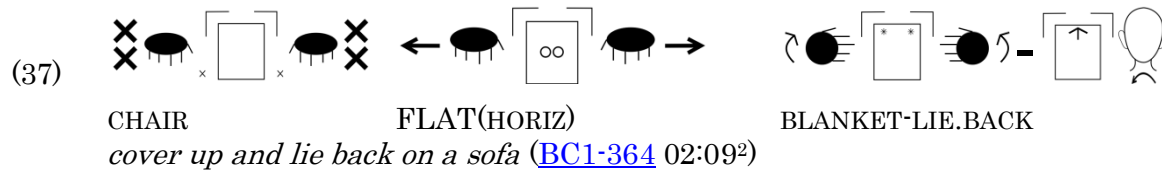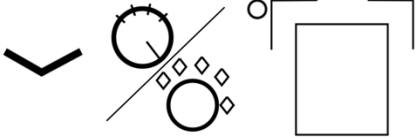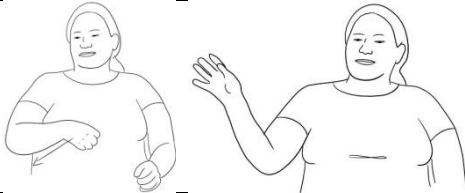
The remaining three shapes (CYL, BIRO, and SMRO) are the most complex in their grammatical use. All three are used with locative and stationary verbs like PUT, DRINK, and WASH (Table 105). For many verbs, object manipulation shapes (see 8.1.4) are used in lieu of these surface shapes. Note also that SMRO in particular frequently serves as a base on the non-dominant hand (see 8.4.1.1).

**Table 105. Surface handshapes with locatives and verbs.**

| Shape | Example 1 | Example 2 | Example 3 |
|---|---|---|---|
| CYL | CYL+HI -REP<br>*cups on a shelf* | DRINK+CYL<br>*drink from a cup* | POUR+CYL(ND)<br>*pour into a cup* |
| BIRO | PUT+BIRO+LOC<br>*put a vase down* | DRINK+BIRO<br>*drink from a coconut* | MOVE.DOWN+BIRO<br>*coconut falls (from a tree)* |
| SMRO | SMRO+LOC-REP<br>*apples in a tree* | PEEL+SMRO(ND)<br>*peel potato* | EAT+SMRO<br>*eat peach (mango, apple)* |

Though one instance in Table 105 shows a signer using a two-handed FALL (a motion predicate) that resembles BIRO for a COCONUT falling from a tree, tests with other BIRO objects, other verbs, and other signers indicate that it is not the typical pattern (see videos ch8cla, BC2-039 through BC2-049[1]). SMRO, however, is the one shape that actually may be a 'classifier' in the making. One problem with determining its significance is that many of the relevant verbs have a default shape that falls within SMRO's parameters (see Table 106). Thus, it is still undetermined whether signs like PICK.FRUIT and THROW are always lexified monomorphemic items or may also appear as dimorphemic items with SMRO.

Table 106. Signs with a default 'SMRO' shape.

| THROW | THROW.AWAY | PICK.FRUIT |
|---|---|---|
|  |  |  |

### 8.1.3 Body parts

The shapes in this category indicate types of body parts, shown in Table 108. These are also flexible in terms of modifications to their basic shape. There is a distinction between small, average, and branched horns, for example, and foot or paw shapes change according to size and the presence of claws or perceived danger (see 8.2 for more on size morphology).

Table 107. Body part handshapes.

| Shape | | | Meaning | Gloss | Examples |
|---|---|---|---|---|---|
| 01234- | | | fisted feet/ hands | FIST | MONKEY, PUNCH, WALK(MONKEY) |
| 1+ | | | thin horns | HRN1 | BUCK.HEAD, COW, GOAT, SHEEP |
| 1b | | | hooked beak, stinger, fang | HOOK | BEE.STING, PARROT, SCORPION |
| 01t(c) | | | triangular beak | BEAK | BIRD, PECK |
| 01234+ | | | typical feet/paws<br><br>ears | FOOT<br><br>EAR | CLIMB(SLOTH), HOP(FROG, RABBIT), SNEAK(PERSON), WALK(SQUIRREL)<br>DOG, HORSE, RABBIT, SQUIRREL |
| 01234s | | | wide feet/hands<br><br>branched horns<br>large ears | FTSP<br><br>HRN5<br>EAR5 | SEARCH, SWIM, WALK(CAT, CAMEL, HORSE, TIGER, TURTLE)<br>DEER, MOOSE<br>ELEPHANT, DOG |
| 01234bs | | | clawed feet/paws<br>jaws | CLAW<br>JAW | BEAR, LION, WALK(RAT)<br>BITE, CROCODILE, SHARK |

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The majority of handshapes in this group are two-handed and symmetrical. Most are used in zero space, but for *ear* and *horn* meanings they are brought to the top of the head. These shapes are used in lexicalized forms such as CHICKEN, MONKEY, and CROCODILE, but also move and bend in verbs like WALK, BITE, and BUCK or as an individual body part (see 7.4.2 for information on nominal and adjectival use). Different types of movement are used for different animals, and non-manuals or additional signs are used for more specificity.

Table 108 gives examples of each shape in use. See videos ch8an, BC2-050 through BC2-054[1], for descriptions of less familiar animals that use quite a few of these shapes as well as the surface handshapes from section 8.1.2. Modifications for baby animals show size morphology as well (see 8.2).

Table 108. Body part handshapes in use.

| Shape | Example 1 | Example 2 |
|---|---|---|
| FIST<br>hands in a fist | <br>PUNCH | <br>WALK(MONKEY) |
| HRN1<br>long and thin horns | <br>ANTELOPE(HORNS) | <br>COW.BUCK |
| HOOK<br>hooked beak<br>stingers<br>fangs | <br>PARROT     GRAB | <br>SCORPION |
| BEAK<br>pointed beak (not hooked) | <br>CHICKEN | <br>PECK |

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Table 108. (Continued) Body part handshapes in use.

| Shape | Example 1 | Example 2 |
|---|---|---|
| FOOT<br>average foot or paw | HOP(KANGAROO, RABBIT) | SLOTH |
| EAR<br>average animal ear<br>tall or long tall ears | DOG, SQUIRREL EARS | RABBIT(LOP.EARS) |
| FTSP<br>wide foot or hand<br>hoof | SEARCH | WALK(HORSE/CAMEL/TURTLE) |
| HRN5<br>branched horns<br><br>EAR5<br>large or wide ears | DEER | ELEPHANT |
| CLAW<br>paws with claws<br>dangerous animals | WALK(RAT) | BEAR |
| JAW<br>jaws with sharp teeth | CROCODILE | BITE(SNAKE) |

### 8.1.4 Object manipulation

The last category includes shapes that show how an object is held or used. Their shapes are relatively unchanging, barring the addition of a second hand for HOLD and HNDL, but they move freely in space with many nouns and verbs. Table 109 describes each shape, and Table 110 gives examples of each as used in monomorphemic signs.

**Table 109. Object manipulation handshapes.**
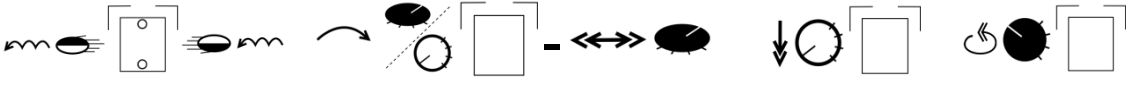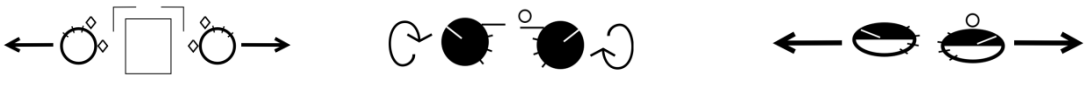
| Shape | | | Meaning | Gloss | Examples |
|---|---|---|---|---|---|
| 01234- | | | hold round or cylindrical piece of an object | HOLD | BRAID, CAR, CART, CARRY, DRIVE, GRAB, POUR, STAB, STICK, STIR, UMBRELLA |
| 0b(/1b) | | | use container that sprays | SPR | AEROSOL.CAN, PERFUME, SPRAY BOTTLE, SPRAY PAINT |
| 01c(234+) | | | handle a small, thin, light object | HNDL | ARROW, EAT.PINEAPPLE, PAINT.NAILS, PICK.UP(FEATHER, WORM, CLOTHES), USE.STRAW |

**Table 110. Lexicalized use of object manipulation shapes.**

| Shape | Example 1 | Example 2 |
|---|---|---|
| HOLD | EAT.SUGARCANE | MOTORCYCLE |
| SPR | PERFUME | SPRAYPAINT |
| HNDL | SHOOT.ARROW | SEW |

HOLD is the most frequently-used in this category. It is used with a variety of verbs and objects which fit the parameters for LORO, BOCA, CYL, BIRO, or SMRO (see Table 103). In some cases, an object is introduced or described using a surface handshape, then 'handled' using HOLD (examples 40, 41, and 42). Two-handed variations can be used for individual objects, one larger object (example 40), or one long object (example 42).

(39)

WATER    GRAB    POUR+HOLD-REP
*grab some water and keep pouring it on* (BC1-397 00:53[2])

(40)

FLOWER    VESSEL    CARRY+HOLD
*carry a flower in a vase* (BC1-358 02:07[2])

(41)

BOCA.REP    POUR+HOLD-DRIZZLE+HOLD    ADD+HOLD    STIR+HOLD
*pour, add, and mix from several containers* (BC1-333 01:03[2])

(42)

THIN+LONG    LOTH+TWIST    KNOT+HOLD
*tie a knot in rope* (BC1-359 06:08[2])

SPR has a more limited application, but is generalized to any container that sprays, such as an aerosol can (example 43). (Note that it is used here with a more common bent index shape rather than using the thumb. This is likely an allomorph used for ease of articulation; see 6.1.1.4 and 6.1.2.)

(43)

TINY+MOVE(HIGH)    /    SPRAY+HI-LOW-HI
*An insect flies by. Spray it in the air and on the ground...* (BC1-397 01:45[2])

The last shape, HNDL, is often used with verbs like PICK.UP, EAT, and DRINK (Table 111). Note that this shape can also be modified for size (see 8.2). See video ch8hndl, BC2-055[1], for a sequence that uses this shape in several ways to describe handling clothing.

Table 111. Popular uses for HNDL.

| Verb | Example 1 | Example 2 |
|---|---|---|
| PICK.UP | *pick up a worm* | *pick up clothes* |
| EAT | *eat small pieces* | *eat (meat) by tearing apart* |
| DRINK | *drink through a straw* | *an insect drinks* |

## 8.2 Manual modifications for size and shape

Depending on a sign's neutral form, certain elements of handshape can be used to further specify physical attributes of a noun, verb, or meaningful handshape. Morphologically distinct values for 1) finger extension and 2) spreading and flexion (see endnote 3, p.222) are discussed below.

### 8.2.1 Finger extension

Number of extended fingers is used as an indicator of width for certain signs. There are three sets of distinctions which apply to different signs, two of which involve extension of more fingers to add the WIDE morpheme (8.2.1.1-2), and one which eliminates fingers to add THIN (8.2.1.3). No instances have been found of a distinction between all three handshapes.

#### 8.2.1.1 WIDE: 1234+ replaces 1+

The first realization of WIDE is the extension of all fingers in a sign that normally uses only the index. It is used in WATER, SNAKE, and FISH. Example 44 shows plain WATER being used to refer to drinking water, while example 45 shows that WATER+WIDE is used for bodies of water. Note that WIDE is used even when the body of water being described is a small stream. (See 8.1.2 for information on the CYL and THIN morphemes).

(44)

WATER                    DRINK+CYL
*drink water from a cup* ([BC1-358](#) 03:00[2])

(45)

WATER+WIDE        WINDING(GROUND)+THIN   /        WATER+WIDE  HERE
*A small stream. There's (a body of) water here.* ([BC1-722](#) 03:16[2])
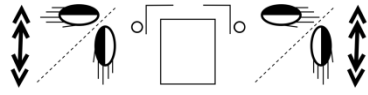
SNAKE and FISH have the same distinction when referring to a smaller or larger animal, as seen in Table 112. All four forms can be translated as nouns or verbs (e.g. *there's a snake / a snake slithers*) depending on the sign's syntactic context (see 7.4). Another trend is that the 1+ shape for FISH is generally used in reference to fishing, and 5+ for cooking.

**Table 112. WIDE used for animals.**

| Small | | +WIDE | |
|---|---|---|---|
|  SNAKE |  FISH |  SNAKE+WIDE |  FISH+WIDE |
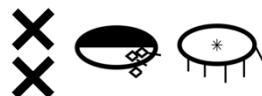
### 8.2.1.2 WIDE: 12+ replaces 1+

Smaller objects and actors are represented by a tapered handshape that uses the thumb and either the index (1+) or the index and middle (12+) fingers. Again, the extension of an additional finger here adds the WIDE morpheme. The examples below show this contrast in the two shapes used for a bird pecking with a small beak (46) and a larger beak (47).

(46) 

BIRD                                        BITE(NM)+PECK-REP
*The bird pecked (him).* (BC1-883 02:09[2])

(47) 

BITE(NM)                     PECK+WIDE-REP
*biting and pecking with a thick beak* (BC1-401 02:19[2])

The HNDL and TINY morphemes (discussed in 8.1) can also be used with WIDE to specify handling and movement of different items, as shown in Table 113 (see 8.2.2 for a discussion of spreading in *wide eyes*).

**Table 113. WIDE with meaningful shapes.**

| Plain | | +WIDE | |
|---|---|---|---|
|  |  |  |  |
| HNDL<br>*pick up (a worm)* | TINY<br>*coffee* | HNDL+WIDE<br>*pick up (a feather)* | TINY+WIDE+LOC<br>*wide eyes* |

### 8.2.1.3 THIN: 12+ replaces 1234+

The last distinction is used for animals and flying creatures. This one is used less consis‑

tently, but there are examples that show its significance when size is being emphasized.
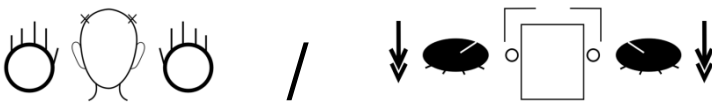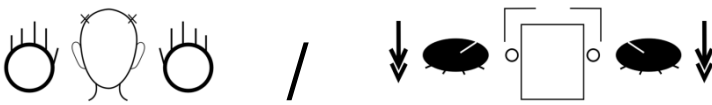
For this pair, the larger option (all fingers: 1234+) is default, and 12+ (the index and

middle) describes something unusually or comparatively thin. The contrast between

descriptions of butterflies and dragonflies in Table 114 shows this distinction. (Note the use

of the non-manual SMALL morpheme as well; see 8.4.2.1.)

**Table 114. Use of THIN for insects.**

| Plain | +THIN |
|---|---|
|  |  |
| FLY(SMALL)<br>*butterfly* | FLY(SMALL)+THIN+SMALL(NM)<br>*dragonfly* |

The same distinction is used in a description of a rat (example 49), contrasting with

a horse (example 48). The 1234+ morpheme glossed as ANIMAL(EARS) is used as a general

sign for most mammals with upright ears, and the 12+ form is used for increased specificity

of thinner ears. ANIMAL(EARS) can also move or change orientation to describe a specific

animal or posture (see 8.1.3 and 7.4.2 for more on animal descriptions).

(48)

ANIMAL(EARS) / HORSE(loan)
*An animal. A horse* ([BC1-307](#) 00:18[2])

(49)

ANIMAL(EARS)+THIN RAT
a *small animal, a rat* ([BC1-304](#) 00:42[2])

## 8.2.2 Spreading and flexion

Some contrasts show that the size and shape of a referent can affect the position of

extended fingers as well (see endnote 3, p.222). A larger meaning is given as the fingers

spread apart and degrees of flexion or tapering decrease, glossed here as LARGE. In two-

handed signs, the hands may also spread apart, glossed as LONG (see 8.3 for more on the

use of space). Spreading and flexion or tapering can be used individually or simultaneously,

depending on the phonology of the sign being manipulated. LARGE and LONG can also

combine with the addition of fingers, or WIDE, described above (8.2.1). Table 115 compares

three signs for animals referring to different types of ears. The sign for *elephant* is a good

example of how spreading alone is used with a larger meaning in comparison to the typical

ANIMAL(EARS) sign. The large rounded ears of a bear, on the other hand, are described with

a spread and bent shape.

Table 115. Size and shape morphology in animal ears.

| Plain | +LARGE | +LARGE+ROUND |
|---|---|---|
| ANIMAL(EARS)<br>*horse* | ANIMAL(EARS)+LARGE<br>*elephant* | ANIMAL(EARS)+LARGE+ROUND<br>*bear* |

Degrees of tapering alone in STACK are significant as a type of quantification for money. In video ch8t116, BC2-056[1], the fingers spread apart to actively show an increase as the non-manual SMALL changes to WOW (see 8.4.2.2). Table 116 shows the initial (+SMALL) and the final (+LARGE) forms.

Table 116. Degrees of tapering in STACK.

| +SMALL | +LARGE |
|---|---|
| STACK+SMALL<br>*a little money* | STACK+LARGE+WOW<br>*a lot of money* |

The one-handed shape in many signs for round objects (SMRO; see 8.1.2) is frequently manipulated in both ways: an increase in spreading and a decrease in flexion. Table 117 shows three sizes of eggs. Again, the final and largest form uses a non-manual size marker (BIG).

Table 117. Size morphology with the SMRO shape.

| Plain | LARGE | LARGE+ |
|-------|-------|--------|
|  EGG *egg* |  EGG+LARGE *big egg* |  EGG+LARGE+-BIG *emu egg* |

The sign for *wide eyes* takes advantage of both realizations of LARGE, as well as the addition of the middle finger for WIDE (see 8.2.1.2). Like the STACK quantifier in Table 116, tapering movement can be used verbally to describe the eyes opening as seen in example 50 (video ch8e50, BC2-057[1]).



(50)

EYE+WIDE+LARGE+PL(ND)+SURPRISE(NM)
*wide eyes* (BC1-354 00:17[2])
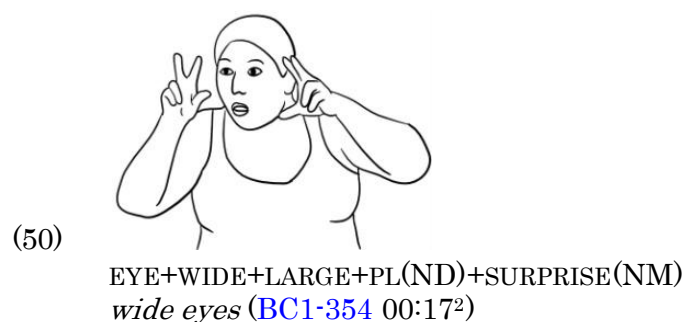
## 8.3 Use of space
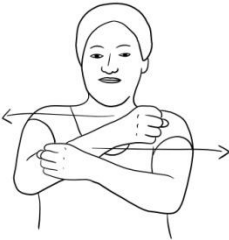
The location in which a sign is articulated can have important morphological implications as well. As is often observed in sign languages, LSSiv uses spatial agreement and incorporation to show locative relationships (8.3.1). The size and shape of the signing space, and how a signer's hands and torso move through it, are also significant (8.3.2). Spatial relationships at the phrasal and sentential levels are discussed in 9.1.

### 8.3.1 Incorporation using locations on the body

Many signs with locations on the body are semantically tied to that body part (e.g. SAD's

downward movement on the mouth is likely related to a frown). While signs like SAD are

unchanging, others may change locations for a specific meaning. Verbs often use this as

object incorporation and nouns use it adpositionally. (See 9.1.2 for patterns involving

objects in zero space, which must be explicitly stated.)

Verbs can incorporate objects through phonological changes to their location and

orientation. Locations on a signer's body and clothing can be used directly as an incorpo-

rated object in a verb and need no further specification or context to be syntactically well-

formed and semantically interpretable. Table 118 gives examples of verbs in their

unspecified citation form and with two different objects incorporated. Section 8.4.1.1

discusses parallel use of meaningful shapes on the non-dominant hand.

Table 118. Verbal incorporation using locations on the body.

| Unspecified | Example 1 | Example 2 |
|---|---|---|
| CUT(SCISSORS) | *cut clothes* | *cut hair* |
| SHAVE | *shave head* | *shave body* |
| TIE | *tie blanket (as bag)* | *tie shoe* |
| WASH | *wash hair* | *wash face* |

Nouns, or meaningful shapes that represent them, and adjectives can also be signed directly on or near the body to give their location (e.g. *worm on shoulder*). Again, the location is rarely signed separately to 'set it up' beforehand, as is usually needed for locations which lie in zero space (e.g. *worm on flower*) . (Location-based agreement, where the location is established in the preceding context, is discussed in morpho-syntax, 9.1.2.) Table 119 gives examples of incorporated locations.

Table 119. Nouns and adjectives with incorporated locations on the body.

| Unspecified (1) | Incorporated (1) | Unspecified (2) | Incorporated (2) |
|---|---|---|---|
| WORM | *worm on shoulder* | FEATHER | *feathers on head* |
| BALD | *bald arm* | TINY | *tiny object on head* |

## 8.3.2 Intensity and size

Another characteristic that LSSiv shares with other sign languages is the use of the signing space to encode degrees of intensity and size. Many signs employ larger movements or a larger overall signing space as an intensifier. This includes the addition of a second hand in signs that are typically one-handed. These modifications can be used for stronger emotions and descriptions, larger objects, and exaggerated actions. The same types of modifications have been observed in quotatives, along with raised eyebrows and exaggerated facial expressions (see 9.4.3). This is likely more of an intonation-level or prosodic feature, and needs more investigation.

Table 120 shows signs in their typical or citation form and in an exaggerated form. (As expected, non-manual intensifiers are used simultaneously; see 8.4.2.2.)

Table 120. Intensity via signing space.

| Typical (1) | Exaggerated (1) | Typical (2) | Exaggerated (2) |
|---|---|---|---|
| ANGRY | *very angry* | SUNNY | *very sunny* |
| TREE | *big tree* | NIGHT | *late at night* |
| EAT | *eat a lot* | RUN | *run quickly* |

Spatial intensification is also possible in combination with the size and shape morphology described in 8.1 and 8.2. Two-handed signs can give additional size information via the space between the hands. These morphemes are glossed as LONG for increased space or SHORT for decreased space, and often involve movement to one of these positions. Table 121 shows the contrast between the typical sign for *branch*, which uses LONG alone with the typical long round (LORO) shape morpheme (see 8.1.2), and the sign for a *thick branch*, which uses two additional morphemes: LARGE (a more spread and less bent shape) and BIG (non-manual; see 8.4.2.1).

Table 121. Size morphology for branches.

| LONG | LARGE+LONG+BIG |
|---|---|
| LORO+LONG<br>*branch* | LORO+LARGE+LONG+BIG(NM)<br>*thick branch* |

Signs for large and small birds are created in the same way. Note the three-way contrast in Table 122 between the typical sign for *bird* and the two polymorphemic versions which are specified for size. This contrast can also be seen in a signer's description of using a telescope to see a bird larger (video ch8bird, BC2-058[1]).

Table 122. Size morphology in BIRD.

| Plain | +LONG | +SHORT |
|---|---|---|
| BIRD<br>*bird* | BIRD+LONG<br>*large bird* | BIRD+SHORT+SMALL(NM)<br>*small bird* |

## 8.4 Multiple articulators

Aside from the spatial modulations discussed in 8.3, the two hands, the face, and other body parts such as the feet all have the potential to be used for independent simultaneous morphemes. The following sections discuss morphemes which appear 1) on the non-dominant hand as simultaneous nouns and modifiers, and 2) on the face or another part of

the body as simultaneous modifiers and lexical distinctions. Sequential use of the two

hands is discussed in 9.5.


### 8.4.1 The non-dominant hand

Aside from its use as an intensifier, described in 8.3.2, the non-dominant hand can simul-

taneously articulate additional morphemes. Section 8.4.1.1 discusses the use of meaningful

shapes as a 'base' in asymmetrical signs (in which the two hands are phonologically

distinct). Section 8.4.1.2 discusses instances in which the two hands simultaneously

articulate a noun or a verb and a modifier.


### 8.4.1.1 Meaningful bases

A limited set of the meaningful handshapes identified in 8.1 may be used on the non-

dominant hand in two-handed asymmetrical signs. They serve as a 'base' on which the

dominant hand acts. These are important in verbs like WASH and CUT, which change to

according to their object (see 9.2.2). Table 123 lists the four shapes in this category. Note

that it includes two object manipulation shapes (HOLD and HNDL), one whole entity shape

(LOTH), and one surface shape (FLAT).


Table 123. Base handshapes for the non-dominant hand.

| Shape | | | Meaning | Gloss | Objects |
|---|---|---|---|---|---|
| 01234-<br>(01234r) | | | hold a round or cylindrical object | HOLD | APPLE, BALL, BOTTLE, BOWL, CUP, ORANGE, POTATO, ROPE |
| 1+ | | | long, thin object | LOTH | (FINGER), NEEDLE, PENCIL |
| 01234+ | | | flat surface | FLAT | CLOTH, DVD, FLOOR, GROUND, MIRROR, PAPER, TABLE, TARGET |
| 01c(234+) | | | handle a small, thin, light object | HNDL | CLOTHES, FOOD |

As expected, fewer distinctions are found on the non-dominant hand for these asymmetrical signs (cf. Sandler 1995, 2006; van der Hulst 1996). HOLD in particular is used for a wide variety of objects as a base, taking the place of some of the more complex shape distinctions which are used on the dominant hand (BIRO, CYL, LORO, SMRO, etc.). Its surface form ranges from a closed fist (example 51) to a round open shape like SMRO (example 52), but this does not always correspond to the literal shape or the shape that would be used on the dominant hand.

(51)

THIN+LONG                  CUT+HOLD(ND)
*cut a rope* (BC1-359 06:08[2])

(52)

ORANGE            HOLD+PEEL(ND)           EAT+HOLD(ND)
*peel and eat an orange*

FLAT can be used for essentially any flat surface (paper, table, wall, ground, etc.) and can indicate the plane on which an action occurs. Examples 53 and 54 show FLAT being used for a vertical mirror and a horizontal DVD player. (Note that in signs like WRITE and CUT the FLAT morpheme is often deleted if a surface has been established previously or if it is not important to emphasize location in a particular context.)

(53)

CLOTH                    SPRAY+FLAT(ND)                WIPE(ND)+LOC
*spray a cloth and wipe off (the mirror)* (BC1-360 02:45[2])

(54)

DVD              PUT.IN.DVD
*play a DVD* (BC1-330 02:05[2])

The remaining two shapes are used rarely, though Table 124 provides a few

examples. These may in fact be used only in signs with frozen unchanging forms (i.e.

THREAD.NEEDLE and SHARPEN.PENCIL) or due to assimilation (i.e. EAT.PIECES and SEW).

Table 124. Use of LOTH and HNDL on the non-dominant hand.

| Shape | Example 1 | Example 2 |
|---|---|---|
| LOTH | <br>THREAD.NEEDLE | <br>SHARPEN.PENCIL |
| HNDL | <br>EAT.PIECES | <br>SEW |

### 8.4.1.2 Modifiers

A second hand can also be used for simultaneous modification. One hand is used for a noun,

index, or verb and the other is used for an adjective or manner, as shown in Table 125.

Which hand is used for each morpheme is related to context and how the signer plans to

continue. Generally, the dominant hand will sign the main or more emphasized morpheme.

In some cases, a description is the main point and this will likely be signed with the

dominant hand. In other cases, it is an interjection or addition that is signed on the non-

dominant hand so that the dominant hand can continue with the main point (see 9.5.3).

Table 125.  Two morphemes on two hands.

| Modifier | Modified | Simultaneous |
|---|---|---|
| DIRTY/GROSS | (THESE)CLOTHES | *dirty clothes* |
| QUIET | SNEAK | *sneak quietly* |

## 8.4.2 Non-manuals

Non-manual components can express a great deal of information, often simultaneously with manual signs. Many morphemes with adjectival and adverbial meanings are entirely non-manual or can be expressed using only non-manual aspects (8.4.2.1). Intensification is largely non-manual as well (8.4.2.2), and a few types of non-manual markers can even create lexical distinctions (8.4.2.3).

### 8.4.2.1 Modifiers

#### 1) Emotions and states

Most morphemes denoting emotions take the form of facial expressions which are used simultaneously with nominal and verbal signs. Emotions like SAD or ANGRY and physical states like NICE/CLEAN or DIRTY/GROSS that have manual components in citation form often occur non-manually as well (a bound form). Table 126 gives examples of signs that have been modified by these morphemes.

Table 126. Non-manual emotions and states.
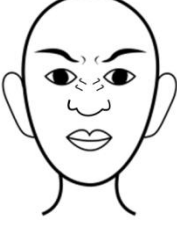
| Modifier | Modified | Simultaneous |
|---|---|---|
| DIRTY/GROSS | PICK.UP | *pick up something gross* |
| EXCITED | GRAB | *take something excitedly* |
| ANGRY | RIP(PAPER) | *angrily rip paper* |
| NICE/CLEAN | CLOTHES | *nice clothes* |
| PAIN | CUT | *hurt self by cutting* |
| SAD | 3 (THIRD PERSON) | *he's sad* |

Table 126. (Continued) Non-manual emotions and states.
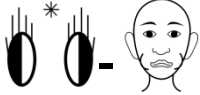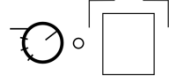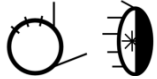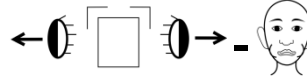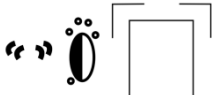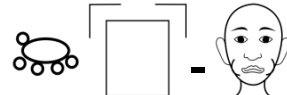
| Modifier | Modified | Simultaneous |
|---|---|---|
| TIRED | HARVEST | *harvest a lot (until tired)* |

Verbs like WALK and SEE are frequently modified by movements and positions of the head and torso. The large range of hand configurations that describes the feet of different animals (8.1.3) is accompanied by non-manual aspects that describe their movement. The movement of human beings is described the same way. Table 127 shows some examples of these morphemes, which often utilize manual and facial modifications as well.
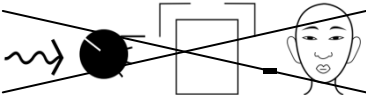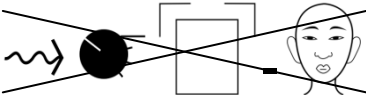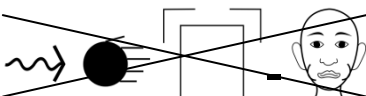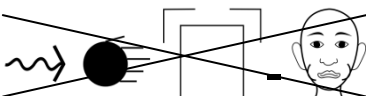
Table 127. Postures and head movements as verbal manners.

| WALK RUN | *rat walks* | *elephant walks* | *walk casually* | *run quickly (try)* |
|---|---|---|---|---|
| SEE | *look around a corner* | *look up in awe* | *observe* | *stare* |

In the case of WALK/MARCH (a sign that uses only the legs), the hands, face, and body are used as manner specifications. This sign is frequently used when the two hands sign

that the walker is carrying something, as seen in Table 128 (videos <u>ch8t128</u>, <u>BC2-059</u>

<u>through BC2-062</u>[1]).

