# Comparing body-part size and shape constructions in village sign languages with co-speech gesture


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## Abstract

This article presents a comparison of constructions used to express size and shape in co-speech gesture and in two village sign language. The analysis focuses on body part size and shape constructions found in the gestures of speakers of Anyi (Côte d'Ivoire), in the emerging SL of Bouakako (Côte d'Ivoire), and the older, well-established SL of Adamorobe (Ghana). An analysis in terms of diversity in forms and in combinatorial properties are indicative of grammaticalization and lexicalization taking place over time.


## Introduction

Elements depicting size and shape are found in many parts of sign language (henceforth: SL) structure and lexicon. An example of a size and shape element that is part of a lexical sign is presented in figure 1 below where the flat hands of BUILDING in Malian SL depict the walls of a building. Thus, size and shape elements can occur in lexical signs, which have a fixed form and a meaning that does not relate to the semantic domain of size and shape.

Figure 1: BUILDING (Malian SL) [1]

[1] Reprinted with permission (Pinsonneault 1999:41).

Size and shape elements may also occur in independent, so-called 'productive' size and shape constructions. Confusingly, both *sub-sign size and shape elements* and *independent size and shape constructions* (henceforth: *S&SCs*) are referred to by the term SASS in the literature. To avoid confusion, we decided to use different terms for each. S&SCs present a distinct type of signs describing the size and shape of referents (Supalla, 1986; Schembri, 2003; Zwitserlood, 2003)[2]. Although they are often mentioned together with classifiers of constructions, they are far less studied. Distinguishing between lexical signs containing (sub-sign) size and shape elements and (productive) S&SCs is not always straightforward, as both signs can be formally identical. Thus, the sign in (1) could also be used to describe an upright rectangular form. The distinguishing criterion is the meaning of such signs, i.e. to what extent it has specialized to refer to a particular type of referent.

Size and shape gestures may extensively accompany speech (Nyst 2016b). Also, S&SCs in SLs may be quite transparent to non-signers, as a result of their highly iconic nature. The integration of gestural elements in SL structure is observed in other domains as well, e.g. in the expression of motion and location (Schembri, Jones & Burnham 2005). Typically, gestural elements undergo formal change when becoming integrated into the linguistic system of SLs (Pfau & Steinbach 2006).

This article will address two questions. Firstly, how do S&SCs in sign languages compare to gestural expressions of S&S (henceforth referred to as gestural S&SCs for ease of reference)? And, secondly, how do S&SCs in an older and an emerging SL compare to each other? Such a comparison would shed light on the process through which gestural S&SCs get integrated into sign languages and on whether or to what extent this process involves lexicalization and grammaticalization.

In view of the challenges in distinguishing S&SCs from lexical items and other productive forms, we will limit ourselves to a formally well-defined type of S&SC found in various West African SLs, including Adamorobe SL and Bouakako SL, and in the gestures of the spoken languages surrounding them. These are body part S&SCs, defined here as signs expressing a size and shape meaning using a body part, typically through delimiting the relevant body part. Thus, in figure 2 (left), a size and shape is expressed that is equivalent to that of the forearm with a clenched fist (Bouakako SL) and in the picture on the right, a size and shape equivalent to that of the extended arm (Adamorobe SL).[3]

[2] For studies on size and shape expressions from the perspective of iconicity, see Taub (2001), Mandel (1977), Nyst (2016).

[3] A striking feature of these body part S&SCs is that they are not in line with the Dominance Condition, which states that in unbalanced signs with different handshapes, the dominant hand is moving while the non-dominant hand is kept still (Battison 1978). For an extensive discussion of body part S&SCs with respect to dominance, see Nyst (2007:145-150), where it is argued that the iconic requirements of these constructions interferes with the Dominance Condition.


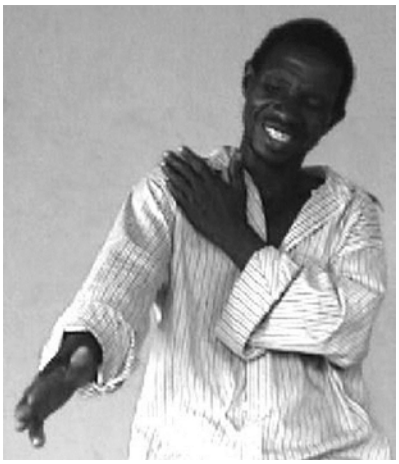

Figure 2: Examples of body part S&SCs in Bouakako SL (left) and Adamorobe SL (right)

To study how S&SCs differ in SLs as compared to co-speech gesture, we will compare the description of body part S&SCs in Adamorobe SL (Nyst 2007, Nyst 2016a) with (gestural) body part S&SCs found in Anyi (Nyst 2016b). To understand the role of time in the process of integrating S&SCs in SLs, we will compare the findings for Adamorobe SL and Anyi with new data on Bouakako SL.

