Creating a sign language out of everything and everywhere: an example from the deaf people of Bissau

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4 THE EXPANSION OF THE LGG LEXICON

[…] gestures […] have the communicative potential
to not only become lexicalised but also
be divided and recombined into other innovative forms.
(Delaporte & Shaw 2009, 55)

4.1 Introduction

While descriptions of how gestures are integrated into sign languages are already scarce, the research on lexical expansion from a gestural base is even less explored. The previous chapter described how conventional gestures are adopted as lexemes in the emerging LGG, particularly in terms of narrowing the semantic scope of each form. This paves the way to explore further how a new lexicon can be expanded.

The current chapter aims to understand how the word formation processes of compounding and derivation are used over time and across semantic fields. Compounding involves the combination of words, like FATHER^MOTHER to mean 'parents'. Derivation in signs is typically a simultaneous arrangement of minimal units where one (or a combination thereof) carries the core meaning, and the remaining units are modified based on that formational root to convey a specific meaning. For instance, the inverted V handshape representing human legs can serve as a root that derives into WALK, with a waggling movement, and into SIT, by bending the fingers in a double hook.

The diachronic study of LGG signs expanding from the stock of gestures used in Bissau relies on the three existing dictionaries collected in 2005, 2006 and 2017. In addition, it looks at one specific case of grammaticalisation, corresponding to the only LGG sign-from-gesture, HIT.

Having identified the signs that derive from gestures used in Bissau in Chapter 3, the present chapter focuses on how those signs-from-gesture are also sources of lexical expansion in LGG. By tracking the path of these forms in the lexicon over time, one wonders what happens to them. Which ones stay the same, which are phonologically modified for new morphological uses, and which ones are used in compounds? Chapter 4 seeks to answer these questions. After giving a general overview of the initial stages of a lexical system (§4.2), I present the methodology to study such a phenomenon in LGG (§4.3). The analyses are then described in three main sections corresponding to the approaches taken to understand lexical expansion in LGG. A more specific literature review precedes each of these analyses. I begin by looking at implicational hierarchies in kinship and colour terms (§4.4). Afterwards, I focus on the morphological processes leading to the expansion of distinct families of LGG signs (§4.5). Finally, I describe the grammaticalisation of the snapping fingers for 'hit' (§4.6).

4.2 Background on lexical expansion

In this section, I briefly frame the emergence of a lexical system as a whole. The study of deaf homesigners has been essential to understanding how a lexicon comes about. Depending mainly on the visual-manual modality, homesigners systematically segment gestures into discrete meaningful units, (re)combine them (Goldin-Meadow 2017), and (re)analyse them (Senghas 2021). While creating a system by themselves to their sole benefit, they outperform surrounding hearing adults (Goldin-Meadow et al. 1995, 254–256). Since they do it without exposure to a conventional linguistic model, it is suggested that such an ability to combine meaningful units is a resilient property of language (ibid., 242–244). Based on the observation of gestural systems of

deaf homesigners, Goldin-Meadow suggests a set of resilient properties of language (2002, 346–347). Table 8 lists only those at the word level, implying that stable – or conventional – gestures are reanalysed and recombined within paradigms, semantically categorised, and assigned with grammatical functions.

Table 8. **Resilient properties of language at the word level** from stable gesture forms to different grammatical functions (Goldin-Meadow 2002, 347, in gesture systems of homesigners)

Property	Instantiation
Stability	Gesture forms are stable
Paradigms	Gestures consist of smaller parts that can be recombined to produce new gestures with different meanings
Categories	The parts of gestures are composed of a limited set of forms, each associated with a particular meaning
Grammatical functions	Gestures are differentiated by the noun, verb and adjective grammatical functions they serve

To zoom in on the different stages leading to the building up of a new lexical system, Morford and Kegl (2004) compared three distinct populations of deaf people regarding their social interaction in visual-manual communication: isolated homesigners, homesigners in contact, and signers. By comparing their linguistic performances, the authors proposed a path leading from the gestural basis to a signed lexicon. Here, conventional gestures with some functional shift used by an isolated homesigner lexicalise and are used in sequence. Still, it is only as signers that they add a bound morphology, constrain forms, and combine lexicalised terms into compounds (ibid., 377–378).

Overall, language-like properties are expected to build on each other over time. The various studies on the initial stages of language

emergence aim to identify the moment when grammatical patterns become more stable (Abner et al. 2019, 235).

With this reasoning in mind, how then do LGG signs based on conventional gestures extend semantically, morphologically and grammatically during the first two decades of language emergence?

4.3 Methodology

Chapter 4 builds from the analysis in Chapter 3, investigating the transition from gesture to sign. Here, I put the focus on lexical changes once gestures are adopted as signs. The methodology is first introduced by the research questions in subsection 4.3.1. These aim at understanding diachronic changes through the analyses of implicational hierarchies, morphological processes and grammaticalisation. The data sources are described in subsection 4.3.2. The analyses of the lexical expansion of semantic fields, families of signs and the grammaticalisation of one gesture-to-sign are explained in subsection 4.3.3.

4.3.1 Research questions

To understand how the lexicon is built up early in language emergence, I posit that emblematic gestures are available to deaf signers as a groundwork lexicon. From there, I focus on the semantic and morphological mechanisms occurring throughout lexical expansion.

- How does lexical structure unfold over time in the sign language emerging in Bissau?

  In particular,

- How do signs-from-gestures expand during the first years of language emergence in the semantic domains of kinship and colours?
- What are the trajectories of development of derivation and compounding in families of signs-from-gestures?
- How do grammatical functions extend from 'hit' in LGG?

4.3.2 Data sources

The present analysis is based on different data sources. For the most part, data is drawn from the three LGG dictionaries collected over time (2005, 2006 and 2017), as explained in Chapter 2 and resumed in this subsection (§4.3.2.1). In addition, the analysis relies on extra videos collected to complement the dictionary records (§4.3.2.2).

To track how a lexicon is built in the first years of language emergence, I used different time snapshots of the LGG collection. I primarily focused on those LGG signs that came from gestures as the starting point of lexical expansion. This enables the diachronic analysis of a specific set of signs lexicalising from gestures.

Figure 104 illustrates the timeframe in which sign collection occurred. As explained in Chapter 2, deaf people in Bissau started gathering in larger numbers (in a school setting) during the October 2003 to June 2004 school year. Therefore, the first two collections, in 2005 and 2006, provide a relatively reliable picture of the original signs. The third moment, in 2017, occurs after a considerable period during which signs may have eventually changed. Therefore, these are significant moments in time, enabling the present diachronic study. In addition, in 2022, I recorded signs that had been collected in 2005 and 2006 but not in 2017, some neologisms related to politics, as well as sentences illustrating the sign HIT in a discursive context.

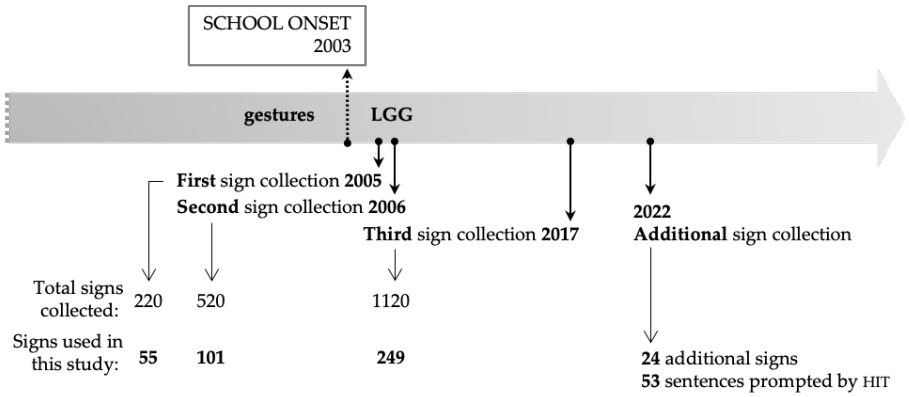


Figure 104. Documentation periods during LGG emergence, which occurred in 2005, 2006, 2017, and 2022, after deaf education was first established in Bissau in 2003

4.3.2.1 LGG dictionaries

As detailed in Chapter 2, there are three LGG dictionaries: two collected in the first couple of years of sign language emergence, in 2005 and 2006, and the third one a decade later, in 2017. Here, I only resume the most relevant information (see §2.3 for details). The first collection in 2005 was not published. The second, collected in 2006, was published only in 2008. The third was published in 2017, the same year as the sign collection.

After deaf students began to gather in school premises in Bissau at the end of 2003, their sign language was first documented in 2005. At that time, ten deaf students participated actively in a small micro-community, gathering often at the school. It was then possible to collect from them 220 signs elicited from pictures in school books and drawings. This first collection was glossed in Portuguese and Creole and informally printed in the school. We and the school saved the digital form.

In 2006, the deaf school wanted to publish a proper dictionary with a larger number of signs. On that occasion, the elicitation was prompted by pictures from primary school books with a large group of deaf students. The dictionary was published two years later, in 2008, with 520 signs. It had an educational purpose, aiming at deaf students' bilingual development, so it included illustrations and literacy exercises. This dictionary was again organised by topics and translated into Portuguese and Creole.

Ten years later, in 2017, a new collection was undertaken with the twelve deaf sign language instructors working at the National School for the Deaf. This resulted in 1120 signs. Since this dictionary was now directed at the general population, it included dialogue samples. It was also divided into topics and translated into Portuguese and Creole.

4.3.2.2 New data

Besides the three dictionaries, I collected additional videos for 14 individual signs and 53 LGG sentences prompted by HIT. The recording sessions occurred during my 2022 field trip and were carried out at the National School for the Deaf (*Escola Nacional de Surdos* – ENS). In this extra data, I also include 10 newly created signs for government-related terms that were sent to me by Amaré Soares.

Set of signs updating the diachronic data

As a basic methodological premise, sign collections were meant to enlarge the vocabulary based on the lexical items that preceded them. However, a few signs were overlooked, especially in the last dictionary. Because they were missing in the diachronic lexical comparison across dictionaries, I collected them on a later field trip. So, in 2022, I

recorded videos that were missing or needed clarification from the previous sign collection.

The first set of 14 individual signs was collected to provide a more complete picture of the lexical expansion in early LGG. Some signs documented in 2005 and 2006 were not included in the 2017 dictionary (19 and 22 items, respectively) due to oversight or redundancy. Therefore, for this particular analysis, I collected six signs that had been recorded only in 2005: HUSBAND, WIFE, NEIGHBOUR, PANTHER, CHOLERA, STOMACH-ACHE; and four in 2006: CHILDREN, BENFICA, SPORTING, and WHITE(SKIN). The last three, together with MAN and FATHER, WOMAN and MOTHER, explicitly aimed at observing eventual articulatory nuances in disambiguating polysemy.

These videos were collected in an informal setting, with about a dozen deaf young adults, mostly LGG instructors and other employed members of the school who would be hanging around. I would ask them as a group how they would sign now those signs collected for former dictionaries. In the case of eventual polysemous signs, I would ask them if they distinguish them in their signing. The explanation was then given to me as a consensual agreement. In the end, someone would volunteer to sit in front of the camera, or I would turn the camera to the one(s) willing to produce the targeted sign or utterance. In total, I filmed 13 deaf young adults, aged between 21 and 36, of whom only four were women. Except for one female sewing instructor, one male employee, and two male LGG teaching trainees, the remaining participants were LGG instructors.

Set of LGG sentences prompted by HIT

A second set of videos was also recorded in 2022, in a special elicitation session to gain a clearer understanding of the usage of the sign HIT. This is a highly conventionalised gesture that occurred in the 2017

dictionary as a polysemous sign with the meaning of 'hit', but also 'better (than)' and 'than'. Given that dictionary sources are often incomplete in the amount of information that they provide about the pragmatic use of signs, I relied on 53 additional LGG sentences explicitly recorded to clarify the analysis of HIT.

To understand its contextual uses, I asked some of those deaf adults, who had already worked with me in the previous collection set, to give me examples of HIT in an LGG sentence. As they would think of a good example, they would sit in front of the camera to produce it. They were free to sit there as they wished and to sign whatever came to their minds, as long as it included the requested sign. In the end, I had 53 sentences involving HIT (with different meanings and grammatical functions) produced by 11 deaf adults, including four deaf women. Of these, two were not LGG instructors, and another one was still in his teaching training. The sentences had an average duration of eight seconds each (in a total of 00:06:40).

Set of neologisms for government-related concepts

To explore the mechanisms of sign creation in more recent signs, I benefited from a video sent to me by Amaré Soares, the deaf teacher in charge of the Mariposa school, in November 2022, documenting ten newly created signs for government-related concepts. Of these, ten referred to governmental structures and roles (GOVERNMENT, PRIME-MINISTER, VICE-PRIME-MINISTER), and seven others to different ministers. They were produced by 12 deaf young adults, students of the Mariposa school.

4.3.3 Data analysis

To analyse the lexical expansion of LGG, I take different approaches. I look at the diachronic unfolding of two semantic fields and of specific families of signs. In addition, I explore the range of grammatical functions deriving from HIT.

I focused on the grammaticalisation of HIT since, within the set of signs-from-gestures, this was the only item showing clear grammatical functions in the 2017 dictionary. Here, it also occurs as HIT. To explore the range of its contextual uses, the 53 LGG sentences collected in 2022 were translated and categorised in terms of the meanings and functions of the snapping-finger form. In the end, I obtained nine categories presented in detail in subsection 4.6.2. Besides HIT (9 sentences), there was one semantic extension to 'beat' (1 sentence). The remaining categories expressed grammatical functions in 'against' (3 sentences), 'more than' (7 sentences), 'better than' (8 sentences), 'better for' (1 sentence), 'best' (6 sentences), 'most' (1 sentence), and 'very' (17 sentences).

The two semantic fields selected for the analysis of lexical expansion – kinship and colours – have been described often in spoken and signed languages. All signs related to those semantic fields in LGG were organised according to the year they were collected to understand how they emerged and developed over time. Besides signs related to kinship and colours, I investigated signs covering other semantic areas that were morphologically related to those occurring in the hierarchies. For instance, I refer to the use of MAN/FATHER and WOMAN/MOTHER not only as a gender marker in kin members, but also in professions. Additionally, I took into account signs that had similar motivations to those I was focusing on. For example, as football references initially supported colours, as well as name signs for countries.

For the observation of the morphological processes activated over time, across the three dictionaries, I included eventual replacements of signs. Given that deaf participants acknowledged during the collection of the 2017 dictionary that newly created signs were intentionally replacing some of the signs-from-gestures, I dedicate a short subsection to this particular phenomenon, in subsection 4.5.3.

4.3.3.1 Lexical expansion through derivation and compounding

Because I have been able to track the signs analysed in this chapter back to their gestural roots (in Chapter 3), I take those signs to be the morphological roots from which further processes of derivation and compounding operate to expand the emerging lexicon of LGG.

The derivation process entails the modification of minimal phonomorphological units of single signs, leading to the creation of new signs to designate related concepts, like the inverted V handshape representing the human legs, from which stems a variety of possibilities, like WALK, SIT, JUMP, or DANCE. These modifications are rooted in the unchanging units connecting semantically all derivative forms. In a different form of lexical expansion, compounding, two or more signs are combined to designate a single lexical concept; e.g., EAT^SLEEP, as the original ASL compound for 'home'. In the analysis of compounds, I seek to identify paradigms relating the semantic relationship between their constituents and the semantic fields that they were designating (as proposed by Downing 1977, 831).

To illustrate how the set of signs for the current analysis was put together, Table 9 refers back to the 41 concepts elicited during the gesture sessions, in the same order as they were presented to the hearing participants (in §3.3.2). Table 9 includes 40 direct sign counterparts of the gestures produced for those concepts, and eight additional sign counterparts with different motivations that were integrated into the LGG

lexicon for other concepts. I recall that, in the gesture elicitation sessions in Bissau, some concepts were expressed by different gestures that were also incorporated into LGG. This was the case of 'sick' (#32) prompting the gesture that is directly adopted as the sign SICK, and cooccurring gestures also integrated as signs, namely COLD, PAIN, FEVER and SLEEP (in grey in Table 9).

Table 9 presents 75 derivatives (including 17 deriving from additional sign counterparts), and 163 compounds (including 35 combinations with additional sign counterparts) sharing roots with the corresponding sign counterparts. In total, the analysis of lexical expansion encompasses 286 signs. That said, 12 sign counterparts, such as the one for 'big' (#1), are not associated with any derivatives or compounds in any of the three dictionaries. In contrast, the other sign counterparts are the basis for derivative or compound signs, or both. This is true for all items, except WITCHCRAFT, KILL and CRAZY.

Table 9. **Total number of signs used in the analyses** of lexical expansion, including the concepts listed in the order they were elicited, their direct sign counterparts, additional sign counterparts (in light grey), and derivatives and compounds

#	Concepts	Direct sign counterparts	Additional sign counterparts	Derivatives	Compounds	Total
1	big	1				1
2	much	1				1
3	animals' height			1	3	4
4	people's height			5	3	8
5	child	1		1	5	7
6	man	2		1	18	21
7	woman	2		1	17	20
8	witchcraft	1		5	3	9

	wings		1	2	9	12
	crazy		1	11	10	22
9	steal	1				1
10	work	1			9	10
11	finish	1			1	2
12	sorry	2				2
13	beg	1		1		2
14	why?	1		1	2	4
15	hit	1		2		3
16	escape	1				1
	go away		1	2	2	5
17	lie	1		1		2
18	die	1			1	2
19	refuse	1				1
20	all good?	1		5	13	19
21	far	1		1		2
22	six	1				1
23	ten	1		1	1	3
24	boy/girlfriend	1		1	4	6
	kiss		1	2		3
25	married	2		1	4	7
26	old person	1		1	3	5
27	friend	1		5	1	7
28	together	1				1
29	same	1		3	5	9
30	chief			4	14	18
31	crook	1			1	2
32	sick	1			6	7
	pain		1		2	3
	fever		1		7	8
	cold		1		2	3
	sleep		1		3	4
33	kill	1		8	12	21
34	heat				1	1
35	hungry	1				1
36	thirsty	1				1

37 talk	1		5		6
38 thank you	1				1
39 please	1				1
40 white	1		3	1	5
41 black			1		1
	40	8	75	163	**286**

The diachronic track of LGG signs was mainly analysed based on the translations provided by the dictionaries, assuming that they referred to the same concepts. Also, as explained in the previous subsection, signs lacking more recent versions were filmed later.

4.4 Lexical expansion of semantic fields: kinship and colour terms

The first of the three analyses of lexical growth in LGG focuses on the diachronic unfolding of kinship and colour signs. I begin by reviewing the literature on the topic in both spoken and signed languages (§4.4.1). Then, I describe the LGG data in each semantic field (§4.4.2).

4.4.1 Background

To understand how the lexicon gets progressively structured, lexicons have been compared crosslinguistically in various semantic domains, like kinship and colours, in both spoken and sign languages (e.g., Zeshan & Sagara 2016, for colour, kinship, and quantification). These typological studies of lexical structures reveal implicational hierarchies that are shared across languages. Depending on the features that a language presents, like a word B predicting (or implying) the presence of a word A, the language is assigned to a particular type (Hengeveld 2006).

Besides searching for common properties in unrelated languages, linguistic dependencies can be investigated synchronically through markedness. This is based on the idea that there are unmarked items (more basic and frequent) and marked ones (Greenberg 1966). However, Greenberg also acknowledges that synchronicity does not give a complete picture of how a hierarchy unfolds. Instead, he argues in favour of using diachronic change to trace language universals (1969, 477–478).

4.4.1.1 Implicational hierarchies in kinship terms

Biosocial categories are a good example of linguistic organisation (Koch 2001, 1145). Excellent candidates for lexical universals for kinds of people are the concepts of 'man', 'woman' and 'child' as the basic units in human reproduction, regardless of cultural practices. Therein, the fundamental mother-child relation becomes foundational for kinship terms (Goddard & Wierzbicka 2013, 50–53). especially when associated with the notion of 'being born' or 'giving birth', as shown in Figure 105. All subsequent semantic derivations will be culture-specific according to Goddard (2018, 133).

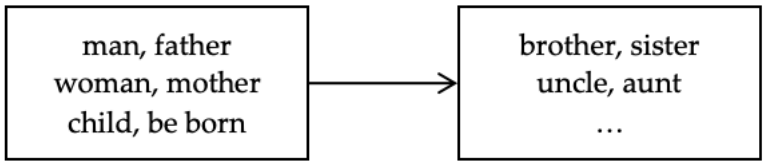


Figure 105. Lexical encoding for kinship terms stemming from the universal biosocial unit and extending to other, more culturally specific, kinship terms (adapted from Goddard 2018, 132)

To contrast with 'child', 'old' is often used (Goddard 2001, 23). Kinship relations are typically analysed according to gender and age, whether they are lineal (ascendant or descendant) or collateral (other than lineal), consanguineal (biologically related) or affinal (Kroeber 1909, 78–79). In his investigation based on 120 languages, Greenberg (1966) demonstrates markedness hierarchies. Here, lineal and consanguineal relationships, like 'offspring' / 'parent' / 'grandparent', tend to be less marked than collateral, as 'sibling' and 'cousin', and affinal ones, such as in-law and step kin. Of course, kin terms express social organisation and will therefore vary accordingly (Jonsson 2001, 1206).

In sign languages, people are likely to be iconically represented by their appearance. In her comparison of 40 sign languages – including those in Kenya, Namibia, Tanzania – Wilkinson found that men are usually represented by their facial hair, while women are represented by breasts (Wilkinson 2009, 121–129). Sagara and Zeshan have observed several other general tendencies in sign languages, such as distinct lexical items for 'mother' and 'father'. Typologically, there are a number of sign languages presenting polysemous forms for MOTHER/WOMAN/FEMALE and FATHER/MAN/MALE. The signs that come to function as 'female' or 'male' usually combine through compounding to mark the gender of kin members, and eventually also with age marking, as in FEMALE^OLDER^SIBLING in Indian Sign Language (2016, 21–22).

Besides MOTHER and FATHER, Woodward (1978, 128), comparing 20 sign languages, identified two more basic native kin terms: OFFSPRING and SIBLING. Cross-linguistically, the notion of 'parents' normally results from the compound FATHER^MOTHER (Wilkinson 2009, 159). The OFFSPRING term may refer to the notions of 'baby', 'child' (as 'short person') or 'give birth' and is generally marked for gender (ibid., 141–144). Other than these, grandparental terms are consistently associated with

OLD(PERSON) (ibid., 140–141). In general, terms used to represent kinship relations are often polysemous (ibid., 146).

In keeping with an implicational hierarchy, cross-linguistic patterns show that as relationships get further away from the nuclear kin, in non-core relations, there are fewer gender and age distinctions (Sagara & Zeshan 2006, 24–25). Also, signs designating such relations tend to integrate fingerspelling initialisation at later stages after continuous language contact (ibid., 26; Wilkinson 2009, 153). In addition, language contact may result in the use of mouthing to tell apart polysemic signs, as in <broer> or <zus> with the NGT sign for 'sibling' (Quer et al. 2017, 35).

To illustrate how kin terms are organised in some sign languages, Table 10 shows examples of sign formation in four African sign languages; namely, those of the villages of Bouakako, Ivory Coast (LaSiBo; Tano 2016, 182–207), Adamorobe, Ghana (AdaSL; Nyst 2007, 98–101), and of the deaf communities of Kenya (KSL; Wilkinson 2009, 273) and Uganda (UgSL; ibid., 285; Lutalo-Kiingi 2014a, 87, 90).

Kinship terms are ordered in rows roughly from closer relations (top) to more distant (bottom). Here, it is worth noting that the signs MAN, WOMAN, and SAME are very similar in these unrelated sign languages, and that BIRTH is the same in LaSiBo, AdaSL and UgSL. Such a coincidence is likely pointing at shared gestural sources, as seen at least for the *chin-beard*, *breasts* and the *joined-fingers* forms for 'man', 'woman', and 'same', in the previous chapter. Moreover, collateral relationships resort to fingerspelling, i.e., to initialisation, in the cases of 'cousin' in KSL and 'uncle' and 'aunt' in UgSL.

Table 10. **Kinship terms in the African Sign Languages** of Bouakako, Ivory Coast (LaSiBo), Adamorobe, Ghana (AdaSL), Kenya (KSL) and Uganda (UgSL)

	LaSiBo	**AdaSL**	**KSL**	**UgSL**
Father	MAN(^BIRTH)	MAN	MAN	MAN^BIRTH
Mother	WOMAN(^BIRTH)	WOMAN	WOMAN	WOMAN^BIRTH
Offspring	BIRTH	BIRTH^CHILD	gender^ CHILD	B(oy)/G(irl)^CARRY-ON-THE-BACK
Sibling	(BIRTH^)SAME (gender^) HEIGHT	SAME	gender ^SAME	B(oy)/G(irl)^BIRTH
Spouse	gender^UNION	MARRY	PERSON^ MARRY	gender^MARRY
Grand-parent	OLD(PERSON)	OLD(PER-SON)	OLD ^PER-SON	gender^OLD
Uncle /aunt	-	-	gender^SIDE	U(ncle)/A(unt)
Cousin	-	SAME	C(OUSIN)	-

In sum, the building up of kinship terms relies on an initial vocabulary, distinguishing kinds of people. In sign languages, these terms are likely to be based on similar motivations. Further along the hierarchy, signs for family members tend to resort to initialisation. Importantly, such descriptions have not been carried out with sign languages as young as LGG.