**Table 128. Modifications of WALK/MARCH.**

| | | | |
|---|---|---|---|
| *march with a gun* | *walk with swinging arms* | *walk holding a balloon* | *walk and carry over the shoulder* |

## 2) Size

Two non-manual morphemes also describe size: SMALL(NM) and BIG. SMALL is more re-

stricted in its use than BIG. Grammaticality judgments indicate that SMALL(NM) is used

with nouns and adjectives only (such as manual SMALL or NARROW (examples 55 through

57), while BIG also modifies shape morphemes such as SMRO (examples 58 through 60).

(55)

HOUSE+SMALL(NM)
*small house*

(56)

HOUSE          SMALL+SMALL(NM)
*small house*

(57)

*POTATO          SMRO+SMALL(NM)
*\*small potato*

206

(58)

HOUSE+BIG(NM)
*big house*

(59)

SCHOOL                    THERE        LIMA        BIG+BIG(NM)
*The school in Lima is big.*

(60)

POTATO                    SMRO+BIG(NM)
*big potato*

Critically, both morphemes are rejected with FISH in its 1+ or 01234+ form (examples 61 and 62), indicating that additional size modifiers are disallowed on signs that use the handshape morphology described in 8.2.1 for size.

(61)

*FISH+SMALL(NM)
*small fish*

(62)

*FISH+WIDE+BIG(NM)
*big fish*

In a natural context, SMALL(NM) is frequently added to signs for animals with a *cute* or *sweet* interpretation. BIG can combine with LONG and intensity markers such as SQ (see 8.4.2.2). Table 129 gives examples of these combinations.

Table 129. Use of SMALL(NM) and BIG.

| SMALL | SMALL + intensity | BIG | BIG + intensity |
|---|---|---|---|
| FROG+SMALL(NM) *cute little frog* | TINY.WIGGLE+SMALL+SQ *tiny stream* | BIRO+LONG+BIG+SQ *really big rock* | (BIG)CIRCLE+BIG+SQ *really big tree trunk* |

## 8.4.2.2 Intensifiers

Three non-manual morphemes are used for intensification of size, time, distance, and quantity. Each morpheme is described below, including its appearance, the measures it modifies, the signs it occurs with, and the relative strength of each morpheme. Many of the examples below also use manual size and shape morphology (see 8.2).

## 1) Puffed cheeks

The use of puffed out cheeks, or BIG, is discussed as a size modifier in 8.4.2.1. This morpheme can also be used to intensify manual size descriptions and MANY. Table 130 gives examples of these two uses.
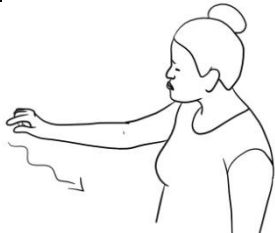
**Table 130. Use of BIG.**

| Type | Neutral | Intensified |
|---|---|---|
| size |  BIG |  *really big* |
| quantity |  MANY |  *very many* |

## 2) Squint

One of the most frequently-used non-manual intensifiers is squinting (glossed as 'SQ'). It is used to further define a time of day or night, to intensify BIG (puffed cheeks) and SMALL (pursed lips), and to add a *far* meaning to paths of motion. Examples of each of these uses are given in Table 131.

**Table 131. Use of the SQ morpheme.**

| Type | Neutral | Intensified |
|------|---------|-------------|
| time | NIGHT | *late at night* |
| size | BIRO (rock) | *huge rock* |
| size | TINY(WIDE) (small stack) | *tiny stream* |
| motion | FLY(PLANE) | *plane flies far* |

## 3) Open mouth

An open mouth, glossed as INTENSE, is used as a general intensifier for all four types of measurement (size, time, distance, and quantity). It is usually added to squinting (SQ) and has a stronger meaning. Table 132 shows a progressive increase in the size of tree trunks, using BIG, SQ, and INTENSE, along with a larger manual component (as discussed in 8.3.2). Table 133 shows INTENSE used to modify time, distance, and quantity.

Table 132. Progressive size intensification.
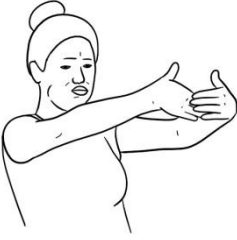
| Neutral | +BIG | +BIG+SQ | +SQ+INTENSE |
|---------|------|---------|-------------|
|  |  |  |  |
| *tree trunk* | *big trunk* | *huge trunk* | *enormous trunk* |

Table 133. Additional uses of INTENSE.

| Type | Neutral | Intensified |
|------|---------|-------------|
| time | <br>LATER | <br>*way later* |
| distance | <br>WALK | <br>*walk really far* |
| quantity/size | <br>PILE | <br>*huge pile* |
| quantity | <br>MANY | <br>*a huge amount* |

*8.4.2.3 Lexical distinctions*

Facial expressions and movements are used in a lexical capacity as well. Phonology (section 6.5) discusses completely non-manual signs and minimal pairs for individual items. The information below identifies morphological patterns which have lexical consequences.

### 1) Verbal derivation via the USE morpheme

A bound morpheme that includes flat pursed lips and sometimes blowing or buzzing, glossed as USE, distinguishes several noun-verb pairs (see discussion in 7.2.1). It is the clearest example of derivation in LSSiv. Vehicles and tools are signed with a neutral face (noun form), and verb forms in which the item is being used are derived with the addition of USE. Table 134 gives two examples of this contrast.

**Table 134. Noun-verb minimal pairs with USE.**

| Noun (1) | Verb (1) | Noun (2) | Verb (2) |
|---|---|---|---|
|  |  |  |  |
| CAR<br>*car* | CAR+USE<br>*drive a car* | SHOPPING.CART<br>*shopping cart* | SHOPPING.CART+USE<br>*push a cart* |

The exact range of this morpheme is not known, though has been observed in 12 pairs at this point. At first it appears to be related to motors, as it applies to cars, motorcycles, boats, helicopters, airplanes, and lawnmowers. Further investigation reveals that USE has more to do with manipulation than any vibration or sound that may be associated with a motor. It is used with non-motorized methods of transportation (bicycling and riding a horse) and tools (pushing a shopping cart, spray painting, sawing, and scrubbing). Verbs

like sawing and scrubbing are often accompanied by other non-manuals which supersede USE, so it may be possible but unobserved with other objects as well. Table 135 shows a few more examples of verbs which have been derived this way.
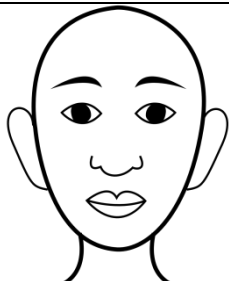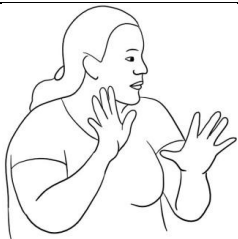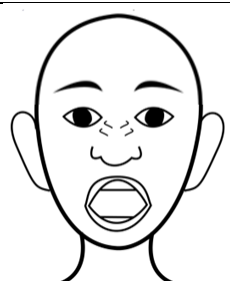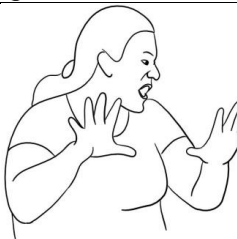
**Table 135. More verbs derived with USE.**

| | | | |
|---|---|---|---|
|  |  |  |  |
| MOTORCYCLE+USE *ride a motorcycle* | PLANE+USE *fly in a plane* | SPR+USE *spray* | SAW+USE *saw* |

## 2) Large numbers

Another non-manual marks (relatively) large numbers. It essentially distinguishes two through ten from twenty through one hundred. The physical form is a wrinkled nose and grimace (see Table 136). Numbers above one hundred are expressed by individual digits, but for factors of one hundred, one thousand, etc. (e.g. 500, 3000), the initial digit is usually given with the high number morpheme, then zeros are added manually. Due to spatial morphology (see 8.3.2), the fingers are usually spread far apart as well.
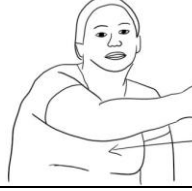
**Table 136. Small and large number comparison.**

| Small | | Large | |
|---|---|---|---|
|  |  10 |  |  100 |

### 3) Mouthing

Mouthing specifies a Spanish-language equivalent for certain signs that have a more general meaning. Some of these even utilize meaningful handshapes (SMRO and TINY; see 8.1.2). Some of these signs can be specified by additional signs as an alternative to or along with mouthing. *Onion*, for example, is often preceded or followed by CRY. Table 137 gives examples of manual components and their range of meaning, and videos ch8t137, BC2-063 through BC2-071[1] show some of the distinctions. More research is needed to determine whether mouthing is a fixed component of certain LSSiv signs, or if its use is influenced by factors such as the presence of hearing people.

Table 137. Signs which can be further specified by mouthing.

| Sign | Literal (LSSiv) Meaning | Possible Specifications |
|---|---|---|
|  | *small round food* (SMRO) | tomate (tomato) naranja (orange) manzana (apple) papa (potato) cebolla (onion) |
|  | *tiny piece* (TINY) | arroz (rice) café (coffee) |
|  | *male/person* | papá (father) no mouthing (man, someone) |
|  | *relation* | amigo/a (friend) primo/a (cousin) hermano/a (sibling) |
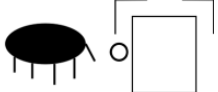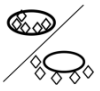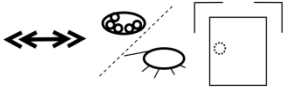
## 8.5 Number

Morphological patterns relating to number are not consistent across all signs, or even in easily-identifiable categories of signs. Though other strategies exist, plurality is most often encoded syntactically with an independent morpheme such as MANY, a number, or locatives (see 10.2.5; 10.4.1.2; 9.1). These are also the most reliable markers in terms of how a recipient will interpret an utterance. What can be described here is 1) reduplication's potential as a pluralizer and 2) three types of plural pronouns. (Number incorporation in verbs is discussed in 8.6.3).

### 8.5.1 Nominal reduplication

Chapter 7 (7.1.1) describes reduplication (REP) as an option for pluralization in a handful of nouns. This includes outward movement in the one-handed *children* and *flowers*, and repeated alternating movement in the two-handed *bees*. Table 138 shows the singular and plural forms of these signs.

Table 138. Reduplicated movement for plurality.

| Meaning | Singular | Plural |
|---|---|---|
| child(ren) | CHILD | CHILD-REP |
| bee(s) | BEE | BEE-REP |
| flower(s) on the ground | FLOWER+LOW | FLOWER-REP+LOW |

Also of note are grammaticality judgments showing that CHILD-REP cannot be used with MANY (63), and that the number ONE can override any plural meaning given by

reduplication in FLOWER-REP (64). Again, evidence suggests that this is a newly-developing

process for pluralization or that reduplication of nouns is largely a stylistic choice in LSSiv

(see also section 7.1.1.2).

(63)

*CHILD-REP           MANY
*many children

(64)

FLOWER-REP           ONE
one flower
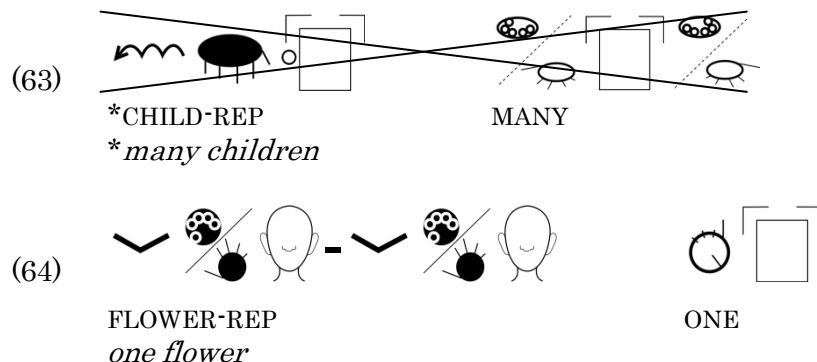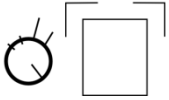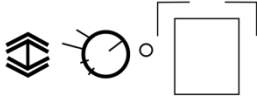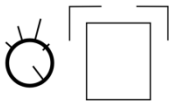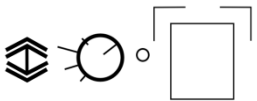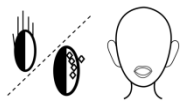
## 8.5.2 Plural pronouns
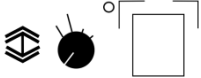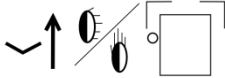
Three strategies can indicate a (morphologically or semantically) plural pronoun: 1) number

incorporation, 2) circular movement, and 3) multiple indices. The third option is by far the

most frequent. Note that, while both 1+ and 01234+ handshapes are frequently used for

pronouns, there is no correlation between either of these and a singular or plural meaning.

Articulatory assimilation to surrounding signs is a more likely explanation.

### 8.5.2.1 Number incorporation

Number incorporation is used with pronouns, but it is another relatively infrequent occur-

rence, usually used as an emphasis on the number. In examples 65 through 67, signers

refer to specific members of their family in groups. This pattern may be a borrowing from

LSP, as most of the observed examples (including those in 65-67) occur in the presence of

LSP signers.
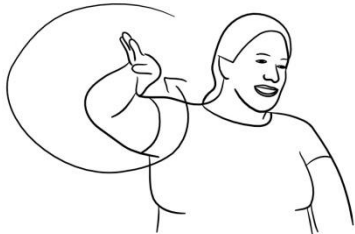
(65)

TWO          3+TWO          DIE

*Two, those two's (fathers) died.* ([BC1-187](#) 00:43[2])

(66)

THREE          3+THREE          TALK

*Three, those three are hearing.* ([BC1-191](#) 00:25[2])

(67)

1-3+TWO          DEAF(loan)

*We two are deaf.* ([BC1-190](#) 02:32[2])

One final example is from a younger signer (68). Note that 67 above and 68 also use multiple indices, discussed in 8.5.2.3.
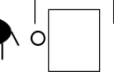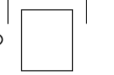
(68)

1-2+TWO          GO          RUN...

*You and I go running...*

### 8.5.2.2 Circular movement

A circular movement can also give a plural meaning to a pronoun, though it is another infrequent phenomenon. It is glossed as a form of the sign ALL, which involves a similar horizontal circular movement (69).

(69)

ALL

*all* ([BC1-339](#) 03:14[2])

217

The following examples show ALL in use as a pluralizer for the third person (example 70) and first person (example 71). (Again, use of 1+ or 1234+ is a matter of context only. See 9.2.3 for more on the verbal number incorporation used in example 71.)

(70)

CHILD-REP    LOVE   /  3    LOVE
*(I) love (my) children. (I) love them.*
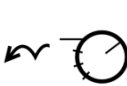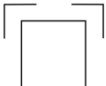
3.ALL    LOVE
*(I) love them all.* ([BC1-330](#) 07:26²)

(71)
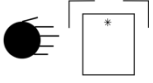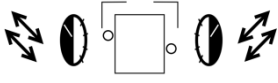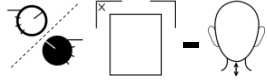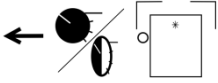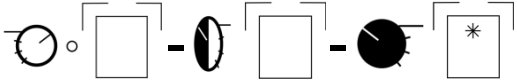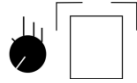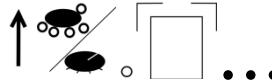
1--     1.ALL    THREE+ZIGZAG
*I-- we all, the three of us go up and around...* ([BC1-719](#) 04:59²)


### 8.5.2.3 Multiple indices

A more frequent phenomenon is the combination of indices. This includes a plural third person (example 72) as well as combinations such as the first and third person (example 73), the first and second person (example 74), or even all three (74). These generally retain a 1+ handshape, and first person is usually the starting point. However, there is currently no strong indication that any of these combinations are used as a single unit (i.e. *we*) rather than two individual signs (i.e. *you and I*).

(72)

3-3      DRESS
*those two dresses* ([BC1-341](#) 00:19²)

(73)

[1                          CAR                    ]        3-1-REP+YES(NM)

*He and I will use my car.* ([BC1-340](BC1-340) 01:44²)

(74)

1-2

*You and I,*

3-2-1                                              THREE        PICK.UP+SMRO...

*we three pick up (rocks)...* ([BC1-719](BC1-719) 04:50²)


## 8.6 Simple verbal morphology

This section discusses patterns which combine with verbs independently of other

constituents. This includes aspectual marking (8.6.1) and negation (8.6.2).


### 8.6.1 Aspect

As in many sign languages, tense is usually implied rather than grammatically encoded.

When a signer wants to be explicit, independent morphemes, such as BEFORE, NOW, and

FUTURE are typically used. Progressive and completive aspect, however, can be com-

municated through changes to a verb's movement.

A continuous or durative aspect (CONT) is marked by lengthened movement. In most

two-handed verbs, this means simple reduplication, but in most one-handed verbs, CONT is

articulated by the use of both hands with repeated alternating movement (alternating

reduplication). Table 139 shows the distinction in EAT and SWEAT. (Note that non-manuals

also change for intensification; see 8.4.2.2.) It is suspected that longer paths or slower

movement can be used in verbs like WALK for a similar effect, though this has not yet been sufficiently measured and tested.

Table 139. Verbs with typical movement and alternating reduplication for CONT aspect.

| EAT | EAT+CONT | SWEAT | SWEAT+CONT |
|---|---|---|---|
| eat | eat a lot, (keep) eating | sweat | sweat a lot, (still) sweating |

The CONT aspect is often paired with topicalization (see 9.3.2-3; 10.6.3) and can be used in perspective switches to describe a character's current (or previous) actions (see 9.3.1; 10.7.1). A similar semantic change is seen in the difference between SEE, with a single one-handed movement, and EXPLORE, with repeated and alternating movement (lit. *see a lot*, or SEE+CONT). Section 9.5 discusses the use of a 'frozen' hand after a verb to indicate continuous events in two-handed patterns.

For the completive aspect, an abbreviated form of GO, an upward flick of the wrist, can punctuate the end of some verbs, though the full GO sign is more frequently used (video [ch8go](#), [BC2-072](#)[1]). The sign FINISH is also used in this capacity. The choice of sign here is an issue that needs to be investigated further. Example 75 (video [ch8e75](#), [BC2-073](#)[1]) shows the use of both CONT and FINISH. Note also that location-based agreement is used in a few places (see 9.1.2) and DROP is used referentially in the final clause (see 10.7.1).

(75)

RAIN          SHIVER+CONT
*He's shivering in the rain.*

BIRD                    DROP(FROM.MOUTH)+LOC    FINISH
*The bird already dropped (the flower).*

SHIVER          FINISH          SWEAT+CONT          FINISH
*He stops shivering and sweats a lot.*

SEE+LOC          SEARCH+CONT          /          DROP          NOT.EXIST
*He's looking for it, but the thing that was dropped isn't there.*

### 8.6.2 Negation

The negative verbs NOT.THINK and NOT.KNOW share a type of movement that may be a

bound negative morpheme, though it has not been observed in use with other verbs. Both

verbs in their positive form involve no movement or a short tap, while the negative forms

involve a longer outward movement or twist. Table 140 shows this contrast. (The difference

between positive THINK and KNOW is non-manual.) Another possibility is that this

movement is a type of blend or incorporation of the sign NO's outward movement, but this

will have to be investigated in the future.

Table 140. Negative movement on THINK and KNOW.

| Positive (1) | Negative (1) | Positive (2) | Negative (2) |
|---|---|---|---|
| THINK | NOT.THINK | KNOW | NOT.KNOW |

## 8.7 Summary

The morphological system of LSSiv takes advantage of meaningful handshapes, modifica-

tions to phonology and the signing space, and simultaneous articulation to convey specific

types of information. Though meaningful handshapes create 'classes' of objects which they

may replace, these are not used as typical sign language 'classifiers'. Phonological modifica-

tions indicate that certain distinctions which are not used lexically (e.g. degrees of sprea-

ding and flexion) can be morphologically significant. This analysis also reveals that, as

expected, spatial relationships, types of movement, and non-manuals are quite important in

LSSiv's morphology.

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Chapter 8 endnotes

[1] Clips referenced in this chapter can be found at https://bleegiimuusclark.com/lssiv-grammar-examples-3/ and https://scholarspace.manoa.hawaii.edu/handle/10125/49885, BC2-039 through BC-073.

[2] Videos from which examples are taken can be found using the BC1-XXX label at the following address: https://scholarspace.manoa.hawaii.edu/handle/10125/34525.

[3] Some of the phonetic specifications used in these shapes are not identified as phonemic in chapter 6, such as spreading. While these parameters do appear in morphemes such as the meaningful

shapes described here and in other morphological modifications to signs, they are not distinctive at the lexical level. Likewise, spatial morphology allows for the assignment of meaning to specific locations or movement patterns which are not used in lexical distinctions. See Fernald and Napoli 2000 for a similar discussion of "ion-morphs" in ASL.

# CHAPTER 9. MORPHO-SYNTAX

This chapter describes morphological patterns which involve more than one sign. The morphemes in these patterns utilize spatial relationships, phonological changes, and multiple articulators to combine with entire phrases and clauses rather than with individual signs. As in the previous chapter, these morphemes are most similar to infixation in spoken languages (changes to the phonological form of the sign). Patterns relating to perspective (9.3) can be suppletive as well, replacing a sign with a completely different form. The discussion below includes 1) the use of space, 2) verbal morphology, 3) perspective and focus, 4), mood, and 5) grammatical patterns using the non-dominant hand.

Note that the term 'agreement' is used here as it is in sign linguistics in general (cf. Meier 2002; Sandler & Lilo-Martin 2006 p.23-46; Aronoff et. al. 2005), to refer to a morphological process in one constituent which is triggered by the presence and properties of another[1]. It therefore is a morphological marking of the syntactic relationship between two signs. In spoken languages, agreement often takes the form of affixation on a verb and is triggered by properties of the verb's arguments, such as number, gender, case, or person. Person properties of signed constituents are often encoded via location (e.g. on the signer's chest for first person and a particular point in the signing space for a third person). In contrast to sequential affixes or suppletive forms, agreement morphemes in signed verbs are simultaneous modifications to locative aspects, corresponding to the properties of a subject/source, object/goal, or subject-object/source-goal pair. In ASL, agreement for a 'directional' sign like ASK requires that movement begin at the grammatical locus of the 'asker' and end at the grammatical locus of the 'askee'. It is not a suppletive verb form, but a morphologically complex form that varies according to the location (person) properties of each constituent. (See section 9.2.1 for a description of directionality in LSSiv.)

This description also uses 'agreement' for patterns in which the locative properties of a subject in the grammatical context trigger a locative change in a non-verbal predicate (9.1.2). Morphological patterns relating to shape classes (meaningful handshapes similar to classifiers) are called 'incorporation', as per the convention in the literature on signed and spoken languages. However, a parallel is emphasized between this and the types of processes called 'agreement': in both types of patterns, the grammatical properties (e.g. person, number, class) of one constituent (e.g. subject or object) necessitate the use of a morphologically complex form of a second constituent (e.g. verb or predicate).

## 9.1 Use of space

Sign languages typically 'set up' syntactic elements in specific locations in the signing space and then use this representation to encode interactions between those elements. This section describes how space is used in LSSiv to express 1) adpositional relationships and 2) agreement between subjects and predicates or objects and verbs. LSSiv users follow these two expected patterns relatively consistently in natural signing. In grammaticality judgments, however, signers do not reject adjectives and verbs articulated in neutral zero space instead.

### 9.1.1 Adpositional relationships

Most adpositional relationships in any sign language are expressed through the use of space (Aronoff et. al. 2003; Emmorey 2002), and LSSiv does not diverge from this tendency. Elicited descriptions of scenes showing different spatial relationships reveal how signers express concepts like *inside*, *beside*, *on top*, etc. by establishing each item in a meaningful

location within the signing space. Table 141 shows some of these descriptions (scenes from Moran 2002; see videos ch9t141, BC2-074 through BC2-079[2]).

**Table 141. Adpositional descriptions.**
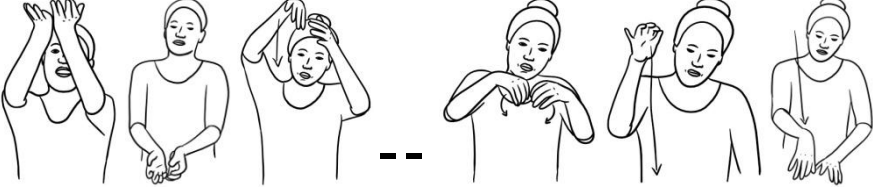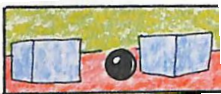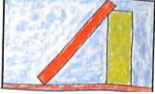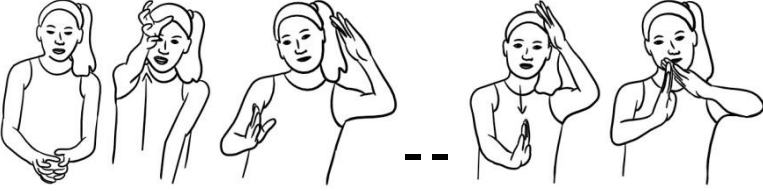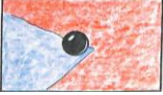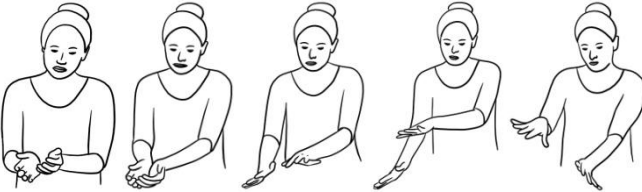
| Scene | LSSiv Description |
|---|---|
| above, beneath | A box is up high and a ball falls-- it breaks, so a ball falls down. |
| between | a square on the right, a square on the left, and a ball in the middle |
| inside | (put) a round object in a square object |
| lean on | a pole and-- it's straight up and someting diagonal is leaning on the top |
| on the corner | on the edge of a flat surface |

Table 141. (Continued) Adpositional descriptions.

| Scene | LSSiv Description |
|---|---|
| *on top, under* | <br>*(put) a ball on top of a box and roll the ball back and forth...*<br><br><br>*(put) the ball down and roll the box back and forth on top of it* |

Examples 76 and 77 (videos <u>ch9e76</u> and <u>ch9e77</u>, <u>BC2-080 and BC2-081</u>[2]) show that the same process is used for less staged scenarios involving more specific lexical items. In example 76, an apple tree is established and described before stating the quantity and placement of the apples on it.

(76)



SMRO+"apple"        PEEL.APPLE        TREE



THIS.BIG+SMALL        SMRO+LOC        SMRO+LOC2

*There are several apples all over a small tree.*

Example 77 shows the use of the more general LOW location, which can be used without a preceding description of a scene. Repetition of SMRO (a small round object; see section

8.1.2) along this low horizontal plane both pluralizes FLOWER and creates the locative predicate *on the ground.*

(77)

FLOWER               SMRO+LOW          SMRO+LOW2
*Flowers are on the ground.*
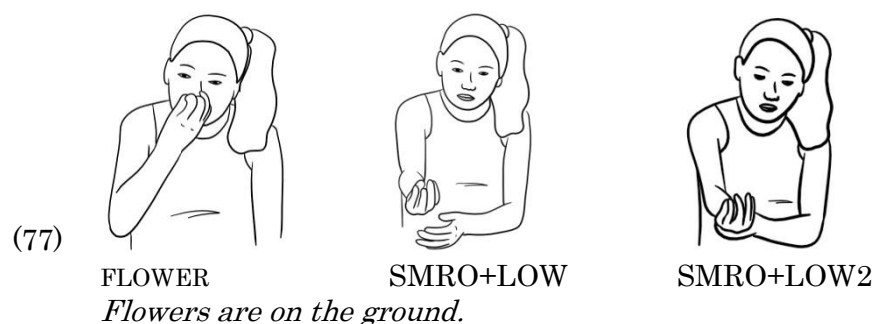
As seen in some of the examples above, the two hands can be used to sign two simultaneous morphemes in this type of structure. The non-dominant hand often signs a meaningful shape, such as FLAT (see 8.1; 9.2.2), while the dominant hand signs additional descriptions or actions in relationship to it. In example 78, the signer signs MIRROR (lit. *vertical rectangle*) with two hands, and later uses FLAT on the non-dominant hand to mark the position of the mirror in front of the face during the following verbs.[3]

(78)

MIRROR               SEE          SHAVE-FLAT(ND)      BRUSH.HAIR-FLAT(ND)
*(He) looks into the mirror and shaves... brushes his hair...* ([BC1-358](#) 02:38[4])
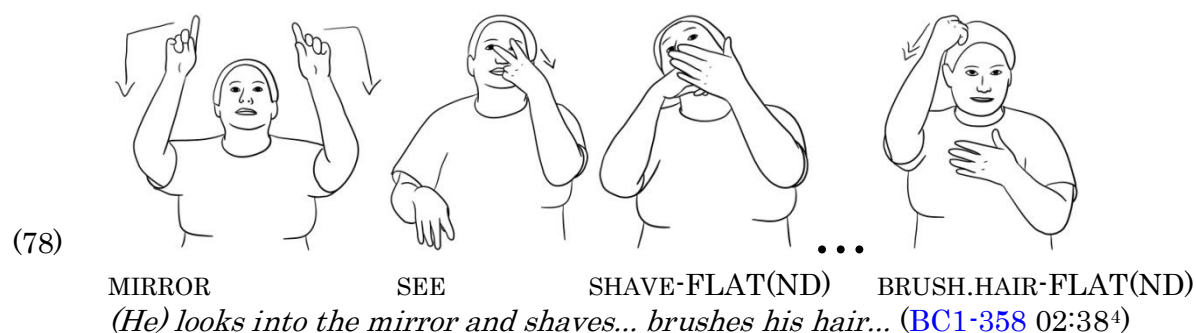
## 9.1.2 Location-based agreement

The majority of spatial agreement occurs after a location or scenario has been established, as described in 9.1.1. Descriptions or actions are then signed in meaningful locations and orientations within that space. Subjects often trigger agreement in predicates such as adjectives, quantities, or verbs. Verbs may also agree with a direct object. Vertical details

like *on the ground* or *up high* are often included in LSSiv and used for agreement, while

horizontal position and distance are often given via indexing rather than locative marking

unless a contrast is emphasized. Grammaticality judgments for verbal and non-verbal

statements indicate that this type of agreement is not obligatory.

Table 142 gives examples of height agreement with adjectival predicates UGLY and

BEAUTIFUL, and the quantitative predicate MANY. These location morphemes (LOC) have

also been observed in use with predicates in which the subject is not overt (i.e. clauses

which have undergone pro-drop).

