Creating a sign language out of everything and everywhere: an example from the deaf people of Bissau
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1 UNPACKING THE FIRST YEARS OF SIGN LANGUAGE EMERGENCE IN BISSAU

In the absence of language input,
humans will treat information in their environments
as though it were linguistic.
(Morford 1996, 175)

1.1 Introduction

An autochthonous sign language, designated locally as *Língua Gestual Guineense*, or *LGG*, has been emerging in the city of Bissau – and elsewhere in the country – at the hands of a growing deaf community. First, in the capital, the number of deaf people has increased since 2003 in school settings and, from then on, also slowly in other regions of Guinea-Bissau. The present thesis captures such a phenomenon by giving a two-pronged record of the deaf people in Guinea-Bissau and their language. On one side, I draw a detailed historical account of the rise of the deaf community and the circumstances leading to the emergence of their sign language. On the other side, I conduct linguistic analyses to understand where LGG signs come from and how the lexical system builds up in the first years of language emergence.

I portray here the rise of a deaf community with an uncommon profile. It is set up in a free-signing environment with no hearing aids or speech-oriented educational ideologies. Even though deaf people primarily meet in a school setting, they have established a well-organised gathering system outside the school walls. In this context, it stands out how much they seek to make their hearing peers aware of their presence as deaf people and their sign language. Moreover, with a deep-rooted sense of pride, deaf people seem to engage in everyday activities alongside their hearing peers.

To investigate the endemic sign language of Guinea-Bissau, I focus first on the integration of conventional gestures into LGG. The analysis identifies three integration routes, differing in linearity. The disambiguation of less linear pathways relies on the frequency with which form-meaning pairs occur. At the same time, signers take advantage of cooccurring gestures to also import them as signs.

The study of the diachronic growth of the LGG lexicon looks at the development of kinship and colour terms, families of signs rooted in signs-from-gestures, and the grammaticalisation of 'hit'. The first analysis of the lexical development reveals that signs for family members and colours conform to the universal hierarchies, while being primarily based on gestures adopted as signs. The description of families of signs shows that both compounding and derivation expand differently per semantic domain. It further observes, for the first time, the emergence of a morphological system rooted in specific body-based locations and handshapes. Finally, the grammaticalisation of the gesture-to-sign 'hit' extends to different grammatical functions expressing comparative degrees and emphasis.

In this first chapter, I begin by justifying the choice of this topic (§1.2). Then, I explain the outline of the research (§1.3). This is followed by a discussion of ethical considerations (§1.4). In the end, I describe how the book is organised (§1.5).

1.2   Choosing the topic of the thesis

As a sign linguist who has grown up in Africa, studying the emergence of the twenty-year-old sign language of Guinea-Bissau has been a privilege. Such an opportunity made me restless to understand how sign language emerges from scratch. Witnessing this process has been proof

that deaf people create sign language not from 'nothing' but from everything and everywhere around them.

Since I had been watching this community thrive and documenting its sign language emergence since 2005, it was inevitable to bring the two-decade-long relationship a step forward. While instinctively taking on the responsibility to portray the community, it was not easy to choose the research topic in linguistics. I started with argument structure and eventually arrived at the subjects of lexical etymology and structuring.

As a teacher of the deaf, I first aimed to describe the emergence of the morphosyntactic structure of LGG with the ultimate goal of favouring a bilingual approach to learning the written language by deaf students. At the beginning of my PhD journey, I was particularly excited about the opportunity to apply elicitation material specifically adapted to the African context. At the time, Hope E. Morgan had already created short video events based on the Haifa clips (Sandler et al. 2005) to elicit single transitive sentences in Kenyan Sign Language (KSL) (c.f., Morgan 2014, 2020). Little did I know that after contacting her to use her innovative material, she would move to Leiden and become my co-supervisor. The collection of such sentences in the emerging sign language of Guinea-Bissau (LGG) showed appealing results in consistent word order patterns and an agreement system in the making (c.f., Martins et al. 2022; Martins 2022).

However, my initial focus on contributing to deaf pedagogies was eventually redirected to the overarching question of language origins. I ended up not pursuing the study of the emergence of verbal agreement in LGG in the present thesis, as Victoria Nyst's work drew me to a set of common gestures and signs observed in West Africa.