4.4.1.2 Implicational hierarchies in colour terms

Similar to kinship, colour terms have also been looked at in terms of their typological hierarchies, as first proposed by Berlin and Kay (1969), based on 89 languages of three unrelated family stocks. They conclude that all languages have terms for white and black (stage I). If

a language has a third colour, it is red (stage II). If it has four colours, then it has either green or yellow (stage III), and, if it has five, it has both (stage IV). The fifth colour is blue (stage V) and the seventh is brown (stage VI). Languages with eight or more colours have at least one term for pink, purple, orange or grey (stage VII). Thus, as the functional need arises, people will expand their colour vocabulary. Depending on the number of basic colours that a language contains, it is assigned a type.

The green, blue, yellow triade was later revised by Kay (1975, 260), who observes that, in the world's languages, green and blue – which he terms as 'grue' when a language only has one term for both of them – get distinguished from one another only after coexisting with yellow, as shown in Stages III and IV in Figure 106.

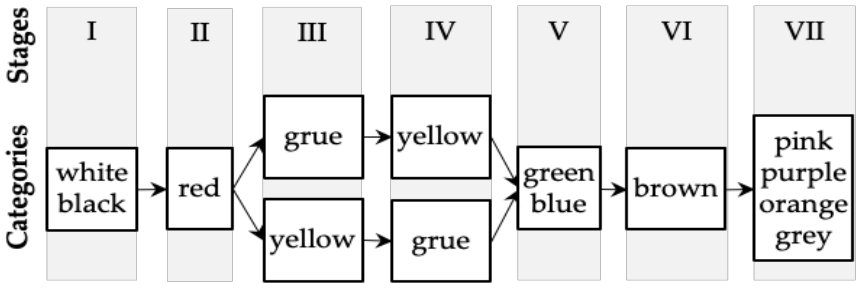


Figure 106. Hierarchy of basic colour terms across seven stages (Kay 1975, 260)

In sign languages, the representation of the three most basic colours is usually made by association with a coloured body part, like lips for RED, which can result in polysemy, in this case for both 'lips' and 'red'. Such polysemy also occurs in other signs designating coloured objects and their corresponding colours, like 'orange' for both the fruit and the

colour, something also found in spoken languages (Sagara & Zeshan 2016, 18). The further away into the hierarchy, the less iconic the signs for colours will typically be (ibid., 19).

Typological studies about colour signs were carried out by Woodward, comparing ten sign languages, including those of Providence Island, Hong Kong and Saudi Arabia (1989, 149, 151), and Sagara and Zeshan, comparing 33 sign languages, including Adamorobe, Indonesian and Finnish Sign Languages, and Kata Kolok (2016, 18). To this comparison, I add descriptions of colour signs in Yolngu Sign Language by Adone and colleagues (2012, 64), and additional information on Adamorobe Sign Language by Nyst (2007, 95–96). In the latter, yellow and green are based on coloured objects, as in BANANA^SOFT and BANANA^HARD (these were not included in Sagara and Zeshan's study).

The data presented in Table 11 shows one example per language type, i.e., a sign language containing only three basic colours (black, white, and red), that of the Providence Island; another with four colours (the previous three and yellow), the Yolngu Sign Language; the Adamorobe Sign Language, with five colours (the last four and green), etc etc. It is worth noting that Kata Kolok has one term for both green and blue, or grue. The lower half of Table 11, from the Hong Kong Sign Language downwards, illustrates macro-community sign languages, contrasting with the first four sign languages used instead by micro-communities. It is worth noting that there are no very young sign languages like LGG in this typological study.

Table 11. **Sign language types according to basic colour terms**, developing from three to nine colours

Sign Language	black	white	red	yellow	green	blue	brown	purple	pink
Providence Island	x	x	x						
Yolngu	x	x	x	x					
Adamorobe	x	x	x	x	x				
Kata Kolok	x	x	x	x		x			
Hong Kong	x	x	x	x	x	x			
Saudi Arabian	x	x	x	x	x	x	x	x	
Indonesian	x	x	x	x	x	x	x	x	?
Finnish	x	x	x	x	x	x	x	x	x

While signs for most basic colours mostly point to some coloured body part, the remaining ones are likely associated with a coloured object. Also, the further along the hierarchy, the fewer signs are expected to present an iconic motivation. All in all, implicational hierarchies in kinship and colour terms can be grounded on universal tendencies and simultaneously manifest differently depending on the cultural environment (Brown 2000, 158–159, 164).

4.4.2 Lexical expansion of kinship and colour terms in LGG

To illustrate how structure is built up in the LGG lexicon, I zoom in on two distinct semantic fields: kinship (in §4.4.2.1) and colours (in §4.4.2.2).

4.4.2.1 Kinship terms in LGG

As listed in Chapter 3, there are five gestures used in Bissau that refer to family members: MAN, WOMAN, CHILD, OLD-PERSON and SAME for 'sibling'. Based on the three existing LGG dictionaries, I observed that these same terms were then combined as compounds over time to specify kinship relationships through compounding further. I found that the initial combinations of signs relied on that original stock. Here, I describe the sequential unfolding of kin terms in LGG to find out which developmental trajectory is followed in this language. I begin by focusing on LGG signs for closer (lineal and consanguineal) kinship ties. Then, I present signs for more distant family members (collateral and affinal relationships). In the end, I also explore other signs related in form to signs within the kinship field.

Table 12 shows that the semantic hierarchy of kinship terms expands from conventional gestures presented in the first column to express closer kin ties. The following three columns of Table 12, representing the sequence of signs collected in the different dictionaries, reveal how signers first extend the designations for family members by resorting to polysemy, in 2005 and 2006, and then by compounding, in 2017. Rows display how manual forms unroll over time. While the upper half of Table 12 illustrates the development of signs for closer kinship terms, the lower half of the last column presents signs from the latest dictionary, collected in 2017. These signs referring to more distant family relationships do not derive from the initial gesture stock but are instead created from scratch by LGG signers.

Table 12. **Diachronic expansion of kinship terms** in LGG, from gestures used in Bissau through the signs collected in 2005, 2006 and 2017

	LGG		
Gestures	**2005**	**2006**	**2017**
	(polysemy)		(compounding)
man/father	FATHER		
woman/mother	MOTHER		FATHER^MOTHER^CHILD 'family'
height-specifier		OFFSPRING	BIRTH^CHILD 'offspring' gender^BIRTH 'son'/'daughter'
married	gender^RING 'wife'/'husband'		
old-person		GRAND-PARENT	gender^ OLD-PERSON 'grandfather'/ 'grandmother'
same	SAME^BREASTFEED 'sibling'		BREASTFEED^SAME 'sibling'
			gender^TWO 'stepfather'/'stepmother' gender^BLESSED 'godfather/mother' BIRTH^TAKE 'adopted' gender ^YOUNGER 'grandson'/ 'granddaughter' gender^RELATION 'cousin' gender^T 'uncle'/'aunt' gender^S 'nephew'/ 'niece'

Closer kinship terms in LGG

Signs for closer family ties in LGG involve the lineal relations of 'parents', 'offspring', and 'grandparents' and the most direct collateral relationship of 'sibling'. Like the gestures for 'man' and 'father', and

'woman' and 'mother' are polysemous, so were their sign counterparts in MAN / FATHER and WOMAN / MOTHER during the first years of LGG emergence. Presumably due to confusability from this polysemy, LGG signers eventually added the mouthing in the kin member signs, namely in FATHER and MOTHER, respectively, as ['pape] and ['mame] (see Figure 76, in §3.5.1). It is important here to note that mouthing seldom occurs in LGG communication, so this is a special case.

Other than MAN vs. FATHER and WOMAN vs. MOTHER, whose polysemy was disambiguated by adding mouthing, the remaining polysemous signs for kinship terms were developed by compounding. The term for 'spouse' is expressed by the sign MARRIED combined with the gender distinction. This is also the case of OLD-PERSON later appended to MAN and WOMAN to mark gender in 'grandparent'. In other words, a gender distinction for married couples became the paradigm that helped to expand kinship terms further.

To refer to the concepts that would have motivated the gestural forms adopted as the signs MAN, WOMAN and MARRIED, signers slightly modified those forms for 'chin beard', in Figure 107a, 'breasts', in Figure 107b, and 'ring', in Figure 107c. Such modifications seem to have recovered the signs' iconicity by making their motivation more explicit.

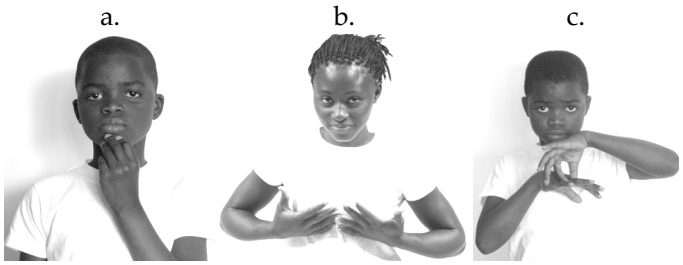


Figure 107. Signs for the original concepts motivating the signs MAN, WOMAN and MARRIED in LGG, distinguished in form for CHIN-BEARD (a), BREASTS (b), and RING (c)

Besides combinations with MAN and WOMAN for gender marking, two other signs turned into compounds. The joined-finger form for 'sibling' was combined as early as 2005 with BREASTFEED, in Figure 108a, specifying what was a highly polysemous gesture. Later, in 2017, the compound for 'sibling' loses one hand in BREASTFEED and inverts the order of its members from higher to lower, in Figure 108b. To express gender, it becomes a three-member compound, as in MALE^BREASTFEED^SAME 'brother'.

Similarly, the height specifier at a lower level, which can also be polysemous for 'child' and 'short', is combined later, in 2017, with BIRTH, for 'offspring', in Figure 108c. However, when specifying gender, it loses the height specifier and maintains a two-member composition as in MALE^BIRTH 'son'.

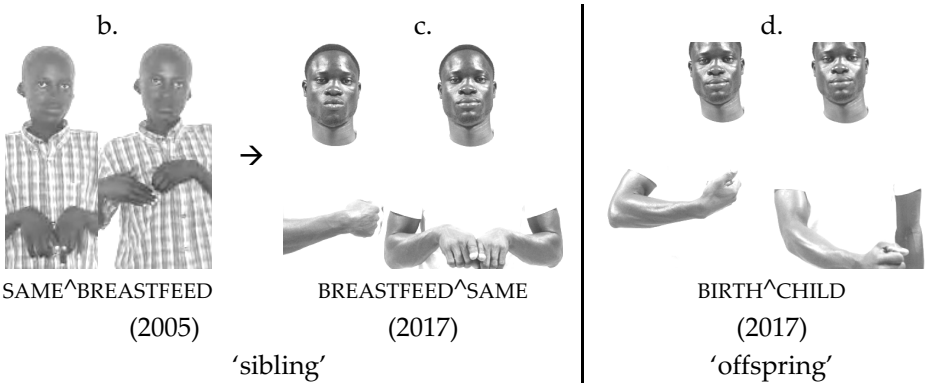


Figure 108. Polysemous signs distinguished by compounding for 'sibling' in 2005 (a), and in 2017 (b), and for 'offspring' (c) in LGG

More distant kinship terms in LGG

Importantly, as kinship relations get farther from the nucleus, such as collateral and affinal ties, new designations no longer consist of combining pre-existing signs but are instead created from scratch. Figure 109 shows how, in the first collection years, in 2005 and 2006, signs for closer kin terms take advantage of gesture sources.

In 2017, new signs were collected for more distant kin relationships. These are ordered in Figure 109 from top to bottom according to the motivations leading to their creation. Thus, signs for 'stepparent' and 'adopted child' are combinations involving gesture sources. The sign for 'godparent' represents a metaphoric association with the blessing drops of water on the head. The sign for 'grandchild' appears to have lost its iconic motivation, i.e., the explanations given by deaf people show how much it has reduced in its form to the point of obscuring its iconicity. The sign for 'cousin' is said to be borrowed from LGP (see §2.5.4.2). Finally, at the bottom of Figure 109, there are signs with initialisation for 'uncle', 'aunt', 'nephew' and 'niece'.

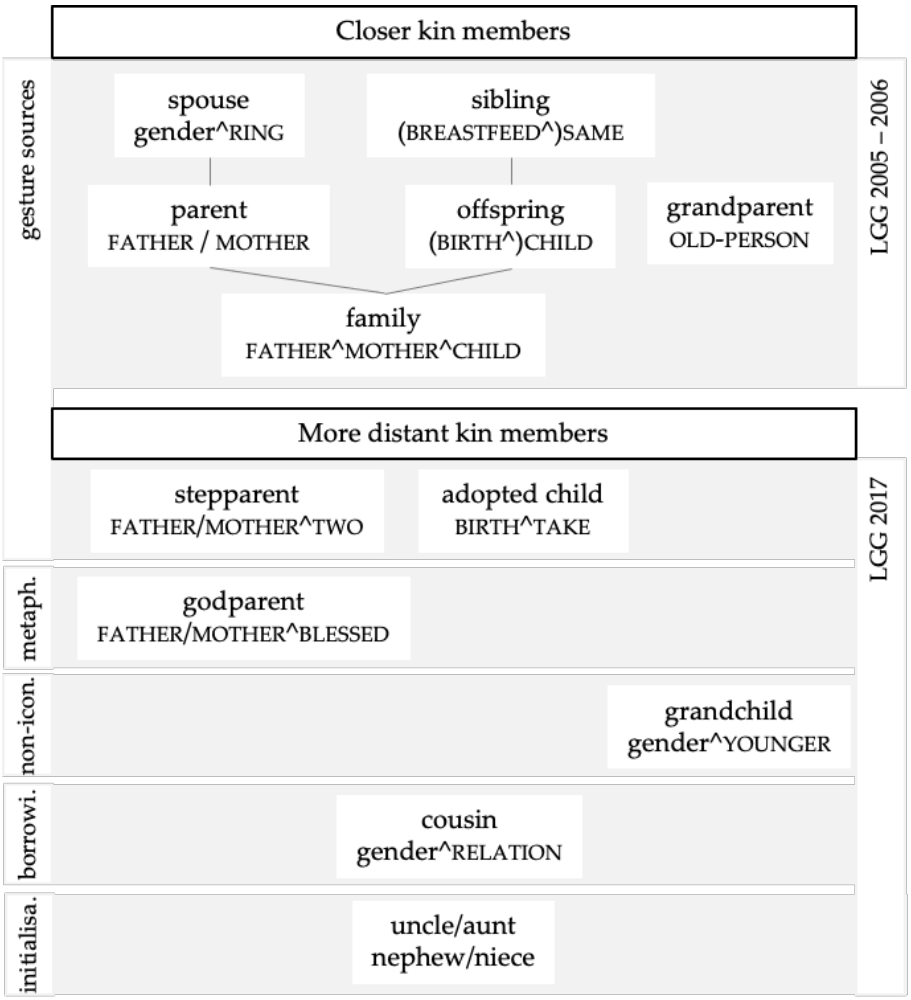


Figure 109. Sequence of kinship terms in LGG according to their motivational origins on the left and their collection year on the right, with the closer kin members on the top half and more distant kin members on the bottom half

Looking more closely at the newly created signs for closer family members that did not benefit from the gesture stock, it becomes clear that signers made use of different strategies. Figure 110a shows the

compound member BLESSED for 'godparent'. This sign represents iconically the act of sprinkling holy water on the head during the baptism ceremony. In addition, it extends metaphorically to signify the kin relation established by that ceremony.

The following two signs, in Figures 110b and 110c, would not be easily deciphered by an outsider, considering the explanations given by one deaf signer about their original motivation. The sign for 'grandchild', produced with the back of the hand against the underside of the chin, in Figure 110b, would refer to a younger person. Also, the sign for 'cousin', tracing a triangle with joined thumbs and index fingers, as shown in Figure 110c, would represent a diagram of that collateral relationship. The fact that deaf signers suggested that this sign is borrowed from LGP makes the diagram explanation probably not the most reliable one.

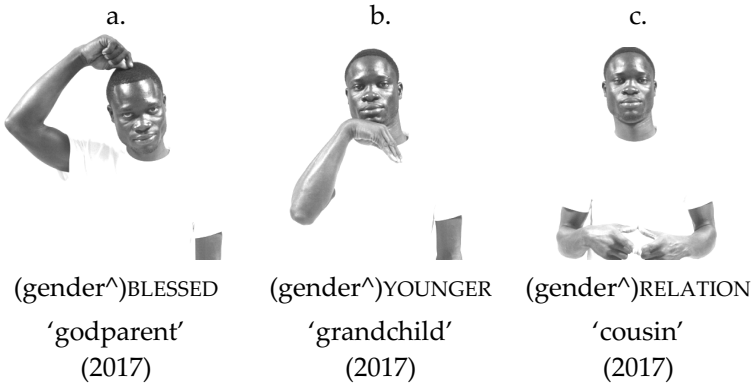


Figure 110. Signs for more distant kin members in LGG, namely for 'godparent' (a), 'grandchild' (b), and 'cousin' (c)

The remaining two more distant kinship pairs resort to initialisation. The signs for 'uncle' and 'aunt' consist of a combination of the gender specification, the signs MAN and WOMAN, with T, corresponding to the

Portuguese and Creole words <*t*>*io* and <*t*>*ia*. Similarly, 'nephew' and 'niece' combine the gender marker with S, again from the words <*s*>*obrinho* and <*s*>*obrinha*, followed by the height specifier. Taking the signs from the three dictionaries as a reference data set, I observed that initialisation appeared only in the later stages of LGG development. Does this indicate a new type of lexical creation? Apart from reference to family members, initialisation occurred in a few other signs, especially for toponyms and school-related concepts. Nonetheless, it remains a marginal strategy in sign creation, corresponding only to 13 of 1100 signs.

To summarise, for kinship terms in LGG, signers took advantage of an initial gestural stock for 'man', 'woman', 'child', 'same' and 'old person' to express closer kin relations through polysemic associations. Then, they combined these first signs as compounds to clarify their designations. Later, they created new signs that refer to more distant family ties, resorting to more abstract associations and initialisation.

Expanding outside of the kinship field

Other than most family members, gender marking with the signs MAN and WOMAN may refer to people concerning different personal relationships and professional activities. Here, the gender assignment would be more adjective-like, as a 'male' or 'female' value attributed to the nature of the relationship or activity.

Besides gender marking, some of the sign sources for family terms present semantic extensions that go outside the scope of kinship ties. For instance, the 'ring' in MARRIED is included in KISS^RING 'civil marriage' and CATHOLIC^RING 'catholic marriage' (in 2017). Similarly, the two joined fingers in SIBLING are polysemous in FRIEND (in 2005) and SAME (in 2006), and part of a compound in SAME^SIDE-BY-SIDE 'neighbour' (in 2005). By modifying the movement of the two fingers so that they

are pulled away from each other, signers (re)create DIFFERENT, by polysemy, DIVORCE, and by compounding KISS^DIFFERENT 'break up'. The sign KISS included in the compounds for 'break up' and 'civil marriage' was first collected in 2006 to mean 'kiss' and then by polysemy boy/girlfriend (in 2017). It is also part of two other compounds, KISS^GIVING-ARM 'fiancé' and KISS^CALL 'to woo'. Interestingly, the sign for 'kiss' with the index finger touching the lips is replaced by two finger-bunch handshapes to signify 'to date' and with a different movement 'soap opera'.

4.4.2.2 Colour terms in LGG

Like in the semantic field of kinship, the expansion of colour terms follows a diachronic sequence, as implied in the literature about synchronic hierarchies for both spoken and signed language types. Similar to the previous description on kinship terms, the current one also assumes that gestures preceded the signed forms and presents the LGG signs for colours in the diachronic order in which they are collected. In addition, it is shown here how similar motivations for colours, namely, based on football, are used to create signs in other semantic fields. At the same time, I describe different motivations, other than football-related, to refer to colours at a later stage.

Contrasting with kinship, which is initially supported by a gestural stock, the only gesture that is reliably linked to a colour is the polysemous form for both 'white' and 'black'. This gesture is incorporated into the LGG lexicon as WHITE and, with a phonological modification of WHITE, to express BLACK (Figure 86, in §3.5.2).

When I trace the colour terms across the diachronic snapshots, as shown in Figure 111, it becomes evident that the two initial colours emerged before RED, GREEN and BLUE, and then YELLOW. These four, which occur in the 2006 dictionary with WHITE and BLACK, are all based

on football references, whether the animal symbols, the jerseys or famous players. The remaining colours, collected a decade later, are (re)created with different motivations, namely by modifying the sign WHITE or by associating particular objects with their corresponding colours. The 2017 colour signs are grouped in Figure 111 according to their original motivation: football related in BROWN, derivatives of WHITE and related to coloured objects (the fruit orange, cigarette ashes for GREY and nail polish for COLOUR).

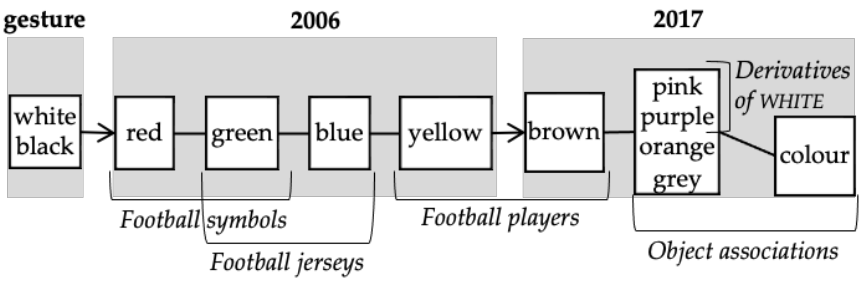


Figure 111. Chronology of emergence of colour terms in LGG, from the gestures used in Bissau to the signs collected in 2006 and 2017

Gesture sources

The first collection of LGG signs in 2005 did not contain colours. However, in the following year, deaf signers were already using six different terms, including WHITE and BLACK. At this point, the distinction between the two was not made by the movement, which involved rubbing the skin in both cases, but by the place of articulation in the forearm, whether the dorsal or the palmar side. For BLACK, the rubbing was kept on the dorsal side of the forearm, as in the most frequent gesture, in Figure 112c, while WHITE was produced instead on the palmar – and lighter – side of the forearm, in Figure 112a. This same sign refers

to 'white' in general, applied to all things, in 2006. A decade later, its meaning is specified as 'white skin', while the designation of the 'white colour' has its location altered from the forearm to the palm of the hand, in Figure 112b. To further differentiate the sign BLACK – for both the skin and the general colour term – from WHITE – also with a rubbing – it changes, in 2017, to a tapping movement, in Figure 112d.

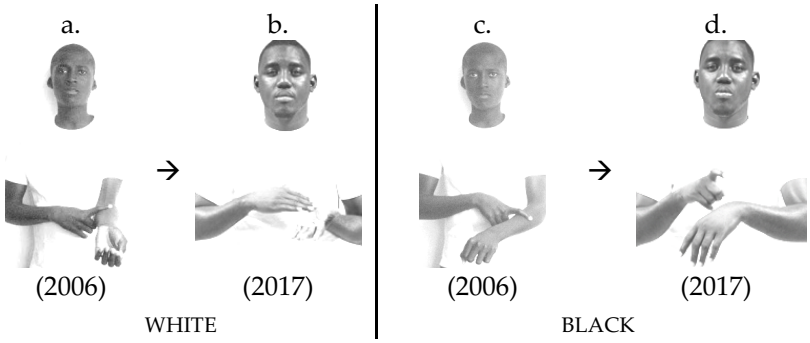


Figure 112. Signs for 'white' and 'black' in LGG, by rubbing the inner side of the forearm for 'white' in 2006 (a), and the palm in 2017 (b), and rubbing the outside of the forearm for 'black' in 2006 (c), and tapping it in 2017 (d)

Football references

From the reasoning behind the motivation of the four other colour terms, it is safe to assume that RED and GREEN were created under the same motivation. These refer to the animals symbolising the two major football teams in Portugal: the eagle of *Benfica*, whose jersey is red, in Figure 113a, and the lion of *Sporting*, whose jersey is green, in Figure 113b. These two animals were represented, respectively, by personifying the eagle's wings and the lion's claws. Following a similar etymological pattern, BLUE refers to another relevant Portuguese football team, *Porto*, whose official shirt consists of vertical stripes of blue and

white. In this case, the sign refers to the vertical stripes on the shirt rather than its animal symbol, the dragon, as in Figure 113d. These three colours and the football clubs they refer to are all recorded in the 2006 dictionary as pairs of polysemous signs.

Interestingly, in the signs for colours collected in 2017, the *claws* for GREEN had been replaced by the horizontal stripes (of green and white) of *Sporting's* jersey, in Figure 113c. In this way, signs for both BLUE and GREEN have become analogues, especially after coexisting with yellow. Also, at this stage, the wings in RED were combined with LIP as a compound, most likely to distinguish the reference to the colour from that of a bird.