**Table 142. Height agreement.**
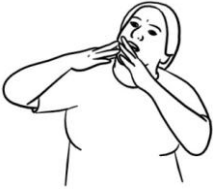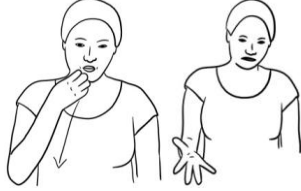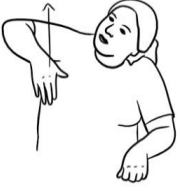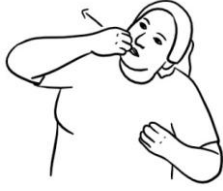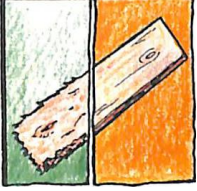
| Neutral Location | With Agreement |
|---|---|
| UGLY | HOUSE+LOC      UGLY+LOC...     • • •<br>*the house looks ugly...* |
| BEAUTIFUL | PAINT+LOC     BEAUTIFUL+LOC<br>*paint the walls and it's beautiful* ([BC1-366](BC1-366) 00:54⁴) |
| MANY | TREE+LOC     MANY+LOC<br>*(There are) lots of (tall) trees* ([BC1-720](BC1-720) 00:08⁴) |

Table 143 shows the way that horizontal positions can be used. The signer compares

smooth and rough pieces of wood (based on an image from Moran 2002) by using adjectival
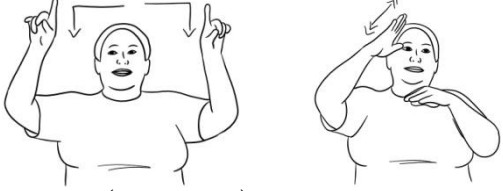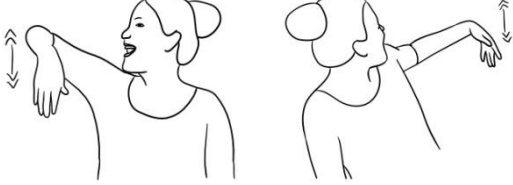
predicates on the right (LOC1) and left (LOC2). Again, agreement on this plane is less common and the specific parameters of its use need to be examined in future research.

Table 143. Location agreement in contrastive description.

| Scene | Description |
|---|---|
|  | 

THIS.SIDE+LOC1    NICE+LOC1        GOOD+LOC1…
*one side is nice, it's good…*

THIS.SIDE+LOC2    UGLY+LOC2
*but the other side is ugly* ([BC1-364](#) 01:23[4]) |

The form of PAINT in Table 142 is also an example of a verb which agrees with its direct object (a wall rather than a ceiling, floor, chair, etc.) through location and orientation. Table 144 shows other realizations of PAINT which agree with a painting, a table, and a rear wall as an object. In the first two examples, the non-dominant hand also signs FLAT (see 8.1.2) as simultaneous incorporation of the direct object's shape and agreement with its location (Loc.sho; see 9.2.2).

**Table 144. Location and orientation agreement in PAINT.**

| | |
|---|---|
| **Painting** |   SQUARE(VERTICAL)  PAINT+LOC+FLAT(ND)  DO  V.loc+Loc.sho(ND)  *paint a painting (lit. paint the middle of a vertical rectangular surface with a flat bottom edge)* |
| **Table** |   PAINT+FLAT(ND)  V.loc+Loc.sho(ND)  *paint a table (lit. paint a horizontal flat surface)* |
| **Walls** |   PAINT.WALL  PAINT.WALL+LOC  V.loc  V.loc  *paint the front and back walls (lit. paint vertical surfaces to the front and back)* |

Example 79 shows the use of significant locations for both adpositional relationships between objects in the scene and location agreement between verbs (GRAB, PUT) and one of the established locations. This example (video ch9e79, BC2-082[2]) is a description of books being taken off and put onto a shelf. A high central location is established for the shelf (HI), a low right location for a pile of books on the floor (LOC), and three locations (x) on the original shelf and a lower one (LOC2) where books are placed in an upright orientation (see ch9e79, BC2-082[2] for all shelf locations). (See 9.2.2 for more on the shape incorporation used in PUT.)

(79)
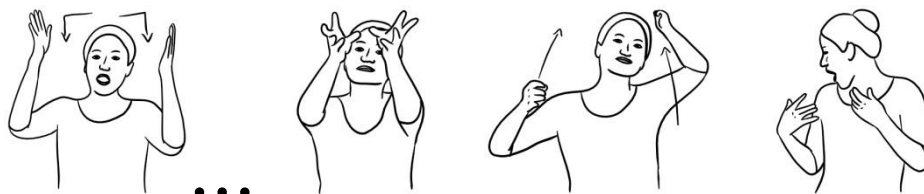
| SHELF | GRAB+HI | THROW.BACK-REP | WOW+LOC |
|---|---|---|---|
| Loc | V.loc | V.rep | Excm.loc |

*Shelf... take (books) from the top and throw them everywhere. Oh no!*

| GRAB+LOC | PUT+FLAT(VERT)+HIX-REP | PUT+FLAT(VERT)+LOC2X-REP |
|---|---|---|
| V.loc | V.sho.loc.rep | V.sho.loc.rep |

*Pick them up from the pile and line them up on the shelves.*

Example 80 (video ch9e80, BC2-083[2]) shows the way direct objects can be named as they are incorporated into a cooking sequence. It again shows the use of meaningful locations as adpositional descriptions and significant loci at which verbs are signed. The signer uses different locations for a pot (LOC) and a pan (LOC2), and the non-dominant hand (indicated in line 4 of example 80) continues to sign the position of the pot with meaningful shapes (see 8.1; 9.2.2) throughout the narrative. The dominant hand signs several direct objects[5] and verbs which agree with one of the locations. Both locations are used in the case of SCOOP, similar to the type of 'source-goal' agreement described for directional verbs in 9.2.1.

(80)

| SMRO(ND)+WATER | ADD+LOC | WHITE(flour) | ADD+LOC | COOK+LOC |
|---|---|---|---|---|
| DO | V.loc | DO | V.loc | V.loc |
| Loc.sho | Loc.sho | Loc.sho | Loc.sho | |

*Add water and flour to a pot and cook it,*

232
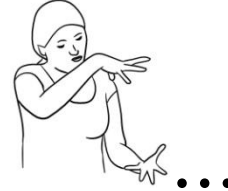
EGG+SMRO(ND)  BREAK+LOC  STIR+HOLD(ND)  RISE+LOC+BIRO(ND)
DO            V.loc      V.loc+loc      V.loc+loc
Loc.sho                  V.sho          Loc.sho

*break an egg into the pot, stir it (while holding the pot) and it rises...*

SCOOP+LOC-2+BIRO(ND)     FRY+FLAT+LOC2   RISE+LOC2
V.loc                    V.sho.loc       V.loc
Loc.sho                  Loc.sho         Loc.sho

*scoop it into a pan, fry it and it rises...*

## 9.2 More verbal morphology

Along with the location agreement discussed in 9.1.2, some verbs utilize directional mor-
phology to agree with an object (9.2.1), and others incorporate direct objects through the use
of meaningful shape morphemes (9.2.2). The possibilities of number incorporation (9.2.3)
and a bound morpheme for transitivity (9.2.4) are also discussed.

### 9.2.1 Directionality

While signers follow the convention of setting up people and objects in space to a certain
extent (as described in 9.1-2), LSSiv does not set up specific grammatical persons and
agents in space. Five directional verbs have been identified which combine with morphemes
deno-ting a first-person object or a non-first-person object. A non-first-person object
morpheme (e.g. hit *him*) takes the form of movement from the set first-person locus (on or

near the signer) to the set non-first-person locus (in front of the signer in zero space). A first-person object inflection (e.g. hit *me*) reverses this movement.

In LSSiv, directionality is a simple two-way distinction, contrary to what has been found in many other sign languages like ASL (Liddell 2003), Libras (Moreira 2007), or Cambodian Sign Language (Woodward et. al. 2015), where directional verbs can also agree with multiple third-person constituents that have been set up in zero space (e.g. she hit her). The pattern appears to be developing, as different verbs function in different ways, and in many cases the preferred strategy to refer to more than one character is through syntactic or prosodic perspective switches (see 9.3).

Four of the five identified directional verbs in LSSiv are monotransitive, so orientation and the end point of movement agree with their direct object. The ditransitive GIVE agrees with its *in*direct object via directionality. This type of agreement is only mandatory for one LSSiv verb: STAB. Examples 81 and 82 show rejected utterances where syntactic and directional objects disagree. LSSiv follows SOV order (see 10.2), so the form of the verb should agree with the second (object) constituent.

(81)



*3  1  STAB₃

*He stabbed me.*

(82)



*1  3  STAB₁

*I stabbed him.*

For the other four verbs (BITE, GIVE, PUNCH, and TALK), one form serves as a 'neutral' inflection, which can be used with both first and non-first objects. With mandatory agreement, every example below (83 through 86) should be ungrammatical, but this is not the case. (See 10.2.4 and 10.5.3 for more on directionality and word order in ditransitives.)

(83)

*3    1    BITE₃

*He bit me.

(84)

1    3    BITE₁

I bit him.

(85)

3    1    ORANGE    GIVE₃

He gave me an orange.

(86)

*1    3    ORANGE    GIVE₁

*I gave him an orange.

Note also that the form that functions as the neutral for BITE differs from the one that is used for GIVE. While GIVE follows a more expected pattern and allows the third person form to be used with either object, BITE uses the first person form as its default. Though grammaticality judgments were not elicited for PUNCH, its first person form has also been observed in use with a third person object. TALK, on the other hand, has been observed only rarely in a first person form. The exact parameters and function of its use are not yet known. Example 87 shows TALK inflected for a plural subject (two-handedness)[6] and a first person object (bodyward orientation).

(87)

MOTHER-FATHER    PLTALK₁...

*My parents told me...* (BC1-346 00:48[4])

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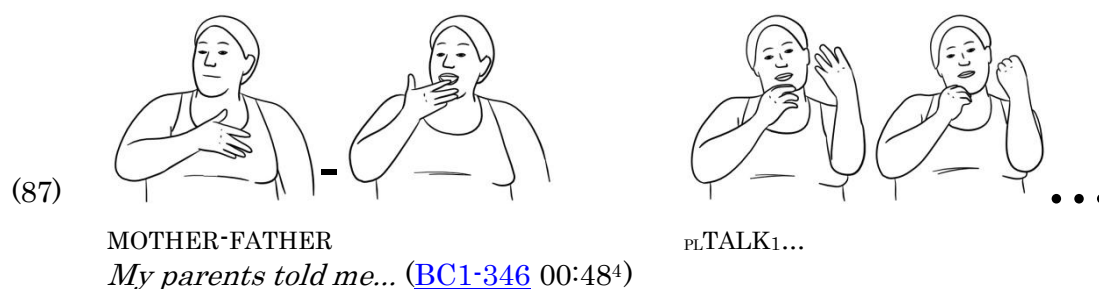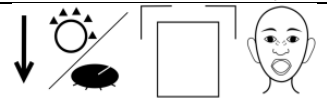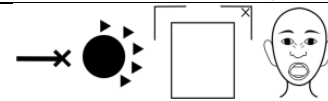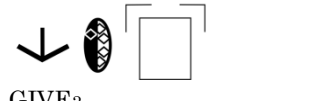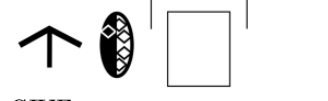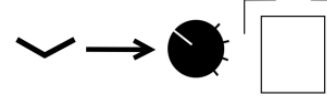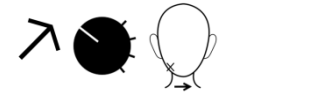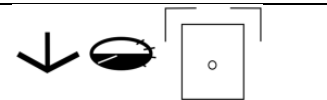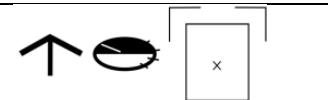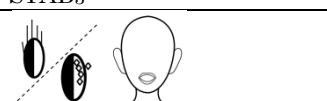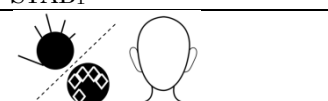
Table 145 summarizes the findings for all five verbs which have exhibited directional patterns. Apparently neutral forms of directional verbs, particularly first-person neutrals, may also be related to perspective shifting, discussed in 9.3.

**Table 145. Directional verbs.**

| Verb | Third Person Object | First Person Object | Neutral |
|---|---|---|---|
| BITE | BITE$_3$ | BITE$_1$ | first person |
| GIVE | GIVE$_3$ | GIVE$_1$ | third person |
| PUNCH | PUNCH$_3$ | PUNCH$_1$ | first person |
| STAB | STAB$_3$ | STAB$_1$ | obligatory agreement |
| TALK | TALK$_3$ | TALK$_1$ | third person |

## 9.2.2 Shape incorporation

The previous chapter (section 8.1) describes a set of meaningful handshapes which are used in place of nouns with certain properties. As described in 8.1, these can be used as locatives and locative or adjectival predicates. Of interest here is the way that these shapes can be incorporated into verbs.

For verbs which allow shape incorporation, the meaning of the verb is maintained by movement, location (usually), and the interaction of the hands. Handshape and orientation are incorporated according to the shape class of the (previously-stated or clause-internal) direct object. Note that this differs from incorporation on the body, which can be used

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without an explicit direct object (see 8.3.1). Examples 88-89 show incorporation of SKEWER (a long thin object; LOTH) and FISH (a flat object; FLAT) into FRY. In example 88, LOTH is also incorporated into EAT.



(88)

SKEWER-REP  FRY+LOTH    EAT+LOTH

*fry skewers and eat them* ([BC1-333](#) 00:24[4])



(89)

FISH      FRY+FLAT

*fry fish* ([BC1-329](#) 00:34[4])
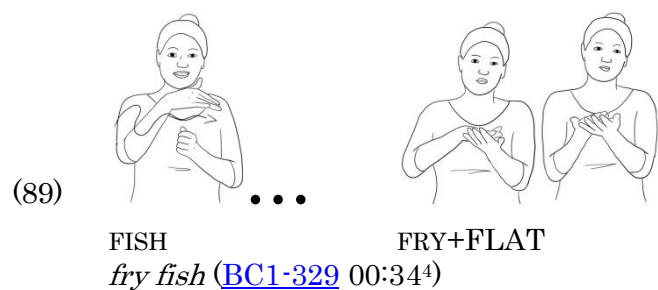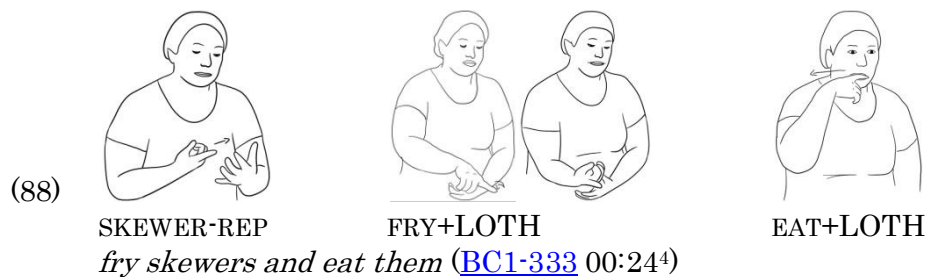
Table 146 shows that DRINK, EAT, and PUT may also incorporate meaningful shapes, with examples of default forms and complex forms for different direct objects. Example 79 above also shows PUT used with a FLAT shape morpheme for *books*.

**Table 146. Shape incorporation.**

| Default | Shape 1 | Shape 2 |
|---|---|---|
| DRINK<br>*drink (water)* | DRINK+BIRO<br>*drink coconut milk* | DRINK+CYL<br>*drink (from) a cup* |
| EAT<br>*eat* | EAT+SMRO<br>*eat a peach (apple, mango)* | EAT+THIN(+WIDE)<br>*eat a sandwich* |
| PUT(+CYL)<br>*put (a cup) down* | PUT+BIRO<br>put a vase down | PUT+FLAT+FLAT(ND)<br>*put slices (in a sandwich)* |
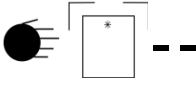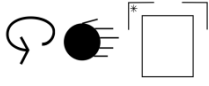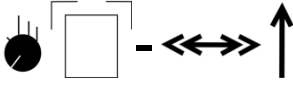
For some asymmetrical verbs, the morpheme for the direct object's shape is expressed on the non-dominant hand while the dominant hand signs the verb. In these cases, the dominant hand often incorporates the shape of a secondary object which semantically equates to an instrument. Table 147 shows this type of incorporation in the verbs WASH and CUT for round or held (HOLD) and flat (FLAT) objects. FLAT on the dominant hand also implies the use of a flat hand or object (a cloth or knife, for example) to perform the action.

Table 147. Shape incorporation in two-handed signs.

| Default | HOLD | FLAT |
|---|---|---|
| WASH *wash* | WASH+HOLD(ND) *wash an apple (orange, potato, etc.)* | WASH+FLAT(ND) *wash a plate* |
| CUT *cut* | CUT+HOLD(ND) *cut an onion (tomato, potato, etc.)* | CUT+LOTH(ND) *cut finger* |

### 9.2.3 Number incorporation

Rarely, LSSiv users incorporate numerals into verbal predicates. Example 90 shows that this may be used as a type of agreement or confirmation for a counted subject. Note that the number, three as opposed to one, is also emphasized in the preceding conversation; see BC1-719 4:26[4].

(90)

1--   1.ALL   THREE+ZIGZAG

*I-- we all, the three of us go up and around...* (BC1-719 04:59[4])

Number incorporation is an infrequently-used possibility, which has only been observed in a few natural contexts. As it has not been tested, the extent of its applicability to different types of verbs with different phonological properties and the potential for use emphasizing quantity in non-subject constituents needs to be investigated.

### 9.2.4 Transitivity

The majority of the time, transitive relationships are communicated through syntax (see 10.1.2). However, contrastive use of two forms of the verb SEE shows what could be a developing transitivity marker in the younger generation. The neutral form of SEE is used intransitively or transitively, but a change in location from the eyes to the chin means that intransitive use is no longer allowed. This is shown by both consistent transitive use and the grammaticality judgments in examples 91 and 92.

(91)

    *(WALK)           SEE+TRANS

    *(I walked and) looked around.*

(92)

    (WALK)           BIRD           SEE+TRANS

    *(I walked and) saw a bird.*
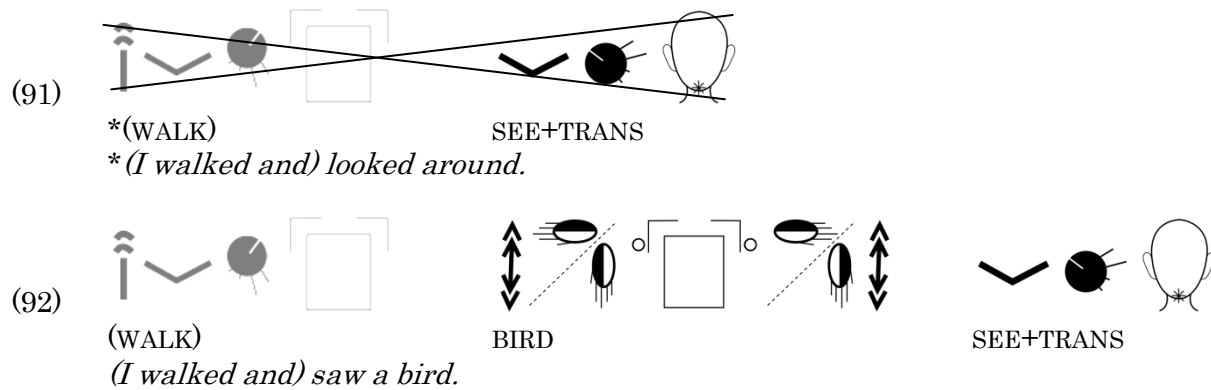
Table 148 shows the two forms of the verb. Though this type of morphological change has not been found in any other verbs, it does show the potential for a feature to become significant in this abstract way and to affect syntactic structures.

**Table 148. Intransitive and transitive SEE.**

| Intransitive | Transitive |
|---|---|
| SEE<br>*see, look* | SEE+TRANS<br>*see something* |

## 9.3 Perspective and focus

This section describes strategies for changing perspectives in narrative-like contexts and for adding focus to specific morphemes and constituents. Verbs may change suppletively for role-shifting (9.3.1) and manner emphasis (9.3.2), while reduplication (along with fronting) is used for topicalization of any core constituent (9.3.3).

### 9.3.1 Role shifts

Role shifts and quotatives are common strategies that signed and spoken languages use in storytelling (cf. Lillo-Martin 1995; Poulin & Miller 1995; Janzen 2004). It is clear that in this context, a morphologically implicit actor (e.g. first person) does not always correspond with the grammatical subject (e.g. third person) or the real-world actor (e.g. a character in a story), though the descriptions cited above report subtle or unidentified cues before and during a changed perspective in ASL or Quebec Sign Language. These patterns are equated to use of English strategies for reported speech such as 'she's like...' or 'he goes...'.

In LSSiv, the head and torso do not typically shift in narratives to switch from one character's perspective to another (a role shift), as in ASL and many other sign languages (Herrmann and Steinbach 2012 p.213; see video ch9ps, BC2-084[2] for an LSSiv example). LSSiv signers are more likely to switch hands (see 9.5.2) or make a reference to a character's appearance or previous actions (see 10.7.1). What some verbs do exhibit is a distinction between the first- and third-person perspective, described below as a type of quotative and in 9.3.2 as focal strategy for conveying different types of manner information. This is similar to alternative role shift strategies described in Janzen 2004 and Schlenker 2017.

Some LSSiv verbs change suppletively depending on whether the signer is using a first- or third-person perspective. First-person forms tend to utilize a larger signing space,

more non-manuals, and other markers of intensity described in 8.3.2. Exaggerated non-manuals are suspected as quotative markers in other contexts as well (see 9.3.3), so first-person forms in examples like 93 and 94 (videos [ch9e93] and [ch9e94], [BC2-085 and BC2-086][2]), where the first- and third-person realizations are used together, are currently interpreted as a type of quotative or mimicry[7].

(93)

DEER            BUCK            3FALL
*The deer bucks and he falls,*

1FALL          /          DOG            3FALL
*"I'm falling!" The dog falls.*

(94)

PUPPY          1ROLL          3ROLL          • • •
*The puppy is doing this (rolling around), he rolls...*
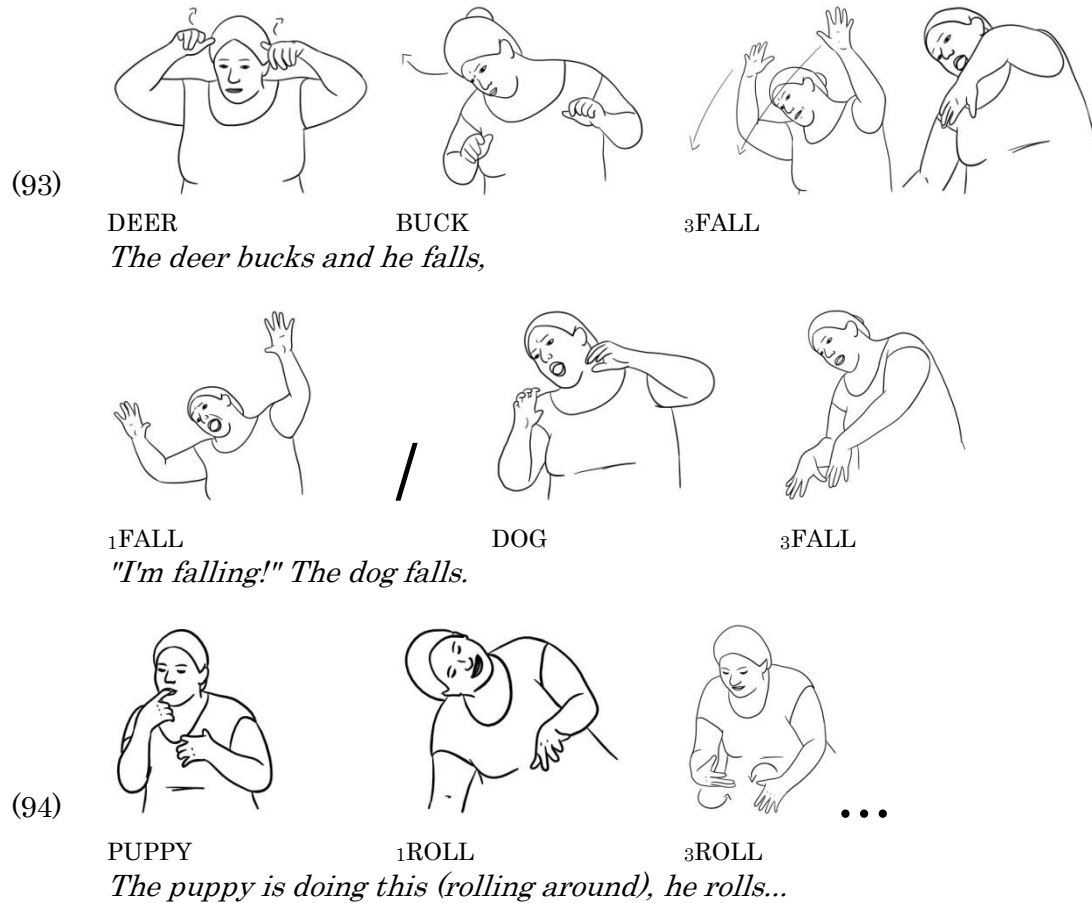
### 9.3.2 Focus

Using the first or third person is also a form of focus that enables a signer to give more details about either a type of movement or a movement path. The first-person perspective often allows for more simultaneous information about a movement's manner. *Walk* in particular has a myriad of realizations in its first person form, including several variants

for animals, shown in Table 149. The signs for *sneak* and *climb* may also be considered to be modified versions of ₁WALK.

**Table 149. Modifications of 1WALK.**

| | | | |
|---|---|---|---|
| ₁WALK | *elephant walks* | *horse walks* | *rat walks* |
| *turtle walks* | *monkey walks* | *sneak* | *climb* (sloth) |

     ₃WALK, the third person form that uses one hand and a 12+ shape, can be used for both people and animals as well. This realization, however, brings focus to the movement itself rather than a type of movement. ₃WALK also frequently combines with simultaneous path information and the completive aspect marker GO (see 8.6.1), neither of which has been observed with ₁WALK. Table 150 gives more examples of verbs in their first- and third-person forms.

**Table 150. First- and third-person perspective in verbs.**

| First Person (1) | Third Person (1) | First Person (2) | Third Person (2) |
|---|---|---|---|
| ₁DIVE | ₃DIVE | ₁HOP | ₃HOP |
| ₁JUMP | ₃JUMP | ₁SEE/LOOK | ₃SEE/LOOK |

### 9.3.3 Topicalization

Though reduplication can be loosely associated with plurality (see 8.5.1) and aspect (see 8.6.1), the clearest and most prevalent motivation for reduplicated movement is topicalization. An item which is the focus of a statement can be brought to the beginning of an utterance in order to be grammatically topicalized (see 10.6.3), and this order is usually accompanied by reduplication and eyebrow raising.

Citation forms are often reduplicated as well, presumably for the same reason of added focus. A common pattern in elicitation is the use of a reduplicated sign in its own phrase, followed by an explanation or story on that topic. A structure resembling relative clauses, which refers to an established participant by their most recent action or state, also uses reduplication in a similar pattern (see 10.7.1). A participant is introduced by this reduplicated sign, and the story continues as it relates to that participant.

## 9.4 Mood

Marking for interrogative, imperative, and quotative moods consists of non-manuals which can be sustained for entire phrases and clauses. None of the patterns encoding mood in LSSiv are atypical in sign languages (cf. Herrmann 2003), so only a brief discussion is included here.

### 9.4.1 Interrogative

A typical raised brow (glossed as YN) is used for *yes-no* questions, beginning approximately at the start of the clause (example 95).

(95)

EAT+YN            FINISH+YN

*Did you eat already?* ([BC1-342](#) 04:08[4])
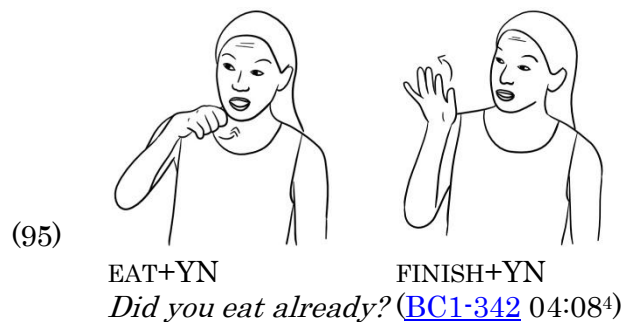
In content questions, the non-manual 'Q' morpheme is used (downturned pursed lips and an upward head tilt), usually along with a manual sign for *what*, *who*, etc. This morpheme begins prior to its manual counterpart in the final position, though the exact timing is not known (see example 96). Furrowed brows are often used before or with the question sign as well. (See Syntax, section 10.3, for more on question structure.)



(96)

2(+Q)            GROW.UP +Q           WH2

*Where did you grow up?* ([BC1-342](#) 02:32[4])
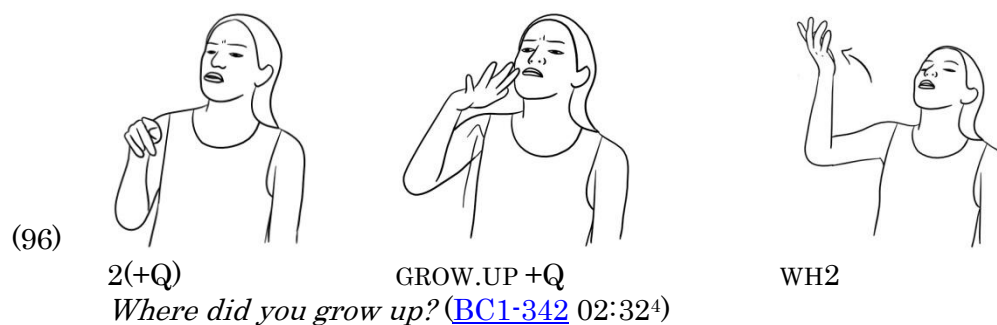
### 9.4.2 Imperative

A furrowed brow is used consistently for imperatives, along with an upward head tilt in some cases. Manual components of signs like NO may also be exaggerated in distance, repetition, and sharpness. This is a parameter that needs to be investigated further. Table 151 shows declarative and imperative forms of NO and QUIET.

**Table 151. Imperative mood.**

| Declarative (1) | Imperative (1) | Declarative (2) | Imperative (2) |
|---|---|---|---|
| NO | *don't* | QUIET | *be quiet* |

### 9.4.3 Quotative

Quotative is marked by exaggerated non-manuals, often including raised eyebrows. Signers may also add a second hand to a typically one-handed sign. Table 152 shows HELLO and GUERRILLA2 in plain and quotative forms. The video ch9gu, BC2-087[2], shows the longer utterance for GUERRILLA2 in which the signer explicitly states the speaker, and in example 100 (9.5.3) the recipient of a quoted command is clarified with the non-dominant hand. The previous section (9.3) discusses the use of perspective switches, which are marked by manual as well as non-manual exaggerations and can be used for quoted speech and actions.

