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Extension and perseveration of list buoys in Libras

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Translation to Libras:
https://youtu.be/GyQczHmIcZU

Resumo

Segundo Liddell (2003), boias de listagem são empregadas geralmente quando o sinalizante quer se referir a mais de um referente em sequência. Heitkoetter e Xavier (2020, 2022) realizaram um estudo detalhado de boias de listagem na Libras, com base em dados coletados de vídeos do *Youtube* de dois sinalizantes surdos paranaenses, um homem e uma mulher. Com esses estudos, os autores mostram que tais construções podem ser de diferentes tipos, a saber, fixas, sequenciais e mistas com ou sem perseveração. Este trabalho, um recorte de Heitkoetter (2024), cujo objetivo geral foi apresentar um aprofundamento das análises anteriores, reporta especificamente os resultados obtidos em relação à extensão (número de itens) e à perseveração (quantidade e número de mão dos sinais empregados para definir os itens listados e tempo de produção) das boias de listagem. Os resultados obtidos mostram variação por sujeito em ambos os aspectos analisados. Em relação à extensão da lista, observamos que, entre as boias fixas predominam listas de três (homem) e quatro (mulher) itens; entre as sequenciais, dois (homem) e três (mulher) itens. Já no que diz respeito à duração, ainda que tenhamos atestado que, para ambos, as boias de listagem sem perseveração, como esperado, durem mais, somente para a mulher essa diferença foi substancial.

Palavras-chave: Libras; boias de listagem; extensão; duração.

Abstract

According to Liddell (2003), list buoys are generally used when the signer wants to refer to more than one referent in sequence. Heitkoetter e Xavier (2020, 2022) carried out a detailed study of list buoys on Libras, based on data collected from YouTube videos of two deaf signers from Paraná, a man and a woman. With these studies, the authors show that such constructions can be of different types, namely, fixed, sequential, and mixed, with or without perseveration. This work, an excerpt from Heitkoetter (2024), whose general objective was to present an in-depth analysis of

previous analyses, specifically reports the results obtained in relation to the extension (number of items) and perseveration (quantity and number of hands of the signs employed to elaborate the listed items and duration) of the list buoys. The results obtained show variation per subject in both aspects analyzed. Regarding the length of the list, we observed that, among the fixed buoys, lists of three (man) and four (woman) items predominate; among the sequential ones, two (man) and three (woman) items. As far as duration is concerned, even though we have confirmed that, for both, the lis buoys without perseveration, as expected, last longer, only for women was this difference substantial.

Keywords: Libras; list buoys; extension; duration.

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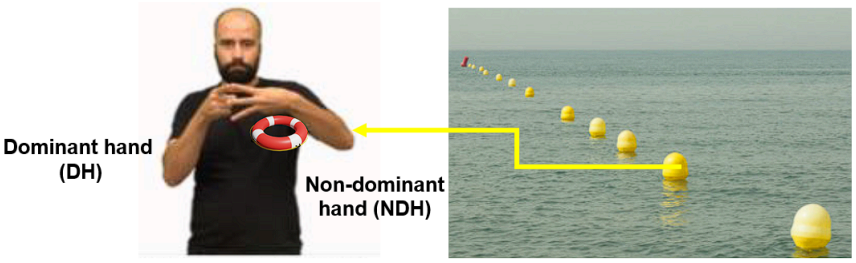
INTRODUCTION

Liddell (2003) proposes the term *buoy* to designate American Sign Language (ASL) signs produced by the non-dominant hand, while the dominant hand produces other signs. This term was chosen by the aforementioned author because, as Figure 1 illustrates, just like real buoys, the signs under discussion appear to be "floating" in the signing space, serving as reference points.

Figure 1 – Illustration concept of the buoy

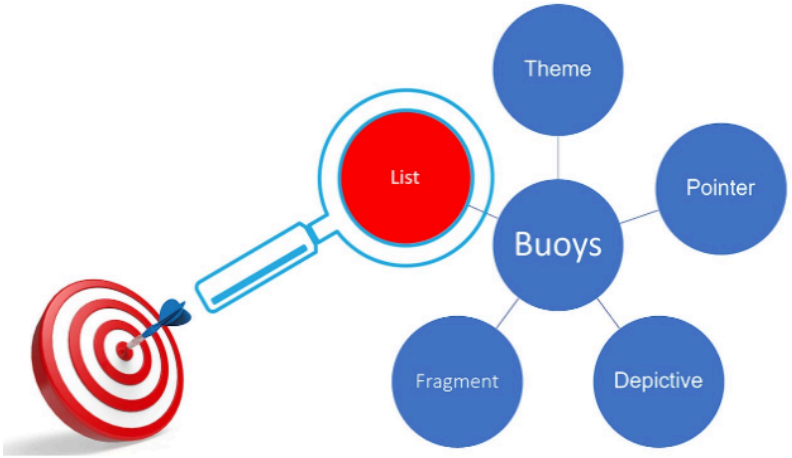


Source: Authors (2024).

Buoy, in fact, is the name of a class of signs, since Liddell (2003) identified five types thereof in ASL: *thematic*, *pointer*, *depictive*, *fragment* and *list*. As Figure 2 indicates, in this work, an excerpt from Heitkoetter's master's thesis (Heitkoetter, 2024), we will focus on list buoys. Such buoys are generally used by signers when they want to refer to more than one entity or event in sequence and, to do so, associate them with each of their nondominant fingers.

[1] Translated by: André Nogueira Xavier. Reviewed by: Ethan Hartzell.

Figure 2 – Different types of buoy and the type chosen for analysis in this work



Source: Authors (2024).

Specifically, in this work the results of the analysis of list buoys in Libras will be reported regarding two of their aspects: their extension (number of items listed) and their perseveration (maintenance in the signing space during the production of other signs). Specifically, with regard to length, we want to verify whether, as reported by Jefferson (1991) for spoken languages, lists with a maximum of three items predominate. In relation to perseveration, we want to test whether, as Liddell (2003) reports for ASL, (1) the number of signs used to define the listed items and (2) the number of hands of used to produced those signs influence whether or not this process occurs and also (3) whether list buoys with perseveration last less than those with perseveration. To achieve these objectives, in the next section, based on data from six different signed languages, the subtypes of list buoys already identified in the literature will be presented and illustrated. Next, we will summarize the studies on the same topic carried out on Libras. After this overview, we will describe our method and present our analyses and results.

TYPOLOGY OF LIST BUOYS BASED ON EUROPEAN SIGNED LANGUAGES

Since Liddell's (2003) seminal work, in which, among other aspects of ASL grammar, the author describes and analyzes different types of buoys, researchers working with other signed languages have developed studies on the same topic. Table 1 summarizes the results of our bibliographic survey and shows that there is already research on buoys for five European signed languages.

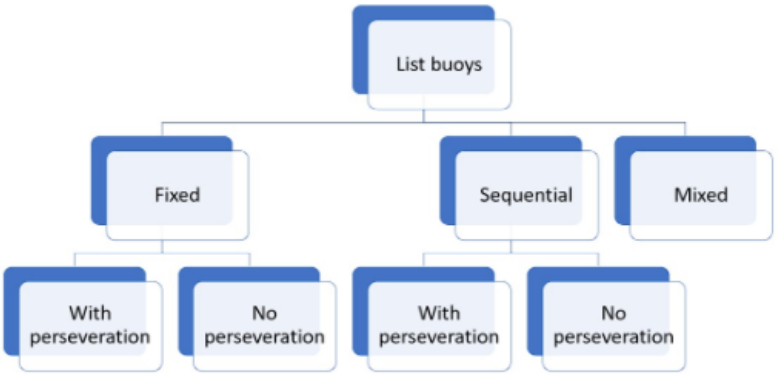
Table 1 – Summary of the work on list buoys surveyed

Language			Authors
Full name	**Acronyms**	**Country where it is used**	
Swedish Sign Language	SSL	Sweden	Nilsson (2007) Liddell, Vogt-Svendsen e Bergman (2007)
Norwegian Sign Language	NSL	Norway	Liddell, Vogt-Svendsen e Bergman (2007)
Gebärdensprache (German Sign Language)	DGS	Germany	Hansen e Heßmann (2015)
Langue des signes de Belgique Francophone (French Belgian Sign Language)	LSFB	Switzerland	Gabarró-Lopez (2017)
Finland-Swedish Sign Language	FinSSL	Finland/Sweden	Siltaloppi (2023) and Wilcox, Xavier e Siltaloppi (2024)

Source: Authors (2024).