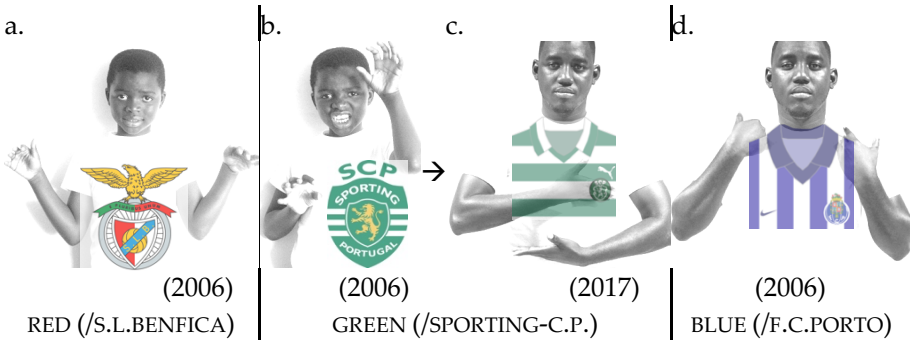


Figure 113. First three newly created signs for colours in LGG, namely by representing the eagle's wings of the football club *Sport Lisboa e Benfica* for 'red' (a), the lion's claws of the *Sporting Clube de Portugal* for 'green' in 2006 (b), its jersey's stripes for 'green' in 2017 (c), and the vertical stripes of the *Futebol Clube do Porto* for 'blue' (d)

With a different motivation, but still football-related, YELLOW refers to the sign name of Ronaldinho Gaúcho, a Brazilian player especially famous in the first decade of the 2000s. His sign name is based on his

prominent front teeth, and it refers not only to the colour of his national team jersey, 'yellow', but, as a polysemous sign, it also extends to the country he represents, 'Brazil', in Figure 114a.

In 2017, five additional signs for colours were created under different motivations. As predicted by the literature in both spoken (Berlin & Kay 1969) and signed languages (Sagara & Zeshan 2016), the new colour designations are BROWN, PINK, PURPLE, ORANGE, and GREY. The first one is still football-related since it represents the classic goal celebration by Didier Drogba, where he would run with his arms like wings, in Figure 114b.

Associating this player with 'brown' is probably because, at that time, he was one of the few famous African players in the European league. This Ivorian-renowned football player had an international career until a few years later than the player mentioned above.

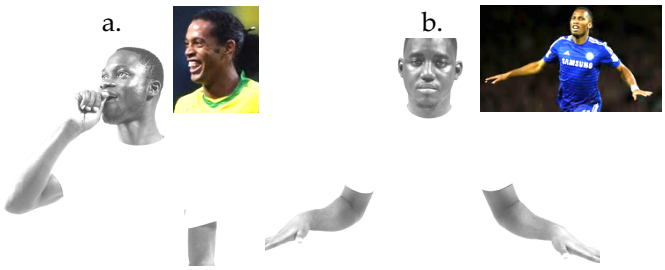


Figure 114. Signs for colours representing football players in LGG, namely for 'yellow' (a), and 'brown' (b)

The predominance of football references in the first five basic colours in LGG, after 'white' and 'black', reflects a topic favoured by men. By being rooted in male socialisation, such a topic demonstrates a

dominance of male signers in Bissau. Thus, engaged with a visually straightforward football iconography, deaf men appear to be leading the emergence of LGG. This is true for colour signs and new designations for countries associated with football. Hence, in 2006, as YELLOW is polysemous to BRAZIL, so will later BROWN derive into IVORY-COAST. Such a polysemy is distinguished by handshape modifications alone. In what countries are concerned, the first signs were motivated by the sign names of football players famous in that same first decade of the years 2000: the sideburns of Luís Figo in PORTUGAL, in Figure 115a, the baldness of Zinedine Zidane in FRANCE, in Figure 115b, and the pony-tails of David Beckham in ENGLAND, in Figure 115c.

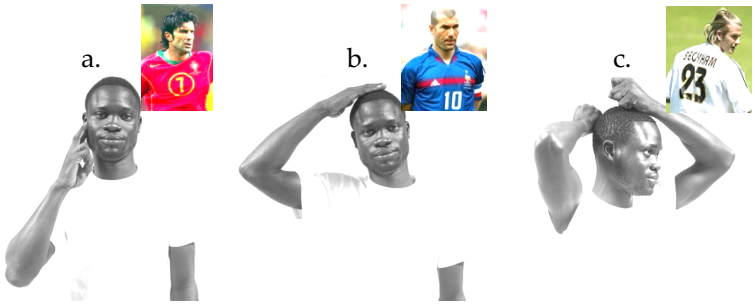


Figure 115. Signs for countries representing football players in LGG, namely Luís Figo for 'Portugal' (a), Zinedine Zidane for 'France' (b), and David Beckham for 'England' (c)

Among the country name signs collected later, in 2017, others follow that same reasoning: ITALY, in Figure 116a, depicting the soul patch beard of Francesco Totti, a well-known Italian football player; GHANA, moulding the large forehead of Michael Essien, also internationally famous as a professional football player, in Figure 116b. Similar to the enactment of the goal celebration of Didier Drogba is the one by

Samuel Eto'o to represent CAMEROON, his home country, in Figure 116c. All of these players had contemporaneous successful careers during the first decade of the 21st century. Finally, still in the football domain but not related to a particular player (so harder to situate in time), the sign for SPAIN depicts the shield logo of the Royal Spanish Football Federation, on the left side of the chest.

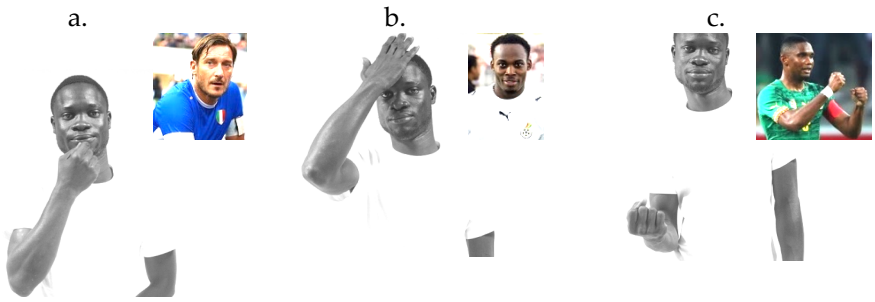


Figure 116. Signs for countries representing football players in LGG, namely Francesco Totti for 'Italy' (a), Michael Essien for 'Ghana' (b), and Samuel Eto'o for 'Cameroon' (c)

Other motivations

Resorting to a different strategy, PINK seems to derive from WHITE by changing its movement and PURPLE, in turn, derives from PINK by extending the movement as if pushing the colour further, in Figure 117c. I recall that WHITE involves rubbing the palm of the hand, in Figure 117a, while PINK is produced with a bouncing movement of the dominant hand, in Figure 117b.

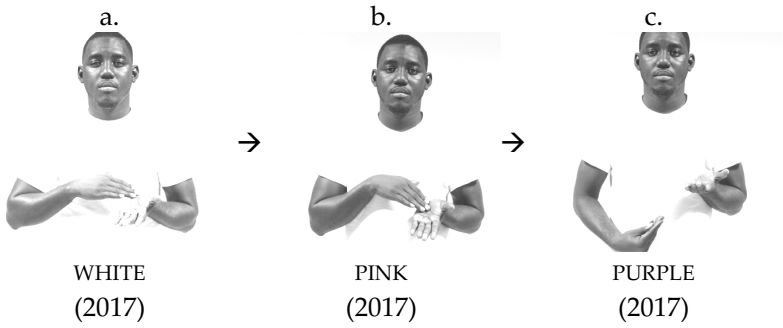


Figure 117. Signs deriving from 'white' on the palm in LGG (a), by modifying its movement for 'pink' (b), and 'purple' (c)

Following a different logic, GREY, representing the handling of a cigarette being tapped to ash it off, indicates the typically grey ashes (in Figure 118a). Also associated with the colour of a particular referent, the colour orange is, as in many other languages, designated by the fruit's name (in Figure 118b). To distinguish one from the other, the colour sign consists of a compound, COLOUR^ORANGE. This general term COLOUR is a reduced version of the act of painting nails (in Figure 118c). Since the colour orange uses this sign for disambiguation, it is safe to assume that the hypernym was probably created at this point.

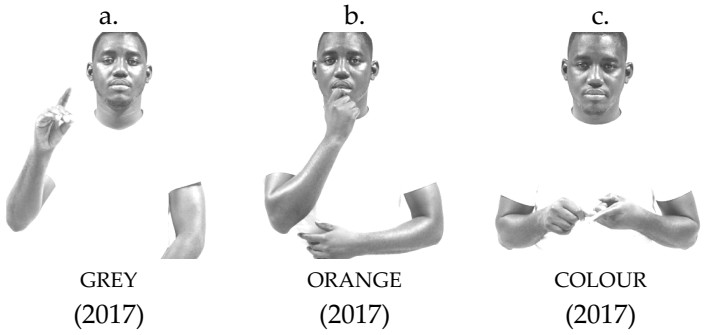


Figure 118. Signs for colours representing coloured objects in LGG, namely ashes for 'grey' (a), the fruit for 'orange' (b), and nail polish for the general term 'colour' (c)

The motivations behind the creation of colour signs consistently demonstrate a universal hierarchy. In this case, a conventional gesture provides the sequence onset with WHITE and BLACK. Together with those two basic colours, the 2006 dictionary recorded RED, GREEN, BLUE, and YELLOW. Interestingly, we see 'green' replaced later by a sign closer to BLUE. The sign YELLOW emerges at this time with a different motivation from the other three colours, associated with a famous football player. The fact that YELLOW, in 2006, and then BROWN, in 2017, as well as signs for country names, rely on personalities known for a limited period, enables a more precise identification of their creation in time in the first decade of the 2000s. Finally, the remaining colour terms collected in 2017 show a distinct set of motivations. Overall, the diachronic collection of colour signs in LGG demonstrates the emergence of a chronological sequence of colour terms.

4.5 Lexical expansion of sign families through compounding and derivation

The second analysis of the lexical expansion of LGG signs looks at the diachronic path of signs sharing formational roots. I first review the literature on compounding in both spoken and signed languages, and derivation of signed forms (§4.5.1). The analysis is described by focusing on five different groups of sign families (§4.5.2). Finally, I show how some of the gestural sources were intentionally replaced at a later stage in sensitive concepts (§4.5.3).

4.5.1 Background

Two common processes for creating new lexemes in sign languages are combining signs, in compounding, or modifying them internally,

in derivation. A lexical system in the making can be observed closely through lexical families, i.e., through clusters of words that share a semantic and a formational core. In sign languages, compounding is relatively straightforward and comparable to spoken languages (in §4.5.1.1). Derivation, however, uses formational roots that differ in type from spoken languages (in §4.5.1.2).

Both of these devices are standard lexicalisation processes in sign languages (Wilcox & Occhino 2016, 12). There are other processes to expand the lexicon, such as creating entirely new signs, using initialisation, or borrowing a foreign word. Over time, words may also be replaced due to cultural shifts affecting some concepts, namely those related to social norms, taboos, or acquired knowledge (Bowern 2019, 52, for spoken languages; Wei et al. 2018, for sign languages). Grammaticalisation, though, is likely to occur only after a basic lexicon and word sequencing structure have been established (Streeck 2021, 110).

4.5.1.1 Compounding

When tracing the earliest words in a young and emerging language, there are reasons why compounding is expected to be one of the most basic morphological constructions. Compounding seems to be the most productive (Guevara & Scalise 2009, 101), "simplest and most common means of building up meaning" (Klima & Bellugi 1979, 203), especially in new sign languages (Tkachman & Meir 2018, 2). It aims foremost at the disambiguation of existing words (Supalla & Clark 2015, 194), which are then used as the semantic basis on which a related concept gets contextually specified with the addition of other words (e.g., Morgan 2015, 12, for 'candle', in KSL, in which FLAME is combined with additional signs for colour, size and shape of the candle and the typical action of lightening it). Usually, such compounds are composed of two – or even three – free lexical items (Schmaling 2000, 127;

Lepic 2015, 10) that may result from the shortening of longer explanatory or characterising word sequences, especially in new languages (Meir et al. 2010, 311–312).

In established sign languages, signed compounds have been described in terms of their motivations (e.g., Klima & Bellugi 1979, 198–224, in ASL; Brennan 1990, 139–150, in BSL; Zeshan 2000, 82–85, in IPSL), the syntactic relationships between their members (Vercellotti & Mortensen 2012; Lepic 2023, in ASL; Santoro 2018, in *Lingua dei Segni Italiana* [LIS] and LSF), and their diachronic blending (e.g., Frishberg 1975, 707–711; Lepic 2015, 95–99, in ASL). In the African continent, types of compounds were systematised in Hausa SL (Schmaling 2000, 169–196) and their creation was analysed in KSL (Morgan 2015).

Here, I review how compounds come about in new sign languages, focusing on the semantic relationships between compound members that are likely to be established in certain conceptual classes. In particular, I look at compounds for kinds of people that include gender and age marking. Since one of the strategies in creating signs for kinship terms involves initialisation, I also review here compound types that resort to initialisation. Finally, I see how literature has approached diachronic change in signed compounds.

Semantic relationships between compound members

Semantic relationships were studied in novel compounds in English by Downing. She determined that the kind of relationship between compound members seems to depend precisely on the entity being named (1977, 831). Table 13 shows that objects are referred to in terms of their use, or function, and animals in terms of their inherent characteristics. In the column on the right, I present examples for each relationship type from the village sign language of the Al-Sayyid Bedouin tribe, given by Meir and colleagues (2010).

Table 13. **Semantic motivations of compounds** deriving from different semantic relationships between the constituents referring to distinct semantic classes (in Downing 1977, 831), with examples from ABSL (in Meir et al. 2010)

Class	Motivation	ABSL examples
Man-made objects	Purpose	MOVIE^WIDE-OBJECT 'tv'
Animals	Appearance	PECK^WINGS 'bird'
People	Gender	MOTHER^OLD 'grandmother'

In the emergence of a visual-manual system, objects can be semantically distinguished from actions by using a disambiguation strategy. In the micro-community sign language of the Al-Sayyid Bedouin (ABSL), deaf people, when naming a new object, tend to produce a string of properties related to it. For instance, for 'calendar', to which there was no conventionalised sign, they refer to its function ('telling the time'), its format ('rectangle', 'written', 'in rows') and the way it is usually handled ('flipping the pages'), in no particular order. In another example, appearing to be more conventionalised than the previous but still showing variation among signers, 'stove' is represented by a selection of a smaller number of salient properties cooccurring in different combinations and ordering, again for function ('cook'), format ('wide object') and handling manner ('turn', 'insert') (Meir et al. 2010, 311–312). If manipulable objects are referred to with an action, the disambiguation between the action and the object may rely on additional information on their format, like size and shape specifiers, as observed in the family homesign system in Zinacantán, Mexico (Haviland 2015, 78), in ABSL, in the macro-community SL of Israel (Tkachman & Sandler 2015, 26–29), and by silent gesturers in Mexico and the Netherlands (Ortega & Özyürek 2020b, 96).

By comparing different stages of conventionalisation of word combinations for naming concepts, Meir and colleagues observe that structure arises in ABSL only when similar types of words (such as function and shape of an object) are consistently selected and put together in the same order (2010, 312). A consistent ordering also emerged in the gestural system used with and by the deaf people in Amami Island, Japan, consisting of source > characteristics (form and action) > handling (Osugi et al. 1999, 104 – 105). From this, we would expect to see such types of combinations in a young sign language like LGG.

Similar to what occurs in systematic correspondences between certain semantic domains and iconic types, studies on the "precursors of compounds" show that specific types of entities consistently activate different combinations (e.g., Morford & Kegl 2004, 373–375). For instance, in the family sign languages of the San Juan Quiahije community, in Mexico, as well as in the gestural system used in Amami Island, in Japan, deaf people represent food items by typically combining information on their source, preparation, consumption and size and shape (respectively in Hou 2016, 164, and Osugi et al. 1999, 104). This is also the case with Nicaraguan homesigners, where fruit items, in particular, are represented by the way they are prepared (cut, squeezed or held) and consumed (Morford & Kegl 2004, 373).

To represent animals, deaf homesigners represent animals by their physical characteristics and typical actions (Morford & Kegl 2004, 373, in Nicaragua). As observed by Hou in the family sign languages of SJQ, the physical characteristics of animals are mostly facial and related to their size, and descriptions may additionally refer to what one does to them (2016, 149–150, 170). Therefore, I expect that LGG will also designate semantic classes in this way.

Gender and age markers

The designation of kinds of people often relies on gender and age specifications. For instance, Pepper observes that cross-linguistically many compounds in his database from 106 languages around the world refer to the gender and age of animate entities, especially in kinship and animal-related terms, like *horse^woman* 'mare' by the Brazilian Mbyá Guaraní (2020, 241, 253). Similarly, native American lexical items refer to acculturated concepts through strong naming tendencies, such as marking the gender and age size of animals, in female^horse 'mare', male^hen 'rooster' and small^cow 'calf' (Brown 2001, 1186). Also, Gavriilidou describes such a combination with gender marking for professions in Greek, like *woman^doctor* (2016, 105).

In sign language, gender marking is not always analysed as a full member of the compound. Quer, Cecchetto and Donati (2017, 243) consider it a "nominal inflection". Schmaling (2000, 168), together with age marking, regards them as "enclitic-like morphemes". Supalla and Clark (2015, 214, 226) view it as a "clitic".

It is common in sign languages for kinship terms to rely on combinations with gender, like MAN^MARRY for 'husband' (Zeshan 2000, 85, in IPSL; Vercellotti & Mortensen 2012, 561, in ASL) and WOMAN^BIRTH for 'daughter' in IPSL (Zeshan 2000, 85) and for 'mother' in LaSiBo (Tano 2016, 199), and with age, as in MOTHER/FATHER^OLD 'grandmother'/'grandfather' (Meir et al. 2010, 319, in ABSL). In addition, gender marking occurs in reference to professions, such as FEMALE^TALL^WRITE 'teacher' (Safar 2020a, 66, in YMSLs), WOMAN^SEW 'seamstress' (Figueiredo-Silva & Sell 2011, 36, in Libras) or MAN^ELECTRICITY^FIX 'electrician' (ibid., 38). Gender marking can be optional in some compounds and be employed only when the contextual distinction is needed, as an "apparent" compound. Otherwise, it can become an indispensable member of the compound (ibid., 32–34).

When gender and age are used in a compound, both spoken and signed, they tend to lose their referential properties and gain a more attributive function. Heine and Kuteva suggest that, as the paradigm increases in frequency and scope, it is more likely to be subject to semantic extension, generalisation and consequently desemanticisation and decategorialisation (2008, 148–149, 157). A good example of such an extension is gender^CHILD 'offspring' in KSL, where CHILD, typically depicting a short height, can also refer to an adult offspring.

Initialised signs

Apart from combinations of more native-like elements, which are mostly iconically motivated, there are sequences of signs that borrow linguistic aspects from the surrounding spoken language(s) (Brentari & Padden 2001). The most productive strategy of the sort employed by signers is to pair-up a native sign with the first letter of a translation from the spoken word, like UNCLE, produced on the forehead where signs for male kin members are rooted, or BLUE, made with the same movement as other colours (Frishberg & Gough 1973, 122; Padden 1998, 45–46, in ASL). Besides such an initialisation, words can also be fingerspelled, as in DEAD^E-N-D 'dead end', in which the ASL sign for 'dead' is joined with three fingerspelled letters for 'end' (Padden 1998, 53, in ASL). It is, of course, implied that the influence of the spoken language on the creation of compounds – and of signs, for that matter – is dependent on the type of contact that deaf people have with spoken and/or written words. One could then imagine that a sign language emerging in a school setting, such as LGG, tends to resort to such a strategy to create new signs.

Diachronic change in signed compounds

Although different types of compounds are constantly being created throughout language development, it can also be the case that 'older' compounds get reduced over time. The diachronic reduction of signed compounds has been typically referred to as blending (Frishberg 1975, 707–708, 710–711; Johnston & Schembri 1999, 174; Meir et al. 2010, 315). This implies a reduction of the combination as a whole and the eventual blending of the member signs of the compound into one another (Johnston & Schembri 1999, 174). This causes them to be perceived as single signs when the reduction process occurring over time camouflages the original combination of different signs. A well-known example of this is the ASL sign for 'home', deriving originally from the compound EAT^SLEEP (Frishberg 1975, 710). Otherwise, one of the constituents may be dropped, as in ~~WINGS~~^BEAK 'bird' (ibid., 709, in ASL). It remains to be seen if any phonological reduction happens in such a short period for LGG.

Overall, compounding is a recurring mechanism of specifying meanings and, in this way, expanding the lexicon, especially to disambiguate polysemous words. It can activate consistent relationships within specific semantic classes to distinguish related concepts from each other. Otherwise, the lexicon can expand through derivational processes.

4.5.1.2 Morphological derivation in signs

In signs, derivation involves the modification of an internal segment to express a new meaning (Quer et al. 2017, 188–189). Some minimal units, namely concerning specific locations (or places of articulation), handshapes and movements tend to link families of signs (Frishberg & Gough 2000 [1973], in ASL; Zeshan 2000, 28–33, in IPSL). Even though in sign linguistics the term 'derivation' still lacks consensus, I will use

it here to refer to the establishment of form contrasts. Given that the notion of derivation implies a root, i.e., a minimal meaningful unit, and an affix modifying the meaning of that root, I review here the designations that have been proposed for such a process in signs.

Within signs, derivational processes are likely to cooccur simultaneously, unlike the typical concatenative affixation in spoken words. Moreover, minimal form units of signs – handshape, location, orientation, movement and non-manual features – are often meaningful (Supalla 1986, 182). When minimal units of signs share the same meaning within a group of signs, they are *morphologically preserved* or *motivated*, such as basing the male/female distinction in ASL on different body locations: 'male' on the forehead and 'female' on the chin (Frishberg 1975, 714–716). With this in mind, Johnston and Schembri suggest that signs are morphologically complex, i.e., multimorphemic (1999, 131), and, thus, the minimal units function simultaneously as both phonemes and morphemes as *phonomorphemes* (ibid., 118).

By considering the role of these minimal units in combining to form new words, they have also been called *ion-morphs* by Fernald and Napoli (2000, 36–37). Here, the forehead for 'male' and the chin for 'female' would be such ion-morphs that can combine with the open palm with the meaning of parent for 'father' and 'mother'. Similarly, Zwitserlood and colleagues (2021) and van der Kooij and colleagues (2023) propose designating such sub-sign elements – whether individually or as clusters – as *form-meaning units*, or *FMUs*.

Based on the intuition that words related in meaning are also related in form (Anderson 1992, 71), language users establish paradigms as part of form-related semantic *gestalts*. They begin by recognising morphological patterns of fixed and variable elements, also in sign languages (Lepic & Occhino 2018, 153, following a usage-based theory of Construction Morphology). Then, they rely on such "schematic

morphological constructions" as templates to derive new signs from (Lepic 2015, 98), by selecting a restricted set of affixes (Fernald & Napoli 2000, 37).

To address the particular mechanism of deriving some minimal units from others in signs, Liddell and Johnson distinguish fixed ones that stand for the root of the sign, calling them *incomplete S(egmental)-morphs*, from units that are modified, which they designate as *P(aradigmatic)-morph* (1989, 254–257). These P-morphs are then the derivational affixes. This type of morphological process is based on the notion that, within a word, there are parts, i.e., morphemes, that are attached to others. The attached parts, the so-called *affixes*, do not occur by themselves and are thus bound morphemes to a root (zooming in on the internal structure of a word) or a stem (zooming out to the relationship to its affix) (Aronoff 1994, 40). Despite the attempts to assign new labels to a modality-specific phenomenon, Lepic suggests that, in the end, *affixation*, as a general term, does fit well with the non-concatenative derivation that occurs in signs (2015, 163). For "ease of exposition", as recognised by Napoli, these can be seen as *root* and *affix* (2019, 604).

Morphological roots can be formed from any of the three main phonological parameters: locations, handshapes, and movement. In what concerns the latter, movement oppositions, such as in GOOD / BAD, or COME / GO, constitute small clusters of signs related in form and meaning (Frishberg & Gough 2000 [1973], 105–106, in ASL).

Handshapes can be the linking element in a family of signs. In this line of thought, entity handshapes can also form a lexical family, as in  for FORK and PLUG (Zwitserlood et al. 2021, 16–17, in NGT). In addition, such a handshape may represent the human legs in activities deriving into JUMP, FALL and WALK (Meir 2012, 80, in ISL), or the eyes into SEE, LOOK, and SIGHTSEEING (Frishberg & Gough 2000 [1973], 113–114, in ASL).

Finally, there are meaningful locations on the body that can project a diversity of related concepts, as observed recurrently across sign languages. Sometimes, different families of signs are rooted in the same location. This is the case of the forehead for signs of mental activity, such as THINK and KNOW (Zeshan 2000, 30, in IPSL; Lepic 2015, 155–156, in ASL; Morgan 2022, 508, in KSL), and for signs representing horns, as in COW and BULL (Zeshan 2000, 23; Morgan 2022, 509, in KSL).

