

The morpho-phonology of nominal plurality in Argentinian Sign Language (LSA)

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This chapter discusses the form of plural nominals in Argentinian Sign Language (LSA). In LSA, the plural of certain nouns is expressed through sideways reduplication of the nominal base, while in other cases the reduplication pattern surfaces over a classifier form. We contend that this distinction is phonologically conditioned. We argue that there is a single plural morph in LSA, which involves repetitions of an arc-like movement. This element is an affix that rejects nominal bases with complex movements or a fixed place of articulation. Whenever affixation is not possible, an epenthetic operation of *handshape insertion* introduces a proper phonological host for the plural affix, i.e., a classifier, which captures the distribution of these forms regarding plural nouns. Moreover, we show that the ipsilaterality of sideways reduplication is not part of the underlying phonological representation of the plural morph but obtains through a process of movement epenthesis.

Keywords: nominal plurality, classifiers, epenthesis, handshape insertion, Argentinian Sign Language

1. Introduction

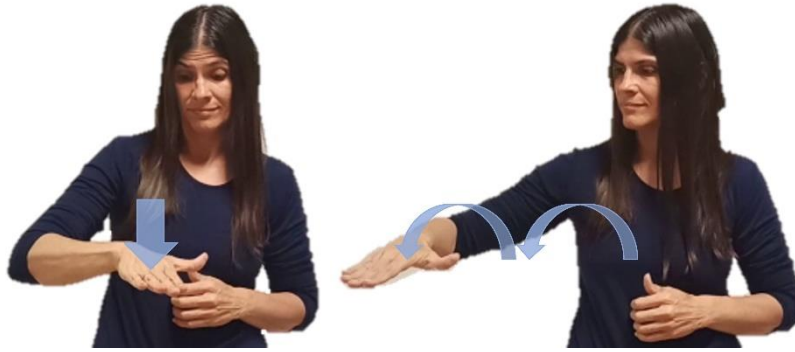
Reduplication is a well-attested pluralization strategy in sign languages. Our focus in this chapter is the functioning of this strategy in Argentinian Sign Language (LSA), the natural language of deaf people in Argentina. As originally pointed out by Massone (1996), nominal plurals are expressed in the language through repetitions of an arched movement. This behavior is attested in the pair of examples in (1) and (2), which correspond, respectively, to the singular and plural forms of the noun CHILD. As can be seen in (2), the plural CHILDREN is realized as a series of short arches that altogether compose a movement towards the ipsilateral side. Each of these arches seemingly “repeats” the noun CHILD.

(1)



CHILD.SG

(2)



CHILD.PL

The phenomena associated to the exteriorization of nominal plurality in LSA is more complex than this general description suggests. As the example in (2) shows, the plural in this case is expressed over the lexeme, i.e., the noun CHILD is “repeated” to convey a plural interpretation. This form of externalization sharply contrasts with scenarios in which plurality is expressed over a *classifier* (CL), i.e., a type of sign denoting prototypical characteristics of a nominal referent (Supalla 1986, Zwitserlood 2012). Consider the pair in (3) and (4). The example in (3) corresponds to the singular form of the noun PENCIL. As can be observed, this noun is articulated in the chin area.

(3)



PENCIL.SG

In contrast to CHILDREN in (2), the nominal base of the noun PENCILS does not “carry” the plural, but a classifier does. That is, the reduplication pattern is expressed on a classifier rather than on the noun, e.g., (4). The introduction of the classifier form in (4) does not seem to have any additional semantic effect, i.e., (3) and (4) conform a minimal pair contrasting singular and plural features.

(4)



PENCIL CL.PL

In principle, these data seem to show that the plural morpheme in LSA has two (or more) allomorphic variants. This line of analysis has been advanced for similar alternations in nominal plurality in German Sign Language (DGS) by Pfau & Steinbach (2005, 2006). In short, these authors argue that plural allomorphy in DGS is constrained by phonological properties of the underlying nominal base.

In this chapter, we advance a rather different characterization for the LSA data. While we build on Pfau & Steinbach's observations, we claim that the LSA patterns in (1) to (4) are not the product of an allomorphic alternation. Instead, we argue that LSA has a single plural morph. This element is an affix that needs to combine with a nominal base complying with certain phonological requirements. In those scenarios in which these conditions are not met, a phonological mechanism that we call *handshape insertion* provides a host for the affix in the form of a classifier. The proposal is framed within a general analysis of the exponence of nominal plurality in LSA.

The structure of the chapter is as follows. In section 2 we describe what we take to be the underlying phonological representation of the plural morpheme in LSA. As part of our proposal, we introduce the hypotheses that (i) certain properties of the plural exponent are epenthetic in nature, and that (ii) the classifier attested in examples such as (4) is introduced in the phonological representation as a proper host for the plural affix. Section 3 presents a typology of nouns in LSA; the resulting classes are based on the phonological properties determining whether the plural affix can be attached to a noun. In section 4 we explore some predictions of the hypothesis in (i). Finally, section 5 contains the conclusions.

This work is framed in the perspective that studying the grammar of sign languages contributes to the visibility and valorization of its users. The research and data collection were conducted with and within the Deaf Community.

2. The phonological representation of plurality in LSA

As pointed out by Pfau & Steinbach (2005, 2006) and Steinbach (2012), sign languages may convey (nominal) plurality in different ways. Reduplication is one of these strategies, but even reduplication comes in distinct variants. On one hand, *simple reduplication* involves the repetition of a movement once and in the same place. On the other, *sideways reduplication* (or “triplication”) involves (i) the realization of a certain sign, and (ii) its repetition two extra times through arc-like movements. These repetitions must be one next to the other in slightly different places; thus, sideways reduplication always requires displacement in space. As the examples in (2) and (4) attempt to show, LSA displays sideways reduplication; this strategy is the only morpho-syntactic means to convey nominal plurality in the language. See Massone (1996: 274), Valassina (1997: xxvi) and Massone & Martínez (2012: 1-2) for preliminary descriptions.

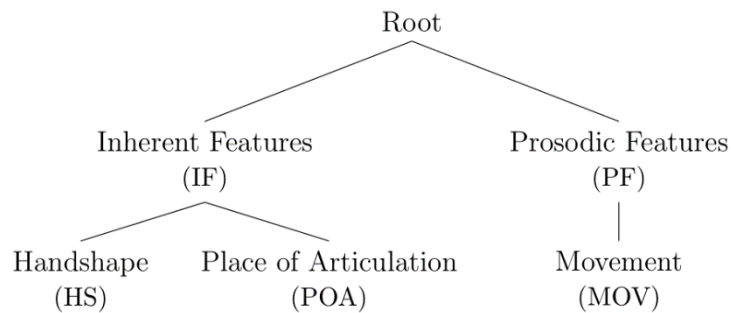
In this section, we aim to provide an explicit characterization of the exponence of nominal plurality in LSA. To do so, we first introduce some basic notions of the *Prosodic Model* (Brentari 1998), a specific theory of sign language phonology in which we will frame our discussion.

Sign languages differ from oral languages in the perceptual channel through which they are expressed: viso-gestual and auditory-oral, respectively. A characteristic feature of the viso-gestual modality are the elements from which the phonetic material is composed, e.g., hands, arms, torso, head, eyes, eyebrows, mouth, and cheeks. These are the articulators responsible for the phonological primitives of sign languages. Traditional literature organizes these phonological features into five major groups: (i) *Configuration* (i.e., the shape of the hand), (ii) *Location* (i.e., the body area in which the sign is articulated), (iii) *Orientation* (of the palm with respect to the location), (iv) *Movement* (i.e., how the hand moves with respect to the location), and (v) *Non-Manual Features*; see Stokoe (1960), Brentari (2012) and Sandler (2012), among many others, for relevant discussion.