These studies attest not only to the existence of different types of buoys in these languages, but also different subtypes of list buoys. These subtypes, summarized in Figure 3, include the so-called *fixed list buoys*, in which all fingers/items are presented at once, *sequential*, in which fingers/items are presented one after the other throughout the speech, and *mixed*, in which these two subtypes are combined. Fixed and sequential list buoys can also persevere or not, while other signs are produced with the dominant hand. Mixed buoys, on the other hand, can also result from the combination of perseveration and non-perseveration throughout their production.

Figure 3 – Types of list buoys



Source: Authors (2024)

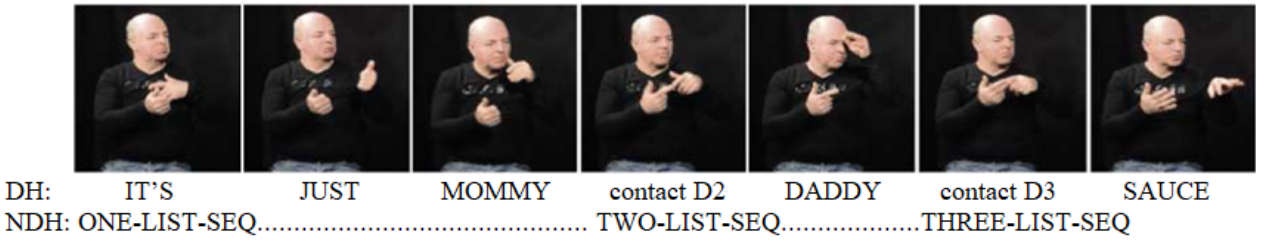
To illustrate these subtypes of list buoys, we will use data from ASL and five other European signed languages listed in Table 1. In Figure 4, we present an example of a fixed list buoy with perseveration in ASL. As can be seen in the images and in the representation in glosses, the signer keeps the FOUR-LIST buoy in the signing space throughout the time he specifies who each finger of his non-dominant hand represents.

Figure 4 – Fixed list buoy with perseveration in ASL[2],[3]

Source: Reproduced, translated and adapted from Liddell, Vogt-Svendsen and Bergman (2007, p. 193)

We did not identify examples of fixed list buoys without perseveration in the studies surveyed. We did, however, identify cases of sequential list buoys both with and without perseveration. In Figure 5, we exemplify the first case with data from French-Belgian Sign Language. As you can see, the signer constructs the list buoy sequentially and maintains it in the signing space while producing other signs with the dominant hand.

Figure 5 – Example of sequential list buoy with perseveration in LSFB[4]

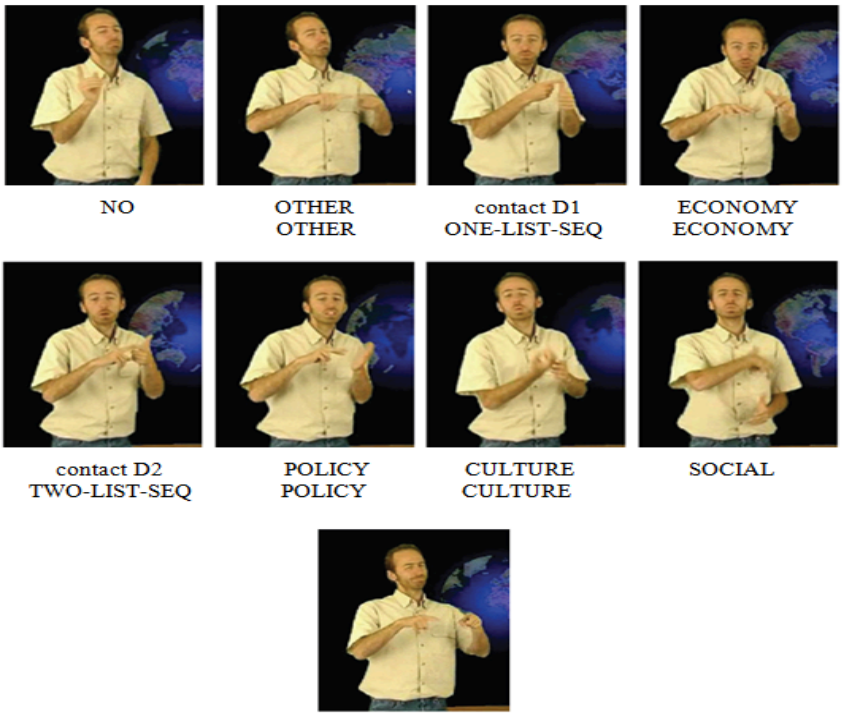


Source: Reproduced, translated and adapted from Gabarró-Lopez (2017, p. 212).

In Figure 6, we exemplify a sequential list buoy without perseveration using LSFB data. In it, it is seen that the signer does not persevere the buoy while specifying what each finger refers to with two-handed signs: thumb, ECONOMY; index: POLITICS and CULTURE.

[2] Liddell (2003) employs D1 to represent the finger associated with the first item of a list.
[3] Liddell (2003) employs D4 to represent the finger associated with the fourth item of a list.
[4] According to Liddell, Vogt-Svendsen and Bergman's (2007) conventions, SEQ (sequential) is used to differentiate sequential buoys from fixed ones, which have no marking.

Figure 6 – Example of sequential list buoy without perseveration in LSFB



Source: Reproduced, translated and adapted from Hansen and Hessmann (2015, p. 30-31).

Finally, we also identified cases of mixed list buoys. In Figure 7, we present an example of FinSSL in which the signer the signer combines a fixed buoy with a sequential buoy. She begins with the fixed buoy to introduce the three items she will discuss, and then follows it with a sequential buoy to elaborate on each item.

