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

Sousa da Silva Martins, M.

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### 3 ROUTES OF GESTURE INTEGRATION INTO LGG

*[...] gestures are not hearing people's gestures,  
they belong to deaf people too.*

(Janzen 2012, 836)

#### 3.1 Introduction

Sign languages are known to incorporate gestures into their lexicons (e.g., Janzen 2012; Wilcox 2014, for overviews). However, how this integration process of gestures as lexemes unfolds has been scarcely described, especially in terms of the meanings ascribed to gestures and how those meanings persist or change when entering the signed lexicon used in deaf-deaf communication. While a few case studies have cracked open a window on this process in different contexts (Washaugh, 1986, Morgan 2016, Coppola 2020, Le Guen et al. 2020), this current study makes a new contribution to our knowledge of language (re)creation by looking systematically at the changes that gestures undergo when becoming part of an emerging signed lexicon – something that the unique situation in Bissau makes possible. Besides showing for the first time how this process occurs in real time, this study relies on new ways of collecting data on gesture use. In particular, the methodology used here prioritises deaf people's observations of multimodal interactions among their hearing peers.

Gestures are highly ingrained in local communication habits, even if they are typically supported by speech. Deaf people are exceptionally skilled at adapting to gestural interactions, capturing the most out of every gesture clue while making themselves perceived by hearing non-signers (Kusters 2017, on deaf-hearing interactions in the street markets of Mumbai, India). While capturing these gestures, deaf

signers benefit from a ready-to-use lexical stock that they must only adapt to a fully visual-manual system.

This chapter sets out to understand the unique transition from gesture to sign as form-meaning pairs. I first focus on identifying a set of gestures used in Bissau by hearing people, and then investigate their subsequent integration into the emerging LGG lexicon. I start by eliciting gestures from a set of 41 concepts, and then investigate their signed counterparts in LGG. By the end, I find that while some of these gestures are directly incorporated into the LGG lexicon with essentially identical form and meaning, others undergo semantic adjustments that involve a few variants or larger networks of forms and meanings.

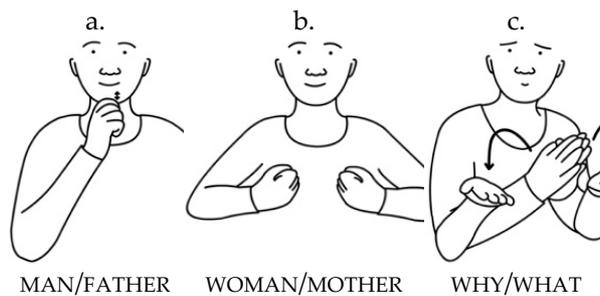
### **3.2 Background**

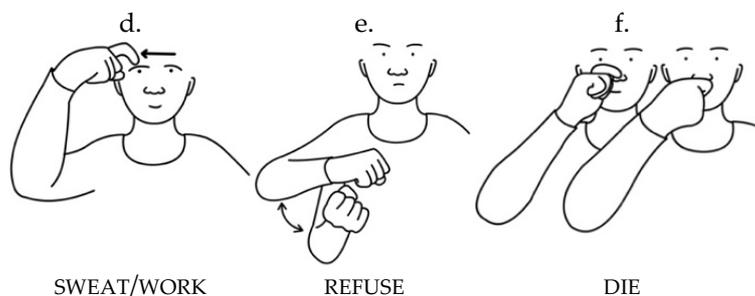
It has been hypothesised that conventionalised gestures “serve as the raw material for deaf language creation” (Washabaugh 1986, 185). Thus, looking at the gestural substrate as a primary lexical stock for sign language to emerge, young sign languages, such as LGG, present the perfect opportunity to witness the lexical integration process in real time (Coppola 2020, 349, 372). Identifying sign origins in gesture further enables the observation of intermediate stages of lexical refinement in both form and meaning when incorporated into a signed lexicon (ibid., 361). Does Guinea-Bissau also have these gesture/sign counterparts, and, if so, how are they integrated into LGG? What other gestures have been incorporated into LGG? When getting integrated as signs, do gestures have their form adjusted to the new linguistic system? Do they specialise in their meaning?

Previous studies have shown that the repeated use of certain gestures leads to their conventionalisation, i.e., to stable forms around related

meanings (Wundt 1974 [1921]; Hanna 1996; Kendon 2004). Gestures of frequent use tend to be more reduced in space and more stylised in their shape (Kendon 1981, 152). Stylisation implies that they are no longer recognised by their iconic motivation but instead as a conventionalised expression (Eco 1976, 238). At the same time, semantically, one gesture may encompass multiple meanings, and different gestures may express the same meaning. Signers promptly adopt these stable forms, expressing a more or less closed range of meanings.

A reasonable expectation is that the more conventionalised gestures are within a community, the more likely they will be integrated into a signed system, thus presenting a consistent form to express a widely recognisable meaning (Le Guen et al. 2020, 339). For example, in West Africa, Nyst describes a set of gestures and their signed counterparts widely-used by both hearing and deaf people (2010a, 39; 2013b; 2015, 135): MAN/FATHER (Figure 50a), WOMAN/MOTHER (Figure 50b), WHY/WHAT (Figure 50c), SWEAT/WORK (Figure 50d), REFUSE (Figure 50e), and DIE (Figure 50f).





**Figure 50.** Shared manual forms in gestures and signs across West Africa: MAN / FATHER (a), WOMAN / MOTHER (b), WHY / WHAT (c), SWEAT / WORK (d), REFUSE (e), and DIE (f)

Conventionalised gestures with a more economical form and a less ambiguous meaning are the best candidates for becoming proto-signs (Arbib 2010, 155; Le Guen et al. 2020, 301). Since gestures easily gain linguistic properties when used without speech (Goldin-Meadow et al. 1996, 34, 47-48), they have been found to lexicalise in the emergence of a new sign language (Delaporte & Shaw 2009, 55). In this way, emerging sign languages enable the observation in real time of the incorporation of gestural sources, especially the most conventionalised ones, into the signed lexicon (e.g., Coppola 2020, for Nicaraguan Sign Language).

To understand what can be expected to occur in the emerging LGG, the present review turns first to the process of conventionalising gestures. Such gestures could then be considered primary candidates for sign language integration.

### 3.2.1 Gesture conventionalisation

Scholars have referred to conventional gestures differently depending on how they view them. They can be seen as *semiotic* (Barakat 1973,

767), i.e., with a shared meaning within a cultural group, becoming *symbolic* (Wundt 1974 [1921], 87-101; Efron 1972 [1941], 96) and growing *autonomous* from speech (Kendon 1983, 40; Payrató 1993, 195-196). They can conventionalise to the point where they are easily assigned to spoken equivalents (Kendon 2004, 177-190), and become standalone lexical items (like words or expressions), i.e., *quotable* (Kendon 1992; Brookes 2005). When used intentionally within a group (Ekman & Friesen 1969, 64), they can represent a complete speech act (Müller 2018, 2). Moreover, their shared meaning tends to be more general and abstract (Kendon 2008, 136), symbolically encoded (and taught as such) by a cultural community. Such highly conventionalised gestures are commonly labelled *emblematic* or *emblems* (Efron 1972 [1941], 96; Ekman & Friesen 1969, 63; Morris et al. 1979, xvii).

The term emblem tends to refer to less transparent gestures, i.e., not pictorial. They possibly derive from recurrent gestures or culture-specific inventions whose origins are not always traceable (Morris et al. 1979, 266-267; Teßendorf 2014, 92) due to processes of reduction and stylisation (Kendon 1981, 152) and semantic change. Because the scope of the term 'emblem' still lacks an accurate delimitation, I am using here the broader designation of 'conventional gesture', as did Coppola in her gesture-to-sign study (2020, 352).

### 3.2.1.1 *The conventionalisation of different types of gestures*

Different types of gestures may conventionalise and thus become emblematic. It is essential to keep in mind that gestures are created according to various semiotic motivations, around Peirce's categories (1940). They can be indexical (involving pointing in space or to the body), iconic (representing an enactment or an object), interactive (implying the reference to the interlocutor) or metaphoric (standing for a concept more abstractly). Abner, Cooperrider, and Goldin-Meadow

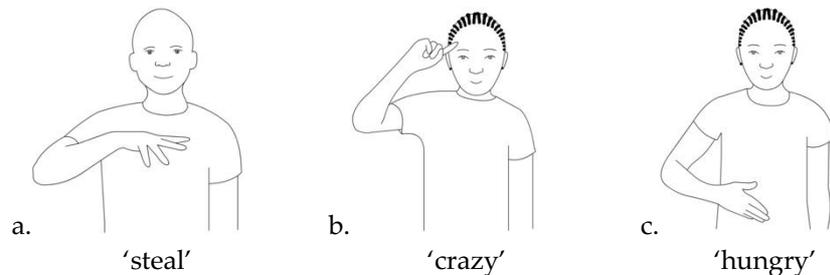
suggest classifying gestures according to their function in communication. When they add meaning to the message, they are re-presentational, as are indexical references and iconic depictions (2015, 438). When they focus on the exchange itself, they are, instead, interactive, i.e., expected to influence the interlocutor's behaviour (Ekman & Friesen 1969, 56).

The conventionalisation of gestures in general presupposes a developmental trajectory (Hanna 1996, 289), i.e., a 'refinement' (ibid., 333) in form and meaning (Wundt 1974 [1921], 72). Changes in form lead to a gradual reduction and stylisation of gestures. While a reduction may consist, for instance, of depicting a motorcycle by slightly twisting the fist (e.g., Kendon 2004, 308), stylisation implies modifying the form in a way that it loses the original iconic motivation (Ekman & Friesen 1969, 65; Kendon 1981, 152).

Following Eco, stylisation is when the iconic representation of a particular expression becomes conventionalised to a point where its symbolism replaces its original motivation (1976, 238). Hanna further suggests that "the stylization process involves remodelling of the original gesture according to an established system of articulation and oppositions" (1996, 349), i.e., in relation to other gestures. Conventional gestures are then reshaped as components within a linguistic system. Good examples of such stylisation are the drinking gesture with the thumb directed to the mouth (Efron 1972 [1941], 181, cited in Hanna 1996, 335) and the recurrent action of taking something away from someone by flexing the fingers inwards one after the other to mean 'steal', in Figure 51a (de Jorio 2000 [1832], 258).

On top of formational refinement and stylisation, conventionalising gestures tends to imply a semantic abstraction at a local level (Morris et al. 1979, xvii). Of course, for conventionalisation to occur, gestures must be used repeatedly over time. Therefore, co-speech gestures used

frequently in daily communication, such as the ones involving evaluative comments about others (e.g., ‘crazy’, in Figure 51b), about oneself (e.g., ‘hungry’, in Figure 51c), and interpersonal control (e.g., threats and requests), seem to conventionalise more easily than iconic representations of objects and actions (c.f., Kendon 1981, 141, comparing several repertoires of emblematic gestures; and Washabaugh 1986, 185-188, studying the integration of emblematic gestures into the sign language of the Providence Island).



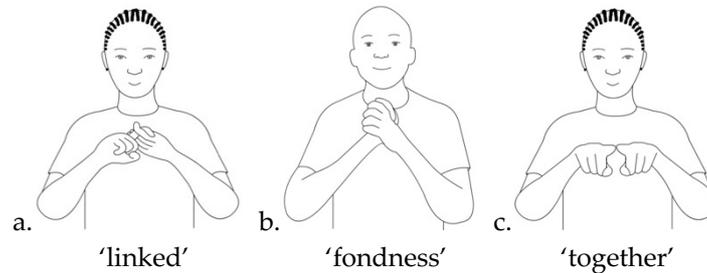
**Figure 51.** Examples of conventional gestures used elsewhere for ‘steal’, showing form stylisation (a), ‘crazy’, expressing an evaluative comment about others (b), and ‘hungry’, expressing an evaluative comment about oneself (c)

Some symbolic gestures tend to be very conservative in form and meaning (Morris et al. 1979, 268), like the thumb up for ‘good’. Others encompass different – though related – meanings; that is, they are polysemous. For instance, the enactment of cutting one’s throat with the hand or the index finger can refer to both the act of killing and the resulting death (Calbris 2003, 22–25, for a French gesture; Brookes 2004, 222, for a South African gesture). As summarised next, such a polysemy can extend to other form variants and related meanings in larger gesture clusters.

### 3.2.1.2 *Gesture clusters of related forms and meanings*

When gestures' variation in form and meaning is acceptable around shared main parameters, they constitute gesture families (Kendon 2004, 227) or gestural *gestalts* (Hirsch 1993; Müller 2017). Such gestures undergoing metaphorical processes around a core meaning are based on a schematic domain of images or actions (Ladewig 2011, 3; Müller 2017, 290-291).

Conventional gestures based on metaphoric associations will likely cluster around similar forms and related meanings, especially if used recurrently. A good example of such structural and semantic islands involves *joining two fingers* (usually the index fingers of both hands or the same hand's index and middle fingers), tapping, rubbing or interlocking each other to indicate a schema of togetherness or linkage (Will 2021, 109), in Figure 52a. This may also correspond to the primary metaphor 'emotional intimacy is proximity' (Grady 1997, 293), where the iconic closeness of the articulators maps metaphorically the (emotional) connection between two entities (Taub 2001, 119). In its embodied sense, *squeezing hands* or hugging expresses love or fondness through touch (de Jorio 2000 [1832], 80), in Figure 52b. Forms with two index fingers or the index and middle fingers of one hand brought together have been attested in Naples to mean 'close friendship', 'matrimony', 'couple', 'similar', or 'equal' (de Jorio 2000 [1832], 90), and are also common in sign languages (e.g., Taub 2001, 119, for ASL), in Figure 52c.



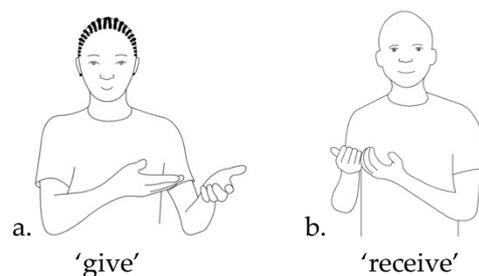
**Figure 52.** Joined-finger gestures for 'linked' (a), 'fondness' (b), and 'together' (c)

Some gestures expressing metaphors are so ingrained in daily communicative acts that they become highly conventionalised in representing abstract concepts (McNeill 1992, 14). Such abstractions will likely encompass related meanings around a semantic core. For instance, meaningful body locations host abstract concepts through metaphors, as in 'physical and emotional states are entities within a person' (Lakoff & Johnson 1980, 50). Ideas can also be seen as growing living entities, as in 'ideas are food or plants' (*ibid.*, 46), corresponding to the primary metaphor 'knowledge is physical contents of the head' (Grady 1997, 298), which is very productive in ASL as 'the mind is a container' metaphor (Wilcox 2000, 107).

There are also metaphors cognitively rooted in everyday proprioceptive experiences (Ladewig 2011, 15), such as giving (Harrison & Ladewig 2021, 156). Bavelas and colleagues categorise these gestures overtly addressed to the interlocutor as interactive (1992, 473). Thus, after getting the interlocutor's attention, these 'spatially anchored gestures', like begging, expect a (physical) response from the addressee (Cooperrider 2020, 5-6, *emphasis in the original*).

These interactive gestures involving a containment transfer are widely expressed by forms with the *palm(s) up* (also known as Palm Up Open

Hand – PUOH, since Müller 2004). These are probably rooted in the act of giving, in Figure 53a, and receiving, in Figure 53b. De Jorio points out that giving something to someone is one of the simplest and most natural human acts, whose handshape is easily adapted to the affordances of the object given (2000 [1832], 306-307). It can also be shaped by cultural rules. For instance, Hausa speakers avoid using their left hand and hand something to someone with the right one or both of them instead (Will 2021, 117). Accordingly, the open palm-up directed to someone else is expected to occur everywhere as a natural way of preparing to receive what has been asked for (be it a piece of bread or help), which can be intensified by extending the two hands (de Jorio 2000 [1832], 128, for classical antiquity).

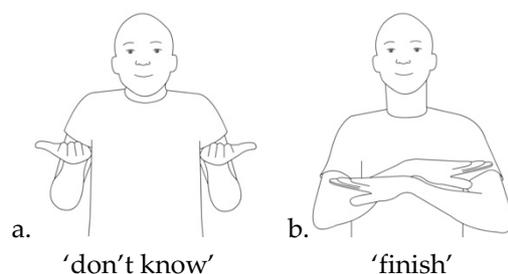


**Figure 53.** Palm-up gestures for 'give' (a), and 'receive' (b)

While the *palm-up* described so far is tendentially directed to the interlocutor and consistently appears to be presenting (or expected to be presented with) something (Cooperrider et al. 2018, 3-4), a concurrent semantic cluster is motivated instead by its empty-handedness (Chu et al. 2014, 700). Cooperrider, Abner and Goldin-Meadow designate it as the “palm up epistemic” (2018, 4), seemingly involving the rotation of the hand combined (sometimes interchangeably) with the shoulders shrug (Johnson et al. 1975, 342, in the USA; Streeck 2009, 189, in the

USA and the Philippines; Chu et al. 2014, 700, in the UK; Gawne 2018, 25, among Syuba speakers in Nepal; and Givens 2016 for a review). The palm up is likely to stand for a reduction of the whole bodily shrug (Cooperrider et al. 2018, 13) and revolve around a core meaning of ‘absence of knowledge’, widely attested crosslinguistically, in Figure 54a. This can intuitively expand to uncertainty or interrogative uses (Cooperrider et al. 2018, 10). It is so conventionalised and easily glossed that it is incorporated in many sign languages, especially as WH signs (Givens 1986, 160; Cooperrider et al. 2018, 7). Significantly, its semantic nucleus expands into different functions and meanings in sign languages (Loon et al. 2014, 2139, for ASL, NZSL and NGT).

When turning the *palm(s) down* (with a more absolute meaning when produced with the two hands) with an energetic outward motion, it can either be based on cutting through or sweeping away any unwanted traces from a surface (Kendon 2004, 263) to mean ‘finish(ed)’, in Figure 54b, or ‘through’ (ibid., 250; Brookes 2004, 221). Calbris designates it as ‘the total cut’ to abstractly signify the result of cutting everything everywhere and remaining with nothing else (2003, 35-36). It can also mean interrupting an evolutive process within the growth axis (ibid., 37-38). Within the ‘sweeping away’ schema, Bressemer and Müller consider it part of a gesture cluster known as the ‘away’ family, possibly grounded on the intuitive act of keeping unwanted objects away from the body (2014, 1596-1597). The fact that this metaphor is iconically decipherable by the human mind makes it a good candidate for being widely adopted as a sign by deaf people around that same semantic core (e.g., Mesh & Hou 2018, 355–356).



**Figure 54.** Palm-up and palm-down gestures, respectively for 'don't know' (a) and 'finish' (b)

Polysemous gestures have been suggested to be generally more frequent than gestures with single meanings (de Jorio 2000 [1832], 33). In a different way, some meanings spread over distinct kinesic forms as gesture synonyms (Payrató 2014, 1476; Poggi 2014, 1492) or variants (Calbris 2011, 127). As an example, a 'mug' or the act of 'drinking' (Ortega & Özyürek 2016, 1182) can be depicted by holding its handle or with a C handshape (Ortega & Özyürek 2020a, 68) or by having the whole hand with the thumb pointed at the mouth (Matsumoto & Hwang 2013, 25). Therefore, there are monosemous forms, i.e., with one meaning; polysemous forms, with more than one meaning; and synonymous or variant forms, when one sense is expressed by more than one form.

Semantically, some conventional gestures are more restricted, while others, especially if metaphoric, tend to be polysemous. Alternatively, some meanings are associated with more than one form; that is, there are "synonymous" gestures for specific meanings. In the end, conventional gestures of the emblem variety have clear, recognisable forms, which makes them stand out as candidates to become meaning-bearing lexical items. At the same time, as seen, for instance, in Figure 52 for gestures expressing 'togetherness', even emblematic gestures can have some fluidity in their contexts of use, i.e., in their potential

semantic meaning when paired with speech. Thus, we might predict that signs derived from gestures will need to go through some disambiguation processes to specify their meaning and create the conventional form-meaning mappings required of lexical items. This is a key step in the transition from gesture to sign.

### 3.2.2 Gesture-to-sign incorporation

Given that the present study focuses on incorporating conventional gestures into the signed lexicon, this subsection reviews previous studies on the adjustments in form and meaning occurring during that process. Research suggests that more conventionalised gestures are directly incorporated into sign language (c.f., Le Guen et al., 2020, 333). Otherwise, less conventionalised gestures can be integrated even if they show variability (Coppola 2020, 370).

The incorporation of gestures into sign language implies a change in the type of linguistic system, from a multimodal combination of gestures with speech to a fully visual-manual language. Although co-speech gestures do not possess the properties of a stand-alone language, deaf people are easily driven to adopt gestures as signs since, unlike their hearing peers, they are pressured to rely primarily on visual cues. Thus, gestures conventionalised within a community are readily available as a linguistic input to deaf people.

Le Guen and colleagues account for a substrate of conventional gestures transferred to Yucatec Mayan Sign Language, like GO, COME (2020, 305), FINISH (ibid., 307). They also observe that gestures specifying height are paradigmatically distinct for humans and four-legged animals (ibid., 314–315). The authors suggest that such gestures seem already sign-like, making it easier for deaf people to appropriate their linguistic features when integrating them into a signed lexicon (ibid.,

331). As such, their form and meaning are maintained during the transfer between communication systems (*ibid.*, 333).

Similarly, Morgan (2016) identified many matching forms when comparing conventional gestures collected by Creider (1977) in Western Kenya and contemporary Kenyan Sign Language (KSL). Of these, two-thirds of the gestures had only one sign counterpart in KSL, and one-third had two or more signs related to the gestures. The latter included lexical clusters of polysemous and morphologically and semantically related forms.

It is also important to acknowledge that the direct incorporation of gestures as signs – in both form and meaning – is assessed more accurately in their respective discursive contexts. Based on spontaneous discourse, Safar (2020b) observed subtle differences between gestures and signs specifying height, such as additional functions in signs (but see Chapter 4 for details on such an expansion in LGG). Mesh and Hou (2018) make a similar point for negation in Chatino gestures and signs.

As with any other communicative instance, the exchange of concepts via the visual-manual modality is ruled by two major linguistic principles: economy and efficiency. Economy is understood here as the “law of the least effort” in producing linguistic items (*c.f.*, Martinet 1955, 43). This results in a tendency to reduce the articulatory effort of manual forms during the conventionalisation process (Coppola 2020, 372). On the other hand, efficiency aims to convey concepts as clearly as possible so they are accurately understood. Gestures are then expected to be specified in meaning when entering the signed lexicon (*ibid.*, 366). Given their importance to language emerging out of communication, both these principles, articulatory economy and semantic efficiency, or the optimisation of production and perception, influence the process of gestures being integrated as signs.

### 3.2.2.1 *Adjustments of form in the conventionalisation of manual items*

Considering that there has been little research on the process of gestures becoming signs in a natural context like the one in Bissau, it is not surprising that there is even less research investigating the changes in form from gestures to signs. Therefore, I broaden the review to the conventionalisation of form occurring both in gestures and signs. In general, formational adjustments during the conventionalisation of a manual item, whether a gesture or a sign, are regulated by the principle of articulatory economy, i.e., manual forms will tend to be produced most easily, with the least effort. For the present study, I will focus on the more relevant modifications of the manual form.

Most studies on formational adjustments of manual items have focused on diachronic changes within sign languages. Of these, only a few are concerned with the historical connection to their source, as has been done between ASL and *Langue des Signes Française*, LSF (e.g., Supalla & Clark 2015). Frishberg (1975) identified systematic changes occurring in ASL over time by comparing signs with their historical origin in old LSF. She observed that the articulation of action embodiments became increasingly limited to the hands, spatially reducing the lexical content in what she calls “true signs” (ibid., 711). Notably, the formational reduction during the conventionalisation of a sign is likely to occur in more frequent forms (Fenlon et al. 2019, 18, comparing pointing in gesture and BSL).

Historical linguistic research has shown that a more economical (and relaxed) articulation of signs leads to the mobilisation of the hand instead of the arm, i.e., a distalisation (Delaporte & Shaw 2009, 55), and that the diachronic reduction of the articulatory effort in signs includes simplification of movement (Kendon 2004, 308; Haviland 2015, 88). A long movement tends to become shorter, reduplicated or less ample if involving both hands (Delaporte 2005, 7–8). Also, two-handed signs

will likely become one-handed if articulated on the head (Frishberg 1975, 703). In addition, the second hand may be dropped in the signing space if it does not add meaning to the sign (Delaporte 2005, 6).

Diachronic processes in signs may show similarities with the conventionalisation patterns in gestures and their transition into signs (Müller 2017, 278, comparing a large set of studies on recurrent gestures, including the palm-up family of gestures). For instance, salient features of elaborate pantomimes tend to be selected and increasingly simplified in the emergence of signs, such as choosing the act of breaking the neck of a chicken to refer to the chicken (Haviland 2013, in a first-generation family homesign system in Zinacantán, Mexico). Such a formational reduction has been noticed as far back as the earlier descriptions of the transition of gestures to ASL signs (c.f., Peet 1868, 173).