The *Prosodic Model* of sign language phonology (Brentari 1998, Fenlon et al. 2018) takes these primitives and organizes them into structured representations of features that follow Dependency Theory (Anderson & Ewen 1987, van der Hulst 1993). These are binary branching hierarchical structures that organize phonological features into segmental units. Within the Prosodic Model, these representations allow to describe lexical units in terms of combinations of phonological properties. This is possible in sign languages because (i) the phonological unit resulting from this analysis is equivalent to a syllable in spoken languages, and (ii) most signs are monosyllabic.

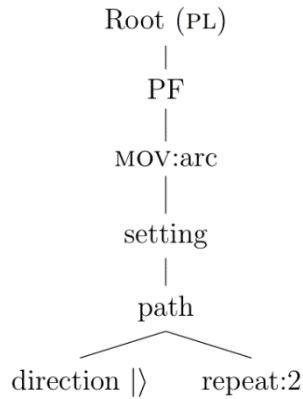
According to the Prosodic Model, phonological features combine to form a *root*, which is roughly the phonological representation of a monosyllabic word. A root branches into two main types of features: *Inherent Features* (IF) and *Prosodic Features* (PF). This distinction allows to capture the parallel between roots and syllables. The PF branch specifies sequential articulations of features that result in movement; within the root, movement plays a function similar to that of syllabic nucleus in spoken languages. The IF branch, on the other hand, specifies static properties of the active and passive articulators, i.e., the *Handshape* (HS) and the *Place of articulation* (POA), respectively. In this model, *Orientation* is derived from the relation between HS and POA. We will attempt to avoid more specific and complex parts of the theory; further aspects of the system will be introduced as they become relevant. The general organization of the major classes of features according to the Prosodic Model is schematized in (5).

(5)



Given this framework, we propose an analysis of the plural morpheme PL in LSA in which the phonological exponent of this element consists of a set of Prosodic Features. This means that there are no Inherent Features (i.e., no Handshape and no Place of Articulation) that are part of the lexical entry of PL. Its underlying phonological representation only specifies (i) that the relevant movement must be in the shape of an arc, (ii) that this movement must be repeated twice, and (iii) that the repetitions proceed in some direction (i.e., that they do not take place in exactly the same location). Note that this specification of features does not include information on why this type of reduplication is *sideways*, i.e., towards the ipsilateral side. We will return to this issue below. In sum, the phonological representation we assume for PL is sketched in (6).

(6)



Since the plural morpheme lacks any Inherent Features, it follows that it cannot be exteriorized by itself. This observation is rather natural: a well-formed sign cannot consist of movement alone; there must be a certain specification of the properties of the active articulator undergoing the movement, i.e., the hand must have some configuration. Under this observation, the analysis in (6) entails that the exponent of the plural morpheme must be phonologically attached to a root providing a Handshape in order to be spelled out. In other words, PL is an affix in need of an appropriate (nominal) host.

We contend that there are phonological conditions constraining the set of nouns to which the plural morpheme can attach. That is, there are cases in which the phonological properties of a nominal base N “clash” with the phonological properties attributed to PL in (6). We consider two types of scenarios in which this happens. First, a noun N having a fixed Place of Articulation (POA) cannot undergo sideways reduplication, e.g., if N is articulated at the top of the head, the signer cannot execute arc-like movements with her head towards the ipsilateral side. Second, a noun N cannot undergo sideways reduplication if N has Prosodic Features of its own specifying a movement with a different shape or direction, e.g., if N already involves a thrilled movement, it cannot also undergo an arc-like movement. In short, the phonological properties of the noun need to be compatible with the phonological properties of the affix for affixation to take place.

As we will see below, nouns with very partial specifications of Prosodic Features can host the plural affix. Adapting Pfau & Steinbach’s (2005, 2006) terminology, we will refer to these nouns as having *simple movement*. As Brentari (1998) puts it, simple movements involve PF tiers that branch only once, i.e., there is a single feature specifying the properties of the movement; *complex movements*, on the other hand, have two or more branching nodes specifying further characteristics of the movement. At the phonetic level, simple movements involve a single path movement or local change, while complex movements involve two or more co-occurring path or local (sub)movements (Brentari 1998: 130). This distinction is one of metrical structure:

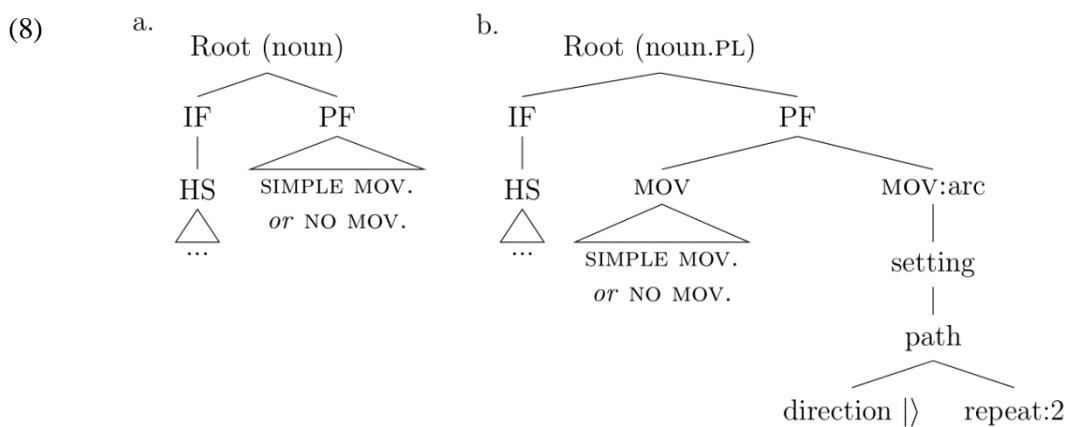
roots with simple movements are equivalent to “light” syllables, while roots with complex movements are equivalent to “heavy” syllables. Thus, the claim here is that phonologically “light” (monosyllabic) nouns can undergo sideways reduplication.

In section 3, we discuss some specific examples of these restrictions based on LSA data. For now, we establish the conditions on plural affixation as in (7).

(7) PHONOLOGICAL CONSTRAINTS ON PLURAL AFFIXATION IN LSA

- a. POA BLOCKS PLURAL AFFIXATION: if the POA features of the relevant Root are specified, PL cannot be attached to that Root.
- b. COMPLEX MOVEMENT BLOCKS PLURAL AFFIXATION: if the PF of the relevant Root determine a complex type of movement, PL cannot be attached to that Root.

Plural affixation to a noun N can occur whenever the constraints in (7a) and (7b) do not apply, i.e., if the noun N is a Root with no POA and simple or no movement. This scenario is schematized in (8), in which (8a) represents the phonological properties of the nominal base, and (8b) the result of attaching the plural morpheme to it. As the representations show, plural affixation involves a phonological process that applies within a single syllable, e.g., if a noun is monosyllabic, the result of applying plural affixation to it is also a monosyllabic word. There is a change, however, on the metrical structure of the resulting form: while (8a) is a “light” syllable, (8b) is a “heavy” syllable.



This pattern of externalization can be attested in the plural noun CHILDREN in (2). As can be seen in this example, sideways reduplication is expressed together with the nominal base, i.e., the exponent of the plural morpheme is realized over the Handshape corresponding to the noun CHILD.

The following subsections develop further important aspects of our proposal.