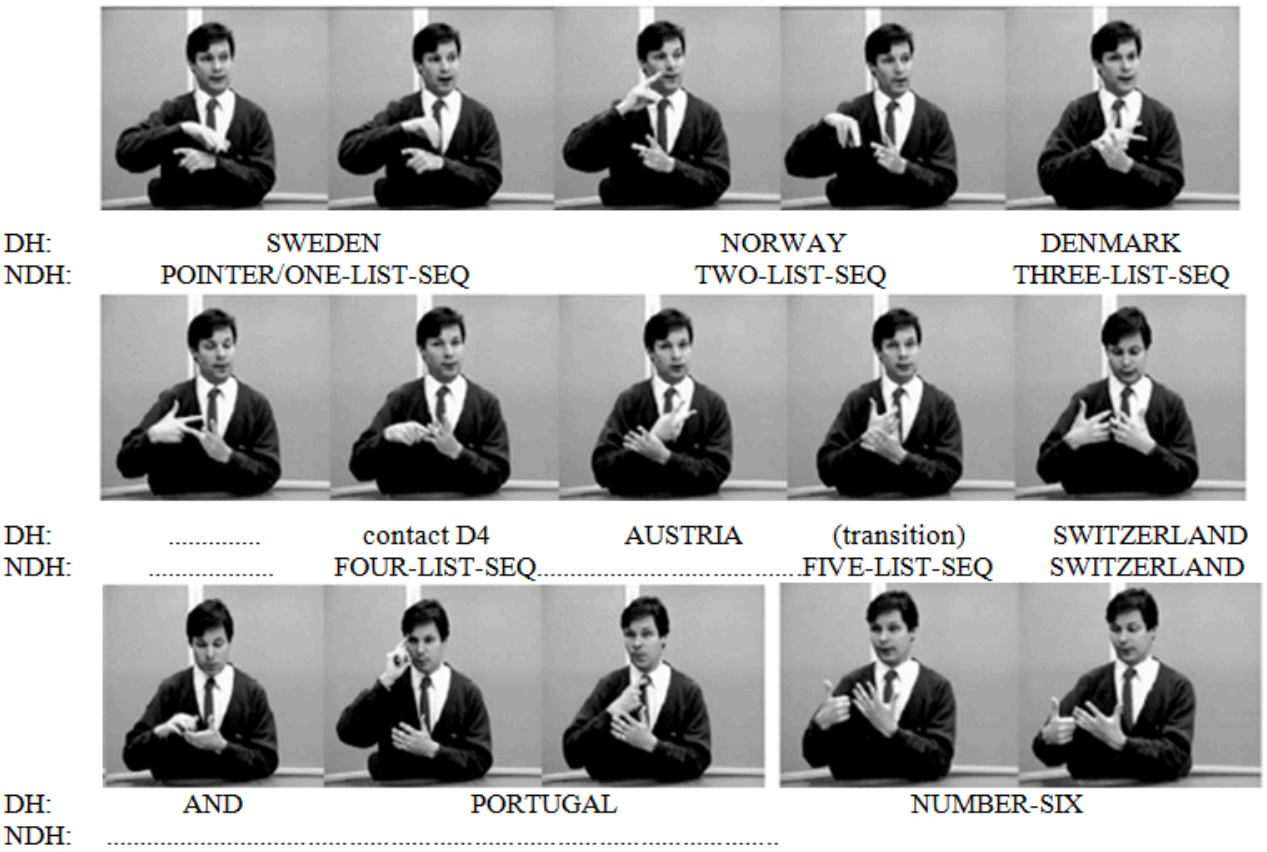
Figure 7 – Example of mixed (fixed and sequential) list buoy in FinSSL

Link: (1:11- 1:25) https://teckeneko.fi/fst/dovas-seniorers-18e-kulturevenemang-17-19-5-2019-i-abo

Source: Reproduced, translated and adapted from Siltaloppi (2023, p. 158).

The mixed list buoy depicted in Figure 8, observed in SSL, unlike the example in Figure 7, mixes not the different list subtypes, but the occurrence or not of perseveration. The signer holds the buoy during the production of the signs for the countries Norway, Denmark and Austria and stops perseverating it when producing the sign for Switzerland. This fact must result from the one-handedness of the former signs, which allows the non-dominant hand to continue producing the buoy, and the two-handedness of the latter sign, which prevents the perseveration of the buoy, precisely because it requires the non-dominant hand for its production.

Figure 8 – Example of mixed list buoy (with and without perseveration) in SSL

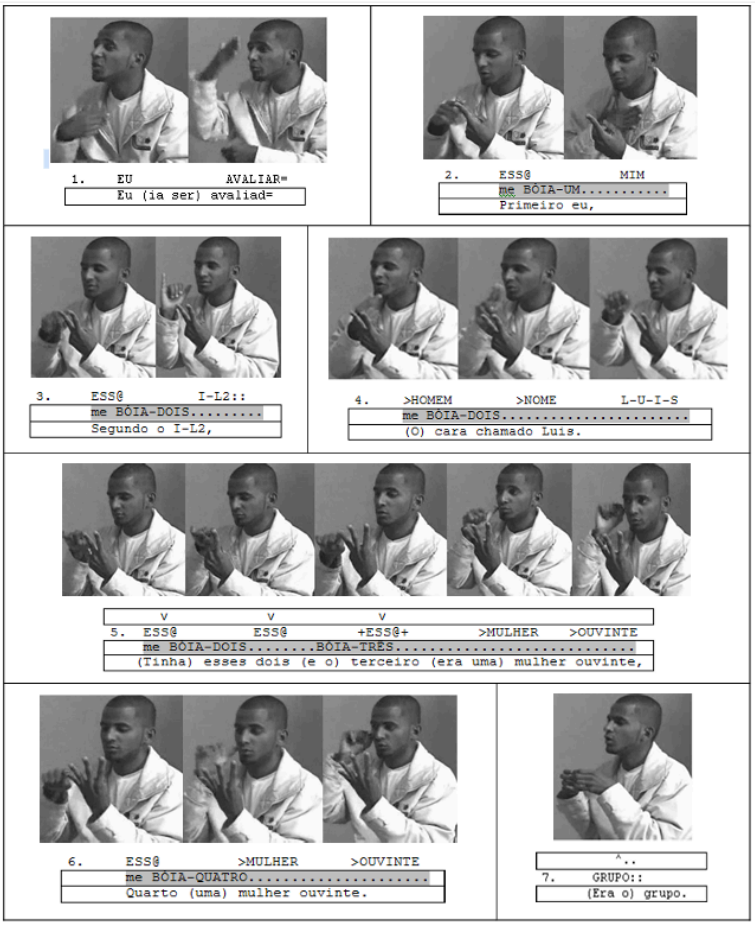


Source: Reproduced, translated and adapted from Liddell, Vogt-Svendsen and Bergman (2007, p. 197).

STUDIES ON LIST BUOYS IN LIBRAS

The first work that describes and analyzes list buoys in Libras was developed by Leite (2008). In his analysis of the data reproduced in Figure 9, the author highlights, in addition to its sequential and perseverative characteristic, the way in which the signer directs his gaze to his non-dominant hand, while pointing to each finger and then producing the sign that he associates with it.

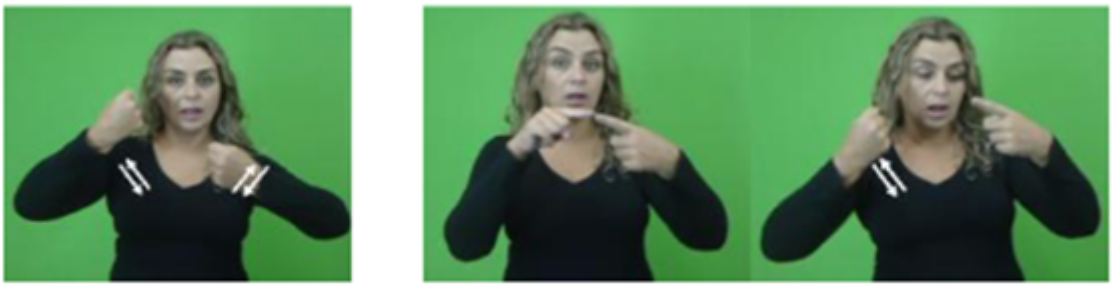
Figure 9 – Sequential list buoy with perseverance in Libras



Source: Reproduced and adapted from Leite (2008, p. 227).

Subsequently, in a study on the production of two-handed signs in Libras when the non-dominant hand is unavailable, Xavier and Barbosa (2011) point out the production of list buoys as one of the linguistic factors for this unavailability. According to the authors, in this situation, balanced two-handed signs, that is, signs in which both hands move, such as CAR, tend to be produced with just one hand, as can be seen in the example in Figure 10. However, unbalanced two-handed signs such as GRAPES, that is, signs in which only the dominant hand moves and contacts the non-dominant hand, contact is observed being made on the list buoy (Figure 11).

