The Syntax of Null Subject in French Sign Language (LSF)

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Abstract

The typology of subject omission in simple declarative sentences ranges from languages that simply do not allow it like English and French to languages that allow it as long as it a minimum degree of topicality is guaranteed like Chinese and Japanese. In between there are various languages in which subject omission is licensed, for example by rich agreement like in Italian and Spanish, or by a particular set of grammatical features like first and second person in Finnish, or tense like in Hebrew. In other languages subject omission is only limited to expletive sentences like in German. This rich typology observed in spoken languages is also attested across sign languages, with one important exception: there is no known sign language disallowing subject omission categorically. The goals of this paper are twofold: first, we apply syntactic and semantic tests to assess the boundaries of subject omission in French Sign Language and characterize it within the typology; second, we discuss in light of some particular aspects of grammars in the visual modality this apparent anomaly of sign languages.

Keywords: Null subject, Sign Language, LSF, Radical pro-drop, Body as subject.

1 Introduction

The phenomenon of subject omission is quite easy to illustrate in its basic properties: given the right context, some languages allow for the subject of a simple declarative sentence with a finite verb to remain unexpressed, while others must categorically express it with an overt pronoun. The prototypical contrast is offered by the Italian and English examples in (1). While subjects can remain unexpressed in Italian (1a), they must be overtly realized in English (1b).

(1) a. *Italian*

A: E Gianni?

B′. __ è in ritardo di cinque minuti.

B″. ? Lui è in ritardo di cinque minuti.

b. *English*

A: What about John?

B′. * __ is five minutes late.

B″. He's five minutes late.

Subject omission is widely attested in sign languages (Quer et al. 2017), documented both in fieldwork studies (Koulidobrova 2017; Lillo-Martin 1986; Neidle et al. 2000 for American SL (ASL), Zwitserlood and Van Gijn 2006 for SL of the Netherlands (NGT), Kimmelman 2018 for Russian SL (RSL), Kayabasi et al. 2020 for Turkish SL (TİD), Sze 2000 for Honk Kong SL (HKSL)) and in corpus studies (Wulf et al. 2002 for ASL, McKee et al. 2011 for Australian SL (AUSLAN) and New Zealand SL (NZSL), Santoro et al. 2016 for Italian SL (LIS) and Oomen and Kimmelman 2019 for RSL and German SL (DGS)).[1] It has been studied both using tests and categories normally used to study null subjects in spoken languages (i.a. Koulidobrova 2017) and using characteristics and properties that are unique to the sign modality, such as the use of the signer's body as expression of the agent/subject (Meir et al. 2007).

Needless to say, subject omission has been the core of a wide and deep theoretical investigation on spoken languages, at least from Rizzi's (1982; 1986) seminal works which offered a first systematic account of the phenomenon and its relations with other grammatical properties like rich agreement, subject inversion and the *that*-trace effect. For an extensive review of the debate about null subject in spoken languages see Biberauer et al. (2010); Camacho (2013); Cognola and Casalicchio (2018); D'Alessandro (2015).

In this paper, we document and characterize for the first time subject omission in French Sign Language (LSF) and study whether the phenomenon correlates with the cluster of prop-

[1] See Abbreviations and glossing conventions for all abbreviations and notation conventions.

erties that characterizes well-described null subject languages. In doing so, we also discuss the validity of the various diagnostic tests that have been proposed for spoken languages when applied to sign languages, trying to uncover similarities and differences between the two modalities. This will lead us to offer new insights on how and why certain diagnostics identiying null subjects are better suited for SLs than others. The paper is organized as follow: Section 2 reviews the typology of subject omission in sign and spoken languages. Section 3 offers an overview of the crucial diagnostics to identify and categorize subject omission. These diagnostics are then used to describe the pattern of subject omission in LSF (Section 4). We then discuss subject omission in sign languages within a broader typological perspective (Section 5). Section 6 concludes the paper.