## Languages

Adamorobe SL is used in the Akan village of Adamorobe in Ghana. It is an estimated 200 years old and as such the oldest documented village SL. A descriptive analysis of the language is presented in Nyst (2007).

Bouakako SL is used by a single generation of seven deaf signers and an unknown number of hearing interlocutors in the Dida village of Bouakako in Côte d'Ivoire (Figure 3). A descriptive analysis of Bouakako SL is presented in Tano (2016). The Dida group in Bouakako shares core cultural practices with Akan cultures in Ghana (Tano 2016:40). Moreover, Adamorobe SL and Bouakako SL have evolved in relatively similar settings, i.e. in small, agricultural communities with a elevated incidence of hereditary deafness. As such, the two languages form a unique opportunity for studying the effect of time depth on the development of S&SCs.


Figure 3: A map showing Bouakako, Abengourou and Adamorobe

The gestures studied in this article are those of speakers of Anyi, spoken in Côte d'Ivoire and Ghana. Like Akan, it is in the Central Tano group of the Kwa language family. Its speakers also use Akan, French and Dioula.[4] The variety analysed in this study is spoken in Abengourou (see figure 3).

## Methodology

The analysis of the S&SCs in Adamorobe SL is based Nyst (2007). These data stem from the corpus of Adamorobe SL and were recorded during nine months spread over of fieldwork (2000-2004) (Nyst 2012). The corpus was annotated in Akan and English and can be accessed at the Language Archive (Nyst 2012). A subsetof the entire corpus (> 14 hours) was scanned for expressions of size and/or shape. One type of discourse stood out as being particularly rich in terms of S&SCs, i.e. the lexical elicitation sessions. These often yielded short descriptions of referents, including their sizes and shapes.

The analysis of the Anyi gestures was based on interviews with four speakers in Côte d'Ivoire. The interviews were conducted by Tano Angoua. The interviews were steered towards food items, crops, and small animals. The interviewer would ask questions like: "What kind of snakes are there?" or "How many different types of peppers do you know?" For more details, see Nyst (2016b). This study, found that all Anyi speakers made use of various body part S&S gestures, in contrast to none of the eight Dutch speakers, to whom they were compared.

The data for Bouakako SL are drawn from the corpus of Bouakako SL, consisting of roughly 20 hours of spontaneous, semi-spontaneous and stimuli-based data, collected with nine signers (Tano 2013)(seven of whom are deaf, and two hearing). These data were collected eight months of fieldwork (2011-2013). Like in the Adamorobe SL corpus, S&SCs were particularly frequent in one part of the Bouakako SL corpus too, i.e. in a semi-directed interview on crops and other food items.

[4] https://www.ethnologue.com/language/any visited on 17/7/2017

# Results

## Adamorobe SL

Nyst (2007) provides an extensive description of body part S&SCs in Adamorobe SL. In this language, body part S&SCs are made with two articulators in most cases. One articulator provides the body part with the relevant size and shape, such as the pinky finger or the thumb tip. This articulator may also take on a particular shape, such as a fist or a curved arm. The role of the second articulator is to indicate which body part presents the relevant size and shape, by holding it or by pointing at it at its most proximal location. Sometimes, this second articulator may also slide over the size and shape body part to indicate a smooth surface.

Two types of body part S&SCs have a one-handed variant. Firstly, these are signs in which a part of the finger is delimited hand-internally by an opposing digit, e.g. the tip of the index is often delimited by the thumb, and vice versa. In a second type of one handed body part S&SCs the indicating function is dropped altogether and the size and shape depicting body part is presented in space by itself. In all cases observed, this concerns a hand or arm held in a particular position, i.e. either a fist or a curved arm.

Two types of constructions with delimited finger tips were attested, one involving the tip of the index, and the other the tip of the thumb (see figure 4).

Figure 4: Delimited finger tips in Adamorobe SL

As far as delimited fingers are involved, again two types were attested; the index and the pinky finger, as illustrated in figure 5 below.

Figure 5: Delimited fingers in Adamorobe SL

Larger sizes are expressed by delimiting the entire arm or parts of it at various landmarks, as indicated in figure 6 below.