**Table 152. Quotative mood.**

| Declarative (1) | Quotative (1) | Declarative (2) | Quotative (2) |
|---|---|---|---|
| HELLO | HELLO.QUOT | GUERRILLA2 | GUERRILLA2.QUOT |

## 9.5 Use of the non-dominant hand

As discussed in this chapter and in Morphology (section 8.4), LSSiv takes full advantage of simultaneous articulation. Along with non-manuals, the two hands can perform separate signs or provide separate morphological information simultaneously. This section shows that the non-dominant hand can be used phrasally for 1) multiple verbs, 2) multiple subjects, and 3) parentheticals. These are more patterns which should be more thoroughly described in future research.

### 9.5.1 Multiple verbs

Similar to the way the non-dominant hand is used as a marker of location (9.1.2), the dominant hand (or presumably whichever hand is being used at the time) can be left in place after a verb to create a continuous aspect. The non-dominant hand can then sign a second verb that takes place while the first is still occurring. Example 97 shows a description of someone yelling out of a window while holding it open.

(97)

PUSH.UP          HOLD.UP+YELL(ND)
(*He) pushes (the window) up and yells (out of it).* ([BC1-879](#) 01:21[4])

### 9.5.2 Multiple subjects

The two hands can also be used for statements about two different subjects, such as two characters in a story. In example 98, one character (on the dominant hand) offers food and

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the other (on the non-dominant hand) refuses. Again, the initial hand is left in place while the second event is signed, giving the first a continuous aspect.

(98)

FOOD　　　　　　　OFFER　　　　　　OFFER+FOOD(ND)　　OFFER+REFUSE(ND)
*(He) offers food, and the other one refuses the food.* ([BC1-352](#) 01:00[4])


### 9.5.3 Parentheticals

The non-dominant hand is also used for clarification in the form of parentheticals, or extra information added outside of an ongoing sentence. In example 99, the signer begins to sign SPRAY with the dominant hand, then clarifies the reason for spraying the ground (an insect, lit. *gross tiny thing*) with the non-dominant hand before completing the full SPRAY sign on the original hand. (Here INSECT is not interpreted as a direct object due to the atypical hand switch and the lack of agreement on the verb with the location where INSECT is signed.) The dominant hand remains in place in this type of construction as well.

(99)

SPRAY--　　　　　　INSECT(ND)　　　　SPRAY+LOW
*Spray-- there's an insect, so you spray the ground.* ([BC1-392](#) 01:48[4])


An object is often signed as a 'parenthetical' during perspective switches as well, as in example 100. The signer uses the dominant hand for the quote, pauses to clarify the recipient on the non-dominant hand, and then repeats the quoted speech on the original

hand. Also note the use of raised eyebrows, suspected to be (part of) a quotative morpheme (see section 9.4.3).

(100)

WAIT+QUOT  QUIET+QUOT--  DOGND  QUIET+QUOT  WAIT+QUOT
"*Wait, be quiet*"*-- he tells the dog, "be quiet, wait".* ([BC1-879](#) 04:36[4])
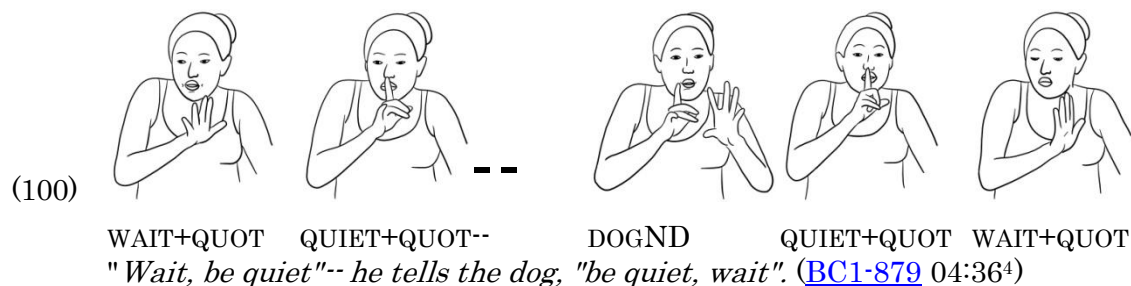
## 9.6 Summary

Locative morphemes can encode adpositional relationships or can be used in predicate-subject or verb-object agreement patterns. Optional forms of agreement and limited specificity indicate that these patterns are developing in LSSiv grammar. The set of meaningful shapes described in 8.1 can also be incorporated into verbs, and role shifts often employ suppletive forms of verbs for different perspectives or types of focus. Topicalization allows a marked constituent to move to an initial position for focus, and quotative, imperative, and interrogative moods are marked non-manually on an entire clause. Hand choice also interacts with focus and role shifting. If multiple actors are being discussed, for example, the dominant hand may be used for clauses in which one actor is the subject while the non-dominant hand is used for clauses in which the other actor is the subject.

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Chapter 9 endnotes

[1] Agreement as it has been described in sign languages also appears to violate the implicational hierarchy used for spoken languages, which states that an utterance with object agreement should also use subject agreement, for example. This may indicate that agreement-like processes described in LSSiv and other sign languages are related to focus or topic-comment structure.

[2] Clips referenced in this chapter can be found at [https://bleegiimuusclark.com/lssiv-grammar-examples-5/](https://bleegiimuusclark.com/lssiv-grammar-examples-5/) and [https://scholarspace.manoa.hawaii.edu/handle/10125/49885](https://scholarspace.manoa.hawaii.edu/handle/10125/49885), BC2-074 through BC2-087.

[3] Use of the non-dominant hand for SEE may be due to locative agreement that holds the phrase *look into the mirror* together (see 9.1.2). It may also relate to ease of articulation, since its movement ends at the position of FLAT. See 9.5 for more on two-handed phrasing.

[4] Videos from which examples are taken can be found using the BC1-XXX label at the following address: https://scholarspace.manoa.hawaii.edu/handle/10125/34525.

[5] These are marked by their pre-verbal position, as the pot location is established in a previous statement; see 10.2.2 and video ch9e80 (https://bleegiimuusclark.com/lssiv-grammar-examples-5#ch9e80/) or BC2-083 (https://scholarspace.manoa.hawaii.edu/handle/10125/49885).

[6] Use of two-handedness as agreement with a plural subject is another pattern that is rarely observed with some verbs. This pattern needs to be investigated further.

[7] Pairs of 'first person' and 'third person' realizations may alternatively be interpreted as a type of manner-path construction. However, it must be noted that these do not always follow the expected strict order, as do manner-path SVCs discussed in 10.4.2.1.

# CHAPTER 10. SYNTAX

The grammatical patterns and rules presented here are largely based on grammaticality judgments provided by the younger generation of signers. Younger signers are more strict in their judgments, and their grammar is a more reliable indication of the direction of the language's development. Observations in naturalistic data are also taken into account, and contradictions are noted. Section 10.1 reviews the way that word classes (see Chapter 7) and syntactic roles (see Chapter 9) are defined. Then the structure of basic declarative state-ments (10.2), interrogative statements (10.3), and phrases (10.4) is given. Section 10.5 discusses variation and types of transitivity in LSSiv, then 10.6 and 10.7 discuss prelimi-nary evidence for more complex structures and prosodic patterns.

## 10.1 Word classes and syntactic roles

Chapter 7 defines word classes that divide the LSSiv lexicon into nouns, verbs, and modifiers according to morphological, co-occurrence, and semantic criteria. Many signs are flexible in their use, appearing with morphological and syntactic patterns associated with more than one of these categories. This has been described in both spoken (Baker 2003 p.226; Hengeveld 2013) and signed languages, and is typical of the latter (Schwager and Zeshan 2010, p.9-10).

Because the patterns in this chapter create specific contexts, signs are described according to their function in that context. While FOOD/EAT is ambiguous as a lone sign, it can be called a verb in a sentence like '1 FOOD/EAT FINISH' (*I ate already*) where it is marked for aspect (see 8.6.1). Where signs are used in a morphologically plain form (a frequent occurrence), syntactic position is a strong indicator of the sign's part of speech and syntactic role. This is expected for languages with 'multi-functional' lexemes (Hengeveld 2013, p.32).

It is clear, for example, that FOOD/EAT functions as a noun in the medial, object (see 10.2), position of a sentence like 'MAN FOOD/EAT COOK' (*A man cooks food*). In other cases, a predicate may be ambiguous, as a verb or adjective (*sleep* vs. *asleep*) for example (see example 106, p.256).

Table 153 gives criteria that can be used to distinguish basic parts of speech in LSSiv (see Chapter 7 for more on lexical categories). Some cannot be applied to all signs due to phonological or semantic restrictions, but they can be markers for certain signs. These are given in parentheses. These criteria are unique to signs which can be used as a par-ticular class; characteristics of one part of speech are not allowed with any of the others. Processes like location-based agreement (described in Chapter 9) that apply to more than one category are not included.

**Table 153. Part of speech criteria.**

|  | Morphological | Co-occurrence | Syntactic |
|---|---|---|---|
| **Noun** | (pluralization)<br>(size and shape modifiers) | quantifiers<br>possessors<br>modifiers<br>NOT.EXIST | initial position<br>pre-verbal<br>subject<br>object<br>location<br>head of NP |
| **Verb** | aspect marking<br>manner<br>(USE derivation)<br>(object incorporation)<br>(directional agreement)<br>(perspective) | aspect marking | clause-final<br>head of VP<br>(takes an object)<br>(used with a path)<br>SVCs |
| **Adjective** | degree marking | nouns (bound/free)<br>verbs (bound) | phrase-final<br>predicate<br>in NP, VP |

Table 154 shows possible morphological markers (see Chapter 9) and typical syntactic markers (described below) for core constituents (subject, object, and verb). All three can be marked as part of one clause via location-based agreement (9.1.2) or mood (9.4),

and some object-verb pairs are used with specific movement patterns (9.2.1) or shape

incorporation (9.2.2). Verbs are uniquely marked for aspect.

**Table 154. Syntactic role markers.**

|  | Morphological | Syntactic |
|---|---|---|
| **Subject** | location agreement with predicate<br>same hand as verb | initial position<br>pre-verbal<br>head of NP |
| **Object** | location agreement with verb<br>shape incorporated into verb | medial position<br>pre-verbal<br>in VP |
| **Verb** | location agreement with S/DO<br>shape incorporation for DO<br>aspect | VP-final |

Parts of speech and syntactic roles in the following sections are generally identified

according to syntactic criteria since simple statements with limited morphological inflection

are used to establish basic sign order patterns. Typical syntactic patterns marking syntactic

roles are discussed in sections 10.2 through 10.4.

## 10.2 Basic declarative orders

The basic order for declarative statements is SOV[1]. Locative and temporal signs take an

initial position, quantification is post-verbal, and negation is post-quantification. Because

tense, aspect, and agreement marking are rare, order is the main indication of each con-

stituent's syntactic role. Chapter 9 describes location-based agreement for most consti-

tuents (9.1.2), as well as directional agreement (9.2.1) and object incorporation (9.2.2) for

some object-verb pairs. The following sections show the basic orders for these constituents

in simple statements, including grammaticality judgments showing a lack of flexibility.

(See section 10.4 for a discussion of more complex noun and verb phrases.)

None of the basic orders found in LSSiv are atypical. SOV is considered by some to be the expected order for sign languages (Goldin-Meadow et. al. 2008), as found in the majority of deaf sign languages with known orders described in Jepsen, et. al (2015). Others (de Vos & Pfau 2015; Fischer 2017) state that both SVO and SOV are equally common. Aarons 1994 (p.154) finds that temporal and locative signs are also initial in ASL, and Zeshan 2006, p.65 describes an overwhelming tendency for clause-final or post-verbal negation in sign languages.

### 10.2.1 Intransitive

Intransitives use subject (S)-predicate order. A predicate may be an adjective, possessor, quantity, or verb. Again, in some cases, the exact classification of the predicate is not clear (e.g. as an adjective or verb) due to morphologically plain forms, but it is clear that in a two-constituent statement, the initial sign functions as the subject and the second as the predicate. More extensive examination of prosodic patterns and verbal morphology may reveal how such distinctions can be encoded, but that is beyond the scope of this description.

Examples 101 and 102 show basic 'noun (S)-adjective (predicate)' statements with irreversible orders.

(101a)

NORA        BEAUTIFUL
*Nora is beautiful.*

(101b)

*BEAUTIFUL        NORA
*\*Nora is beautiful.*

(102a)

TREE STRONG

*The tree is strong.*

(102b)

*STRONG TREE

**The tree is strong.*
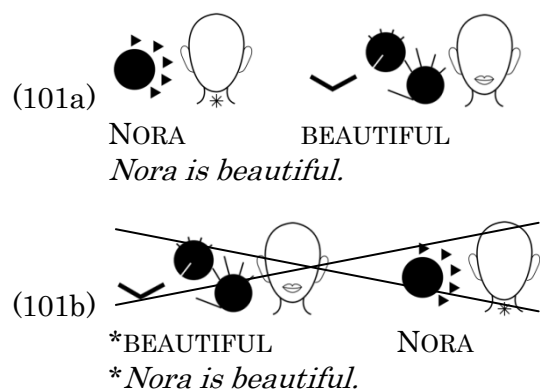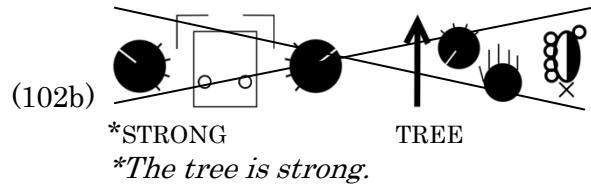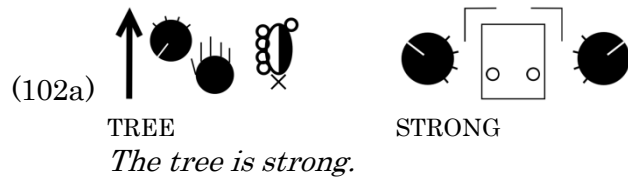
Statements of possession (example 103) and quantification (example 104) follow the same set order  of 'noun (S)-descriptor (predicate)'.

(103a)

THAT CHILD 1

*That child is mine.*

(103b)

*THAT 1 CHILD

**That child is mine.*

(104a)

DOG MANY

*There are a lot of dogs.*

(104b)

*MANY DOG

**There are a lot of dogs.*
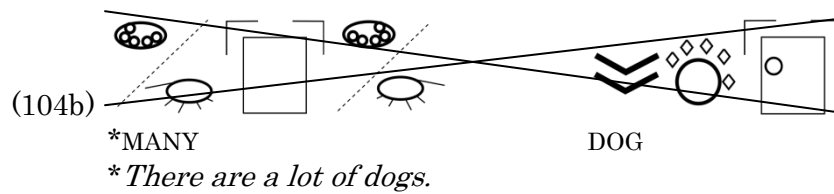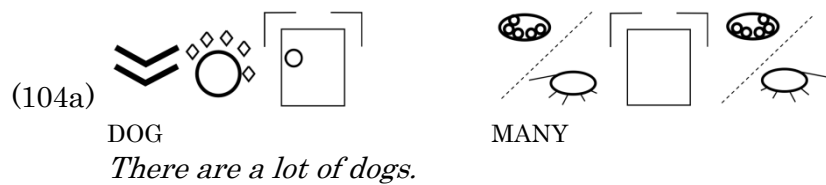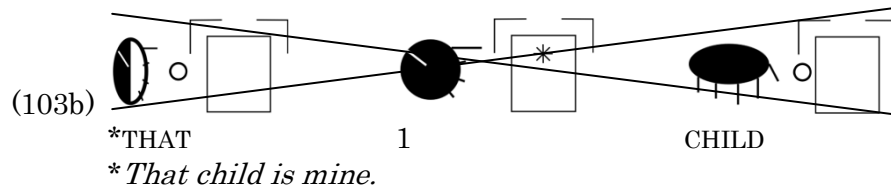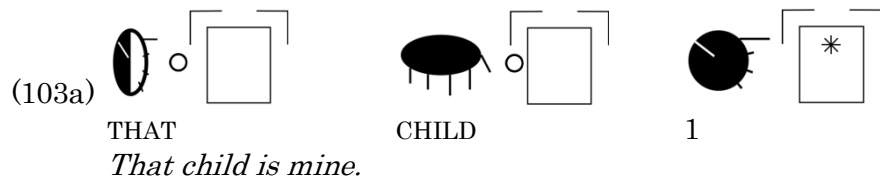
The final type of intransitive clause is a noun (S) followed by a verb (examples 105 and 106). (The use of multiple verbs is discussed in 10.4.2.)

(105a)

1           SWIM

*I swam.*

(105b)

*SWIM                             1

*\*I swam.*

(106a)

MOTHER           SLEEP

*(My) mother is sleeping/asleep.*

(106b)

*SLEEP                 MOTHER

*\*(My) mother is sleeping/asleep.*
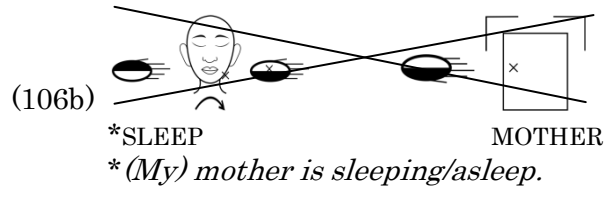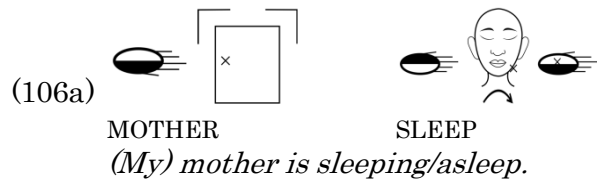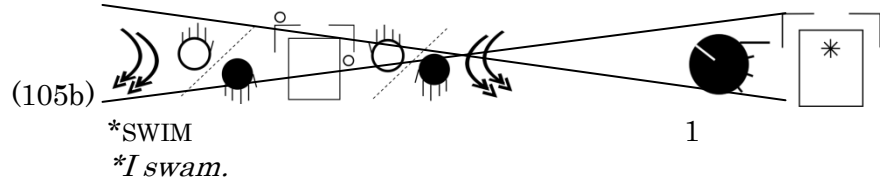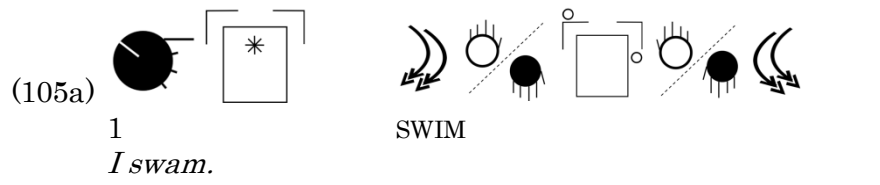
## 10.2.2 Transitive

The default order for the majority of transitive patterns in LSSiv is SOV. Examples 107 and

108 show grammaticality judgments to this end, though the rule is more strict in the

younger generation. (See section 10.5.2 for a discussion of transitivity and types of verbs).

(107a)

1                    COW                   HIT

*I hit the cow.*

(107b)

*COW                   1              HIT

*\*I hit the cow.*

(107c)

*1        HIT        COW

*I hit the cow.

(108a)

MOTHER       DOG       TAKE.PICTURE

(My) mother took a picture of the dog.

(108b)

*MOTHER     TAKE.PICTURE       DOG

(My) mother took a picture of the dog.
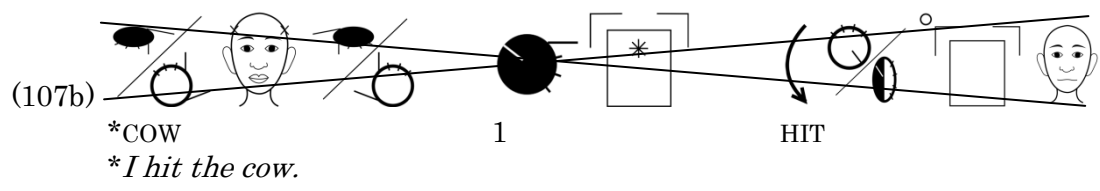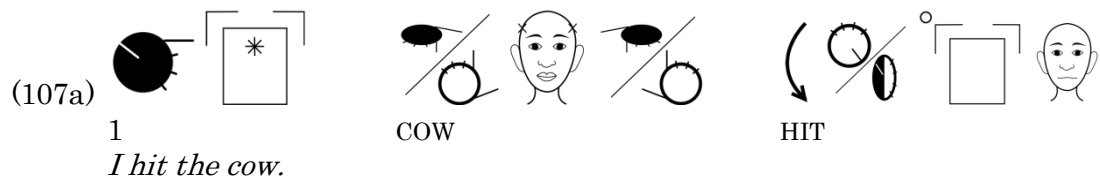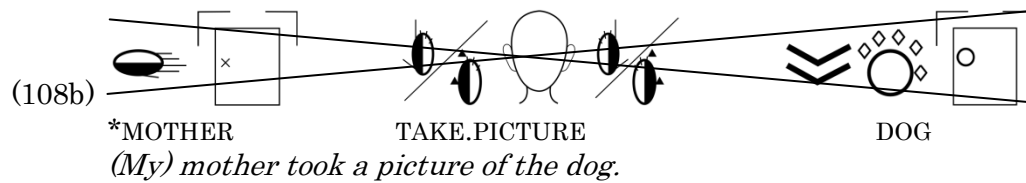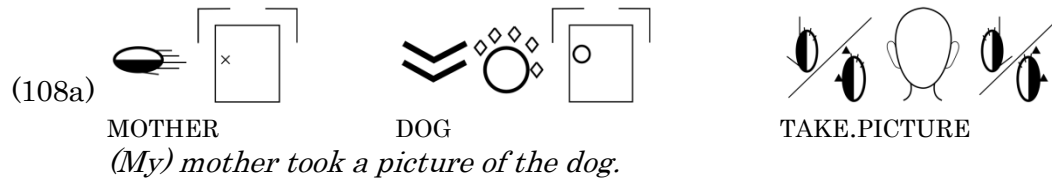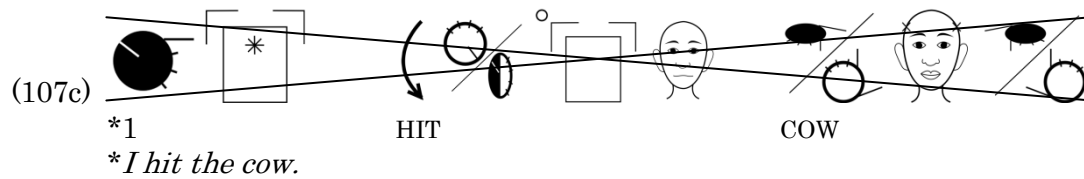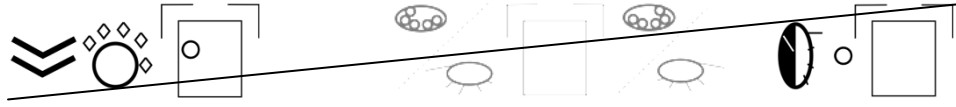
Example 109 shows SOV order in a narrative context (SOV, OV).

(109)

DOG(loan)      THAT      BARK.BITE

The dog was biting at that (bee hive),

TREE      BARK.BITE

biting at the tree. ([BC1-877](#) 01:50[2])
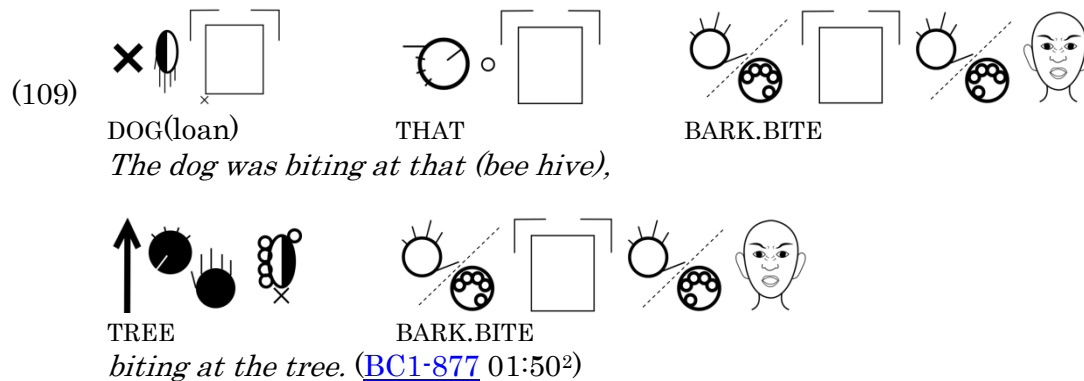
## 10.2.3 Locative and temporal signs
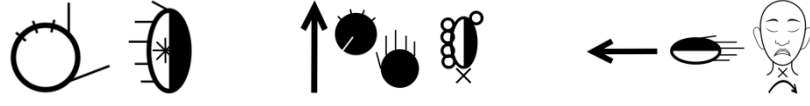
The default order for a location or time is the expected initial position. Examples 110-112

are grammaticality judgments for non-verbal sentences which show this pattern.

(110a)

THERE      DOG      (MANY)

There are a lot of dogs there.

257
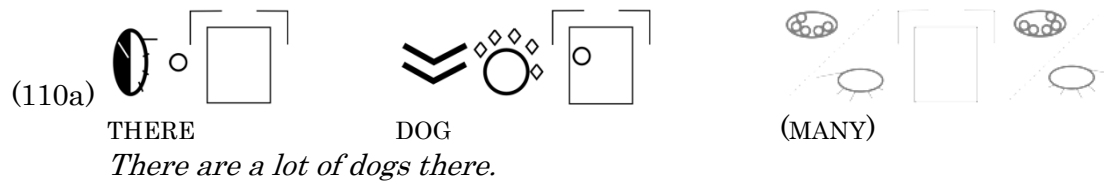
(110b)

~DOG             (MANY)             THERE

*~There are a lot of dogs there.*

(111a)
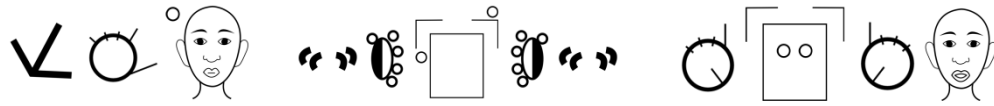
LIMA          TREE          DEAD

*In Lima, the trees are dead.*

(111b)
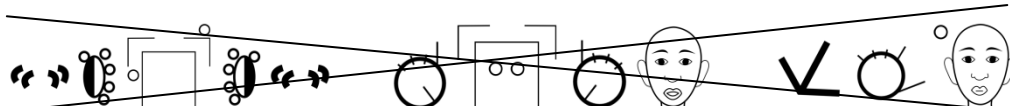
*TREE        DEAD        LIMA

*\*In Lima, the trees are dead.*

(112a)

US          PAPAYA          SMALL

*In the US, papayas are small.*

(112b)

*PAPAYA        SMALL        US

*\*In the US, papayas are small.*

Examples 113-116 show the same initial order with intransitive (113-114) and transitive (115-116) verbs in spontaneous signing. These patterns show that locations are distinct from indirect objects, which follow subjects and (typically) direct objects in ditransitive structures (see 10.2.4).

(113)

FAR+INTENSE              SEE

*See (it) very far away...* ([BC1-390](#) 08:30[2])

(114) NINE     1     SLEEP

*At 9 (o'clock), I sleep.* ([BC1-394](#) 00:58²)



(115) DISH     CIGARETTE     CRUSH

*(She) crushed the cigarette in the dish.* ([BC1-357](#) 01:20²)

(116a) HOUSE     COCONUT     PUT

*(I) put the coconut in the house.*

(116b) ~COCONUT     HOUSE     PUT

*~(I) put the coconut in the house.*

### 10.2.4 Ditransitive

Ditransitive structures are rare in LSSiv, and grammaticality judgments are difficult to elicit. However, they are a possible structure in the language with specific syntactic rules. The most frequent and accepted order for these sentences is subject-direct object-indirect object-verb (SDIV). Though this is atypical for an SOV language, variations from this appear to be related to directional agreement (see 10.5.3). The most consistent (and presumably important) internal orders are subject before indirect object (SI) and all three nominal constituents before the verb.

Without morphological marking such as directionality (S-IO; see 9.2.1) or shape incorporation (V-DO; see 9.2.2), syntax is the only indication of ditransitivity. Unfortunately, none of the potentially-ditransitive verbs identified use both of these morphological patterns (directionality in GIVE is discussed in 9.2.1 and 10.5.3). The examples below are

considered to be ditransitive because they do not follow the expected patterns for locatives (an initial 'indirect object', e.g. *DOG 1 WATER THROW; see 10.2.3) and subject-direct object pairs are never translated as possessives (e.g. (I) threw *my* water on the dogs; see 10.4.1.1). Nor do they follow a topic-comment structure (see 10.6.3).

The default SDIV order is attested by grammaticality judgments for THROW (example 117) and the same order is used in a more natural context for spraying water on a fire (example 118).

(117a)

1          WATER          DOG          THROW
*I threw water on/at the dogs.*

(117b)

*1         DOG          WATER          THROW
**I threw water on/at the dogs.*

(118)

3          WATER          FIRE          USE.HOSE
*He sprayed water on/at the fire.* ([BC1-246](#) 02:10²)
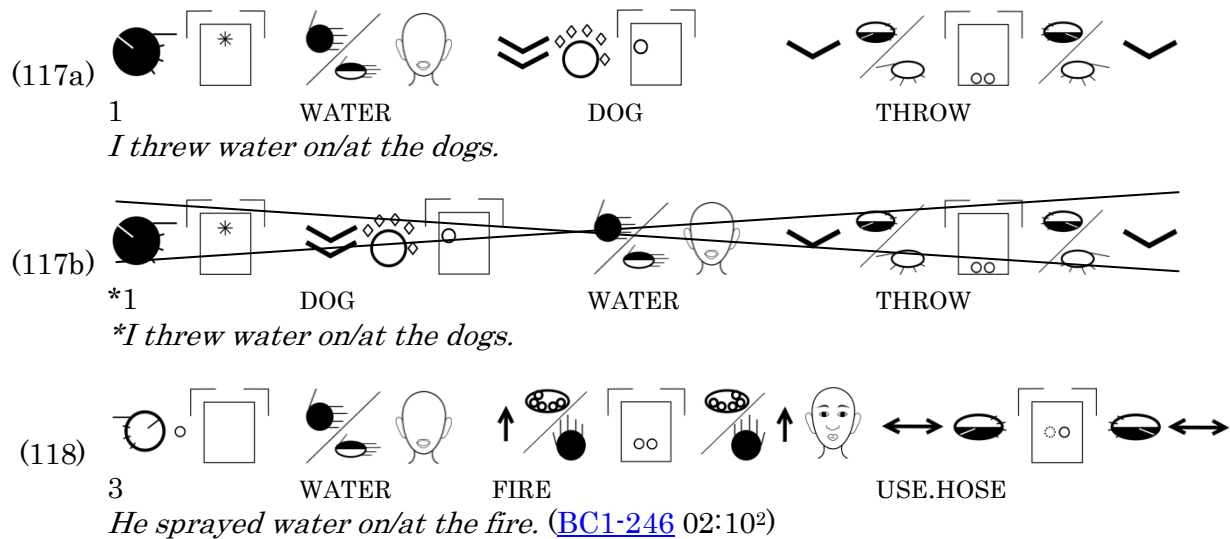

## 10.2.5 Quantification

The default position for quantification is post-verbal. For general quantifiers, LSSiv does not allow movement to specify that a particular constituent is being described. (For quantification of a subject, two clauses are used; see example 123.) Examples 119-121 show post-verbal order for a numeral, MANY, and NONE.