2.1. *Ipsilateral movement as an epenthetic property*

As discussed, the underlying representation of the plural morpheme in (6) does not contain features stating that the two arc-like movements must proceed towards the ipsilateral side; the same observation applies for the resulting representation in (8). In the Prosodic Model, a change in the POA that obtains through movement is encoded in the *setting* node. In both (4) and (6), *setting* has no specification determining the realization of its dependent node *path*. In other words, the instance of *sideways* reduplication that should result from these underlying representations is not truly “sideways” yet.

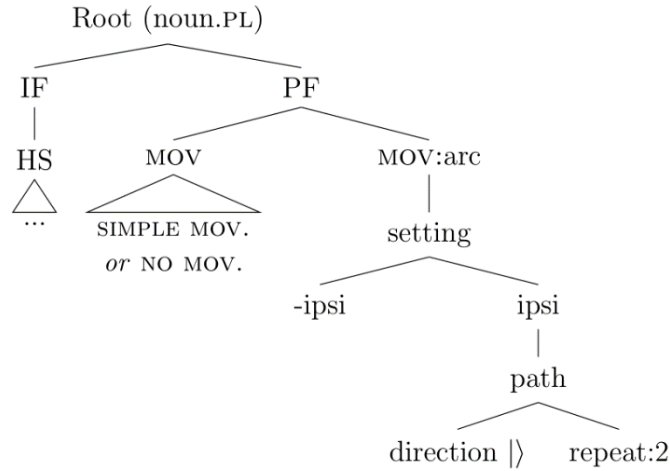
According to Brentari (1998), the *setting* node can receive features by default. In this scenario, *setting* must introduce movements articulated by the shoulder. There are two types of movement that can be realized as default values for *setting*: *contralateral-ipsilateral* or *top-down*. This is formally captured in (9).

(9) ORDERING OF SETTINGS IN THE DEFAULT CASE (Brentari 1998: 153)

When no *setting* order is indicated in the input, the following default settings are used: [contra] will occur before [ipsi], and [top] will occur before [bottom].

The basic intuition is the following. The plural exponent is expressed through two arc-like movements that cannot be realized in the same place. This means that the articulator must move somewhere. Instead of executing random movements, there are two default options: contra-ipsi and top-down. Clearly, the plural morpheme makes use of the alternative in which there is movement in the horizontal plane, towards the ipsilateral side. This is to say that the *setting* features in the phonological representation of the plural noun are merely epenthetic. The result of introducing an epenthetic value to the representation in (8b) is schematized in (10).

(10)



We discuss data supporting this mechanism in section 4. For ease of presentation, we will include the specification of the setting features in the remaining phonological representations of the paper.

2.2. *Handshape insertion*

What about nominal bases that cannot host the plural affix? As discussed, these are nouns in LSA that fit at least one of the descriptions in (7), i.e., (i) nouns with a specified POA or (ii) nouns with complex movements. Do these elements lack a plural form?

We maintain that the phonological system of LSA applies a “last resort” type of mechanism in these cases. Since the plural affix cannot attach to these nouns, a new exponent is inserted in the surface representation to host it. Phonologically, the element in question is a hand configuration, i.e., it consists of a set of Handshape features. We refer to the operation introducing this element as *handshape insertion*.

Our claim is that handshape insertion applies whenever plural affixation is blocked in the sense of (7), i.e., it is an operation triggered by phonological constraints. Under the assumption that the root in (5) is equivalent to a syllable in spoken languages, with PF depicting the properties of the syllabic nucleus, the mechanism of handshape insertion can be taken to be parallel to consonant epenthesis, i.e., consonant insertion. Certain instances of consonant epenthesis have been proposed to apply when there is a consonant slot that needs to be filled but there is no lexically underlying consonant available (Broselow 1995, i.a.). This is roughly, we argue, what happens in LSA: the plural morpheme has no specification for IF, and its PF cannot form a root structure

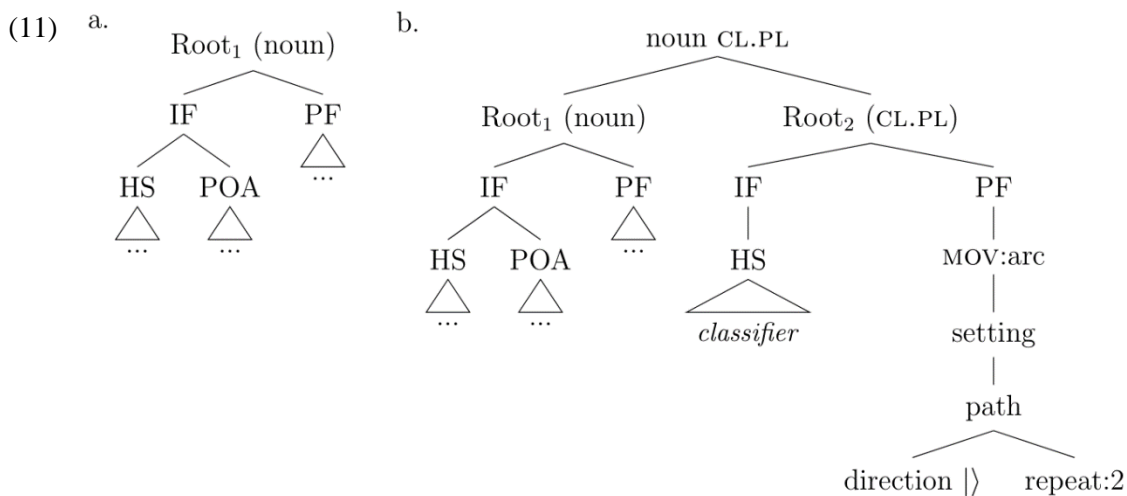
together with the exponent of the lexical noun due to the phonological restrictions in (7); therefore, a set of IF providing a Handshape is introduced to support the PF expressing the plural.

We contend that handshape insertion can only handle sets of Handshape features that already function as units in the language. This means that there is a closed class of signs in LSA providing exponents for the mechanism of handshape insertion. Our assumption is that such class corresponds to the type of element known as *classifier* (Supalla 1986, Zwitserlood 2012). Thus, the observable result of applying handshape insertion in the contexts of (7) is the realization of the plural affix over a classifier.

Classifiers, also known as *depicting handshapes*, constitute a poorly understood grammatical category that is found in most sign languages. Basically, they are morphemic elements that have no specific lexical meaning but establish an iconic relation with a nominal referent by depicting its salient characteristics, e.g., shape, size, function, weight, edges; for instance, the classifier in (4) seemingly represents the size for a prototypical pen. Similar quasi-anaphorical relations hold between classifiers and nouns referring to people, “legged” entities, squarish objects, and so on: the classifier establishes an iconic accordance with perceived properties of a nominal antecedent. Given this behavior, classifiers have been analyzed both as agreement markers (e.g., Glück & Pfau 1998, Zwitserlood 2003, Benedicto & Brentari 2004) or as pronominal forms (e.g., Chang et al. 2005). At the syntactic level, classifiers never occur alone; they are always part of a so-called *classifier constructions*. They typically appear in combination with verbs indicating a referent’s movement through space, although they have also been consistently attested as part of nominal inflections (e.g., Pizzuto & Corazza 1996, Herbert 2018). At the phonological level, classifiers always consist of hand configurations.

While the trigger to apply handshape insertion is purely phonological, we contend that the choice of a specific classifier in a given grammatical context is a matter of morpho-syntactic structure. In other words, phonology dictates when to introduce a classifier, but morpho-syntax determines its shape. The data we discuss in this chapter does not allow us to advance any concrete proposal regarding the latter mechanism, but a preliminary conjecture can be offered. As a working hypothesis, we conceive classifiers as dissociated morphemes in the terminology of Embick (1997) and Embick & Noyer (2001), i.e., as morphemic material that is inserted post-syntactically and reflects structural properties indirectly. Thus, once handshape insertion applies, the form of the corresponding classifier obtains as a function of configurational or featural values in the underlying syntactic representation. We take that an analysis on these lines offers a rationale for the iconic accordance observed between a nominal and its classifier, although much work is still required to advance an explicit proposal.