Figure 119 shows the mouth as a phonomorphological root, deriving into ASL signs related to communication, like TALK, SHOUT and ANSWER (Lepic & Occhino 2018, 156). It can also derive into ASL signs related to the consumption of food and drinking, such as EAT, TASTE and DRINK (Lepic & Occhino 2018, 156). Finally, Figure 119 illustrates ASL signs stemming from the mouth for types of beaks to refer to different birds, like BIRD, DUCK, PARROT and EAGLE (Fernald & Napoli 2000, 28–29). In sum, these clusters select distinct schematic constructions sharing the same root location.

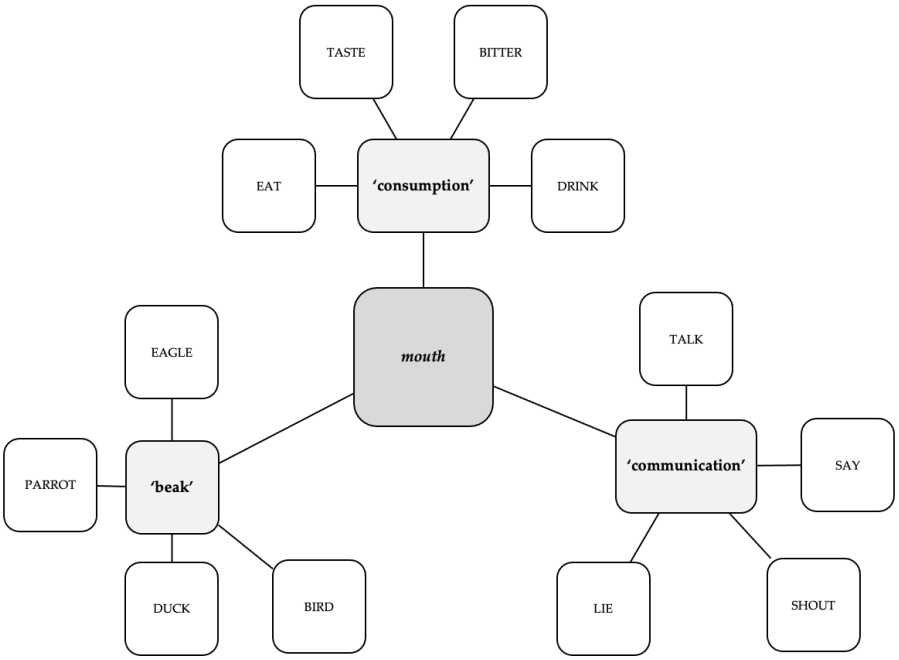


Figure 119. Families of signs rooted in the mouth (in dark grey and italic) involving terms related to the concepts of consumption, communication and beaks (in light grey and between single quotes), with examples from ASL, with their lexical meanings in glosses (based on data from Lepic & Occhino 2018, 157)

In a modality-specific way, i.e., in a signed system, minimal units constituting a sign, such as handshape, location, or movement, may simultaneously modify to derive new signs. In such a concomitant derivational process, some elements are fixed and others vary, entwined with one another. Given the different proposals of terminology for this process, I henceforth opt to use phonomorphemes to refer to the minimal units, for easier interpretation. In addition, I distinguish fixed and variable phonomorphemes as roots and affixes.

Both derivational processes, rooted in specific phonomorphemes, and combinations of certain semantic relationships in compounding are very productive in sign languages. However, only compounds have been described in emerging signed lexicons, and scarcely. I wonder then how these morphological processes functioned in the first years of LGG emergence.

4.5.2 Lexical expansion of sign families in LGG

In this subsection, I show that signs that derive from gestures are fruitful in serving as a basis for expanding into new signs. To illustrate how signers rapidly expand their lexicon from gestural sources, I pinpoint five groups of sign families (13 sign families in total) and describe the morphological processes established therein. These five types of families are organised from those favouring compounding to those presenting more derivation. Thus, to find out how these strategies are deployed for different sign families over time, I detail for each one the processes of derivation (expressed by single glosses) and compounding (represented by a combination of glosses followed by the corresponding meaning in single quotes).

Specifically, I profile compounds using SICK, FEVER, and WORK as hypernyms (§4.5.2.1). Then, I describe sign families deriving from polysemous gestures, *thumb(s) up*, *palm(s) up*, and *go away*. These extend especially by compounding but also by derivation (§4.5.2.2). Next, I demonstrate how signs rooted in the height specifier unfold through both derivation and compounding (§4.5.2.3). Subsequently, I present sign families expanding from four meaningful body locations. Although the gesture-to-sign variants prompted by 'chief' are exploited as derivatives of a form-meaning unit rooted on the shoulder(s), they are mostly combined with other signs in LGG.

In contrast, the remaining three body locations show a preference for derivation. These correspond to the forehead for cognition, which includes CRAZY, the chest for feelings, including FRIEND, and the sign family of TALK (§4.5.2.4). Lastly, I describe signs based on specific handshapes favouring derivation, namely handshapes depicting *cutting tools* and *claw*(s). Here, I also refer to the sign family of *wings*, which resorts instead to compounding, as an additional illustration of how animal designations may expand over time based on those two gesture sources (§4.5.2.5).

I recall that the analysis of the lexical growth is based on the three documentation periods that occurred during the emergence of LGG (§2.3), which enables the capture of the primary lexical stock and the strategies used by deaf signers to (re)create new signs. I do not address polysemy as a separate process but rather as a mechanism leading to the need for disambiguation through form modifications, involving derivation and compounding.

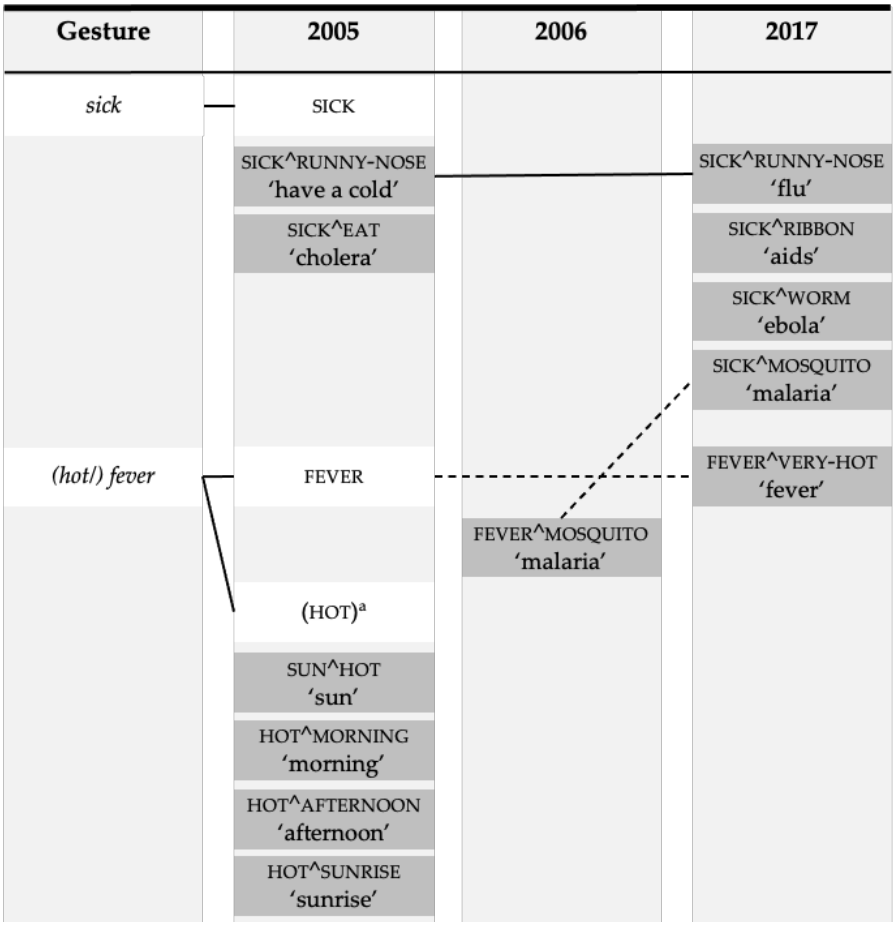
4.5.2.1 Signs SICK, FEVER and WORK for hypernymy

In the first of the five groups of families of signs, I focus on three signs-from-gestures that, when integrated into the LGG lexicon, desemanticise and become hypernyms. In these cases, they are exclusively part of compounds, as shown in Table 14. Here, the gesture forms functioned as LGG signs as early as 2005 (in the second column). Across the three families, it becomes evident that they are extended through compounding in the very beginning, especially in (*hot*/) *fever*, and later on, in 2017, as shown by the compounds involving SICK and WORK. The families of SICK and FEVER are presented together in Table 14a because the compounds for 'malaria' rely on both signs at different periods. Importantly, I represent the polysemous signs for the concepts of 'hot' and 'fever' (in Table 14a), on one side, and 'sweat' and 'work' (in Table

14b), on the other side, with different glosses expressing their two meanings.

Table 14. **Family of signs of SICK, FEVER (a) and WORK (b)** in LGG, expanding from gestures through the signs collected in 2005, 2006 and 2017; the white boxes correspond to the gesture sources and their sign counterparts and the grey boxes to compounds; the straight lines indicate equivalent forms and the dotted lines equal meanings with form modifications

a.



	HOT^SUNSET 'sunset'		

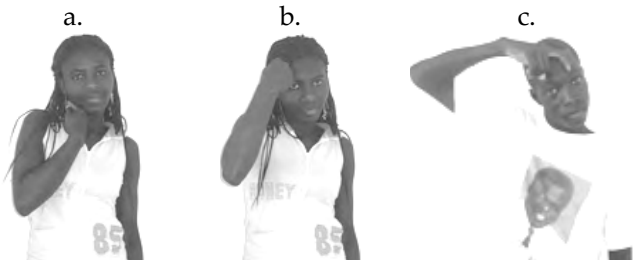
[a] *HOT has the same form as FEVER, but is glossed differently to express another meaning*

b.

Gesture	2005	2006	2017
(sweat/) work	(SWEAT)[b]		
	SWEAT^HEAT1 'heat'	SWEAT^HEAT2 'heat'	SWEAT^HEAT2^ HEAT1 'heat'
	WORK		WORK^RUN-ABOUT 'work'
			WORK^CLOTHES-SEW 'sewer'
			WORK^WASH-FLOOR 'maid'
			WORK^CLOTHES^WASH 'laundress'
			WORK^NEWSPAPER 'journalist'
			WORK^CUT-TREE 'lumberjack'
			WORK^RELATE 'business person'
			WORK^WHITE-LAND 'farmer'

[b] *SWEAT has the same form as WORK, but is glossed differently to express another meaning*

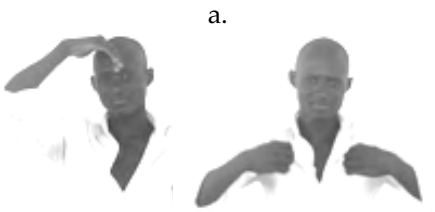
As early as 2005, the signs SICK and FEVER were incorporated directly from their gesture sources, i.e., maintaining the same form and meaning, in Figures 120a and 120b. Similarly, the act of wiping the sweat off the forehead was integrated into LGG as a single sign to express 'work', in Figure 120c.



a. SICK (2005) b. FEVER (2005) c. WORK (2005)

Figure 120. Signs adopted from gestures for the hypernyms 'sick' (a), 'work' (b), and 'heat' (c) in LGG in 2005

Besides referring to WORK, wiping the sweat off the forehead is also integrated as part of a compound to express its more literal meaning, 'heat'. Over the years, the signs involved in that combination varied between shaking the shirt, in 2005 (in Figure 121a), flapping the hands, in 2006 (in Figure 121b), and using both of them, in 2017 (in Figure 121c).



a.

(2005)
SWEAT^HEAT1 'heat'

b.

(2006)
SWEAT^HEAT2 'heat'

c.

(2017)
SWEAT^HEAT2^HEAT1 'heat'

Figure 121. Signs combining with wiping the sweat off the forehead in LGG for 'heat' in 2005 (a), in 2006 (b), and in 2017 (c)

Compounds with SICK

The sign SICK occurs in the 2006 collection to mean the state of being affected by some illness. Still, it had been specifying different kinds of diseases through compounding since 2005. As part of a compound, it typically precedes the cause, a symptom or the symbol of a disease, as in SICK^MOSQUITO 'malaria', in Figure 122a, SICK^WORM 'ebola', in Figure 122b, SICK^NAUSEOUS 'colera', SICK^RUNNY-NOSE 'flu', in Figure 122c, and SICK^RIBBON 'aids', in Figure 122d.

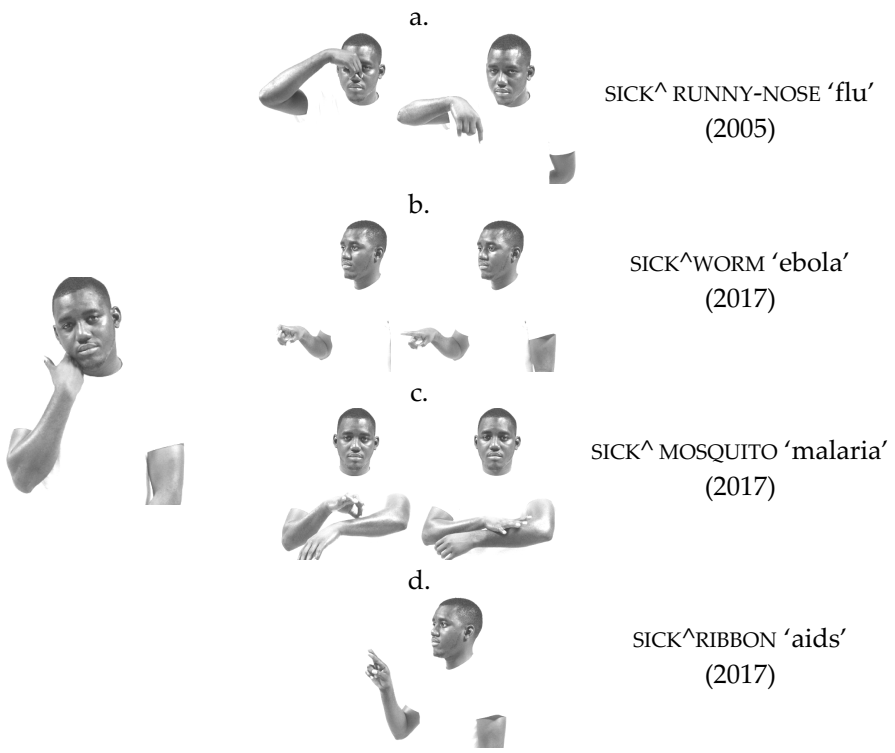


Figure 122. Signs combining with SICK in LGG for 'flu' (a), 'ebola' (b), 'malaria' (c), and 'aids' (d)

Compounds with FEVER (or HOT)

In 2005, besides the sign FEVER, this form expressed the additional meaning of 'hot' to designate SUN^HOT 'sun', in Figure 123a. Based on this concept, it was combined with signs for different periods of the day in the compounds HOT^MORNING 'morning', in Figure 123b, and HOT^AFTERNOON 'afternoon', in Figure 123c. The sign pointing to the sun for daytime with a movement upwards referred also to 'sunrise', and with a movement downwards to HOT^SUNSET 'sunset'.

a.

SUN^HOT 'sun'
(2005)

b.

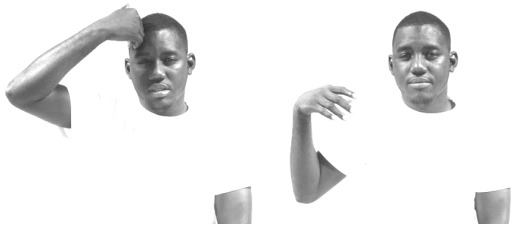
HOT^MORNING 'morning'
(2005)

c.

HOT^AFTERNOON 'afternoon'
(2005)

Figure 123. Sign compounds with HOT in LGG for 'sun' (a), 'morning' (b), and 'afternoon' (c)

Otherwise, it occurred in 2006, in FEVER^MOSQUITO 'malaria', which was replaced by SICK^MOSQUITO 'malaria' in 2017. Curiously, also, in 2017, 'fever' was further specified by turning it into a compound in FEVER^VERY-HOT, in Figure 124.



FEVER^VERY-HOT 'fever'
(2017)

Figure 124. Sign compound with FEVER in LGG for 'fever'

In brief, feeling the forehead with the back of the fingers refers to the heat of one's body, in 'fever', but also to the heat of the environment, from the sun.

Compounds with WORK

The third hypernym came into the LGG lexicon, from the gestural form wiping the sweat off the forehead, as the sign WORK and as part of the compound SWEAT^HEAT 'heat'.

As shown in Table 15, it was only in the 2017 dictionary that WORK became a more general term classifying different professions. At this point, most professions characterised by their most current activity or object were preceded by WORK.

The first row of Table 15 demonstrates how, in 2005, the first occupations documented in LGG were 'teacher' and 'doctor', the only ones in the data marked for gender. In 2006, the collection included professional activities consisting of simple descriptions of their typical actions. In 2017, there were also professional activities that do not rely on WORK, but combine, instead, the object and the activity. The last row of Table 15, with the grey shade, shows how work became used as a hypernym.

Table 15. **Types of compounds for professional activities** in LGG with different combinations over the years, including with WORK to designate the class of professions in 2017, in grey shade

Motivation	Compound	Meaning	
gender^activity	MAN / WOMAN^WRITE	*Teacher*	2005
gender^object	MAN / WOMAN^SYRINGE	*Doctor*	
object^activity	SHOE^FIX	*Shoemaker*	2006
	SHOE^POLISH	*Shoe polisher*	
	SHAPE^SCULPT	*Sculptor*	
	BOOK^CUT	*Paper cutter*	2017
	CAR^FIX	*Mechanic*	
	WATER^FIX	*Plumber*	
	PLANT^CUT	*Gardener*	
	FISH^CAST-NET	*Fisherman*	
class^activity	WORK^WASH-FLOOR	*Maid*	
	WORK^WASH-CLOTHES	*Laundress*	
	WORK^CHOP-TREES	*Lumberjack*	
	WORK^PLOUGH	*Farmer*	
	WORK^DEAL	*Business person*	
class^object	WORK^NEWSPAPER	*Journalist*	
class^object^activity	WORK^CLOTHES^SEW	*Sewer*	

Not so often, professions are designated by the object or the activity alone, as CARPENTER, in 2006, and REPORTER, BRICKLAYER, SALESPERSON and FASHION-MODEL by their usual activities, in 2017. Another strategy is to describe the typical clothing, as in LAWYER. Importantly, in the latest dictionary, signers distinguish the sign for the general class of professions from the verb 'to work', by turning it into a compound as well, in Figure 125.

WORK^RUN-ABOUT 'to work'
(2017)

Figure 125. Compound for 'to work' in LGG

To conclude, the gestures for SICK, FEVER and WORK, which had straightforward incorporations into LGG, were generalised as lexical items to encompass semantic classes. The first labelled diseases, the second day periods, and the third professions, by preceding signs of the same class in compounds. Compounding was the only process deployed in this sign-family type. Here, the hypernym signs did not undergo any derivational modification. In a different way, other sign types may trigger derivation as well, like those described next.

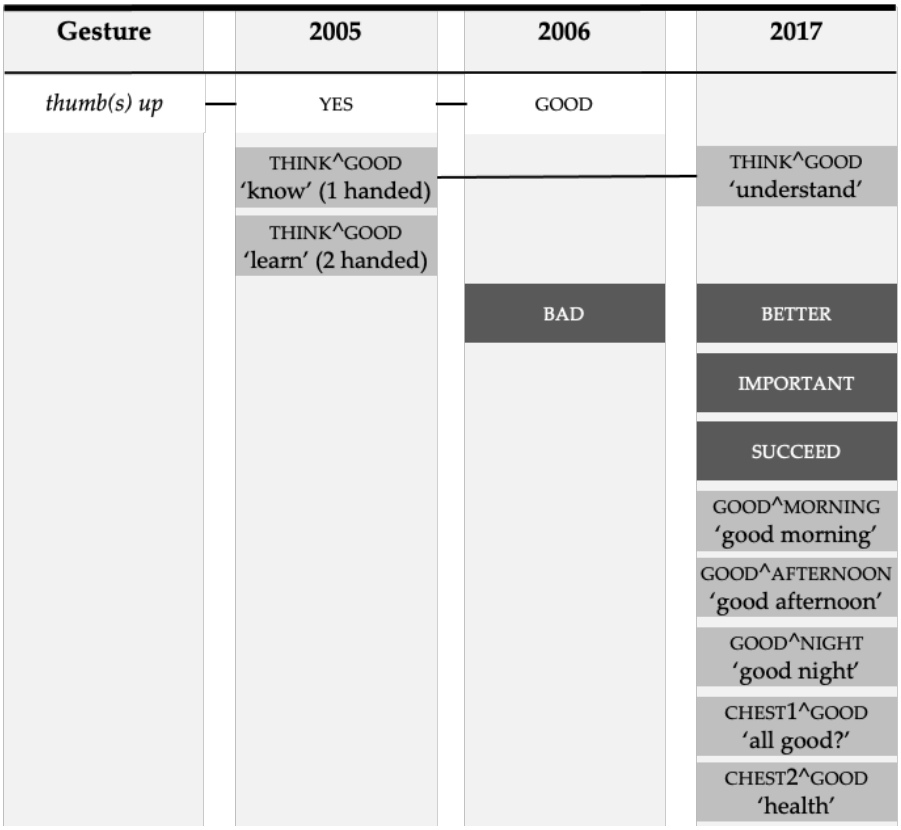
4.5.2.2 Sign families of thumb(s) up, palm(s) up, and GO-AWAY

In this second group of sign families deriving from polysemous gestures, compounding is still the most favoured process, especially in the *thumb-up* family. However, derivation also occurs in all three clusters. Table 16a shows how the *thumb(s) up* is polysemous in the first two years and then modifies through derivation. As compounds, this item combines with other signs to express distinct evaluative concepts, as seen in the 2005 and 2017 columns. The *palm(s)-up* form is also the source of derivation and compounding to convey different wh-questions (in the last column), as shown in Table 16b. Finally, Table 16c demonstrates how, in the 2006 column, GO-AWAY extends semantically

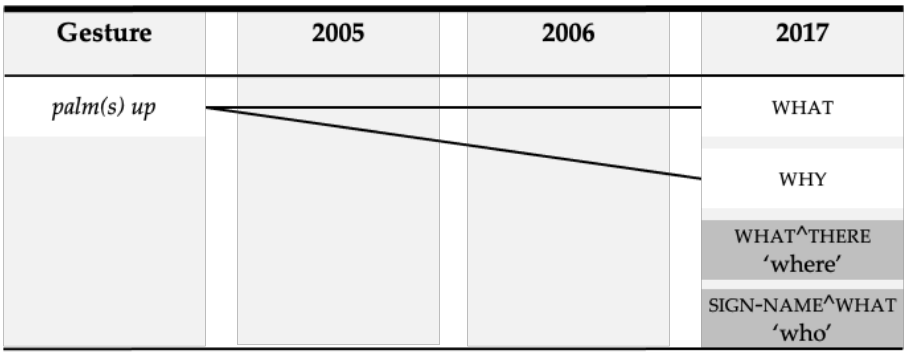
through derivation, while in the last column, it relies instead on compounding.

Table 16. **Sign families of GOOD (a), WHAT/WHY (b), and GO-AWAY (c)** in LGG, expanding from gestures through the signs collected in 2005, 2006 and 2017; the white boxes correspond to the gesture sources and their sign counterparts, the light grey boxes to compounds; and the dark grey boxes to derivatives; the straight lines indicate equivalent forms

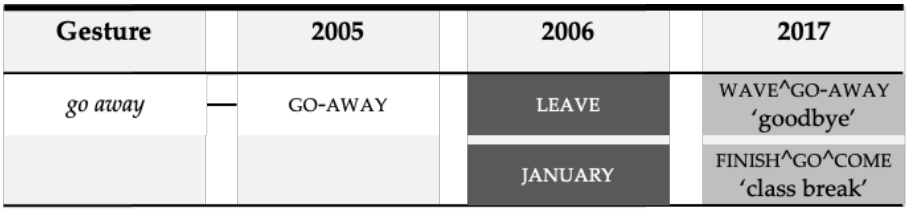
a.



b.



c.



Sign family of thumb(s) up

The first sign family described here is based on the *thumb(s) up* as one of the most polysemous gestures collected in Bissau. As described in Chapter 3, it is used for 'please', 'beg', 'thank you', 'sorry' and 'all good'. For these meanings, only the latter was turned into a sign as part of a compound, in Figure 126a. To refer to the related concept of 'health', the original form was modified in the handshape for CHEST, in Figure 126b. Apart from 'all good', the remaining expressions of

salutation also rely on good, in GOOD^MORNING, GOOD^AFTERNOON, and GOOD^NIGHT. However, I recall that these are likely borrowed from LGP, at least in terms of the signs for parts of the day. The *thumb up* corresponds instead to a widespread form that occurs in both LGP and as a gesture in Bissau.