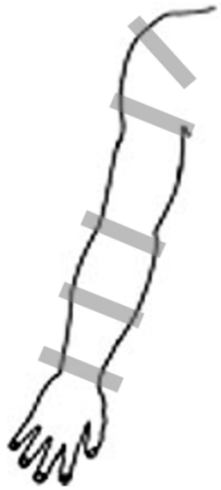

Figure 6: The various points at which the arm can be delimited in Adamorobe SL body part S&SCs

In those cases where the hand or the arm is delimited, the hand may take on a particular shape: a fist, an extended index, a flat hand, and a bunched hand (see figure 7).

Figure 7: Handshapes in body part S&SCs in Adamorobe SL

Table 1 summarises the main findings from Adamorobe SL.

| Delimited body part type | Fig. | Delimited body-part | Number of types | Examples of referents |
|---|---|---|---|---|
| fingertips | 3 | Tip of index, tip of thumb | 2 | a type of pepper, beads, sugar cubes, a boil, melon pips |
| fingers | 4 | Index, pinky finger | 2 | Okra, a large bee<br>long teeth, a big bee (index); a small bee (pinky finger) |
| entire hand | 5 | Handshapes: fist, extended index, flat hand, bunched hand | 4 | Big eyes, a clod of bee wax (fist); a banana (index with hand); a small bottle (flat hand); an egg (bunched hand) |
| parts of the arm | 6 | Mid forearm, elbow, beneath shoulder joint, on shoulder joint | 4 | A fish species (mid forearm); a yam (beneath shoulder joint); a stick (on shoulder joint) |
| Total | | | 12 | |

Table 1: Overview of the types of body part S&SCs found in Adamorobe SL

## Anyi co-speech gesture

A detailed description of gestural S&SCs produced by speakers of Anyi is found in Nyst 2016b). Like in Adamorobe SL, the Anyi gestures are a) typically executed with two hands, but one-handed body part S&SCs are found as well, and b) the one-handed ones concern delimitation of the relevant part by the opposing digit, or a non-delimited fist. When the shoulder is indicated as the point of delimitation by the ipsilateral hand, this implies that the length of the contralateral arm together with the breadth of the upper body is referred to (figure 8) .This may for example indicate the size of a snake.

In about thirty minutes of gesturing, the Anyi speakers produced an impressive total of 187 S&SCs, including 89 body part S&SCs, coming in 22 different types.

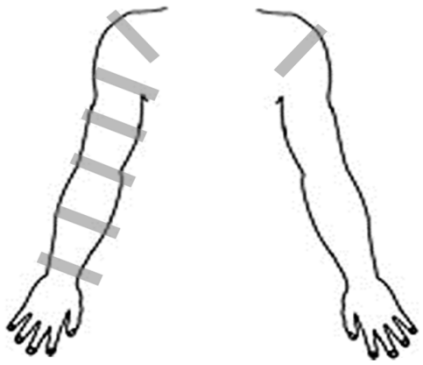

Figure 8: Body part S&SCs in Anyi co-speech gesture

These included seven forms delimiting part of the arm, three fingers delimited in their entirety, and one case in which all fingers together (touching at the tips) are delimited. Two types of gestures delimiting the entire hand were found; one delimiting a fist and one delimiting a flat hand. Five types of delimited finger parts were found, involving the tip of the thumb, index, middle finger, and little finger (see figure 9). Also, all fingers joined together at the tips were delimited halfway to express the size and shape of an oblong type of tomato.

Figure 9: delimited fingertips found in the Anyi data

Four additional types of delimitations were attested that all went beyond the domain of the arm, as represented in figure 10. These were delimitation of the waist (figure 11), the upper and lower leg (see figure 12, left) and the top of the head (figure 12, right).

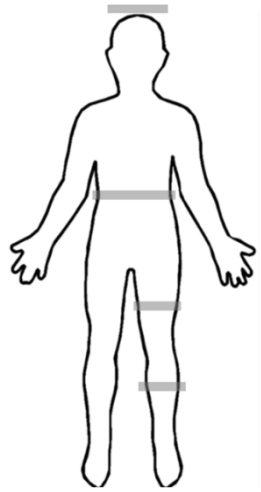

Figure 10: Delimited body parts beyond the arm in Anyi co-speech gestures

Interestingly, the delimitations of the leg and the waist mostly focused on the size of the circumference of the body at its delimited point, rather than on the length of the delimited body part. This was different for the gestures delimiting the body as a whole by placing the hand on the head, which triggered the particular speaker to stand up. There, the size expressed indeed concerned the full length of the body.