The basic functioning of handshape insertion is illustrated in (11). Take a noun N that cannot host the plural affix, e.g., N has POA or complex movement; the phonological structure corresponding to N is labelled as *Root₁* in (11a). In order to produce the plural form of N, a proper base for the plural affix must be introduced. Thus, a set of Handshape features corresponding to a classifier is inserted in the phonological representation. Being a hand configuration, the classifier itself consists only of an IF branch. Therefore, when combined with the PF of the plural affix, they form a new root structure, i.e., *Root₂* in (11b). The unit formed by *Root₁* and *Root₂* is basically a dissyllabic plural noun, in which the plural morpheme is realized on the second syllable, i.e., *Root₂*. Thus, handshape insertion has the effect of generating a dissyllabic form from a monosyllabic one.



If this analysis is on the right track, the mechanism of handshape insertion provides an account for the distribution and functioning of a number of classifier forms in LSA. As mentioned, classifiers are ubiquitous elements in sign languages, but there is no consensus on how they should be analyzed; see Zwitterlood (2012) for relevant discussion. According to our proposal, at least a subset of the classifier forms attested in LSA appear in the surface representation to provide Handshape features for functional morphemes that are expressed through movement alone. Thus, the corollary of our proposal is that (at least some) classifiers serve as support units for morpho-phonological processes.

The idea that classifiers may have a support role in the expression of nominal plurality is not totally new. In their discussion of nominal inflection in Italian Sign Language (LIS), Pizzuto & Corazza (1996:185) make very similar observations regarding sideways reduplication.

Nouns articulated on, or close to the signer's body cannot be modified to mark the numerosity inflection in the same manner that is observable in nouns articulated in neutral space: their handshapes cannot be re-located and reduplicated in the signing space, but must retain the same point of articulation they have in

citation form. The use of classifier signs easily overcomes this morphophonological constraint. For example, suppose the signer wishes to express the meaning of ‘many binoculars’. χ BINOCULARS is a noun that can neither be inflected in space, nor undergo the nonmanual numerosity inflection. But a classifier sign can be produced immediately after the noun, and this classifier can be inflected in space for numerosity in the same manner as neutral space nouns can.

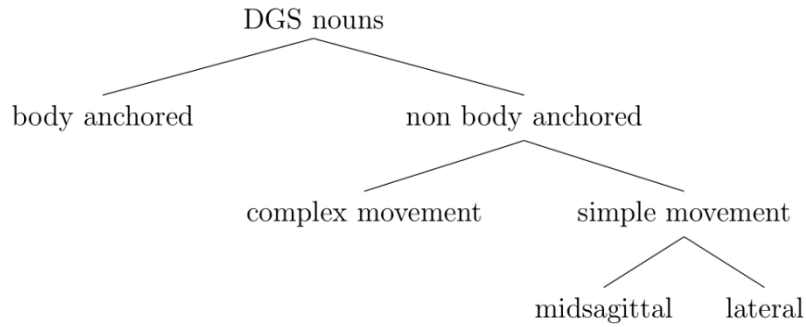
In the following sections, we analyze a number of pluralization patterns attested in LSA. The discussion of the data strongly confirms the theoretical approach advanced throughout this section.

3. A phonological typology of nouns in LSA for the expression of plurals

The data from LSA to be presented throughout this section was gathered by Yanina Boria in collaboration with Carolina Galvez, our consultant from the Argentinian Deaf Community. A comprehensive protocol (Van Herreweghe & Vermeerbergen 2012) consisting of sign language observation, data production, data elicitation, and data review was employed. As a first step in the collection of the data, public access recordings in LSA, dictionaries and virtual applications were consulted; among the dictionaries used are *Diccionario de Lengua de Señas Argentina* (Valasina 1997), *Lengua de Señas Argentina: Análisis y Vocabulario Bilingüe* (Massone & Machado 1992), *LSA en Familia* (Proyecto DANE), and *Señario* (Confederación Argentina de Sordos 2019). A total of 360 nouns (together with their plural forms) was analyzed. From this corpus, 9 representative data points were selected for discussion. Our consultant signed and filmed the singular and plural forms for this reduced sample. These examples were further corroborated by informants from two non-governmental organizations (Círculo de Sordos and Asociación Civil de Artes y Señas).

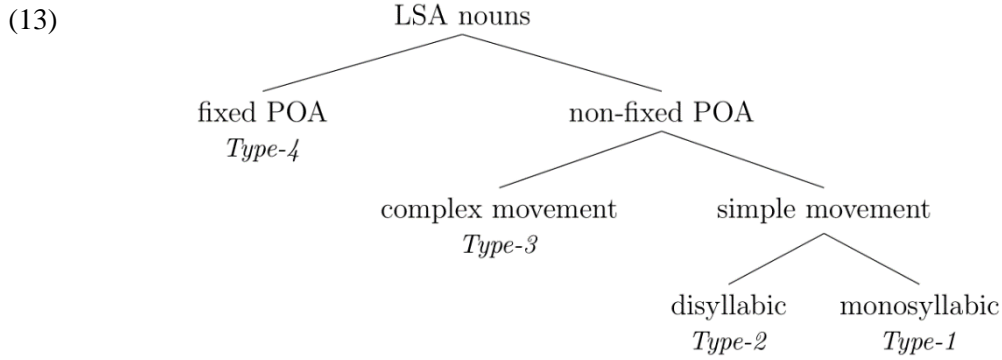
We take as a starting point the work by Pfau & Steinbach (2005, 2006). These authors capture the patterns of externalization of nominal plurality in German Sign Language (DGS) by classifying the nouns in the language according to their phonological properties. They argue that there are two major groups of nouns: nouns that are body-anchored, and nouns that are not body-anchored. The latter classification ramifies into two subgroups depending on the type of movement they involve: nouns with complex movement, and nouns with simple movement. Moreover, nouns with simple movement can be divided into two types depending on their place of articulation: they can be midsagittal or lateral. The scheme in (12) summarizes the typology.

(12)



This classification correlates with distinct pluralization strategies in the language. That is, the plural of body anchored nouns and nouns with complex movement is spelled-out as a null morph, i.e., it receives zero marking. Plural nouns that are articulated in the midsagittal plane are realized as simple reduplication. Finally, Plural nouns with a lateral place of articulation involve sideways reduplication. The availability of distinct exponents for the plural morpheme in DGS together with these strong correspondences suggest an analysis of the pattern in terms of phonologically conditioned allomorphy; this is precisely the approach taken by Pfau & Steinbach. Basically, they propose that the selection of the exponent for the plural morpheme depends on the phonological context in which this element appears.

Our analysis of nominal plurals in LSA follows closely the classification by Pfau & Steinbach (2005, 2006). However, in contrast to these authors, we claim that the plural morpheme in LSA does not exhibit an allomorphic alternation, i.e., the phonological representation in (6) constitutes the only exponent for PL in the language. We contend that all discernible differences in the phonological manifestation of the plural morpheme are mainly due to (i) the mechanism of handshape insertion (see section 2.2), and to a lesser degree to (ii) contexts in which there is no ipsilateral movement epenthesis (in the sense of section 2.1). Our discussion for now will focus on the first factor. As argued, handshape insertion applies depending on the phonological properties of the nominal base to which the plural morpheme needs to be attached. We advance the typology of nouns in (13) to capture the distribution of handshape insertion in LSA.