Figure 10 – CAR (a) in its citation form and (b) co-occurring with a list buoy



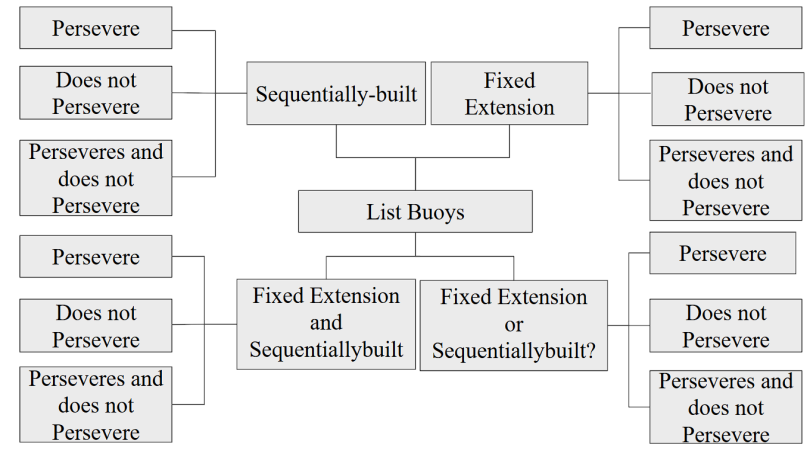
Source: Reproduced from Xavier e Barbosa (2011, p. 648).

Figure 11 – GRAPES (a) in its citation form and (b) co-occurring with a list buoy

Source: Reproduced from Xavier e Barbosa (2011, p. 648).

More recently, Heitkoetter and Xavier (2020) carried out a more in-depth study of list buoys in Libras, using data from a deaf person from Paraná, collected from videos posted by him on his YouTube channel. Starting from the types and subtypes of list buoys identified in the ASL, SSL and NSL (Liddell, Vogt-Svendsen and Bergman, 2007), the aforementioned authors propose two new categories: one to bring together mixed cases, which concatenates a fixed list buoy with a sequential one, and another to group cases whose classification does not appear to be possible. According to the authors, in these cases, the signer usually produces a list buoy with two fingers extended, which resembles a fixed buoy. Despite this, he does not previously indicate that he will talk about two things, nor does he touch the finger that refers to the first item on the list (thumb or index finger), mentioned even before the list buoy was presented. The signer touches only the finger that refers to the second item. As she does not introduce a third element in her list, she does not allow us to determine whether the list buoy is sequential. Figure 12 summarizes all the types and subtypes proposed by Heitkoetter and Xavier (2020) based on the data they analyzed.

Figure 12 – List buoy types



Source: Reprinted from Heitkoetter and Xavier (2020, p. 90).

In a subsequent study, Heitkoetter and Xavier (2021) deepened their analysis of formal aspects of list buoys analyzed in the previous study (Heitkoetter; Xavier, 2020) and included data from a female deaf signer, also from Paraná and also collected from YouTube videos. In addition to the types and subtypes presented in Figure 12, the authors classified the list buoys in relation to the finger associated with the first item on the buoy (thumb, index or little finger) and the type of movement described by the dominant hand when touching the buoy (straight or circular). In addition, Heitkoetter and Xavier (2022) compared the data from the two subjects and, as a result,

reported that they observed, as can be seen in Table 2, that in some cases both subjects produced the same type of list buoy (cf. 2. Fixed list buoy initiated at the index with perseveration of the non-dominant hand and with straight movement on the dominant hand), but in others not (cf. 1. Fixed list buoy initiated at the index without perseveration of the non-dominant hand and with straight movement on the dominant hand). Due to the sample size, these differences cannot be attributed to idiolectal or any other type of variation.

Table 2 – Comparison between two deaf Libras signers (a woman and a man)

Tipo de Boias	Mulher	Homem
1 FIXO\INÍCIO INDICADOR\NÃO PRESEVERAR\RETO		
2 FIXO\INÍCIO INDICADOR\PERSEVERAR\RETO		
3 FIXO\INÍCIO POLEGAR\HÍBRIDO\RETO		
4 FIXO\INÍCIO INDICADOR\NÃO PERSEVERAR\RETO		
5 FIXO E SEQUENCIAL\INÍCIO INDICADOR\HÍBRIDO\RETO		
6 FIXO E SEQUENCIAL\INÍCIO INDICADOR\NÃO PERSEVERAR\RETO		
7 FIXO E SEQUENCIAL\INÍCIO INDICADOR\PERSEVERAR\RETO-CIRCULAR		
8 FIXO E SEQUENCIAL\INÍCIO POLEGAR\NÃO PRESEVERAR\RETO – CIRCULAR		
9 FIXO OU SEQUENCIAL\INÍCIO INIDICADOR\NÃO PERSEVERAR\CIRCULAR		
10 FIXO OU SEQUENCIAL\INÍCIO INIDICADOR\NÃO PERSEVERAR\RETO		
11 FIXO OU SEQUENCIAL\INÍCIO INIDICADOR\PERSEVERAR\RETO		
12 FIXO OU SEQUENCIAL\INÍCIO INDICADOR\NAO PERSEVERAR\CIRCULAR		
13 FIXO OU SEQUENCIAL\INÍCIO INDICADOR\NAO PERSEVERAR\RETO		
14 FIXO OU SEQUENCIAL\INÍCIO INDICADOR\PERSEVERAR\RETO		
15 SEQUENCIAL\5 ou mais\2 MÃOS\INÍCIO INDICADOR\RETO		
16 SEQUENCIAL\5 ou mais\2 MÃOS\INÍCIO POLEGAR\HÍBRIDO\RETO – CIRCULAR		
17 SEQUENCIAL\5 ou mais\2 MÃOS\INÍCIO POLEGAR\PRESEVERAR\RETO		
18 SEQUENCIAL\5 ou mais\CONTAGEM REVERSA\INÍCIO POLEGAR\HÍBRIDO\RETO		
19 SEQUENCIAL\5 ou mais\RECONTAGEM\INÍCIO COM O POLEGAR MAS SUBSTITUIR INDICADOR\HÍBRIDO\RETO CIR		
20 SEQUENCIAL\Até 5\INÍCIO INDICADOR\NÃO PERSEVERAR\CIRCULAR		
21 SEQUENCIAL\Até 5\INÍCIO INDICADOR\NÃO PERSEVERAR\RETO		
22 SEQUENCIAL\Até 5\INÍCIO INDICADOR\NÃO PERSEVERAR\RETO-CIRCULAR		
23 SEQUENCIAL\Até 5\INÍCIO INDICADOR\HÍBRIDO\RETO		
24 SEQUENCIAL\Até 5\INÍCIO MÍNIMO\HÍBRIDO\RETO		
25 SEQUENCIAL\Até 5\INÍCIO MÍNIMO\HÍBRIDO\RETO-CIRCULAR		
26 SEQUENCIAL\Até 5\INÍCIO MÍNIMO\NÃO PRESEVERAR\RETO		
27 SEQUENCIAL\Até 5\INÍCIO POLEGAR\HÍBRIDO\RETO		
28 SEQUENCIAL\Até 5\INÍCIO POLEGAR\HÍBRIDO\RETO-CIRCULAR		
29 SEQUENCIAL\Até 5\INÍCIO POLEGAR\HÍBRIDO\RETO		
30 SEQUENCIAL\Até 5\INÍCIO POLEGAR\NÃO PERSEVERAR\RETO		
31 SEQUENCIAL\Até 5\INÍCIO POLEGAR\NÃO PERSEVERAR\RETO-CIRCULAR		
32 SEQUENCIAL\Até 5\INÍCIO POLEGAR\NÃO PERSEVERAR\RETO		
33 SEQUENCIAL\Até 5\INÍCIO POLEGAR\PRESEVERAR\RETO		
34 SEQUENCIAL\Até 5\INÍCIO COM O POLEGAR MAS SUBSTITUIR INDICADOR\NÃO PRESEVERAR\RETO-CIRCULAR		
35 SEQUENCIAL\Até 5\INÍCIO INDICADOR\HIBRIDO\RETO		
36 SEQUENCIAL\Até 5\INÍCIO INDICADOR\NÃO PERSEVERAR\\RETO		
37 SEQUENCIAL\Até 5\INÍCIO INDICADOR\NAO PERSEVERAR\RETO-CIRCULAR		
38 SEQUENCIAL\Até 5\INÍCIO INDICADOR\PERSEVERAR\RETO		

Source: Reprinted from Heitkoetter and Xavier (2022, p. 14).