I had been working with Guinea-Bissau for only a couple of years when Victoria Nyst and I had our first contact in 2007. By then, she was building a network for African deaf studies and has been extensively

researching sign languages developing locally in West Africa, especially in Ghana and Mali (see Nyst 2010a for an overview). As my PhD supervisor, she suggested that, apart from the sentence elicitation task, I collect conventional gestures used in Bissau, which I did in the kick-off field trip in 2018. That same year, Nyst started her VIDI project, "From Gesture to Language", focused on West Africa. Before that, she had been developing the Gesture Research in Africa database at Leiden University (Nyst 2013b; 2015, 148). Over the years, she gathered evidence that certain gestures and their signed counterparts were shared in West Africa (Nyst 2010a, 39; 2013a; 2015, 135). Nyst proposes that such sharedness derives from language contact in multilingual contexts, such as trade settings (Nyst 2010a, 20, 40–41), and puts forward a *gesturebund* hypothesis, i.e., the existence of a regional gestural system (Nyst 2013a; Nyst & Martins 2022).

Remarkably, in addition to studying the argument structure, Morgan also looked at the emergence of signed words (2015) and the incorporation of gestures into KSL (2016). Influenced by this line of work, the question concerning the roots of LGG progressively struck me. I was especially puzzled by which gestures were shared socially and then picked up and reshaped by deaf signers. As a result, I became increasingly motivated to understand where the signs used by the deaf in Bissau came from and how they were organised within a new sign language.

Overall, I was driven by the broader quest to unravel the origin of language, aware of the rare opportunity to have witnessed and documented the inception of an autochthonous sign language (Martins & Morgado 2008, 2017). In search of the moment when a language becomes one, I look at both the etymology of signs and the establishment of a lexical system. To do so, I resumed previous work on diachronic change in LGG signs (Martins & Morgado 2016, 147–151), focusing the

linguistic study exclusively on the lexicon of LGG, as is further explained next.

1.3   Overview of the thesis's research

The study of the emerging sign language of Guinea-Bissau can be explored from different viewpoints, but the academic influences that surrounded me at Leiden University, primarily centred on Nyst's work, narrowed down the research topic to the origin of the lexicon.

To understand the first two decades of LGG emergence, the thesis develops three main contents: the sociolinguistic description of the deaf community of Guinea-Bissau and its sign language (in Chapter 2); the integration routes of gestures into LGG (in Chapter 3); and the diachronic expansion of the LGG lexicon (in Chapter 4).

Studying the dynamics of a community in the making and a language at such an early stage allows us to witness how a sign language becomes one in the hands of deaf people. After exploring the sociolinguistic context where LGG is emerging, I undertake linguistic analyses of the LGG lexicon. I first seek to understand how gestures are adopted as signs and then how these items drive lexical expansion over time.

To study a sign language, it is essential to understand what characterises its users and the dynamics of their social interactions. Only then will we know how such a sign language is shaped and what motivates and sustains its use. As shown in Figure 1, the study of the emergence of the LGG lexicon branches out into two analyses: the integration routes of gestures as signs and the lexical expansion. The latter focuses specifically on the diachronic hierarchies of kinship and colour terms, the development of families of signs and the extension of 'hit' into different grammatical functions.
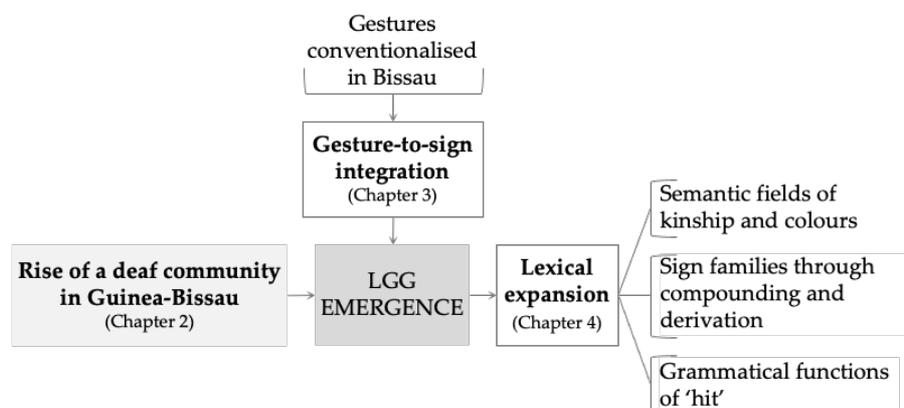
Figure 1.   **Organisation of the thesis's studies**, which include the sociolin-
            guistic description of the rising deaf community of Guinea-Bis-
            sau (in Chapter 2); linguistic analyses of the emerging LGG lexi-
            con, namely of the integration routes of gestures as signs (in
            Chapter 3), and the lexical expansion (in Chapter 4), of the se-
            mantic fields of kinship and colours, sign families through com-
            pounding and derivation, and the grammatical functions of 'hit'