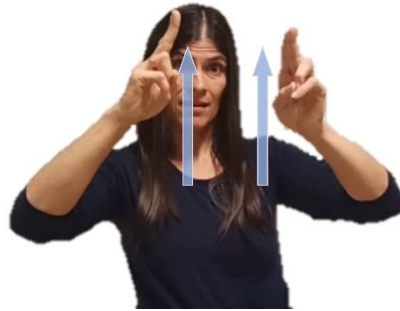


In principle, the classification in (13) looks similar to its DGS counterpart in (12). However, it includes a number of distinctions that can be made on the basis of the Prosodic Model. To begin with, consider nouns classified as Type-1. These are monosyllabic nouns (i.e., they have only one root structure) that involve a Handshape undergoing a simple movement, e.g., a straight path. Nouns pertaining to this class are CHILD, HOUSE, BUILDING, TREE, COIN, BALL, CITY, PIZZA, TABLE, PLATE, among many others; in our corpus, 104 of the 360 nouns collected belong to this class. The functioning of Type-1 nouns is firstly illustrated with the noun CHILD in (1). As can be seen in (14), the underlying phonological representation of CHILD is just a Handshape; it has no POA or PF. The top-bottom movement attested in (1) is a “by default” realization of the PF tier in the quotation form of the sign; this follows the rule for epenthetic movement in (9). We take that epenthetic movements like this one are always simple straight movements in LSA, just as Brentari (1998: 131) proposes for American Sign Language (ASL). Since straight movements are assumed to be the “default” type of movement in LSA, they do not need to be specified in the underlying representation of the root.



Many nouns pertaining to Type-1 do not involve an epenthetic movement. In contrast to CHILD, the underlying phonological form of a noun like BUILDING does partially specify Prosodic Features. As (15) shows, BUILDING involves a simple bottom-top movement. In this case, such movement is an invariable part of the phonological realization of the noun in all contexts, and therefore it does not display a “by default” realization in its quotation form.

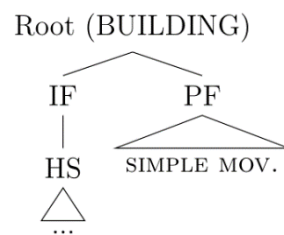
(15)



BUILDING.SG

For concreteness, we assume that this movement depends on the specification of a single node in the PF tier, i.e., setting, and that the rest of the PF branch remains “free”; as discussed earlier, the result of this sort of specification is a simple movement. For ease of presentation, we label the underlying PF branches of nominal roots as having simple or complex movements instead of offering a complete phonological description for each sign.

(16)



No matter they have simple movement due to epenthesis or lexical properties, all Type-1 forms are monosyllabic nouns with no POA, i.e., they have no fixed place of articulation.

Type-2 nouns also lack POA features and exhibit simple movements. What distinguishes them from Type-1 nouns is that they are disyllabic, i.e., they involve the conjunction of two root structures. Nouns pertaining to this class are BOOK, CAR, PEA, FRUIT, SHIP, BICYCLE, GARLIC, among many others; in total, 95 of the 360 nouns collected belong to Type-2. As examples of this class, consider BOOK and BICYCLE in (17) and (18), respectively.

(17)



BOOK.SG

(18)



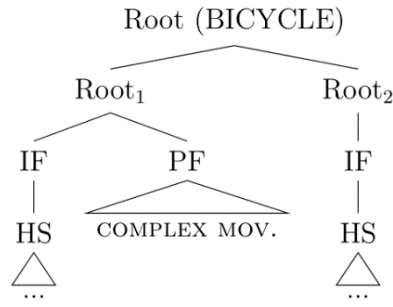
BICYCLE.SG

As the schematic description in (19) shows, these nouns have two roots, i.e., *Root*₁ and *Root*₂, each of them with their own phonological properties. In both cases, *Root*₁ is specified for Handshape, POA and complex movement.¹ *Root*₂, on the other hand, has only Handshape features; therefore, the movement in *Root*₂ is an epenthetic simple movement. As can be seen, these nouns are classified as Type-2 due to the properties of *root*₂, which exhibits simple movement and no POA, just like monosyllabic nouns of Type-1.²

¹ We take BOOK to involve two roots, one involving complex movement, i.e., the first two captures in (17), and one with simple movement, i.e., the last capture in (17). However, a potential analysis in terms of three roots with simple movement could also be possible. Further research in the phonology of LSA is needed to better establish a method for syllable separation and a language specific metric for simple/complex movement. The issue does not alter any significant aspect of the analysis.

² Type-2 includes many nouns with complex morphological structure, i.e., nouns that obtain through derivation or composition. For instance, BICYCLE seems to be a deverbal noun; its second syllable is a classifier that seemingly has a nominalizing function. Further research on the morphological structure of nouns in LSA is needed to provide a better characterization of the internal structure of these signs.

(19)



Just like elements of Type-1 and Type-2, nouns pertaining to Type-3 do not have a fixed place of articulation. What distinguishes Type-3 nouns is that their final (and in most cases only) root exhibits complex movements, i.e., movements involving parallel submovements. This is the class in the typology of (13) with the least number of samples within our corpus: only 5 nouns from a total of 360. These are BOX, DONUT, MOTORBIKE, TRUCK and FURNITURE. The functioning of Type-3 nouns is exemplified with BOX in (20).

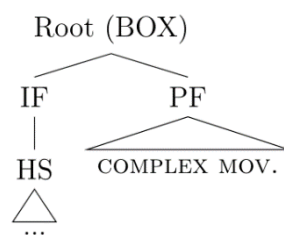
(20)



BOX.SG

As can be seen, this noun has Handshape features in both articulators, and undergoes a change of configuration and arm-movement in both of them. This is summarized in (21) as involving complex movement.

(21)



Nouns pertaining to Type-4 are the only ones in our typology that are specified for POA features in their underlying phonological representation; this means that they are fixed to a certain place of articulation. In our

corpus, a total of 161 nouns was classified as Type-4 forms; NOSE, DEER, PENCIL, STOMACH, APPLE, EYE-BROW, PARROT, (COCHLEAR) IMPLANT and RABBIT are some examples of this class. Consider the case of NOSE in (22), which is invariably articulated on the nose.

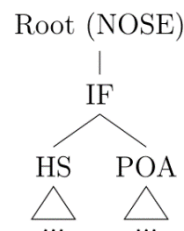
(22)



NOSE.SG

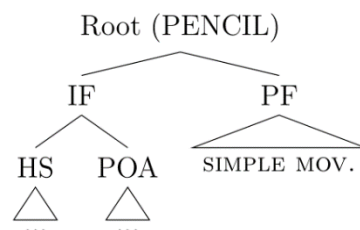
As illustrated in (23), this noun is phonologically composed by Handshape and POA, but lacks a specification for PF, i.e., it involves no movement at all.

(23)



Type-4 nouns can display simple movement within their own place of articulation. This is the case of PENCIL, illustrated in (3). In this example, the noun incorporates a local movement towards the chin. This is codified as simple movement in the root structure of (24).