In line with the articulatory adjustments described previously, Coppola observes that, in the incorporation of conventional gestures into LSN, “[s]ome gesturers produced the form much higher, much lower, or even farther away from the body, out to the side, than in the citation form in LSN, which is produced in a centralized vertical location” (2020, 363). She concludes that, when contrasted to the gestural form, the sign tends to be shorter, more constrained to the hand and centralised in the signing space, potentially losing its semiotic information. In addition, two-handed forms may drop the second hand as signs (ibid., 364).

Overall, the general tendency is to articulate manual items, whether gestures or signs, more easily and quickly, reducing muscular effort (Delaporte 2005, 15). This includes shorter movements and, occasionally, the loss of the second hand. More frequent forms, gestures or signs, will likely conventionalise faster and eventually stylise into less iconic forms. This is to say that conventional gestures that have already

undergone a form reduction may not leave much more to reduce when being adopted as signs.

### 3.2.2.2 *Semantic change over time*

Since the literature on the diachronic semantics of gestures and signs is even more scarce than the literature on changes to form, the present review focuses primarily on semantic change in spoken languages. Over time, the meanings of words seem to head towards semantic disambiguation or the avoidance of “some difficulty of expression” (Bréal 1964 [1900], 60). Otherwise, meanings can also generalise, or desemanticise to encompass more abstract concepts (Bloomfield 1933, 426-427).

Since ambiguities are often found in polysemous forms expressing different meanings and in similar meanings spanning across synonymous forms, semantic change will deal with these phenomena “to secure greater clearness” in communication (Bréal 1964 [1900], 65). In both cases, the semantic clarification takes time. The meanings of synonymous words are likely to gradually differ from each other (*ibid.*, 27; Kutuzov et al. 2018, 2). As for polysemy, when the sense of a form changes from A to B, the two senses will probably coexist in an intermediary stage (Sweetser 1990, 9), “typically for a long time” (Traugott 2006, 126).

Besides the semantic array of a polysemous form, other phenomena are found in semantic change over time. For instance, different lexemes may be replaced by frequently cooccurring words expressing the same concept (Kutuzov 2020, 36–37). Cultural shifts may also affect some concepts that may be addressed differently due to social norms, such as taboos or acquired knowledge (Bower 2019, 52). In addition, external factors, such as technological or cultural modifications, usually lead to semantic change by resorting to polysemous senses or synonymous terms (Bréal 1964 [1900], 104).

Sweetser states that metaphor – the analogy between different concepts – is both the “source” connecting polysemic meanings (1990, 18) and the “structuring force” driving semantic change (ibid., 10). She believes metaphoric links trace historical paths in semantic change (ibid., 45). Bréal further suggests that metaphor reflects a “universal intelligence” in establishing a relationship between two ideas. For being similar in many languages, metaphoric associations may be the most prevalent process of semantic change (Bréal 1964 [1900], 122-123).

In addition to the metaphor(isation), metonymy(sation) – an analogous relationship with parts of an entity – is another mechanism of semantic change (Traugott 2009, 27). Semantic shifts involving metonymy occur in “a concrete-to-abstract direction” (Sweetser 1990, 27). Through the repeated application of a word in distinct communicative contexts, its original semantic content is likely to be reanalysed by the language users for a less literal meaning (Traugott 2006, 130).

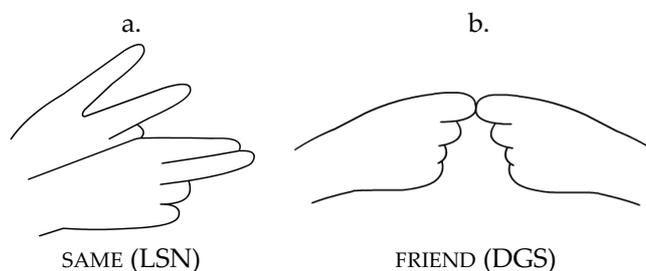
Bloomfield sets up paired classes of semantic change, such as the narrowing (restricting) and widening (expanding, generalising, broadening) of meaning (1933, 426-427). In general, language change is triggered by an innovation within a community and spreads over time through its social networks (Bowerman 2019, 49). Semantic change – or shift – of an original meaning to a subsequent one, implying the acquisition or the loss (or both) of a sense in a word, may be tracked through dictionary entries over time (Kutuzov 2020, 32).

Laws of diachronic semantic change have been proposed based on their recurrence across languages. For instance, Hamilton and colleagues (2016) put forward the law of conformity (in which less frequent words change more quickly because they are more prone to re-interpretation) and the *law of innovation* (in which polysemous words – being quite frequent – change faster due to a higher need for disambiguation). In this line of thought, more frequent, monosemous words

would change more slowly. These laws were challenged by Dubossarsky and his team, who also proposed the law of prototypicality, in which more prototypical meanings, i.e., more representative of their categories, would change more slowly (2015, 2017).

Morford and colleagues have observed that, at least within the classifier system in emerging signed systems, synonymous and polysemous forms tend to decrease over time (1995, 329). For instance, in Nicaragua, a gesture expressed by tracing a vein on the arm encompasses a range of (polysemous) meanings of genetic relatedness, including 'sibling'. At the same time, the meaning 'sibling' can also be expressed by the one-handed gesture with two joined fingers – the index and the middle finger. Yet, when transitioning into a sign used by deaf signers, the meaning of the first form is narrowed to 'sibling', while the sense of the two joined fingers is subsequently widened in LSN to mean 'similar', in Figure 55a (Coppola 2020, 365). Coppola also suggests that semantic generalisations may trigger the need to create new lexical items (ibid., 370). In other words, two synonymous gestures cooccurring for 'sibling' were integrated in LSN. However, only one adopted that meaning, specifying semantically, pushing the other to generalise instead. In another example, a polysemous gesture in Nicaragua meaning 'kill' and 'dead' has its meanings distinguished by being adopted as two different signs in LSN (Coppola 2020, 360).

Nonetheless, some manual forms keep some polysemy, such as the two joined knuckles of the fingers, which in *Deutsche Gebärdensprache* (DGS) refer to 'friend', 'contact' and 'bond', in Figure 55b (Lazarus et al. 2022).



**Figure 55.** Sign involving two joined fingers used in LSN in SAME (a) and DGS in FRIEND (b)

Distinct manual forms with equivalent meanings, i.e., synonymous forms, may result from signers choosing different aspects of a concept to represent it. While signers decide which salient feature will be selected to represent a particular concept, variability is expected, and, as a consequence, conventionalisation has yet to be reached (Morgan 2015, 12–16).

To sum up, in a situation in which gestures are used to expand a growing sign language lexicon, the same form is likely to be used to convey more than one meaning. However, effective communication relies on semantic clarity, which presumably leads to formational distinctions between polysemous words. Over time, some meanings will change and adjust to new contexts of use and cultural transformations. Eventually, they may also be replaced by new lexemes, whether they are synonymous or cooccurring words.

### 3.3 Methodology

This research follows the steps of only a few studies comparing a larger set of conventional gestures and their signed counterparts, such as

Washabaugh (1986) with Providence Island SL, Morgan (2016) with KSL, Coppola (2020) with LSN, and Le Guen (2020) with YMSLs. I foremost aim to see the extent to which LGG signers have recruited conventional gestures. In addition, assuming that conventional gestures already have a well-defined form and meaning, I seek to check what kind of adjustments occur, if any, when gestures are integrated into the LGG lexicon.

Benefitting from the fact that the emerging lexicon of LGG has been recorded during its first two decades of emergence, it is possible to witness in real time if and how those gestures are adopted as signs. Gestures used in Bissau were collected based on 41 concepts with hearing and deaf participants. Those gestures were then compared with LGG signs that were equivalent in form and meaning. Such signs were collected over three different periods after deaf people first gathered in 2003 in a school setting in Bissau. The LGG data is supported by three dictionaries: two were collected in the first couple of years of its emergence (2005 and 2006), and the third was collected a decade later (2017).

Ultimately, the data set comprised the gestures elicited by the concepts and their sign counterparts. The analysis revealed that form modifications were insignificant during the recruitment of gestures as signs. In contrast, the semantic integration was not always direct, i.e., signers seemed to make the most out of gesture variants and synonyms to enlarge the lexicon.

### 3.3.1 Research questions

Considering previous studies on the incorporation of gestures into signed lexicons, conventional gestures will likely constitute the initial lexical stock of an emerging sign language like LGG. What gestures have then been conventionalised in Bissau? Have signers adopted

them? If so, have they modified them when recruiting them as signs? I posit that a set of conventional gestures is used in Bissau as hinted by Nyst in her *gesturebund* hypothesis for West Africa, where Guinea-Bissau is included. Also, as put forward by previous studies, signers will likely adopt conventional gestures used in their surrounding community as signs.

The comparison between emerging LGG signs recorded during the first decade and a half and their corresponding gestural sources enables tracking any adjustments occurring during the adoption process. This study will then aim to answer the following questions:

- What are the routes incorporating conventional gestures into LGG?

In particular,

- What exactly occurs in the form and meaning of gestures, ready to be picked up by signers, when integrated into an emerging sign language?

To answer such questions, I use data elicited for gestures in Bissau from hearing and deaf informants and signs in the three available LGG dictionaries collected over three time periods (2005, 2006 and 2017). As Coppola (2020, 350, 353) and Morgan (2016) have done, I compare the two datasets – of both gestures and signs – to check for modifications occurring in the transition from one to the other.

### 3.3.2 Collection of gestures in Bissau

During the 2018 field trip (see §2.3 for details on the field trips), I collected data on gesture use in Bissau, where LGG has developed for the past twenty years, to discover which gestures may have preceded LGG signs. Data was collected from 20 hearing participants at the National School for the Deaf (ENS), and 38 deaf participants at the ENS and the

Mariposa school. The collection was carried out in groups of four, who were supposed to encode a list of concepts as gestures.

I did the gesture collection without any assistance. To the hearing participants, I asked in Portuguese if they would generally use gestures with other hearing people for each of the concepts in the elicitation list. To the deaf participants, I asked in LGG if they would see hearing people normally using gestures among themselves for each of the sign counterparts on the elicitation list.

All responses for gesture equivalents were filmed on video. I used one camera and recorded the videos on SanDisk cards. The raw videos were then saved on a computer, a memory disk and the cloud. They were assigned with easily identifiable filenames, mentioning whether participants were hearing or deaf and their code numbers. Later, videos were compressed to MP4 through Adobe Media Encoder and backed up in those same locations.

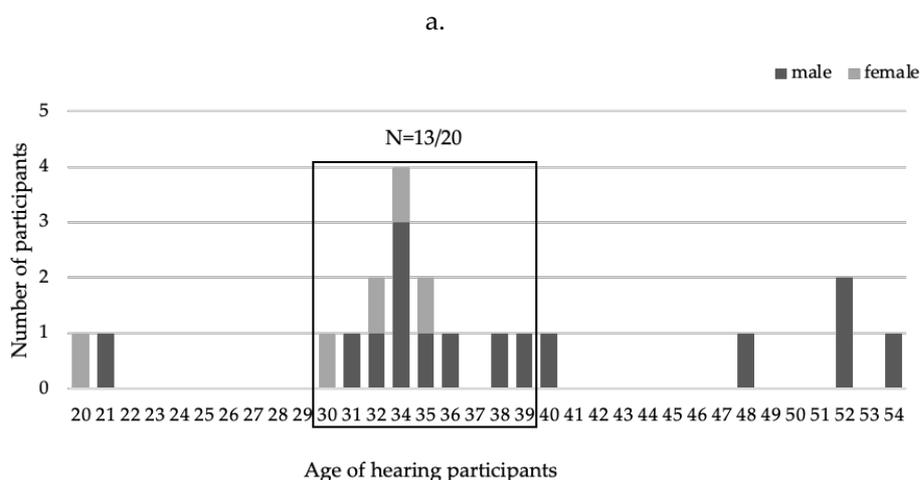
#### *3.3.2.1 Participants*

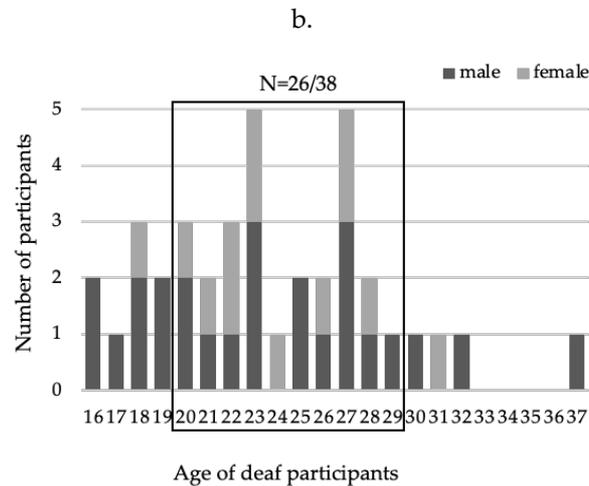
I used a questionnaire in Portuguese to collect information about the participants, namely gender, age, place of birth, ethnicity, languages spoken, schooling, and professional experience. To understand the extent of contact with LGG, I asked hearing participants – all teachers at the ENS – how often they interacted with the deaf. I translated the questionnaire into LGG for the deaf participants. I asked them if they had a deaf partner and for how long, if they had any deaf family members, how many years they had attended a deaf school, and how often they attended deaf groups. Such metadata was then processed in Excel.

Importantly, I recall that gesture elicitation was not initially planned in a way that made me look for sign-naïve hearing people (see §1.2).

The ENS was the location I was most familiar with in Bissau that assembled a significant number of hearing people – many without immediate contact with the deaf. In 2022, about 600 hearing students shared the premises with almost 500 deaf students (see §2.5.2.2). This implied a meaningful amount of hearing teachers, many of them working only with hearing students. For that reason, I sent out a request to the hearing teachers who were willing to participate.

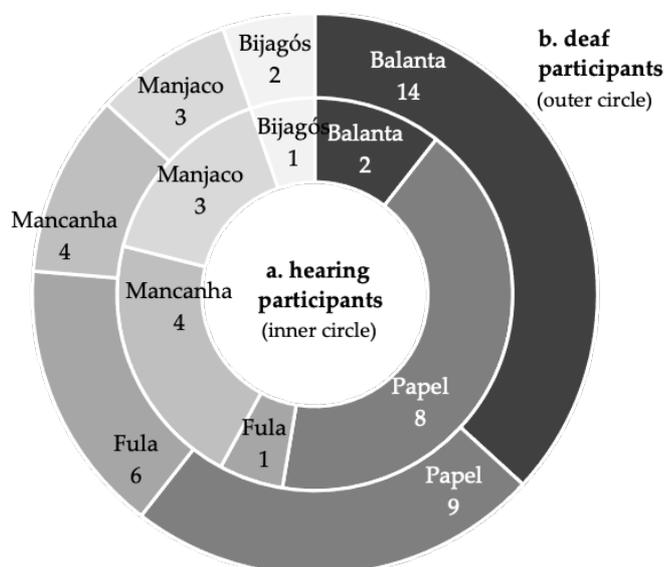
In terms of age, the hearing teachers were older than the deaf participants, representing a still very young community. Hence, teachers were between 20 and 54, most in their thirties (13 of 20), as shown in Figure 56a. In contrast, deaf people were between 16 and 37 years of age, with a more considerable concentration in those still in their twenties (26 of 38), in Figure 56b. Unfortunately, it was challenging to have more gender-balanced groups of participants since both target populations are male-dominated (see §2.5 for a description of the social organisation of the deaf community in Bissau). Thus, there were 25 deaf male participants and 13 deaf women, and only five female teachers and fifteen male teachers.





**Figure 56.** Age and gender of participants, hearing (a) and deaf (b), and, within the squares, the ages where there is a higher number of participants

For ethnic diversity, it was at first assumed that the participants would reflect the nationwide ethnic diversity since the capital city is the primary destination of internal migration for all ethnic groups (see §2.5.1.7). However, that was not the case, as both groups differed in ethnic backgrounds. The hearing teachers are mostly Papel (eight of 20), Mancanha (four of 20) and Manjaco (three of 20), in Figure 57a, while among the deaf participants, the prevailing ethnicities are Balanta (14 of 38), Papel (nine of 38), and Fula (six of 38), in Figure 57b. Except for the Fula people, these ethnic groups are originally from the Bissau region.



**Figure 57.** Ethnic groups of participants, hearing (a) and deaf (b)

Importantly, of the 20 hearing teachers working at the ENS, seven rarely interact with deaf people, be they students or fellow teachers. Of the remaining, those who reported more frequent contact with the deaf, only four were said by the deaf participants to use LGG effectively.

### 3.3.2.2 Elicitation lists

The list of concepts for gesture elicitation was based on Nyst’s ongoing study on the West African *gesturebund* hypothesis (e.g., Nyst & Martins 2022). I selected 20 items from the Nyst list, and added 21 more items based on observations of local communicative interactions in Bissau. This resulted in an elicitation list of 41 concepts, as shown in Table 3.

**Table 3.** List of 41 concepts presented to the hearing in Portuguese to elicit gesture use in Bissau based on Nyst's list (a) and local observations (b)

<b>a. From Nyst's list</b>	
Big ( <i>Grande</i> )	Work ( <i>Trabalho</i> )
Much ( <i>Muito</i> )	Finish ( <i>Acabar</i> )
Animals' height ( <i>Altura animais</i> )	Sorry ( <i>Desculpa</i> )
People's height ( <i>Altura pessoas</i> )	Beg ( <i>Pedir</i> )
Child ( <i>Criança</i> )	Why? ( <i>Porquê?</i> )
Man ( <i>Homem</i> )	Hit ( <i>Bater</i> )
Woman ( <i>Mulher</i> )	Escape ( <i>Fugir</i> )
Witchcraft ( <i>Feitiçaria</i> )	Lie ( <i>Mentir</i> )
Steal ( <i>Roubar</i> )	Die ( <i>Morrer</i> )
	Refuse ( <i>Negar</i> )
	All good? ( <i>Tudo bem?</i> )

<b>b. From observations in Bissau</b>	
Far ( <i>Longe</i> )	Crook ( <i>Bandido</i> )
Six ( <i>Seis</i> )	Sick ( <i>Doente</i> )
Ten ( <i>Dez</i> )	Kill ( <i>Matar</i> )
Boy/girlfriend ( <i>Namorado/a</i> )	Heat ( <i>Calor</i> )
Married ( <i>Casado/a</i> )	Hungry ( <i>Fome</i> )
Old person ( <i>Idoso</i> )	Thirsty ( <i>Sede</i> )
Friend ( <i>Amigo</i> )	Talk ( <i>Falar</i> )
Together ( <i>Junto</i> )	Thank you ( <i>Obrigado</i> )
Same ( <i>Mesmo</i> )	Please ( <i>Por favor</i> )
Chief ( <i>Chefe</i> )	White ( <i>Branco</i> )
	Black ( <i>Preto</i> )

Based on the gestures produced by the hearing participants for those concepts, I reorganised the elicitation list to be presented to the deaf participants for confirmation of gesture use in Bissau. Since I communicated with the deaf participants in LGG to ask them about the

concepts, I used sign equivalents in the encoding list expressed in glosses in Table 4.

Some gesture responses given by the hearing for certain concepts were assigned in the analysis to semantically-related concepts because they were produced in the same way by the hearing gesturers. These were the cases of 'child' (produced for 'child' and within the height specifier for people), 'kill' (asked together with 'die'), 'heat' (same as 'work'), 'please' (same as 'beg'), and 'black' (same as 'white'). Unfortunately, I left a few others out of this second list, namely 'big', 'animal's height', 'sorry', 'all good?', 'together', and 'same'. They were overlooked due to the dynamics in the gesture elicitation with deaf participants (very different from the hearing one), which entailed many side comments diverting me from the original list. For these reasons, the elicitation list of gestures in Table 4 is eleven items shorter, thus comprising 30 items in total.

**Table 4.** List of 30 gestures presented to the deaf in LGG to confirm their use in Bissau, excluding those that were left out of the original list

big	finish	far	sick
much	sorry	six	kill
animal's-height	beg	ten	heat
person-height	why	boy/girlfriend	hungry
child	hit	married	thirsty
man	escape	old person	talk
woman	lie	friend	thank-you
witchcraft	die	together	please
steal	refuse	same	white
work	all good?	chief	black
		crook	

### 3.3.2.3 *Encoding method*

For the elicitation procedure, I followed the encoding method (although I did not include the decoding stage, see Payrató & Clemente 2020, 81, for a review of the encoding part of this method in gesture studies). In *encoding*, participants are supposed to convert concepts into gestures of everyday use. In this task, hearing participants are expected to represent the gesturers themselves. At the same time, I considered deaf participants to be experts for being especially aware of gestural production by hearing people.

Like Coppola (2020, 354), I used an elicited production paradigm, asking participants in spoken Portuguese if they knew gestures associated with those concepts and if they used them in their daily activities. In this way, I expected them to encode each concept as a corresponding gesture. I first presented the 41 concepts – one at a time – to the 20 hearing participants by asking them in spoken Portuguese if they expressed them with gestures or saw them being expressed by others as gestures. In this way, they would produce (“encode”) gestures corresponding to those concepts, as they would typically do (or see done by others) in the regular course of daily life.

The list of concepts was then rearranged to be presented to the 38 deaf participants in LGG, resulting in 30 concepts glossed with the sign equivalents. Again, one at a time, I asked them if they would see hearing people use gestures for those concepts with each other. As such, they would confirm which gestures were typically used by hearing people for those meanings. Deaf people have the advantage of being the primary beneficiaries of gestures. Thus, they are especially aware of the variants employed and their contextual meanings. Deaf participants could answer not only as observers of spontaneous gestures in communication between hearing people but also as experiencers of the efforts of hearing people in communicating with them. For that reason,

they naturally commented on gesture use, such as frequency, typical users, and provided examples of its usage in conversations. Sometimes, they also made suggestions about the kind of actions that are at the origin of specific gestures and observations about articulation differences between gestures and signs.

#### 3.3.2.4 *Elicitation sessions*

In gesture studies, observations of real-life situations have been typically complemented by interviews (Meyer 2013, 228). Here, the diversity of communicative contexts is likely to trigger more form variants and semantic nuances in gestures. However, since observing the natural use of gestures can be extremely time-consuming, questionnaires have become a practical alternative to surveying gesture use. Such a technique can serve to encode messages into gestural forms while gathering additional information about the elicited gestures (Payrató & Clemente 2020, 94–95). Nonetheless, it is essential to keep in mind that eliciting conscious observations of language use does not always align with its actual use.

Although they have not been explored in gesture studies, focus groups are a quick way of collecting qualitative data (Ogunbameru 2003, 2). Participants are led to act in response to each other. Thus, four focus groups, especially if homogeneous, seem to be enough to collect the necessary information to understand a particular subject (Hennink et al. 2009). Moreover, smaller groups of four participants encourage all members to share their experiences, especially if the group is homogeneous (Acocella 2011, 1127).

Both hearing and deaf participants responded in small groups. The concepts were first presented verbally in Portuguese to the five groups of four hearing teachers each (i.e., a total of 20 people). After eliciting user knowledge from hearing gesturers, I asked (in LGG) deaf

participants, in eight groups of four people and two of three people each (in total 38 people), to confirm the uses of gestures for those concepts by presenting them with the corresponding LGG signs.

The fact that participants were brought together in small groups revealed aspects such as response time and the level of general agreement within a group, as shown in Figure 58a. This was crucial to provide clues into the degree of conventionalisation of gestures concerning their forms and associated concepts, as in the variety of gestures produced for the concept of ‘witchcraft’, in Figure 58b.



**Figure 58.** Examples of gesture elicitation in groups of four participants with equal responses to ‘sick’ (a) and differing responses to ‘witchcraft’, namely to mean ‘claws’, ‘crazy’, ‘tail,’ and ‘big eyes’ (b)

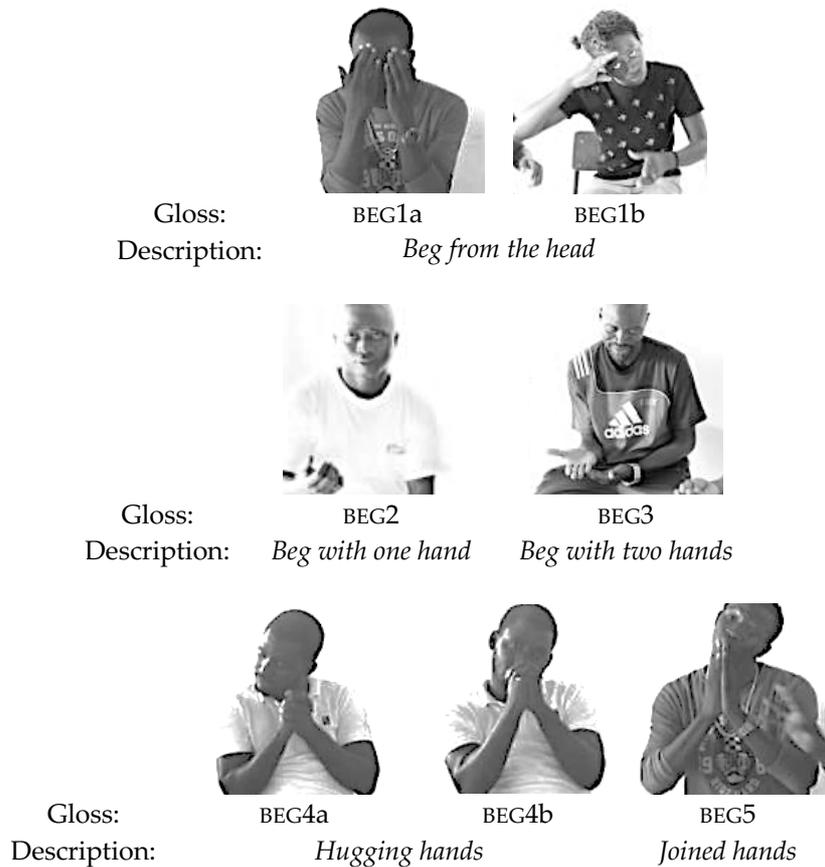
The downside of focus groups is that data can be biased since participants may influence each other (Acocella 2011, 1134). A previous study of a description task shows that in a two-participant context, one of them tends to imitate the other’s gestures (Kimbara 2008).