In this third section, I present the motivations for this research (§1.3.1),
I raise the research questions (§1.3.2), and summarise the methodolog-
ical approaches (§1.3.3).

1.3.1 Research motivation

The current subsection focuses on the three content chapters of this
thesis: the sociolinguistic description of the deaf community of
Guinea-Bissau and its sign language (§1.3.1.1); the linguistic analysis
of the integration routes of gestures into the LGG lexicon (§1.3.1.2); and
the diachronic expansion of those signs (§1.3.1.3). Here, I present the
motivations and contributions for each topic.

1.3.1.1 *The deaf community of Guinea-Bissau and its sign language (Chapter 2)*

The sign language of Guinea-Bissau (*Língua Gestual Guineense* – LGG) is documented in three dictionaries collected at different moments in time (2005, 2006, and 2017) and is further described in several more specific works (see Table 1). However, the community is yet to be described. Having observed LGG emerging for the past two decades in a school setting within a fast-growing and close-knit deaf community, I aim to thoroughly explain the sociolinguistic context in which such emergence is taking place.

This description is fundamental, not only because it has not been done yet in Guinea-Bissau, but also since historical reports of emerging deaf communities are scarce (e.g., Polich 1998, for the Nicaraguan case). Thus, the characterisation of the deaf community of Guinea-Bissau and its sign language is outlined here in the context of the most relevant studies of sign language emergence to highlight the unique opportunity LGG presents of witnessing sign language emergence in real time.

1.3.1.2 *Routes of gesture integration into LGG (Chapter 3)*

Capturing the emergence of the LGG lexicon from its inception in an exceptionally vibrant community provided a rare opportunity to witness a linguistic system in the making. Given this, the first question that comes to mind is: how does the LGG lexicon come about?

According to the literature on gesture use in West Africa and the integration of gestures into sign languages, LGG is likely to have arisen from gestures and maintained a high level of autochthony throughout its first twenty years. In West Africa, Nyst was particularly aware of the impact of gestures integrating different sign languages (2010a,

2013b, 2015). In the region, such a phenomenon was given special attention within locally-evolved deaf communities, like the ones in the city of Akure, in Nigeria (Orie 2012, 81; 2013, 244), and in the Extreme North Cameroon (Lutalo-Kiingi & de Clerck 2015, 48, 51; Sorin-Barreteau 1996, 207, 212).

Studies on homesigners ('isolated' among hearing people) show that a deaf person – relying mainly on the visual-manual modality – treats gestures as linguistic input (Morford 1996, 175). Based on such gestures, they create a communicative system with language-like properties (Goldin-Meadow 2012, 2017). It is then expected that, in the hands of deaf people, the available gestures within the surrounding community give rise to a sign language (Washabaugh 1986, 185, in Providence Island). This is especially the case with more conventionalised gestures (Le Guen et al. 2020, 339, in the Yucatán Peninsula).

The incorporation of a larger set of conventional gestures into sign languages has been explored in only a few studies. When comparing gestures and their signed counterparts in Providence Island, Washabaugh (1986, 187–188) observes that deaf people adopt most conventionalised gestures directly as signs. They further make the most of all available gesture variants, incorporating them into the sign language, often maintaining their form and meaning. In line with Washabaugh's observations, Le Guen and colleagues also argue that conventional gestures are always directly adopted as signs in Yucatec Maya Sign Languages, YMSLs (2020, 301).