Figure 11: Delimitation of the waist (Anyi gestures)

Figure 12: Delimitation of the lower leg (left) and the whole body (right) (Anyi gestures)

Table 2 lists the body parts in S&SCs in the Anyi data.

| | **Body part** | **N=** | **Concepts referred to** |
|---|---|---|---|
| *Fingertips* | | 5 | |
| | Thumb tip | | pebble, okra, gold nugget, eggplant, pepper |
| | Tip of index finger | | eggplant, tomato, snail, pepper |
| | Tip of middle finger | | small soup cube, eggplant (sp.) |
| | Tip of little finger | | eggplant, pepper (sp.) (NB. About halfway the fingertip); gold nugget (NB. About halfway the fingertip) |
| | Fingers form a bud, held half-way | | Tomato |
| *Fingers* | | 4 | |
| | Fingers form a bud, held at base joints | | Snail |
| | Thumb | | big Maggi-cube, snake (volume) |
| | Index finger | | pepper, okra, gold nugget |
| | Little finger | | Pepper |
| *Hand* | | 2 | |
| | Flat open hand | | fish (a flat one), cassava, turtle, snail |
| | Fist (+ and – delimitation at the wrist) | | yam, root, eggplant, tomato, snail, turtle, pepper, gold nugget |
| *Arm* | | 6 | |
| | Lower arm | | banana, carrots, cassava, fish, snake |
| | Lower arm – halfway | | fish, roots, snake |
| | Upper arm – halfway | | beer bottle, snake |
| | Upper and lower arm combined | | tubers, cassava, fish, bread |
| | Shoulder contralateral | | snake, cassava |
| | Shoulder ipsilateral | | snake, vehicles |
| *Non-arm* | | 4 | |
| | Waist | | yam, coco yam |
| | Upper leg | | Fish |
| | Lower leg | | beer bottle |
| | Full body length | | Snake |
| *Total* | | 21 | |

Table 2: Overview of body part S&SCs in Anyi gestures

Another difference with the S&SCs in the two languages concerns the automaticity with which appropriate body part gestures and signs are produced. Thus, the production of a delimited body part gesture was regularly preceded by hesitations and searching for the body part that would best match the depicted size and shape. For example, when the interviewer inquired about carrots, one of the Anyi speakers looked around the room in doubt, searching for something with a shape similar to that of a carrot. After failing to find such an object in the environment, she looked at her arm in doubt, and stated *ó ʤua kɛ mɛ sa hl̩ kpa mɛ* ('It is not as big as my arm') while touching her forearm, adding *ɔ tl̩ kɛ matra ŋgg̰ŋgg̰ mɔ bɛ sa* ('It is like the hand of small children'). Such comments or specifications were not found in the Adamorobe SL data. Also, there was considerable variation in the way the body part was delimited, including chopping movements, striking movements, etcetera. For more details, see Nyst (2016b).

## Bouakako SL

In the Bouakako SL corpus, 33 body part S&SCs were found, coming in seven types.

Two types of constructions involving fingertips were found, one with in which the tip of the index is delimited, and one in which the tip of the index and the thumb are pressed together at the tips.

Therefore, the tip of the index and the thumb are the only fingertips delimited in the Bouakako SL data (see figure 13).

Figure 13: Delimited finger tips in Bouakako SL

The pinky finger was the only digit to be delimited in its entirety in the Bouakako SL data (figure 14).

Figure 14: Delimited fingers in Bouakako SL

The only body part S&SC involving delimitation at the wrist joint involves a fist handshape (figure 15).

Figure 15: Delimitation of the entire hand was only found with fist handshapes in Bouakako SL

In terms of parts of the arm, delimitations were found at the elbow and at the shoulder joint (see figure 16 for an example of the latter type).

Figure 16: A body part S&SC referring to the full length of the arm to express the size of a particular snake (Bouakako SL)

Only one type of S&SC was found to refer to a body part other than the arm or part of it, i.e. the upper leg (see figure 17). This sign was also observed in spontaneous conversations outside of the corpus.

Figure 17: A body part S&SC delimiting the upper leg (Bouakako SL)

Figure 18 below shows the different delimitations of the arm and leg observed in Bouakako SL .