METHOD

DATA SOURCE

The data analyzed in this work were originally collected by Heitkoetter and Xavier (2020, 2022) from videos posted by two deaf signers from Paraná, a man and a woman, on their YouTube channel. Table 3 summarizes information about the sources of data for the man and for the woman.

Table 3 – Description of the analyzed data

Man	Woman
• Total videos analyzed: 18 • Total duration: 1h57min • 17 public YouTube videos + 1 Facebook video • Target audience: deaf community in general • Period considered: from January 27, 2015 to July 9, 2019 • Amount of data: 60	• Total videos analyzed: 12 • Total duration: 1h31min • 12 unlisted YouTube videos • Activities developed for subjects in the Libras Literature course at UFPR • Period considered: from May 29, 2016 to May 14, 2019 • Amount of data: 25 data

Source: Heitkoetter (2024, p. 38-39).

PARTICIPANTS

In order to outline a profile of each of the subjects whose data were analyzed, Heitkoetter and Xavier (2020, 2022) conducted an interview with each of them. In this interview, the first author of this paper asked each subject (1) their place of birth, (2) the time they have lived in Curitiba, (3) whether they came from a hearing or deaf family, (4) their profession, (5) if they had a degree, (6) the age at which they started learning Libras, (7) how and where they first had contact with Libras, (8) the type of school they attended (bilingual or mainstream) and (9) the time spent attending speech therapy. The information collected from the man and from the woman is summarized in Table 4.

Table 4 – Profile of the subjects

Man	Woman
1. Born in Goioerê (PR). 2. In 2020, he had lived in Curitiba (PR) for 11 years. 3. Hearing family. 4. Profession: university professor of the Libras Literature degree course. 5. Training: master's degree in education. 6. Started learning Libras when he was 2 or 3 years old. 7. First contact with Libras was through a deaf neighbor. 8. Attended an inclusive school without an interpreter. 9. Attended speech sessions for approximately 10 years.	1. Born in Curitiba (PR). 2. In 2020, she had lived in Lapa (PR) for two years. 3. Hearing family. 4. Profession: student. 5. Education: Bachelor's degree in the Libras Literature course. 6. Started learning Libras at the age of 8. 7. First contact with Libras took place at school. 8. Attended school for the deaf. 9. Attended speech sessions from 1 to 12 years of age.

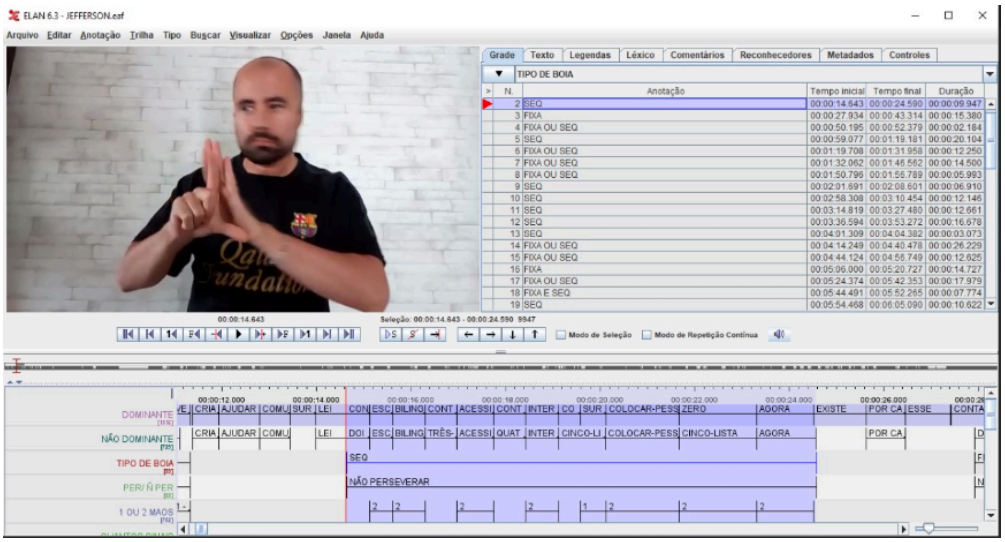
Source: Heitkoetter (2024, p. 40).

PROCEDURES

In Heitkoetter's master's work (Heitkoetter, 2024), the data considered here were analyzed in relation to eight formal aspects, namely, (1) the length of the lists, (2) the duration of the list buoys with and without perseveration and the number of hands of the signs used during their production, (3) the eyegaze, (4) the regions of contact on the non-dominant hand, (5) whether or not contact is made, (6) the movement of the trunk, (7) the actions of the dominant hand in relation to the non-dominant hand during the production of list buoys and, finally, (8) the actions of the non-dominant hand besides that related to the production of the list buoy.

To do so, the videos were analyzed using the free software ELAN (Eudico Language Annotator), which allows the creation of annotation tracks synchronized with them. In the first two tracks, Heitkoetter (2024) annotated each sign produced using Portuguese glosses, considering the hand used: the dominant, the non-dominant or both. In the third track, the author annotated the type of buoy: fixed, sequential, mixed. In the fourth track, he delimited the entire interval in which the list buoy took place and annotated whether the buoy perseverated during it or not. With this track, it was possible to obtain the duration of each list buoy. On the fifth track, Heitkoetter (2024) annotated the number of hands for each sign produced during the list buoy.

Figure 13 – Elan screen *print*

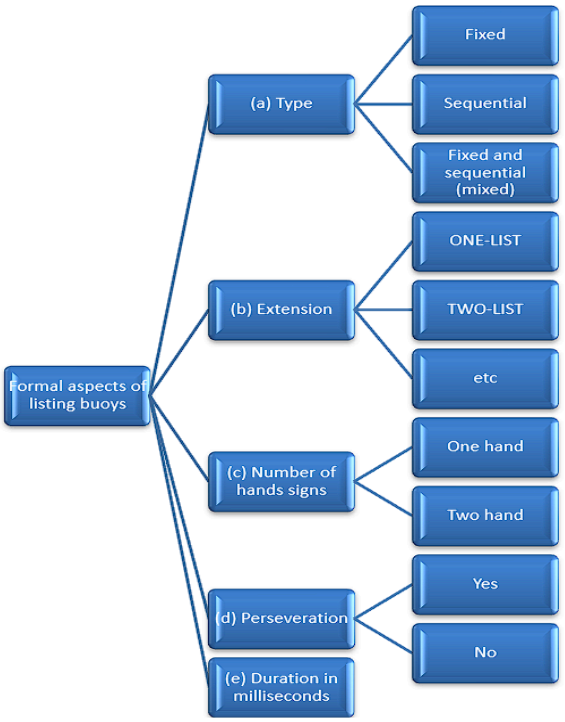


Source: Authors.

ANALYSIS CATEGORIES

As previously stated, in this work we will only focus on the first two formal aspects of list buoys in Libras, analyzed by Heitkoetter (2024). Therefore, we present in Figure 14 only the categories that we used for data analysis: (a) type of list buoy (fixed, sequential and mixed), (b) the length of the list (one item, two items, etc.), (c) the number of hands of the signs used to describe each item on the list (one or two hands) and (d) the occurrence or not of perseveration. We exported from ELAN to Excel for quantitative analysis of both these data annotations and (e) the duration, in milliseconds, of each list buoy.

Figure 14 – Analysis Categories



Source: Adapted from Heitkoetter (2024, p. 41).