2 The typology of (subject) argument drop

Despite the simplicity of the illustrative examples in (1), subject omission is far from being a trivial aspect of grammar across languages. On the one hand, the possibility of omitting the subject is not always a categorical property, since there are languages like German and Dutch, or Finnish and Hebrew, where the subject can remain unexpressed only under certain conditions, while it must be overt in others. On the other hand, there are clear differences even among languages that can largely drop the subject concerning the extension of the phenomenon. In particular, while so-called radical pro-drop languages like Chinese can omit the object alongside with the subject, object drop is much more constrained in consistent pro-drop languages like Italian. Recently, Koulidobrova (2017) proposed that American Sign Language (ASL) instantiates a specific type of grammar that shares with radical pro-drop languages the possibility of omitting both subject and object but where argument omission displays the features of a special type of NP ellipsis. The full typology of language variation concerning argument omission, going from languages that do not allow subject drop at all to languages that do so across the board is given in Table 1. In the use intended here, the term *pro-drop* uniformly identifies the possibility of leaving a pronominal subject unexpressed.[2] For spoken languages we indicate one language per type for illustrative purposes, while we report all the sign languages for which

[2]A note on terminology. From its first identification in modern linguistics in the early Seventies, subject omission and its properties have been named in various ways. We refer to D'Alessandro (2015) for a complete discussion of the terminology. In this paper, we use subject omission, subject-drop, pro-drop as equivalent terms to indicate the fact that the subject of a clause with finite temporal inflection is omitted.

null subject has been investigated.

	Non pro-drop	**Expletive pro-drop**	**Partial pro-drop**		**Consistent pro-drop**	**Radical pro-drop**	
			Person restr.	*Tense restr.*		*Topic-drop*	*Ellipsis*
SpL	English	German	Finnish	Hebrew	Italian	Chinese	Japanese
SL			DGS, RSL		ASL, LIS, NGT	ASL, AUSLAN, LIS, NZSL TİD NGT	ASL

Table 1: Typology of subject omission in spoken languages. Columns indicate language types; lines indicate language modality (SpL = Spoken languages, SL= Sign Language).

Notice that a number of sign languages are reported as being both of the consistent and of the radical pro-drop type. This double categorization depends either from a disagreement among scholars, or on an alleged double nature of subject omission in a given language. We shall go back on this point in Section 3.

An important consideration can be drawn from the classification in Table 1. While there are spoken languages attested in each slot of the typology, the sign languages described so far all appear to allow subjects (and objects) to remain unexpressed. Of course, the number of documented sign languages is a small fraction when compared to that of spoken languages, still the fact that no sign language falls in the non pro-drop or in the expletive pro-drop category is quite striking.

We shall go back to this important typological gap at the end of article, after having described subject omission data in LSF. Before going there, let us briefly summarize the key properties associated to the various types of (non) pro-drop languages in the two modalities. The examples that we use to illustrate the various types will constitute the baseline for the description of subject omission in LSF.

Non pro-drop languages include French, English, Swedish and Sindhi among many others (D'Alessandro 2015). Subject omission is never allowed and leads to ungrammaticality in these languages. This holds true for expletive subjects (2a), first (and second) person subjects (2b) and third person subjects both in main (2c) and subordinate clauses (2d), as illustrated in French below.

(2) **Obligatory subject in French**

a. *(Il) pleut.
(EXPL.) rains
'It rains.'

b. Je suis fatiguée. *(J') ai besoin de vacances.
I am tired. *(I) AUX need some holidays
'I am tired. I need some holidays.'

c. J'ai vu Pierre. *(Il) mangeait une glace.
I AUX saw Pierre. *(He) was eating an icecream
'I saw Pierre. He was eating an icecream.

d. Pierre pense que *(ll$_{Pierre}$) part demain.
Pierre think that *(he) leave tomorrow
'Pierre thinks that he is going to leave tomorrow.'

As we just mentioned above, there are no known sign languages within this category.

Expletive pro-drop languages allow only expletive subjects to remain unexpressed under certain conditions, while any other type of subject omission is not allowed. German, some varieties of Dutch and Afrikaans, Cape Verdean, Berbice, Kriyol, Mauritian among other languages belong to this category (for a discussion see Biberauer et al. 2010). This typology is illustrated in (3) for German.