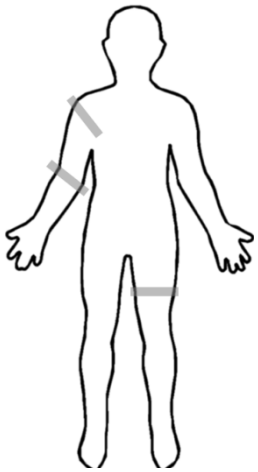

Figure 18: Delimitation of the arm and leg in Bouakako SL

An overview of various types of body part S&SCs (table 3) and their referents (table 4) in Bouakako SL are presented below.

| **Delimited body part type** | **Delimited body-part** | **Number of types** |
|---|---|---|
| Fingertips | Tip of index, tip of thumb | 2 |
| Fingers | Index, pinky finger | 2 |
| Entire hand | Handshapes: fist | 1 |
| Parts of the arm | elbow, shoulder joint | 2 |
| Beyond the arm | Upper leg | 1 |
| **Total** | | **8** |

Table 3: Overview of the types of body part S&SCs found in Bouakako SL

| **Type of S&SC** | **Referents** |
|---|---|
| Tip of index | Size of gold, a few |
| Tip of index and thumb | Size of gold (extremely small) |
| Little finger | A type of banana |
| Fist | Size of gold, a type of stone, tomato |
| Forearm | A type of banana, a type of stone, a penis, a bottle, a mushroom |
| Whole arm | A type of snake |
| Thigh | Size of banana |

Table 4: The body part S&SCs and their referents in the Bouakako SL data

Above, a number of features were found to set the Anyi data apart from the Adamorobe SL data, i.e. the use of body parts other than parts of the arm, pointing to objects in the environment, the verbal modification of the body part S&SC, and lastly hesitating before selecting the best matching body point. In the Bouakako SL data, no instances were found of signers pointing at elements in the surrounding environment to express a particular size and/or shape, or of comments, corrections or other types of modifications of body part S&SCs. In the corpus, hesitations were common when referring to colors. Colors are mainly making a rubbing movement with the index on or in the direction of colored objects or body parts (see Tano 2016). However, no cases were found of hesitation related to body part SASS.

## Integration of body part S&SCs in the linguistic system

In Adamorobe SL, body part S&SCs may also combine with other meaning bearing elements, e.g. a meaningful location, mouthing or another independent sign. In some cases, such combinations have lexicalized, i.e. taken on a specific, new meaning.

### Productive combinations with size mouthings

In Adamorobe SL, delimited body part S&SCs can be combined with the mouthings that otherwise accompany a closed set of (relative) size adjectives (see Table 5 below).

| sign | Mouthing | probable source |
|---|---|---|
| TALL | [spread lips, teeth closed] | *tenten* ('tall' in Akan) |
| SHORT | [spread lips, teeth closed][5] | *tia* ('short' in Akan) |
| BIG | [abo], in fast repetition: [puffed cheeks + release] | *agbo* ('big' in Gã)[6] |
| SMALL | [spread lips, teeth closed + ttt] | *ketekete* ('small' in Akan) |

Table 5: The mouthings associated with Adamorobe SL signs of relative size

These mouthings originate from the spoken languages Akan and Gã. These productive combinations thus convey information on absolute size and shape on the hands, and relative size on the mouth. Thus, in example (1) below, the manual sign indicates an absolute size, equaling that of the signer's hand, whereas the mouthing [abo-repeated] is part of the sign BIG, indicating that the absolute size of the object is relatively big for the object referred to. The same manual sign can also be combined with the mouthing of the sign SMALL. In that case, the combination indicates that the absolute size of the entity referred to is actually relatively large. Thus, whereas both the banana in (1) and the bottle in (2) are claimed to have the size and shape of a hand, this is considered big in the case of the banana and small in case of the bottle of beer.

(1) [abo-*repeated*]
BANANA SIZE-OF-HAND
´A relatively big banana of about the size of a hand´

(2) [spread lips, teeth closed + ttt]
BOTTLE SIZE-OF-HAND
´A relatively small bottle of about the size of a hand´

### Lexicalized combinations with color mouthings

Body part S&SCs may also combine with color mouthings. In combination with a meaningful location and/or orientation, the color mouthings may further specify the meaning of the body part S&SCs. Most of these combinations have lexicalized meanings. Thus, a fist, wiggling in front of the mouth, combined with the mouthing *ftftft* derived from *fita* ´white´, refers to a 'garden egg' (a white, round egg plant species) (figure 19, left). The same manual sign in combination with the mouthing derived from *kɔkɔ* 'red' means 'tomato' (figure 19, right).

[5] TALL and SHORT differ only in their manual component.
[6] Gã is spoken as a second language by many inhabitants of Adamorobe (Nyst 2007).