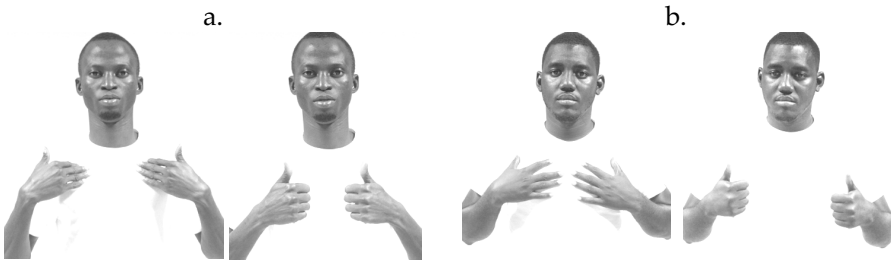


Figure 126. Signs combined with GOOD in LGG for 'all good' (a) and 'health' (b) in 2017

In the first two collections of LGG signs, in 2005 and 2006, GOOD as a single sign was glossed as 'yes', in Figure 127a. This form was, however, replaced by a different sign in 2017, in Figure 127b. Also in 2005, a few verbs combined with the *thumb(s) up*, such as THINK^GOOD 'know (of knowledge)', with one hand, and 'learn', with two hands, and SEE^GOOD 'know (a particular person, place or thing)'. By 2017, the *thumb(s) up* had been dropped in all three concepts, but it was added in SMELL^GOOD.

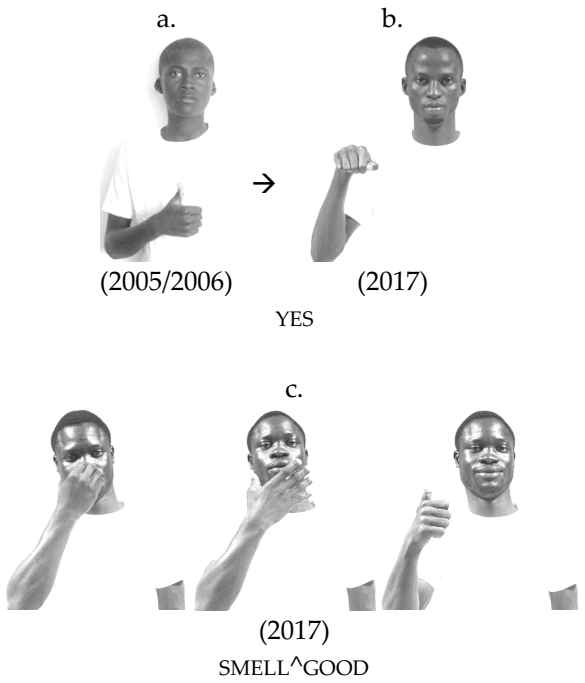


Figure 127. Signs with the *thumb(s) up* in LGG, for 'yes' in 2005 and 2006 (a), and 2017 (b), and 'smell good' in 2017 (c)

A few adjectives were combined with the *thumb(s) up* as well. The compound FACE1^GOOD 'beautiful' remained identical throughout the years, in Figure 128a. Others were added only in the latest dictionary, such as FACE2^GOOD 'important person', where the handshape changed slightly in FACE and the facial expression was produced differently in GOOD, in Figure 128b. Interestingly, BEHAVIOUR^GOOD 'well behaved', in Figure 128c, was modified to GOOD^BAD 'badly behaved', in Figure 128d.

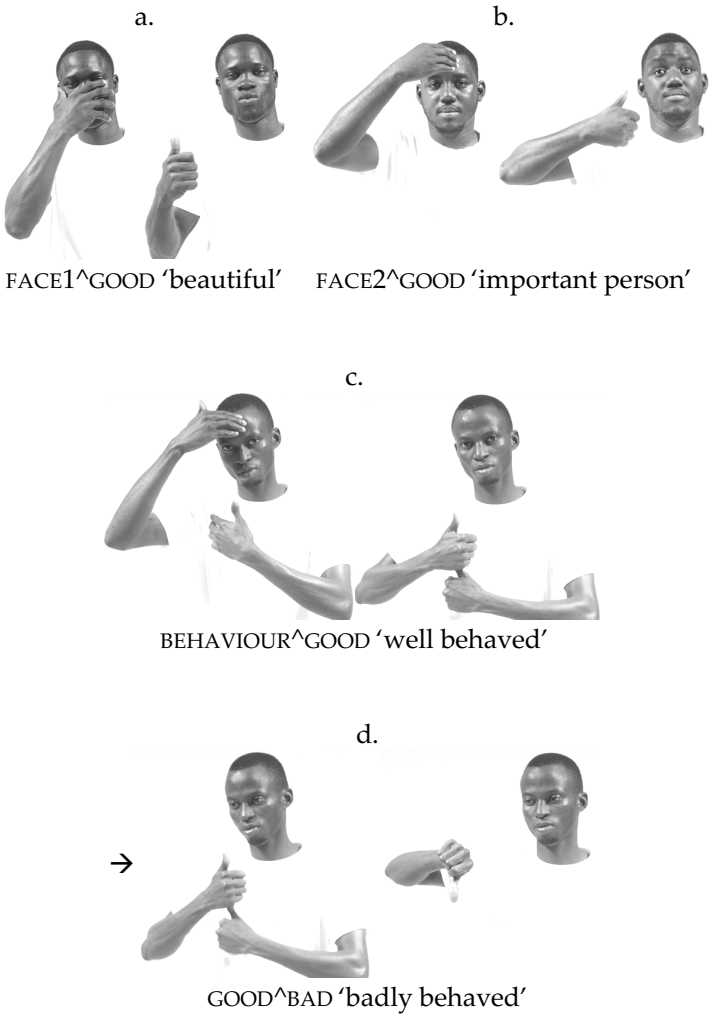


Figure 128. **Signs combined with GOOD** in LGG as adjective-like for 'beautiful' (a), 'important person' (b), 'well behaved' (c), and 'badly behaved' (d), all collected in 2017

Besides these compounds involving GOOD, the *thumb(s) up* can modify its movement and be combined with different facial expressions to contrast meanings and grammatical categories, as shown in Figure 129.

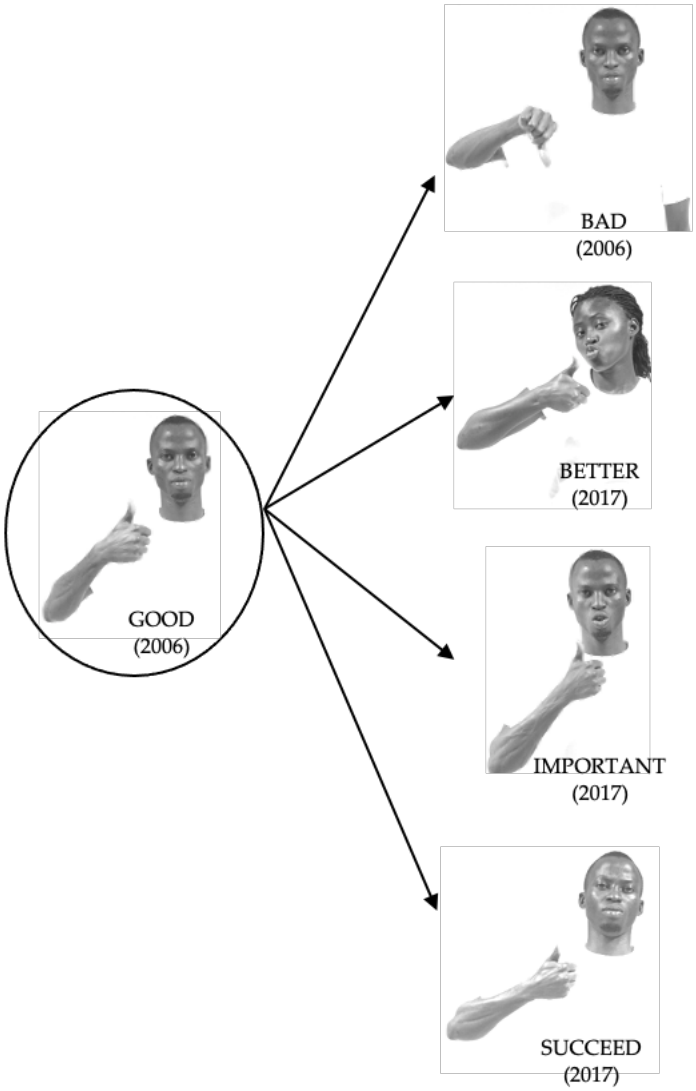


Figure 129. Signs deriving from GOOD in LGG for different grammatical categories, modifying in movement and facial expression

Sign family of palm(s) up

The second sign family is also based on a polysemous gesture. The *palm(s) up* encompasses different meanings in Bissau: 'what', 'why',

'where', and 'how', as shown in Figure 130. Although the one-handed variant is also used as a gesture, deaf LGG signers adopt both two-handed variants. They turn their hands for 'what' and clap their palms before turning them for 'why'. To distinguish these from other wh-questions, signers combine the *palms up* in different compounds for 'who' and 'where'.

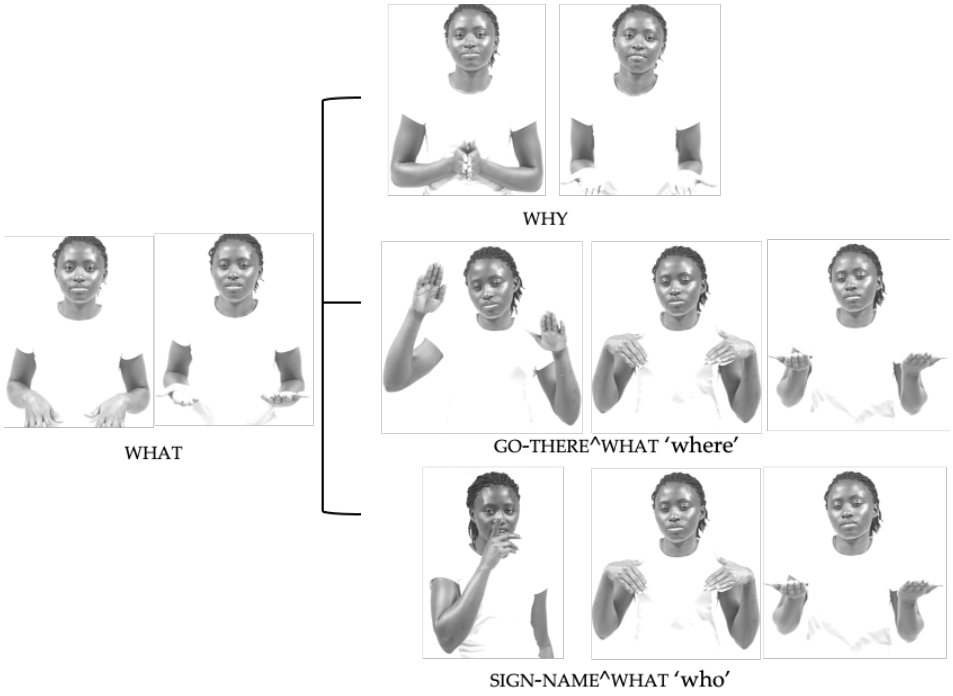


Figure 130. Family of signs deriving from the *palms up* in LGG, including the signs for 'what', 'why', 'where', and 'who', all collected in 2017

Sign family of GO-AWAY

The third and final sign family in this group involves another gesture presenting some polysemy in Bissau. As a gesture, *go away* is

associated with both 'escape' and 'steal'. As a sign, GO-AWAY was integrated into LGG as early as 2005, in Figure 131a. In the collection of the following year, a form modifying its usual place of articulation was recorded for 'January', meaning '(when the old year) goes away', in Figure 131b. In the latest dictionary, such a form is again modified by adding a base hand to designate 'to leave', in Figure 131c.

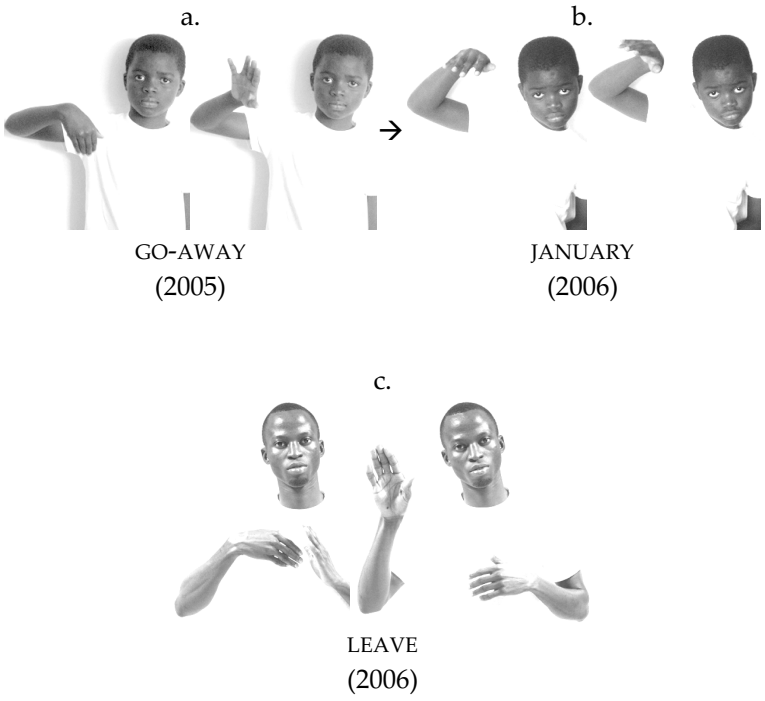


Figure 131. Signs deriving from GO-AWAY (a), namely JANUARY (b), and LEAVE (c) in LGG

As January refers to the 'going away' of the old year, so do all other months rely on polysemy. Thus, in due order, from the second month of a Guinean year onwards, there is the 'carnival' period, the 'warm' weather, the 'cashew' season, the 'rainy' period, 'foli fruit' season,

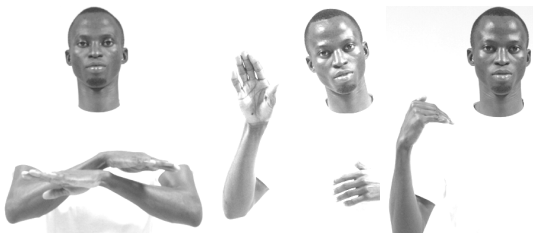
'corn' season, 'hard rain' period, 'peanut' season, 'school' year starting period, catching 'fish' season, and partying holidays with 'champagne'.

Since the earliest LGG collections, the sign for 'goodbye' has been expressed by waving. Later, in 2017, it was combined with GO-AWAY, in Figure 132a, to distinguish it from a similar waving for 'hello'. At this same stage, another compound was formed for 'class break' involving GO-AWAY, in Figure 132b.

a.

WAVE^GO-AWAY 'goodbye'

b.



FINISH^GO-AWAY^COME 'class break'

Figure 132. Signs combining with GO-AWAY in LGG for 'goodbye' (a), and 'class break' (b) in 2017

These three examples of polysemous gesture sources show how they can extend through derivation and compounding to encompass related meanings. Of all three, the *palms up* was the most productive in

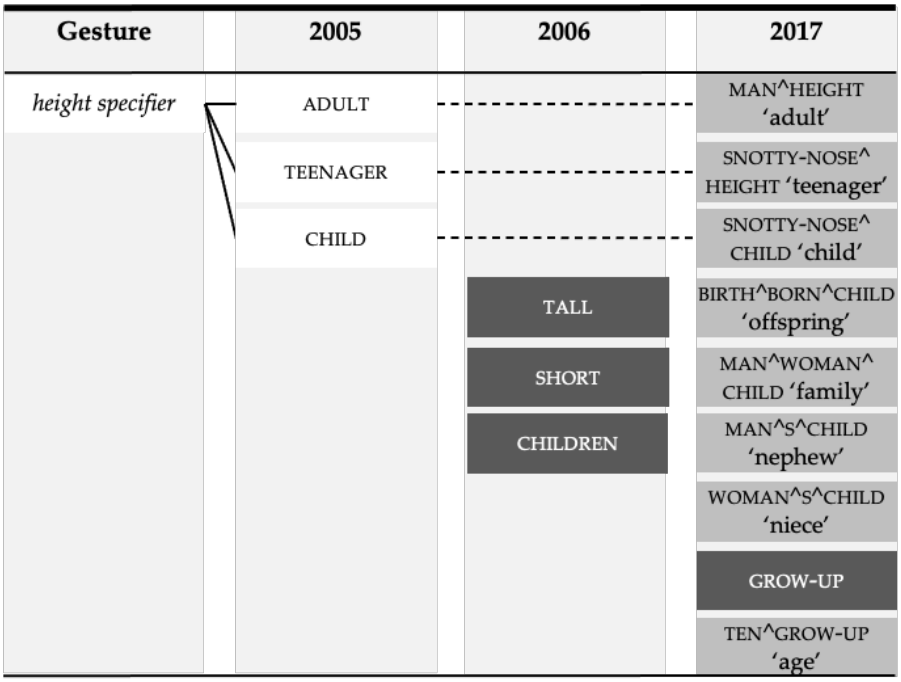
terms of the size of its family of signs in the first decade of LGG collection. As a gesture, it was also the most polysemous form.

4.5.2.3 Sign family of the height specifier

The third group in this cluster corresponds to the sign family expanding from the height specifier for human referents, which is expressed as a gesture in Bissau by a closed fist with different heights. The data is first described by the more literal senses of signs specifying the actual height. Then it focuses on age-related signs. In the end, I show how the height specifier for non-human referents was integrated into the LGG lexicon.

The signs expressing people's height are equally produced with the fist and delimited between the hand and the ground. Such a handshape could be interpreted as a human head. It is used as a gesture in Bissau, especially for children and male adults. Table 17 illustrates how such a gesture is adopted as a sign, in the 2005 column, to represent three age groups. The 2006 column shows derivational extensions referring to actual height and plural marking. Finally, in 2017, besides modifying to express a verbal form, it combines with different signs to clarify age groups and kin members, especially those involving the shorter height specifier in CHILD.

Table 17. **Sign family of the height specifier** in LGG, expanding from gesture through the signs collected in 2005, 2006 and 2017; the white boxes correspond to the gesture source and their sign counterparts, the light grey boxes to compounds; and the dark grey boxes to derivatives; the straight lines indicate equivalent forms and the dotted lines equal meanings with form modifications



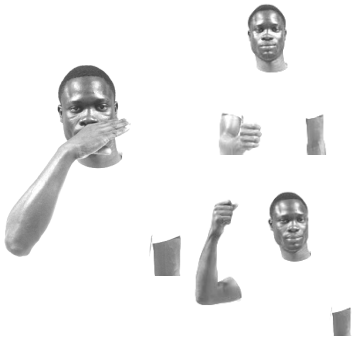
Height-related adjectives

Initially, in 2006, the same polysemous forms referred to different heights and the corresponding age groups in LGG. It was only later, during the 2017 collection, that such polysemy was distinguished by particular facial expressions in SHORT, in Figure 133a, and TALL, in Figure 133b.

Figure 133. Signs deriving from the height specifier in LGG for 'short' (a) and 'tall' (b) collected in 2006, and showing distinct facial expressions in 2017

Specifying age

With the intent to set apart such polysemous forms, different age groups were also specified later through compounding. In this way, the height levels for 'child' and 'teenager' collected in 2005 were both combined with SNOTTY-NOSE, IN 2017, respectively, in Figures 134a and 134b. Similarly, the highest height specifier, was registered in 2005 as ADULT. As a gesture, it was often accompanied in Creole by *omi garandi*, meaning 'big man', which comes to be represented by the corresponding compound MAN^HEIGHT 'adult', in 2017, in Figure 134c.



c.

(MAN^)TALL ‘adult’
(2017) 2005

Figure 134. Signs combining with the height specifier in LGG for different age groups of people, namely for ‘child’ (a), ‘teenager’ (b), and ‘adult’ (c)

The height specifier generalises semantically by coming to mean ‘to grow up’ with a continuous movement upward, from the lower to the higher position found in gestures, in Figure 135a. This same concept of growing up signifies ‘age’ if preceded by TEN in a compound, in Figure 135b.

a.

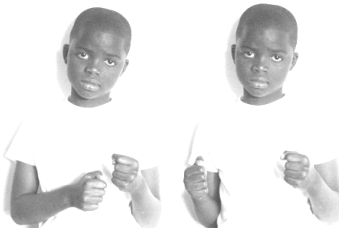
GROW-UP
(2017)

b.

TEN^GROW-UP ‘age’
(2017)

Figure 135. Desemanticisation of the height specifier in LGG in the signs for ‘grow up’ (a) and ‘age’ (b)

In addition, to inflect for plural in CHILDREN, the lower height designating ‘child’ is reduplicated with both hands in the 2006 collection, in Figure 136, and by movement with one hand in the latest dictionary. Finally, CHILD is further specified through compounding to designate kin terms, BIRTH^CHILD ‘offspring’, and (gender^)S^CHILD ′nephew/niece’.

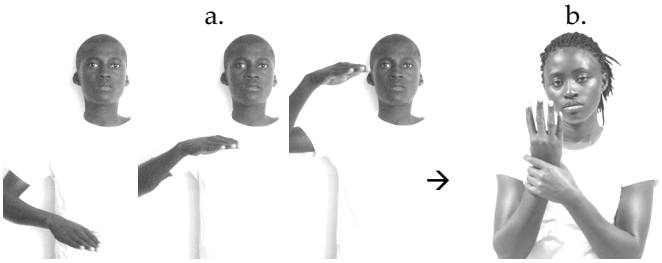


CHILDREN
(2006)

Figure 136. Inflection of the height specifier for plural in LGG in the sign for ‘children’

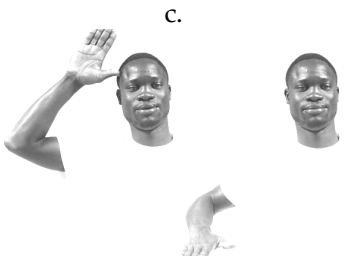
Specifying non-humans

The height specifier for non-human referents is used for plants in the 2006 collection, in Figure 137a. However, the sign is replaced later, in 2017, by an entity handshape, i.e., the hand represents the shape of the plant, in Figure 137b. It is also at this stage that the sign for 'animal' is collected. In the latest dictionary, such a concept is expressed by the compound EAR^ANIMAL-HEIGHT, in Figure 137c.



(2006) (2017)

GROWING-PLANT



(2017)

EAR^ANIMAL-HEIGHT 'animal'

Figure 137. Signs deriving from the non-human height specifier in LGG, namely for 'growing plant' in 2006 (a), replaced by a different sign in 2017 (b), and for 'animal' (c)

In sum, the height specifier produced with the fist for human referents unfolds into various signs to designate different concepts while distinguishing grammatical categories. The use of particular facial expressions contrasts the adjectives SHORT and TALL. The verb GROW-UP is specified with a movement. The plural in CHILDREN is expressed by reduplication. Finally, different age groups (CHILD, TEENAGER and ADULT) – and kinship members (OFFSPRING and NEPHEW/NIECE) – are clarified through compounding. The height specifier for non-human referents is not as productive. Nonetheless, it occurs initially in the designation of plants and later in that of animals.

Within the family of signs rooted in the height specifier, two signs mark semantic classes, such as SNOTTY-NOSE for an underage person and EAR^ANIMAL-HEIGHT for animal type. Such signs function as hypernyms as described previously in the first group.

4.5.2.4 *Sign families of meaningful body locations: CHIEF, CRAZY, FRIEND, and TALK*

The fourth type of sign families focuses on specific body locations. Here, four locations on the body, carrying their meanings, make good root candidates and, thus, derivation more effective. This is true for all four locations, where the shoulders are associated with responsibility, the forehead with cognition, the heart with feelings, and the mouth with communication. I recall that the fact that primary forms are gestural, i.e., used by hearing people, implies a conceptualisation that is not necessarily limited to the manual modality, but instead results from cognitively-motivated metaphors.

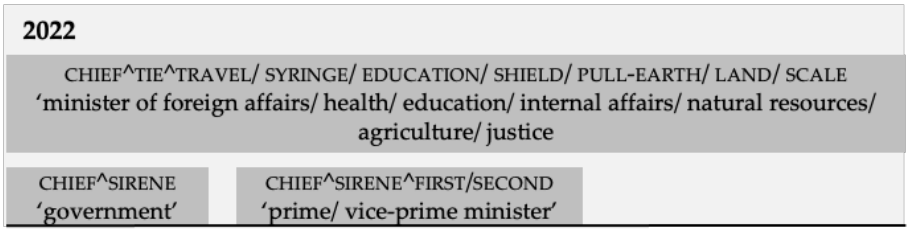
Table 18 shows how these meaningful body locations unfold across the three dictionaries, represented in the different columns for LGG signs. In Table 18a, signs expanding from the gestural source for 'chief' reveal a higher preference for compounding, especially in the 2017 collection.

The sign family rooted on the forehead, which includes CRAZY, in Table 18b, is quite balanced between derivation and compounding, as demonstrated by the 2017 column as well. In contrast, the 2017 data shows additionally that the sign family stemming from the chest, which includes FRIEND, in Table 18c, and the family of TALK, in Table 18d, expand in derivation only.