(3) **Null expletive subjects in German** (Cardinaletti 1990)

a. Gestern wurde (*es) getanzt.
Yesterday was (it) dances.
'Yesterday there was dancing.'

b. Gestern wurde (*es) geschlossen.
Yesterday was (it) closed.
'Yesterday it was closed.'

As far as we know, there is no description ascribing any sign language to this typology either.

In *partial pro-dop languages*, subjects can be optionally omitted under some grammatically determined conditions. This is the case for Finnish, first described by (Holmberg 2005), where only first and second person but not third person subjects can be omitted (4). This is also the case in Hebrew, where the omissibility of the subject depends on tense marking (see also Russian, Icelantic, Marathi and Brazilian Portuguese (for a discussion see Biberauer et al. 2010).

(4) **Null subjects in Finnish** (Holmberg 2005: 539)

a. (Minä) puhun englantia.
I speak-1SG English
'I speak English.'

b. (Sinä) puhut englantia
You speak-2SG English
'You speak English.'

c. *(Hän) puhuu englantia
He/She speak-3SG English
'He/she speaks English.'

d. (Me) puhumme englantia
We speak-1PL English
'We speak English.'

e. (Te) puhutte englantia
You speak-2PL English
'You speak English.'

f. *(He) puhuvat englantia
They speak-3PL English
'They speak English.'

Whether there are sign languages exhibiting this pattern of subject omission depends on the interpretation to be given to the phenomenon of agreement. We shall discuss this issue in details in the next section. As a matter of fact, a number of documented sign languages allow for argument omission only with a certain class of verbs, but not with others. As such, they might qualify as partial pro-drop languages, in that omission is only possible under some grammatically determined conditions.

Recently, Oomen and Kimmelman (2019) reported that DGS and RSL show some similarity to the Finnish type just illustrated, in that with plain verbs (i.e. verbs that do not vary in their morphological shape: see below, Section 3.1) they only allow omitted subjects to be interpreted as first person. This particular pattern is due, they claim, by the fact that plain verbs are articulated with the hand next to some location of the signer's body. Following Meir et al. (2007), they analyze the signer's body itself as an instantiation of the subject, which in turn provides the first person interpretation. Although it is not currently clear whether the body of the signer in these cases should be analyzed as a special overt type of pronoun or as a particular type of inflection, the fact remains that in DGS and RSL an overt pointing pronoun can be omitted only if it is interpreted as first person with plain verbs. We shall go back to this important issue of how to interpret the 'body as signer' and the possible consequences that this

entails for the typology of sign languages as pro-drop languages in Section 5 below.

Consistent pro-drop languages typically display a rich morphological inflection, with a differentiated marking for each singular and plural persons. They allow subjects to be omitted throughout the paradigm. This type is illustrated in (5) with Italian. This category of languages includes among others Greek, Turkish, Arabic, Hausa, Basque, Berber and all Romance languages except French (D'Alessandro 2015).

(5) **Null subjects in Italian**

a. __ mangio
'I eat'

b. __ mangi
'You eat'

c. __ mangia
's/he/it eats'

d. __ mangiamo
'We eat'

e. __ mangiate
'You eat'

f. __ mangiano
'They eat'

(6) __ mi hanno rubato la macchina.
__ to me AUX.3p.pl. steal the car
'Someone stole my car.'

Turning to sign languages, a number of them has been described as consistent pro-drop languages, Catalan SL being an example.

(7) **Null subjects in Catalan SL** (Quer et al. 2017: 348)

a. WASHINGTON IX$_a$ BRISTOL IX$_b$ $_a$MOVE-HOME$_b$
'He moved from Washington to Bristol.'

b. ARRIVE$_a$ EARLY
'She arrived (there) early.'

In *radical pro-drop languages*, both subject and object omission is possible insofar the omitted argument represents the topic of the sentence. Omission of topic arguments is possible both in main and subordinate sentences as shown in Mandarin Chinese in (8b) and (8c), respectively. Several other Asian languages besides Chinese, like Japanese, Korean, Thai and Vietnamese are of this type (Biberauer et al. 2010).