The sessions with the hearing participants were organised at the ENS for practical purposes since there was a high concentration of hearing and deaf people in one place. Deaf participants were filmed at both the ENS and the Mariposa school. Deaf and most hearing participants were familiar with the emerging sign language. Thus, signs derived from local gestures could trigger biased responses. While the participants' knowledge of LGG may have influenced their gesture production, I argue that precisely because of their knowledge of sign language, these participants and deaf people in particular were more aware of gesture use outside the deaf community.

### 3.3.3 Data analyses

For the analysis, data was transcribed in ELAN, a standard program used in sign language linguistics (Crasborn & Sloetjes 2008). Responses about gesture correspondences were glossed, and additional comments and explanations about gestures were translated into English. Both glosses and translations were then exported to Microsoft Excel, respectively, for frequency of occurrences and content analysis.

Transcriptions included glosses for each gestural form, which assigned different numbers and letter codes for variants. For instance, the concept of 'beg' prompted several gesture variants, glossed as in Figure 59. Importantly, these glosses indicate how many variants there are for each concept and of which kind. The type of variant can imply a different motivation, coded with numbers, or a slight variation in form, coded in letters. Figure 59 shows five different motivations. Here, BEG1 and BEG4 present each two slightly different form variants that are glossed with the letters a and b. Furthermore, to make the manual forms easier to understand for the reader, I assign each numbered variant a simple description.



**Figure 59.** Glosses and form descriptions for the gestures elicited by the concept of 'beg', including gesture variants in form (expressed in letters) and gestures with different motivations (expressed in numbers)

### 3.3.3.1 Gesture responses

The elicitation based on the concept and gesture lists with 20 hearing and 38 deaf participants resulted in 2209 tokens (782 produced by hearing participants and 1427 by deaf ones). If the 58 participants, hearing and deaf, had produced one response for each of the 41 concepts, there would have been 2378 tokens. They typically produced gestural

equivalents for each prompt (concept or gesture). However, they did not always respond and sometimes gave different responses to a single prompt. Thus, some of them were expressed by more than one gesture, either with variation in form or with different semiotic motivations, i.e., as totally different items. Remember that the elicitation list presented to deaf participants was eleven items shorter.

When grouping repeated tokens, the analysis of the incorporation process of gestures-to-signs relied on 69 variant types in form and 100 variant types in motivation. Form variants include gestures produced with different handshapes concerning only the gestural form that was adopted as a sign (e.g., 'kill' with the palm or the index finger running across the throat) or one or two hands (e.g., 'woman' with both fists on the breasts simultaneously versus one fist that touched one breast and then the other). Examples of two variants in motivation are representing an older person by either touching the hair or enacting holding a cane. All concepts presented to both hearing and deaf participants are expressed by conventional gestures, which in turn have sign counterparts. Since some gesture variants in form and gestures with different motivations expressing the same concepts are adopted as signs, there are 52 sign counterparts, i.e., equal in form and meaning to specific conventional gestures.

Table 5 shows the number of responses involving gestures with variants in form (e.g., 'woman', 'refuse', 'lie') and different gestures for the same concept (e.g., 'steal', 'thank you', 'married'). The fact that gestures, with variants in form and different motivations, were incorporated along more or less linear pathways determined how the results of gesture integration in LGG are presented in the description of the results. In this way, I split the data into three main groups. The first set of thirteen concepts involves the direct integration, in form and meaning, of conventional gestures into the LGG lexicon, such as the one for 'finish', in Table 5a. The second group of twelve concepts includes

gestures incorporated with variants, whether different variants for a single concept, like for ‘talk’ with one or two hands, or overlapping variants for two related concepts, such as rubbing the skin for both ‘white’ and ‘black’, in Table 5b. Lastly, the third set of 16 concepts concerns the integration of gestures that overlap in form and meaning within three different clusters, in Table 5c. Of course, determining the linearity of gesture-to-sign incorporation is not always straightforward. Therefore, in Tables 5a, 5b and 5c, I add footnotes (a to h) showing that such arrangements are not always without glitches.

I point out that gesture variants in form and motivation correspond largely to phonological and lexical variants in signs. I opt for this distinction to maintain a clearer difference between the systems in which gestures and signs are included. Also, when referring to the motivation of gestures, I simply acknowledge them, instead of describing them.

**Table 5.** Number of elicited gesture responses per concept, group of participants (hearing and deaf), variation type (form and motivation), and sign counterparts, concerning the direct integration of gestures as signs (a), the integration of gesture variants as signs (b), and the integration of gesture networks as signs (c)

a. Concepts (N=13)	Number of responses			Variant types		Sign counter- parts (N=13)
	Total (N=556)	by hearing (N=232)	by deaf (N=324)	Form (N=20)	Motivation (N=19)	
animals’ height	19	19	-	1	1	1
person’s height	42	18	24	2	1	1
child	18	18	-	1	1	1
finish	49	19	30	1	1	1
sick	83	19	64	1	5	1(+4 <sup>a</sup> )
old person	24	14	10	1	3	1

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woman	52	21	31	2	1	1
man	38	17	21	1	1	1
refuse	69	20	49	2	1	1(+1 <sup>b</sup> )
ten	41	24	17	2	1	1(+1 <sup>b</sup> )
six	25	8	17	2	1	1
hungry	58	21	37	2	1	1
thirsty	38	14	24	2	1	1

<sup>a</sup> gestures with different motivations adopted as signs for other concepts

<sup>b</sup> gesture variants in form adopted as interchangeable signs for the same concept

b. Concepts (N=12)	Number of responses			Variant types		Sign counter- parts (N=19)
	Total (N=601)	by hearing (N=193)	by deaf (N=408)	Form (N=24)	Motivation (N=15)	
hit	61	16	45	2	1	2
talk	58	19	39	2	1	2
chief	65	13	52	4	1	3
lie	80	13	67	2	1	2
far	64	21	43	2	2	2
why	73	20	53	3	1	2
big	7	7	-	1 <sup>c</sup>	1	1
much	55	21	34	2 <sup>d</sup>	1	1
work	59	21	38	2 <sup>c</sup>	2	1(+1 <sup>e</sup> )
heat	26	26	-	2	3 <sup>d</sup>	1(+2 <sup>d</sup> )
white	53	16	37	2	1	1
black <sup>f</sup>		(=)	-	(=)	(=)	1

<sup>c</sup> gestural forms overlapping with the concept listed below

<sup>d</sup> gestural forms overlapping with the concept listed above

<sup>e</sup> gestures with different motivations adopted as members of signed compounds

<sup>f</sup> concept said to be expressed by the same gestural forms as the one listed above

c. Concepts (N=16)	Number of responses			Variant types		Sign counter- parts (N=20)
	Total (N=1052)	by hearing (N=357)	by deaf (N=695)	Form (N=25)	Motivation (N=66)	
beg	100	38	62	3	4	1(+4 <sup>§</sup> )
please	15	15	-	3	3	1 <sup>§</sup> (+3 <sup>§</sup> )
thank you	85	29	56	2	6	1(+4 <sup>§</sup> )
sorry	25	16	9	2	5	2(+3 <sup>§</sup> )
all good?	17	17	-	2	1	1 <sup>§</sup>
married	151	37	114	1	5	1(+4 <sup>§</sup> )
boy/girl- friend	85	15	70	1	5	1(+4 <sup>§</sup> )
friend	104	22	82	1	4	2(+3 <sup>§</sup> )
together	21	21	-	2	2	1(+1 <sup>§</sup> )
same	19	19	-	1	1	1
die	88	25	63	1	6	2 <sup>§</sup> (+1 <sup>§</sup> +2 <sup>h</sup> )
kill	11	11	-	1	1	1 <sup>§</sup>
witchcraft	87	30	57	1	9	1(+2 <sup>§</sup> +3 <sup>h</sup> )
crook	96	15	81	1	8	2(+3 <sup>§</sup> )
steal	67	18	49	2	2	1 <sup>§</sup> (+1 <sup>§</sup> +1 <sup>h</sup> )
escape	81	29	52	1	4	1(+1 <sup>§</sup> +2 <sup>h</sup> )

<sup>§</sup> manual forms overlapping within the same cluster (within row lines)

<sup>h</sup> non-overlapping gestures with different motivations adopted as signs for other concepts

When describing the results, I use glosses in small caps when referring to manual items and single quotes to express their meanings. It is also the case, especially in the description of gesture networks (in §3.5.3), where I use italics to describe the form of gesture variants for the same concept. I have, however, to acknowledge how challenging it is to rely on glosses in a spoken language to describe how form and meaning get aligned and specified from gesture to sign.

3.3.3.2 *Observations by deaf participants*

Discussions by deaf participants were fruitful in elucidating aspects of gestures in use, including their frequency, gender preferences, and conversational contexts. These are addressed whenever relevant during the description of the results. In terms of the gestures' form, deaf people alone made observations about which actions might have been the origin of those gestures. They commented on differences in articulation between gestures and their sign counterparts.

These additional comments that did not assign concept equivalents were translated into English in Elan and assigned to different content categories, as in Table 6, again for 'beg'. This particular example shows comments on gesture use, gender preferences and frequency of use.

**Table 6.** Translation of comments by deaf participants and corresponding content categories for the concept of 'beg', concerning gesture use, gender preferences and frequency of use

Gesture	Comments by deaf participants	Content category
 BEG1	<i>hearing kneel</i> <i>some hearing kneel</i>	Gesture use
	<i>old women exaggerate and kneel used by women</i> <i>hearing women do this</i> <i>hearing old women do this</i>	Gender preferences
 BEG4	<i>used by men</i>	Gender preferences
	<i>only some hearing people use this</i>	Frequency of use

Besides observations by deaf participants, I carried out a comparison between gesture and sign data.

### 3.3.3.3 *Gesture-sign comparison*

In an approach similar to Coppola (2020, 354), I first elicited gestures from hearing participants. Then, I had them checked by deaf observers. Finally, I compared the elicited gestures with lexical items in dictionaries. These LGG signs had been documented in the three available LGG dictionaries collected in 2005, 2006 and 2017 (see §4.3.2.1 for details on the sign collection). Such time-locked records of LGG signs provide a set of lexical items used in the first couple of years of language emergence and then a decade later. In this way, it was possible to identify sign counterparts for the gestures collected in Bissau at an early phase and, for some of the counterparts, their course over the years could be tracked, whether involving modifications of form, modifications of semantic meaning, or neither (i.e., conserving both the form and meaning of the gesture).

The procedure for analysing gesture-to-sign integration began by establishing correspondences between the gestures elicited in Bissau and their formational and semantic counterparts in LGG. The form analysis involves instead deaf observations on form distinctions between gestures and signs, and actual distinctions captured during the analysis. The latter are limited to notable differences in only two phonological parameters: handedness and handshape. The semantic analysis compares the concepts from the elicitation list with the sign translations recorded in the dictionaries.

#### 3.3.3.4 *Form analysis*

In analysing the form of the elicited gestures, I consider, first, empirical explanations given by deaf participants about the original motivations of gestures. Because these are not supported by substantial evidence, I describe them in the analysis of the gestures' form merely as possible origins. In addition, the analysis includes deaf observations of the articulatory distinctions between gestures and signs that were not confirmed in the productions of hearing gesturers collected in Bissau.

When comparing the form of gestures and signs recorded in the dictionaries, I identified only two types of modifications: one in handedness, involving modifications from two-handed to one-handed forms, and in handshape, from the whole hand to the index finger. Though both variants in handedness (two and one-handed forms) and in handshape (whole-handed and index-finger forms) were already occurring as gestures, I considered them formational modifications since the final form was determined only as a sign.

As a result, I determine form adjustments from deaf perceptions on the original motivations of gestures and differences between gestures and signs. In addition, I describe actual modifications observed in gesture-sign equivalents, namely in handedness and handshape.

#### 3.3.3.5 *Semantic analysis*

In the semantic integration of gestures into LGG, I observed three integration processes: one-to-one, few-to-few, and many-to-many. The one-to-one relationship between the gestures and the signs implied a direct correspondence between the elicited concept and the translation in the dictionary of equivalent manual forms. When there was instead a relationship between a few gestures and signs, I considered such a process as the integration of gesture variants into LGG.

Finally, some gestures overlapped in form and meaning with each other within specific semantic clusters. In these entangled networks leading to the integration of many gestures as many signs, I considered the correspondences between equivalent manual forms with different meanings as polysemous. At the same time, I considered the correspondences between elicited concepts for gesture equivalents and sign translations in the dictionaries to be synonyms, expressed by different manual forms.

### **3.4 Bissau gestures to LGG signs: form adjustments**

The formational adjustments occurring during the process of gestures becoming signs were identified through two different lenses. From the reports of deaf participants regarding the elicitation list (§3.4.1), it was possible to retrieve possible original motivations for three gestures (§3.4.1.1) and differences between gestures and signs for three other items (§3.4.1.2). From the data collected from the sessions in Bissau, based on a formal comparison of the data recorded, there is evidence of formational modifications in handedness in six forms and handshape in four other items (§3.4.2).

Although referred to in the literature, movement reductions were not observed when contrasting collected gestures and their sign counterparts. However, they were described by deaf participants and, for that reason, were included in the analysis of their perceptions of the differences between gestures and signs. Like Coppola (2020, 356), I considered in the formal comparison the number of hands (one or two) and changes in handshape (yes or no). Whenever there were changes in handshape, they were described further in terms of the selected fingers.

### 3.4.1 Observations about gesture use by deaf observers

Besides providing gesture equivalents to the elicited concepts, deaf participants often added side comments on gesture use. These included their sense of how frequent or infrequent certain gestures were used in Bissau, who would typically produce them, if men or women, and how different they seemed to them when compared to their sign counterparts. Finally, deaf observers of gesture use also hypothesised the actions behind specific gestures. In terms of the gestures' form, this subsection focuses on the observations made by deaf people about the original motivation of gestures (§3.4.1.1) and how hearing people articulate certain gestures (§3.4.1.2). In both types of observations, the gestures given as examples by deaf participants are contrasted with their sign counterparts to deduce from there possible adjustments in form when being adopted as signs.

#### 3.4.1.1 *Observations about the original motivation of gestures*

Deaf participants made several comments on different aspects of gestures. As far as form is concerned, they suggested the original motivation in three cases: REFUSE, HIT and BEG. Interestingly, they added information on the people who usually perform such actions (children in the first one and women in the latter), the context (in the first), and the way these behaviours are performed initially. I present here such observations for each of the three gestures.

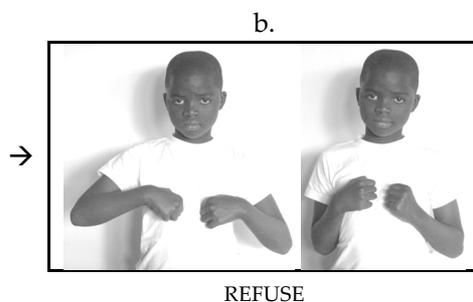
One of the deaf participants suggested that the conventionalised form in REFUSE derived from the action typical in children of pressing the elbows tightly against the sides of the body and rotating the whole torso repeatedly to embody an act of refusal (in Figure 60a). As a gesture, it is reduced in bodily movement to two interchangeable forms: one with each elbow striking against the sides of the torso and another with only one elbow (in Figure 77). Although the latter was produced

more often, one deaf observer commented that the two forms were equivalent among the hearing. Occasionally, the hearing participants accompanied the gesture (irrespective of the variant) by the word in Creole <nega>, meaning 'to deny doing something'. Such a denial, as exemplified by one of the deaf participants, may refer simply to declining food when one is satisfied.

When contrasting the original action and the conventionalised gesture, it becomes evident that the latter is produced with much less effort than the former, as can be seen in Figure 60b. That is, there is a difference in the overall amount of torso rotation, where the original action goes in two clear directions (counterclockwise, then clockwise) versus the single movement of the arms downward in REFUSE. There is also a highly expressive facial expression in the behaviour of the gesturer that is quite neutralised in the sign.



*Act of refusing by children*



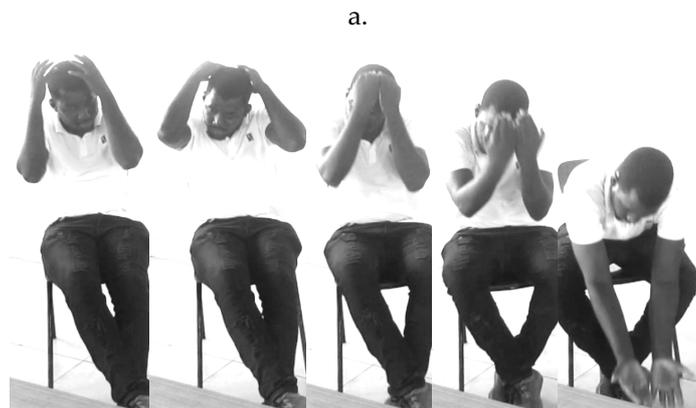
**Figure 60.** **Original act of refusing**, typically produced by children by pressing the elbows against the sides of the chest and bouncing them, as explained by deaf participants (a), and its sign counterpart REFUSE constrained to the movements of the elbows against the sides of the chest (b)

In what concerns the following concept, 'hit', deaf people suggest that the original action consists of grabbing someone with one hand while hitting her with a stick with the other hand. This gestural form is expressed frequently only by deaf observers (in Figure 61). Hearing gesturers produced consistently a one-handed variant. Local hearing people further explained that such a frequent form often cooccurs with the expression in Creole <na sutai>, meaning '(someone) hits (somebody else)', which can be uttered as a threat.



**Figure 61.** **Original act of hitting** by grabbing someone and hitting them with something, usually a stick, as explained by deaf participants

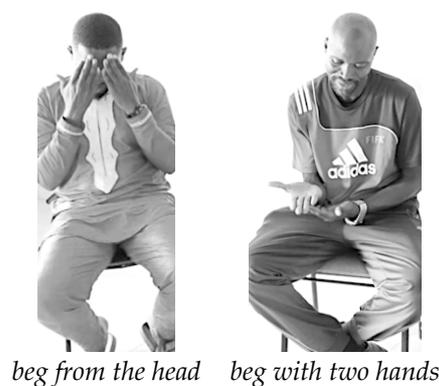
Deaf participants explained that the gesture for 'begging', with the hands moving from the forehead to the palm of the other hand (in Figure 62a), derives from an action typically produced by women when they take off their headscarf and prostrate themselves on the ground. In Bissau, such an action seems to have reduced versions, including the starting point at the forehead (in Figure 62b) or being limited to the open palms (in Figure 62c). That same deaf informant clarified that men articulate two hugging hands instead of the 'begging' act shown below.



*Act of begging by women*

b.

c.



**Figure 62.** **Original act of begging**, typically produced by women by taking off their headscarf and putting it on the ground, as explained by deaf participants (a), and the corresponding conventional gesture, sometimes split into two parts, one with the hands touching the forehead (b) and the other with one hand over the other (c)

Two of the three cases suggest an original motivation for the gestures that shows an evident formational reduction. Thus, from their supposed origin to the conventionalised gesture, the signs REFUSE and BEG are produced with less effort. This means that the arms articulate a shorter movement, the torso and the head adopt a neutral position and facial expression. Also, as a gesture, the snapping fingers in HIT replace the reference to a stick beating someone up, and HIT may lose the handling handshape in the non-dominant hand.

#### *3.4.1.2 Observations about gesture-sign differences in form*

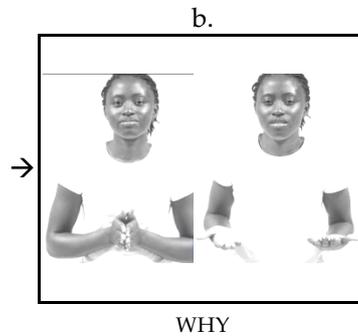
Besides commenting on the original motivation of three gestures, deaf observers commented on articulatory differences between gestures produced by hearing people and their sign counterparts in LGG. In particular, they observed that, in three cases, gestures were more ample than signs. This is to say that deaf people perceived some of the

gestures produced by the hearing as different from the forms used by signers. Therefore, in WHY, WORK, and STEAL, deaf participants remarked jokingly how gesturers would articulate such forms more expressively and widely than signers. I recall that deaf people did not respond to HEAT since its form was very similar to WORK.

For instance, for the concept of 'why', a deaf participant noted that hearing gesturers would extend their arms largely while shrugging their shoulders with the whole chest (in Figure 63a). As a sign, such a form is reduced to the movement of the forearms, and the shoulders' shrug is articulated instead as a turning of the hands (in Figure 63b).

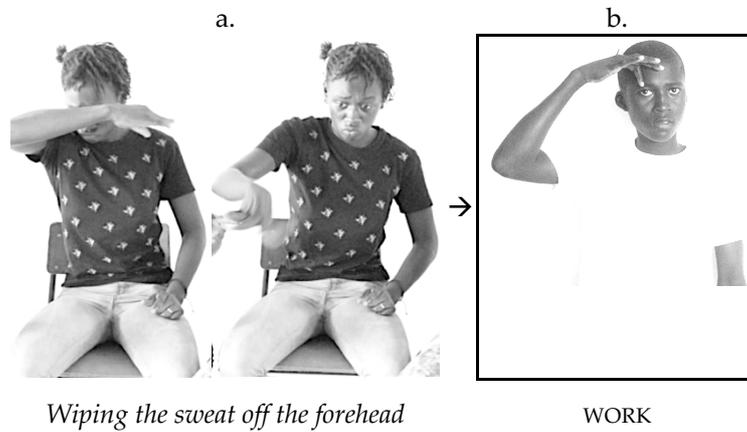


*Asking the reason for something*



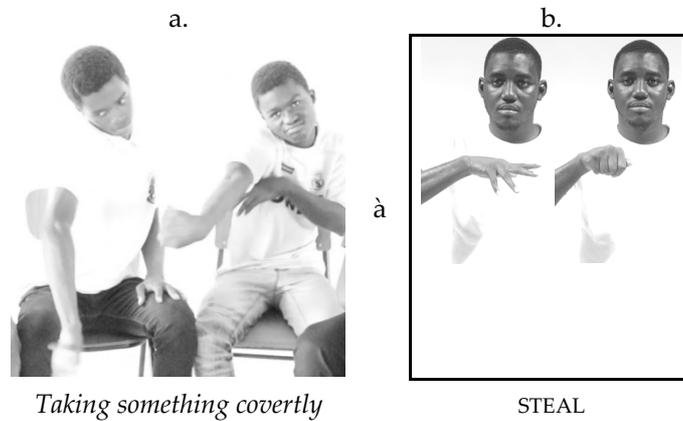
**Figure 63.** Articulation of the gesture for ‘why’ with a broad movement of turning the arms outwards after clapping the hands, as demonstrated by deaf participants (a), and its sign counterpart WHY constrained to the movement of the turning of the hand after clapping the hands (b)

Another such case where the articulation by hearing people is said to be much larger is the representation of ‘work’. Here, some deaf observers commented that wiping the sweat from the forehead was typically produced with more amplitude, including passing the forearm over the forehead. Sometimes, such an action ended with flicking fingers as if shaking the sweat off (in Figure 64a). In contrast, the sign is constrained to a short movement with the side of the hand on the forehead (in Figure 64b).



**Figure 64.** Articulation of the gesture for ‘work’ with a broad movement of wiping the sweat off the forehead and shaking the sweat off the hand, as demonstrated by deaf participants (a), and its sign counterpart WORK constrained to the movement of the hand passing across the forehead (b)

Finally, when comparing the way certain manual items were produced by hearing gesturers and by deaf signers, some of the deaf participants pointed out that the emblematic gesture for ‘steal’ is articulated as larger compared to its signed counterpart. In such a larger utterance, hearing people would extend their arm and turn it as if taking something covertly (in Figure 65a). In a more constrained way, the articulation of the sign is limited to the sequential bending of the fingers, from the little one to the index (in Figure 65b).



**Figure 65.** Articulation of the gesture for 'steal' with a broad movement of turning the arm outwards, as demonstrated by deaf participants (a), and its sign counterpart STEAL constrained to the movement of the fingers bending one at a time (b)

To sum up, deaf observers perceived notable differences in three cases: WHY, WORK and STEAL. They argue that hearing gesturers produce them with more spatial amplitude when compared to their signed counterparts. Even if the hearing participants did not produce these particular gestures in such a manner during the elicitation sessions, deaf people's observations can be considered as indicators of alternative production ways. Their perceptions likely point to a more amplified articulation by hearing gesturers in general in informal communicative contexts. Besides such perceptions, other articulatory reductions were observed in the collected data.