Although Washabaugh had already hinted at the presence of gesture variants, Coppola went further to identify in Nicaragua less linear pathways involving polysemous gestures for related concepts and cooccurring gestures for the same concept, i.e., synonymous forms, which then had their meanings specified as signs of the *Lengua de Señas Nicaragüense*, LSN (2020, 365–366). Still, in terms of the integration of

signs, Morgan identified clusters of KSL signs as polysemous and closely related in form, associated with the same gestural source (2016).

Therefore, I aim to identify a set of gestures that have been conventionalised in Bissau. Through such a collection of gestures, I seek to assess how linear their recruitment as signs is by observing any adjustments occurring in their form and meaning.

1.3.1.3 *The expansion of the LGG lexicon (Chapter 4)*

Conventional gestures are likely to extend the lexicon through polysemy and morphological processes of derivation and compounding (Washabaugh 1986, 187–188). Thus, the signs identified in the analysis of the gesture integration routes are now analysed in terms of their impact on lexical expansion. From this groundwork, the study of the diachronic growth of the LGG lexicon focuses on the hierarchies of kinship and colour terms, families of signs relying on compounding and derivation and the particular case of the grammaticalisation of 'hit'.

Several studies have proven that specific semantic fields, like kinship and colours, follow a similar sequential arrangement across languages (Greenberg 1980, Berlin & Kay 1969, for spoken languages; and Zeshan & Sagara 2016, for sign languages). However, there are no real-time reports of the diachronic development of these particular topics in emerging sign languages. For that reason, I aim to see how they develop from the very beginning and during the first two decades.

The processes of derivation and compounding have been established to push the lexical expansion forward (e.g., Wilcox & Occhino 2016, 12, for sign languages; and Hockett 1960, 8, for all human language). The emergence and development of the lexicon have been studied mainly in deaf homesigners (Goldin-Meadow 2002). In this initial period, the

formation of signed compounds has been extensively described again in homesigners (Morford & Kegl 200), sign languages used by very small groups of people (Hou 2016, in San Juan Quiahije, Mexico; and Osugi et al. 1999, in Amami Island, Japan), and young sign languages, like KSL (Morgan 2015), and the one used by the Al-Sayyid Bedouin, ABSL (Meir et al. 2010; Tkachman & Meir 2018). From these accounts, patterns of semantic relationships between compound members arise, in line with Downing's claims of particular motivations for different semantic classes (1977, 831). Hence, I propose to observe the nature and the extent of such combinations in the emerging LGG.

In contrast, in emerging sign languages, derivation was examined only in terms of the distinction between nouns and verbs in both homesigning and in the young ABSL (Tkachman & Sandler 2015). In established sign languages, it has been described as being rooted in specific locations and handshapes (Frishberg & Gough 2000 [1973]; Fernald and Napoli 2000, 28–29; Lepic & Occhino 2018, 156–157, in American Sign Language [ASL]; Zeshan 2000, 28–33, in Indo-Pakistani Sign Language [IPSL]; Zwitserlood et al. 2021, 16–17, in *Nederlandse Gebarentaal* [NGT]; and Meir 2012, 80, in Israeli Sign Language [ISL]). Therefore, I aim to describe the emergence and development of derivational paradigms.

Finally, the more gestures are conventionalised, the easier they will be syntactically integrated with a grammatical function (Le Guen et al. 2020, 331–332). The concept of 'hit', also expressed by a conventional gesture in Bissau, offers a clear example of grammaticalisation. It occurs as a comparative marker in spoken (Heine & Kuteva 2002, 123–127) and sign languages (Costello 2015, 195–196, in *Lengua de Signos Española*, LSE; Wilbur et al. 2018, 65, in ASL; and Martins & Machado 2024, shortly referencing it in LSN). It is also observed as an emphatic marker in *Língua Brasileira de Sinais*, Libras (ibid.) and KSL (Morgan 2022, 284). I aim then to look at the grammaticalisation of 'hit' in LGG, namely as a comparative marker and an emphatic.

Overall, the three expansion processes – semantic, morphological, and grammaticalisation – have not yet been systematically studied across different domains in an emerging sign language.

1.3.2 Research questions

To understand the process of LGG emergence, I conduct different linguistic analyses, focusing first on the gestural origin and then on the lexical expansion resulting from that gestural origin. Of course, such analyses presuppose a deaf community creating an autochthonous sign language based on the surrounding gestures. If that is so,

→   How does a signed lexicon emerge and expand from gestures?