(8) **Argument omission in Chinese** (Huang 1984: 533)

Speaker A:

Zhangsan kanjian Lisi le ma.
Zhangsan see Lisi LE Q

'Did Zhangsan see Lisi?'

Speaker B:

a. ta kanjian ta le
He see he LE
'He saw him.'

b. ___ kanjian ___ le
see LE
'(He) saw (him).'

c. wo cai [___ kanjian ___ le]
I guess see LE
'I guess (he) saw (him).'

As for sign languages, TİD has been described as belonging to this type (Kayabasi et al. 2020). The relevant examples are illustrated below.

(9) **Argument omission in Turkish SL** (Kayabasi et al. 2020: 377, 381)

a. WOMAN$_a$ MAN$_b$ $_a$SEE$_b$ ___ ___ $_a$ASK$_b$
'The woman saw the man. (She) asked (him) a question.'

b. GÜL LAST WEEK BODRUM GO. LOT SWIM
'Gül went to Bodrum last week. (She) swam a lot.'

Finally, among radical pro-drop languages, *ellipsis drop languages* allow argument omission as a special case of ellipsis, which is only possible with bare NPs. This phenomenon is illustrated by the Japanese example in (10) and the ASL example in (11).

(10) **Argument omission in Japanese** (Takahashi 2006: 1)

Taroo-wa Hanako-ni __ sono syoku-ni __ suisensuru to itta.
Taroo-Top Hanako-to __ that position-to __ recommend that said

'Taroo told Hanako that (he) would recommend (her) for that position.'

(11) **Argument omission in ASL** (Koulidobrova 2017: 399)

Signer A: JOHN$_a$ MARY$_b$ PAPER $_a$SEND$_b$

'Did John send Mary the paper?'

Signer B: YES, __ EMAIL __

'Yes, he e-mailed it to her.'

As appears clear from this brief survey, one reason why argument omission and in particular subject omission triggered so much interest in the field of linguistics is because it provides a clear criterion for typological classification. Languages can be easily categorized based on what type of omission they allow for. Interestingly, this typological classification appears to extend to sign languages, which distribute across a number of different categories along this dimension. There is however an important exception: no sign language to the best of our knowledge disallows subject omission. We shall go back on this typological anomaly at the end of the paper, after our analysis of LSF.

3 On the properties associated to different types of subject omission

The different types of subject omission that we have just described systematically correlate with other properties, that can thus be used to determine the typology of the phenomenon in any given language.

As for consistent pro-drop, in addition to rich agreement, other proprieties that appear to cluster with subject omission are: the possibility of omitting non-thematic subjects (i.e., null expletives), the absence of that-trace effect, and the possibility of having post-verbal subjects. The fact that these properties are superficially unrelated is what makes their clustering of theoretical relevance. The exact explanation of how and why these properties are related at a deeper level in a given formal analysis is not of particular concern for this paper. What is relevant for us is the empirical validity of the correlation. Based on a typological survey on 100 languages, Gilligan (1987) challenged the correlation between subject omission, null-expletives, subject

inversion and that-trace effect. However, Roberts and Holmberg (2010) re-interpreted Gillian's original findings explaining that each individual feature of the cluster can be obscured by other independent properties. To illustrate, the that-trace effect cannot be observed adequately in languages without overt complementizers, in the same vein as the relevance of post-verbal subjects is little informative if a language has a canonical VSO or VOS order or no canonical order at all.

As for radical pro-drop, subject omission correlates with island sensitivity and some liberality in the available interpretations for the omitted pronoun.

In this section, we critically review whether these clusters of secondary properties can work as diagnostics to determine the type of pro-drop that is at play in LSF given the general properties of sign language grammar. In doing so, we shall discuss in particular the status of agreement in sign languages and its relevance for determining the conditions for the omission of arguments, and the interpretations available to null arguments.