(119a)

CAMCORDER-SCREEN (video)          WATCH(SCREEN)          EIGHT
*(I) watched eight videos.*

(119b)

*CAMCORDER-SCREEN (video)　　　　　EIGHT　　　　　WATCH(SCREEN)

***(I) watched eight videos.*

(120a)

HOUSE　　　　　BUILD　　　　　MANY

*(He) built a lot of houses.*

(120b)

~HOUSE　　MANY　　　　　BUILD

*~(He) built a lot of houses.*

(121)[3]

1　　　　　CHILD.PL　　　NONE

*I have no children.*

Example 122 shows that MANY can also be combined with a numeral, in which case the numeral takes the latter position.

(122)

PACAY　　　　　PICK　　　　MANY　　　　FOUR

*(I) picked four pacay.*

A separate clause is used to quantify a subject, as seen in the structure of example 123. (Note that data in section 10.4.1.2 indicates that MANY and numerals function differently from 'adjectival' quantifiers for specific types of objects, which can be used in noun phrases).

(123)

BABY　　　　2　　　/　BABY　　　SLEEP

*There are two babies. The babies are sleeping.*

### 10.2.6 Negation

There are a three types of negation in LSSiv: 1) the independent signs NO, NOT.EXIST, and NONE, 2) simultaneous non-manual negation, and 3) negative verbs. The most common form of negation is an independent sign, closely followed by non-manuals (which sometimes occur simultaneously with independent signs). Negative verbs are rare. All three types are typically clause-final (or simultaneous with the clause-final sign), including after quantification. (The only exception is in content questions, where the question sign takes the final position; see 10.3.)

#### 10.2.6.1 Independent signs
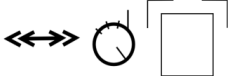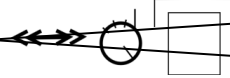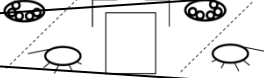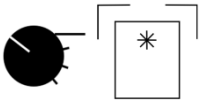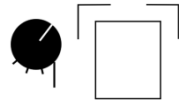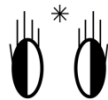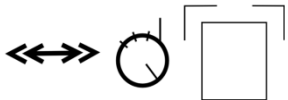
Three independent signs are used for negation. All are consistently post-verbal and post-quantifier, and all are used for sentential negation, but each is used for a specific type of information. (Negation of individual constituents is expressed through shorter statements or contrastive structure, as described in 10.6.1.) Most sentences can be negated with the general sign NO, non-verbal and limited verbal statements are negated with NOT.EXIST, and NONE is used as a negative quantity and in limited verbal contexts.

#### 1) NO
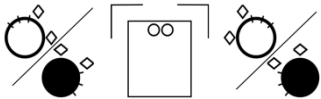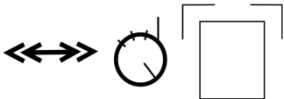
The sign NO has the most widespread use. It is seen with non-verbal, intransitive, transitive, and even ditransitive structures. Examples 124-126 show NO being used to negate an adjective (124), quantity (125), and location (126).

(124)

TREE    STRONG    NO

*The tree is not strong.*
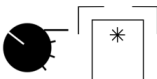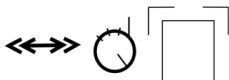
(125a)

SELLER　　　　　　　　　　　　MANY　　　　　　　　　NO

*There weren't many vendors.*

(125b)

*SELLER　　　　　　　　　　NO　　　　　　　　MANY

*\*There weren't many vendors.*

(126)

1　　　　　　　　HERE　　　　　HOUSE　　　NO

*I don't live here. (lit. My home is not here.)*

As opposed to the tone-neutral negation of NOT.EXIST (shown in examples 132-135 below), NO implies *don't want* or a negative command when used with a lone noun (example 127).

(127)

BEAN　　　　　　　　　NO

*I don't want beans. / Beans won't work. / Don't use beans.*

The majority of verbs are also negated with NO, barring those with opposing negative verbs (see 10.2.6.3). Note that some verbs are used with both NO and NOT.EXIST. For these verbs, NO gives a simple one-time meaning, while NOT.EXIST gives a 'never' meaning (compare examples 128-129 with 138-139 for NOT.EXIST). The following examples show NO consistently in a final position with no effects on basic word orders for intransitive (128), transitive (129-130), and ditransitive (131) verbs. (See 10.5.3 for more on directionality and sign order with GIVE.)

(128)

1　　　　　　　RUN　　　　　　　NO

*I didn't run.*

(129)

COW          SEE          NO

*I didn't see a cow.*

(130)

1       PIG          SHOOT          NO

*I didn't shoot the pig.* ([BC1-201](#) 0:34[2])

(131)

1       2       BOOK       GIVE         NO

*I didn't give you a book.*


## 2) NOT.EXIST

The sign NOT.EXIST negates non-verbal statements of existence (example 132), possession

(example 133), quantity (example 134) and location (example 135).

(132)

BEAN          NOT.EXIST

*There aren't any beans.*

(133)

1          CHILD          NOT.EXIST

*I don't have any children. (lit. My child does not exist.)*

(134)

SELLER          MANY          NOT.EXIST

*There weren't a lot of vendors.*

(135)

HERE       WATER          NOT.EXIST

*There isn't any water here.*

Rejected items show that NOT.EXIST cannot be used to negate an adjective (example 136), and it must be in the final position (example 137).

(136)

*FATHER          TALL                   NOT.EXIST
*(My) father isn't tall.

(137)

*NOT.EXIST                         BEAN
*There aren't any beans.
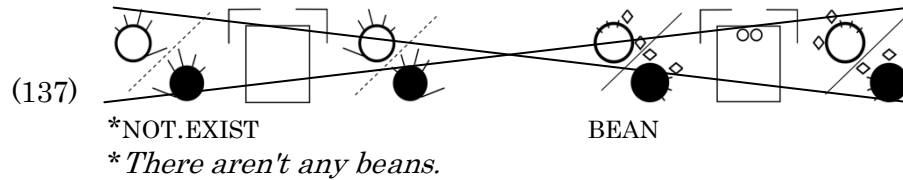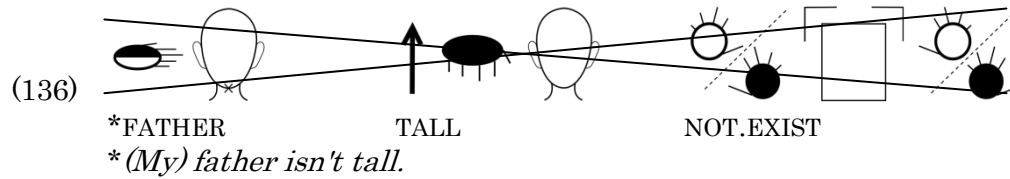
NOT.EXIST can also be used to negate some intransitive and low transitive (see 10.5.2) verbs. RUN (example 134), DANCE, and SEE (example 135) are attested. All of these can be used with NO as well, but with a slightly different meaning. Use of NOT.EXIST with RUN or DANCE adds 'never' or 'not usually' (*I don't run/dance usually/ever*) as opposed to a single event with NO (*I didn't run/dance this one time*).

(138)

1                    RUN                    NOT.EXIST
I don't run.

(139)

COW                    SEE              NOT.EXIST
I didn't see a cow. (lit. I saw that there weren't any cows.)
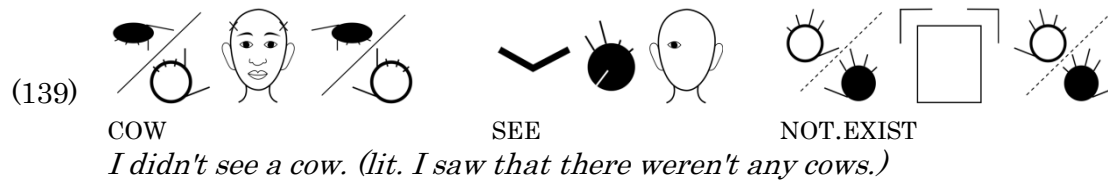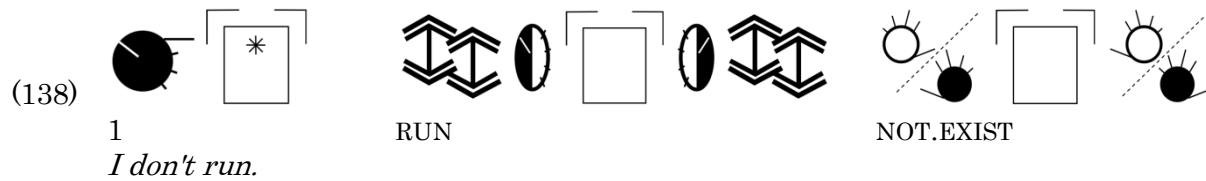
## 3) NONE

The relatively rare NONE is most often used as a negative quantity, as described in 10.2.5, but it can also be used to negate the presence of an object (example 140). In this way, its
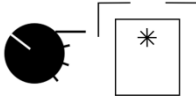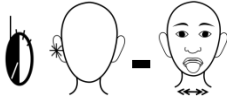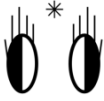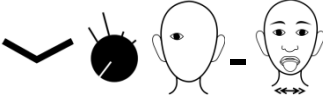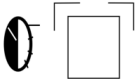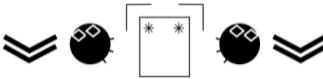
functions can overlap with NOT.EXIST and NO. (This sign is also commonly glossed as NO.MORE, and is a frequent way to end an elicited response.)

(140)

HEAVEN        SEE              THERE              NOT.EXIST

*In heaven, (he) looks and there's nothing there,*

SEE                              NONE

*(he) sees nothing.* ([BC1-413](#) 02:49[2])
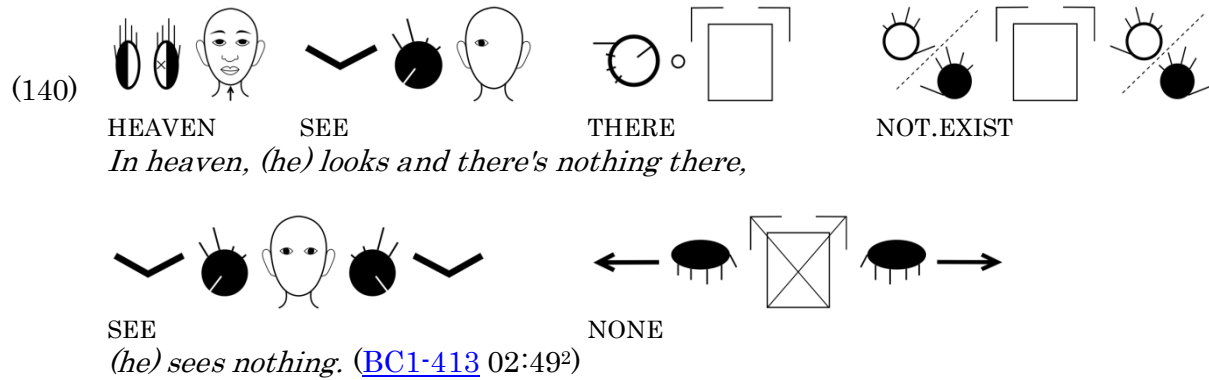

### 10.2.6.2 Non-manual negation
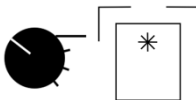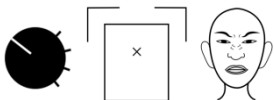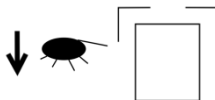
Non-manual negation (NEG) uses the tongue and head shaking to negate a declarative statement. Like other types of negation, it is sentence-final (excluding *wh*-questions), co-occurring with the final sign. The use of this morpheme is another aspect which differs between the two generations, as described below.
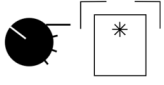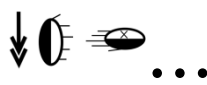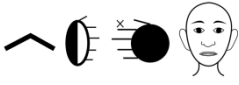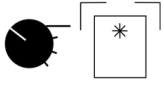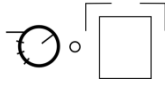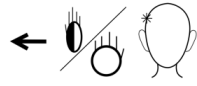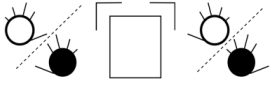
While simultaneous non-manual negation can be used for any verb in the older generation, it has taken on a more specific use for younger signers. In the older generation, use of the tongue also seems to imply ignorance, as it is most frequently used with verbs like KNOW, HEAR, SEE, and THINK. Younger signers place more emphasis on head shaking rather than the tongue, and they only accept non-manual negation with intransitive verbs (example 141) or low transitive verbs (example 142; see discussion in 10.5.2) with no negative counterpart (e.g. KNOW was rejected). In this way, non-manual negation takes the place of NOT.EXIST. The examples below are unmarked if accepted by both generations (141-142), and marked with a tilde (~) if only acceptable to the older generation (143-144). In every case, the manual NO is also acceptable in place of or along with the non-manual.

(141)

1                      EXPLORE                          HEAR+NEG(NM)

*I walked around and I didn't hear anything...* ([BC1-322](#) 00:40[2])

(142)

HOUSE                       SEE+NEG(NM)

*(I) didn't see the house.*

(143~)

2              CLOTHES              WASH+NEG(NM)

*You didn't wash the clothes.*

(144~)

TIME                  KNOW+NEG(NM)

*I don't know the time.*

### 10.2.6.3 Negative verbs

Negative verbs are negative counterparts to a handful of verbs. These verbs cannot be negated with independent signs, nor with typical non-manual negation, and instead must be replaced with their negative counterpart. This type of negation appears in the same positions as other verbs: after subjects (example 145), in multiple-verb structures (example 146; see 10.4.2), and between objects and other types of negation (example 147).
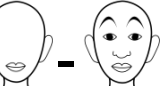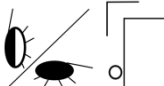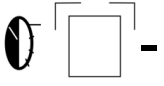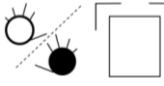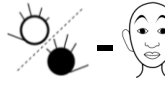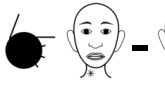
(145)

1                      NOT.LIKE                    /          STAY

*I don't like that (I don't want to). I'll stay.* ([BC1-342](#) 08:17[2])

(146)

1                NOT.THINK        CHOP...           CUT.SELF

*I was chopping and not thinking... I cut myself.* ([BC1-204](#) 00:34[2])

(147)

1                THAT             NOT.KNOW          NOT.EXIST

*I don't know what that is, it doesn't exist here.* ([BC1-250](#) 00:21[2])


## 10.3 Basic interrogative order

### 10.3.1 Yes-no questions

Typical *yes-no* questions do not usually affect sign order. They only require non-manual marking on statements or, frequently, individual signs. As in many sign languages (Zeshan 2006, p.40), they are marked by raised eyebrows, glossed here as the morpheme YN. This morpheme usually co-occurs with all signs in the statement, though the exact start and end point is an issue left for later research. Examples 148-151 are typical *yes-no* questions.

(148)

EAT+YN(NM)                      FINISH+YN(NM)

*Did you eat already?* ([BC1-342](#) 04:08[2])

(149)

TRUE+YN(NM)      2+YN(NM)                  CALL.PHONE+YN(NM)

*Did you really call? (lit. Is it true that you called?)* ([BC1-342](#) 04:44[2])

(150)

2+YN(NM)              NOT.EXIST+YN(NM)              NO.MONEY+YN(NM)

*You don't have any money?*

(151)

NOW+YN(NM)       GO+YN(NM)

*(Are we) going now?* ([BC1-342](#) 04:13²)
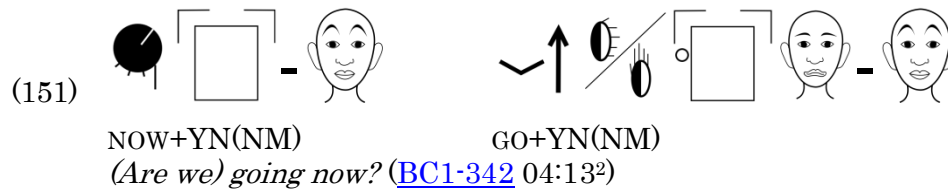
One exception to declarative orders given in section 8.2 occurs when *yes-no* questions ask about location. In these cases, atypical location-final order is the norm, as in example 152. (Note that times still occur initially, as in example 151.)

(152)

2+YN(NM)       SEE+YN(NM)       THERE+YN(NM)

*Did you look there?* ([BC1-342](#) 04:17²)
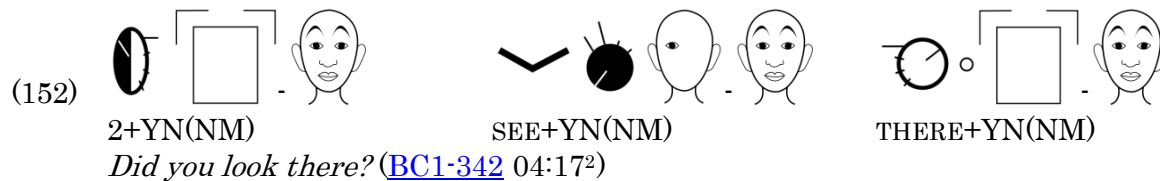
## 10.3.2 Content questions
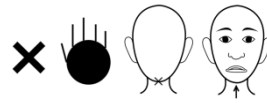
LSSiv uses four manual signs for content questions: 1) WHAT, 2) WHO, 3) HOW.MUCH (also *how many*), and 4) WH2 (*where*, *when*, or *why*). Each of these has pronounced non-manual components. WHAT also serves as a general question sign that can be used in most contexts, apart from quantities. Another general question sign (usually used alone) is completely non-manual. It is used to ask for general clarification, explanation, or repetition.

The most frequent place for a question sign to appear is clause-finally. This is also an expected order for signed languages (Zeshan 2006, p.64). Questions are overwhelmingly formed this way in a natural context, though other orders are accepted in grammaticality judgments (see 10.5.6). In any context, only one question sign may be used at a time (no double *wh*-questions). Note that in some cases (e.g. *how many*), final is also the in situ order. These are marked with an apostrophe (') in the examples below.
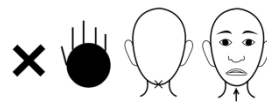
### 10.3.2.1 Intransitive questions

The following examples show final order for questions about a subject (153), possessor (154'), predicate (155'), quantity (156'), location (157), time (158), and reason (159), using all four content question signs. (See 10.4.1 for information on the possessive phrases used in 155b and 156b.)
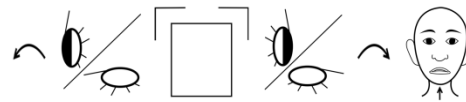
(153)
WALK    WHO
*Who is walking?*
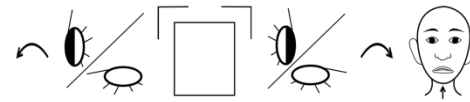
(154')
DOG    WHO
*Whose dog?*
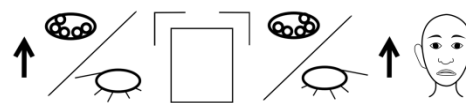
(155a')
SUNDAY    WHAT
*What happened on Sunday?*
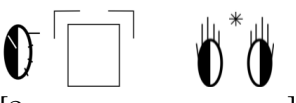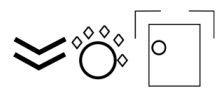
(155b')
[WORK  2  ]  WHAT
*What is your job?*
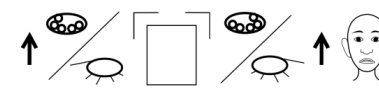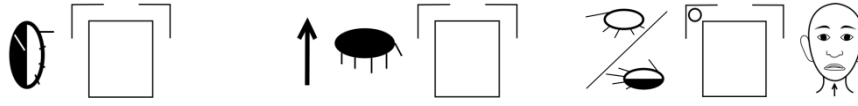
(156a')
CHILD+PL    HOW.MANY
*How many children?*

(156b')
[2    HOUSE ]  DOG    HOW.MANY
*How many dogs are at your house?*

(157)

2          GROW.UP          WH2

*Where did you grow up?* ([BC1-342](#) 02:32²)

(158)

COME                WH2

*When are (you) coming?* ([BC1-342](#) 04:32²)
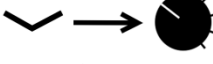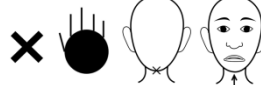
(159)

CRY                WH2

*Why is (he) crying?* ([BC1-343](#) 02:11²)

### 10.3.2.2 Transitive questions

The matter of whether the question sign replaces the subject or object for transitive verbs is resolved by strategies such as sign choice (WHO vs. WHAT), context, perspective shifts, directionality, paraphrasing, and animacy, rather than constituent order. Examples 160-163 show *wh*-questions in the final position when asking about subjects and objects of low transitives (160'-161'; see 10.5.2), a directional transitive (162; see 9.2.1), and an object quantity (163'). Many of these are also in situ, marked with apostrophes (').

(160')

MOTHER          TALK          WHO

*Who is talking to (my) mother? / Who is (my) mother talking to?*

(161')

EAT                WHAT

*What did (you) eat?*

(162)

2                 PUNCH₃           WHO

*Who did you punch?*

(163')

3           ORANGE     PICK             HOW.MANY

*How many oranges did he pick?*


### 10.3.2.3 Ditransitive verbs in questions

Questions have never been observed with surface ditransitive structures. Double w*h*-questions are not understood, and single *wh*-questions are always expressed mono-transitively (or intransitively) regardless of a verb's potential higher valency. One way to ask for the subject of GIVE, shown in example 164, is to use a possessive phrase to express the direct object (CLOTHES) and indirect object (YOU). The question can then be asked monotransitively, and WHO occurs finally.

(164)

[2           CLOTHES          ]   GIVE₃          WHO

*Who gave (you) your clothes? (lit. Who gave your clothes?)*
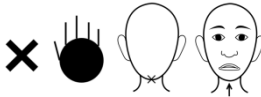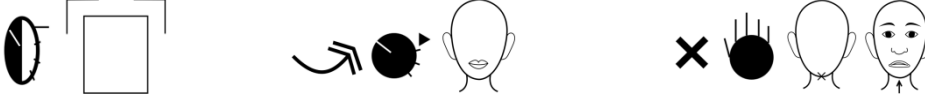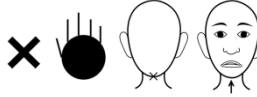

GIVE can also become monotransitive by deleting both objects and asking a general question with WHAT (example 65). A signer can then specify the type of information being requested by suggesting a person or object that may be the answer as a *yes-no* question. This is similar to non-interrogative strategies which use a series of short phrases to convey information that English speakers may convey with a single long sentence (see section 10.7).

(165)

2               GIVE₃             WHAT

*What did you give (to whom)?*
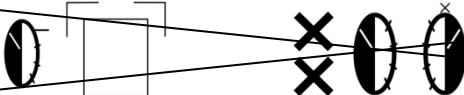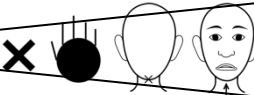
### 10.3.2.4 Semantic content and overlap

Though content question signs are glossed with simple equivalents in English, usage in the two languages does not completely align. The sign WHAT, for example, is a generic question and can be used for *who*, *where*, *when*, or *why* meanings as well. WH2 may also be translated in a few different ways (*where*, *when*, or *why*). Mouthing of a Spanish word may, but does not necessarily, play a role for both. HOW.MANY is the most specific, as it always asks for a quantity (*how much* or *how many*).

There is a notable degree of overlap in how WHAT and WHO are used (examples 166-167). Likely, the borrowed WHO has simply begun to take over some of WHAT's former semantic territory, and is moving away from an LSP (or English) interpretation of the term.

(166)

SUNDAY          WHO
*What happened on Sunday?*

(167)

2          EAT          WHO
*What did you eat?*

This overlap is not unlimited, however, as one of the tested items was rejected (example 168). It is unclear why this particular one is ungrammatical (perhaps the LSP loan WORK primes an LSP meaning for WHO), but it does indicate that there is a distinction between the use of the two signs.

(168)

*[2          WORK (LSP) ]          WHO
*\*What is your job?*

Both WHO and WHAT can also be used to ask for an explanation, as shown by examples 169-170, using SMILE. It is not clear at this point whether these two questions elicit different answers, but this is an area for future research.

(169)



2        SMILE        WHO

*Why are you smiling?*

(170)



2        SMILE        WHAT

*Why are you smiling?*
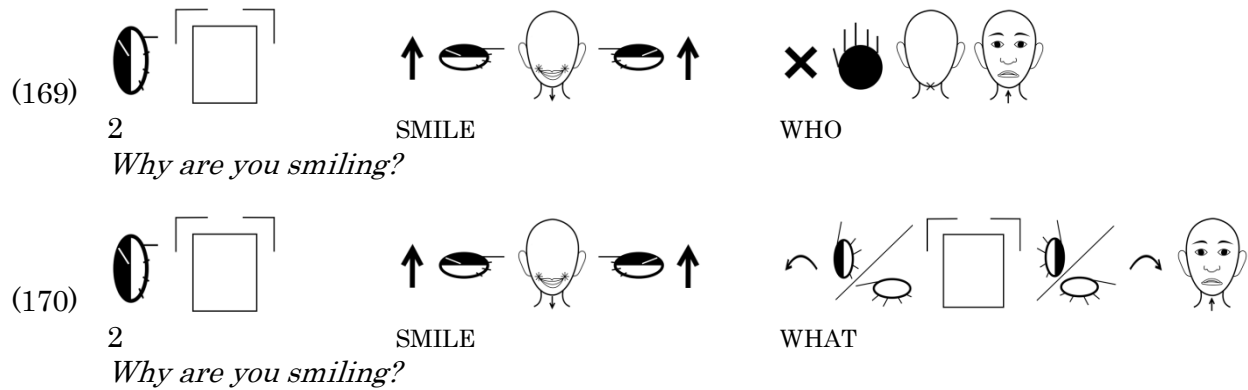
Another content question, glossed as WH2, can be used for approximately *when* (example 171), *where* (example 172), and *why* (example 173), though other strategies are probably more common. *When* is asked using TIME or TIME WHAT, and both *where* and *when* are frequently expressed with a *yes-no* structure. Sometimes WH2 is accompanied by mouthing of the Spanish word for a specific meaning and other times its interpretation is a matter of context.

(171)



COME        WH2

*When are (you) coming?* (BC1-342 04:32[2])

(172)



2        GROW.UP        WH2

*Where did you grow up?* (BC1-342 02:32[2])

(173)



CRY        WH2

*Why is (he) crying?* (BC1-343 02:11[2])
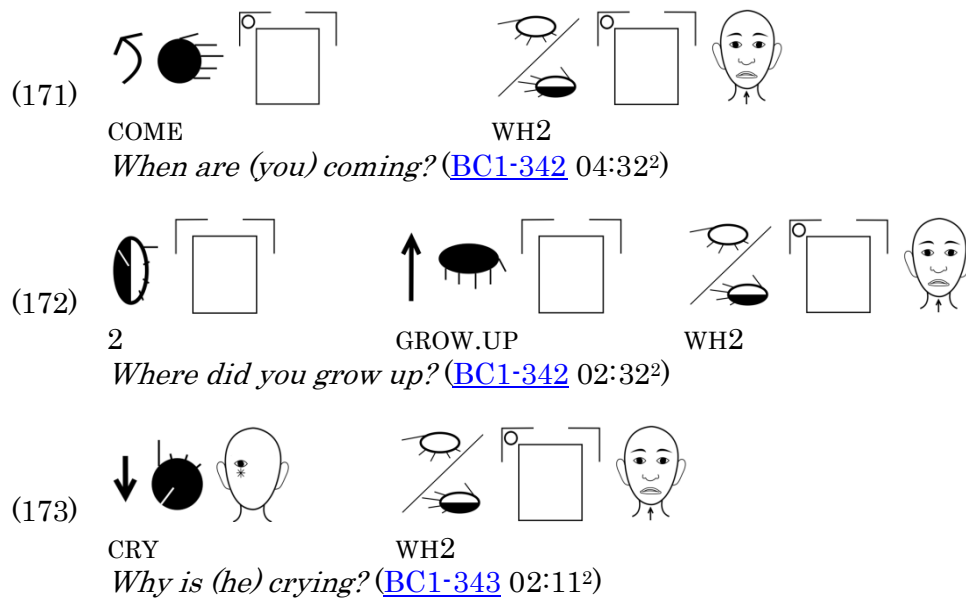
## 10.4 Phrasal order

Sections 8.2 and 8.3 describe basic patterns in single clauses with only core constituents. This section describes the orders of smaller segments, namely how nouns and verbs combine with other constituents into phrases.

### 10.4.1 Noun phrases

Nouns most frequently form adjectival and possessive phrases, as described in section 10.4.1.1. 'Adjectival' mass quantifiers that reference a noun's size and shape can also be used in a noun phrase (10.4.1.2).

### 10.4.1.1 Adjectives and multiple nouns

A noun-adjective sequence can form a noun phrase if another noun or a verb follows as a predicate. This order is fixed in the younger generation only. Their judgments are shown in examples 175-176. While this head-initial tendency for NPs conflicts with head-final OV order for VPs, this combination has also been described in several other sign languages (cf. Jepson et. al. 2015 p.113, 188, 683 and 696; HSL Production Team 2016).