### 3.4.2 A few notes on gesture-sign differences from formal data comparison

The formal data comparison encompassed the 41 gesture equivalents elicited from the list of concepts. When contrasting gestures elicited

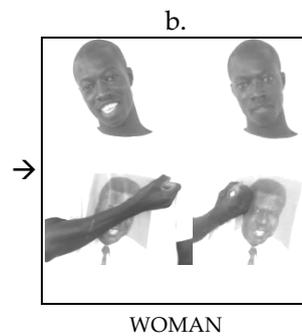
during the data collection and their signed counterparts as reported in the three dictionaries (compiled in 2005, 2006 and 2017), I observed modifications in the form of ten items. As shown in Table 7, such modifications concerned two-handed to one-handed forms in six items and from whole-hand to index-finger handshapes in four other items. The remaining pairs of gestures and signs were identical in form.

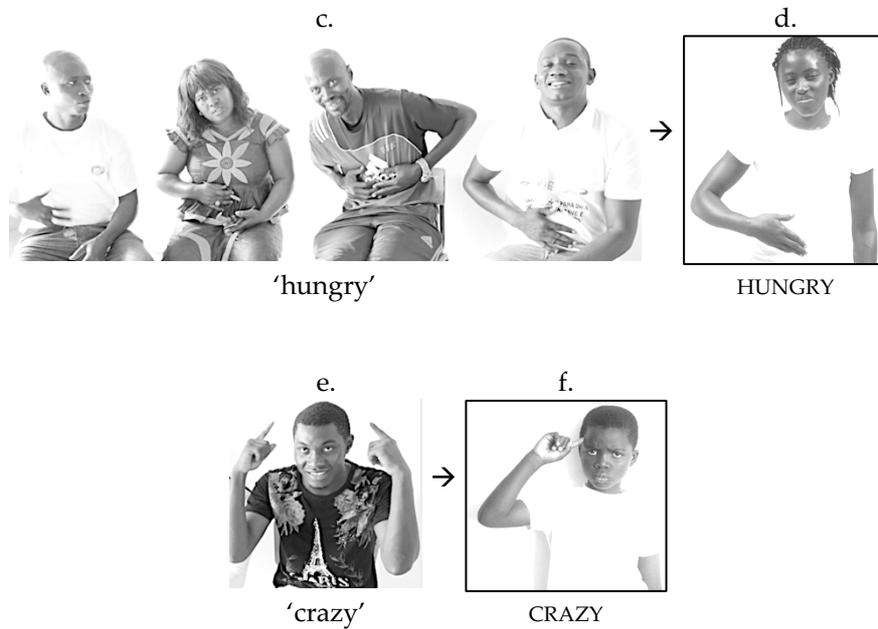
**Table 7. Gesture variants in handedness and handshape**, produced by deaf and hearing participants with either one or two hands (a), or with either the whole hand or the index finger (b), and highlighted for the most frequent variants

a.	One-handed	Two-handed	b.		
woman	34	18	work / heat	44	21
hungry	46	12	white / black	29	24
crazy	6	3	thirsty	21	17
hit	43	18	die / kill	5	51
chief	41	24			
talk	44	14			

In all ten gestures adjusted in form as signs, the articulatory modifications occurred already as gestures. This means that form variants (two and one-handed, and whole hand and index finger) were produced as interchangeable forms by gesturers and were selected only later in LGG. Thus, conventional gestures presenting slight variations in form are integrated as invariable forms into LGG. As exemplified in Figures 66a, 66c, 66e, the gestures of WOMAN, HUNGRY, and CRAZY are primarily produced with one hand (respectively in 65%, 79% and 75% of the occurrences), but, on some occasions, they also occur with two symmetrical hands. As signs, however, these forms are articulated from the beginning with only one hand, in Figures 66b, 66d, 66f.

I add that the gesture for 'hungry' typically involves a bodily contraction mimicking the painful feeling of hunger (in Figure 66c), which is reduced to an iconic facial expression in the corresponding sign (in Figure 66d). Also, as the two variants of the gesture HUNGRY are produced in the same location, so is the one-handed form of WOMAN articulated across the two breasts (in Figure 66b). Additionally, by dropping one of the hands, the sign CRAZY is produced in only one of the temples (in Figure 66f).



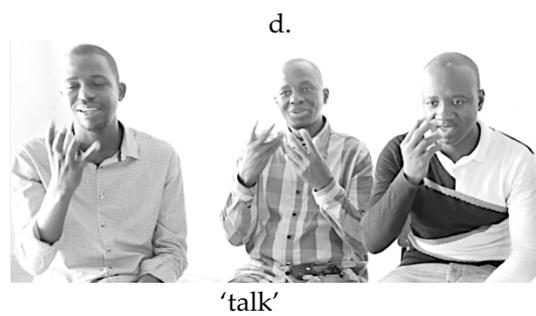
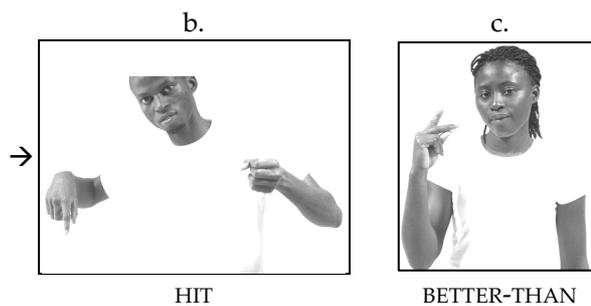


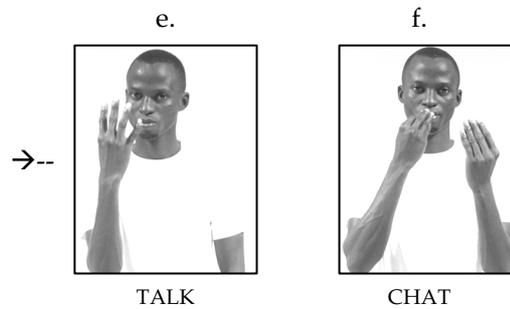
**Figure 66.** Selection of one form variant in handedness, from gestural forms produced with one and two hands for 'woman' (a), 'hungry' (c), and 'crazy' (e) to the adopted one-handed signs WOMAN from 2005 (b), HUNGRY (d) and CRAZY (f) from 2006

If a gesture used in Bissau has two clear form variants by handedness – i.e., a one-handed and a two-handed variant – LGG signers prefer to adopt the one-handed variant as a sign for the same meaning. However, in two other cases, both variants are preserved (with some modification) in LGG, but are recruited for different meanings. That is, gestures for the same concept occur interchangeably with one and two hands, but both variants are incorporated into the LGG lexicon.

In the case of 'hit' (in Figure 67a), the sign HIT articulated with a base hand represents that primary sense in LGG (in Figure 67b). In contrast, the one-handed sign adopts grammatical functions such as a comparative (in Figure 67c). In the case of 'talk' (in Figure 67d), the one-

handed sign comes to signify both 'talk' and 'explain' (in Figure 67e), while the two-handed sign refers to 'chat' (in Figure 67f).



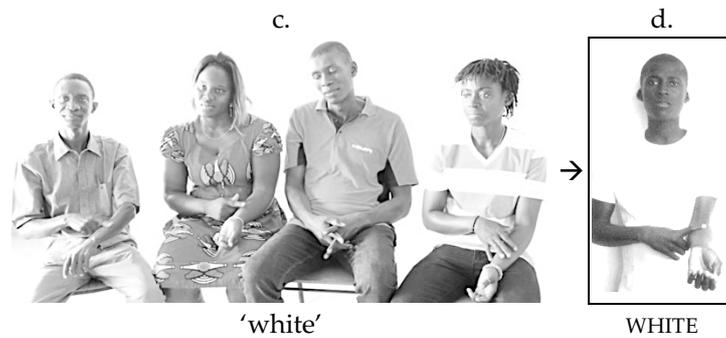


**Figure 67.** Selection of both form variants in handedness, from gestural forms produced with one and two hands for ‘hit’ (a), and ‘talk’ (d), to the adopted one-handed signs HIT from 2017 (b) and TALK from 2005 (e), and the two-handed signs BETTER-THAN (c) and CHAT (f) from 2017

It can also be the case that signers use not only one but two one-handed variants, as in the gesture variants for ‘chief’, as exemplified in Figure 68a. The one-handed form articulated in only one of the shoulders becomes part of a compound to mean ‘president and ‘director’ (in Figure 68b). In parallel, the one-handed variant produced across both shoulders is also integrated in LGG as part of a compound to mean ‘police’ and ‘soldier’ (in Figure 68c). There is only one two-handed variant being incorporated into LGG signifying ‘responsible’ as a sign (in Figure 68d).

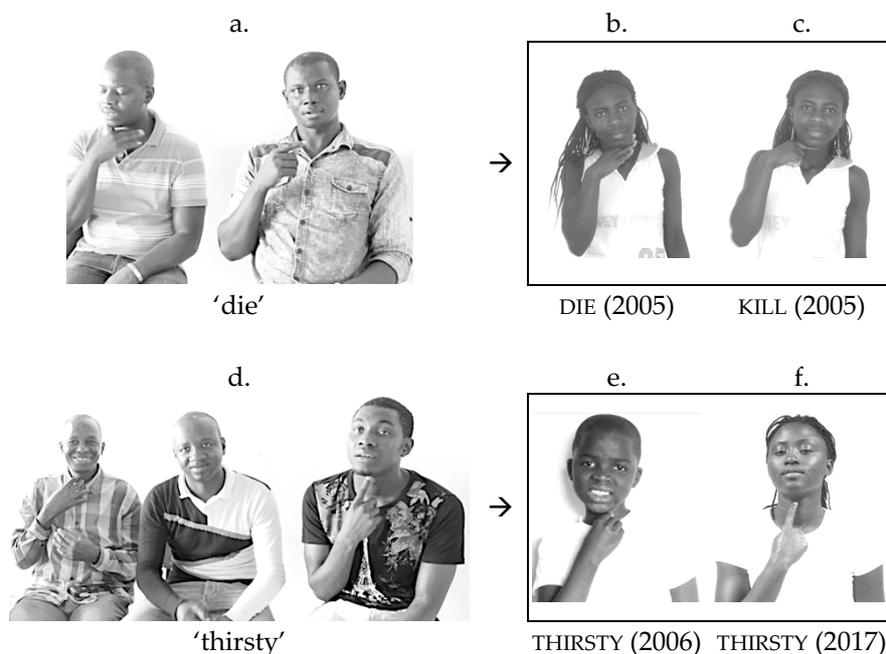






**Figure 69.** Selection of one form variant in handshape, from gestural forms produced with the whole hand and the index finger for ‘work’ (a) and ‘white’ (c) to the adopted signs produced with the index finger WORK from 2005 (b), and WHITE from 2006 (d)

Similarly, ‘die’ and ‘thirsty’ use both handshapes, the whole hand and the index finger, in Figures 70a and 70d. The *cut-throat* form is incorporated in both variants, but for different meanings: the whole hand for ‘die’ (in Figure 70b) and the index finger for ‘kill’ (in Figure 70c). The former was later replaced by a different sign, also based on a gesture, though less frequent, articulated on the nose. Importantly, of all four forms that vary in handshape, the *cut throat* is the only one that occurs much more often with the index finger. The sign THIRSTY was integrated with the whole-handed variant first (in Figure 70e) and only later became reduced to the index finger (in Figure 70f).



**Figure 70.** Selection of both form variants in handshape, from gestural forms produced with the whole hand and the index finger for ‘die’ (a) and ‘thirsty’ (d) to the adopted signs produced with the whole hand DIE from 2005 (b) and THIRSTY from 2006 (e), and with the index finger KILL from 2005 (c) and THIRSTY from 2017 (f)

Even though formational modifications have been observed in the integration process of conventional gestures into the LGG lexicon, they can hardly be considered a trend. The loss of a mirror or base hand in a two-handed gesture can only speak for the cases where such a process occurs, namely, in six items within the whole set. Therefore, I do not consider them representative of an articulatory tendency, because many signs with symmetrical hands are found in the LGG lexicon. The same can be said about the four cases where the whole hand was modified to an index-finger handshape. These cases can also be counterargued by signs that have changed in the opposite direction, such as in

PORTUGAL, that is produced in 2005 with the index fingers and in 2006 with the index and middle fingers (in Figure 115a). Either way, no other articulatory modifications were observed in the data.

### 3.5 Bissau gestures to LGG signs: integration routes

The current section focuses on lexical meaning. For signs that have gestural counterparts, do the semantic concepts conveyed by the original gestures carry over to the meaning in the sign? If so, is it the same scope of meaning? Is there evidence of a semantic split in which a gesture is modified into two (or more) signs with diverging forms? To analyse the changes occurring during the transition between gestures and signs, I compared the data collected with hearing and deaf people in Bissau on gesture use and the corresponding signs registered in the three LGG dictionaries. The comparison considered both similarities in form and semantic relationships around core concepts.

Recall that for 41 concepts, hearing people identified corresponding gestures used in Bissau, and that usage was subsequently confirmed by deaf observers (§3.3.2). Then, all the gestures collected in group sessions of both hearing and deaf people were compared with their sign counterparts in the three LGG dictionaries.

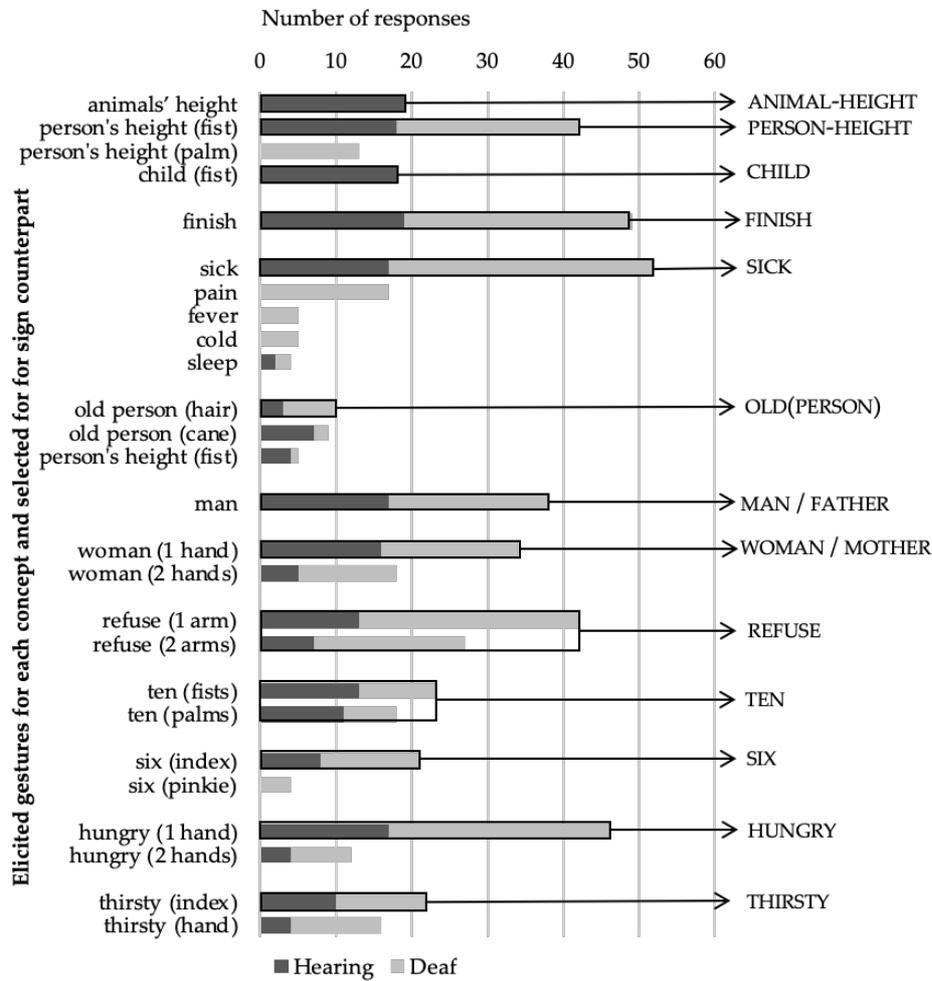
The results detailed in this section show different integration processes from gesture to sign. A third of the signs conserved the form and meaning of the original gestures, like FINISH or HUNGRY (in §3.5.1). Another third resulted from the disambiguation of polysemous gestures, like WHY and WORK, and variants very similar in form expressing the same concepts, such as ‘much’ or ‘ten’ (in §3.5.2). In the last third of the data, gestures distinct in form referred to the same concept and were thus considered synonyms, such as in ‘married’ or ‘witchcraft’. Since

in such situations, polysemous and synonymous gestures coexisted within the same semantic cluster, integration processes were more complex. Therefore, I treat them here in terms of specific networks of form-meaning pairs of gestures, such as those around the concepts of ‘beg’ – ‘thank you’ – ‘sorry’ or ‘married’ – ‘friend’ – ‘boy/girlfriend’ (in §3.5.3). Throughout the analysis, the manual forms of gestures and signs are expressed through glosses, while their meaning is referred to in single quotes. At the end of this section, I summarise the overall results (in §3.5.4).

### 3.5.1 Direct integration of gestures into LGG: one-to-one relations

Conventional gestures, i.e., gestures that are widely used within a group of people, are supposed to have already made a particular developmental path to ensure their recognisability within the community at large. Here, gestures are ready to be picked up by deaf people to be used as signs, i.e., they undergo integration processes that do not seem to require any significant phonological or semantic adjustments. I found that form and meaning were preserved in thirteen out of 41 gesture-to-sign transitions.

Of the thirteen cases showcased here, as shown in Figure 71, seven elicited gestures have their form and meaning preserved in their sign counterpart, namely in ANIMAL-HEIGHT, PERSON-HEIGHT, CHILD, FINISH, SICK, OLD-PERSON, and MAN. Six other concepts are expressed by gesture variants, of which one of them has an equal sign counterpart in WOMAN, REFUSE, TEN, SIX, HUNGRY, and THIRSTY. I will describe each one in turn, following this partition between the high preservation of the gesture and selecting a preferred form to adopt as a sign. Throughout the description, I contrast the gesture with the sign counterpart, examining how well the form and meaning are maintained during its integration into the new signed lexicon.



**Figure 71.** Direct integration of one gesture as one sign for thirteen concepts ('animal's height', 'person's height', 'child', 'finish', 'sick', 'old person', 'man', 'woman', 'refuse', 'ten', 'six', 'hungry', and 'thirsty'), including gesture variants in form and gestures with different motivations

The height specifier for animals is expressed mainly by the palm turned downwards (in Figure 72a), contrasting with the fist turned sideways for people (in Figure 72b). Deaf participants reported (in 13

of the 37 responses) that hearing people would also use the palm turned downwards for people's height, though not so often. In the same line, the fist indicates a shorter height for 'child'. Such an idiosyncratic gestural form is occasionally combined with the gesture for 'man' to specify the reference to 'adult man'. In LGG, the fist indicates human height and distinguishes age levels. The animal height with the palm in LGG is used only to refer to the general term 'animal' as part of the compound EAR^ANIMAL-HEIGHT.



**Figure 72.** Gesture responses to specify height produced equally by hearing participants for animals with the palm turned downwards (a) and for people with the fist turned sideways, including for 'child' (b)

The gesture responses for 'finish' exhibit the most invariable form and meaning across hearing gesturers (in Figure 73a), deaf observers (in Figure 73b) and as a sign over time in the 2005, 2006 and 2017 LGG dictionaries. This gesture was sometimes accompanied by the spoken word in Creole corresponding to its meaning: <caba>.

a.



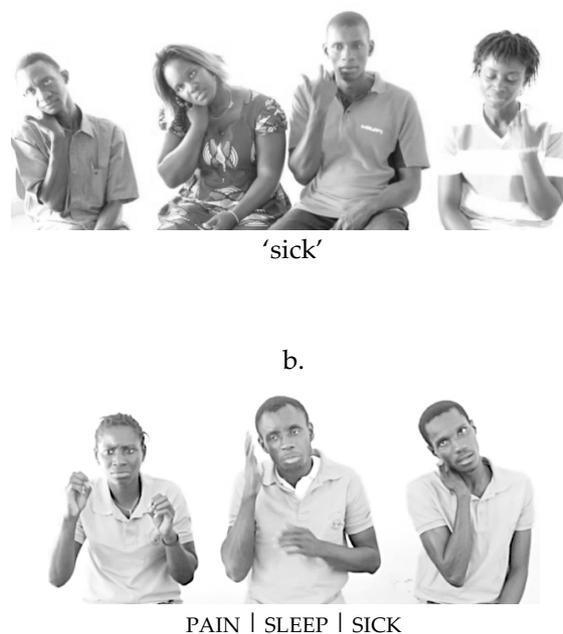
b.



**Figure 73.** Gesture responses for ‘finish’ produced equally by hearing (a) and deaf participants (b) with the palm turned downwards, moving away from each other

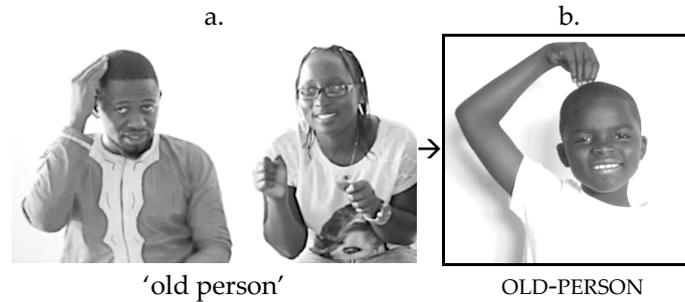
Similarly, the form for ‘sick’, where the back of the hand feels the fever heat on the side of the neck, was consistently produced as a gesture across groups (in Figure 74a). However, deaf observers add that besides that more conventionalised gesture for ‘sick’, it could be further represented by gestures for ‘pain’, ‘sleep’ (meaning ‘staying in bed’) (in Figure 74b), ‘fever’ and ‘cold’. These gestures are incorporated into LGG in the same forms and original meanings.

a.



**Figure 74.** Gesture responses for 'sick' produced equally by hearing participants with the back of the hand touching the side of the neck (a), and gesture responses with different motivations produced by deaf participants that have the sign counterparts PAIN, SLEEP and SICK, from 2005 (b)

There are three ways of representing an older person motivated by different iconic representations (in Figure 75a). One of them is the reference to the hair, which deaf observers most often produce. Another is acting as if walking with the support of a cane, more frequent among hearing gesturers. Alternatively, in only a few occurrences (five of 24), and especially with hearing participants, an older person is referred to by the height specifier for people. In LGG, signers adopt the sign articulated on the hair for an elderly person in general alone (in Figure 75b) and as part of a compound in HAIR^MAN 'grandfather' and HAIR^WOMAN 'grandmother'.

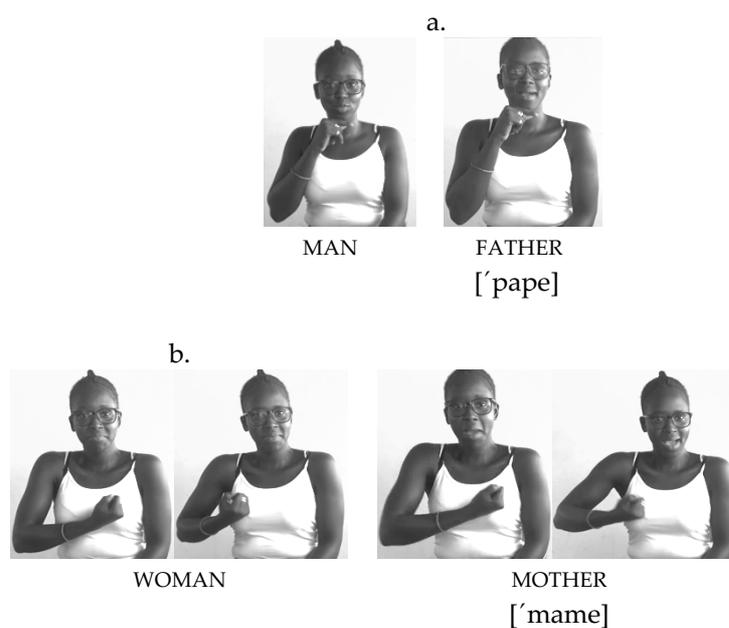


**Figure 75.** Gesture responses for ‘old person’ with different motivations, the grey hair and holding a cane (a), and the sign counterpart based on the grey hair, OLD-PERSON from 2006 (b)

The seventh preserved gesture as an LGG sign is MAN, consistently expressed in the same form across hearing gesturers and deaf observers and over time as a sign in the three LGG dictionaries. The remaining six concepts elicited gestures with variants in form. These include the two gesture variants for ‘woman’. Although mainly produced with one fist touching a breast at the time, it can also be expressed by a two-handed variant. As observed in subsection 3.4.2, it is often the case in gesture-to-sign integration that the most frequent gesture variant is adopted as a sign.

Besides selecting the one-handed form in WOMAN, signers incorporate the polysemy inherent to the gestures for ‘man’ and ‘woman’ and adopt them in LGG. In this way, MAN refers to both ‘man’ and ‘father’ and WOMAN to ‘woman’ and ‘mother’. In the elicitation sessions with the hearing participants, the gestures of MAN and WOMAN were sometimes accompanied by spoken words in Creole (see §2.5.4.4), revealing their polysemy. In this way, MAN could be produced together with <ome> and <pape> (translated respectively as ‘man’ and ‘father’), and WOMAN with <mame> (meaning ‘mother’). LGG signs maintain such a polysemy, distinguishing MAN from FATHER and WOMAN from

MOTHER by mouthing ['pape] and ['mame], respectively, in Figures 76a and 76b.