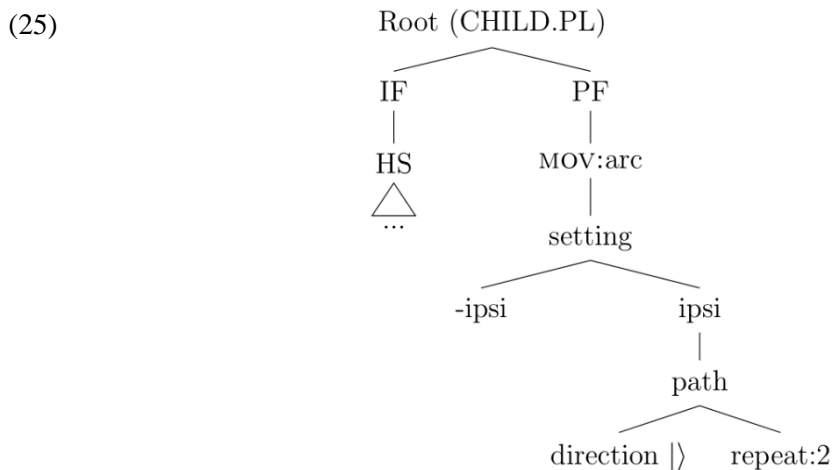
(24)



We contend that the typology advanced in (13) allows to predict the distribution of handshape insertion in LSA, just like Pfau & Steinbach's classification in (12) captures the patterns of allomorphy in DGS.

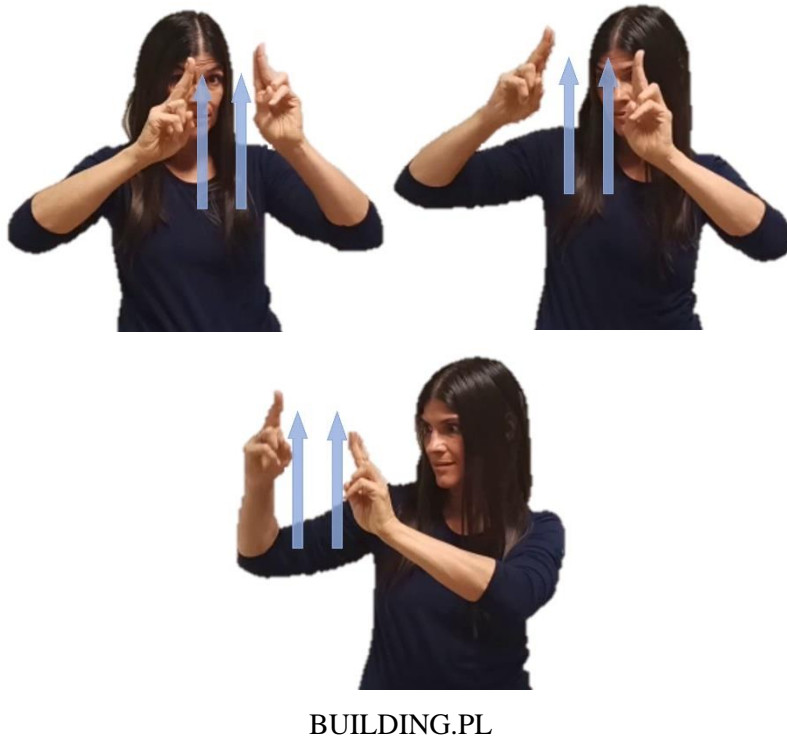
Basically, we observe that LSA nouns pertaining to Type-1 and Type-2 can host a plural affix without the need of introducing a classifier. Nouns of Type-3 and Type-4, on the other hand, trigger handshape insertion. As discussed earlier, this follows from the constraints on plural affixation in (7). That is, a hand configuration is needed if the nominal base cannot host the plural affix. The exponent of the plural affix is a complex type of movement that needs to apply over a Handshape; if the phonological properties of the noun do not allow this exponent to be expressed, e.g., in virtue of having a fixed place of articulation (7a), or because the noun already exhibits a complex sort of movement (7b), plural affixation cannot take place. Thus, nouns of Type-3 and Type-4 are predicted to require a classifier to surface as plural nouns.

Consider first the Type-1 noun CHILD, already discussed in (14). As said, the underlying phonological representation of CHILD consists only of Handshape features; this element has no POA nor PF. Thus, the conditions in (7) do not apply to it and, therefore, plural affixation can take place. This prediction is borne out in (2), where the plural affix is realized over a single root together with the nominal base. The following scheme describes the resulting form.



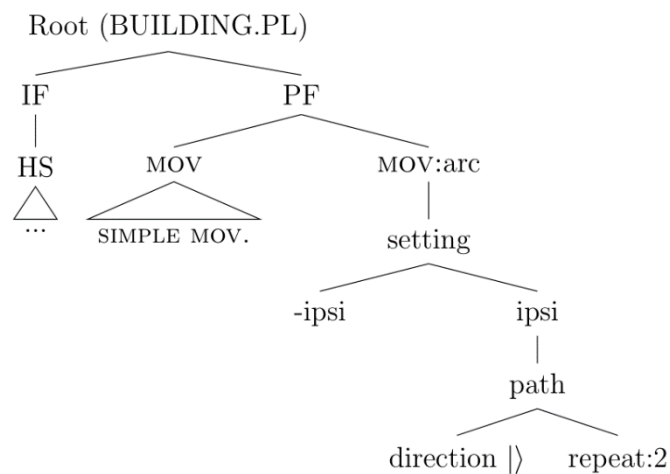
The same behavior is observed with nouns of Type-1 that are specified for simple movement in the PF tier. This is the case of BUILDING. As can be seen in (26), the plural form of this noun involves sideways reduplication of its nominal base.

(26)



As this example shows, the plural exponent can be realized together with other movements as long as these are simple movements. Thus, we confirm that the restriction in (7b) is on the right track, and that metrical weight is a key factor governing plural affixation in LSA. The representation in (27) summarizes the analysis.

(27)



Type-2 nouns also allow for direct plural affixation. By comparing the plural forms of BOOK and BICYCLE in (28) and (29) with their singular counterparts in (17) and (18), it is possible to observe that the material undergoing sideways reduplication is the final part of the nominal base.

(28)



BOOK.PL

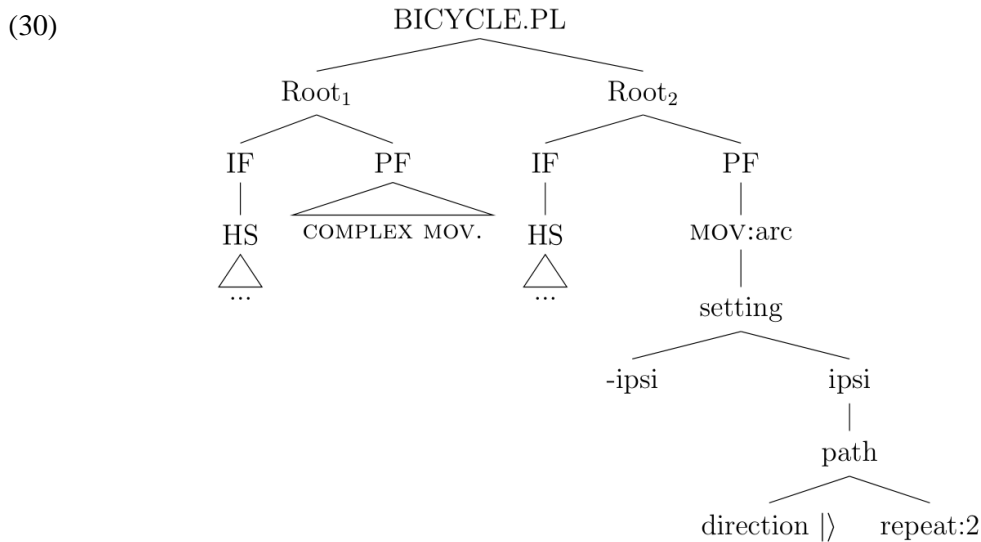
(29)



BICYCLE.PL

This scenario is predicted by our analysis. As discussed, Type-2 nouns are disyllabic in the sense that they are composed of two root structures, $Root_1$ and $Root_2$. As pointed out in (19), $Root_2$ consists of Handshape features

only and, therefore, can host the plural affix. The examples in (28) and (29) confirm this prediction. The result is the phonological representation sketched in (30).