(175a)

[MANGO   GREEN     ]  (EAT)
*(eat) a green mango*



(175b)

*[GREEN    MANGO   ]  (EAT)
*\*(eat) a green mango*

(176a)

[CLOTHES BEAUTIFUL ] (BUY)
*(buy) beautiful clothes*

(176b)

~[BEAUTIFUL CLOTHES ] (BUY)
*~(buy) beautiful clothes*
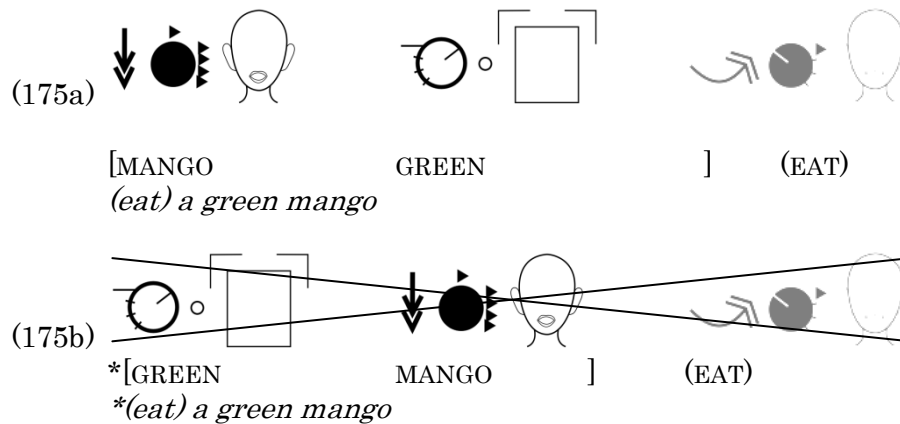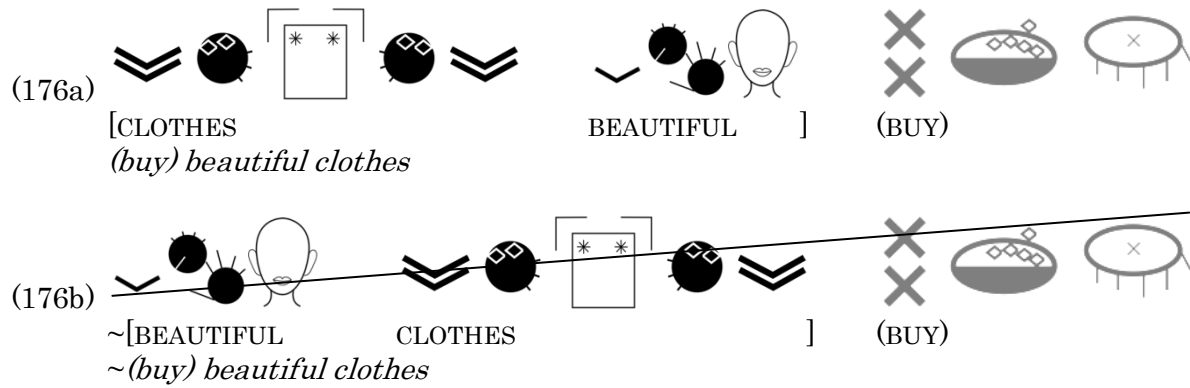
Two consecutive nouns or a noun and a pronoun can form possessive phrases. The order of possessor and possessed is flexible, with meaning established by animacy and context. Note that the first person and the animate noun are the possessors in examples 178 and 179. (In ambiguous cases, paraphrasing and strategies like topicalization are used; see 10.6.3.)

(178a)

1 MOTHER
*my mother*

(178b)

MOTHER 1
*my mother*

(179a)

FATHER SHIRT
*(my) father's shirt*

(179b)

SHIRT FATHER
*(my) father's shirt*

*10.4.1.2 Quantity*

While true 'adverbial' quantities (numbers, MANY) take a post-verbal position, as described in 10.2.5, other uncountable 'adjectival' quantities may follow the item they describe. This is not strictly a countability distinction, however, as MANY is used to modify uncountable nouns and verbs as well. The key markers for the 'adjective' category are compatibility with degree marking and use in a noun phrase (see 7.3). While both quantifiers and adjectives can be marked for degree, there is a distinction between quantities like numerals and MANY, which are only modified non-manually, and quantities like STACK and PILE which also undergo manual changes (increased spreading, decreased flexion, larger signing space; see Chapter 8) as seen in typical adjectives. This, added to syntactic flexibility, creates the proposed distinction.

It is also possible that this is an example of quantifier float. The examples that have been found are used with objects, which should imply that the pattern is compatible with subjects as well. However, these types of quantities are not semantically compatible with typical (agentive) subjects and to this point no examples have been found of floated quantifiers with subjects. Future research may strengthen the argument for this interpretation if 'S-quant-V' or 'S-quant-O-V' orders can be confirmed.

Example 180a shows that BIG.STACK can be post-nominal like an adjective, but it is also allowed to take a post-verbal position like a typical quantity in example 180b. According to the adjectival quantity interpretation, 180a is composed of a noun phrase (CLOTHES BIG.STACK) and a verb, while the order in 180b is a quantified VP or a post-verbal description (see 10.2.5; 10.6.2).

(180a)
[CLOTHES                          BIG.STACK           ]     BUY
*I bought a lot of clothes. (I bought a big stack of clothes.)*

(180b)

CLOTHES                    BUY                BIG.STACK

*I bought a lot of clothes. (I bought enough clothes for a big stack.)*


## 10.4.2 Verb phrases (predicates)

Aside from objects and quantifiers, discussed in 10.2.2 and 10.2.5, the most common elements in verb phrases are other verbs. It is not uncommon in LSSiv to encounter more than one verb in a row. These types of structures fit into three categories that help explain the order in which the verbs may appear: 1) manner-path, 2) object manipulation, and 3) complex event. The structure of each type is discussed below, including whether or not it can be considered a serial verb construction. Examples are observed in responses to short elicitation and narrative tasks.


### 10.4.2.1 Manner-path

Verb pairs describing motion always follow the expected manner-path order (Slobin and Hoiting 1994), apart from simultaneous modifiers such as *far*, *fast*, or *drunk* (see 8.4.2.1). Manner verbs indicate a type of motion, such as walking, flying, running, etc., while paths indicate a direction. This type of predicate always describes a single event, which is a key criterion for many definitions of serial verb constructions (SVCs; cf. Aikhenvald 2006, p.7). Such pairs are also considered to be SVCs according to Haspelmath's (2016) cross-linguistic definition: 1) their meaning is apparent based on the meaning of each verb, 2) they are monoclausal (there is no prosodic evidence of a clause break), 3) both verbs can be used independently, 4) the verbs are not linked by any other signs or morphemes, and 5) the verbs do not have a predicate-argument relationship.

Example 181 shows the ZIGZAG path, frequently used with DRIVE, RUN, or WALK to express a subject heading off into the distance. Example 182 uses a circular path with WALK, and example 183 shows that WALK itself may be used as the path with FLY. (RUN and CARRY are also used this way.)

(181)

DRIVE                 ZIGZAG
*drive on a zigzagged path* ([BC1-364](#) 03:02[2])

(182)

WALK           CIRCLE.PL
*walk in circles* ([BC1-355](#) 00:52[2])

(183)

FLY                 WALK.FAR-GO
*fly up and away* ([BC1-355](#) 02:49[2])
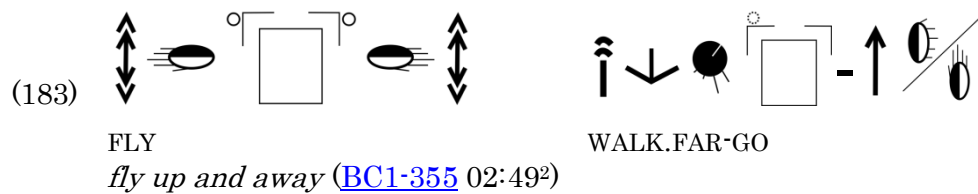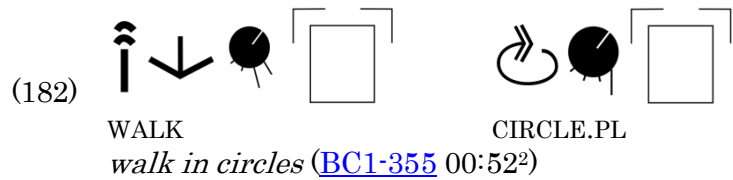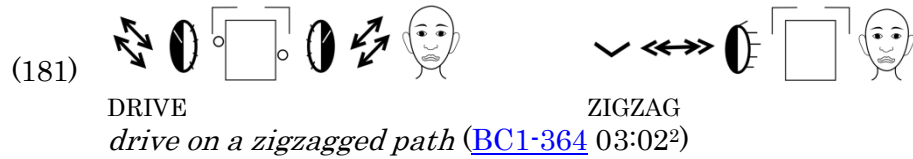
Adverbial manners like *secretly* or *angrily* also precede verbs, as in examples 184 and 185 (though these are no longer considered to be SVCs). Note that some signs can be used pre-verbally to modify a verb or post-nominally to modify a noun (e.g. *walking quietly* as opposed to *a quiet person*).

(184)

QUIET      RUN...                   QUIET      GRAB
*(He) quietly runs... quietly takes (something).* (BC1-384 04:51)

(185)

1           PARENTS (LSP)      ANGRY        GATHER.SWEEP...
*My parents angrily sweep up...* ([BC1-360](#) 00:47[2])
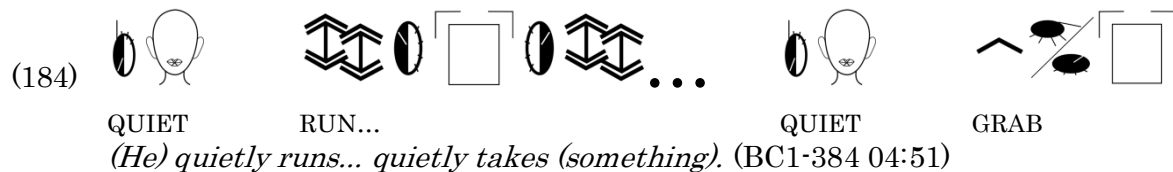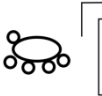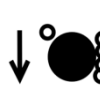
### 10.4.2.2 Object manipulation (sequential)

Another type of verb sequence involves the manipulation of an object. The object is identified and multiple verbs follow, agreeing with the location or incorporating the shape of the object if applicable (see 9.1.2; 9.2.2). These also fit Haspelmath's (2016) definition of serial verbs, though not other definitions which require SVCs to describe a single event, distinct from the meaning of a multiple-clause structure (Aikhenvald 2006, p.7). Intonational pauses are possible in this type of sequence as well, and example 189 shows a similar structure using multiple clauses. Thus, these sequences are better explained as a type of coordination. Closer examination of non-manual and prosodic elements when single and multiple clauses are used may reveal specific markers of coordination in LSSiv.
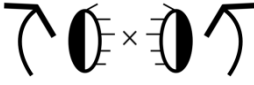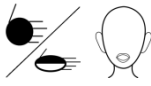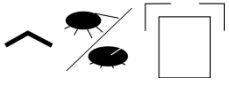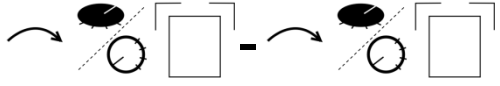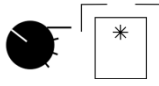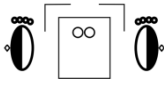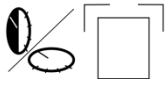
Examples 186-188 show short sequences from elicited descriptions of images. Certain two-part sequences like FILL DRINK (186) and GRAB PUT (187) are quite common in this type of data.

(186)



WATER   CYL-FILL(FAUCET)   DRINK+CYL
*Fill a cup with water and drink it.* (BC1-361 00:48²)

(187)



FAR+INTENSE   SEE
*See (the ball) very far away*



WALK.FAR+TIRED   GRAB   PUT.DOWN
*and bring it back.* (BC1-390 08:31²)

(188)



SMRO   PICK   WIPE+SMRO(ND)   EAT.APPLE
*(I) pick, wipe off, and eat an apple.* (BC1-247 00:37²)

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Example 189 shows a sequence in which FLOWER continues to be present through multiple clauses (in the LOC1 location). It is set up in space in the first clause, and later serves as the location of POUR and the object of SNAP.OFF and GIVE. (See 9.1.2 for more on this type of location-based agreement.)

(189)



FLOWER  BOWL(VASE)+LOC1
*a flower in a vase,*

WATER  GRAB+LOC2  POUR-REP+LOC2-1
*take water and pour it in over and over.*

1  SWEETHEART  SNAP.OFF+LOC1  GIVE.3(ROUND)--
*My sweetheart snaps it off to give--* ([BC1-397](#) 00:53[2])

### 10.4.2.3 Complex events

The final reason for using multiple verbs in a row is to convey a 'complex event' which involves several activities. Unlike object manipulation sequences described in the previous section, these structures often use continuous aspect marking (see 8.6.1) and are typically intransitive. They describe multiple events that occur over a period of time, but not necessarily the exact order of the events. According to examples like 190, these seem to have no real limit and allow repetition. Exact order and repetition patterns are likely related to matters of discourse and emphasis, a topic to be further investigated in the future (see 10.6.3; 10.7).
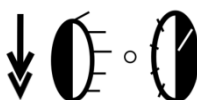
The evidence here for considering this type of structure to be an SVC is mixed. Because the order of the verbs does not correspond to the real-world order of events, it can

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be argued that they are part of a complex event (cf. Hale 1991 p.7; Schultze-Berndt 2000 p.36) On the other hand, it is expected that all verbs or only one verb will be marked for aspect (Aikhenvald 2006 p.8), which is not the case in example 190. Prosodic information indicates that these may also involve multiple clauses. Pauses are shown by line breaks in example 190, indicating that it may in fact be composed of a simple SV clause followed by two SVCs.

(190)

1-GROUP                                  THREE-ZIGZAG
*The three of us are walking around (uphill),*

TAKE.PICTURE.CONT        RECORD.CONT        ZIGZAG
*taking pictures, recording videos, walking around,*

RECORD            SIGN
*recording, and signing.* ([BC1-719](#) 04:59[2])

Further investigation of coordination and subordination in LSSiv may reveal how tightly each group of verbs (prosodic units and the entire utterance) is linked in this type of construction. Rather than constituting a complex SVC, constructions like example 190 may be composed of several linked clauses containing single verbs (cf. Foley & Van Valin 1984 p.244-63). Again, this type of structure needs to be examined more closely.

## 10.5 Variation from basic orders

This section discusses variation from the basic orders established above (SOV, initial time or location, post verbal negation, and final *wh*-questions). Variations relate to more flexible orders with morphological marking (pro-drop, SVO/SVX), fronting of long phrases (OSV),

and a few observations for further investigation. These patterns also indicate a distinction between verbs with high and low transitivity. Information on 1) pro-drop, 2) high and low transitivity, 3) ditransitives, 4) heavy objects, 4) verbal locatives, and 6) interrogatives is given below.

### 10.5.1 Pro-drop

As in many languages, it is possible to eliminate the subject entirely when it is known, and to make a complete statement with a verb alone (191), or with a verb and an object (192).
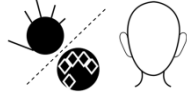
(191)

WRITE
*(He) wrote.*

(192)

ONION　　　　　　　　CUT+HOLD(ND)...
*(I) cut an onion...* ([BC1-275](#) 00:16[2])
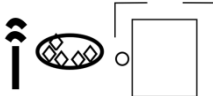
　　　　Direct objects can be dropped as well, but only when the verb is marked by location or shape incorporation (see 8.3.1; 9.2.2) or directionality (see 9.2.1). Example 193 shows WASH with CLOTHES locatively incorporated and example 194 shows use of the THIN shape as for *sandwich* in EAT. Example 195 shows TALK used with a significant orientation that indicates a first person direct object.

(193)

WASH+CLOTHES
*(I) washed clothes.* ([BC1-341](#) 02:14[2])

(194)

EAT+THIN+WIDE
*(I) eat it (the sandwich).*

(195)

TALK₁
*(He) told me.*

Ditransitive GIVE allows the indirect object to be dropped because it agrees with that constituent via directionality (see 9.2.1). In example 196, the direction of movement indicates that the money is being given to someone else (not the first person). Section 10.5.3 discusses more variation allowed with directional agreement.

(196)

MONEY               GIVE₃
*(He) gives (him) money.* ([BC1-398](#) 01:22²)

### 10.5.2 High and low transitivity

Patterns in sign order variation (and lack thereof) indicate a distinction between verbs that follow strict SOV order, and those which allow objects, or object-like constituents, to appear post-verbally. The majority of verbs are used with SOV order only and have no morphological means for marking a direct object. As expected, verbs which use certain morphological markers corresponding to their object (location incorporation or the transitivity marker) allow a more flexible sign order (SOV/SVO). These verbs with explicit object marking and those with strict SOV order are described in section 10.5.2.1 as 'high transitives', which are also prototypically transitive semantically (*hit, kick*, etc.).

Contrary to expectations, another small set of verbs with no known form of morphological object marking also appear to allow SVO order. Because SOV order has been established as the main marker of syntactic roles in LSSiv, it is unlikely that true SVO utterances are also acceptable without specific marking. Critically, these verbs allow SV order as well (unlike high transitives), meaning that they do not require an object syntactically or semantically (e.g. *write*, *know*, etc.). They are therefore classified as 'low transitives' which appear intransitively with SV or SVX order, and transitively with SOV order. These are described in  section 10.5.2.2.

### 10.5.2.1 Verbs with high transitivity

High transitive verbs normally require a direct object constituent or morpheme in single-clause structures and are used in SOV order. The only exceptions are lack of an overt object for verbs used with a continuous aspect (see 8.6.1) and SVOV order in 'verb echo' structures (see 10.6.4). Object pro-drop is allowed only when a verb marks its object through changes to location, shape, or direction of movement (see 10.5.1), and many high transitive verbs do not make use of these types of marking at all. Therefore, an overt object in the pre-verbal position is required in the majority of clauses with high transitive verbs (cf. grammaticality judgments in 10.2.2 (examples 107-108) showing strict SOV order).

High transitive verbs typically have meanings that relate to a direct physical effect on the object. Known verbs in this category form the relatively large group listed in Table 155 below. Those in the 'confirmed' column are judged as completely ungrammatical with post-verbal objects/patients, while the smaller group listed in the 'possible' column are judged as 'better' with SOV. Also included are a few verbs in a neutral form, marked with

(N), contrasting with a morphologically complex form involving location incorporation (see section 10.5.2.1(1)).

Table 155. High transitive verbs.

| Confirmed | | | | Possible |
|---|---|---|---|---|
| BITE | CUT(N) | LOCK | STAB | DRINK |
| BOIL | DROP | MOVE(N) | STEAL | PAY |
| BRAID(N) | GRAB | PLANT | SWEEP | PICK |
| BREAK | HIT | POUR | TAKE.PICTURE | RECOGNIZE |
| BRUSH | HUG | PUSH | THROW | RECORD(VIDEO) |
| CALL | KICK | READ | THROW.AWAY | SELL |
| CARRY.ON.BACK | KILL | SLAM | WASH(N) | WATCH |

The following sections discuss two types of morphemes which allow a high transitive verb to be used with a 'VX' pattern in which the patient is signed after the verb: 1) location incorporation and 2) a suspected transitivity marker used with SEE. The sum of both categories adds up to only a handful of verbs. The sections below describe both types and discuss evidence that 'X' can be considered to be an object. (Note that other types of marking which allow an object pronoun to be dropped (shape incorporation and directionality) do not allow an overt direct object or patient to appear in a post-verbal position. These verbs must always appear in SV or SOV structures.)

## 1) Object incorporation

Verbs which incorporate patients locatively (see 8.3.1) use a place on the signer's body to indicate a verb-object combination. The patient can be left implicit (197), signed in its typical medial position (198), or signed after the verb (199). This flexibility is shown when CLOTHING is incorporated into CUT(SCISSORS) and WASH.

(197)

CUT(SCISSORS)+CLOTHING
*(I) cut clothing.*

(198)

1       CLOTHING       WASH+CLOTHING
*I washed clothes.*

(199)

1       WASH+CLOTHES       CLOTHING
*I washed clothes.*
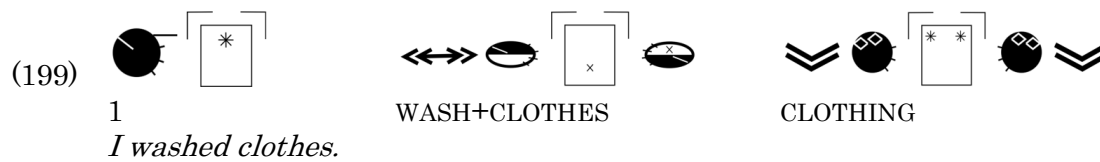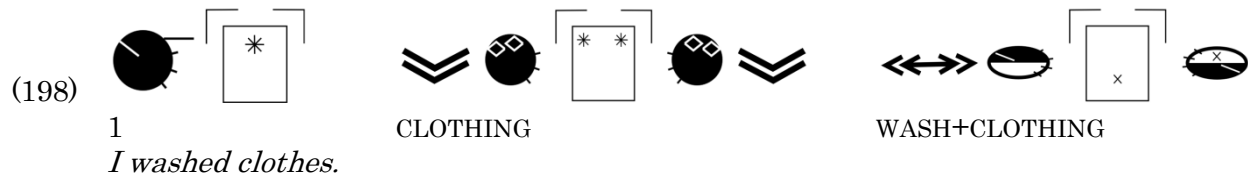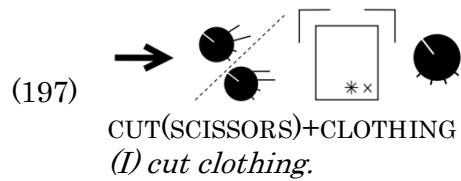
It is not clear here whether the overt patient constituent is syntactically a direct object or an oblique. If it is a direct object, location incorporation is a type of agreement that allows pro-drop and object movement. It would be distinct from shape incorporation and directional agreement, which only allow pro-drop. If it is an oblique, location incorporation satisfies a highly transitive verb's bivalency and a patient can be optionally specified via a different role.

Given the importance of order for establishing the object role for most verbs, it is likely that SOV/SXV order marks the second constituent as the direct object regardless of verbal morphology. It is also likely that pro-drop is allowed here, as it is with other types of agreement or incorporation (see 10.5.1). SVO/SVX, on the other hand, is still ambiguous at this point.

## 2) A transitivity marker?

There is a form of SEE, articulated on the chin rather than near the eyes (see 9.2.4), which occurs with OV or VO/VX order only (no SV). Examples 200-202 show grammaticality judgments (from the younger generation) for all three orders.

(200)

*SEE+TRANS
*I saw.

(201)

BIRD                    SEE+TRANS
(I) saw a bird.

(202)

SEE+TRANS               BIRD
(I) saw a bird.
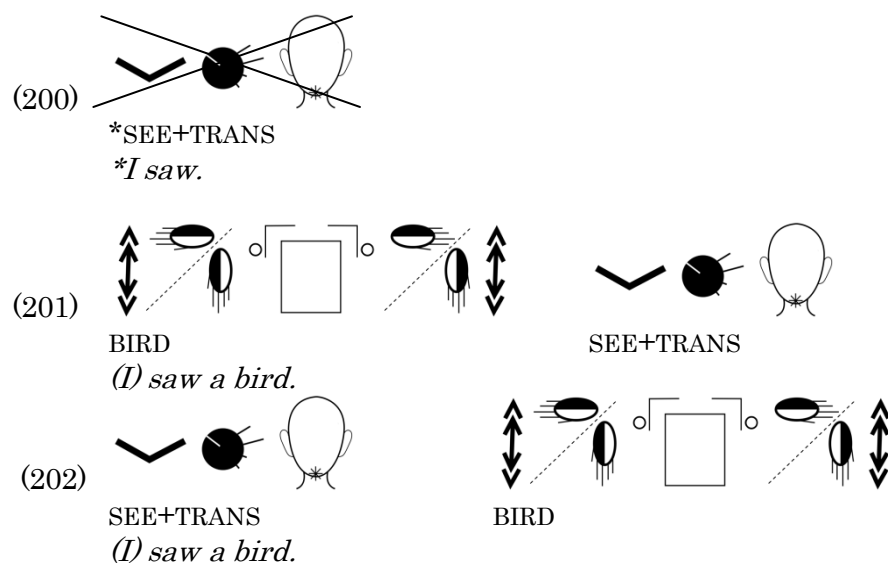
It is of note that SEE+TRANS differs from verbs with location incorporation. The object cannot be deleted for a V or SV structure (as it can when verbs undergo agreement and incorporation). This implies that if a post-verbal constituent cannot fill the object role, example 202 (VO/VX) would also be ungrammatical. Because VO/VX and OV are allowed (to the exclusion of (S)V), it is proposed that 1) the TRANS morpheme marks SEE as bivalent and 2) this marking can create an object role for a post-verbal constituent. Therefore, this is considered to be a true SVO structure.

### 10.5.2.2 Verbs with low transitivity

Verbs with low transitivity may be used with (S)V, (S)OV/(S)XV, and (S)VO/(S)VX structures. They have no object-related morphology and tend to have meanings related to perceptions or states rather than physical and agentive actions that directly affect a patient.

Secondary (non-subject) constituents used with these verbs also tend to be less animate than objects or patients of highly transitive verbs. Table 156 lists attested low transitivity verbs with consistent grammaticality judgments.

**Table 156. Verbs with low transitivity.**

| | | | |
|---|---|---|---|
| HEAR | LAND.ON | SMELL | WRITE |
| JUMP.ON | PICK | TALK | YELL.AT |
| KNOW | SEE/LOOK | TALK(PHONE) | |

Examples 203a-204c show SMELL and STEAL with all three patterns: (S)V in 203-204a, SOV/SXV in 203-204b, and SVO/SVX in 203-204c.

(203a)
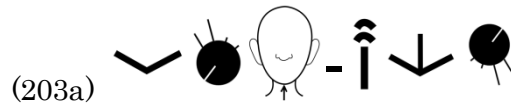
SMELL-WALK
*(He) smelled (the air) and walked around.* ([BC1-398](#) 03:46[2])

(203b)

1    FLOWER    SMELL
*I smelled a flower.*

(203c)

1    SMELL    FLOWER
*I smelled a flower.*

(204a)

3    STEAL
*He stole.* ([BC1-384](#) 04:59[2])

(204b)

MAN    MONEY    STEAL
*The man stole money.*

(204c)  MAN      STEAL      MONEY

*The man stole money.*
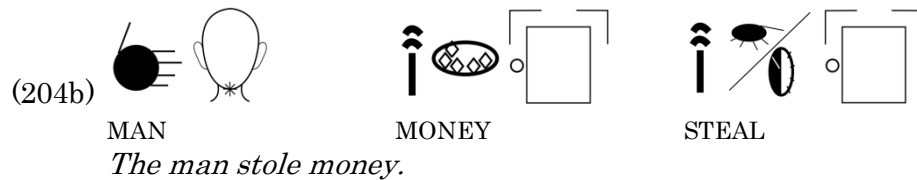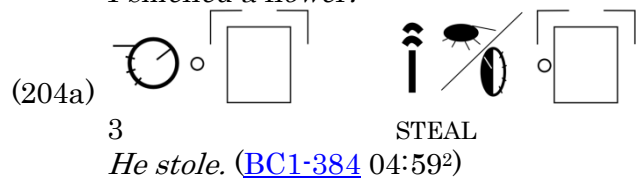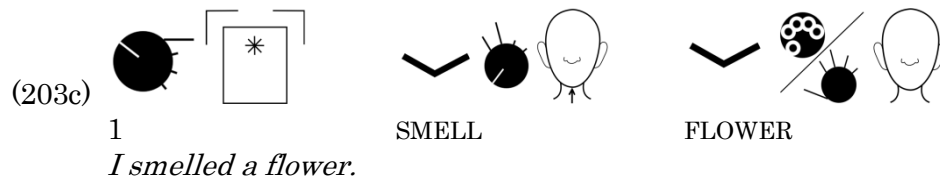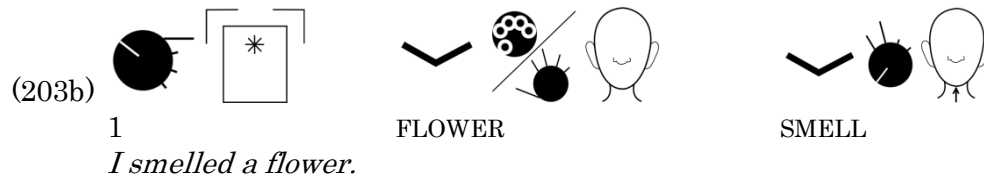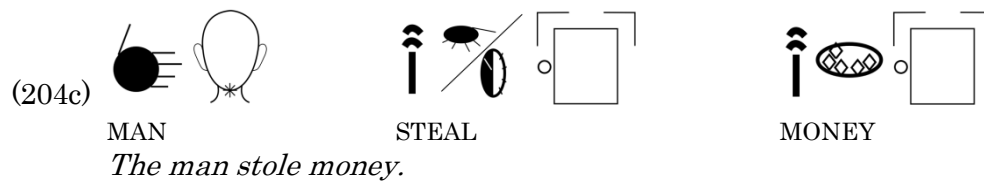
Again, the exact syntactic role of each constituent in the SOV/SVX and SVO/SVX patterns needs to be determined. Due to the rarity of morphological marking for objects in general, it is again surmised that order marks the medial constituent in structures like 203b and 204b as a direct object, and these are considered to be SOV. The orders in examples 203c and 204c, however, are considered to be SVX, with an as-yet unknown role for 'X'. In all other structures where a (potentially) transitive verb is used without an object or with a post-verbal object/constituent, the verb is marked morphologically (cf. examples 193-195, 197-198, and 202). Highly transitive verbs with no morphological marking require an object to be established via SOV order and do not allow SV. SVX structures with low transitives have no known morphological or syntactic means for marking the post-verbal constituent as an object, and are therefore considered to be intransitive. This means that low transitives are used with SV, SOV, and SVX patterns.

### 10.5.3 Ditransitives

Evidence from both grammaticality judgments (205) and natural signing (206-207) indicates that the directionality used with GIVE allows a few variations in sign order aside from pro-drop (see 10.5.1). Verbs remain in the final position, and the subject always precedes the indirect object. It is also preferred that the subject-indirect object pair (marked by brackets in 205-207) stay together. Direct objects move to either side of the S-IO pair. Note that 'FRIEND 1' in 207 is not likely a possessive phrase because has not been fronted (see 10.5.4). '1 TEACHER' in 206 is ambiguous.