**Figure 76.** Distinction of polysemous signs by mouthing the Creole word for 'father' and 'mother' respectively in the pairs of signs MAN and FATHER (a) and WOMAN and MOTHER (b) from 2005

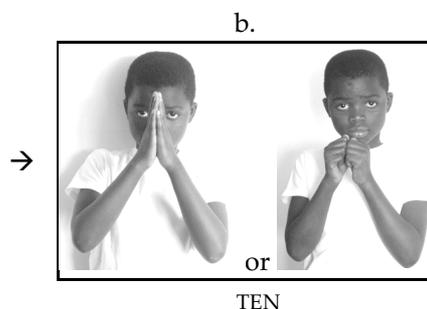
Apart from 'woman', five other concepts were expressed by gestures with variation in form, typically two main variants. The gesture for 'refuse' was the only one whose two forms, produced whether with one or two arms (in Figure 77), entered the LGG lexicon as interchangeable signed variants in the 2006 and 2017 dictionaries.



**Figure 77.** Interchangeable gesture variants in form for 'refuse', produced consistently across participants, either with one or two arms

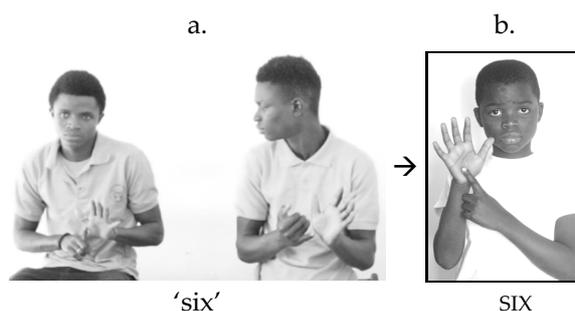
Similarly, the two gesture variants for the number 'ten' produced by joining the fists or the palms (in Figure 78a) are equally adopted by signers. In earlier stages of LGG, signers used both variants interchangeably for the number in isolation (in Figure 78b), but by the 2017 dictionary, they favoured facing palms making full contact. However, at this time, it also occurs as part of a signed compound with its joined fists variant, in TEN<sup>^</sup>GROW 'age' (see §4.5.2.3).





**Figure 78.** Interchangeable gesture variants in form for 'ten', produced consistently across participants, either with joined palms or fists (a), and their sign counterparts in TEN from 2006 (b)

In this line, hearing people produce the manual forms for numbers six to nine, mostly with contact between the palm of one hand and the fingers of the other hand. Nonetheless, some variation occurs whether by starting the counting with the little finger, the index, or even the thumb (in Figure 79a), and by representing 'five' with a fist instead of the palm. As a sign, the variant retained in LGG corresponds to the one produced with an open base hand and contact on the palm with the index finger in SIX (Figure 79b).



**Figure 79.** Gesture variants in form for 'six', produced by deaf participants, either with the thumb or the index pressed against the open palm (a), and the selected form with the index finger in its sign counterpart SIX from 2006 (b)

The gesture for ‘hungry’ was produced with either one or two hands on the stomach. The one-handed variant occurs more frequently as a gesture (in 79% of the responses by hearing and deaf participants for that concept), and was integrated into the LGG lexicon as early as 2006 (in Figure 66d, in §3.4.2). Similarly, THIRSTY was produced as a gesture in Bissau with two variants: the whole hand (all fingers) and only the index finger on the throat. The first variant was collected as a sign in 2006, but was replaced by the second variant in 2017 (Figure 70f, in §3.4.2).

This subsection presented the integration of the best conserved and straightforward gestures in form and meaning into LGG, of which FINISH is the most consistent example. Although in most cases, signers adopt the most frequent gestural forms, REFUSE keeps the two variants interchangeable in LGG, and HUNGRY adopts one in an earlier stage and the other later on. Semantically, polysemy is observed only in MAN / FATHER and WOMAN / MOTHER in gestures and signs, making it hard to state which one preceded the other. I recall that, at least, the emblematic gestures REFUSE, MAN / FATHER and WOMAN / MOTHER have been attested in different parts of West Africa, confirming their deeply rooted conventionalised use. It is also worth noting that the concept ‘sick’ was not only represented by the highly conventionalised gesture that was integrated as SICK, but also by four other gestures different in motivation, which have sign counterparts as well, namely PAIN, FEVER, COLD and BED.

### 3.5.2 Integration of gesture variants into LGG: few-to-few relations

During the gesture sessions in Bissau, a third of the concepts were expressed by gesture variants or polysemous gestures that were later specified in LGG to convey different meanings. In other words, of the 41 concepts studied, twelve involved the incorporation of more than

one form, either variants in form prompted by a single concept or very similar forms prompted by related concepts.

In this subsection, I describe the gestural responses to these twelve concepts and their LGG sign counterparts. These gestures were not adopted into LGG as directly as those in the previous subsection. The analysis of less direct gesture-to-sign integration processes starts by looking at the number of variants elicited by concepts, and then checking if the gestural forms correspond to more than one meaning. Six concepts presented variants in form that were also incorporated as signs for related meanings, as shown in Figure 80a. In contrast, six other concepts with associated meanings were expressed by polysemous gestures that were also integrated as signs, in Figure 80b.

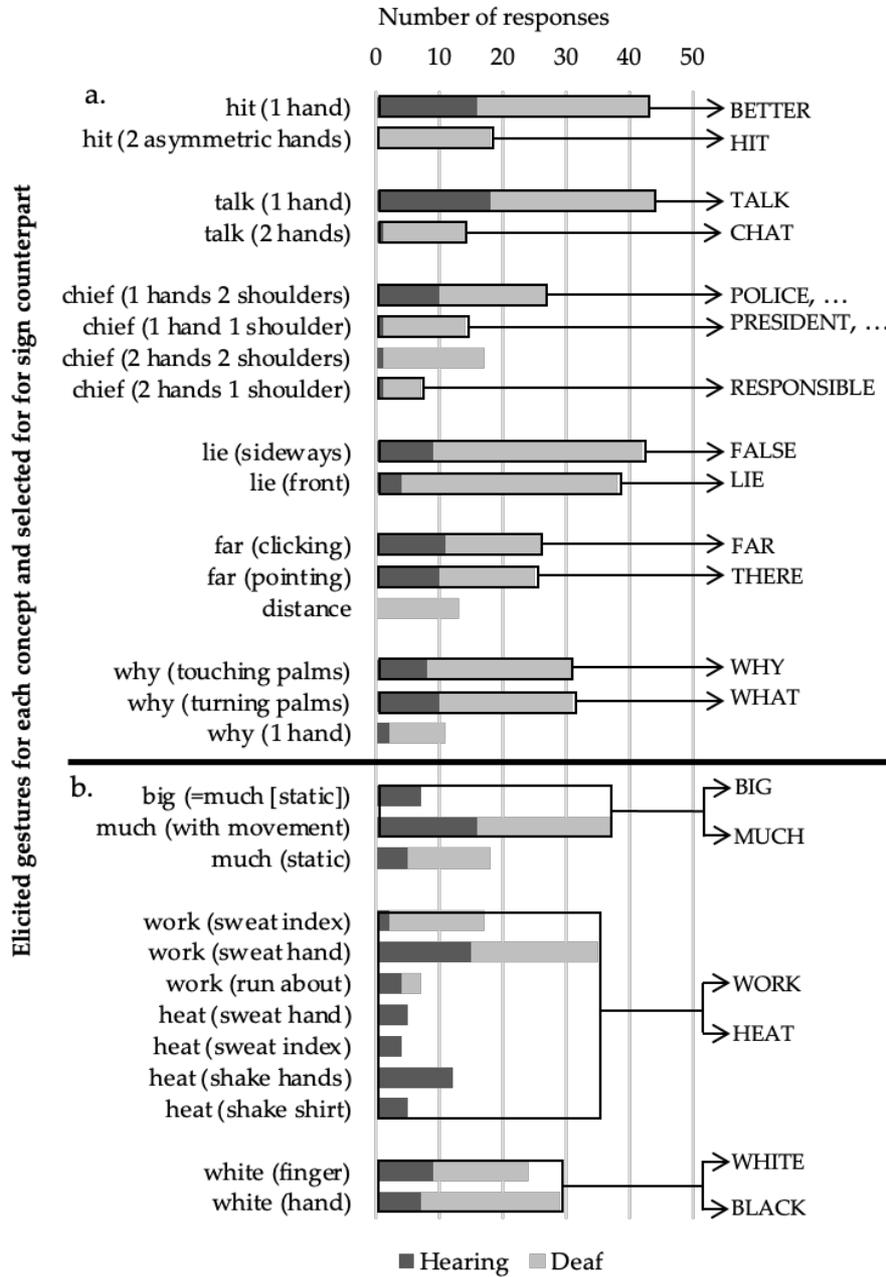


Figure 80. Integration of a few gesture variants in form as a few signs in twelve concepts with related meanings, six concepts ('hit', 'talk',

'child', 'chief', 'lie', 'far', 'why') eliciting two form variants both recruited as signs (a), and three pairs of concepts ('big' / 'much', 'work' / 'heat', 'white' / 'black') eliciting overlapping forms both distinguished as signs (b)

I first look at the six concepts expressed by gesture variants. Three of these concepts – 'hit', 'talk', and 'chief' – have already been described in subsection 3.4.2 concerning the incorporation of variants in handedness. In these cases, both one-handed and two-handed variants were adopted by signers but specified semantically as they entered the LGG lexicon.

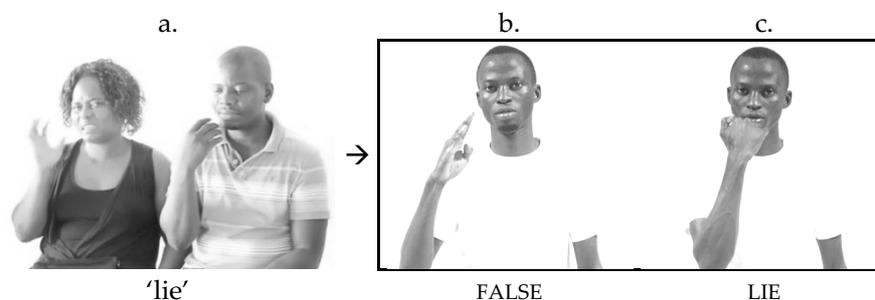
The first case of this level of gesture-to-sign integration is the expression of the concept 'hit'. In the elicitation sessions, a one-handed variant was consistently produced across participants with the sense of 'hit'. The sense conveyed by the two-handed variant, which represents the act of grabbing someone with one hand while hitting her with a stick with the other hand, meaning 'to beat someone up,' is maintained as a sign. This variant corresponds to the less common gesture variant – produced only by deaf observers. It recovers the iconicity of that act by adding a handling handshape as if grabbing the person being beaten. In contrast, the one-handed gesture is integrated into the LGG lexicon by expanding metaphorically to signify 'to beat someone at something'. Both gesture variants and sign counterparts meaning 'hit' and 'better than' are illustrated in Figures 67a, 67b, and 67c, in subsection 3.4.2.

Similarly, the concept of 'talk' elicits two gesture variants: a more frequent one, produced mostly with one hand, and, with fewer occurrences, a two-handed form. Sometimes, it is accompanied by the word <papia> in spoken Creole. Both variants are integrated into the LGG lexicon. As signs, the one-handed variant with reduplication signifies

'talk', whereas, with a single movement, it means 'explain'. The two-handed variant denotes 'chat'. The gesture variants for 'talk' and their signed counterparts are shown in Figures 67d, 67e and 67f, in subsection 3.4.2.

In a different way, the concept of 'chief' prompts three main gesture variants, and all of these are incorporated into the LGG lexicon with distinct meanings. One of the variants, produced with one hand on each shoulder at a time, is used as part of a compound in signs designating figures of authority, in POLICE, SOLDIER, and earlier versions of PRESIDENT. Another variant, articulated with one hand on one shoulder with an upward movement, is used in DIRECTOR, and is also recorded in the latest LGG dictionary in a more recent version of PRESIDENT. A third variant, with two hands on one shoulder, is integrated into LGG as RESPONSIBLE. The gesture variants and their sign counterparts are referred to in subsection 3.4.2, in Figures 68a, 68b, 68c, and 68d.

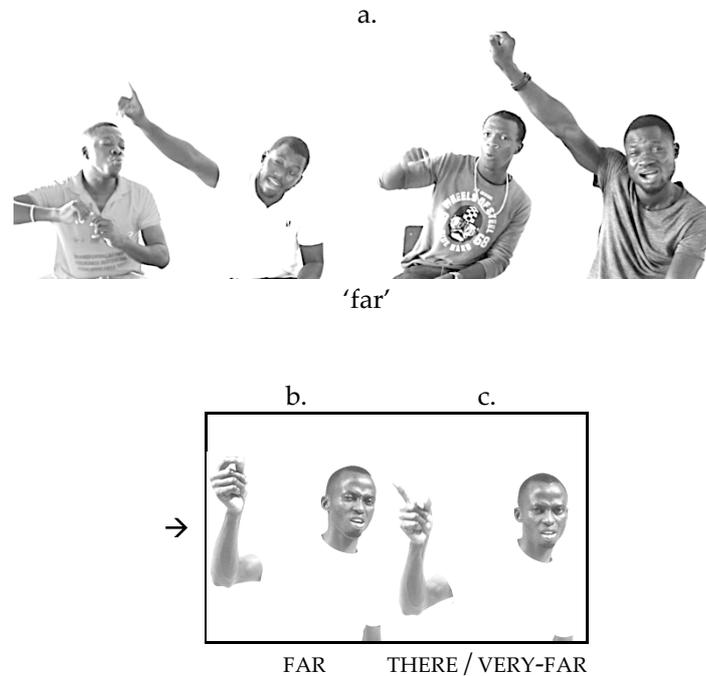
As in the previous cases, so do 'lie', 'far' and 'why' elicit gesture variants in form. The notion of falseness is expressed in Bissau by blowing air to a moving hand or index finger in front of the mouth, whether sideways or facing forward (in Figure 81a). In the elicitation sessions, the variants articulated with the hand were more frequent. They are the ones incorporated into LGG. In the integration process, signers created a grammatical contrast between those two forms, i.e., the side-ward variant means FALSE (in Figure 81b) and the front-directed form LIE (in Figure 81c).



**Figure 81.** Gesture variants in form for ‘lie’, produced consistently across participants, either with the hand moving sideways or away from the mouth (a), and their sign counterparts for related meanings in FALSE with the hand moving sideways (b) and LIE with the hand moving away from the mouth (c) from 2017

The fifth concept eliciting gesture variants, the one for ‘far’, shows once again how somewhat similar forms are incorporated into LGG with distinct meanings. The two main variants are evenly distributed across the responses by both hearing and deaf (in Figure 82a). Still, only clicking the fingers while the arm is extended carries the original concept of ‘far’ as a sign (in Figure 82b). At the same time, pointing to a distant location with the extended arm pointing away signifies ‘there’ or ‘very far’ in LGG (in Figure 82c).

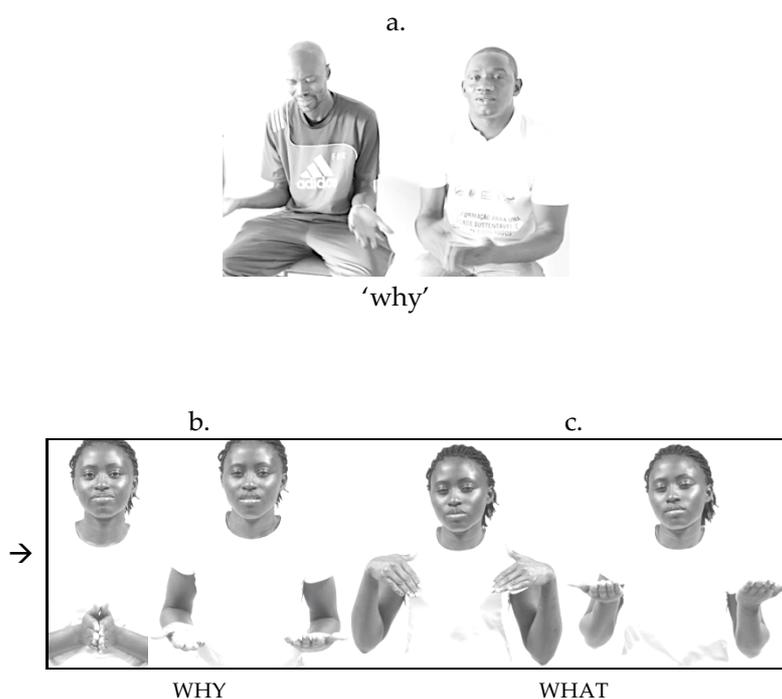
It is worth noting that both gesture variants contain deictic content and distance at the same time, while the two LGG signs cleave these apart. Unsurprisingly, the deictic sign retains the pointing index finger form, while the adjective uses an emphatic click for the adjectival meaning. Also, in LGG, the signing space is reduced, and the arm is held in a very similar position. This increases the regularity in form and makes the analogical differences between the two signs stand out, creating a more combinatoric system.



**Figure 82.** Gesture variants in form for 'far', produced consistently across participants, either with a clicking hand or pointing away (a), and their sign counterparts for related meanings in FAR with a clicking hand (b) and THERE / VERY-FAR by pointing away (c) from 2017

The last concept eliciting gesture variants is 'why' (in Figure 83a). Hearing gesturers produced slightly different forms when elicited with that concept, which deaf observers then confirmed. The two main variants implied turning the palms with and without a clapping before turning were also said to mean 'how' and 'what'. Overall, the most common gestural form was the one with clapping. LGG signers adopted this gesture for 'why' (in Figure 83b). In addition, the form without the clapping was integrated into the LGG lexicon to signify

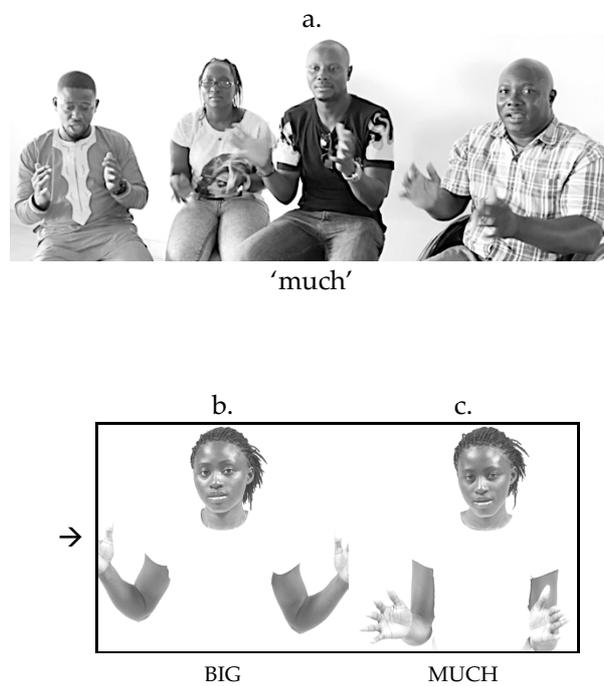
'what' (in Figure 83c) and combines in different compounds for 'where' and 'who'.



**Figure 83.** Gesture variants in form for 'why', produced consistently across participants, by turning the hands either preceded by a clapping or not (a), and their sign counterparts for related meanings in WHY with the clapping (b) and WHAT without the clapping (c) from 2017

Besides showing gesture variants, the same gesture can express related concepts, i.e., they present polysemy. In the first pair comprising the concepts of 'big' and 'much', the form articulated with two static hands in space is often used for both concepts by the same gesture. In contrast, the less frequent gesture involving a back-and-forth movement

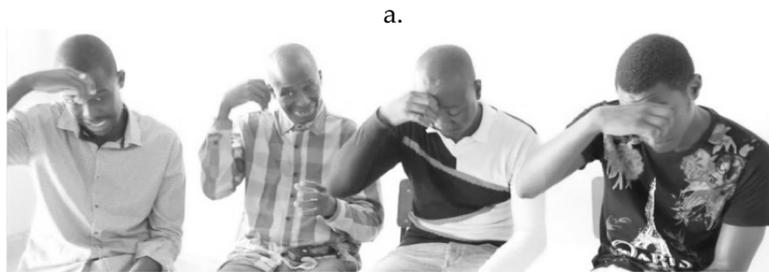
is produced only in response to 'much'. In other words, while 'big' elicits consistently the two static hands, 'much' triggers responses of both forms (in Figure 84a). Subsequently, both gestures are adopted as signs with different meanings, the first for 'big' (in Figure 84b) and the second for 'much' (in Figure 84c).



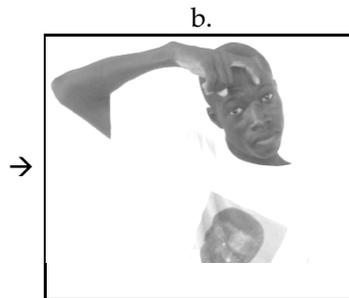
**Figure 84.** Gesture variants in form for 'much', produced across participants, with both hands either static, also for 'big', or with a back-and-forth movement (a), and their sign counterparts in BIG with both hands in space (a) and in MUCH with a back-and-forth movement (b) from 2017

The remaining two pairs of related concepts prompted polysemous gestures, although in slightly different circumstances. The first pair,

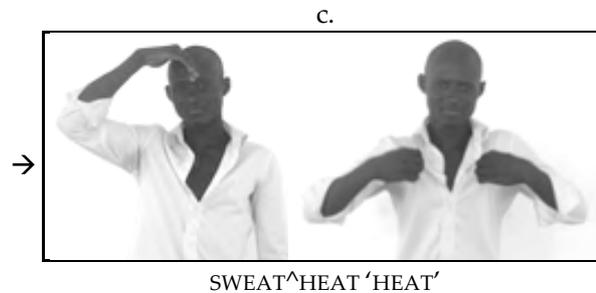
'work' and 'heat', was consistently expressed in Bissau by wiping the sweat off the forehead (in Figure 85a). Thus, the gestural form iconically motivated by 'sweat' extends semantically to what causes it, whether the physical effort in 'work' or the environmental conditions in 'heat'. While the sign WORK is recorded as a single sign in the 2005 dictionary (in Figure 85b), HEAT is combined in the same year with another bodily reaction, namely by shaking the shirt, in a compound, SWEAT^HEAT (in Figure 85c).



'work' / 'heat'



WORK

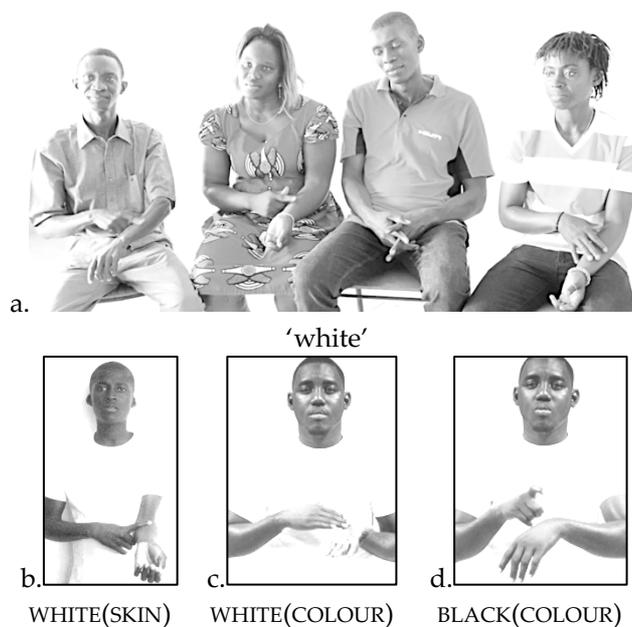


**Figure 85.** Polysemous gesture for 'work' and 'heat' produced consistently across participants with the side of the hand on the forehead (a), and its sign counterpart in WORK (b) and HEAT produced as a compound (c) from 2005

The third and last pair of related concepts was expressed by polysemous gestures for both 'white' and 'black'. As a gesture, in Bissau, the skin colour seems strongly conventionalised only for 'white', although presenting some variation in arm orientation and handshape (as described in §3.4.2). Figure 86a shows such a variation. Here, the two participants on the left use the index finger, while the one on the right uses the whole hand (the third participant from the left is not producing any gesture in that particular frame). As far as 'black' is concerned, hearing people responded to the concept by saying that its gestural form was equal to 'white'. Probably to disambiguate such polysemy, deaf observers of gesture use in Bissau add that hearing people sometimes combine the skin rubbing with a gesture with the palm for 'plane', referring to the white people from abroad.

In LGG, deaf signers disambiguate the polysemous form for both 'white' and 'black' by indicating 'white skin' (i.e., 'white person') with the index rubbing the inner side of the forearm (in Figure 86b). To distinguish 'white', as a general colour term, from 'white skin', signers

produce it on the palm to specify it further (in Figure 86c). Because 'black' did not seem as conventionalised as 'white' in gestures, it is possible that signers found 'white' to be more available to be picked up into LGG. As WHITE was specified as a sign in location and hand-shape, BLACK is likely to have been adjusted in terms of form contrasts, by tapping with the index finger on the outer side of the forearm (in Figure 86d). Before being produced with the tapping movement, in the 2017 dictionary, the sign for 'black' was produced by rubbing the forearm in 2006. At this stage, it was only distinguished from 'white' by the place of articulation.