In a nutshell, plural affixation with both Type-1 and Type-2 nouns is a phonological process that applies to “light” syllables. The result is a “heavy” syllable exhibiting complex movement. In both cases, the plural form of the noun has the same number of syllables as its singular counterpart.

Nouns pertaining to Type-3 cannot host the plural affix. As discussed with respect to BOX in (21), these nouns have a PF specification that determines a complex movement. Consequently, they fit the constraint in (7b), and reject plural affixation. The ungrammaticality of plural affixation to Type-3 nouns is exemplified in (31) with what would be the plural form of BOX. If plural affixation was possible in this case, the plural BOXES should be realized as a sequence of complex movements that move towards the ipsilateral side. This is considered unacceptable by LSA speakers.

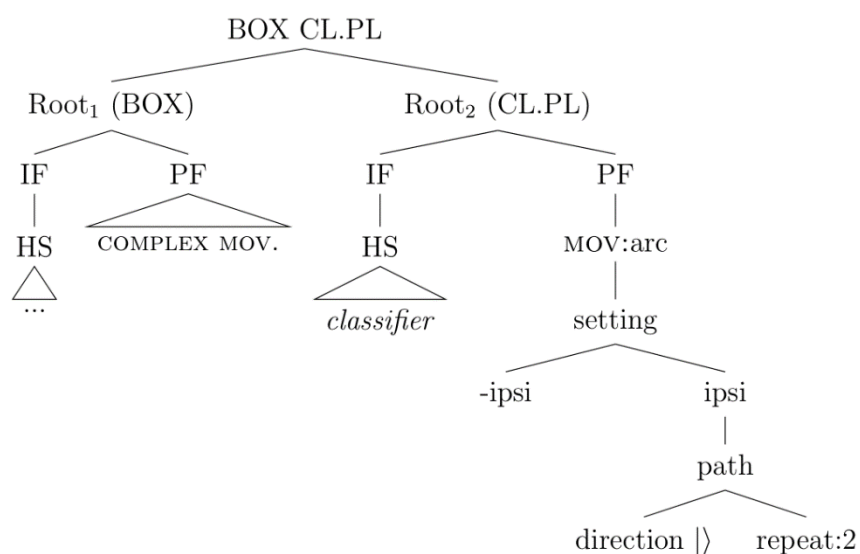
(31)



*BOX.PL

The grammatical way to construct the plural form of BOX is through handshape insertion. That is, since the plural morpheme cannot attach to BOX due to the restriction in (7b), a set of Handshape features needs to be inserted in the phonological representation to host the plural. By introducing a Handshape, the classifier makes available a new root structure that has no POA nor complex movements, i.e., it is a “light” syllable. The plural affix attaches to this new root and converts it into a “heavy” syllable with complex movement.

(32)



The resulting plural form for BOX is exemplified in (33). As can be seen, the plural exponent is spelled-out on a (two-handed) classifier consisting only of Handshape features.

(33)



BOX CL.PL

Nouns pertaining to Type-4 also require handshape insertion. As discussed regarding the nouns NOSE in (3) and PENCIL in (22), Type-4 nouns have POA features, i.e., they have a fixed place of articulation. Thus, according to the constraint in (7a), they cannot host the plural affix. This restriction is exemplified in (34) and (35) with the ungrammatical forms that obtain from directly attaching the plural affix to NOSE and PENCIL. As can be seen, these forms would require moving the whole place of articulation (nose or chin, respectively) towards the ipsilateral side. LSA speakers find these realizations strongly unacceptable.

(34)



*NOSE.PL

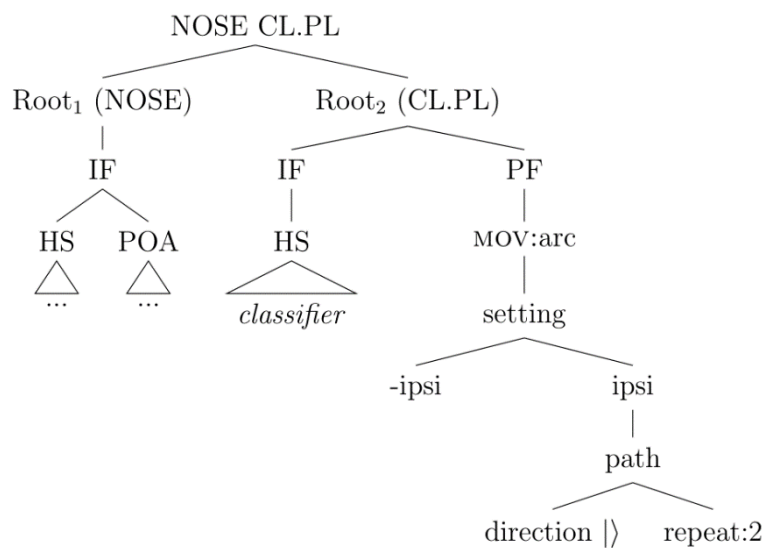
(35)



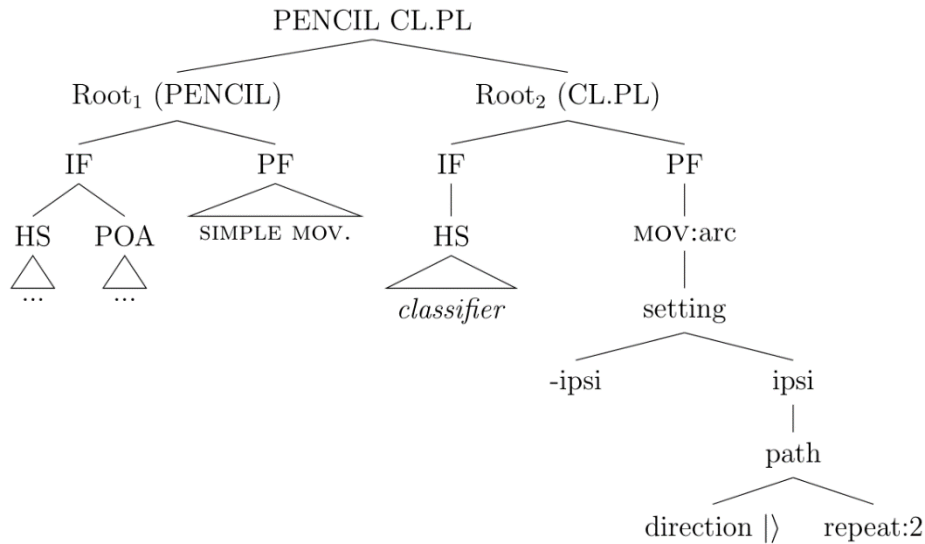
*PENCIL.PL

The adequate plural forms of these nouns require inserting a hand configuration to host the plural affix. This process applies just as described for Type-3 nouns. That is, the classifier provides a Handshape over which the movement corresponding to the plural affix can be expressed. The corresponding phonological representation for these plural forms is sketched in (36) and (37).