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(205a)

[1      2     ]     BOOK         GIVE₃
Subj      IO       DO             V+IO

*I gave you a book.*

(205b)

~1      BOOK       2       GIVE₃
Subj     DO        IO       V+IO

*~I gave you a book.*

(206)

[1       TEACHER     ]     ESSAY           GIVE₃
Subj      IO            DO             V+IO

*I gave (my) teacher the essay.* ([BC1-358](#) 01:34²)

(207)

THAT        [FRIEND    1           ]     GIVE₁
DO          Subj      IO             V+IO

*(My) friend gave me that.* ([BC1-253](#) 00:37²)
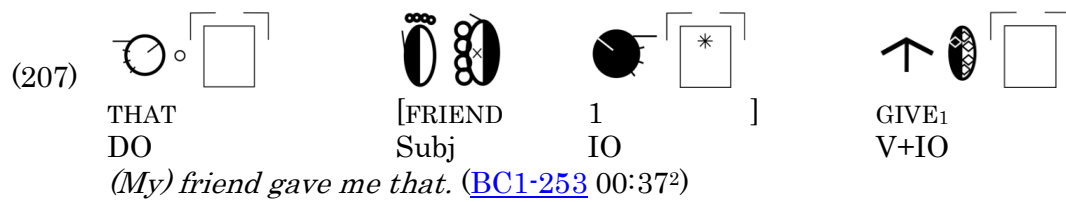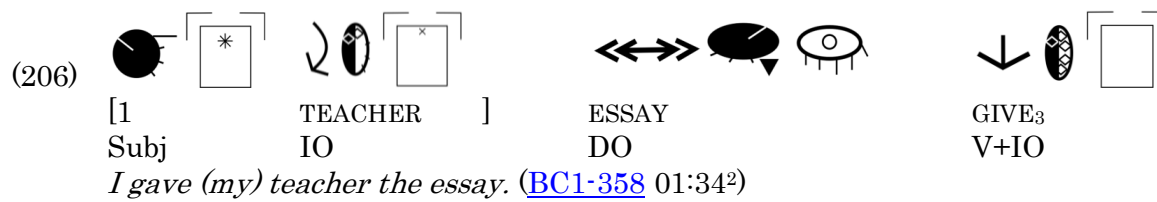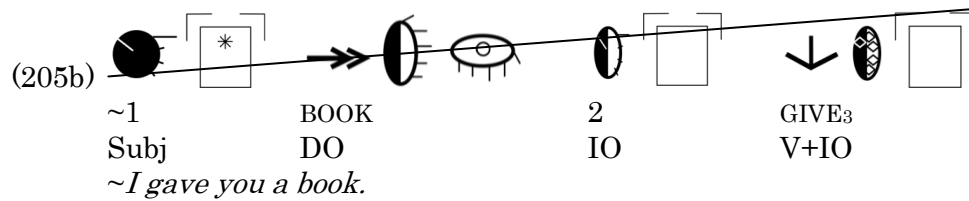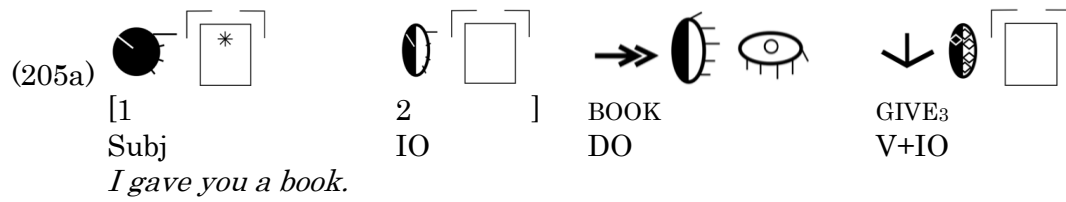
### 10.5.4 Heavy objects

As is typical of SOV languages, 'heavy' objects composed of multiple signs, such as possessive phrases, tend to be fronted. This leads to OSV order, as in example 208.

(208)

[FATHER      SHIRT        ]     1             CUT

*I cut (my) father's shirt.*
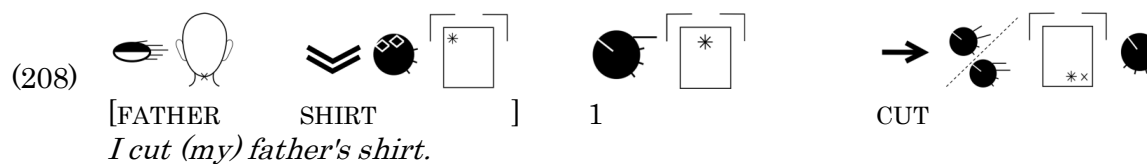
Example 209 shows that this fronting also overrides the initial position of a simple location.

(209)

[SIBLING         HOUSE ]              AYACUCHO

*(My) sibling lives in Ayacucho. (lit. (My) sibling's home is in Ayacucho.)*
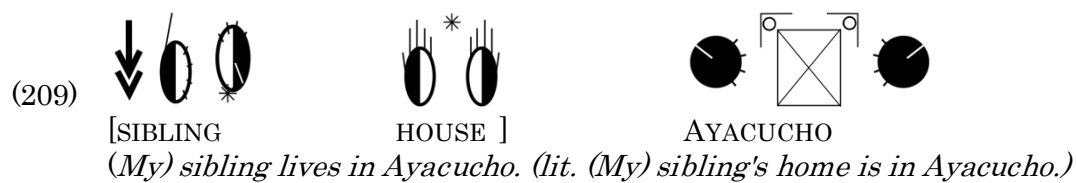
Possessed and otherwise complex or heavy objects, such as noun-adjective phrases, are the most common environment for OSV order. More investigation is needed to determine whether other heavy phrases are fronted as well.

### 10.5.5 Verbal locatives

Certain types of locative (example 210) and temporal (example 211) markers include verbal elements, describing movement and periods of time rather than set places and moments. These are used after a subject, perhaps forming a type of SVC (such as those described in 10.4.2.1). This phenomenon requires more investigation to determine members of this group and their syntactic consistency.

(210)

CAR                          OVER.BUMPS                    GO
*The car went over bumps.* ([BC1-351](#) 00:56[2])
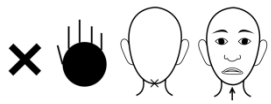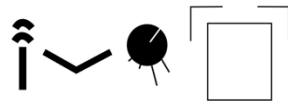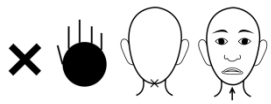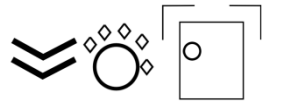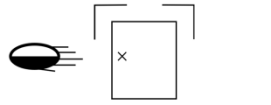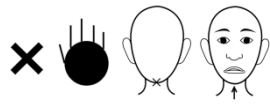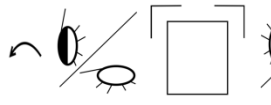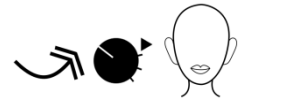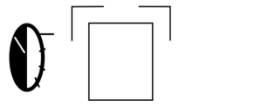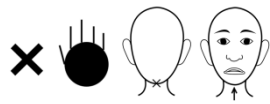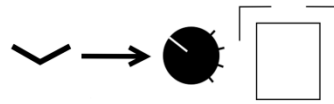
(211)

1                    GROW.UP                    PLAY
*When I was growing up, I played.* ([BC1-345](#) 00:25[2])

### 10.5.6 Interrogatives

According to grammaticality judgments, content question signs can appear in situ and in other non-final positions. The final position (described as the basic order for content questions in 10.3.2) is overwhelmingly observed in natural contexts, but signers accept some alternatives without hesitation as a form they might use. In some cases, the final position is in situ (e.g. *how many*). It also follows that questions taking the role of

constituents with a flexible order (e.g. possession) may be considered in situ in more than one position.

Examples 212-216 show accepted non-final in situ orders for WHO and WHAT asking about a subject (212), a possessor (213), and the object of low transitive (214), high transitive (215), and directional (216) verbs.

(212)

WHO           WALK

*Who is walking?*

(213)

WHO           DOG

*Whose dog?*

(214)

MOTHER     WHO                TALK

*Who is (my) mother talking to?*

(215)

WHAT                 EAT

*What did (you) eat?*

(216)

2           WHO          PUNCH$_3$

*Who did you punch?*

In situ *wh*-questions are rare in sign languages (Zeshan 2006, p.64), so the reason that LSSiv appears to allow them needs to be investigated. Use with other question signs and other types of questions, as well as the reasons that certain combinations are rejected,

are all topics for future research. Use of question-initial order and apparent violations of basic word orders in some questions also need to be investigated.

## 10.6 Additional structures

This section discusses other structures that have been observed in LSSiv. Most use more than one clause, as indicated by pauses and changes to non-manuals. The sections below describe preliminary observations on 1) contrast and confirmation, 2) conditionals and resultatives, 3) topicalization, and 4) SVOV 'verb echoes'.
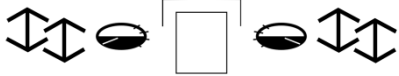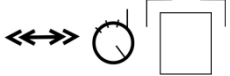
### 10.6.1 Contrast and confirmation
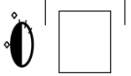
Structures which show contrast and ask for confirmation use an independent clause followed by a short (often single-sign) clause. (It is unclear at this point whether these are dependent or simply utilize pro-drop.) In a contrastive structure, a negated initial clause is followed by the correction or difference. A change in non-manuals (such as head shaking and then nodding) occurs between the two clauses. Exact parameters and timing of this change are a topic to be investigated in the future.
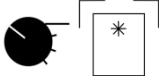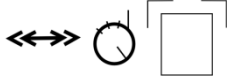
Adjectives (217), quantities (218), verbs (219), and subjects of non-verbal statements (220) are corrected with a single sign. Note that negation remains clause-final no matter which constituent is being corrected (compare examples 217 and 220).
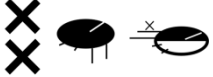
(217)
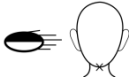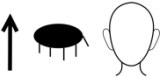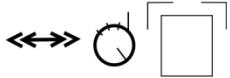
FATHER     TALL              NO              /     SHORT
*(My) father is not* tall, *(he's)* short.

(218)

SELLER
*There weren't a lot of vendors,*

MANY

NO
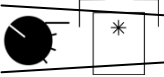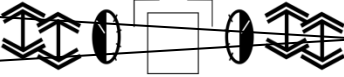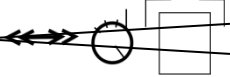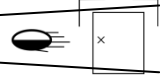
FEW
*just a few.*
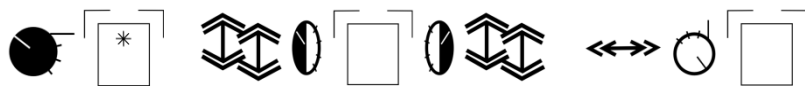
(219)

1
*I didn't run*

RUN

NO

SIT
*(I) sat.*

(220)
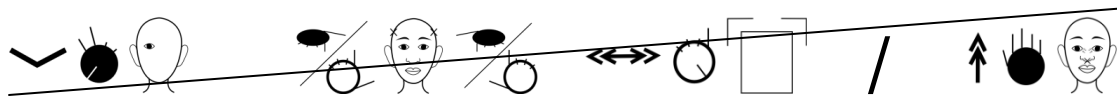
FATHER

TALL

NO

/

SIBLING

*(My) father is not tall, (my) sibling is.*

In order to contrast a verbal subject (example 221) or object (example 222), the verb must be repeated as well. This applies to any level of transitivity, and the pattern reveals that ANGRY functions as a verb in this capacity (example 223).

(221a)

*1

RUN

NO

/

MOTHER

*\*I didn't run, (my) mother.*
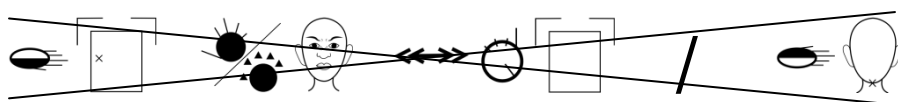
(221b)

1　　　　RUN　　　　　　　NO

*I didn't run,*
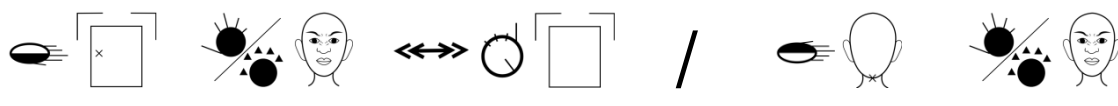
MOTHER　RUN

*(my) mother ran.*

(222a)

~SEE　　　　COW　　　　　NO　　　　　/　　PIG

*~(I) didn't see a cow, a pig.*
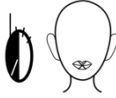
(222b)

SEE　　　　COW　　　　　NO

*(I) didn't see a cow,*
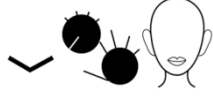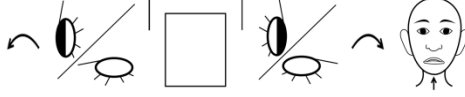
PIG　　　　　SEE

*(I) saw a pig.*
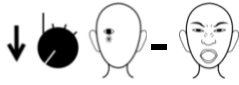
(223a)

*MOTHER　ANGRY　　NO　　　　　/　　FATHER

**(My) mother isn't angry, (my) father.*
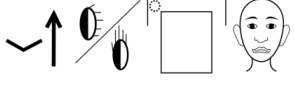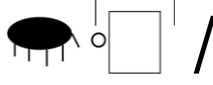
(223b)

MOTHER　ANGRY　　NO　　　　　/　　FATHER　ANGRY

*(My) mother isn't angry, (my) father is angry.*

Tag-questions use a similar structure: a statement is followed by a request for confirmation using WHAT (example 224) or WELL (example 225). For these, non-manual marking is exclusive to the final sign, indicating that it is part of a separate clause (as typical interrogative marking begins at the start of the question; see 9.4.3).

(224)

WATER　　　　　TAKE.PILL　　　　QUIET

*Drink water, take a pill, be patient,*

BEAUTIFUL　　　　/　　　WHAT

*and you'll get better, right?* (BC1-342 01:00[2])
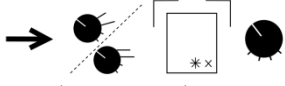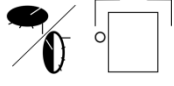
(225) ...

... CRY-WHINE

*...crying and whining.*

GO.FAR　　　　　　　CHILD　　/　　WELL

*When you go too far with a child, you know?* (BC1-719 04:02[2])

## 10.6.2 Conditionals and resultatives

Resultatives use a two-clause structure similar to the contrastives described above. The most typical resultatives use an 'action-result' structure, where the 'action' is a clause using a verb and the 'result' is a single adjective or noun. (The use of verbs in this capacity is likely possible, but not unambiguously observed at this point).

The most frequently observed result in these structures is an adjective such as GOOD or BEAUTIFUL. Descriptions of everyday activities and conditional advice are often formatted this way (i.e. *if you do this, it will be good*), as in example 226.

(226)

CUT(SCISSORS).CLOTHES　　OTHER　　　　WIPE(VERTICAL)　　BEAUTIFUL

*Cut another piece of cloth and wipe (the mirror), and it's beautiful.* (BC1-360 02:45[2])

In some cases, a preceding cause yields a 'cause-action-result' structure, usually adjective-verb-adjective. The result in example 227 also includes negation of the earlier description (NO.MORE). Clause and phrase divisions in this type of structure are not yet clear.

(227)

BICYCLE                          WASH--
*(He) washed the bicycle--*

DIRTY          WASH                          NO.MORE                GOOD
*it was dirty so he washed it and it wasn't anymore, it was better.* ([BC1-354](#) 05:14[2])
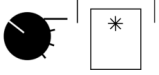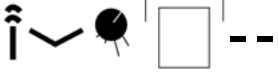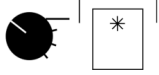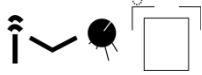
Nouns may also appear as a result (example 228).

(228)   …

…STRIKE.MATCH              THROW.DOWN                  FIRE
*…threw down a lit match and started a fire.* ([BC1-230](#) 00:51[2])
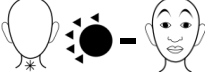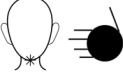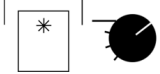
### 10.6.3 Topicalization and emphasis

Topicalization is a frequent phenomenon in LSSiv (and other sign languages; see Ingram 1978, Petronio 1991, Neidle 2002, Morales-López et. al. 2012) which brings any constituent to the beginning of an utterance for emphasis. It is also marked by reduplication and eyebrow raising (see 10.6.3). Example 229 shows a multiple-clause strategy that introduces a plural subject and includes three topicalized signs. These signs serve as checkpoints to ensure that the interlocutor is following the story.

(229)

1+TOP(NM)                BEFORE
*In my case, a while ago,*

298

1            WALK --                1            WALK+LOC1

*I was walking-- walking over there.*
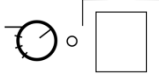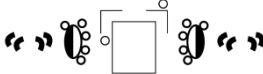
NORA(ND)+TOP(NM)     MAN(ND)     1(ND)

*It was Nora, a man, and me.*

3+TOP(ND)          WALK.FAR --

*The three of us, we were walking over there--* ([BC1-719](#) 00:44²)
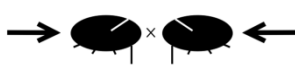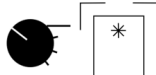
A subject or topic can also be repeated at the end of an utterance with a similarly emphatic effect (example 230).

(230)    THAT              COCONUT

*That's a coconut.*

1                KNOCK.DOWN(WITH.STICK)...     CRACK.OPEN       CHEW

*I knock it down with a stick... crack it open, and chew (it).*

MILK(loan)      SAME            CHEW      /      1

*There's milky stuff, and the part you chew. For me.* ([BC1-256](#) 00:47²)

A similar topic-comment structure is often used to 'set a scene', introduce a topic, or explain background information simply (in the topic clause) before giving more details (in the comment clause). A time period, location, verb, noun, or meaningful shape is often used as an initial single-sign topic clause (example 231).

(231)

BOOK(loan)-REP
*Books,*

SHELF+LOC      BOOK(loan)      PUT+FLAT+LOC-REP...
*putting books on a shelf...*
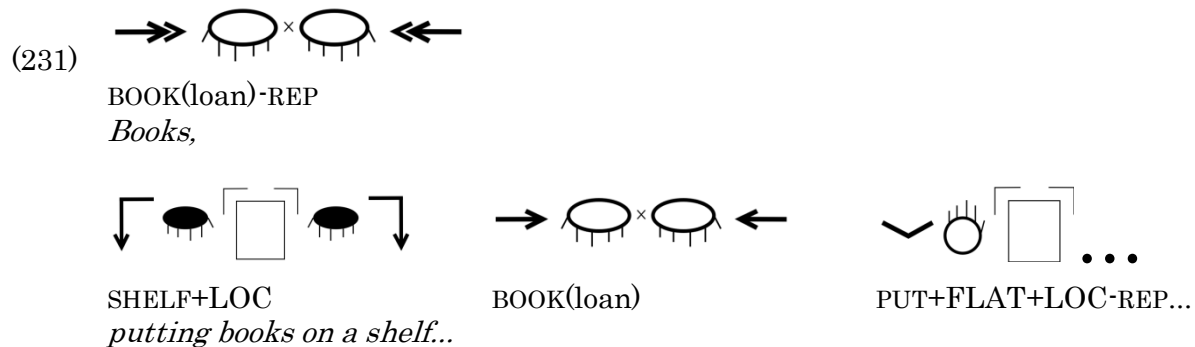
Topic-comment structure is also used with a small group of verbs which can only be used with VX order (OV is ungrammatical). The verb 'sets the scene' by describing an actor's state before the main point (comment) is signed (examples 232-233).

(232a)

LISTEN      GUITAR
*I listened (was listening) and there was a guitar.*

(232b)

*GUITAR      LISTEN
**I listened to a guitar.*

(233a)

IMAGINE      MAN      STRONG
*I imagined (was imagining) and there was a strong man/the man was strong.*

(233b)

*MAN      STRONG      IMAGINE
**I imagined a strong man/the man was strong.*
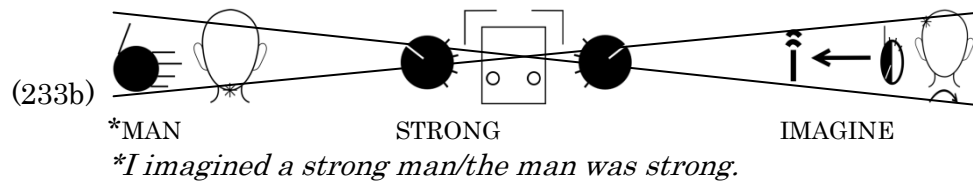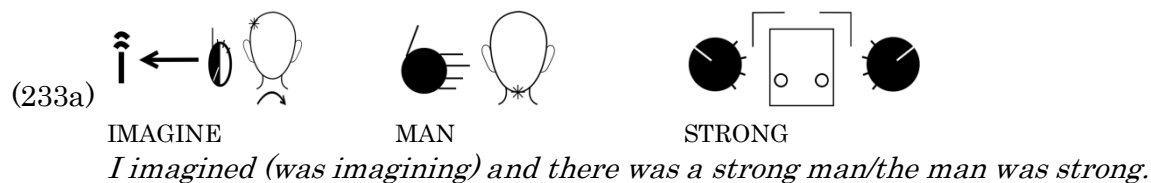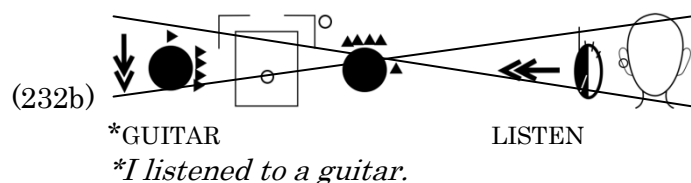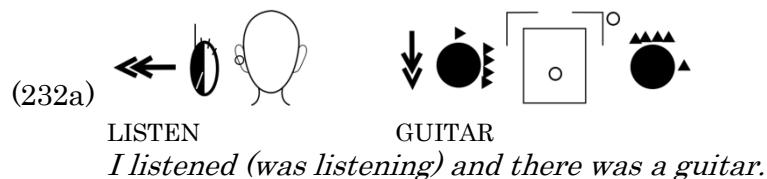
## 10.6.4 SVOV structure

The most natural way to use some verbs is in a 'verb echo' structure, as described in Milković, Bradarić-Jončić, & Wilbur 2006 (p.188-9). As opposed to 'verb sandwiches', where

the second verb has additional aspectual information (Fischer & Janis 1990), the second verb in a verb echo has the same type of inflection as the first. During elicitation sessions, SOV examples were sometimes repeated with this structure instead (example 234), and many examples are found in more natural data (examples 235-236). SVOV structure is possible with both low and high transitives (see 10.5.2).

(234)

MOTHER   TAKE.PICTURE   DOG   TAKE.PICTURE
*(My) mother took pictures of a dog.*

(235)

CHILD   SEE   CLOWN   SEE
*The child saw a clown.* ([BC1-242](#) 00:41[2])

(236)

DOG (LOAN)   SHAKE   TREE   SHAKE
*The dog shook the tree.* ([BC1-877](#) 02:16[2])

This structure differs from error correction (e.g. a signer begins to use SVO order and corrects to SOV). These examples are observed without interrupted movement or negating non-manuals. As in Milković, et. al. (2006), it is suspected that SVOV may be an alternative method of topicalization (see 10.6.3) or a way to emphasize an object. This hypothesis and the issue of whether SVOV is a single clause or a two-clause structure need to be investigated further.

## 10.7 Prosodic observations

Though this description does not include a complete analysis of LSSiv's prosody, certain conventions are evident in the data. An overarching pattern is the use of many short phrases rather than any of the longer structures described above (e.g. ditransitives, explicit

subjects, or combining locations, adjectives, and possession into a single phrase). Strategies like topicalization (10.6.3), perspective shifts (10.7.1), use of the non-dominant hand (10.7.2), and eye gaze and sign length (10.7.3) help achieve continuity and clarity among strings of these shorter phrases.

### 10.7.1 Perspective shifts and continuity
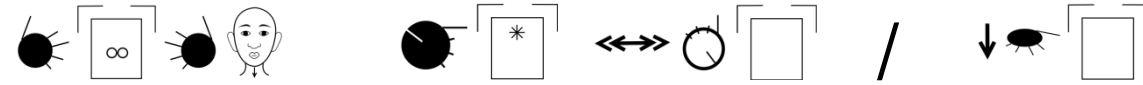
A number of strategies are used to indicate a switch from one character's perspective to another (see 9.5), including changes in gaze and facial expression (but notably not the head and torso shifts found in ASL; cf. Janzen 2004 p.153-4). General use of space is discussed in 8.3 and 9.1, and the non-dominant hand in 8.4, 9.5, and the following section (10.7.2). Several 'conjunction' signs are also used to end, change, or continue a story or conversation. Two of these are the manual confirmation questions mentioned in 10.6.1, WELL and WHAT, which effectively signal the end of a turn by asking an interlocutor to participate. NO.MORE is used for finality as well. The sign OTHER is often used to change a topic, but can also be used to connect parts of a story, like English *then*. Gestures like putting the hands together or looking upward or to the side, as well as the sign WAIT are used to hold the floor through a pause.

The use of verbs as a strategy for referring to people or things previously mentioned in a context is frequently observed as well. This strategy can clarify a topic and switch perspectives or characters. The way Sivia signers refer to the United States is also related to this pattern. The sign FLY(PLANE) became the accepted way to refer to the foreign country, i.e. *the place that you fly to*. These structures are translated here as relative clauses since they appear to serve that purpose, though prosodic and morphological evidence is not yet available to confirm this.
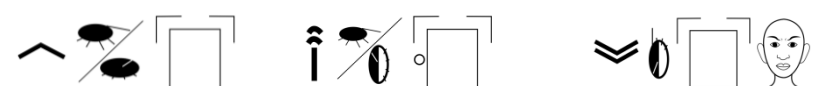
The most frequent use of these 'relative clauses' is a verb serving as a subject or object. (It is unclear whether this is possible with other types of signs.) In the second line of example 237, the signer begins talking about a second character, even using a quotative (see 9.4.3). Instead of using a name, a sign like OTHER, or an indexed location to indicate the switch, she refers to the character's last actions. She uses the sign PROTECT to refer to a character who was last described protecting a flower and then she quotes him.

(237)

GO                           PARTY
*(This character) goes to party.*

PROTECT                      1+QUOT        NO+QUOT        /        STAY+QUOT
*The one who was protecting (the flower) says, "Not me. I'll stay."* ([BC1-354](#) 01:47²)

Example 238 shows a two-verb sequence used to refer to an object. After describing a character in line one, the signer uses [GRAB STEAL] (in a second clause) to refer to characters who stole something earlier in the story. This reference is used as the object of SCOLD. Pauses and non-manual information also help separate the actions of the current and referenced subjects (see video cited below).

(238)

3                            ANGRY
Subj                         Predicate
*He was angry*

[GRAB                        STEAL          ]        SCOLD
DO[V                         V              ]        V
*and scolded the ones who grabbed and stole.* ([BC1-398](#) 04:04²)

## 10.7.2 The non-dominant hand

Use of the non-dominant hand in LSSiv is a topic that requires additional study (see discussion in 8.4.1; 9.5). One user in particular has quite fluid use of both hands and switches between them often, while other users seemingly adhere to more typical patterns of single-hand dominance. Spatial references to the environment may play a role here, as in one instance where the signer uses each hand for a topic related to a location on that side (see video ch10ha1, BC2-088[4]).

Sometimes the position of the non-dominant hand is a clue to continuity and phrasing when it remains in place after a sign from the same phrase or perspective. For example, the signer in video ch10ha2, BC2-089[4], uses the non-dominant hand to preserve a 'needle' that has been threaded (by the dominant hand) to be later 'taken' and used in signing on the dominant hand.

The two hands can also be used for two separate objects or people. In an elicited response to an image of a man looking someone up and down (video ch10ha3, BC2-090[4]), the signer uses the dominant hand to set up a scene where a man sees someone walking far ahead. She then switches to the non-dominant hand to specify the location of the man, and shows the location of the other person on the dominant hand. At 00:08, the signer switches to the watcher's perspective. The non-dominant hand (which was originally used to show this character's position) signs that he is thinking as the dominant hand describes his thoughts. At the end of the description, both hands drop and are used to sign NO.MORE, indicating that the signer is ready to move on to the next image.

In some cases, the non-dominant hand can be used to sign an aside that almost 'interrupts' the other hand as a parenthetical insertion (see 9.5.3). This can be seen in example 229, where the identity of the three people in *we* is given as an afterthought on the

non-dominant hand before the story continues on the dominant. Lists encourage separate morphemes on each hand as well (a number and an item on the list).

### 10.7.3 Eye gaze and sign length

Where a signer looks during signing is also significant. Eye gaze often shifts downward during a phrase, and the end brings the gaze upward toward the interlocutor (see video ch10gaze, BC2-091[4]). Expected patterns are seen with regard to sign length: phrase-final signs are lengthened (note the difference in the number of repetitions in the first and final signs in ch10le, BC2-092[4]) and repeated signs are shortened (note the shorter movement in two repetitions of GROW.UP in ch10sh, BC2-093[4]). This is another aspect that needs to be examined more closely.

## 10.8 Summary

LSSiv can be described as an SOV language with post-verbal quantification and negation, and final content questions. Variation is frequently in the form of pro-drop, fronting of heavy objects, topicalization, and SVOV 'verb echoes'. Variation patterns also indicate a distinction between verbs with a high or a low level of transitivity. As expected, a series of short clauses is preferred over longer ones, such as ditransitives, in natural discourse. Generational differences indicate that syntactic orders are becoming more strict and more intertwined with morphology as the language develops.

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Chapter 10 endnotes

[1] Spanish and Quechua are the two majority spoken languages in Sivia, with respective SVO and SOV order. While it is possible that Quechua has exerted some influence on LSSiv syntax, the majority of lexical influence (mouthing) is Spanish, and schools use Spanish exclusively. Quechua use is also declining, with many Sivians under 30 being monolingual in Spanish. As the younger generation of signers with stricter syntactic rules fit into this group (hearing signers use Spanish

exclusively), it is expected that Spanish would be the influencer (SVO). The one place this influence may be seen is in the solidification of noun-adjective order (8.3.1.1), but many other orders are contradictory (wh- questions, negation, etc.)

[2] Videos from which examples are taken can be found using the BC1-XXX label at the following address: https://scholarspace.manoa.hawaii.edu/handle/10125/34525.

[3] In this example, plural CHILD-REP is used rather than the singular (see 7.4.2.1). This indicates a quantitative structure, in which NONE takes the place of a number, rather than a possessive structure as seen in example 28.

[4] Clips referenced in this chapter can be found at https://bleegiimuusclark.com/lssiv-grammar-examples-4/ and https://scholarspace.manoa.hawaii.edu/handle/10125/49885, BC2-088 through BC2-093.

# CHAPTER 11. SUMMARY AND CONCLUSION

This dissertation is the first description of Sivia Sign Language (LSSiv). LSSiv is used by an estimated 12 native signers and 38-50 additional users in the town of Sivia, located in the VRAEM region of Peru (3.2.1). According to reported histories, the language originated approximately 50 years ago and is now used by two generations of deaf and hearing people. Lexical comparisons indicate that it is distinct from Peruvian Sign Language, which is used in major cities (3.2.3). LSSiv is also considered to be endangered due to low user numbers and a lack of institutional support or recognition.

Data collected from native signers in 2015 and 2016 (4.2) is used to outline the basic structure of the language at the levels of phonetics, phonology, morphology, and syntax. Elicited, narrative, and conversational data are taken into account as much as possible. LSSiv's phonetic inventory contains a variety of realizations of handshape, orientation, location, movement, and non-manual features (5). At the phonological level, however, the aspects of location, movement, and non-manuals have the largest number of distinctions. Relatively few handshapes and potentially no orientations are distinctive (6.1-2). This tendency is strengthened by the fact that fingerspelling (often a source for new handshapes and more complex distinctions) is rarely used. An 'open' feature is proposed to explain some forms of free variation in handshape (6.1.1.3). The applicability of this feature to other languages and the status of orientation as a distinctive feature need to be investigated further.