**Figure 86.** Gesture variants in form for 'white', also said to be the same for 'black', produced across participants either with the index finger or the hand rubbing either the inner or the outer side of the forearm (a), and their sign counterparts in WHITE(SKIN) with the index on the inner side of the arm (b), WHITE(COLOUR) with the index on the palm (c), and BLACK(COLOUR) by tapping the index on the outer side of the arm (d) from 2006

Unlike the direct incorporation of gestures into the LGG lexicon described in the previous subsection, the course of gesture-to-sign integration here shows a less direct correspondence. Certain concepts are expressed by gesture variants adopted by signers for related meanings. In addition, pairs of related concepts may have polysemous gestures that are disambiguated by signers when entering the LGG lexicon. This means that, besides the twelve concepts expressed by gestures and with sign counterparts, there were eight more form variants adopted as signs and three others different in motivation that were combined as signed compounds. All of these cooccurring gestures were produced by both hearing and deaf participants.

Overall, this is privileged data in capturing gesture variation and the transition into signs. It enables the witnessing of how LGG signers select gestural forms and specify meaning when picking conventionalised gestures surrounding them and adopting them as signs. It also confirms the integration of highly conventionalised gestures used across West Africa, such as REFUSE and WHY. The following subsection addresses a much more complex entanglement of gestural forms and meanings jostling at some juncture before being unravelled into more discrete form-meaning correspondences.

### 3.5.3 Integration of gesture networks into LGG: many-to-many relations

In this subsection, I look at three clusters of concepts that are expressed by overlapping gestures. Each cluster involves gesture variants in form and gestures with different motivations cooccurring across concepts. Thus, on one hand, concepts are represented by synonymous forms, i.e., different forms with the same meaning. On the other hand, because many of them cooccur across concepts, they reveal polysemy, i.e., the same form with different meanings. Even in the face of such an

entanglement of synonymous and polysemous gestures, signers selected a form to integrate as a sign into the LGG lexicon, which was usually the one used more often for the concept in question.

Connections between gestures within these networks are set through distinct synonymous forms expressing the same concept, such as having both the gesture representing a *ring* on the finger and two *joined palms* for 'married'. At the same time, some of these forms expand semantically, taking on multiple meanings, like having the *cut-throat* gesture to refer to 'die', 'kill', 'criminal' and 'witchcraft'. In what follows, I present three networks that contain synonymous and polysemous forms of different – though related – concepts, overlapping as gestures, that become disambiguated as signs. The three networks involve the following sets of concepts:

- 1) 'beg' – 'please' – 'thank you' – 'sorry' – 'all good?'
- 2) 'married' – 'boy/girlfriend' – 'friend' – 'together' – 'same'
- 3) 'die' – 'kill' – 'witchcraft' – 'crook' – 'steal' – 'escape'

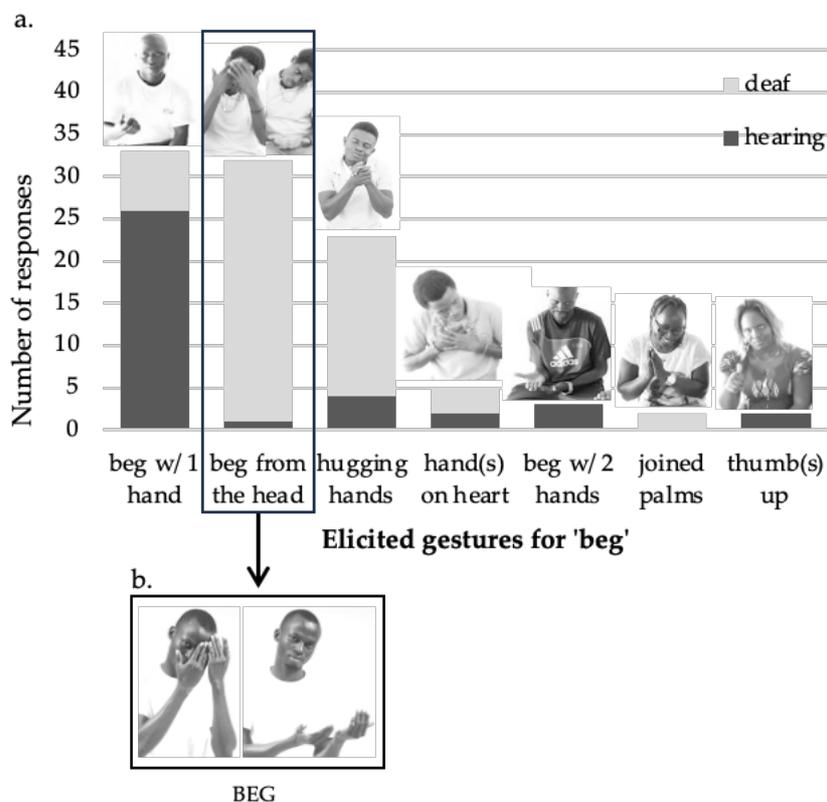
To analyse the entanglement between synonymy and polysemy, I will first describe the lexical variants, or synonymous gestures, expressing semantically related concepts. Besides using glosses to describe the manual forms of gestures and signs, and single quotes to refer to their concepts, I also italicise form descriptions of gesture variants for the same concept. Gestural forms overlapping for different concepts reveal an additional polysemy. Finally, I explain which forms are adopted for those concepts in LGG and if any other forms are incorporated into the lexicon to express related meanings.

### 3.5.3.1 'Beg' – 'please' – 'thank you' – 'sorry' – 'all good?'

The first network arises from an intertwining of forms and meanings around the semantically related concepts of 'begging', 'asking politely', 'appreciating', 'apologising', and 'greeting'. Though it became clear that different gestures could express each concept, some forms were used more often than others in particular concepts, like the gestures *beg from the head* and *hugging hands*, corresponding respectively to the LGG signs BEG and THANK-YOU (in Figures 87 and 89).

In this semantic network, the concept of 'beg' elicited the most responses (N=100), distributed across seven different gestures (in Figure 87a). As suggested by the deaf participants (in §3.4.1.1), this concept may originate in a behaviour mainly performed by women where they take off their headscarf and prostrate themselves on the ground. If that is so, this behaviour could have been reduced to a conventionalised gesture to a movement starting on the forehead and ending with one palm over the other. This *beg from the head* form is by far the most frequent gesture provided by deaf participants for 'beg' (31 of 62). In contrast, most hearing participants (26 of 38 gestures) produced a *begging* gesture *with one hand*. Deaf observers commented that while women favour the *beg from the head* gesture, the two *hugging hands* gesture is preferred by men. This was the second most produced gesture by both groups (19 of 62 deaf participants and 4 of 38 hearing participants).

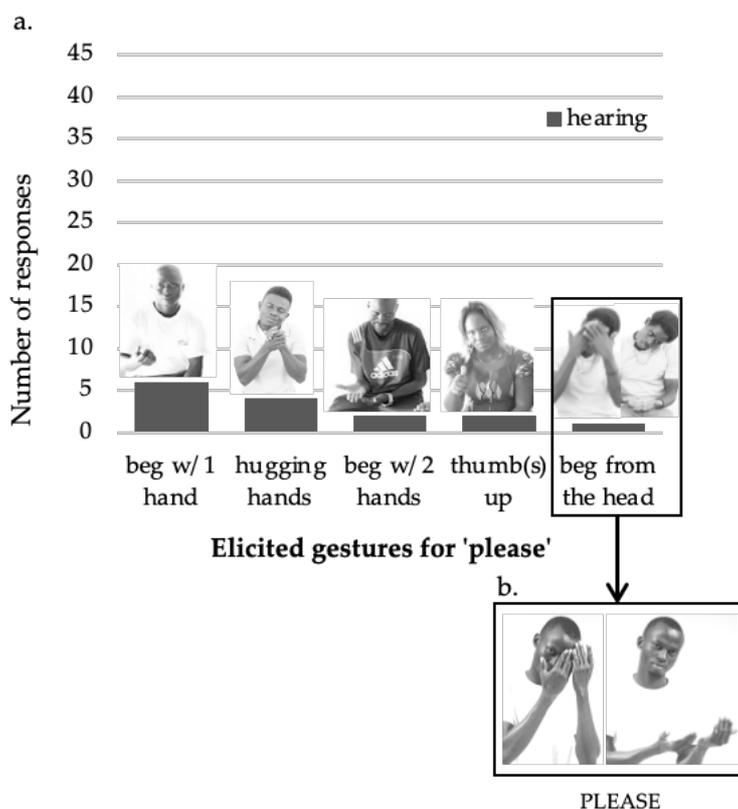
The three other gestural forms occurring for this concept – *joined palms*, *hand(s) on heart* and *thumb(s) up* – were used very few times. When looking at the gestures that were adopted as signs, the form *beg from the head* corresponds to the LGG sign BEG (in Figure 87b), and *beg with one hand* to RECEIVE. As shown in Figure 87a, these two gestures adopted as signs were the most frequently used in the concept of 'beg'.



**Figure 87.** Gesture synonyms for 'beg', namely seven forms distributed across 100 responses by deaf and hearing participants (a), and the adopted gesture *beg from the head* (N=32) as the sign BEG from 2017 (b)

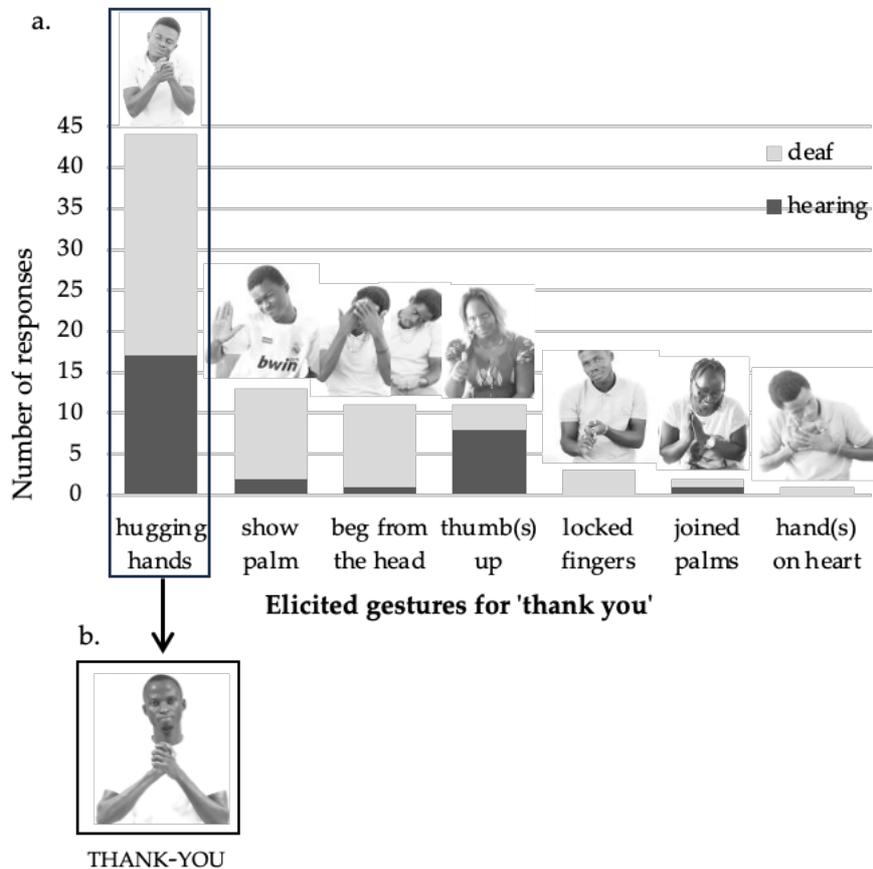
The gestures elicited for the concept of 'beg' coincided with those elicited for 'please'. Because of such redundancy, I opted not to ask the latter to the deaf participants. Thus, Figure 88a shows only responses by hearing gesturers. For 'please', there are five different gestures instead of the seven elicited by 'beg'. Curiously, the proportion of responses by hearing participants for each gesture was equivalent for both concepts. Thus, as with the concept of 'beg', the most frequent

gesture produced for 'please' was *beg with one hand*, followed by *hugging hands*. Even if produced less frequently within this group, the *beg from the head* gesture is the one adopted by LGG signers for PLEASE. In this way, signers seem to adopt its polysemy since it is also used as BEG. Despite the polysemy of this LGG sign, I glossed it differently in Figure 87b and Figure 88b, following its 2017 dictionary entries. Henceforth, I will use two different glosses for this sign.



**Figure 88.** Gesture synonyms for 'please', namely five forms distributed across 15 responses by hearing participants (a), and the adopted gesture *beg from the head* (N=1) as the sign PLEASE from 2017 (b)

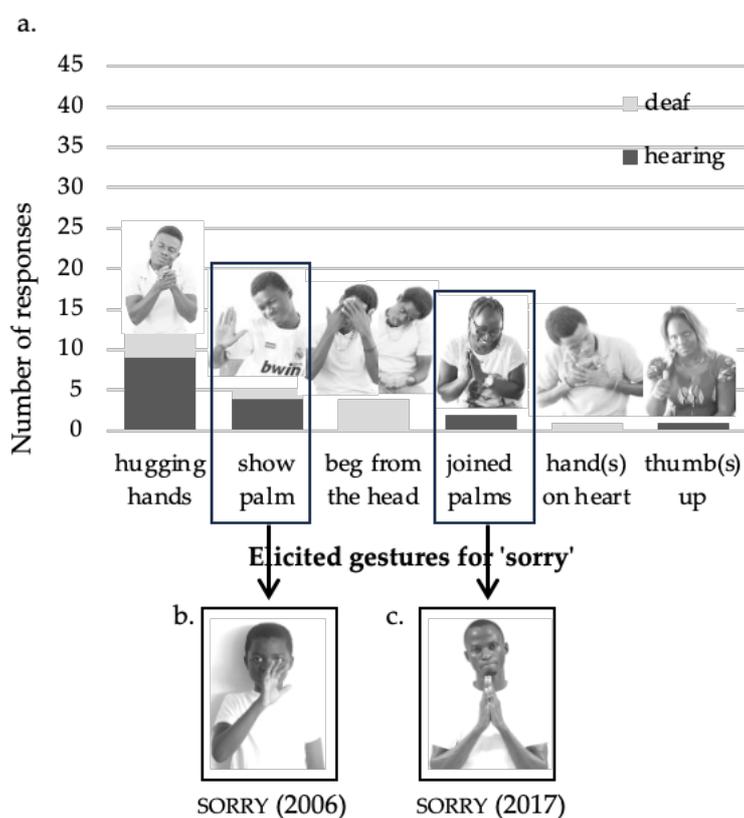
The concept of 'thank you' elicited the second most responses in this cluster (N=85), after 'beg', also distributed across seven different gestural forms (in Figure 89a). Here, the *hugging-hands* gesture represents the most frequent response (44 of 85 by both hearing and deaf participants). Most of the gestures elicited for 'beg' coincide with the ones produced for the concept of 'thank you'. The exception is made only by the *show-palm* and the *interlocked-fingers* gestures that are also elicited by other concepts. To represent 'thank you', LGG signers adopt the most frequent gesture response in both deaf and hearing participants, which is *hugging hands* (in Figure 89b). Again, more frequent gestures with more conventionalised meanings seem more likely to integrate into the signed lexicon.



**Figure 89.** Gesture synonyms for ‘thank you’, namely seven forms distributed across 85 responses by deaf and hearing participants (a), and the adopted gesture *hugging hands* (N=32) as the sign THANK-YOU from 2017 (b)

The fourth concept in this cluster shows again overlapping forms with the previous concepts. The concept of ‘sorry’ is also expressed by the *hugging-hands* and the *beg-from-the-head* gestures (in Figure 90a). Because these two gestures were adopted for the most conventional meanings in THANK-YOU and BEG / PLEASE, the following two most used forms by hearing gesturers integrate the LGG lexicon for ‘sorry’.

The integration of the two different gestures occurs at different periods. The *show-palm* form is registered in the 2006 dictionary (in Figure 90b), and the *joined palms* are documented in 2017 (in Figure 90c). The fact that different gestures are selected as signs in distinct years shows some difficulty in choosing from less frequent forms. The gesture for ‘sorry’ was not elicited with deaf participants. Nonetheless, they commented, especially in response to ‘thank you’, that some of the gesture variants could also mean ‘sorry’.

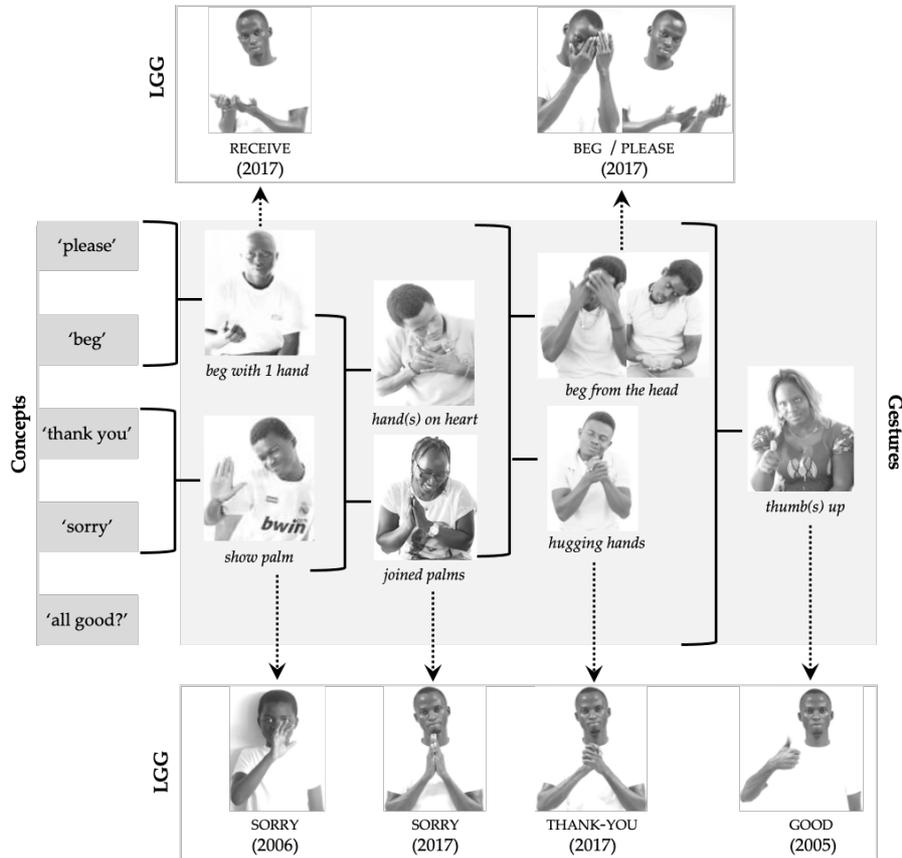


**Figure 90.** Gesture synonyms for ‘sorry’, namely six forms distributed across 25 responses by deaf and hearing participants (a), and the adopted gestures *show palm* (N=5) as the sign SORRY from 2006 (b) and *joined palms* (N=2) as SORRY from 2017 (c)

The previous figures show that often the same gestures are produced for different concepts. Out of these, the *thumbs up* is the most polysemous gesture. It is associated with all concepts involving asking, thanking and apologising, especially by hearing gesturers. Although it was not the preferred response for those concepts and was not chosen as a sign to denote any of those meanings, it is incorporated into the LGG lexicon as GOOD. The concept of 'all good?', asked only to hearing participants, elicited the *thumbs up* alone, justifying a higher conventionalisation for this particular meaning. As a sign, it occurs in the 2017 dictionary, with the two hands for 'good' after touching the chest. In 2005, it had been recorded to mean 'yes', and, in 2006, to signify 'good'.

Looking at the semiotics of the gestures, it is striking how, except for *thumbs up*, all of them put the gesturer in a subservient position to the interlocutor, by implying a message of 'I humbly request something', 'I am humbly thankful', or 'I am sorry'. In contrast, the *thumbs up* seems to be targeted at an interlocutor with a more equal status than the others.

Figure 91 demonstrates how the *thumbs up* can express all concepts in the cluster, contrasting with other gestures. The following two most polysemous gestures, the *beg from the head* and the *hugging hands*, are associated with four meanings each. Two other forms, the *joined palms* and the *hand(s) on heart*, are associated with three meanings. Some gestures have two meanings, like *beg with one hand* expressing 'beg' and 'please', and the *show-palm* gesture signifying 'thank you' and 'sorry'.



**Figure 91.** Network of ‘please’, ‘beg’, ‘thank you’, ‘sorry’, and ‘all good?’, eliciting a set of polysemous gestures adopted as signs, *thumb(s) up* as GOOD from 2005, *show palm* as SORRY from 2005, *joined palms* as SORRY, *hugging hands* as THANK-YOU, *beg with one hand* as RECEIVE, and *beg from the head* as BEG / PLEASE from 2017

Even with high polysemy, some forms have stronger associations with particular meanings, as shown in the frequency of responses. From the different responses to the concepts within the present cluster, signers tendentially choose the most frequent gesture to express the corresponding concept in LGG. Thus, in this semantic network, most

conventionalised gestures, i.e., forms linked more often to specific meanings, namely in BEG, THANK-YOU and GOOD, are readily incorporated into the LGG lexicon. This also occurs with RECEIVE although to express a different meaning than the ones elicited for gestures.

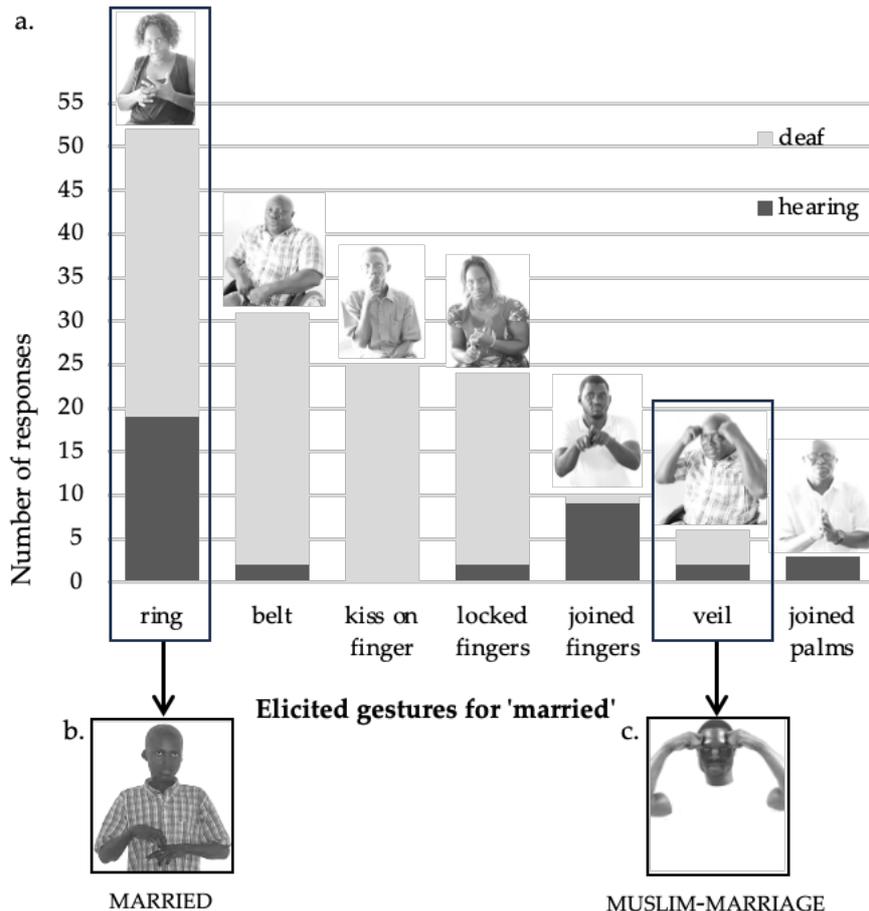
In this semantic cluster, the *thumb(s) up* was the most polysemous gesture, associated with all five concepts, which were also expressed by other gestures. Curiously, the meaning in which it is adopted as a sign, ‘all good?’, elicited the *thumb(s) up* as the only response. This signifies that highly polysemous gestures are likely adopted as signs with the meaning that is most strongly associated with them. This is not the case in the concepts of ‘please’ and ‘sorry’. The former is assimilated by the *beg from the head* for both ‘please’ and ‘beg’. In ‘sorry’, the forms integrating the LGG lexicon are the competing ones, i.e., those that had not been adopted as signs for other meanings. Therefore, signers recruit alternative synonymous gestures for SORRY at different moments in time, namely in the 2006 and 2017 dictionaries.

To summarise, this semantic network of intertwining gestures shows that, in the face of synonymous forms, most frequent gestures tend to be adopted as LGG signs. At the same time, most polysemous gestures favour their most strongly conventionalised sense.

#### 3.5.3.2 ‘Married’ – ‘boy/girlfriend’ – ‘friend’ – ‘together’ – ‘same’

Another set of concepts was found to be highly prone to synonymy and polysemy. This set references personal connections; namely, gesture responses to the concepts of ‘boy/girlfriend’, ‘married’, and ‘friend’. In this semantic cluster, I again found that the different concepts were expressed by synonymous forms that overlapped across meanings. Also, as occurred in the previous network of gestures and signs, the gesture produced the most often in response to each concept ended up integrating the LGG lexicon.