3.1 Properties associated to consistent (and partial) pro-drop

As illustrated by the Italian examples in (5) above, one of the key properties of consistent pro-drop languages is that of displaying a rich inflectional agreement.

Turning to sign languages, the issue of whether their grammars actually instantiate an agreement system or not is still at the center of a lively debate (Lillo-Martin and Meier 2011). Two candidates have been identified as potential exponents of agreement marking, one is manual and it is instantiated by verb directionality (Padden 1983) or hand facing (Meir 1998), the other one is non-manual and it is instantiated by head-tilt and eye-gaze, at least in ASL (Neidle et al. 2000). Both these manual and non-manual devices rely on the use of space to identify the arguments. Specifically, locations in the space in front of the signer (*loci*) are associated to nominal referents and work as *indices* that can be incorporated into the directionality of the predicate hence unequivocally identifying its arguments (Lillo-Martin and Klima 1990; Sandler and Lillo-Martin 2006; Schlenker 2011). Whether this morphological system qualifies as the exact equivalent of morphological agreement in spoken languages is still open to debate, but this is not particularly relevant for our sake. What is most relevant here is whether this serves the same role of licensing argument omission as (rich) agreement does in partial pro-drop spoken languages. The answer seems *prima facie* to be generally positive. Predicates that can

include in their trajectory the *loci* where arguments have been previously established (so-called directional predicates) do incorporate the *indices* and unequivocally identify their arguments, which can be then left unexpressed. This is illustrated by the ASL example in (12) where the directional predicate SHOOT incorporates the subject and object *loci* indicated in the subscript and allows for the subject to remain unexpressed.

(12) ___ $_i$SHOOT$_j$ FRANCK$_j$ (Bahan et al. 2000: 15)

's/he shoot Frank.'

However, not all predicates have the spatial flexibility that allows to incorporate *loci* in their trajectory. In fact, sign languages systematically include a class of predicates that does not allow for any type of spatial manipulation. This is the class of plain verbs which are usually articulated on the body and do not exhibit a path trajectory (Padden 1983). These verbs do not display any sort of directionality, hence behaving like Chinese verbs. For these verbs, argument omission is not possible in ASL (13a) unless either some "agreement" non-manual components are co-articulated with the verb (head tilt in (13b)) or the argument is the discourse topic (13c).

(13) **Plain verbs in ASL**

a. *___ LOVE MOTHER$_j$ (Bahan et al. 2000: 15)

b. $\overset{\text{head tilt}_i}{\overline{\text{___}_i \text{ LOVE MOTHER}_j}}$ (Bahan et al. 2000: 15)

'S/he loves mother.'

c. **SIGNER A:** $\overset{\text{topic}}{\overline{\text{MY CANDY}}}$, $\overset{\text{y/n}}{\overline{\text{YOU EAT}}}$? (Lillo-Martin 1991: 53)

'Did you eat my candy?'

SIGNER B: $\overset{\text{hn}}{\overline{\text{YES}}}$, ___ EAT-UP ___.

'Yes, I ate it up.'

These facts appear to confirm that argument omission depends on the availability of some morphological marking, whether or not it is equated to morphological agreement in spoken languages[3]

While it is clear that referential *loci* make the use of additional overt nominal and pronominal forms unnecessary, their morpho-syntactic status is still under debate. In fact they have been analyzed either as a genuine instantiation of agreement morphology (Lillo-Martin and

[3]It has been noted that sign language predicates do inflect for person but not for number if the subject is the external argument (Benedicto and Brentari 2004; Mazzoni 2008). In other words, plural inflection is optionally observed only in unaccusative predicates where the surface subject originates in complement position. Interestingly, this restricted number marking does not seem to affect subject omission.

Meier 2011), or as clitic pronouns (Nevins 2011), or as a referent-tracking system (Schembri et al. 2018). Independently from their particular analysis, the major issue from a typological perspective is that this system is only present in a sub-class of sign language verbs. This is indeed the reason for the mixed analysis proposed in Lillo-Martin (1986, 1991) for ASL: ASL would be consistent pro-drop with directional verbs, and topic-drop with plain predicates In Section 5, we shall add to the picture the usage of the body as subject (Meir et al. 2007) and discuss its implication for the general typological characterization of sign languages as pro-drop languages.