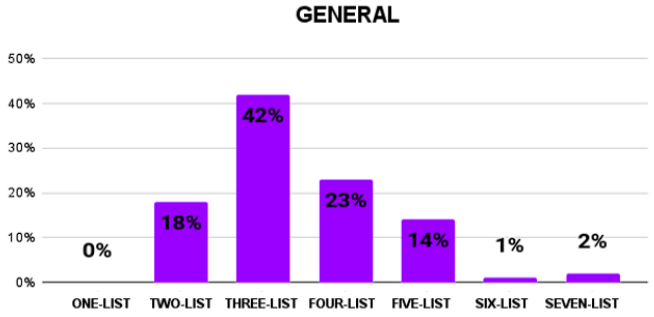
As will be seen in the results section, we first compared classifications (a) and (b) to check whether the type of list buoy influenced its length. Subsequently, we compared classifications (c) and (d) to verify whether or not the occurrence of perseveration is correlated with the number of hands of the signs used to create the items on the list, and (d) and (e) to see if short list buoys tend to show more perseveration than longer ones.

ANALYSIS

LIST BUOY EXTENSION

As can be seen in Graph 1, although we found list buoys varying in their extensions, ranging from two to seven items listed, three-item-long lists were the most frequent ones. This result is interesting because it suggests similarity between lists in signed and spoken language (Jefferson, 1991).

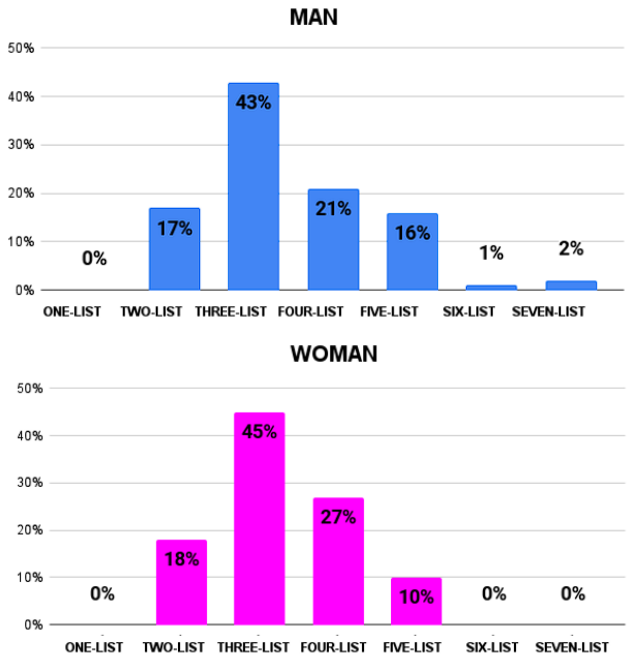
Graph 1 – Frequency of list buoys by number of items listed



Source: Authors (2024).

Separating our data by signer, as can be seen in Graph 2, this result does not change. In both man's and woman's data, lists with two items predominate.

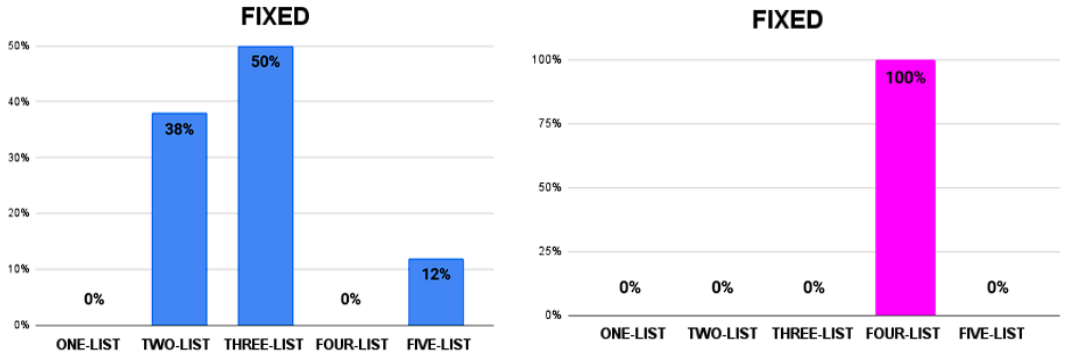
Graph 2 – Frequency of list buoys by number of items listed and by subject



Source: Authors (2024).

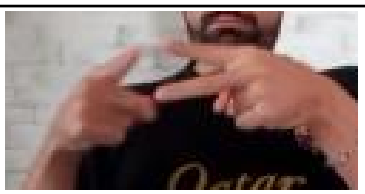
To check whether the type of list buoy can have any influence on its extension, we separated the data for both man and woman taking into account their fixed, sequential, mixed (fixed and sequential) or unclear (fixed or sequential) characteristic. Graph 3 shows the frequency of fixed list buoys per subject. It can be seen that the man presented fixed buoys of different extensions (two, three and five elements), while the woman only presented buoys with four elements. We believe, however, that this may be a result of our sample size. Table 5 illustrates each of these cases.

Graph 3 – Fixed list buoy frequency



Source: Authors (2024).

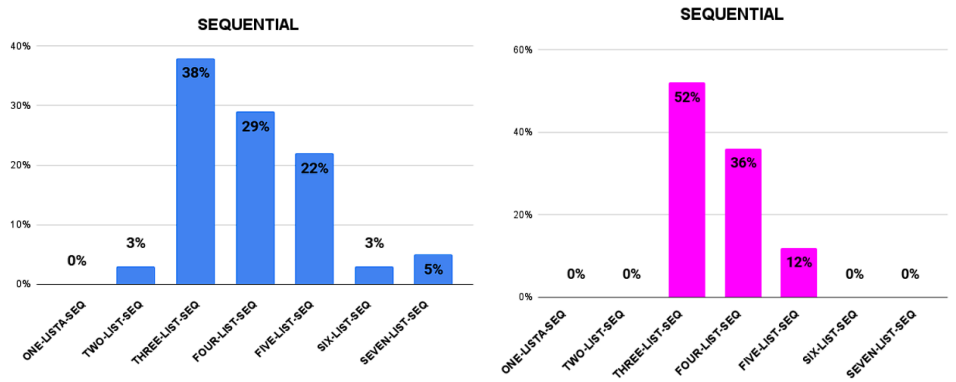
Table 5 – Examples of fixed list buoys

TWO-LIST	 https://youtu.be/NCepHF0383I (0:51-1:01)	
THREE-LIST	 https://youtu.be/W5Dr1C-yqpk (2:34-2:45)	
FOUR-LIST		 https://youtu.be/KcrSHScwR6w
FIVE-LIST	 https://youtu.be/KEx2XxmIU3A (1:24-1:30)	

Source: Heitkoetter (2024, p. 43).

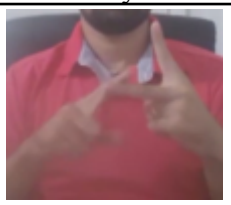
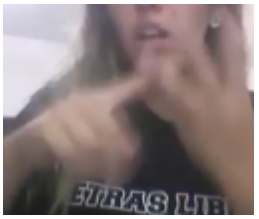
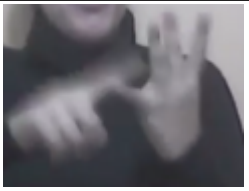
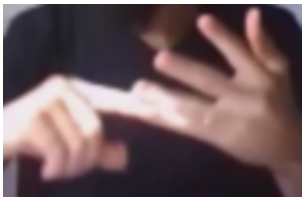
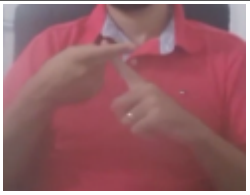
In relation to the sequential list buoys, we see in Graph 4 that in the man's data list buoys ranging from two to seven items were observed, while in the woman's data, list buoys ranging from three to five items were observed. Examples of each type are presented in Table 6.