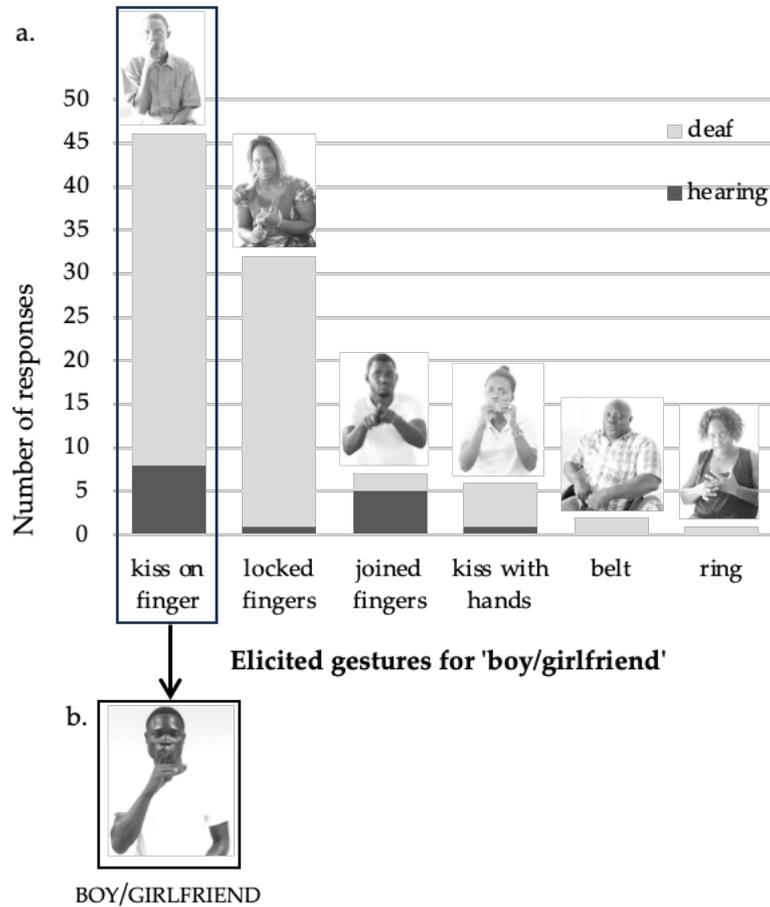
In the present semantic network, the concept of 'married' elicited the highest number of responses (N=151) across seven gesture variants (in Figure 92a). Besides the most frequent reference to the *ring* (52 of 151), 'marriage' is also represented by clothing items, such as a *belt* and a *veil*, the first being more common (31 of 151) than the second (10 of 151). Some participants suggested that both forms were interchangeable, and a couple of them added that these forms referred to Muslim marriage. In addition, hearing gesturers relate marriage with closeness, preferably represented metaphorically by two *joined fingers*, two *joined palms* or *interlocked fingers*. In the end, LGG signers recruited metonymic references for 'married', namely the gesture produced the most often, the *ring*, integrated as MARRIED (Figure 92b), and a much less frequent form, the *veil*, incorporated for a more specific concept as MUSLIM-MARRIAGE (in Figure 92c).



**Figure 92.** Gesture synonyms for 'married', namely seven forms distributed across 151 responses by deaf and hearing participants (a), and the adopted gestures *ring* (N=52) as the sign MARRIED from 2005 (b), and *veil* (N=6) as MUSLIM-MARRIAGE from 2017 (c)

The next concept, 'boy/girlfriend', is expressed by six different gestures, five of which overlap with 'married' (in Figure 93a). In this case, however, it is mainly associated with the gesture *kiss on finger*, in which the index finger, typically on the radial side, presses on the lips. This is followed by the representation of closeness through the *interlocked*

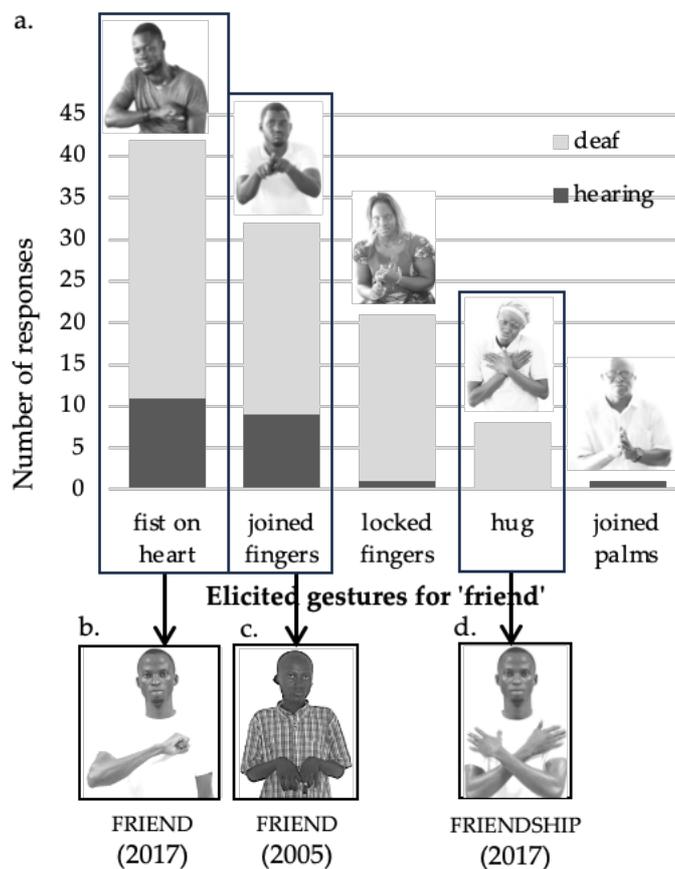
*fingers* and the *joined fingers*. Kissing was also represented by two hand bunches touching each other. Finally, the two other gestures produced in response to this concept coincided with the two most frequent for 'married', referring to the *ring* and the *belt*. Again, signers selected the form used most often as a gesture to incorporate into the LGG lexicon, corresponding to the *kissing-the-index* gesture (in Figure 93b). Importantly, it was incorporated as KISS in 2006, and only later in 2017 extended to BOY/GIRLFRIEND.



**Figure 93.** Gesture synonyms for ‘boy/girlfriend’, namely six forms distributed across 94 responses by deaf and hearing participants (a), and the adopted gesture *kiss on finger* (N=46) as the sign BOY/GIRLFRIEND from 2006 (b)

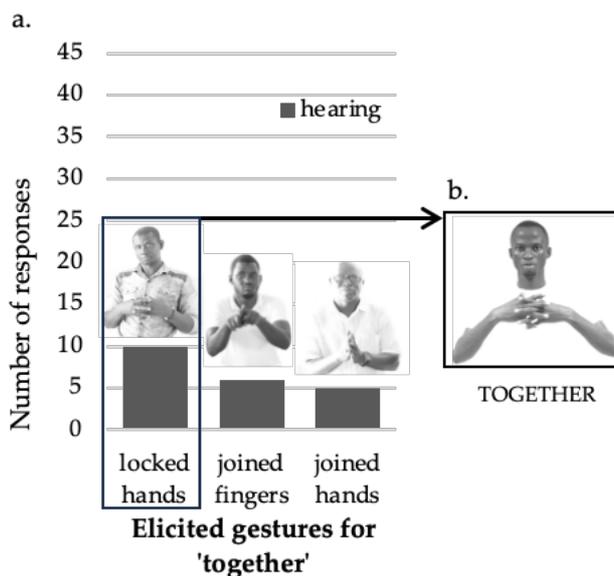
The concept of ‘friend’ was in the majority (42 of 104) represented with the *fist on the heart* (in Figure 94a). This gesture was followed by the reference to closeness with two fingers, whether *joined* or *interlocked*. The *joined index fingers* was the form adopted by signers in the first LGG dictionary, in 2005 (in Figure 94c). Deaf observers also mentioned

the *hug* associated with the concept of 'friend', incorporating it in FRIENDSHIP (in Figure 94d), and hearing gesturers the *joined palms*. As with the previous concepts, the most frequent gesture for FRIEND was incorporated into the LGG lexicon (in Figure 94b).



**Figure 94.** Gesture synonyms for 'friend', namely five forms distributed across 104 responses by deaf and hearing participants (a), and the adopted gestures *fist on heart* (N=42) as the sign FRIEND from 2017 (b), *joined fingers* (N=32) as FRIEND from 2005 (c), *hug* (N=8) as FRIENDSHIP from 2017 (d)

In the previous three concepts, deaf and hearing people perceived gesture use in Bissau differently, i.e., they responded with different proportions for each gesture variant. Nonetheless, as shown in Figures 92, 93, and 94, both deaf and hearing participants produced the most frequent gestures for the same concepts. In addition, since they concern close personal relationships, these concepts were associated with gestures representing closeness: *joined fingers*, *interlocked fingers*, *joined palms* and *interlocked hands*. Three such gestures were provided for 'together'. This concept and the one of 'same' were elicited with hearing gesturers alone because they were overlooked when compiling the list for the deaf participants. With the hearing participants, the concept of 'together' was expressed by three gestural forms (in Figure 95a). The most frequent one (with 10 of 21 responses), the *interlocked hands*, was again adopted as an LGG sign (in Figure 95b). In contrast, the concept of 'same' was consistently expressed by only the *joined index fingers* (with 19 of 19 responses).

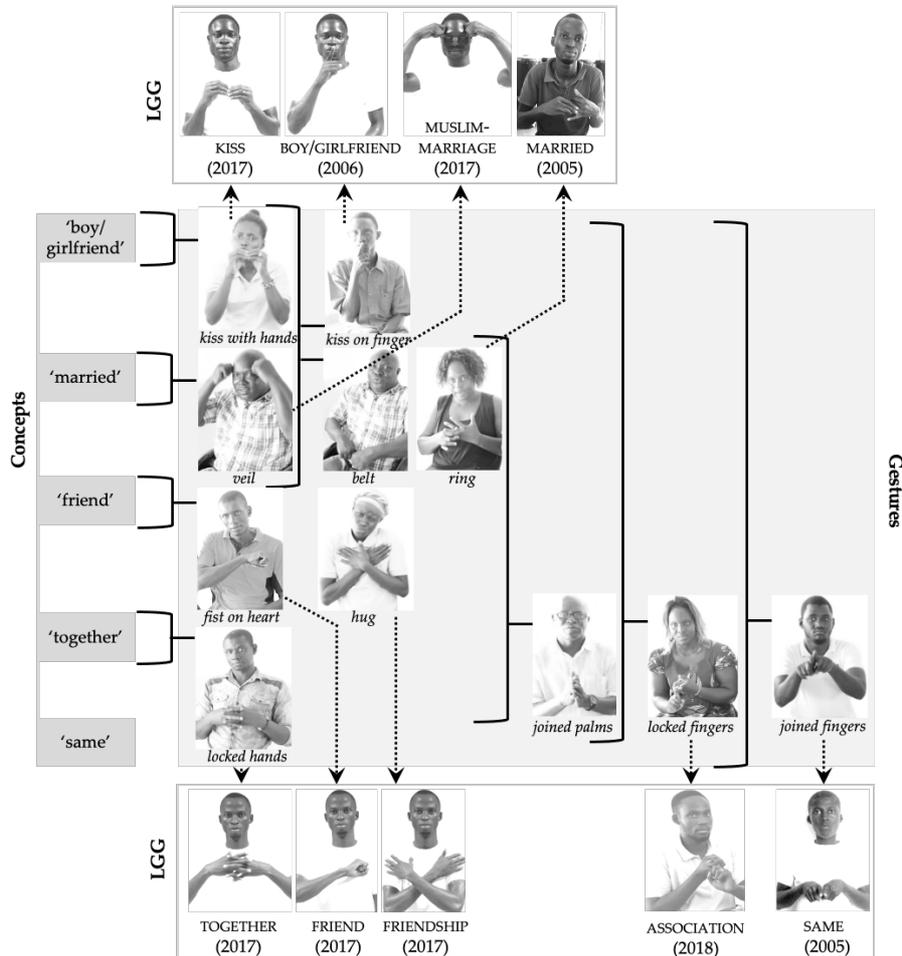


**Figure 95.** Gesture synonyms for ‘together’, namely three forms distributed across 21 responses by hearing participants (a) and the adopted gesture *locked hands* (N=10) as the sign TOGETHER from 2017 (b)

Looking at the whole set of concepts, gestures and signs together in Figure 96, those produced more often for a particular concept, even if bearing some polysemy, were directly incorporated into the LGG lexicon to express that same meaning. Such direct integration occurs with the *index on the lips* and the *ring*, both denoting the ‘boy/girlfriend’ and the ‘marriage’ relationships. Still, they are incorporated into the LGG lexicon, respectively as MARRIED and BOY/GIRLFRIEND, corresponding to the concepts where they occur more frequently. This is also the case of the *hand on the heart* in FRIEND, and *interlocked hands* in TOGETHER. While being produced the most often, such forms did not present any polysemy, i.e., they are not used to express other concepts.

A few other gestural forms were used in this semantic network to refer to only one concept, i.e., without polysemy. However, because the concepts in which they occur elicited other more frequent forms, they were instead promptly adopted by LGG signers for different – though related – meanings. This was the case of *kiss with two hands* in KISS, tracing a *veil* in MUSLIM-MARRIAGE, and a *hug* in FRIENDSHIP. In contrast, two polysemous gestures, the *belt* and *joined palms*, are not adopted by signers.

The gesture that intersects the most with the different meanings, and thus is the most polysemous, the *joined index fingers*, adopts the sense of ‘same’ in the 2017 dictionary. Concurrently, the concept of ‘same’ was expressed only by the *joined index fingers*. In the first LGG dictionary, in 2005, such a form represents ‘friend’, and as part of a compound, it also refers to ‘sibling’ and ‘neighbour’. Finally, another highly polysemous gesture that was not conventionalised with any particular meaning, the *interlocked fingers*, came to be used in 2017 as (DEAF) ASSOCIATION.



**Figure 96.** Network of 'boy/girlfriend', 'married', 'friend', 'together' and 'same', eliciting a set of polysemous gestures adopted as signs, *ring* as MARRIED, *joined fingers* as SAME from 2005, *kiss on finger* as BOY/GIRLFRIEND from 2006, *kiss with hands* as KISS, *veil* as MUSLIM-MARRIAGE, *locked hands* as TOGETHER, *fist on heart* as FRIEND, *hug* as FRIENDSHIP from 2017, and *locked fingers* as ASSOCIATION from 2018

As in the previous semantic network, the most frequent gestures of synonymous concepts are also incorporated into LGG here. The concept of 'married' is associated more often with putting a ring on the finger. The concept of 'boy/girlfriend' was expressed mainly by kissing representations, and that of 'friend' with the heart. As a consequence, the form used more often in each concept was adopted as the corresponding sign in LGG, respectively, in MARRIED, BOY/GIRLFRIEND, FRIEND and TOGETHER. However, while the *ring* and the *kiss-on-finger* forms were polysemous for both 'married' and 'boy/girlfriend', the *fist on heart* and the *interlocked hands* occurred only in the concepts of 'friend' and 'together', respectively.

In contrast, the *joined fingers* spread across all concepts, but is the only response for 'same'. The fact that such meaning is the most conventionalised leads to its integration as SAME. In addition, other gestures used for those concepts are assigned with related meanings, such as KISS, MUSLIM-MARRIAGE, FRIENDSHIP and ASSOCIATION.

This semantic network, as the previous one, shows how LGG signers recruit most conventionalised gestures – in form and meaning – as signs. They also take advantage of cooccurring forms by integrating them into the LGG lexicon as signs for related meanings.

### 3.5.3.3 'Kill' – 'die' – 'witchcraft' – 'crook' – 'steal' – 'escape'

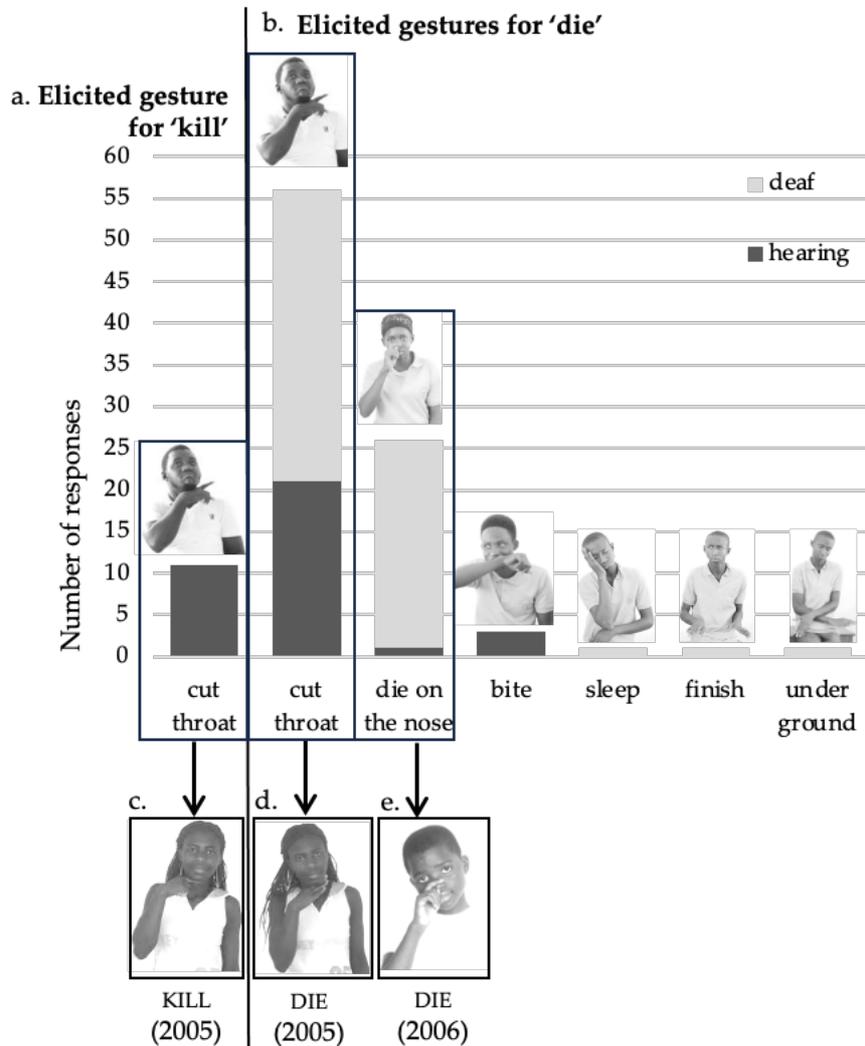
The third and last cluster presents one polysemous gesture linking the different concepts by representing the act of *cutting the throat*. Similar to the *thumb(s) up* and the *joined fingers* in the preceding networks, the highly polysemous *cut-throat* gesture was the only expression for only one concept, 'kill'. Here, again, each concept shows a favourite form, i.e., produced more often, which is then integrated into LGG. Also, as in the previous cluster, three forms produced more often in their

corresponding concepts – against cooccurring forms – were monosemous in those concepts, namely for ‘die’, witchcraft’, and ‘crook’.

Since *cutting the throat* was the gesture with the largest breadth across the different meanings, I start with the first two concepts, ‘kill’ and ‘die’, for which this gesture was provided more consistently. The concept of ‘kill’ was asked only to the hearing participants, since to the deaf ones it was included in the elicitation for ‘die’. For ‘kill’, hearing people produced exclusively the *cut-throat* gesture (11 of 11 responses), as shown in Figure 97a.

Otherwise, the concept of ‘die’ gave rise to 88 responses across seven different gestures. Here, deaf observers commented that hearing gesturers produced the *cut-throat* form much more often. *Cutting one’s throat* represents the majority of the responses to the concept of ‘die’ (in Figure 97b). Although the *cut-throat* gesture was primarily produced with the index finger, a few tokens relied on the whole hand. The two forms were adopted at the beginning of LGG emergence in 2005: the first in KILL (in Figure 97c) and the second in DIE (in Figure 97d).

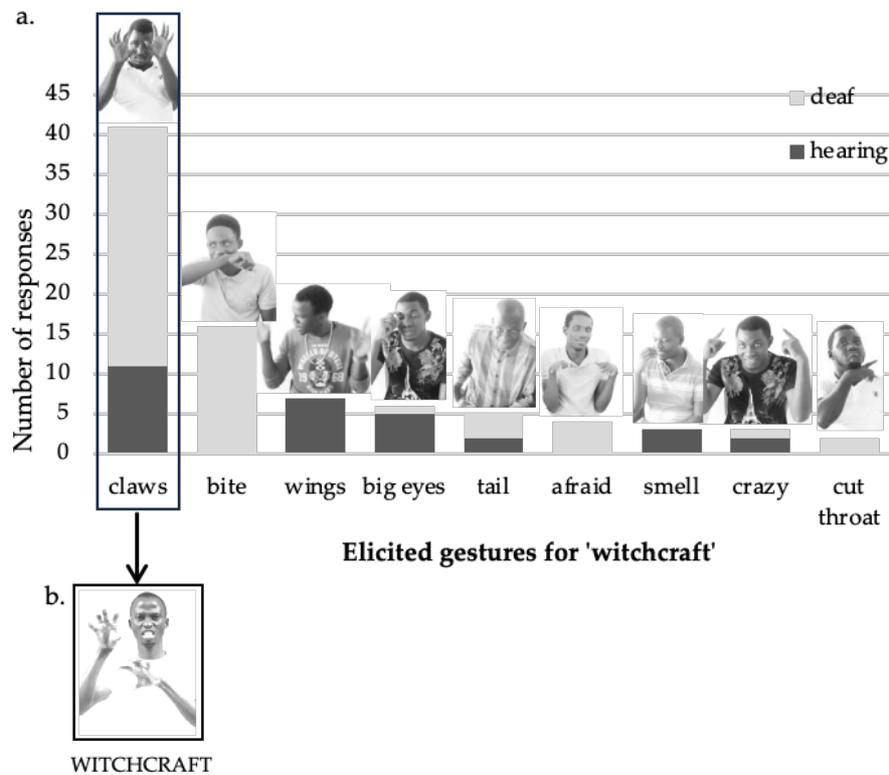
In contrast, *die on the nose* was seldom used. Only one hearing acknowledged it against 25 responses by deaf participants, where they recognised that it was not a widespread gesture among hearing people. The *cut-throat* form cooccurs with the emblematic gesture of *dying on the nose*, which one of the deaf participants justified with the idea of turning off the act of breathing. Deaf people adopted such a form in DIE in 2006 (in Figure 97e), replacing the *cutting throat* with the whole hand that was given the year before for the same meaning.



**Figure 97.** Gesture responses for 'kill' and 'die', namely eleven responses for *cut throat* by hearing participants (a), and gesture synonyms for 'die', namely six forms distributed across 88 responses by deaf and hearing participants (b), and the adopted gestures *cut throat* (N=11) as the signs KILL with the index finger (c), and (N=56) as DIE with the whole hand from 2005 (d), and *die on the nose* (N=26) as DIE from 2006 (e)

The following concept, 'witchcraft', got the highest variety of responses with nine different gestures in a total of 87 responses (in Figure 98a). Two of them also occur for the concept of 'die', namely, *cutting the throat* and *bite*. In fact, 'witchcraft' prompted the depiction of some supernatural entity with *claws*, *wings*, *big eyes* and a *tail*. The most frequent gesture for 'witchcraft' was the 'claws', sometimes combined with some other gesture like the ones referred to above or, on very few occasions, recoiling in *afraid*, indicating that it *smells* or that it makes one *crazy*. Again, the most frequent gesture, the *claws*, is the one incorporated into LGG in WITCHCRAFT (in Figure 98b).

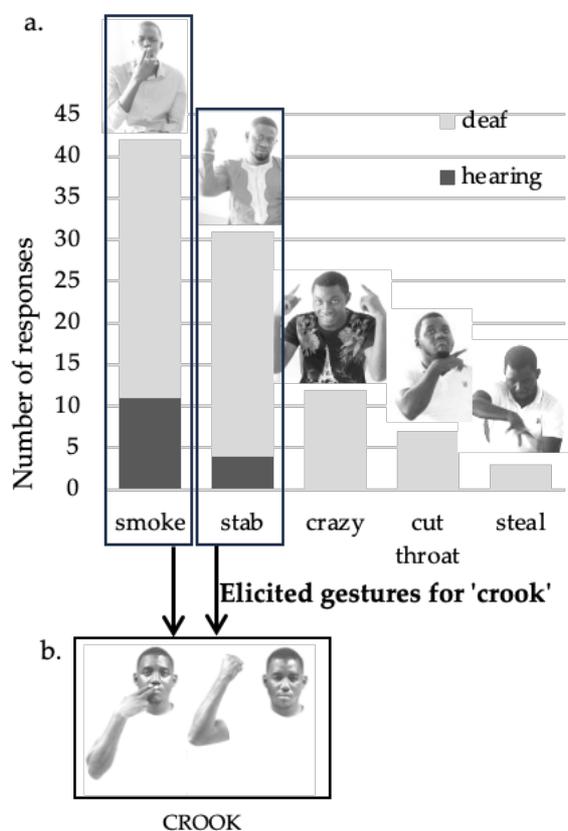
I recall that this item is included on Nyst's elicitation list for conventional gestures in West Africa. Although aware of the LGG sign WITCHCRAFT to be based on the *claws* form, such a concept was portrayed by other various images during the elicitation sessions. While curious about this subject, I felt that local hearing and deaf people were not comfortable elaborating about it with me. For that reason, I am not able to provide their view about the origin of these iconic references.