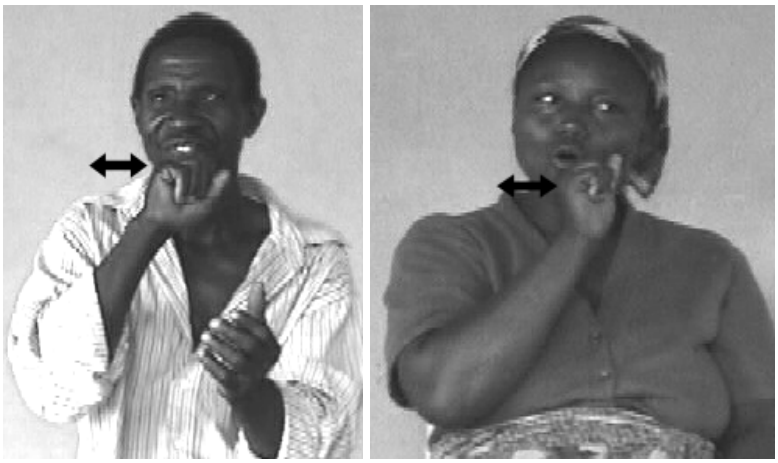

Figure 19: The Adamorobe SL signs GARDEN_EGG (left) and TOMATO (right)

### Localization of body part S&SCs

Body part S&SCs can also be combined with a location on the body, expressing a particularly size and shape quality of an object located on the body. Thus, the SIZE-OF-THUMB-TIP sign moving and contacting a path halfway around the neck plus the mouthing of the sign BIG was used to mean necklace. Another example is found in Figure 8 below, where the SIZE-OF-FIST sign is located on the belly accompanied by the mouthing of the sign BIG. This sign was used to refer to a person with a big belly button. Such localization of body part S&SCs was only found with one-handed versions, either delimited hand-internally (as in the description of a necklace) or not delimited (as in the description of the big belly button in figure 20 below).

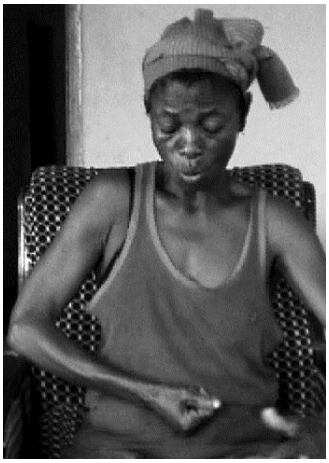

Figure 20: 'big belly button' (Adamorobe SL)

In the Bouakako SL data, only a few forms were identified that modified in terms of meaning or in terms of combinations with other meaningful elements. Three cases of S&SCs with specialized semantics were found in the Bouakako SL data. Thus, delimitation of the tip of the index by the thumb has acquired the conventional meaning of 'narrowly, only just, by a split hair'. However, the same form also has a conventional meaning for hearing, non-signing Dida speakers, which is the same as in Bouakako SL, i.e. 'narrowly, only just'. It is likely that the form was adopted together with its conventional meaning from Dida gestures and as such is not a case of innovation in Bouakako SL.

Another case of a body part S&SC with a specialized meaning is a compound consisting of CRUSH and S&S:fist. This has taken on the conventional meaning of 'tomato' (see figure 21).

CRUSH S&S:fist

Figure 21: The compound sign meaning ‘tomato’ consisting of CRUSH and S&SC (fist) (Bouakako SL)

Another case of lexicalization is the sign for BOTTLE. In this sign, a body part S&SC is combined with a non-default orientation. In this sign, the forearm is held vertically and is both delimited and supported by the opposing hand at the elbow joint. This particular constellation has lexicalized into the meaning of BOTTLE (figure 22, left). Strikingly, Adamorobe SL has the same form with the same meaning (figure 22, right). As such, in comparison to Dida gestures, Bouakako SL has lexicalized two additional body part S&SCs.

Figure 22: The sign BOTTLE in Bouakako SL (left) and Adamorobe SL (right)

## Discussion

Importantly, in all three datasets, body part S&SCs are found. Similar body part S&SCs have also been widely attested in the co-speech gestures of speakers of Dida and Akan, the spoken languages surrounding Bouakako SL and Adamorobe SL respectively. The largest number of different types was found in Anyi gestures (n=22), followed by Adamorobe SL (n=12), and Bouakako SL (n=8). The difference in number of types attested may to some extent follow from the differences in data collection method, which specifically targeted the use of S&SC in the case of the Anyi data. The strategy of asking speakers to describe different natural types of food was clearly a successful one, resulting in a large database of gestures to study.