A property that robustly correlates with consistent pro-drop languages is the absence of that-trace effect. Non pro-drop languages like English disallow long distance questions with an embedded subject gap when the complementizer is overtly realized (14a), while consistent pro-drop languages like Italian do (14b).

(14) **That-trace effect & consistent pro-drop**

a. Who did you say (*that) t_{who} ate the cake?

b. Chi hai detto che t_{chi} ha mangiato la torta?
WHO HAVE SAY.3.SG THAT t_{chi} HAVE.3.SG EAT THE CAKE
'Who did you say that ate the cake?'

Unfortunately, this type of phenomenon is hard to test in sign languages as there is in general very little evidence for endogenous complementizers: in most sign languages investigated so far embedded clauses are never introduced by any specific manual sign (see Hauser 2019 for an interesting exception in LSF).

Another property that is documented in consistent pro-drop languages is the possibility of having a post-verbal subject with very little stress, if any, on the post-verbal element (15).

(15) È arrivato Gianni.
'Gianni has arrived.'

Curiously enough, while word order in sign languages has received a lot of attention in the literature (for a recent overview see Quer et al. 2017), most of the focus has been on the position of the complement with respect to the verb in order to determine the macro-typological OV-VO status of a language, and little attention has been devoted to the possible positions of the subject. A general observation that can be drawn about known sign languages is that word order is quite flexible, and is affected by the nature of the verb, and in particular its "agreement"

features (whether it is directional, plain or spatial), its lexical status (whether it is a lexical verb or classifier predicate) and its semantic reversibility (*comb* vs. *eat*). Given the general flexibility of word order in sign languages, we would in principle expect the subject to be possible in post verbal position. However, beside the phenomenon of *subject pronoun copy* whereby a pointing pronoun in clause final position may duplicate a pre-verbal subject,[4] to our knowledge no work has discussed in details whether it is possible to have post-verbal subjects and whether these display the properties that have been described in Italian.

In Section 4, we will see that despite a certain flexibility in the position of the object, our LSF informant clearly reject nominal subjects in post-verbal positions.

3.2 Properties associated to radical pro-drop

Turning to radical-pro drop languages and the properties defining them in contrast to partial and consistent pro-drop languages, Huang and Yang (2013) show that argument omission in Mandarin Chinese depends on topicalization, which is sensitive to islands. In (16) a relative clause (a Complex NP island) intervenes between the topicalized NP and the null subject of the embedded clause, and the sentence is ungrammatical. Similar examples are perfectly acceptable in a consistent pro-drop language, as illustrated with Italian (17).

(16) *Zhangsan, [wo renshi hen duo [__dezui guo de ren]].
Zhangsan [I know very many [__offend PERF DE person]]
'Zhangsan, I know many people that he has offended.

(17) Gianni$_i$, (io) conosco [molte persone che ___$_i$ ha offeso].
Gianni, I know many people that has offended
'Gianni, I know many people that he$_i$ offended.'

Adapting examples from Lillo-Martin (1986, 1991) in ASL, Koulidobrova (2017) reports that having a wh-island intervening between a topic and a coindexed null argument is possible

[4] Bos (1995) argues that what look like OVS orders in the Sign Language of the Netherlands are derived by a mechanism of pronoun copy followed by deletion of pre-verbal subject. This phenomenon is easier to observe with plain predicates and is also found in acquisition data as shown in the following examples from Coerts (2000: 99-100).

i. IX$_{building-block}$ BLUE IX$_{building-block}$
'The building-block is blue.'

ii. ~~IX~~$_{building-block}$ YELLOW IX$_{building-block}$
'The building-block is yellow.'

iii. ~~DOLLS~~ CRY IX$_{dolls}$
'The dolls are crying.'

with directional verbs (18a) but not with plain verbs (18b), where a resumptive pronoun is obligatory (18c).