Nyst suggests that West Africa is a gesture-prone region, where local sign languages feed from (2010a, 2013b, 2015). Since the emergence of LGG is occurring within this geographic area, deaf people likely have access to a gestural stock that is ready to be used as signs.

The few scholars who have examined the integration of a larger set of conventional gestures into sign languages (Washabaugh 1986, in Providence Island; Morgan 2016, in Kenya; Coppola 2020, in Nicaragua; and Le Guen 2020, in the Yucatec Peninsula, Mexico) agree that such integration occurs directly. Nonetheless, Coppola identified polysemous and synonymous forms that, only as signs, were semantically specified (2020, 365–366).

Therefore, I assume that the integration route from gestures to signs is not always linear. This implies that some gestures are more likely to be directly recruited than others, especially concerning their semantics.

With this in mind, and benefitting from the real-time data available for gestures and signs, I question

- What are the routes incorporating conventional gestures into LGG?
  - o   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?

Considering the integration of gestures into LGG, I question what the role of these signs-from-gestures is in expanding the lexicon. I postulate they act as sources in semantic hierarchies, families of signs and grammatical extensions. Overall,

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

Semantic hierarchies of kinship and colour terms provide universally tested implications across spoken (respectively in Greenberg 1966; and Berlin & Kay 1969) and sign languages (c.f., Zeshan and Sagara 2016). However, this has not been studied yet in an emerging sign language likely grounded on gestures. Thus, specifically,

  - o   How do signs-from-gestures expand during the first years of language emergence in the semantic domains of kinship and colours?

When examining the incorporation of gestures into the sign language of Providence Island, Washabaugh (1986[12], 187–188) observes that such forms extend the lexicon through polysemy and morphological processes of derivation and compounding. Assuming that there is also a set of gestures being incorporated into LGG that expands over time,

> o What are the trajectories of development of derivation and compounding in families of signs-from-gestures?

Besides lexicalising, gestures can also grammaticalise as signs (Wilcox 2004, 48–49). The process of grammaticalisation is illustrated by the different grammatical extensions of 'hit' in spoken (Heine & Kuteva 2002, 123–127) and sign languages (Costello 2015, 195–196, in LSE; Wilbur et al. 2018, 65, in ASL; Morgan 2022, 284, in KSL; Martins & Machado 2024, in Libras and shortly referencing it in LSN). Presuming that such a phenomenon will occur as early as the emergence of a new sign language,

> o How do grammatical functions extend from 'hit' in LGG?

1.3.3 Methodological approaches

In the three chapters that describe data about the deaf community and its sign language, I employ different methods. In Chapter 2, the description of the uncharted terrain of the deaf community in Guinea-Bissau is based on various field trips conducted over the past 20 years. In addition, I rely on the available documentation on the sociolinguistic environment in general and the deaf population in particular.

In Chapter 3, the methods to collect gestures used in Bissau bring innovation to gesture studies. On one hand, I elicit gestures with groups of four people to check the response agreement level. On the other hand, besides asking hearing participants, I rely on the expertise of deaf people as the primary beneficiaries of gesture use.

In addition, to analyse the linearity of gesture incorporation routes into the signed lexicon, including any eventual modifications that occur in the process, I compare a set of gestures elicited by a list of 41 concepts with LGG signs from the three existing dictionaries (collected in 2005, 2006, and 2017). Here, I introduce a semantic-based approach, where the examination of cooccurring forms for the same concept intersects with polysemous forms. This methodology reveals three integration routes with different linearity levels.

In Chapter 4, I follow up on the signs recruited from gestures expanding into the semantic fields of kinship and colours and as families of signs through compounding and derivation. To do that, I benefit from the three LGG dictionaries collected over time – in the first couple of years of language emergence and a decade later – to track lexical growth.

To analyse the grammaticalisation of 'hit', the individual signs documented in the 2017 dictionary were insufficient. For that reason, I collected additional videos with several uses of the signed forms deriving from the gesture for 'hit' in discursive contexts.