Graph 4 – Frequency of sequential list buoys



Source: Authors (2024).

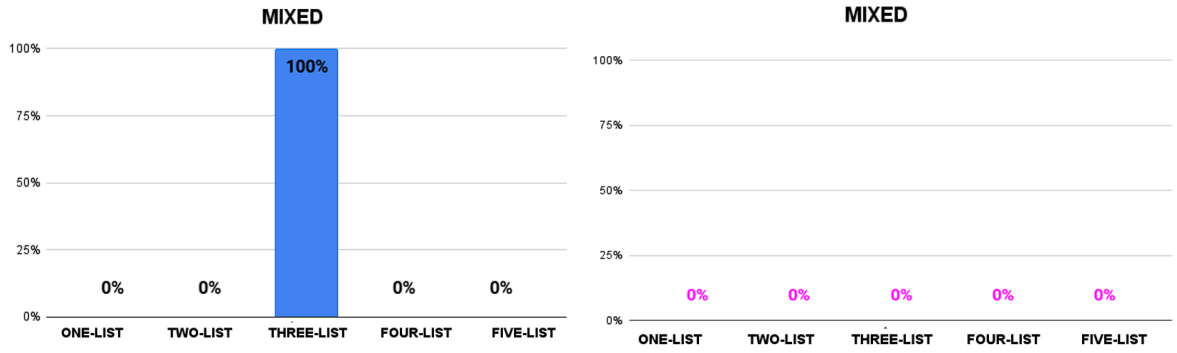
Table 6 – Examples of sequential list buoys

TWO-LIST-SEQ	 https://youtu.be/1l3yqYH5YFY (2:35-2:52)	
THREE-LIST-SEQ	 https://youtu.be/ETLYgHYgKCo (01:38-2:04)	 https://youtu.be/oTv1AmIvKt8
FOUR-LIST-SEQ	 https://youtu.be/JtzkwhQHRIg (4:44-4:58)	 https://youtu.be/b8iNv935ZRk
FIVE-LIST-SEQ	 https://youtu.be/70wyZhApi0E (03:26-3:37)	 https://youtu.be/Rxa18-0kfYU
SIX-LIST-SEQ	 https://youtu.be/1l3yqYH5YFY (1:47-2:05)	
SEVEN-LIST-SEQ	 https://youtu.be/JtzkwhQHRIg (4:33-4:43)	

Source: Heitkoetter (2024, p. 44).

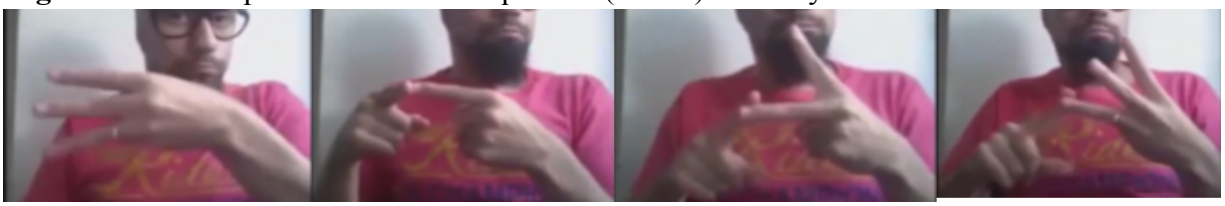
Regarding mixed buoys, that is, those which consist of the production, in sequence, of a fixed buoy and a sequential buoy, the graphs in 5 show that they were found only in the man's data and that, in addition, the only extension attested was three items. We illustrate this type of buoy in Libras with the data in Figure 15.

Graph 5 – Frequency of fixed and sequential (mixed) buoys



Source: Authors (2024).

Figure 15 – Examples of fixed and sequential (mixed) list buoys

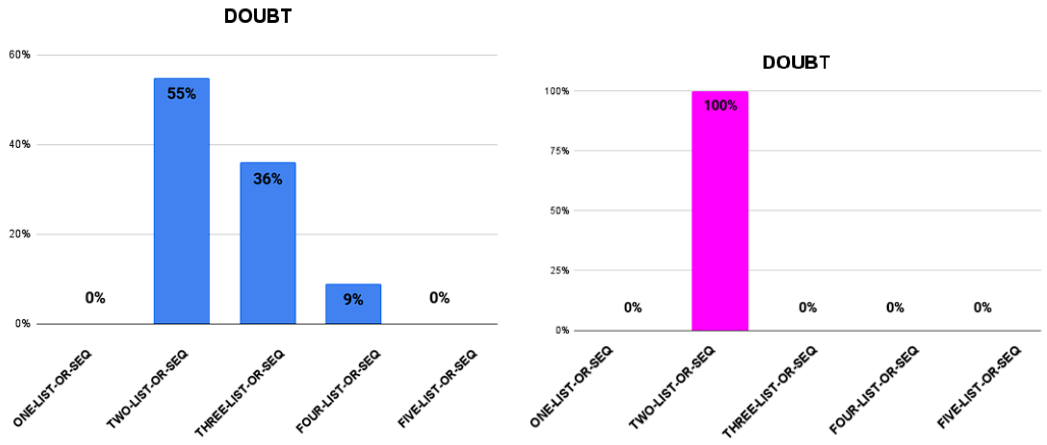


MD: pointing pointing pointing
MND: THREE-LIST A-LIST (...) TWO-LIST (...) THREE-LIST
https://youtu.be/BhDjqXjaVB8 (2:10-2:23)

Source: Authors.

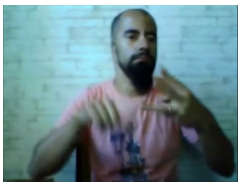
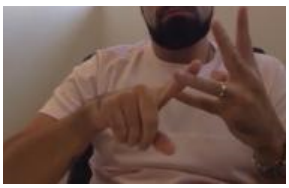
Finally, Graph 6 shows the frequency of buoys whose type is not clear (fixed or sequential) by extension. The man's data is distributed between lists of two, three and four items, while the woman's data is concentrated only on lists of two items. Each case is illustrated in Table 7.

Graph 6 – Frequency of fixed or sequential buoys



Source: Authors (2024).

Table 7 – Examples of fixed or sequential list buoys

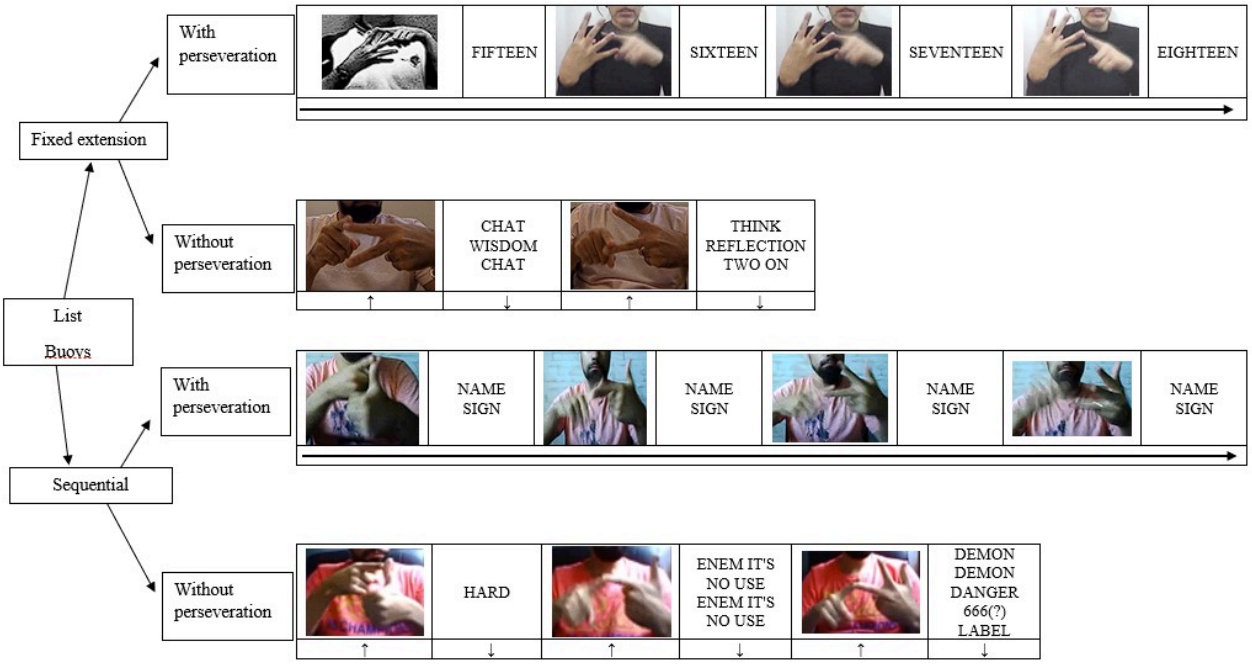
TWO-LIST-OR-SEQ	 https://youtu.be/JtzkwhQHRIg (3:45-3:59)	 https://youtu.be/FaBGCq3sei0
THREE-LIST-OR-SEQ	 https://youtu.be/ETLYgHYgKCo (01:50-2:27)	
FOUR-LIST-OR-SEQ	 https://youtu.be/ETLYgHYgKCo (1:03-1:11)	