(18) a. $\overset{\text{topic}}{\overline{\text{MOTHER}_i}}$, IX-1 DON'T-KNOW WHAT $\_\_\__i$ $_i$SEND$_1$ (Koulidobrova 2017: 400)

'Mother, I don't know what she sent me.'

b. * $\overset{\text{topic}}{\overline{\text{MOTHER}_i}}$, IX-1 DON'T-KNOW WHAT $\_\_\__i$ LIKE

c. $\overset{\text{topic}}{\overline{\text{MOTHER}_i}}$, IX-1 DON'T-KNOW WHAT IX$_i$ LIKE

'Mother, I don't know what she likes.'

This pattern seems to confirm the hypothesis we mentioned above (Lillo-Martin (1986, 1991) that argument drop can stem from very different phenomena in ASL: when correlating with "agreement", hence with directional verbs, argument omission displays the properties of consistent (or partial?) pro-drop; when associated with topicalization in absence of any morphological marking on the verb, as with plain predicates, it patterns as radical pro-drop. This mixed analysis is the reason why ASL appears in two different cells of Table 1.

However, Koulidobrova (2017) goes further in evaluating the effect of *loci* in licensing null arguments in ASL. She argues that if a nominal expression is not explicitly localized in the signing space, then both directional and plain verbs allow co-reference between the topic element and the null argument across an island, as illustrated in (19).

(19) a. $\overset{\text{topic}}{\overline{\text{MOTHER}}}$, IX-1 DON'T-KNOW WHAT $\_\_\_$ $_3$SEND$_1$ (Koulidobrova 2017: 402)

'Mother, I don't know what she sent me.'

b. $\overset{\text{topic}}{\overline{\text{MOTHER}}}$, IX-1 DON'T-KNOW WHAT $\_\_\_$ LIKE

'Mother, I don't know what she likes.'

These examples are used by Koulidobrova (2017) to argue that ASL argument omission is neither of the agreement-related consistent pro-drop type nor of the topic-related radical pro-drop type, but rather stems from NP ellipsis.[5]

[5] Bahan et al. (2000: 16) report that subject topicalization through a clause boundary is degraded with plain verbs even when no island intervenes (i). However, when the embedded clause is co-articulated with a head tilt, subject topicalization becomes possible (ii), even when the non-manual marker is directed towards a neutral position, as in (iii).

i ?? $\overset{\text{topic}}{\overline{\text{JOHN}_i}}$ ix-2 say $\_\_\__i$ LOVE MARY

ii $\overset{\text{topic}}{\overline{\text{JOHN}_i}}$ ix-2 say $\_\_\__i$ $\overset{\text{head tilt}_i}{\overline{\text{LOVE MARY}}}$

iii $\overset{\text{topic}}{\overline{\text{JOHN}_i}}$ ix-2 say $\_\_\__i$ $\overset{\text{head tilt}_{neu}}{\overline{\text{LOVE MARY}}}$

As an evidence for this elliptical nature of null arguments in ASL, Koulidobrova (2017) tests the availability of strict and sloppy readings in the relevant contexts. While null subjects in consistent pro-drop languages only allow for a strict reading, as illustrated in Italian in (20), null arguments in ASL are ambiguous between a strict and a sloppy interpretation in (21).

(20) **SPEAKER A:** Tre studenti si sono iscritti al mio corso.
'Three students joined my class.'
SPEAKER B: E __ hanno mollato il mio.
'And __ dropped mine.'

i. ✓'The same three students dropped B's class.'

ii. * 'Different three students dropped B's class.'

iii. * 'Some other number students dropped B's class.'

(21) **SPEAKER A:** THREE STUDENT JOIN POSS-1 CLASS (Koulidobrova 2017: 404)
'Three students joined my class.'
SPEAKER B: __ DROP POSS-1 CLASS
'__ dropped my class.'

i. ✓'The same three students dropped B's class.'

ii. ✓'Different three students dropped B's class.'

iii. ✓'Some other number students dropped B's class.'