1.4   Ethical considerations

Studying a young deaf community and its emerging sign language comes with a weighty responsibility. Inevitably, researchers have an outsider look. Thus, when opening that door, ethical values become

especially relevant. In the present statement, I address the principles I held as fundamental in relating with the community during the research.

Essentially, I made a point of learning the language used by the deaf people of Bissau as well as I could through informal conversations, while knowing about the community's internal dynamics, values, and rituals. I aimed at explaining the research clearly to them in LGG, so that participants could engage consciously and consent to it (as stated by the Linguistic Society of America for research with people[1], but see also Nyst 2015b, 114). In the end, to avoid personal disputes, and following the leaders' advice, participants were compensated as a group with food items.

Although I highly value the principle of deaf people's involvement and have made quite an effort to apply it, I have unfortunately not been able to practice it more intensively. For one, online contact with the deaf people of Bissau has proved impractical in fostering tighter collaboration and mentorship. Moreover, physical contact time has been far from enough to develop it appropriately. Still, the training occasions have left seeds regarding awareness of deaf culture, sign language rights, documentation techniques and linguistics.

Since the deaf community of Bissau is very young, deaf individuals are still navigating their educational path – a path, I must add, where digital literacy receives too little attention. As slow as the captivating process feels, deaf individuals have become keen on thinking about their language and increasingly engage in its analysis. In this regard, I have been cautious in avoiding the gender gap since men, at least in Guinea-Bissau, are usually privileged in their educational opportunities. In addition, I have shared the research development to the extent their

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[1] https://lsaethics.wordpress.com/2008/07/ (accessed 03-06-2024).

interest allows. Finally, as a point of honour adopted since the beginning, products made public about the community and its sign language result from requests by local leaders or discussions with community members.

Regarding research outputs, the Sign Language Linguistics Society (SLLS) calls for caution when handling signers' privacy since exemplifying linguistic aspects of signs often implies showing the signers' faces. Even if informants in Bissau have consciously consented to disseminate their facial identities, it is difficult to determine the limitations of such a disclosure. Thus, when is too much enough, if ever? The exposure to which signers and their sign languages are subject by the academia, showcasing unique phenomena, puts them on a list of must-see attractions to be explored by anyone who wishes (e.g., Moriarty 2020, on deaf tourism in Bali).

As Erard (2019) discussed, the linguist studying an "untouched" community may be tempted to shield it from the external risks of altering its natural development and consequently losing its scientific value. For any linguist, witnessing the birth of a language in real time is indeed a rare opportunity. When you are at the right place and time, you want to keep the original story as "pure" as possible. But how much of this concern is about science rather than the community's wishes? Does the community want to remain "isolated"? Do not surviving languages shift over time and eventually absorb features from their contact languages? I must distinguish between the gradual change based on "social and cultural trends" and language replacement for ideological reasons, such as status. In this case, the community's attachment to its language must be supported with responsibility.

By letting the world know about these "isolated" deaf communities, audiological intervention will also be in the cards. When ENT doctors and hearing aid technicians know about untreated ears, their saviour

instincts are likely to step in. Even if we wish instead to leave the community in a "pure" state, is it not inevitable that such an intervention will occur along the way? Would not a number of deaf individuals prefer to have the chance to choose a hearing aid rather than having no options at all? (see the interview with Zeshan in Erard 2019[4] on the ethical responsibilities of undescribed sign languages).

In the end, I cannot overprotect a community from outside influences in an increasingly global world. The physical and virtual mobility of deaf people has promoted language contact, leaving some traces (Moriarty 2020, 196) inevitably. So, as an observer of language phenomena, I have to trust signers' communication choices and determination to self-preserve their sign language (e.g., in the interview with Hou and Mesh in Erard 2019[4] on Chatino Sign Language, in Mexico). Crucially, I was positively surprised, in Guinea-Bissau, by deaf people's pride in their sign language.

Finally, although I had a clear educational goal at the beginning, giving back to the community from a more scientific context still occupies my mind. Therefore, I am constantly thinking of ways to make the present thesis accessible – and appealing – to the deaf people of Guinea-Bissau (see Nyst 2015b, 114). And again, no matter how much I idealise materials for them, whatever is produced must always have their previous endorsement.

Above all, the community's true interests will have to be taken into account. To conclude this first chapter, I explain next how the book is organised.