Body part S&SCs mostly refer to relatively small, spherical or cylindrical shapes. The thumb tip was also used to refer to small cubes and other non-round shapes like a gold nugget. Also, the fist was

used for various roundish lumps, like a tomato, an egg, a stone, a bump on the body, or protruding knees. This suggests that the body part S&SCs focus on the three-dimensional size of an object (and perhaps its solid quality), rather than geometrical properties. Obviously, the system is not particularly suited for expressing two-dimensional shapes, as the body has no two-dimensional parts. As such, it contrasts with the system of outlining shapes in space, which is particularly good at tracing out two-dimensional shapes. Tracing gestures and signs were found in each data set as well, but not discussed here. However, a comparison of tracing gestures in Anyi and Dutch shows that the former use a significantly smaller set of handshapes than the latter in this type of gestures (Nyst 2016b). Similarly, Nyst (2007) observes that only two handshapes are used in tracing S&SCs in Adamorobe SL. This suggests a relation between the use of body part S&SCs on the one hand, and the number of handshapes used in tracing S&SCs on the other.

The data sets differ in the set of body parts involved in the S&SCs. The analysis suggests that Bouakako SL patterns differently from Adamorobe SL and similar to Anyi gestures when it comes to the body parts that are used. Whereas Adamorobe SL only uses parts of the arm, Anyi gestures and Bouakako SL signs may use other body parts as well. Thus, Bouakako SL signers were found to use the thigh as well. However, Anyi speakers were found to make use of relatively many other parts in addition to the thigh, i.e. the waist, the entire length of the body, and the lower leg. In this respect, Bouakako SL can be understood as being in between Anyi gestures and Adamorobe SL. However, it should be noted that there was considerable variation between the Anyi speakers.

At the same time, Bouakako SL does not pattern like Adamorobe SL in the type of linguistic phenomena its body part S&SCs are involved in. Of the three linguistic phenomena compared (lexicalization, localization, and combinations with mouthings), Bouakako SL body part S&SCs are only characterized by lexicalization. However, only two cases of lexicalization unique to Bouakako SL were found; TOMATO and BOTTLE. Interestingly, TOMATO and BOTTLE are examples of lexicalized body part S&SCs in Adamorobe SL as well. A third case of a S&SC with a specialized meaning, ‘narrowly, only just’, seems to have been adopted as a conventional form-meaning unit from the repertoire of conventional Dida gestures, as an identical emblematic gesture is used by Dida speakers with the same meaning (Tano Angoua, personal knowledge). As far as the other two linguistic phenomena observed in Adamorobe SL are concerned -localization and combinations with mouthings- no examples were found in the Bouakako SL corpus.

The results of the comparison in this study are summarized in table 6 below.

| | Anyi gestures | Bouakako SL | Adamorobe SL |
|---|---|---|---|
| Hesitation | + | - | - |
| Pointing at objects | + | - | - |
| Modification | + | - | - |
| Concentration on the hands | - | - | + |
| Lexicalization | + | + | + |
| Localization | - | - | + |
| Combine with mouthings | - | - | + |

Table 6: Overview of the features of body part S&S elements in Anyi gestures, Bouakako SL and Adamorobe SL

The results of the comparison thus seem to be in line with the difference in age between Bouakako SL and Adamorobe SL. The emerging Bouakako SL seems to have adopted the gestural S&SCs has integrated the body part S&SCs in a few lexical items, but does not seem to have integrated these

signs morphologically in any other way. The established Adamorobe SL has integrated the body part S&SCs in its linguistic system, i.e. in its lexicon *and* its morphology.

The results of the comparison of Bouakako SL and the Anyi gestures show that there is even lesser overlap between these data sets. However, the comparison of Anyi gestures, Bouakako SL, and Adamorobe SL suggests that body part S&SCs may move over time towards being concentrated on the parts of the arm. Thus, whereas the Anyi gesturers used a number of non-arm body parts and even non-body part items, the Bouakako SL signers only use the thigh as a non-arm body part. Adamorobe SL signers only used parts of the arm. This concentration of information towards the hands is also described as a tendency in historical changes in a comparison of American SL and Old French SL by Frishberg (1975).

Also, the data suggest that there is an implicational hierarchy in the distribution of the types of body parts delimited. Thus, if a person uses S&SCs delimiting body parts other than the parts of the arm, he/she also uses S&SCs delimiting parts of the arm. Also, if a person uses S&SCs delimiting body the arm or part(s) of it, he/she also uses constructions delimiting the hand or part(s) of it.