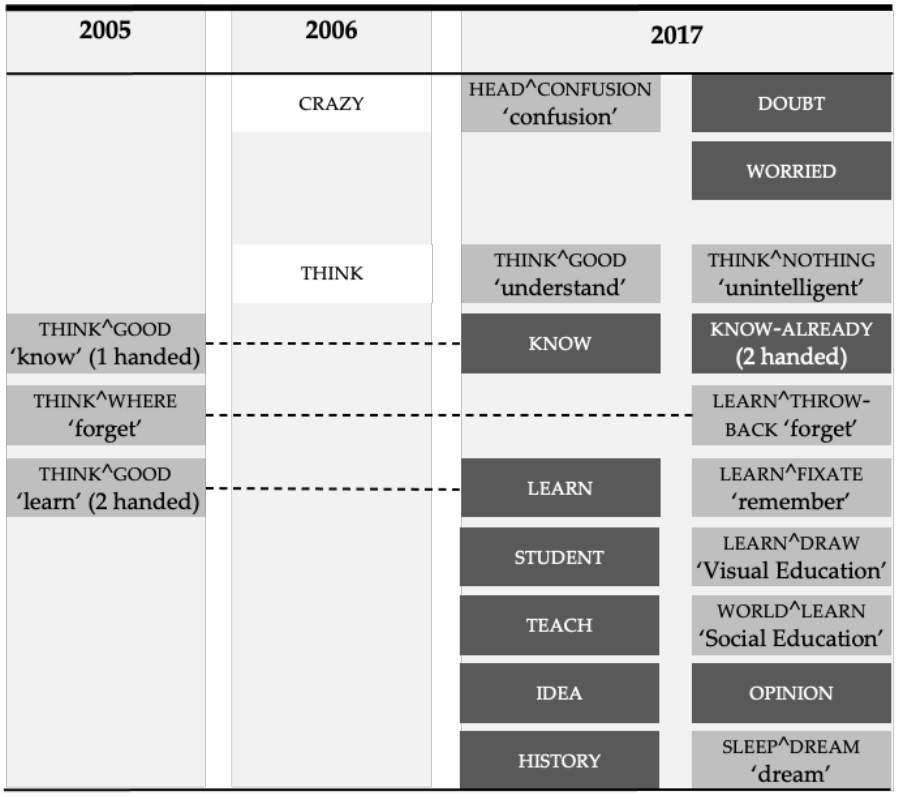
Table 18. **Sign families of CHIEF (a), CRAZY (b), FRIEND (c), and TALK (d)** in LGG, expanding from gestures through the signs collected in 2005, 2006 and 2017; the white boxes correspond to the gesture sources and their sign counterparts, the light grey boxes to compounds, and the dark grey boxes to derivatives; the straight lines indicate equivalent forms and the dotted lines equal meanings with form modifications

a.

Gesture	2005	2006	2017
chief	CHIEF^TIE 'president'	OF-ALL^CHIEF 'president'	CHIEF^OF-ALL 'president'
		SALUTE^CHIEF 'police'	CHIEF^SHIELD 'police'
			CHIEF^BERET 'soldier'
			EAT^CHIEF 'glutton'
			DIRECTOR
			RESPONSIBLE
			FAMOUS
			SHOULDERS


2022
CHIEF^TIE^TRAVEL/ SYRINGE/ EDUCATION/ SHIELD/ PULL-EARTH/ LAND/ SCALE
'minister of foreign affairs/ health/ education/ internal affairs/ natural resources/ agriculture/ justice
CHIEF^SIRENE
'government'
CHIEF^SIRENE^FIRST/SECOND
'prime/ vice-prime minister'

b.


2005
2006
2017
CRAZY
HEAD^CONFUSION
'confusion'
DOUBT
WORRIED
THINK
THINK^GOOD
'understand'
THINK^NOTHING
'unintelligent'
THINK^GOOD
'know' (1 handed)
KNOW
KNOW-ALREADY
(2 handed)
THINK^WHERE
'forget'
LEARN^THROW-BACK 'forget'
THINK^GOOD
'learn' (2 handed)
LEARN
LEARN^FIXATE
'remember'
STUDENT
LEARN^DRAW
'Visual Education'
TEACH
WORLD^LEARN
'Social Education'
IDEA
OPINION
HISTORY
SLEEP^DREAM
'dream'

c.

Gesture	2005	2006	2017
friend			FRIEND
			FRIENDSHIP
			HEART
			HEARTBEAT
			LIKE
			WANT
			MISS
			HEART^ONE 'favourite'

d.

Gesture	2005	2006	2017
talk	TALK		CHAT
			EXPLAIN
			SHOUT
			ASK
			CARTOON

I recall that the gestures for 'talk' and 'chief' show slight variation in their forms, namely in handedness, that are integrated into LGG for related meanings. These primary forms represent the meaningful body location where the corresponding sign families are rooted. In a different way, the gesture for 'crazy' also varies in handedness while

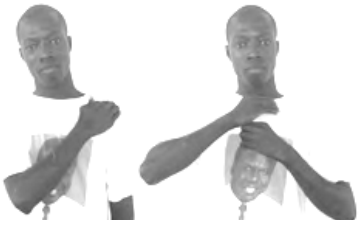
showing polysemy. In contrast, the gesture for 'friend' presented a high agreement in its form and meaning. As signs, these two items integrate larger families of signs rooted in specific body locations.

Sign family of CHIEF

The metaphorical gesture produced on the shoulder, implying 'responsibility', results in a whole set of signs contrasting with each other to designate concepts related to the notion of 'high rank'. As the gesture showed different forms, so will signs deriving from such a notion at this body location use those variants.

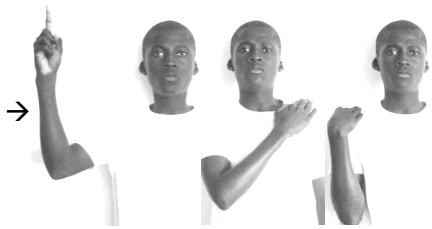
In 2005, it was used only in CHIEF^TIE 'president' with one hand touching each shoulder at a time, in Figure 138a. In the 2006 collection, the second member of that compound was replaced with OF-ALL, in Figure 138b, and a new compound was constituted in CHIEF^SALUTE 'police', in Figure 138e. In the 2017 dictionary, 'president' was expressed by the same compound, but the hand was now moving upwards from one shoulder alone, in Figure 138c. This had also been observed as a gestural variant. This same form was used as a single sign to mean '(school) director', in Figure 138d. Although at this time, the second compound member in 'police' had been replaced as well with SHIELD, in Figure 138f, the two-shoulder form was kept and extended to CHIEF^BERET 'military', in Figures 138g, 138h, and 138i.

a.



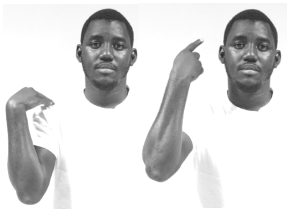
CHIEF^TIE 'president' (2005)

b.



OF-ALL^CHIEF ‘president’ (2006)

c.

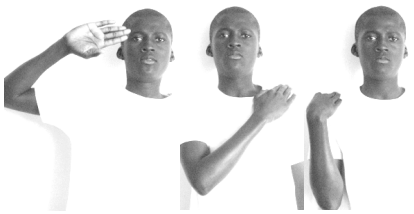


CHIEF^OF-ALL ‘president’ (2017)

d.

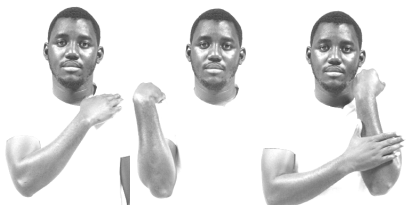
(SCHOOL)DIRECTOR (2017)

e.



SALUTE^CHIEF ‘police’ (2006)

f.



CHIEF^SHIELD ‘police’ (2017)

g.

(2005)

h.

(2006)

MILITARY

i.

CHIEF^BERET 'military' (2017)

Figure 138. Signs combining with the shoulder for 'chief' in LGG, namely for 'president' in 2005 (a), 2006 (b), and 2017 (c), 'director' (d), 'police' in 2006 (e), and 2017 (f), and 'military' in 2005 (g), 2006 (h), and 2017 (i)

Later, signs for governmental structures were formed overwhelmingly by compounding. In particular, the designation for the different ministers was always preceded by the combination of the sign expressing the notion of 'high rank' or 'responsibility' produced on the shoulder and TIE, as the first compound, collected in 2005 for 'president', as shown in Figure 139a. In a slightly different combination, signers create the compound CHIEF^SIRENE ´government', which will precede FIRST in 'prime minister' and SECOND in vice prime-minister, in Figure 139b.

a.

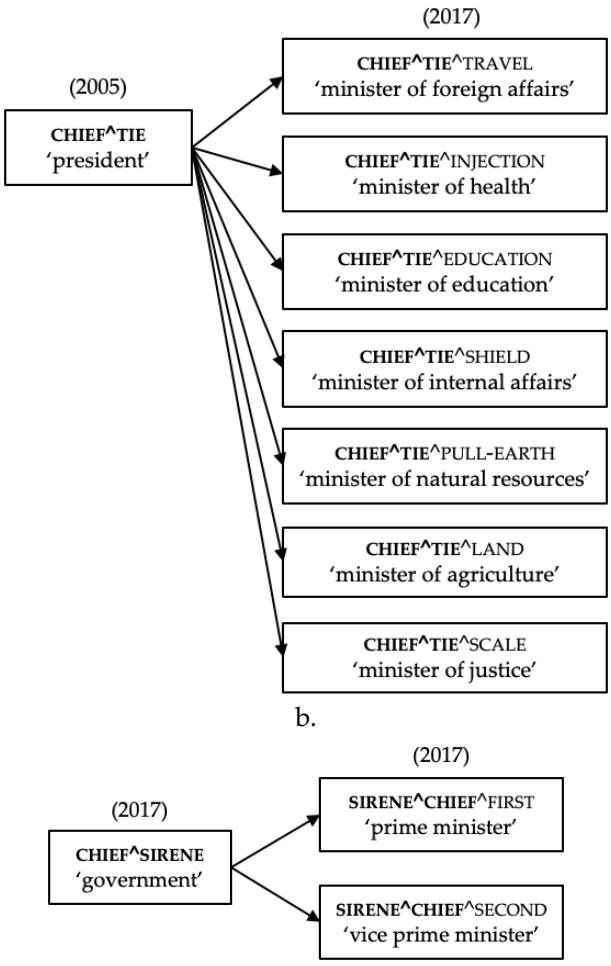


Figure 139. Compounds expanding from other compounds with CHIEF in LGG, namely CHIEF^TIE 'president' from 2005 (a), and CHIEF^SIRENE 'government' (b), all from 2017

Deaf signers recreated the remaining contrasting forms. One of the gestural variants with the two hands on one shoulder comes to signify 'responsible', in Figure 140a, as collected for the 2017 dictionary. The other two, FAMOUS, in Figure 140b, and EAT^CHIEF 'glutton', in Figure

140c, are novel forms. Although signers modify the gestural sources, these two new forms seem to keep the semantics rooted on the shoulder for the notion of 'high rank', even if metaphorically.

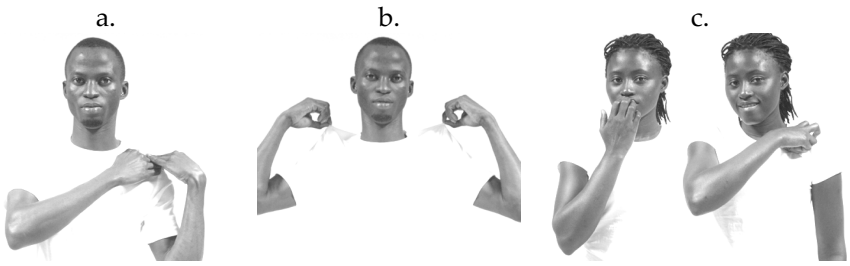


Figure 140. Signs deriving from the shoulder for 'chief' in LGG, namely for 'responsible' (a), 'famous' (b), and 'glutton' (c)

Sign family for cognition on the forehead, including CRAZY

The forehead is a particularly fertile ground to create signs for mind-related concepts. This family of signs rooted primarily on the side of the forehead is observed as the gesture *crazy* and very likely as a more literal mental activity, *think*. In LGG, the corresponding signs were recorded only in 2006. At the first collection, however, there were already three compounds based on THINK: THINK^GOOD 'know', if one-handed, and 'learn', if two-handed, and THINK^WHERE 'forget'. In 2017, the sign KNOW was no longer produced as a compound but contrasted instead with THINK by slightly modifying its movement. At this stage, the 16 new signs relied more on derivation than on compounding, as shown in Table 18b.

Looking first at the signs deriving from CRAZY, i.e., the visual-manual representation of the concept of 'unsteady thoughts', they take not

only the temple(s) as the base location but also a circular or alternating movement as the fundamental minimal units to convey such an idea, in Figures 141a and 141b. Here, both CONFUSION, in Figure 141c, which is expressed by a compound (HEAD^MESSY), and DOUBT, in Figure 141d, are two-handed signs. I recall that, as a gesture, *crazy* was alternatively produced with two hands.

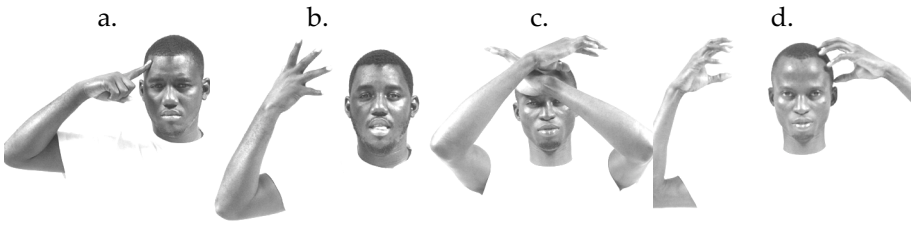


Figure 141. Signs related to 'unsteady thoughts' in LGG: CRAZY1 (a), CRAZY2 (b), CONFUSION (c), and DOUBT (d)

As expected, the sign THINK or, semiotically speaking, the indexation of the head as the abstract source of thought, gives rise to a variety of form contrasts, as shown in Figure 142. The movement changes by reduplication in KNOW, extension in IDEA and intensification of contact in WORRIED, which is further marked by a facial expression. The concept of having thoughts coming out of one's mind is contrasted by different movements directed away from the temple. It is represented by an index projecting upwards in IDEA, swirling in DREAM and a palm undulating away in HISTORY. Handedness establishes a contrast between KNOW and KNOW-ALREADY, and in LEARN as a single sign and as part of a compound in REMEMBER and FORGET.

Additionally, STUDENT presents an alternate motion contrasting with the simultaneous movement of both hands in LEARN. This sign metaphorically represents the idea of 'feeding the mind with knowledge'. Thus, the opposite action implies 'feeding the mind of others'. For that reason, TEACH takes the same handshape but directs the movement outwards instead of to one's forehead.

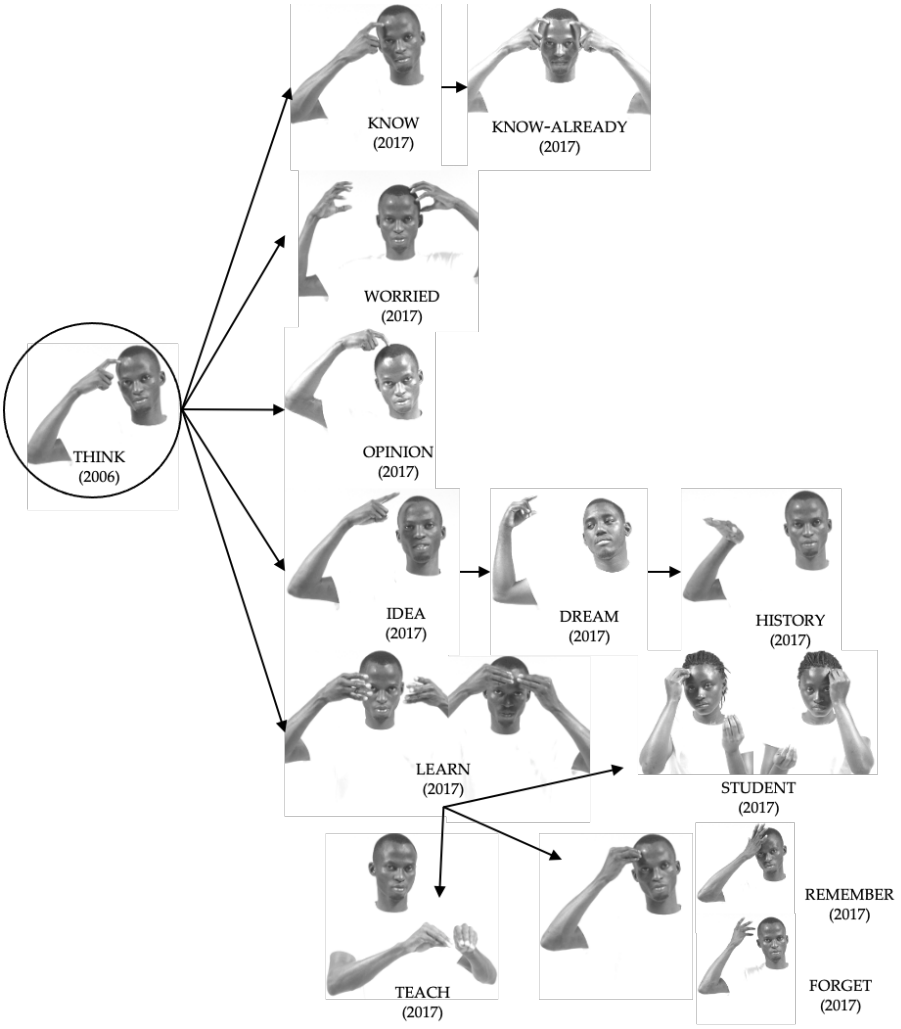


Figure 142. Signs deriving from THINK representing mind-related concepts in LGG

Sign family for feelings on the heart, including FRIEND

The heart is typically associated with feelings. In the 2017 dictionary, signers touch the location of the heart with different handshapes and movements. For the sign HEART, the tips of the finger-bunch tap the chest once, and then the open palm lies on the chest. It is distinguished from LIKE which uses tapping twice instead, in Figure 143a. The sign WANT is limited to that first tapping, in Figure 143b, while 'favourite' is designated by the compound LIKE^ONE, in Figure 143c. With a different handshape, MISS involves a slight circular movement of a small claw on the heart, in Figure 143d. Included in this family of signs is FRIEND, with the fist tapping the heart, in Figure 143e. Finally, instead of touching the body location symbolising emotions, the HEARTBEAT sign is produced with a movement outwards, in Figure 143f.

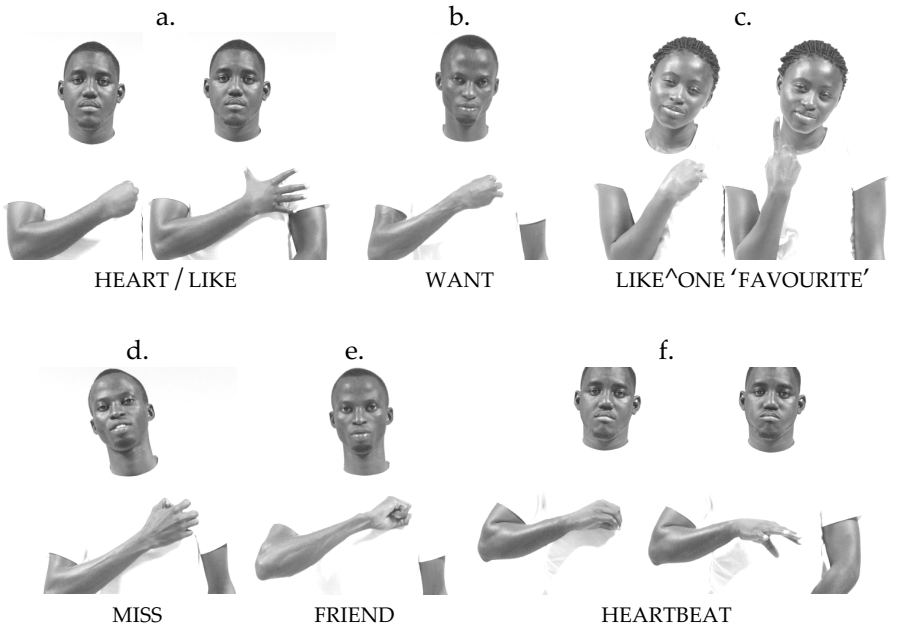


Figure 143. Signs deriving from the heart representing communication-related concepts in LGG: HEART / LIKE (a), WANT (b), LIKE^ONE 'favourite' (c), MISS (d), FRIEND (e), and HEARTBEAT (f)

Sign family of TALK

In the case of TALK, produced from the mouth, as if emitting abstract content, signers selected the one-handed form, in Figure 144a, as early as 2005 from the available gestural variants. In this first dictionary, the two-handed form was also collected, but to express a different meaning, 'chat', in Figure 144e. By 2017, TALK had extended only by derivation, whether by modifying the movement in EXPLAIN, in Figure 144b, changing the handshape and the intensity of the movement in SHOUT slightly, in Figure 144c, and then as if pulling a response from the interlocutor in ASK, in Figure 144d. In 2017, signers brought the sign CHAT to the neutral space to designate two puppets talking to each other in CARTOON, in Figure 144f, similar to what occurred with KISS in 2017, where the hands represent two mouths.

a. 
TALK
(2005)

b. 
EXPLAIN
(2017)

c. 
shout
(2017)

d. 
ASK
(2017)

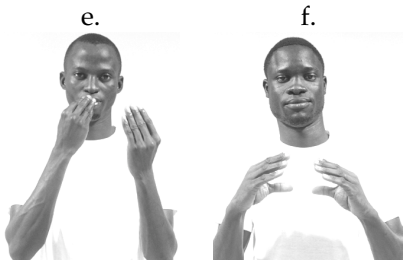


Figure 144. Signs deriving from TALK (a) representing communication-related concepts in LGG with one hand: EXPLAIN (b), SHOUT (c), ASK (d), and with two hands: CHAT (e), and CARTOON (f)

The four meaningful locations illustrated here, where abstract concepts are rooted, show how both derivation and compounding extend into larger families of signs. Importantly, in these cases, the place of articulation serves as a basis for a conceptual schema to take shape. Along this schema, modifications in movement, handshape, orientation and facial expression convey the necessary contrasts to encode different – but related – concepts. Meaningful body parts frequently stand for roots that extend through derivation, as is the case with thought, communication and feelings-related signs. Still, compounding is also quite productive, especially in signs referring to high-ranking positions stemming from the shoulder.

4.5.2.5 Sign families of specific handshapes: cutting tool and claw(s)

Similar to the meaningful body locations presented previously, the fifth and last group of sign families describes handshapes serving as roots. Examples of these are handshapes that depict cutting tools, in Table 19a, and claw(s), in Table 19b, where the gestures for 'kill' and 'witchcraft' are included. Here, the columns for the years in which the

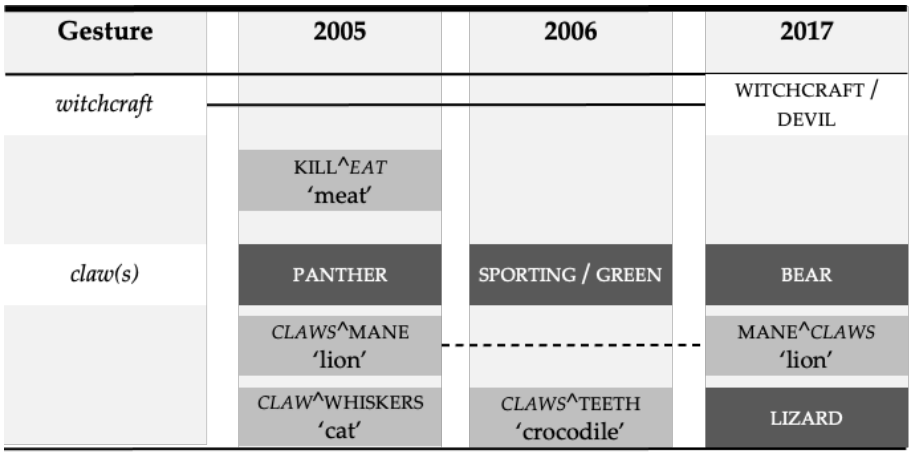
three dictionaries were collected show how those handshapes expand through derivation and compounding. Importantly, even when combining with other signs, the handshapes present derivational modifications.

Table 19. **Sign families of *cutting-tool* (a) and *claw* (b) handshapes** in LGG, expanding from the gestures used in Bissau through the signs collected in 2005, 2006 and 2017

a.

Gesture	2005	2006	2017
kill	KILL / DIE		
	KILL^*EAT* 'meat'		
cutting tool	FISH	KNIFE	CAKE
	PINEAPPLE	MANIOC	*CUT*^OPEN-TURN 'manioc'
	BUTTER	CUCUMBER	*CUT*^OPEN 'dried fish'
	CUT^*EAT* 'papaya'	CARROT	*CUT*^*EAT* 'passion fruit'
	CUT^CRY 'onion'	CUT-TREE	BOOK^*CUT* 'paper cutter'
		CUT^*STICKY* 'okra'	
		CUT^*STICKY* 'jackfruit'	
		CUT^*EAT* 'breadfruit'	
		CUT-ARM^SPILL 'blood'	

b.