(36)

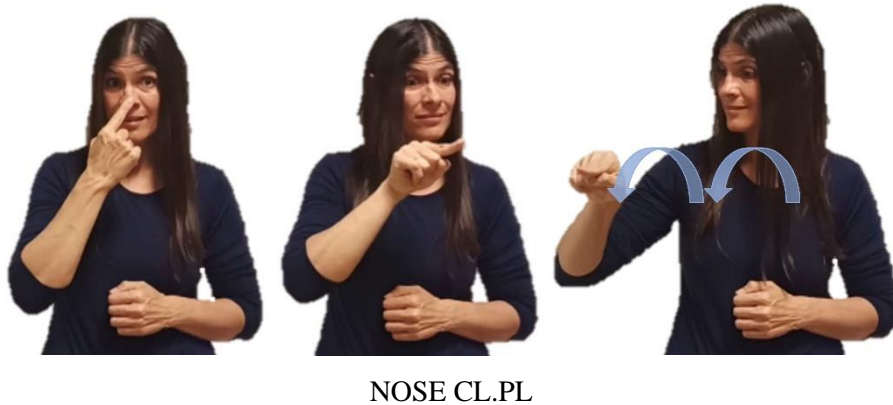


(37)



Thus, the acceptable plural forms for NOSES and PENCILS must involve classifiers, just as shown in (38) and (4), respectively.

(38)



There are two main conclusions that can be drawn from this analysis. First, the alternation between distinct forms of pluralization in LSA depends on the phonological properties of the nominal base; this is in line with Pfau & Steinbach's (2005, 2006) proposals for DGS. Second, the variants in the realization of nominal plurality in LSA do not involve allomorphy. As seen, the exponent for the plural morpheme always remains the same, i.e., it has the phonological properties described in (6). This contrasts sharply with the behavior of nominal plurality in DGS, which, in principle, does seem to involve allomorphic variants.³

³ Under this analogy, our proposal resembles the hypothesis that the vowel *-e* found in Spanish pairs such as *flor* 'flower' vs. *flores* 'flowers' is epenthetic (e.g., Harris 1980). According to this analysis, *-s* and *-es* are not allomorphs. Instead, *-s* is

A final qualification is in order. All the examples discussed in this paper belong to the *native lexicon* of LSA; no systematic analysis of items pertaining to the *non-native lexicon* was conducted. As is known, the relevant difference between these is that the items from the non-native lexicon are constructed with phonological features that are not part of the language (e.g., the manual alphabet); see Brentari (1998) and Padden (1998) for relevant discussion. Our corpus had only 5 nouns that belong to non-native lexicon: BREAD, ZOO, BAR, CLUB, DAY. In all these cases, the plural forms are formed through handshape insertion.

4. More on the epenthetic nature of ipsilateral movement

As discussed in section 2, the underlying phonological representation of the plural morpheme does not specify features for sideways movement. That is, the schematic structure in (6) requires (i) that the exponent of plural must move in the shape of an arc, (ii) that this movement must be repeated twice, and (iii) that the repetitions do not take place in the same location; the “sideways” aspect of this movement, i.e., the fact that it proceeds from the contralateral towards the ipsilateral side, was argued to be epenthetic. In this section, we present some patterns supporting this characterization.

Authors like Brentari (1998) and Geraci (2009) have extensively argued that movement epenthesis is a standard trait of sign languages. In ASL, for instance, Brentari (1998) observes that certain verbs display path movement in their quotation form but lose this movement when forming a compound sign. She interprets this pattern as involving a “by default” movement in the quotation form. Her rationale is schematized in (39).

- (39)
- a. A sign requires movement to be well-formed (just like a syllable requires a nucleus).
 - b. Some signs have no underlying specification for movement; when they are uttered in isolation, they are spelled-out with epenthetic movement.
 - c. These signs might not require movement epenthesis in certain contexts; this is the case of compounding in ASL, as the resulting compound is already specified for movement.

An analogous reasoning led us to propose that the ipsilateral movement displayed by the plural affix in LSA is epenthetic. That is, there are grammatical contexts in which the plural is realized as arc movements that do not

the only plural exponent in both cases, while *-e* is inserted due to requirements of syllabic structure. Obvious differences aside, our analysis follows a parallel line of reasoning.

develop towards the ipsilateral side. Following the logic depicted in (39), this means that the “ipsilaterality” of sideways reduplication is a “by default” value.

Evidence for this claim comes from cases in which the plural noun is accompanied by a locative modifier. In these scenarios, the locative is instantiated by a prenominal sign that is spelled-out in a certain place of articulation. The setting features corresponding to the plural noun are restricted to that place of articulation, in such a way that the arc movements of the plural morpheme must be realized within it. In other words, the locative specifies a signing space for the noun, either in its singular or plural forms.

Consider the following example based on the behavior of the noun HOUSE.

(40)



HOUSE.SG

HOUSE is a noun of Type-1, i.e., it is a monosyllabic word that can host the plural affix without the need of introducing a classifier. As can be seen in (41), the plural form of this noun exhibits sideways reduplication with ipsilateral (epenthetic) movement.

(41)



HOUSE.PL

However, this realization is very different if the plural NP is modified by a locative. Consider the example in (42), which translates as ‘the house is in the mountain’. As can be seen, the place of articulation introduced by the locative MOUNTAIN becomes the signing space for the noun; in particular, the reduplication pattern of the plural morpheme does not involve movement towards the ipsilateral side in this case, but a series of arches

within the designated place of articulation. Pfau & Steinbach (2005, 2006) refer to this type of realization as *random reduplication*.

(42)



MOUNTAIN IX.ADV HOUSE.PL

This sort of pattern is attested with nouns pertaining to any of the four classes depicted in (13). Plural forms that require handshape insertion behave much in the same way as HOUSE in (40). Consider as a further example the case of COOKIE in (43). This is a noun classified as Type-4, i.e., it has a fixed place of articulation in the chin area (and also displays a short simple movement).

(43)



COOKIE.SG

As a Type-4 noun, its plural form COOKIES requires a classifier; the example in (44) shows how the classifier undergoes sideways reduplication.

(44)



COOKIE CL.PL

However, if the locative PLATE modifies the noun COOKIES, e.g., as in ‘cookies on a plate’, the movement of the classifier carrying the plural morpheme is constrained to the signing space depicted by PLATE, and it does not proceed towards the ipsilateral side.

(45)



PLATE IX.ADV COOKIE CL.PL

This type of phenomenon is standard for sign languages. As observed by Quer et al. (2017), the viso-gestual modality allows to mark location features on nouns; if the location is not part of the quotation form of the noun, the noun is realized with a location “by default”. Our proposal is that the exteriorization of nominal plurality in LSA follows the same logic: the movement of the plural morpheme is ipsilateral unless the noun displays some location.

5. Concluding remarks

In this chapter, we have advanced an analysis of the functioning of nominal plurality in LSA. We have argued that the plural morpheme in this language behaves as an affix, in the sense that it needs a nominal base to be spelled out. The plural has only one exponent, which is expressed as repetitions of an arched movement carrying over the noun. All remaining variation in how plural nouns are exteriorized lies on two phonological mechanisms: handshape insertion and movement epenthesis.

We conceive handshape insertion as a rescue operation that applies in the phonological component. It applies whenever a plural affix is phonologically incompatible with the nominal base. In these scenarios, a classifier,

i.e., a sign consisting of Handshape features only, appears to provide a configuration for the articulator undergoing plural movement. We further advanced a typology of nouns in LSA based on the phonological properties that trigger handshape insertion.

We have also argued that the “sideways” directionality of the plural morpheme is a “by default” option in LSA that is not part of the underlying phonological representation of the plural morpheme. This follows from the observation that plural nouns do not display ipsilateral movement in contexts in which they have locative modifiers.

While this chapter provides a rather explicit approach to the morpho-phonology of nominal plurality in LSA, significant work is still needed in this area. We hope that this paper contributes to encourage further research on the grammar of sign languages spoken in Latin America.

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Acknowledgements

We would like to thank *Círculo de Sordos* and *Asociación Civil de Artes y Señas* for their collaboration and support during this research. Usual disclaimers apply. Carlos Muñoz Pérez acknowledges financial support from ANID/FONDECYT project 3190813.