This study concerns the emergence of S&SCs, i.e. independent signs predominantly expressing S&S. Across sign languages, S&SCs as well as classifier constructions expressing motion and location are found to be built up of handshapes conveying size and shape features (Schembri 2003). These handshapes (and sometimes other parameters as well) recur with a consistent form-meaning pairing in other types of signs as well (Nyst 2016a). Such sub-sign morphemes recur in productive constructions as well as in lexical signs, e.g. in SL of the Netherlands (Kooij, Nyst, & Zwitserlood 2012). In Bouakako SL and Adamorobe SL too, sub-sign morphemes are found that consistently contribute a particular S&S meaning across different types of signs. Thus, in both languages, a fist expressing a solid, roundish shape is found in a S&SC conveying precisely that meaning, but also in a sign for MOTHER, where the fist depicts the shape of a woman's breast.

Figure 23 The gesture for woman or mother (left) and the signs for WOMAN/MOTHER in Bouakako SL (left) and Adamorobe SL (right)

This study finds that S&SCs may lexicalize, raising the question to what extent S&S gestures are the source not only of S&SCs, but also of the sub-sign S&S morphemes found in other types of signs, including the lexicon. We argue here that these sub-sign S&S morphemes are already available in the gesture system of speakers.

Thus, the repertoire of conventional or quotable gestures (or emblems) of speakers of Dida, Anyi and Akan includes sign-like gestures that depict S&S features of a referent, while expressing a meaning that is not one of S&S. A good example is the gesture for 'woman/mother', which very much looks like the signs for WOMAN in both Bouakako SL and Adamorobe SL. In fact, West African gesture repertoires seem to have a considerable proportion of quotable gestures that resemble content

words, including those for ‘man/father’, ‘water’, ‘child’ and ‘dead’. Given the availability of corresponding quotable gestures for various lexical signs, it is much more likely that SLs adopt quotable gestures in their early stages of emergence in addition to S&S gestures. As such, the sub-sign morphemes available in both types of gestures enter SLs through both routes. This leaves the question of why the body part S&SCs have more combinatorial properties in Adamorobe SL than in Bouakako SL. We argue that it is just a matter of time that opens up the possibility of combining body part S&SCs with meaningful locations and mouth actions.

A final note concerns parallels between the conventionalization of S&SCs and color terms. Firstly, searching behavior and hesitation prior to selecting a matching body part or object is observed in the Anyi S&SCs, but not in Bouakako SL or Adamorobe SL. It is, however, observed and described for the expression of colors in Bouakako SL, which has no fully conventionalized color signs (Tano 2016:237). As such, the conventionalization of body part S&SCs has preceded the conventionalization of color terms in this language.

## Conclusion

Despite using different methods for data collection, this study finds that body parts are used to express size and shape not only in Adamorobe SL and Anyi gestures, but also in Bouakako SL, an emerging village SL in Côte d’Ivoire. However, in each of the three data sets, the body part S&SCs have different formal properties. Keeping in mind that differences between the data sets may have resulted from differences in data collection, the following observations can be made. A comparison of the three data sets shows that most of the properties setting apart the Anyi size and shape gestures from S&SCs in Adamorobe SL as gestural are not found in Bouakako SL. Thus, no instances of hesitation were found prior to selecting the best matching body part, nor were additional comments found on how the body part S&SC should be understood. Also, no cases of pointing at objects in the environment to express a size and/or shape were found. The only feature that Bouakako SL did share with Anyi gestures and not with Adamorobe SL was the use of body parts other than (parts of) the arm. However, whereas Anyi speakers were found to use about five non-arm body parts, the Bouakako signers used only one, the thigh. Overall, this confirms the tendency of sign languages over time to concentrate information in the hands (cf. Frishberg 1975).

Unlike in Anyi gestures, S&SCs in Adamorobe SL are integrated into the linguistic system. Thus, they may be combined with a meaningful location, mouthing or other independent sign. As such, S&SCs in Adamorobe SL present another case of the grammaticalization of gestural elements (cf. Pfau & Steinbach 2006). Moreover, some of these combinations have lexicalized. Like in Adamorobe SL, Bouakako SL has lexicalized body part S&SCs, but they are fewer in number. Also, in one case, the “lexicalization” (i.e. the conventionalization of the link between form and meaning) was found to already have taken place in gesture.

Thus, in all respects considered, Bouakako SL seems to be in between Anyi gestures and Adamorobe SL when it comes to body part S&SCs. Bouakako SL did not have any features that were not encountered either in Anyi gestures or Adamorobe SL. Wherever Bouakako SL shares features with gesture or Adamorobe SL; it appears to display these features less extensively. This pattern supports an analysis in which body part S&SCs have their origin in gesture. Moreover, the analysis of Adamorobe SL shows that body part S&SCs have become building blocks of SL structure and lexicon. The comparison with Bouakako SL suggests that that process may take more than one generation to develop.

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