Sign families of cutting-tool handshapes

The first type of handshape represents cutting tools by representing them with the hand(s) or finger(s). This cluster is especially productive with the whole hand and the index finger.

The index finger can stand for the knife in body parts to exemplify contrasts in signs of this sort. Here, 'cutting the neck' commonly extends semantically to 'kill', in Figure 145a, as was the case of the gesture used in Bissau also for 'die', 'witchcraft', 'crook', and 'steal'. The index finger also represents a knife on the arm for 'blood', in Figure 145b, and 'fish', in Figure 145c. In the cases where both index fingers interact with each other, the type of motion appears to be contrastive enough, as shown in Figures 145d, 145e, and 145f. Otherwise, it can resort to compounding, as for 'okra', in Figure 145g.

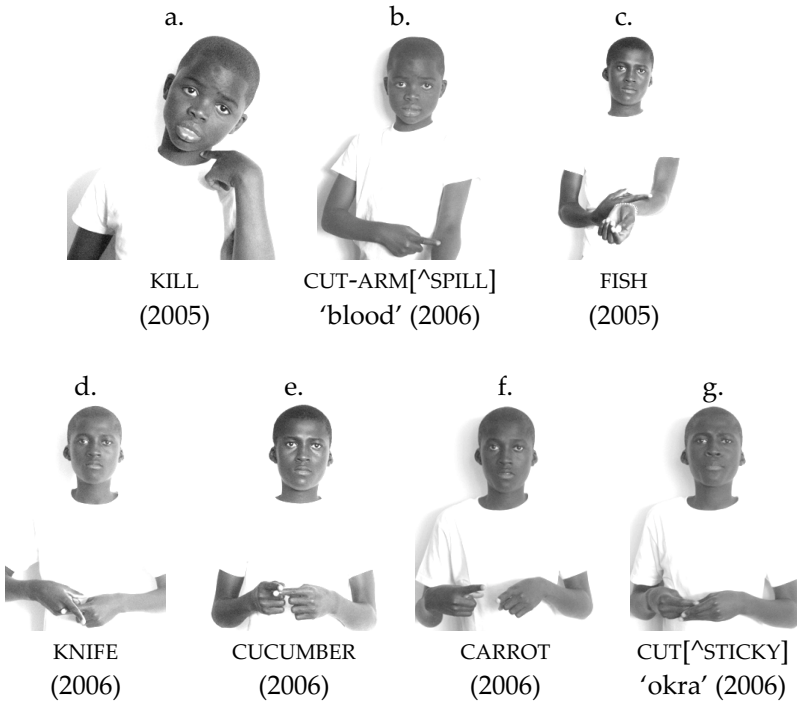


Figure 145. Signs representing a cutting tool with ☝ in LGG, for 'kill' (a),' blood' (b), 'fish' (c), 'knife' (d), 'cucumber' (e), 'carrot' (f), and 'okra' (g)

The ambiguity arises when both palms interact with each other in a way that the type of motion is not sufficient to distinguish the signs from one another. For that reason, they tend to combine with other signs specifying their meaning in compounds, in Figures 146a to 146f, even when the base hand adopts a different handshape, in Figure 146g. This is not the case when the movement is quite distinctive, such as 'slicing' a cake, in Figure 146h, and 'buttering' bread, in Figure 146i, or the non-dominant hand takes an identifiable shape, like in CUT-TREE, in Figure 146j.

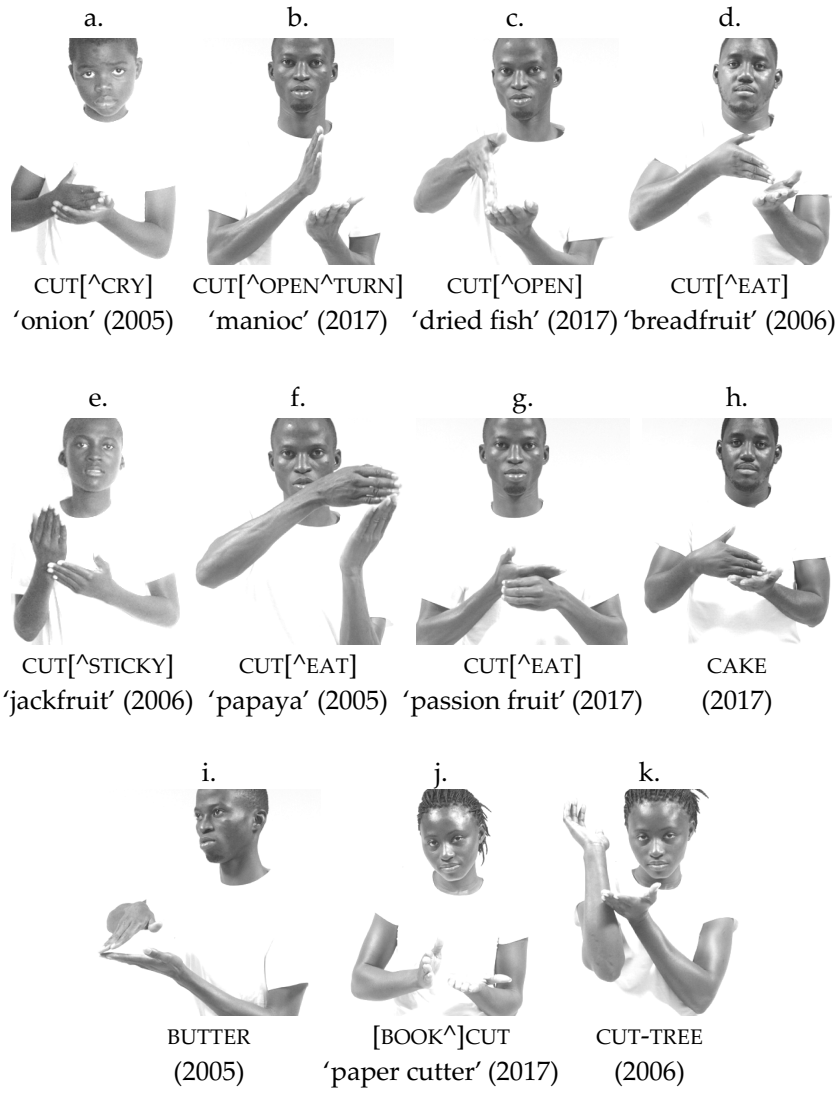


Figure 146. Signs representing a cutting tool with in LGG, for 'onion' (a), 'manioc' (b), 'dried fish' (c), 'breadfruit' (d), 'jackfruit' (e), 'papaya' (f), 'passion fruit' (g), 'cake' (h), 'butter' (i), 'paper cutter' (j), and 'cutting a tree' (k)

Sign families of claw(s) and wings

In this second cluster, I focus mainly on the *claw*(s) handshape. It was relevant to analyse the *wings* form as well to illustrate how animal terms based on these two gesture sources unfold over time in LGG. As gestures in Bissau, *claw(s)* and *wings* occur both as responses to 'witchcraft'. However, the first form is much more conventionalised and is thus the one integrated into the signed lexicon.

To depict animals, people intuitively use parts of their bodies to represent parts of animals' bodies. Although in the gesture elicitation sessions, the depictions aimed to reproduce parts of some monster, they were available as animal parts: the hands replacing claws and the arms representing the wings. Importantly, the polysemy in *claws* is kept in the LGG sign for 'witchcraft', and occurs as well in *wings* for 'red'.

Table 20 shows how, from those gestures at hand, signers expanded the lexicon of animals over the years. Worth noting is that *claw(s)* were expanded equally by derivation, modifying, for instance, location or movement. In a different way, the sign WINGS was preferentially combined with other signs for semantic specification. In addition, it was eventually assigned to the generic category for 'bird'. Overall, for animals, compounds involved mainly the combination of physical characteristics. On top of these, they could be combined with a typical action of the animal.

Table 20. **Expansion sequence of signs for animals based on *claw(s)* and *wings*,** expanding from the gestures used in Bissau through the signs collected in 2005, 2006 and 2017

Gesture	2005	2006	2017
 *claw(s)*	PANTHER CLAWS[^MANE] 'lion'  CLAW[^WHISK-ERS] 'cat'	 CLAWS[^TEETH] 'crocodile'	LIZARD  BEAR
 *wings*	WINGS[^BEAK] 'hen' / 'rooster' [SMELL^]WINGS 'fly'	BIRD WINGS[^GRAB] 'eagle' WINGS[^STING] 'ray'	WINGS[^NECK] 'pigeon' WINGS [^EYES^BEAK] 'owl'

Most animal signs in LGG (39 of 63) are represented by mapping salient non-human physical features on the signer's body. In the personification of bigger animals, enactment, in which *wings* and *claw(s)* are included, is the most common strategy. In contrast, entity handshapes are preferably used for smaller animals.

All families of signs described in this subsection demonstrate how productive signs-from-gestures can be. Though overall, compounding seems to be the most productive process to expand a new lexicon, derivation is favoured in certain roots, such as specific handshapes and body locations. Importantly, all such signs are kept in the lexicon in their original form and used to build new lexemes. There are, however, some exceptions that are covered next.

4.5.3 Creating new signs to replace signs-from-gestures in sensitive concepts

While the previous subsection demonstrated how gesture sources have impacted the growing lexicon of LGG, they can also be intentionally replaced. In this way, signs are created from scratch instead of being recreated based on pre-existing forms. Especially in more sensitive concepts based on gestures, deaf people create new signs expressly to avoid transparency that enables them to be understood by the hearing.

For instance, the compound SMOKE^STAB 'crook' cooccurs with a new abstract sign, in Figure 147a. Also, the widely known stylised form for 'steal' coexists with a snapping movement as if snatching a wristwatch, in Figure 147b.

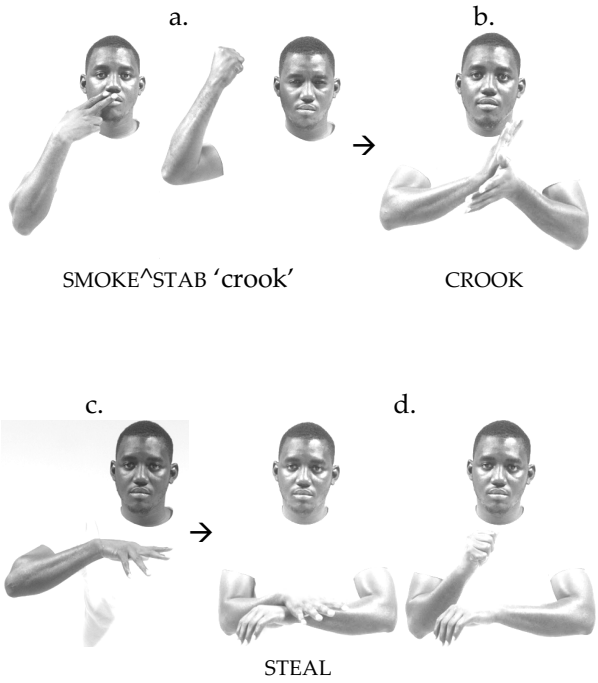
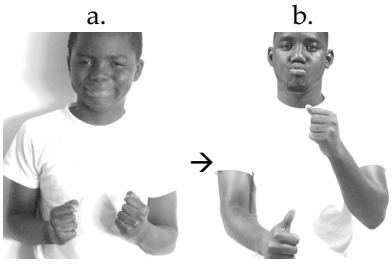
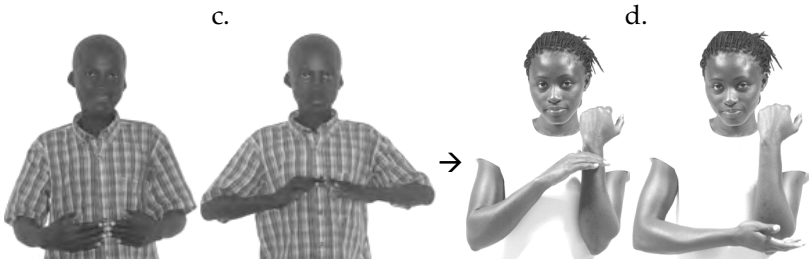


Figure 147. Signs for sensitive concepts deriving from gestures for 'crook' (a), and 'steal' (c), recreated to avoid transparency in CROOK (b), and STEAL (d) in LGG, all collected in 2017

Some LGG signs collected over time were eventually replaced (37 of 209). These replacements were of different kinds. For instance, more iconic signs were occasionally dropped in favour of entity handshapes, as in POO, in Figures 148a and 148b. A good example of iconicity camouflaging is PREGNANT, articulated on the forearm, in Figures 148c and 148d. Probably taking advantage of an emerging pattern, other signs semantically related to 'pregnant' are rearranged in that same location, like ABORTION and even BIRTH. These were not documented in the 2017 dictionary but were instead observed on later field trips. Other signs seem to have been created to conceal the iconic motivation by altering its location. These are the cases of PERIOD, based on the washing enactment, but articulated on the cheek, in Figure 148e, and SEX, articulated on the nose, in Figure 148f.



POO



PREGNANT

Figure 148. Signs created for sensitive concepts to avoid transparency in POO in 2006 (a), and in 2017 (b), in PREGNANT in 2005 (c), and 2017 (d), in PERIOD (e), and SEX (f) in LGG

The only signs-from-gestures that were replaced by new – more abstract – signs in the twelve-year collection span concerned taboo concepts. Besides the few cases deriving from gestures, namely CROOK and STEAL, other sensitive terms that were tendentially more iconic were later replaced by new signs, involving entity handshapes, like POO and PREGNANT, and produced on a location different from the original iconic one, as in PERIOD and SEX. In such cases, the lexical replacement made the sign less easy to interpret by hearing people.

4.6 Lexical expansion through grammaticalisation: the case of 'hit'

The third and last analysis of the lexical expansion of LGG signs looks at the grammaticalisation of the gesture source for 'hit'. I first review the literature on the grammaticalisation of gestures-to-signs, and, specifically, on the grammaticalisation of 'hit' in both signed and spoken languages (§4.6.1). The analysis is described by tracing the semantic

and grammatical extensions of the snapping finger from its more literal senses to the range of grammatical functions it expresses (§4.6.2).

4.6.1 Background

As seen in the previous two sections (§4.4 and §4.5), lexicalisation is the synchronic adoption of new items into the lexicon (Brinton & Traugott 2005, 20, 96). This integration originates in productive word formation processes, like derivation and compounding (ibid., 33, 91). While compounding and derivation drive lexicalisation, i.e., the (re)creation of new lexemes, these can additionally extend to different grammatical functions. Therefore, in certain linguistic contexts, lexical items can acquire grammatical functions, which may extend subsequently into new functions (Hopper & Traugott 2003, 1). A central question in this thesis is how such grammaticalisation occurs from the earliest stages of a language. I first review literature on the grammaticalisation of gestures-to-signs (in §4.6.1.1). Then, I examine existing studies on the grammaticalisation of 'hit' in both spoken and signed languages (in §4.6.1.2).

4.6.1.1 Grammaticalisation of gestures-to-signs

Gestures may either lexicalise or grammaticalise. The grammaticalisation can occur after a previous lexicalisation (route 1: gesture > lexical morpheme > grammatical morpheme) or directly from gestures (route 2: gesture > grammatical morpheme) (Wilcox 2004, 48–49). Grammaticalisation necessarily implies semantic generalisation (Coppola 2020, 370). This is especially the case with frequent items (Bybee 2012, 72). For instance, the gesture used to specify height in the Yucatán Peninsula lexicalises into YMSLs as CHILD, OFFSPRING and GROW, while simultaneously grammaticalising as a person classifier. Such expansion into different grammatical functions may or may not keep formational proximity to the original gesture (Safar 2020a, 67, 101–102).

4.6.1.2 Grammaticalisation of 'hit'

The grammaticalisation of 'hit' or 'beat' is a very illustrative example of a similar behaviour crosslinguistically. It occurs in both spoken and signed languages. In sign languages, it has been shown to derive from a gesture, as is the case in LGG. Morgan mentions briefly that besides meaning 'to beat', in general, or with a stick, the gestural finger snap also grammaticalises in Kenyan Sign Language as an emphatic, to express, for instance, 'very hot' (2022, 284). Such intensification is observed in Libras as well (*My mother tried hard to communicate with me.*) and as a comparative marker in LSN (Martins & Machado 2024).

With a different form but signifying equally 'to beat', it also represents a comparative marker in LSE. Costello (2015, 195–196) classifies it as an auxiliary verb with spatial agreement, comparing elements that can be nominal (*My sister's got more money than me.*), adjectival (*Ioar is clumsier than Jeison.*) or verbal (*I smoke more than you.*). He further observes that it covers only human referents. In a more detailed description, Wilbur and colleagues (2018) focus on the ASL BEAT as a comparative marker for degrees of both quantity and quality. They add that such a transitive verb inflecting spatially for agreement with subject and object has a lexical origin in the sense of competition (*Trump beat Clinton [in the election]*) (ibid., 65).

The comparative marker based on the notion of 'beat' fits into the *exceed*-type verbal constructions documented in spoken languages, meaning 'to defeat' or 'to surpass' (Heine & Kuteva 2002, 123–127). The development of the polysemy of 'beat' or 'hit' was traced in children acquiring Mandarin back to the physical action verb extending progressively to metaphorical senses (Chen & Wang 2020). In Mandarin, it can have abstract meanings such as 'defeat', 'punish' or 'opposition' (Gao 2001, 163, 165). These semantic extensions of 'beat' have also been attested in Swedish for 'defeat' (*Bill beat Harry at tennis*) and 'punish'

(Viberg 2016, 186, 193). Similarly, it can extend semantically as an intensifier in Catalan (*He drinks a lot.*) (Ramos 2015, 143).

Having reviewed the literature, I wonder how the snapping finger for 'hit' is built up in LGG. In the following subsection, I describe the analysis of its grammaticalisation based on the 53 sentences that were collected in 2022.

4.6.2 Lexical expansion of HIT in LGG by grammaticalising it as a comparative marker and an emphatic

In the following subsection, I focus on the grammaticalisation of a particular sign-from-gesture. I describe the special case of HIT whose semantic elasticity manifests in different grammatical structures. As a gesture in Bissau, it was uniformly produced with the sense of 'hit', indicating a high conventionalisation of such a form. As a sign, it is first recorded in the 2017 dictionary with three senses and slightly different forms, as shown in Figure 149.

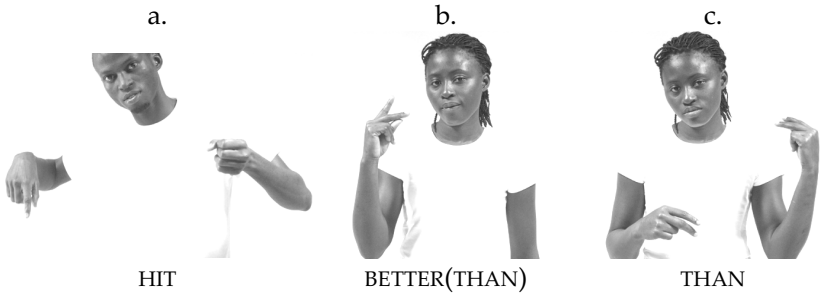


Figure 149. Signs deriving from the gesture 'hit' in LGG collected in 2017: HIT (a), BETTER(THAN) (b), and THAN (c)

To understand the different uses of this form as a sign in discursive contexts, deaf people were asked to give examples of its use in common LGG utterances. As a result, 53 sentences involving HIT were produced by eleven deaf adults. In analysing the sentences, I categorised the different meanings and grammatical functions of the signs deriving from the gestural etymon. I observed that the primary meaning of 'beating someone up' was kept and extended to a non-physical sense of 'beating someone at something'. Taking this competition-related sense as a semantic source, it became used as a grammatical particle to convey the notion of 'against' between two parties. In addition, it is explored to express comparison degrees, namely the comparative and the superlative. Finally, it is used as an emphatic intensifier.

4.6.2.1 Primary meaning

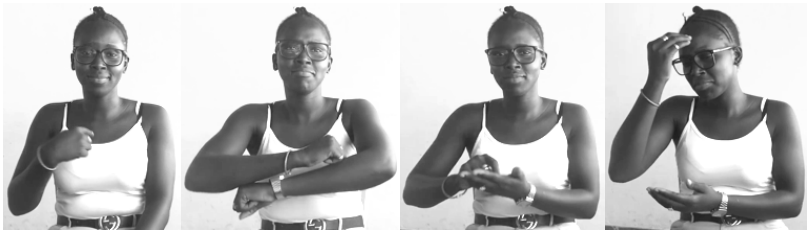
Local hearing people explained that HIT often cooccurs with the expression in Creole *na sutai*, meaning '(someone) hits (somebody else)', which can be uttered as a threat. As an etymology, deaf people suggest that the original action consists of grabbing someone with one hand while hitting them with a stick with the other hand. This primary sense conveyed by the gestural form of 'hitting physically' is maintained in the two-handed variant, referring to the original action of grabbing someone with one hand and beating her up with the other, in Figure 150.

JUSTINO 3P CHILD 3P HIT(3P)

*Justino **hit** the child.*

Figure 150. Example of 'hit' in the two-handed asymmetric variant in a discursive context in LGG

As a verb-like sign, it selects a human subject and an animate object. Thus, in LGG, it may inflect for person, redirecting to the direct object, which, in Figure 151, is herself, i.e., the first person. I recall that the one-handed variant produced by this signer corresponds to the most frequent form used as a gesture.



ME STUDENT CLASS LEARN

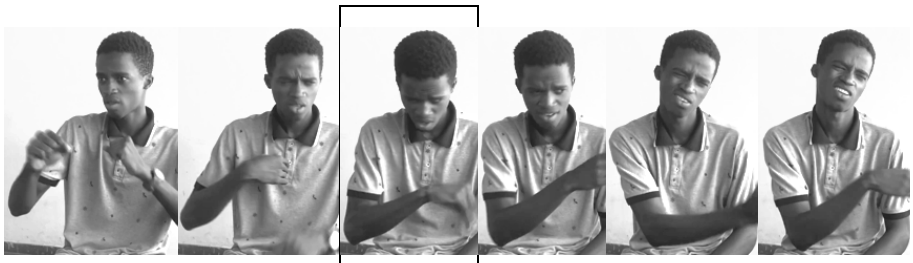
ME MATH WRITE LITTLE TEACHER HIT(1P)

*In class, I am learning very little math, so the teacher **hits** me.*

Figure 151. Example of 'hit' in the one-handed variant inflected for the first person in a discursive context in LGG

4.6.2.2 Semantic extension

The sense of this sign can also expand metaphorically to signify not the physical confrontation per se, but the stronger party. For instance, in Figure 152, the deaf signer warns somebody else that if they fight, he will defeat him. This sense would correspond to the English expression 'beat someone at something'.



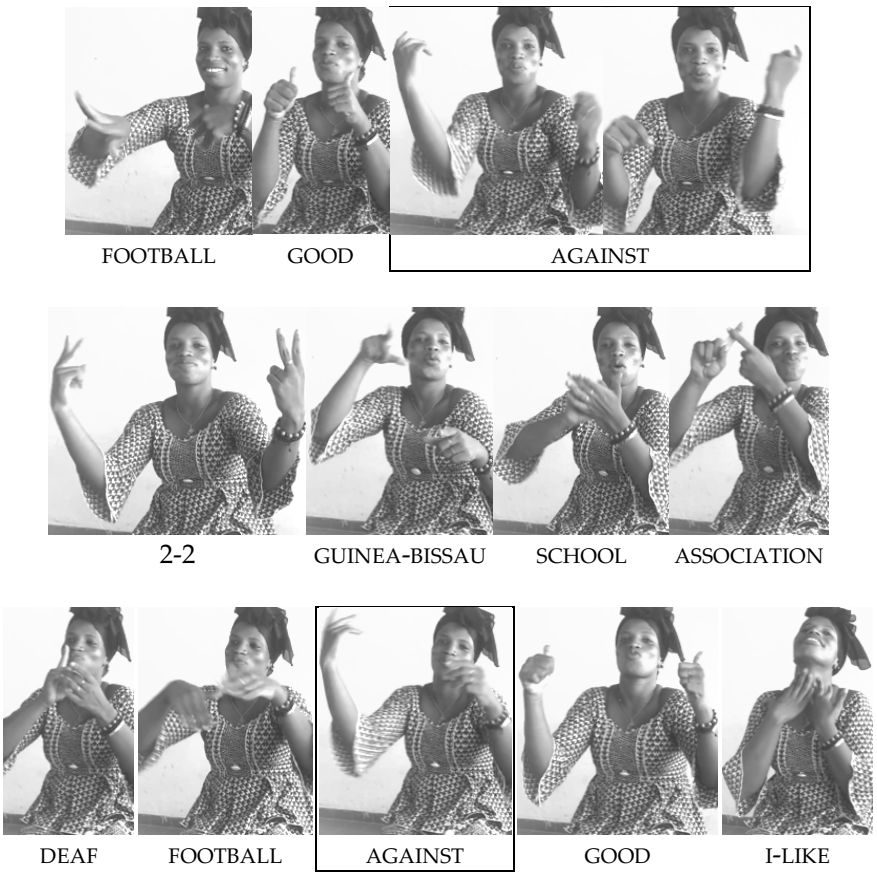
FIGHT ME BEAT YOU SMALL WEAK

*If we fight, I will **beat** you. You are too small and weak.*

Figure 152. Example of the semantic extension for 'beat' in a discursive context in LGG

4.6.2.3 Grammatical functions

Still in a semantic association with the opponent sides, the sign may modify its grammatical function to become a preposition-like particle for 'against'. In the example in Figure 153, the sign indicates an opposition between two parties in a football match. Importantly, this particular sign is always produced with two hands snapping in turns. Such a form variant was also observed as a gesture in Bissau.