Source: Heitkoetter (2024, p. 45).

LIST BUOY PERSEVERATION

Regarding perseveration, the analysis of our data revealed, firstly, a tendency for its occurrence when the elaboration of each of the items, both in fixed and sequential list buoys, is shorter, that is, involves fewer signs, rather than when it is lengthier, that is, it involves more signs (Graph 7). This is illustrated in Figure 16 through a diagram in which we show the number of signs used to describe a given item listed.

Figure 16 – List buoy types with and without perseveration

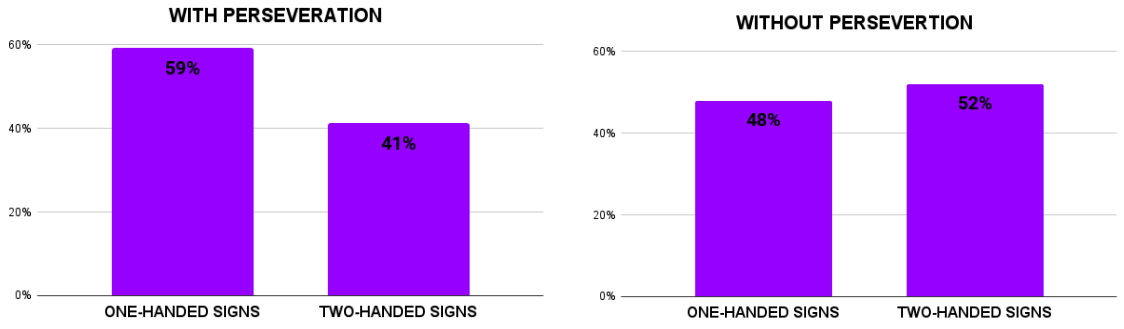


(a) https://youtu.be/KcrSHScwR6w
(b) https://youtu.be/ETLYgHYgKCo (0:16-0:31)
(c) https://youtu.be/KEx2XxmIU3A (0:54-1:08)
(d) https://youtu.be/tk5kUfeDTaU (8:25-8:43)

Source: Heitkoetter (2024, p. 46).

To check whether or not the number of hands used to produce each listed item influences the occurrence of perseveration, we counted how many one and two-handed signs were used. As can be seen in Graph 7, in general, as expected, there is a predominance of one-handed signs being co-produced with list buoys that perseverate since those do not require the non-dominant hand. In contrast, we observed a small difference in the use of one and two-handed signs, when the list buoy does not persevere.

Graph 7 – Number of mono- and bi-manual signs on list buoys with and without perseveration

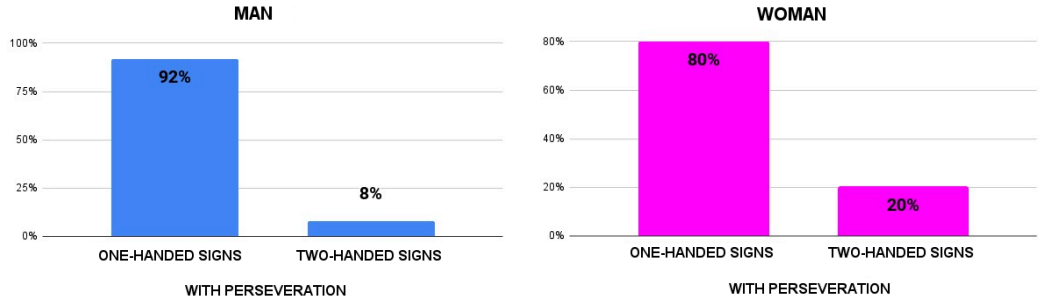


Source: Authors (2024)

We separated the data presented in Graph 7 by gender and observed that, in relation to list buoys with perseveration, the trend does not change substantially (Graph 8). However, with regard to cases of non-perseveration, the expected result, that is, a greater number of two-handed signs in

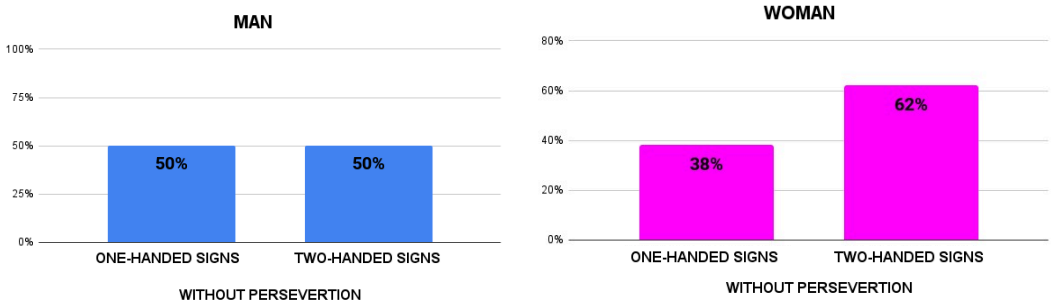
list buoys that do not persevere, was only observed in the woman's data, as in the man's data there is no difference.

Graph 8 – Number of one and two-handed signs co-occuring with list buoys with perseveration per signer



Source: Authors (2024).

Graph 9 – Number of one and two-handed signs co-occuring with list buoys without perseveration per signer



Source: Authors (2024).

Finally, using ELAN, we measured the duration of list buoys with and without perseveration, regardless of their type, and we observed, once again, a more substantial difference in the woman's data. As can be seen in Table 8 below, it can be seen that the list buoys without perseveration lasted twice as long as the list buoys with perseveration.

Table 8 – Mean duration of list buoys with and without perseveration per signer

	Mean duration	**Mean duration**
WITHOUT PERSEVERATION	4.818ms	11.496ms
WITH PERSEVERATION	2.223ms	10.179ms

Source: Authors (2024).

CONCLUSION

In this article we report the results of the analysis of list buoys in Libras in relation to two of their formal aspects, namely, their extension (number of items listed) and their perseveration (maintenance in the signing space during the production of other signs). Specifically, with regard to their length, our data show that, similarly to Jefferson (1991) in his study on lists in English, list buoys with three items predominate.

Regarding perseveration, we observed that, as Liddell (2003) reports for ASL, (1) the number of signs used to define each listed item is smaller in buoys that persevere than in buoys that do not persevere, (2), at least for fixed buoys, there is a tendency for cases of perseveration to co-occur with one-handed signs, and (3), at least for the woman, list buoys with perseveration last substantially less than those without perseveration.

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