**Figure 98.** Gesture synonyms for 'witchcraft', namely nine forms distributed across 87 responses by deaf and hearing participants (a), and the adopted gesture *claws* (N=41) as the sign WITCHCRAFT from 2017 (b)

The fourth concept in this semantic network, 'crook', elicited the highest number of responses (N=95) across five different gestures (in Figure 99a). This concept proved to be more conventionalised in two primary forms, *smoke* and *stab*, among both hearing gesturers and deaf observers. Thus, as expected, the most frequent gestures, SMOKE and STAB, are incorporated in LGG, but this time as a signed compound (in Figure 99b). Although the compound for 'crook' is incorporated only in 2017, the individual sign SMOKE occurs in the 2006 dictionary.

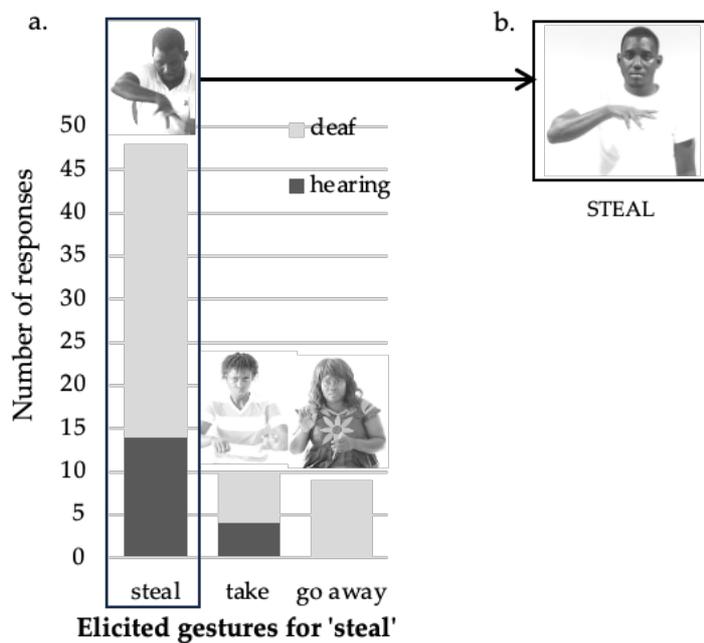
The reference to the act of *smoking* includes smoking drugs, implying getting high or *crazy*. The gestures *crazy* and *cut throat* occurred also in other concepts. The first is produced in response to ‘witchcraft’, while the second is associated with all previous meanings. These two forms and the emblematic gesture *steal* occur in a few responses only by deaf observers.



**Figure 99.** Gesture synonyms for ‘crook’, namely five forms distributed across 95 responses by deaf and hearing participants (a), and the adopted gestures *smoke* (N=42) and *stab* (N=31) as the signed compound CROOK from 2017 (b)

The sixth of this seven-concept cluster, ‘steal’, elicited again a highly frequent response (48 of 67) in the emblem *steal* (in Figure 100a). This

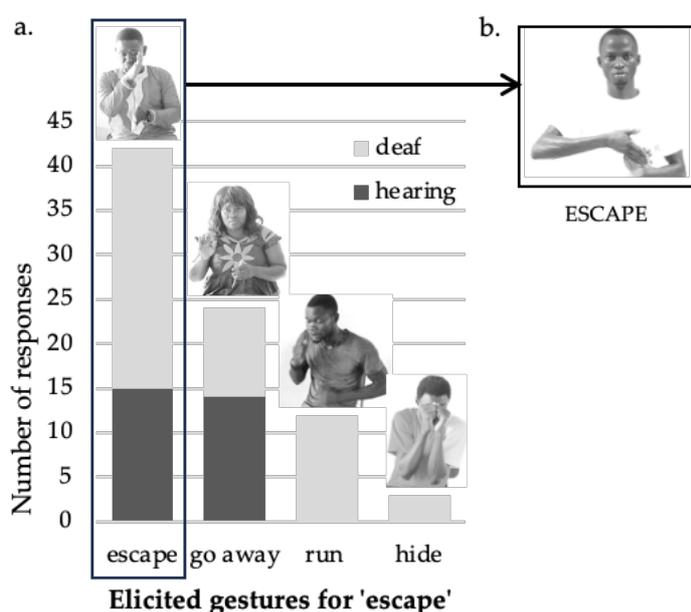
form is also produced in response to the previous concept, 'crook'. It was, however, of all the concepts in this semantic network, the one with the fewest gesture variants. The gesture *steal* was, on a few occasions, followed by a more iconic enactment of taking something. In addition, deaf observers alone associated such a concept with the gesture *go away*. As expected, signers adopted the form produced most often, STEAL (in Figure 100b).



**Figure 100.** Gesture synonyms for 'steal', namely three forms distributed across 67 responses by deaf and hearing participants (a), and the adopted gesture *steal* (N=48) as the sign STEAL from 2017 (b)

The last concept of this semantic network, 'escape', triggered different gestural responses (in Figure 101a). The emblematic gesture *escape* was the most frequent (42 of 81), closely followed among the hearing

gesturers by *go away*, which was also produced for the concept of 'steal'. Deaf observers alone also produced, on fewer occasions, the enactment of *run* and *hide*. Unsurprisingly, the form used more often, ESCAPE, integrates the LGG lexicon (in Figure 101b).



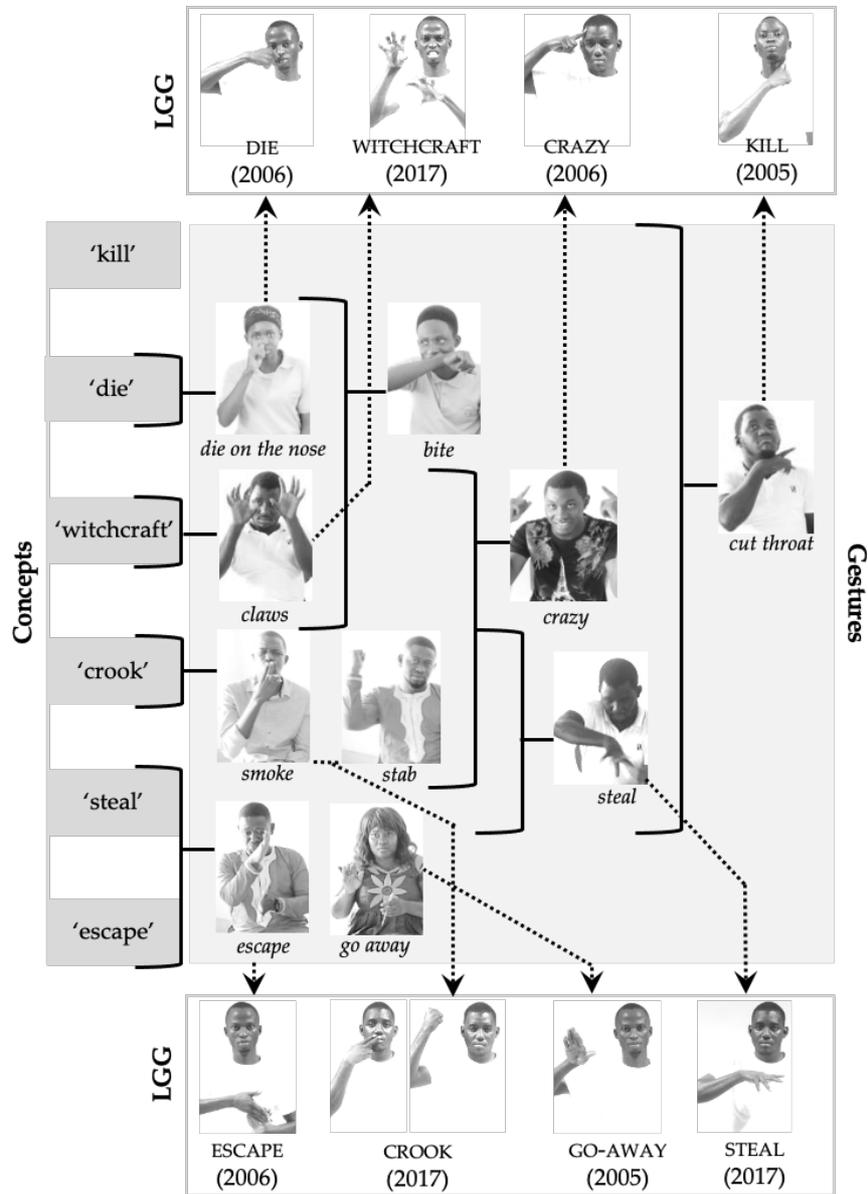
**Figure 101.** Gesture synonyms for 'escape', namely four forms distributed across 81 responses by deaf and hearing participants (a), and the adopted gesture *escape* (N=42) as the sign ESCAPE from 2006 (b)

Overall, this semantic cluster was connected by gestures overlapping across the different concepts. To express 'die', both hearing and deaf people agree mainly on *cutting the throat*, which is produced as the only response for 'kill'. While this gesture occurs in 'witchcraft' as well, such a concept is preferably represented by the characteristics of an evil entity, especially its *claws*. In addition, it is represented by what it makes one feel, such as *crazy*. This feeling is equally attributed to a

'crook', which is preferably represented by the enactment of *smoking*, *stabbing*, and *stealing*. The emblematic gesture for 'steal' can also be referred to by another emblematic gesture, favoured to express its corresponding concept, 'escape'.

In the end, deaf signers chose the most frequent gestures to represent the concepts of 'witchcraft', 'die', 'escape', 'steal' and 'crook'. Exceptionally, for 'die', signers adopted the two forms used most often to distinguish between 'die' and 'kill'. In addition, for 'crook', LGG signers combined the two most frequent gestures into a compound.

As shown in Figure 102, the least polysemous gestures – that, I recall, were also the ones produced more often for each concept, in 'die', 'witchcraft' and 'crook' – were incorporated into the LGG lexicon. Similarly, 'steal' and 'escape' are expressed as signs by the emblematic gestures that carry those meanings more frequently. In addition, other polysemous forms, such as *go away*, *crazy* and *cutting the throat*, are adapted as signs with the senses used more often in the corresponding notions.



**Figure 102.** Network of 'kill', 'die', 'witchcraft', 'crook', 'steal' and 'escape', eliciting a set of polysemous gestures adopted as signs, *cut throat* as KILL, *go away* as GO-AWAY from 2005, *die on the nose* as DIE, *crazy* as CRAZY, *escape* as ESCAPE from 2006, *claws* as WITCHCRAFT, *smoke* and *stab* as CROOK, and *steal* as STEAL from 2017

In the present semantic network, synonymous gestures are selected according to frequency of use to incorporate the LGG lexicon in each concept, similarly to the two preceding sets of concepts. Gestures produced more often for certain concepts presented different levels of polysemy. The least polysemous, for 'die', witchcraft', and 'crook' were readily integrated as signs, as was already the case in the previous cluster for 'friend' and 'together'. The opposite was true for the most polysemous form, *cut throat*, which was recruited with the meaning prompting this gesture alone, 'kill'. Again, this occurred in the same way in the previous two networks with the *thumb(s) up* for 'good' and the *joined fingers* for 'same'.

Again, as observed in the previous integration routes, so did signers recruit cooccurring gestures elicited for the different concepts within these gesture networks. Hence, besides the 16 signs corresponding to the listed concepts, 15 more cooccurring gestures for those concepts were also adopted as signs. Of these cooccurring gestures integrated as signs, ten were produced by both hearing and deaf participants. Two of them consist of form variants with the same motivation, and the remaining correspond to signs based on different motivations.

Looking back over all types of gesture-to-sign integration – i.e., direct, with minimal variants or in clustered networks – gestural sources more consistently associated with specific meanings are recruited as signs throughout the first 14 years of language emergence. Out of the 41 concepts with corresponding gestures that were integrated as signs, two entered the LGG lexicon already as compounds, SMOKE<sup>^</sup>STAB 'crook', and HEAT<sup>^</sup>SWEAT 'heat'. Four others combined later with other signs to specify their meaning: EAR<sup>^</sup>ANIMAL-HEIGHT 'animal', SNOTTY<sup>^</sup>CHILD 'child', WORK<sup>^</sup>RUN-ABOUT 'work' and CHEST1<sup>^</sup>GOOD 'all good?'. The only signs-from-gestures that were replaced later with newly created signs in the 2017 dictionary were STEAL and CROOK. Deaf signers argued that such sensitive concepts had to be replaced in

social contexts through forms that hearing people could not recognise (this topic is further developed in §4.5.3).

In sum, when integrating gestures into the LGG lexicon, signers benefit from previously conventionalised forms assigned to specific meanings. One-third of such gestures were incorporated directly into LGG, in one-to-one relationships. Another third involved the incorporation of a few gesture variants as a few signs, and the disambiguation of polysemous gestures when entering the LGG lexicon. This indicates that signers take advantage of gesture variants in form and gestures expressing similar meanings to incorporate them into the emerging lexicon as well. The last third concerns gesture networks, including overlapping forms around semantically related concepts. To disambiguate a set of several polysemous and synonymous gestures, signers tend to recruit those used more often for specific concepts. This is especially true when the most frequent gesture for a concept is associated exclusively with that meaning. It can also be the case that an otherwise highly polysemous gesture is the only one used for a particular concept, revealing how much that meaning has conventionalised in that form.

#### 3.5.4 Summary of results: the three integration routes of gestures as LGG signs

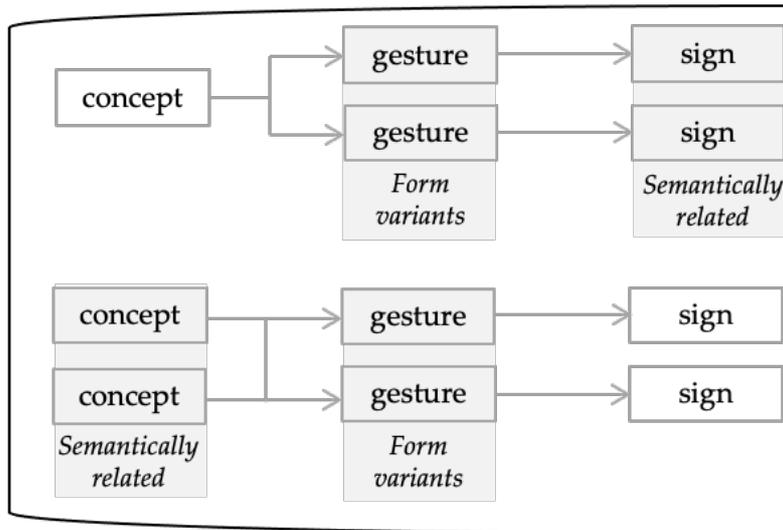
The present study focuses on how gestures used in Bissau are integrated into the LGG lexicon. Gestures were collected from hearing and deaf participants based on a set of 41 concepts. Such gestures were then compared to LGG signs equivalent in form and meaning from three dictionaries compiled over time. Finally, two significant findings emerged from the analysis. First, all concepts were expressed by conventional gestures, and these have, in turn, sign counterparts. Next, the integration route of gestures into the LGG lexicon is not always

linear. I found that the integration of gestures followed one of three patterns: direct integration of one gesture as one sign (in Figure 103a), integration of a few gesture variants as a few signs (in Figure 103b), and integration of many gestures entangled in semantically related networks also as many signs (in Figure 103c).

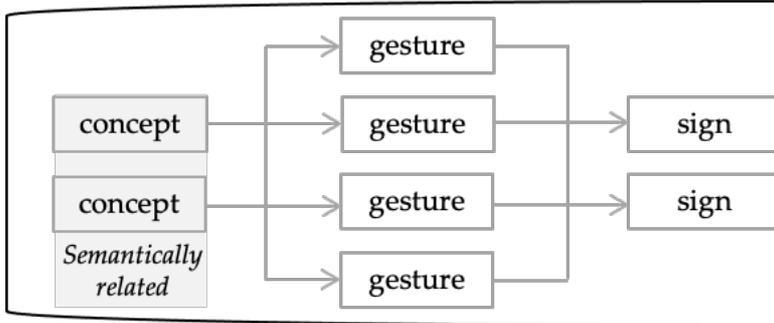
**a. Direct integration of gestures:**



**b. Integration of gesture variants:**



**c. Integration of gesture networks:**



**Figure 103. Routes of gesture integration as LGG signs for certain concepts:** direct integration of gestures (a), integration of gesture variants in form as semantically related signs (b), and integration of gesture networks (c)

First, one-third of the concepts (thirteen of 41) are expressed by equivalent gestures that were directly integrated into the LGG lexicon. In other words, the same manual form was consistently assigned with the same concept as a gesture and translation in the LGG dictionary, like FINISH. Another third (twelve of 41) concerned the incorporation of gesture variants. Half of them showed a couple of variants in form that were both adopted as signs, like blowing the hand sideways or to the front of the mouth, which were incorporated as LIE and FALSE. The other half consisted of pairs of related concepts, each expressed by the same gesture, such as wiping the sweat off the forehead for 'work' and 'heat'. As signs, WORK remained a single sign, and HEAT turned into a compound.

The final third (16 of 41) comprises three clusters of gestures whose meanings overlap across different forms. The three networks of synonymous and polysemous gestures were then integrated based mainly on their frequency of use for each concept. This is to say that, when different gestures cooccurred for the same concept as synonymous, the one produced more frequently for that concept was usually (eight of 16) the one recruited by signers, like *ring* for 'married'. Of these, half were monosemous, i.e., besides being the most frequent expression of a concept, they were exclusively used for that concept, like the *claw* for 'witchcraft'. In addition, the three most polysemous gestures, the *thumb(s) up*, the *joined fingers*, and the *cut throat*, were each associated with five concepts. While cooccurring with other gestures in four concepts, they were the sole response to the fifth concept, respectively, for 'all good?', 'same', and 'kill'. These meanings were associated with forms adopted into the LGG lexicon. A couple of signs are based instead on gestural forms that occur less often in certain concepts. This was the case when the cooccurring gestures with higher frequencies were more easily assigned to other concepts. Thus, the adopted gestures remained available, such as the *joined palms* for 'sorry'.

The highly polysemous gesture, *beg from the head*, is integrated with some of that polysemy in BEG and PLEASE. Notably, both concepts were expressed by synonymous gestures that were either selected or co-opted to other meanings. Also, the *hugging-hands* gesture presents simultaneously a high polysemy and a preference for a particular concept, 'thank you'. From this, it is possible to conclude that while there is a direct one-to-one integration of gestures with no cooccurring forms for the same concept, gestures with competing forms will be chosen as signs based on their frequency of use, i.e., on their degree of conventionalisation for specific meanings.

Considering the number of responses for each concept, one can assume that the gestures elicited more often had already been conventionalised. This justifies that there were only minor formational adjustments when entering the LGG lexicon. In fact, in a few cases with variants in handedness and handshape, signers selected one of the forms as a sign. Between gestures produced with one and two hands, the one-handed form was adopted as a sign for six items primarily anchored on the body, such as WOMAN, HUNGRY, and CRAZY. Similarly, index-finger handshapes were favoured against whole-handed forms in four gesture variants when recruited as signs, again anchored on the body, such as THIRSTY and KILL. Still, in terms of form, deaf participants suggested that three gestures originated in actions involving larger movements. In three others, they notice hearing people producing the gestures larger in space than their sign counterparts.

Finally, it is also worth noting that besides the corresponding signs to each of the 41 elicited concepts, signers adopted, within the different integration routes, additional signs from the available gesture variants, both in form and with different motivations. Hence, looking at the sign counterparts in the three LGG dictionaries, I found 20 more gestures adopted as signs to express different – though often related – concepts. Four cooccurred with SICK in the one-to-one integration route; seven

were form variants in the few-to-few integration route; and nine more, mainly with different motivations, cooccurred within gesture networks.

### 3.6 Discussion

A young sign language thriving in a gestural environment, such as LGG, provides an excellent opportunity to observe how the integration process of conventional gestures occurs. Methodologically, the study benefits from privileged access to a diachronic collection of LGG signs, allowing the examination of gesture conventionalisation in real time. Moreover, the observations about gestures from deaf participants during the elicitation sessions offer a unique perspective on gesture use. That said, I follow up on the question of whether gestures are directly incorporated or if they undergo modifications in form and meaning in the process.

Overall, the contrast between the gestures collected in Bissau and their signed counterparts only occasionally resulted in formational and semantic modifications. This is expected when there is a high conventionalisation of gestures serving as a substrate to an emerging signed lexicon, as suggested by Washabaugh (1986, 185) and Coppola (2020, 349, 372). However, the present analysis of the incorporation of a set of conventional gestures into the LGG lexicon points to a diversity of integration processes, particularly concerning their semantics.

Looking first at eventual form adjustments, most of the articulatory reduction occurs as early as gestures of frequent use are conventionalised. Therefore, form adjustments occurring during the integration of gestures as signs were incipient and limited to a general reduction of the manual items. This was deduced from deaf observers' perception

of the original motivation of gestures and the differences in the production of the same manual form by gesturers and signers.

Accordingly, deaf observers notice that gestural forms may become more reduced when being integrated into LGG, as also described by previous research (Kendon 2004, 308; Delaporte 2005, 7–8, 15; Delaporte & Shaw 2009, 55; Haviland 2015, 88; Coppola 2020, 363) and observed, for instance, in ASL when contrasted to old LSF (Frishberg 1975; Supalla & Clark 2015) and gestural sources (Peet 1868, 173). In general, modifications aim to lighten the articulatory effort (Delaporte 2005, 15) by reducing the movement of the hands (Frishberg 1975, 711; Delaporte & Shaw 2009, 55).

Overall, the data, consisting of gestures and LGG signs collected in Bissau, confirms a consistent conventionalisation of gestures' forms before their recruitment as signs. Still, actual variations in form were observed in only a few gestures collected in the elicitation sessions, namely in handedness and handshape. Thus, signers just had to select from one of the coexisting variants, typically the most frequent one. Other than these differences between gestures and signs obtained from the formal data, form adjustments were deduced for a few more items from deaf participants' perceptions of how hearing people articulate gestures compared to their sign counterparts.

As no noteworthy formational adjustments occurred in gesture-to-sign incorporation, their semantics were also kept in the process. In this study, concepts were expressed by gestures that were adopted as signs. Although their meaning and form were maintained, the incorporation route was not always linear. One may compare this to Morgan's findings (2016) on the integration of gestures used in Western Kenya into KSL, according to which most of the gestures in her set had only one sign counterpart. However, she identified one-third of the items as part of lexical clusters, including polysemous forms. This

coincides with the integration route of gesture networks described in the present study.

What comes out of these clusters used in Bissau is that they include widespread interactive and metaphoric gesture families (Kendon 2004, 227) or *gestalts* (Hirsch 1993; Müller 2017). The first network involves two gesture families: one revolving around interactive palm-up gestures centred on the act of receiving, as suggested by Muller (2004), and the other on the notion of fondness expressed by embracing hands. Both of these semantic clusters imply similar forms spreading across related meanings intertwined with one another. In the second network, human relationships are iconically expressed by *joined hands* and *fingers* as described for both gestures (Will 2021, 109) and signs (Taub 2001, 119), corresponding to the primary metaphor ‘emotional intimacy is proximity’ (Grady 1997, 293). Ultimately, they are integrated into the signed lexicon for the most generalising concepts of ‘together’ and ‘same’. This was also the case in the transition of the Nicaraguan *joined-finger* gesture for ‘sibling’ to the LSN sign for ‘same’ (Coppola 2020, 365).

Another widely spread polysemous gesture is the *cut throat* for ‘kill’ and ‘dead’ (Calbris 2003, 22–25, for a French gesture; Brookes 2004, 222, for a South African gesture), whose meanings were distinguished, in Nicaragua, by being expressed with two different LSN signs (Coppola 2020, 360). Again, this was also the case in the integration of that gestural form into LGG.

To understand how signers sort out these tangles of forms and meanings, the analysis focused on the number of occurrences of the various synonymous gestures for each concept and the spread of polysemous gestures across different meanings. Such a new way of looking at gesture networks reveals that the conventionalisation of form-meaning pairs, expressed by how often they occur, is paramount to their

incorporation as signs. In addition, highly polysemous forms, like the *cut throat*, the *joined fingers* and even the *thumb(s) up*, reveal a preferred meaning for which there are no competing gestures, which is subsequently adopted as KILL, SAME and GOOD.

The integration of signs through gesture networks also reveals a maximal exploitation of cooccurring gestures used in the local community. This is to say that synonymous gestures elicited for various concepts are usually adopted as signs for different, though related, meanings. Such maximisation of cooccurring gestures is observed in all three integration routes. The fact that synonyms are generally distinguished in their meanings when being adopted as signs demonstrates a high degree of conventionalisation as gestures, as argued by Morgan (2015, 12–16).

It is worth noting that the proportion between the responses by hearing and deaf participants was generally balanced for the gestures recruited as signs. Considering that, in the elicitation sessions, only a few of the hearing teachers were said to be able to use LGG, there is probably no reason to assume a bias by the participants' knowledge of LGG, leading to the presence of many sign counterparts for the elicited gestures.

To conclude, the incorporation route of gestures expressing different concepts into the LGG lexicon reveals their degree of conventionalisation as form-meaning pairs. While gestures may take time to conventionalise in a multimodal system, form-meaning pairs are promptly determined throughout the emergence of a sign language. At the same time, signers capitalise fully on the array of available gestures to optimise lexical growth.