It was a good football match against each other. It was 2-2, the deaf school ***against*** *the deaf association of Guinea-Bissau. It was a good football match* ***against*** *each other. I liked it.*

Figure 153. Example of the opposition marker for 'against' in a discursive context in LGG

This sign also expands to function as a grammatical particle in comparisons, namely to establish the comparative degree. As such, it may cooccur with adjective-like signs, in Figure 154a, or quantifiers, in Figure 154b, to signify MORE-THAN.

a.

BEAUTIFUL ME MORE-THAN YOU

*I am **more** beautiful **than** you.*

b.

CLASS ME SCHOOL FIRST-GRADE

STUDENTS FEW NANINA CLASS

SCHOOL KINDERGARTEN STUDENTS MANY

MORE-THAN(1P)

*My first-grade class has few students. Nanina's pre-school class has **more** students **than** mine.*

Figure 154. Example of the comparative marker for 'more than' with adjective-like signs (a) and quantifiers (b) in a discursive context in LGG

Similarly, when cooccurring with verb-like signs, it may signify 'better than'. In Figure 155, the signer jokingly names the signs of the football players by referring to a former president of Guinea-Bissau, Jomav, and the president elected at that time, Sissoco.

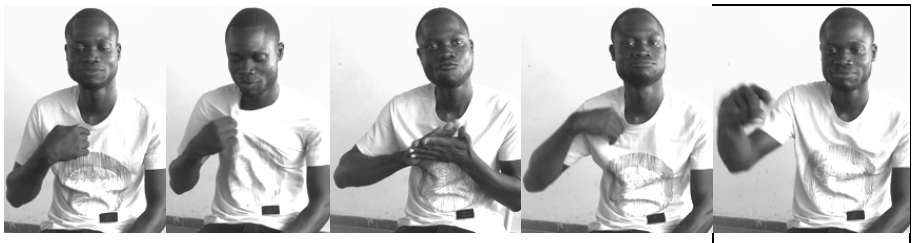
JOMAV 3P SISSOCO FOOTBALL BETTER-THAN 3P

*Sissoco plays football **better than** Jomav.*

Figure 155. Example of the comparative marker for 'better than' with a verb-like sign in a discursive context in LGG

Apart from the comparative degree, where two parties are weighed against each other, the same sign can indicate the superlative degree. Here, it can apply to an adjective, as in CLEAN 'the most', in Figure 156a, or to a noun, as in BENFICA 'the best', in Figure 156b. As noted, the latter example omits the adjective while implying the notion of 'good'.

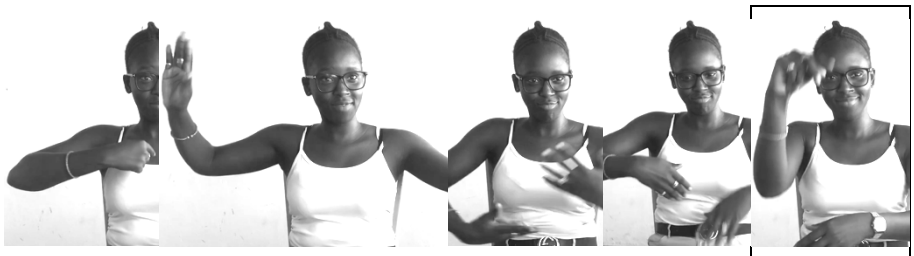
a.



ME CLOTHES CLEAN ME THE-MOST

*My clothes are **the** cleane**st**.*

b.



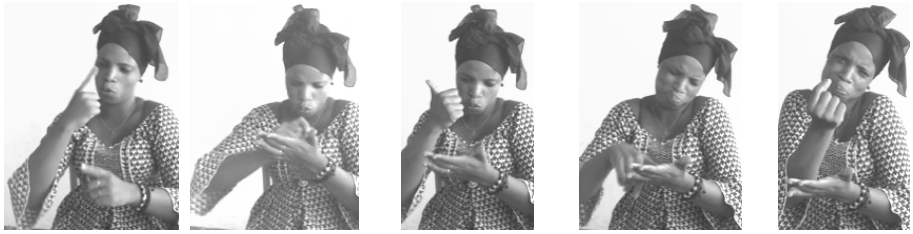
ME BENFICA TEAM FOOTBALL THE-BEST

*To me Benfica is **the best** football club.*

Figure 156. Examples of superlative markers with an explicit adjective sign, such as CLEAN (a), and with an implicit adjective for the notion of 'good' (b) in discursive contexts in LGG

An interesting use of this sign is more generic in the sense that it is no longer referring to a specific person or characteristic but to a more abstract situation. In the example in Figure 157, the signer comments on the importance of children being well taught as the 'best one can do' for them.

CHILDREN TEACH TEACHER GOOD SOME



SEE WRITE GOOD READ A-LITTLE

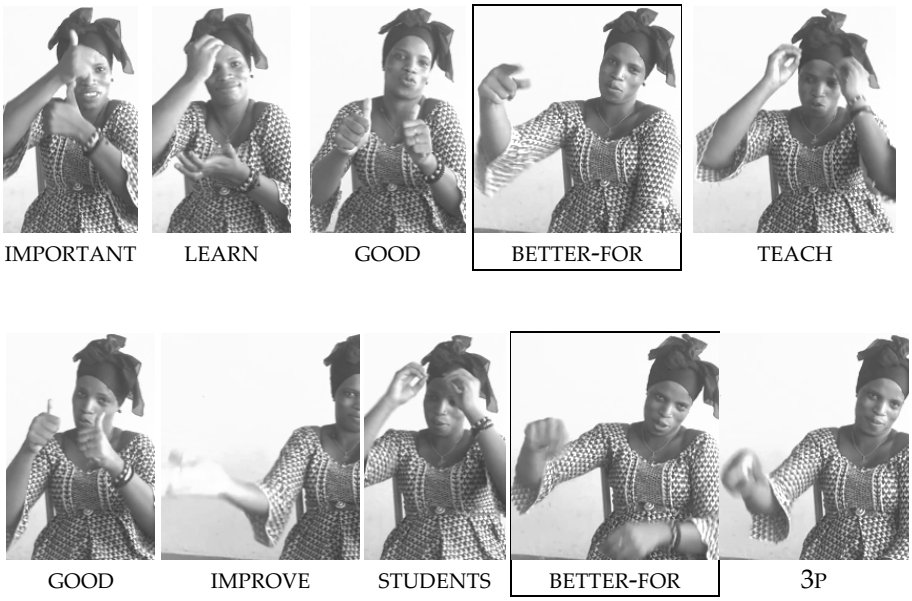


Figure 157. Example of the comparative marker for 'better for' in a discursive context in LGG

Finally, it has acquired the function of an adverb-like emphatic intensifier of, in the example in Figure 158, noun-like signs referring to physical features. It appears to be an extension of the superlative degree.

EARRING ME VERY(GOOD) DRESS VERY(GOOD)

My hairdo looks very good, my earrings are very nice, my dress is very nice.

Figure 158. Example of the emphatic intensifier for 'very (good)' in a discursive context in LGG

This subsection illustrates instances of grammaticalisation of one gestural etymon. The data showed that such a highly conventionalised gesture in the local community maintained the original meaning and expanded it semantically as 'beat someone at something', in LGG. Moreover, signers explored it grammatically to establish oppositions, as the prepositional-like sign for 'against', to mark degrees in comparisons (e.g., for 'better' and 'best'), and emphatic intensifications.

Overall, many gestures incorporated into the LGG lexicon generate further lexical expansion. This occurs with the grammaticalisation of HIT, the development of colour and kinship terms, and various gesture sources being modified by derivation and combined in compounding to form families of signs.

4.7 Summary of results: the expansion of semantic fields, sign families and grammatical functions in LGG

After describing different ways that the LGG lexicon has expanded over the initial years of its emergence, this section presents a summary

of the findings. This chapter looks at the signs deriving from a set of gestures collected in Bissau and how they serve as the basis for lexical expansion in LGG. To understand how LGG signs expand over time, I analyse hierarchies in kinship and colour terms, the morphological development of families of signs through derivation and compounding, and the grammaticalisation of HIT.

4.7.1 Lexical expansion of kinship and colour terms in LGG

Regarding the implicational hierarchies, diachronic records of LGG emergence demonstrate how kinship and colour terms are sequentially organised in this new language. In both cases, it becomes clear that such semantic fields expand from gestures-to-signs following a universally expected order. Still, while family members are designated in LGG mostly by combinations of those signs-from-gestures, colours other than WHITE and BLACK rely instead on metaphoric associations with colourful items. In particular, deaf signers in Bissau use football-related imagery to refer to more basic colours within the initial stages of lexical development.

4.7.2 Lexical expansion of sign families in LGG

Figure 159 shows how sign counterparts and their corresponding derivatives and compounds have developed across the three dictionaries. Sign counterparts of gestures used in Bissau were mainly (33 of 48) recorded in the first few years of deaf schooling, in 2005 and 2006. However, a little less than a third of those lexical counterparts appear only later in 2017, like HIT, LIE and WITCHCRAFT. This may be because many signs were overlooked during the collection moments. As such, it is hard to know if it was because they were not used yet as signs

(even if they have gestural sources) or if they didn't come up in the sessions for referring to more abstract concepts.

Overall, Figure 159 presents compounding as the most productive process during the first decade of LGG emergence. Many compounds (104 of 153) are constituted later, manifesting a need to specify the sign's meaning further or eventually distinguish it from similar forms. This contrasts with a much lower – though increasing – number of derivation cases (75 out of a total of 286 signs).

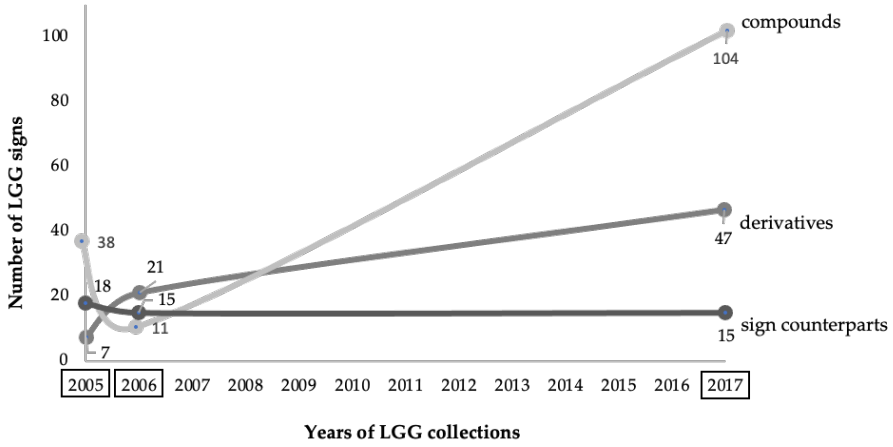


Figure 159. Diachronic integration of sign counterparts of gestures used in Bissau and the expansion of their corresponding derivatives and compounds in LGG from 2005 to 2017

When zooming in on the different groups of sign families expanding from signs-from-gestures, I find that morphological processes of compounding and derivation show distinct preferences depending on the type of signs they are expanding from. Figure 160b to 160e displays the groups of families of signs described in subsection 4.5.2. The sign family stemming from the height specifier is included in Figure 160a,

clustering sign families related to people, mostly in kinship terms. Accordingly, colours deriving from WHITE appear in Figure 160 only for reference.

Looking more closely at Figure 160a, it becomes clear that lexical items for kinds of people, including kin members, favour mainly combinations with each other or other signs. This is especially true with gender and age designations. In addition, Figure 160b makes it obvious how compounding is the sole strategy of hypernyms. Compounding is also highly expressive in signs rooted on the *thumb(s)-up* gesture (with 13 compounds and five derivatives), in Figure 160c, and on the shoulder for 'chief' (with 14 compounds and four derivatives), in Figure 160d. In contrast, derivation is a frequent mechanism in signs-from-gestures rooted in the remaining meaningful body locations, such as the forehead for thought-related concepts (with 11 derivatives and ten compounds), also in Figure 160d, and meaning-carrier handshapes, like cutting tool, which include 'kill' (with eight derivatives and 12 compounds), in Figure 160e.

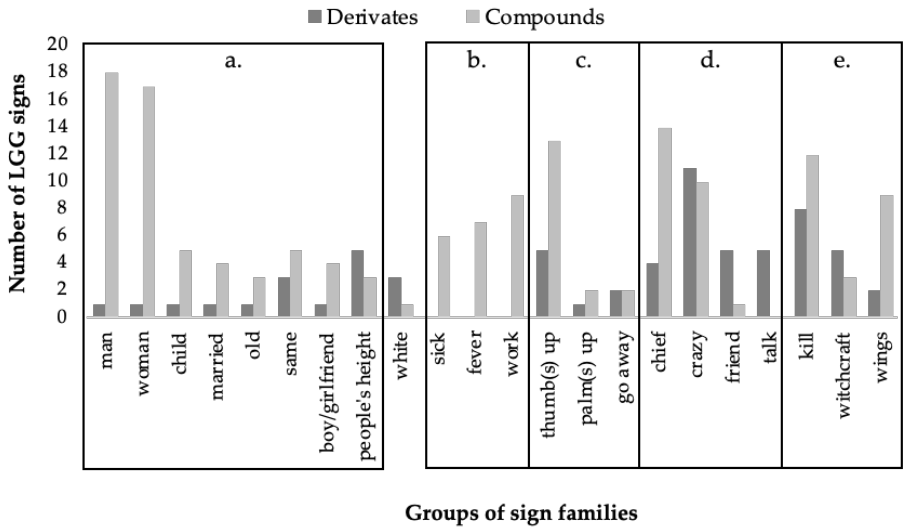


Figure 160. Lexical expansion through derivation and compounding per group of LGG sign families, namely of kinds of people (a), hypernyms (b), polysemous gesture sources (c), meaningful body locations (d), and specific handshapes (e)

As seen in the previous chapter, all the gestures collected in Bissau are adopted as signs. However, only about half of them expand into families of signs. Importantly, they are all preserved over time except for a few items that signers replaced to prevent them from being understood by hearing people.

4.7.3 Lexical expansion of 'hit' in LGG through grammaticalisation

Parallel to the diachronic systematisation of such lexical expansion, the LGG lexicon extends through grammaticalisation. The range of grammatical functions of the sign-from-gesture HIT was analysed synchronically. The original meaning of 'hit' extended semantically to a comparative marker, as recorded in the 2017 dictionary. Likely after some

time, as collected in the additional videos in 2022, comparative structures enlarged their range and eventually became emphatic.

In sum, during the first years of LGG emergence, the lexical stock rooted in the gestures collected in Bissau developed sequentially in kinship and colour terms, according to universal expectations. In addition, the diachronic analysis of lexical expansion demonstrated that compounding is the most productive process of lexical expansion, especially in particular semantic fields. Finally, although limited to one case, the sign-from-gesture HIT showed the possibilities of grammaticalising into different functions in a short period.

4.8 Discussion

When looking at the processes driving lexical expansion in LGG over time, it becomes clear that polysemy occurs consistently over time and that both compounding and derivation are quite productive along the way.

4.8.1 Lexical expansion of kinship and colour terms in LGG

Both semantic fields described in this analysis – kinship and colour terms – validate their corresponding diachronic sequences as universal. The analysis further shows that the earliest stage in semantic stratification stems from gestures.

As previewed by Goddard and Wierzbicka (2013, 50–51), 'man', 'woman' and 'child' constitute lexical universals, which, in Bissau, are expressed by a gestural triad from which kinship terms expand. They extend by polysemy to 'father', 'mother' and 'offspring', and then by taking advantage of other gestural sources to refer to 'sibling' and 'grandparent'. This aligns with the idea suggested by Woodward

(1978, 128) that, at least, the former four terms are the basis for kinship lexical structuring.

In the 2017 LGG collection, created at most 14 years after the first larger concentration of deaf people, new kinship terms, apart from the sign FATHER^MOTHER^CHILD 'family', refer to more distant family relationships. These are composed mainly of combinations of gender distinctions and newly created signs from metaphoric and abstract associations, or manual letters. The latter strategy is found in other macro-community sign languages, like KSL, and also in UgSL for collateral kin members (Wilkinson 2009, 273, 285).

The fact that we can trace the diachronic sequencing of kinship terms in LGG corroborates, on one hand, the universality of the implicational hierarchy in this semantic field, and, on the other hand, a more precise timing of the activated strategies to represent kin members. From the description presented here, it becomes evident that LGG signs for closer family relations collected during the first couple of years of language emergence derive from common gestures used in Bissau. Within the following decade, and as expected, terms were created for more distant family ties.

Similar to kinship terms, the lexical sequence for colours in LGG expands from a gestural base as well. The gesture for 'white' used in Bissau, which consists of rubbing a typically dark skin, quickly gets distinguished in its articulation as a sign from 'black'. According to the universally established hierarchy, the colour terms that come after the gestural source are related to football references. From the mechanisms behind the creation of colour signs, it is possible to deduce the order in which they were created and, in this way, demonstrate that LGG signs conform to the implicational hierarchy claimed by Berlin and Kay (1969). Thus, 'white' and 'black' would naturally be succeeded by 'red'

as demonstrated by Providence Island Sign Language (Woodward 1989, 151).

Ambiguities arise in the following three colours in line. Kay argues that 'green' and 'blue' are set apart only after coexisting with 'yellow' (1975, 260). Data from LGG shows that the initial motivation for 'green' is similar to 'red', pointing to the possibility that it was created around the same time. Nonetheless, during the first decade of language emergence, 'green' was replaced by a sign whose motivation was closer to 'blue', as if moving towards a "grue" symbiosis rather than away from it (ibid.). Moreover, according to the motivation type, 'yellow' is singled out as a colour in the 2006 collection, for depicting a famous football player instead of a particular football club. LGG signers used this same logic to represent countries, in 2006 and 2017, though, in the latest collection, 'brown' was also created according to such a motivation. This sequence validates the stages – at least until stage VI – as described by Kay (1975, 260). In 2017, the remaining colours from stage VII resort to both the morphological derivation from 'white' and polysemy related to coloured objects. Again, in this stage, the type of sign formation in LGG suggests that PINK precedes PURPLE and ORANGE comes before GREY.

The LGG data on colours collected over the years shows how the sequence is organised diachronically at the hands of a fast-growing deaf community. Similar to the kinship hierarchy, colours also derive from a gestural source, though limited to the first two signs. The following five colour signs are original creations based on football imagery, and the last four colours rely on different strategies. Within the distinct types of representation mechanisms, it is possible to infer the order in which colour terms were created. While this conforms to a universal hierarchy, it also reveals a curious disposition of 'green' and 'blue' to become similar in their forms after coexisting with yellow.

4.8.2 Lexical expansion of sign families in LGG

When looking at families of signs, it becomes evident that they manifest different preferences for derivation or compounding. Compounding presupposes the conventionalisation of lexical items, and derivation implies the conventionalisation of meaningful phonomorphemes. That said, conventional gestures collected in Bissau are ready to be picked up by signers who integrate them into the lexicon, combine them with each other and with other signs created in the meantime. In this way, deaf signers benefit from the first resilient property of language, i.e., a set of stable gestures, as claimed by Goldin-Meadow (2002, 347). However, at such an early stage of language emergence, only some of the phonomorphemes are reanalysed as meaningful enough to be combined with other formational units to derive new signs. Again, this demonstrates another resilient property of language in the building up of paradigms rooted in smaller form-meaning units (ibid.).

With such an initial stock in hand, establishing contrasts between the items, like distinguishing between CHILD and ADULT, was the natural step that followed (ibid., 348). Lepic and Padden argue that iconicity makes the recognition of paradigms easier (2017, 497). Also, Johnston and Schembri had already suggested that iconicity promotes the combination of meaningful components (1999, 125).

That said, specific body locations or handshapes carrying certain concepts are treated as morphological roots from where families of signs expand. Signs within these families are contrasted with each other by modifying the minimal units of signs, designated as *phonomorphemes* (Johnston & Schembri 1999, 118), *ion-morphs* (Fernald & Napoli 2000, 36–37) or *form-meaning units* (van der Kooij et al. 2023).

This is well illustrated by the lexical expansion of TALK in LGG, similar to what was demonstrated by Lepic and Occhino in ASL (2018, 156).

In this line of thought, the gesture for 'crazy' is readily included in a family of signs rooted in the semantics of mental activity expressed by the forehead as seen in ASL (Lepic 2015, 155–156) and IPSL (Zeshan 2000, 30).

The same occurs with entity handshapes forming lexical families, which in the LGG set studied here occurs with the *claw* handshape and those representing cutting tools.

Significantly, grammatical categories can also be determined by derivational processes. For instance, the *thumb(s) up* meaning 'good' is modified in LGG to express the comparative degree BETTER, a related adjective IMPORTANT, and the verb-like SUCCEED. In the same way as described by Frishberg and Gough for ASL, a reverse movement also signifies a semantic opposition in BAD (2000 [1973], 105–106). Also, the height-specifier turns into the verb-like sign GROW by relying on the upward movement to highlight the action, as suggested by Abner and colleagues (2019, 233). In contrast, the static forms for CHILD / SHORT and ADULT / TALL are distinguished only by a more specific facial expression in the adjective-like signs. Not unlike what was suggested by Meir (2012, 85), these distinctions coexist with multifunctional signs, like SICK that can be adjective, noun or verb-like.

Besides derivational processes, polysemy can be distinguished by mouthing, as also observed in NGT (Quer et al. 2017, 35), and in noun-verb pairs in *Österreichische Gebärdensprache*, ÖGS (Hunger 2006, 83) and Auslan (Johnston 2001, 240–241). In the LGG development of gestures into signs, a distinction with mouthing occurred only between the pairs MAN / FATHER and WOMAN / MOTHER, namely in the kinship term.

Guevara and Scalise claim that compounding is a very productive strategy, especially in new languages (2009, 101). It is often used to disambiguate related meanings and grammatical categories in sign

languages, as is the case in ASL (Supalla & Clark 2015, 194) and ABSL (Tkachman & Sandler 2015, 33). One way of clarifying more ambiguous signs is turning them into hypernyms and combining them with different signs to refer to their hyponyms, like the LGG signs SICK and WORK. These are used respectively in compounds for distinct diseases and professions. In a similar way, the sign-from-gesture CHIEF is employed to distinguish different high-ranking positions, as is *palm(s) up* combined with other signs to disambiguate the wh-question.

Some LGG lexical clusters analysed here conform to Downing's claim that novel compounds consistently activate specific relationships according to their semantic motivations (1977, 831). LGG signs for animals involve references to their appearance, such as *claw(s)* and *wings*. Also, LGG signs for people, whether kin members or of professions, are combined with gender. Gender and age are used recurrently in other sign languages, such as ASL (Vercellotti & Mortensen 2012, 561), IPSL (Zeshan 2000, 85), LaSiBo (Tano 2016, 199), ABSL (Meir et al. 2010, 319), YMSLs (Safar 2020a, 66), and Libras (Figueiredo-Silva & Sell 2011, 36, 38).

In addition, similar to what has been observed in emerging signed systems in San Juan Quiahije, in Mexico (Hou 2016, 164), and Amami Island, in Japan (Osugi et al. 1999, 104), food items are typically represented by the way they are prepared, especially by the way they are cut, as in Nicaragua (Morford & Kegl 2004, 373). Thus, unsurprisingly, depicting cutting movements for specific food items is very productive in LGG.

Over time, very few LGG signs resort to combinations with fingerspelled letters, different from other sign languages, such as ASL (Padden 1998, 53, 91), probably due to less regular contact with the written language. In a different way, more socially sensitive terms in gestures-to-signs tend to be replaced, as predicted by Bowern (2019, 51). The

creation of new signs to mask the iconic motivation of sensitive concepts, as observed in only a few items in LGG, has been scarcely documented in sign languages. Still, in Hong Kong Sign Language, Wei and colleagues (2018) studied euphemistic expressions of sex-related signs.

4.8.3 Lexical expansion of 'hit' in LGG through grammaticalisation

Overall, when a sign becomes part of different combinations, it desemanticises, as observed by Heine and Kuteva (2008, 148–149, 157). Such semantic generalisation also occurs in the grammaticalisation of signs, as suggested by Coppola (2020, 370). This is the case of HIT in LGG as an intensifier, similar to KSL (Morgan 2022, 284) and Libras (Martins & Machado 2024). As part of a comparative construction, it occurs equally in LSN and with the same meaning but in a different form in ASL (Wilbur et al. 2018) and LSE (Costello 2015, 195–196.