Morphologically, LSSiv shows some tendencies that align well with what has been found in other sign languages. Meaningful handshapes represent different types of nouns (8.1), the use of space is important for description (8.3) and agreement (9.1). Multiple articulators allow a great deal of information to be communicated simultaneously (8.4; 9.3),

and individual signs and sign order rather than inflection most often communicate tense, aspect, and grammatical relations (9.2). Perhaps due to the age of LSSiv, true classifiers and full location agreement have not been found, though current tendencies indicate that these features may develop in the future. Markers of perspective and focus (9.4), as well as the use of the non-dominant hand (9.5) as a supra-segmental feature need to be researched.

The LSSiv lexicon contains signs which can be categorized as nouns, verbs, and modifiers, and one derivational process is identified. Many signs are also used in multiple ways without derivation (7). Shape incorporation and location agreement are used with some verbs to mark syntactic roles and phrase boundaries in LSSiv. Stricter syntactic orders with verbs that do not undergo these types of morphological processes ensure that roles, phrases, and clauses are reliably established in other contexts.

LSSiv is an SOV language with post-verbal negation and final *wh*-questions (10.2-3). Evidence is also found for serial verbs (10.4.2) and a distinction between low and high transitive verbs (10.5.2). Additional structures used for contrast, confirmation (9.6.1), conditionals, resultatives (10.6.2), and topicalization (9.6.3) are also identified. These, as well as patterns like fronting (10.5.4), and sign order variation in questions (10.5.6), are areas to be investigated further. Preliminary observations about intonation-level aspects (10.7) are another topic to be more thoroughly explored in the future.

As an initial sketch of LSSiv's grammatical structure, the information given here is intended as a starting point for further investigation of this language and other unrecognized or un-researched sign languages in Peru and the surrounding region. It provides tangible evidence that Peruvian Sign Language is not the only sign language used in Peru, and that deaf populations in diverse environments are capable of forming and sustaining unique languages.

# APPENDIX

## Appendix A. Lexical comparison of LSSiv and LSP

Tables A1 and A2 show LSSiv and LSP signs for lexical items on the Swadesh list. Some images for LSP signs are from Ministerio de Educación 2010, Asociación de Sordos de Lima 2004, and Asociación de Sordos del Perú 1958. Signs marked with asterisks (*) in Table A1 are iconic or similar in many sign languages.

**Table A1. Phonetically similar (potentially related) signs in LSSiv and LSP.**
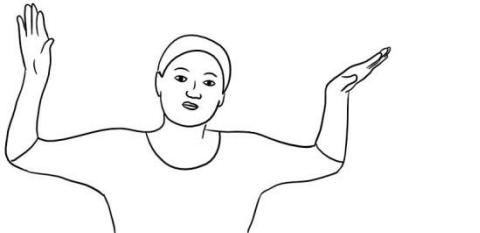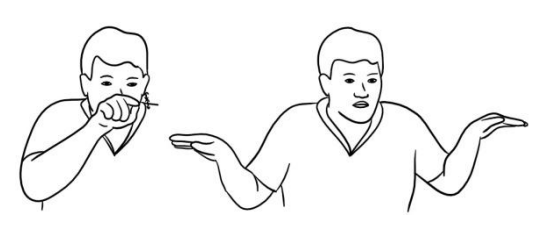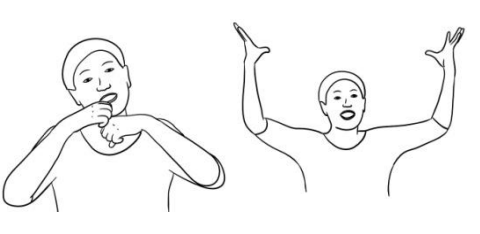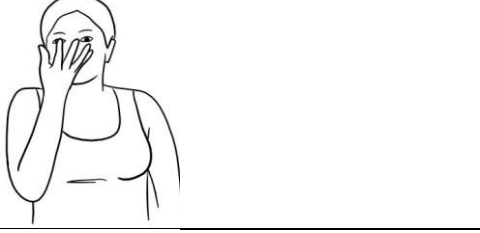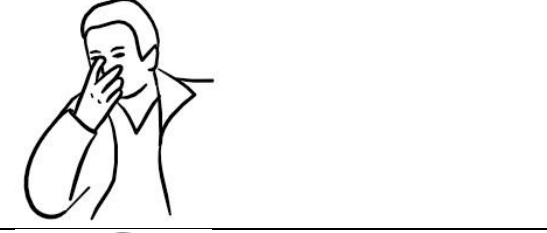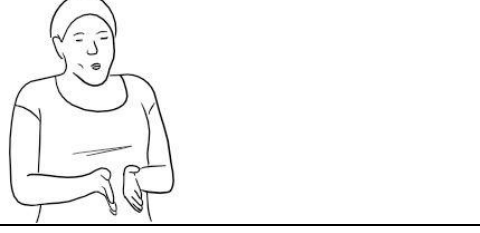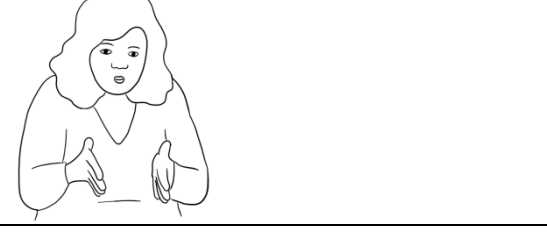
| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 1 | bird* |  |  |
| 2 | day |  |  |
| 3 | fish* |  |  |
| 4 | flower* |  |  |
| 5 | narrow* |  |  |

# Table A1. (Continued) Phonetically similar (potentially related) signs in LSSiv and LSP.
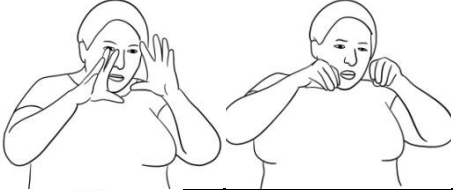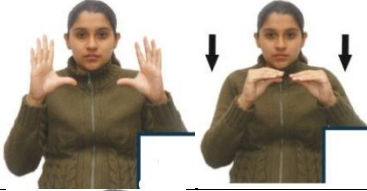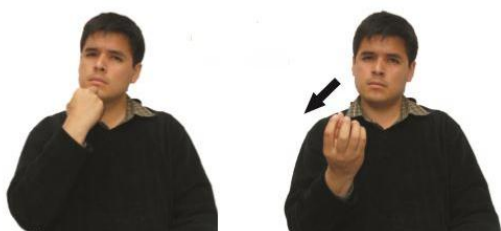
| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 6 | night | | |
| 7 | no | | |
| 8 | old | | |
| 9 | rain* | | |
| 10 | rock* | | |
| 11 | short | | |
| 12 | sun* | | |

Table A1. (Continued) Phonetically similar (potentially related) signs in LSSiv and LSP.
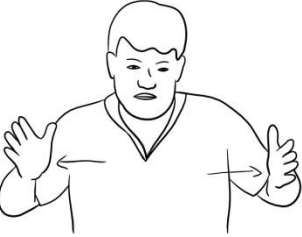
| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 13 | warm* | | |
| 14 | water | | |
| 15 | wide* | | |
| 16 | world/ earth | | |
| 17 | worm* | | |

Table A2. Lexemes which are distinct in LSSiv and LSP.

| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 1 | all | | |
| 2 | bad | | |
| 3 | black | indexed | |
| 4 | blood | | |
| 5 | cat | | |
| 6 | child | | |

Table A2. (Continued) Lexemes which are distinct in LSSiv and LSP.
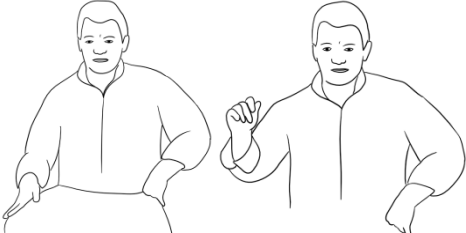
| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 7 | correct |  |  |
| 8 | dance |  |  |
| 9 | die |  |  |
| 10 | dirty |  |  |
| 11 | dog |  |  |
| 12 | dry |  |  |

Table A2. (Continued) Lexemes which are distinct in LSSiv and LSP.
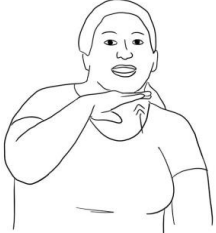
| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 13 | egg | | |
| 14 | father | | a. <br> b. |
| 15 | feather | | |
| 16 | fire | | |
| 17 | full | | |

| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 18 | good | | |
| 19 | grass | | |
| 20 | grease/oil | | |
| 21 | green | indexed | |
| 22 | heavy | | |
| 23 | how | | |
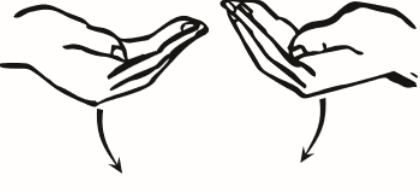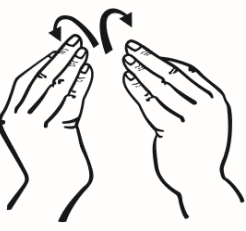
Table A2. (Continued) Lexemes which are distinct in LSSiv and LSP.
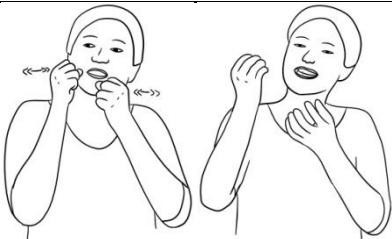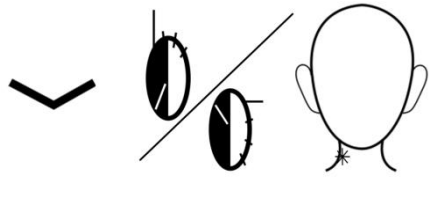
| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 24 | ice | | |
| 25 | laugh | | |
| 26 | leaf | often indexed | |
| 27 | lie | | |
| 28 | live | | |
| 29 | long | | a.<br><br>b. |

| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 30 | look for | | |
| 31 | man | | |
| 32 | moon | a.<br><br>b. | |
| 33 | mother | | a.<br><br>b. |

Table A2. (Continued) Lexemes which are distinct in LSSiv and LSP.
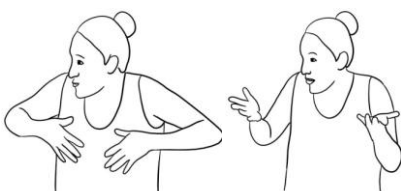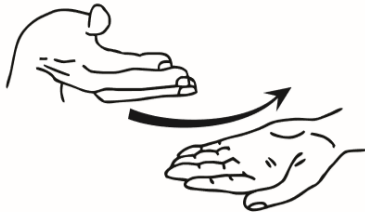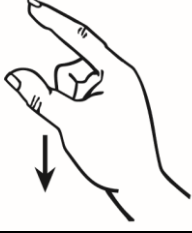
| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 34 | mountain | | |
| 35 | name | | |
| 36 | new | | |
| 37 | other | | |
| 38 | person | | |
| 39 | pig | a. b. | |

Table A2. (Continued) Lexemes which are distinct in LSSiv and LSP.
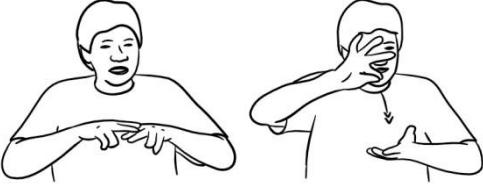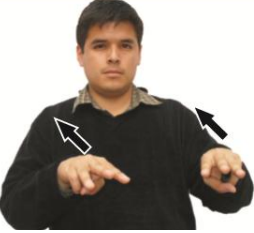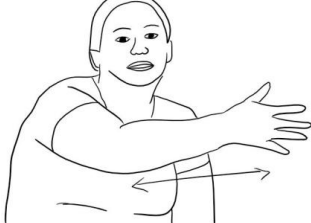
| | Meaning | LSSiv | LSP |
|---|---------|-------|-----|
| 40 | play | | |
| 41 | red | indexed | |
| 42 | river | | |
| 43 | salt | | |
| 44 | sea | | |
| 45 | sibling | | |

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Table A2. (Continued) Lexemes which are distinct in LSSiv and LSP.
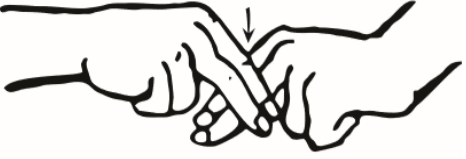
| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 46 | sing | | |
| 47 | sit | | |
| 48 | small | a. b. | |
| 49 | snake | | |
| 50 | spouse | | |

| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 51 | stand | | |
| 52 | star | | |
| 53 | tail | | |
| 54 | thin | a.<br><br>b. | a.<br><br>b. |
| 55 | tree | | |

Table A2. (Continued) Lexemes which are distinct in LSSiv and LSP.
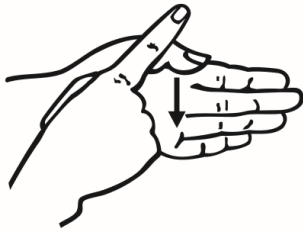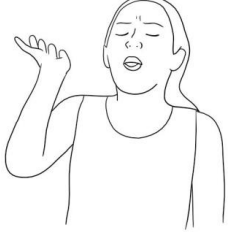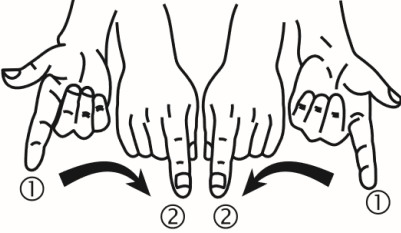
| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 56 | wet | | |
| 57 | what | | |
| 58 | when | | |
| 59 | where | | |
| 60 | white | indexed | |
| 61 | who | | |

Table A2. (Continued) Lexemes which are distinct in LSSiv and LSP.
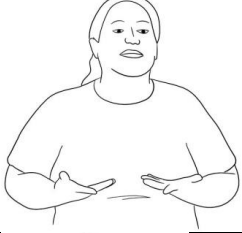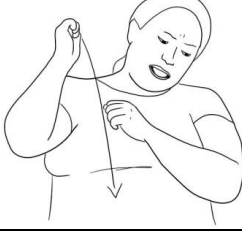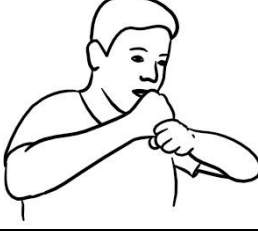
| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 62 | why | | |
| 63 | wind | | |
| 64 | with | | |
| 65 | woman | | |
| 66 | wood | | |
| 67 | work | | |

Table A2. (Continued) Lexemes which are distinct in LSSiv and LSP.

| | Meaning | LSSiv | LSP |
|---|---|---|---|
| 68 | year |  |  |
| 69 | yellow | indexed |  |

# Appendix B. Elicitation materials

This section lists the video (B1) and print (B2) materials from external sources used for elicitation tasks. Written lists of vocabulary and slideshows of images created by the author (some illustrations provided by Eleanor Clark or Moran, 2002) are archived in Kaipuleohone (https://scholarspace.manoa.hawaii.edu/handle/10125/34525) along with the videos they helped create. Section B3 gives the complete text of the consent form.

## Appendix B1. Short videos

Bird, Brad (Director). 2005. Jack-Jack attack [short film]. Pixar Animation Studios.
Bocabeille, Julien, François-Xavier Chanioux, Olivier Delabarre, Thierry Marchand, Quentin Marmier, and Emud Mokhberi. 2007. Oktapodi [short film]. Gobelins l'ecole de l'image.
Casarosa, Enrico (Director). 2011. La luna [short film]. Pixar Animation Studios.
Chafe, Wallace. 1975. Pear film [short film]. University of California, Santa Barbara.
Cooley, Josh (Director). 2009. George & A.J. [short film]. Pixar Animation Studios.
Docter, Pete and Roger L. Gould (Directors). 2002. Mike's new car [short film]. Pixar Animation Studios.
Eggleston, Ralph (Director). 2000. For the birds [short film]. Pixar Animation Studios.
Jimenez, Andrew and Mark Andrews (Directors). 2005. One man band [short film]. Pixar Animation Studios.
Luckey, Bud (Director). 2003. Boundin' [short film]. Pixar Animation Studios.
Lasseter, John (Director). 1986. Luxo Jr. [short film]. Pixar Animation Studios.
_____. 1987. Red's dream [short film]. Pixar Animation Studios.
_____. 1988. Tin toy [short film]. Pixar Animation Studios.
_____. 1989. Knick knack [short film]. Pixar Animation Studios.
Newton, Teddy (Director). 2010. Day & night [short film]. Pixar Animation Studios.

Pinkava, Jan (Director). 1997. Geri's game [short film]. Pixar Animation Studios.

Rydstrom, Gary (Director). 2006. Lifted [short film].Pixar Animation Studios.

Smith, Alvy Ray (Director). 1984. The adventures of André and Wally B. [short film]. Pixar Animation Studios.

Sohn, Peter (Director). 2009. Partly cloudy [short film]. Pixar Animation Studios.

Sweetland, Doug (Director). 2008. Presto [short film]. Pixar Animation Studios.

## Appendix B2. Illustrated books

Carle, Eric. La oruga muy hambrienta. 1994. New York, NY: Philomel Books. (Original work published 1969.)

Mayer, Mercer. 2003. Frog, where are you? New York, NY: Dial Books.

Moran, Patrick R. 2002. *Pro Lingua's Color Lexicarry: Pictures for learning languages.* Battleboro, Vermont: Pro Lingua Associates, Publishers.

Ríos Boettiger, René (Pepo). ca. 1987. Condorito de oro no. 6. Editorial Televista.

Ríos Boettiger, René (Pepo). ca. 1987. Condorito de oro no. 32. Editorial Televista.

Ríos Boettiger, René (Pepo). ca. 1987. Condorito de oro no. 33. Editorial Televista.

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## Appendix B3. Consent form

The full text of the consent forms used for data collection in 2016 appears below.

**"       University of Hawaiʻi**

**Declaración de Consentimiento**

*Comparación preliminar de las lenguas de señas peruanas*

Mi nombre es Brenda Clark. Yo estudio lingüística (lenguas) en University of Hawaiʻi at Mānoa (UH) de los EE.UU. Por mis estudios, yo hago una descripciones, videos y teorías de las lenguas de señas del Perú. En este momento, mi trabajo es escribir una descripción de las señas de Sivia. Pregunto tu ayuda porque tú sabes la lengua de señas de Sivia.

**Detalles del estudio:** Yo estoy acá en Perú por 4 meses. Tú (el participante) compartes señas, frases, historias, conversaciones y otros ejemplos de tu lengua. Tu puedes describir fotos y dibujos, conversar y responder a preguntas. A veces yo voy a preguntar si es posible usar ciertas frases o señas. También voy a preguntar sobre tu educación, tu familia y la comunidad sorda.

Cada sesión es 30-60 minutos y yo quiero grabar todo por video. Hay 1 o más personas en cada sesión. Tú puedes hacer cualquier número de sesiones.

**Riesgos:** No hay riesgos probables para ti. Si te sientes incómodo en cualquier momento, nosotros paramos la sesión o tú puedes pedir que yo no uso la información.

**Beneficios:** No hay beneficios directos.

**Compensación:** Tú ganas S/. 20 por sesión.

**Confidencialidad**: Yo no voy a dar la información personal ni los videos a nadie sin tu permisión. La información estará en mi computadora y en una biblioteca inaccesible al público sin mi permisión. Solo yo y el Programa de Estudios Humanos de UH si puede ver la información.

Yo voy a usar algunos videos y dibujos como ejemplos cuando yo escribo mi descripción, pero no voy a usar tu nombre ni tu identidad. Tú puedes escribirme (Brenda Clark) por email (brendarc@hawaii.edu) para ver los papeles finales.

**Participación voluntaria:** Tú participas voluntariamente. Tú escoges participar o no participar. Tú puedes parar en cualquier momento sin problema.

Cada parte del estudio es voluntario. Tú puedes escoger la información que tú das y las actividades que tú haces en cada sesión. Tú no tienes que hacer todas las partes.

**Preguntas:** Tú puedes hablar conmigo (Brenda Clark) por teléfono (980-309-575), email (brendarc@hawaii.edu), o facebook (Brenda Clark) con cualquiera pregunta.
Si tú tengas preguntas sobre tus derechos, tú puedes contactar a University of Hawai'i, Human Studies Program (Programa de Estudios Humanos) por email (uhirb@hawaii.edu).

La parte arriba es para ti.
Si tú entiendes y quieres ayudar con mi estudio, por favor llena la próxima página y dámela.

**Consentimiento**
(Tú dices que estás de acuerdo con estas palabras.)

Parte 1:
'Sí, quiero participar en el estudio *Comparación preliminar de las lenguas de señas peruanas.* Yo he leído la página arriba y yo escojo a participar en este estudio libremente. Entiendo que puedo parar la permisión en cualquier momento si yo contacto a la investigadora (Brenda Clark).'

Nombre y Apellidos: _____

Firma: _____

Fecha (hoy): _____

Parte 2:

'Yo entiendo que las sesiones de este estudio son grabadas por video. Yo quiero aparecer en estos videos. Entiendo que partes de los videos van a aparecer en la descripción final.'

☐ Sí
☐ No

Nombre y Apellidos: _____

Firma: _____

Fecha (hoy): _____            "

# Appendix C. Transcription

## Appendix C1. Phonological codes

The following tables present the codes used in the phonological transcription of LSSiv signs in this text. They are divided into 1) hands, 2) location, 3) movement, and 4) non-manuals, which are identified by capital letter codes. Columns with the options for each sub-category are given in the order that they must appear (left to right). Categories in parentheses are optional, depending on whether a particular sign uses those features.

### Table C1. Hands (D/ND).

| Hand | | (Time) | | Palm Orient | | Finger Orient | | Fingers | | Value | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| D | dominant | s | start | f | forward | f | forward | 0 | thumb | - | unextended |
| ND | non-dominant | e | end | b | body | b | body | 1 | index | + | extended |
| | | | | i | in | i | in | 2 | middle | b | bent |
| | | | | o | out | o | out | 3 | index | r | rounded |
| | | | | u | up | u | up | 4 | pinky | t | tapered |
| | | | | d | down | d | down | | | c | contact |

Locations are given in Tables C2a-d. Grid blocks in brackets correspond to the head and torso grids in 6.7.2 (figures 2 and 3). All of the specifiers in Tables C2b-d are optionally added to a zero space, head, or face location. (Proximity is also optional for general locations given in Table C2a.)

### Table C2a. Location (L).

| (Hand) | | (Time) | | Proximity | | Place | |
|---|---|---|---|---|---|---|---|
| D | dominant | s | start | T | tip | zero | zero space [A9-G11, see C2b] |
| ND | non-dominant | e | end | C | contact | h | head [A1-G8, see C2c] |
| | | | | N | contact | f | face [B2-F7, see C2d] |
| | | | | F | near | neck | neck region [F-F8] |
| | | | | | far | nd | non-dominant hand |
| | | | | | | foot | foot |
| | | | | | | knee | knee |
| | | | | | | calf | calf |
| | | | | | | elbow | elbow |
| | | | | | | arm | arm |

### Table C2b. Zero space (Lzero).

| Height | | Width | | Other | |
|---|---|---|---|---|---|
| hi | shoulder level [9] | center | on center line [D] | cross | hand(s) on |
| Ø | chest level [10] | Ø | neutral position [C/E] | | opposite side of |
| lo | below waist [11] | side | near periphery of body [B/F] | | body |
| | | wide | out to side [A/G] | | |

## Table C2c. Head (Lh).

| Height | | Width | | Other | |
|---|---|---|---|---|---|
| hi | forehead or above [A/G1-3] | Ø | to side [A/G1-8] | cross | hand(s) on opposite side of body |
| top | top of head [C/E2] | | | | |
| mid | ear level [A/G4-6] | | | | |
| lo | chin or below [A/G7-8] | | | | |

## Table C2d. Face (Lf).

| Feature | | Detail | |
|---|---|---|---|
| fh | forehead | Ø | center of forehead [D3] |
| temp | temple | Ø | side of head [B/F3] |
| | | cross | opposite temple [F/B3] |
| eye | eye | Ø | on eye [C/E4] |
| | | under | under eye [C/E5] |
| | | cross | opposite eye [E/C4-5] |
| ear | ear | Ø | middle of ear [B/F5] |
| n | nose | Ø | center/tip of nose [D5] |
| chk | cheek | Ø | side of cheek [C/E6] |
| | | cross | opposite cheek [E/C6] |
| lip | lip | Ø | side of upper lip [D6] |
| m | mouth | Ø | center of mouth [D6] |
| j | jaw | Ø | side of jaw [C/E7] |
| | | cross | opposite side of jaw [E/C7] |
| chin | chin | Ø | bottom of face [D7] |

All movement specifiers in Tables C3a-b are optional, depending on the movement of the sign. Only those that apply to the sign need to be used. Again, if more than one category (column) is needed, the description must be in the order shown below, from the directions in the beginning of Table C3a through the timing features at the end of C3b.

## Table C3a. Directional movement (M).

| (Hand) | | Direction | | Sequential | |
|---|---|---|---|---|---|
| D | dominant | f | forward | +f | then forward |
| ND | non-dominant | b | toward body | +b | then toward body |
| | | i | inward | +i | then inward |
| | | o | outward | +o | then outward |
| | | u | upward | +u | then upward |
| | | d | downward | +d | then downward |
| | | l | left | +l | then left |
| | | r | right | +r | then right |

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Table C3b. More movement specifiers (M).

| Path | | Type | | Time | |
|------|------|------|------|------|------|
| arc | arced | shake | fast repeated rotation | rep | repeated |
| bounce | several small arcs | wf | fingers wiggle | alt | hands |
| circle | circular | rub | continual location | | alternate |
| short | short path | | contact | | |
| spiral | circles toward a | | | | |
| z | direction | | | | |
| w | zigzag | | | | |
| | wiggle | | | | |

Non-manual descriptors use the code NM, followed (with the exception of 'nw') by a second capital letter code to specify the feature being modified (e.g. M for mouth). Table C4a describes the face, and C4b describes additional body parts.

Table C4a. Non-manuals (NM).

| (Time) | | Place | | Modification | |
|--------|-----|-------|------------|-------|------------------|
| s | start | Ø | general | nw | wrinkled nose |
| e | end | B | eyebrow(s) | f | furrowed |
| | | | | r | raised |
| | | | | rc | raised to center |
| | | | | rep | repeat |
| | | E | eye(s) | sq | squinted |
| | | | | cl | closed |
| | | | | wide | wide open |
| | | G | gaze | u | up |
| | | | | d | down |
| | | | | cross | cross |
| | | | | rep | repeat |
| | | CHK | cheek | out | puff out |
| | | | | in | suck in |
| | | | | d | dominant side |
| | | | | nd | non-dominant side |
| | | M | mouth | rnd | rounded |
| | | | | sm | smile |
| | | | | fr | frown |
| | | | | gr | grimace/growl |
| | | | | grin | small smile |
| | | | | open | open |
| | | | | open+ | wide open |
| | | | | to | tongue out |
| | | | | purse | purse |
| | | | | purse+ | purse wide |
| | | | | wince | wince |
| | | | | inv | lips over teeth |
| | | | | rep | repeat |

Table C4b. More non-manuals (NM).

| Time | | Place | | Modification | |
|---|---|---|---|---|---|
| s | start | H | head | u | up |
| e | end | | | d | down |
| | | | | l | left |
| | | | | r | right |
| | | | | shake | shake side to side |
| | | | | nod | nod up and down |
| | | | | tilt | tilt instead of turn |
| | | | | rep | repeat |
| | | SH | shoulder | u | up |
| | | | | d | down |
| | | T | torso | l | left |
| | | | | r | right |
| | | | | u | up |
| | | | | d | down |
| | | | | f | forward |
| | | | | b | backward |
| | | | | rep | repeat |
| | | HIP | hip | l | left |
| | | | | r | right |
| | | | | rep | repeat |
| | | ELB | elbow | u | up |
| | | | | d | down |
| | | | | rep | repeat |
| | | KN | knee | u | up |
| | | | | d | down |
| | | | | rep | repeat |
| | | | | alt | alternate |
| | | FO | foot | u | up |

## Appendix C2. Conventions and abbreviations

The following symbols and abbreviations are used in the transcription of polymorphemic signs and longer utterances. Other abbreviations follow Leipzig glossing conventions.

| | |
|---|---|
| SIGN | translation (small caps) |
| . | multiple-word translation |
| + | simultaneous morpheme |
| - | sequentially-connected signs/morphemes |
| -- | interruption |
| / | prosodic break |
| ( ) | notes |
| " " | mouthing |
| 1/2/3 | first/second/third person pronouns |

| | |
|---|---|
| ₁/₃SIGN | first/third-person subject |
| SIGN₁/₃ | first/third-person object |
| CONT | continuous aspect |
| Excm | exclamation |
| loc | location agreement |
| ND | non-dominant hand |
| NM | non-manual |
| rep | repeated/reduplicated |
| sho | shape/object incorporation |
| TRANS | transitivity marker |
| YN | *yes-no* question marker |

The following capitalized abbreviations are used for meaningful location and shape morphemes (see sections 9.1-2 and 8.1). Numerals can be added to locations when more than one position is established as significant.

| | |
|---|---|
| LOC | meaningful location |
| HI | high location |
| LOW | low location |
| BEAK | triangular beak |
| BIRO | big and round object |
| BOCA | bottle, can, container |
| CLAW | clawed foot/paw |
| CYL | cylindrical surface |
| EAR | ear |
| EAR5 | large ear |
| FIST | fisted foot/hand |
| FLAT | flat surface |
| FOOT | typical foot/paw/hand |
| FTSP | wide foot/hand |
| HNDL | handle a small object |
| HOLD | hold an object |
| HOOK | hooked beak, stinger, fang |
| HRN1 | thin horn |
| HRN5 | branched horn |
| JAW | jaw/teeth |
| LORO | long and round surface |
| LOTH | long and thin object |
| SMFL | small and flat object |
| SMRO | small and round object |
| SPR | spraying container |
| TINY | tiny surface |
| THIN | thin surface |

# Appendix D. Initialization in ASL

Table D1 shows three signs for different types of 'clusters' or groups in ASL, which are distinguished only by handshape. The handshape for each is the same as that used for the first fingerspelled letter of the English translation. Images are from www.lifeprint.com.

**Table D1. Initialized ASL signs for different types of 'clusters'.**

| Morphemes | Initialized Sign |
|---|---|
|  F  CLUSTER |  FAMILY |
|  G  CLUSTER |  GROUP |
|  T  CLUSTER |  TEAM |

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