The reliability of sloppy readings as a diagnostics for ellipsis has recently been questioned by Quer and Rosselló (2013). Presenting new data from LSC and Catalan, they showed that the correlation between ellipsis and the availability of sloppy readings is not straightforward, and in particular that sloppy readings are possible with overt pronominal elements. In their conclusions, Quer and Rosselló (2013) claim that it is not possible to classify argument omissions in Catalan (sign language) as cases of ellipsis based on data from sloppy reading only.

Another property characterizing radical pro-drop concerns the interpretation available to null subjects when the antecedent is under the scope of a disjunction (Sakamoto

While the example in (i) is in clear contrast with Koulidobrova (2017), see also the example in (19b) in the text, the examples in (ii) and (iii) are in line with what is reported in Lillo-Martin (1986, 1991) in the sense that when identification is possible (in this case via non-manual markers) arguments can be omitted in ASL. Interestingly, the acceptability of the example in (iii) opens the door for another interpretation of the example in (19a). Specifically, the null argument in (19a) could be licensed by the default agreement of directional verbs, in the same vein as head tilt towards a neutral location licenses the null subject in (iii).

2015): While in radical prodrop languages such as Japanese a null subject can corefere to either disjoined antecedent, in consistent pro-drop languages the interpretation of the missing argument is severely constrained.

This difference is illustrated below. In the Italian example in (22b), the null subject is only allowed to co-refer with whoever scolded Maria in the first sentence, while the null subject can co-refer with either conjunct in the equivalent ASL construction in (23b).

(22) **Disjunction and null subjects** (Sakamoto 2015)

a. Ieri, o Giovanni o Guglielmo ha sgridato Maria.
yesterday either Giovanni or Gugliemo 3SG.have scolded Maria
'Yesterday, either Giovanni or Guglielmo scolded Maria.'

b. Oggi, ___ ha sgridato Lucia.
Today, 3SG.have scolded Lucia
'Today, (he) scolded Lucia.' (he = the same who scolded Maria.)

(23) a. MARY HEARING disj-shift LUCY DEAF DON'T-KNOW WHICH WILL COME MY HOUSE. ___ OUT FAST. (Koulidobrova 2017: 411)

'Either Maria (who is hearing) or Lucy (who is deaf) . . . I don't know which one . . . will stop by my house. She'll be out quickly.'

b. LUCKY-IX2. ___ WILL COME MY HOUSE SAME$_{trill}$ ___ SIGN disj-shift TALK ALL-NIGHT

'Lucky you. She will also come by my house. Will wind up signing or talking all night.' (she = either Mary or Lucy)

Finally, a last property associated to null arguments of the anaphoric type (as in Japanese, and ASL according to Koulidobrova (2017)) is their ability to serve as antecedents for sluicing (Hankamer and Sag (1976), as illustrated in (24) for ASL.

(24) **Sluicing and null subjects** (Koulidobrova 2017: 402)

Context: *Marie loves children; she never minds the noise. But today, she had a migraine. I don't really know what happened but . . .*

IX-1 HEAR SAY MARIE FINISH SPANK ___$_i$

BUT DON'T-KNOW [WHO$_i$ ~~MARIE SPANK t$_i$~~]

'I heard Marie spanked someone, but I don't know who.'

3.3 Summary of the diagnostics

In the next section, we will investigate the nature of subject omission in LSF by using the various properties discussed in Sections 2 and 3 as diagnostics. These are summarized in the table below.

Property	**Pro-drop type**
Null expletive only	Expletive pro-drop
Omission only for 1^{st} and 2^{nd} person	Partial pro-drop
Omission for all persons	Consistent, Radical pro-drop
Post-verbal subject	Consistent pro-drop
Omission with directional verbs only	Partial pro-drop
Omission with all verbs	Consistent, Radical pro-drop
Sloppy reading available	Radical pro-drop (but see the footnote 6)
Co-reference with a topic across an island	Radical pro-drop of the ellipsis type only
Disjoint reference	Radical pro-drop of the ellipsis type only
Antecendent for sluicing	Radical pro-drop of the ellipsis type only

Table 2: Diagnostics

Despite Quer and Rosselló (2013) show capitalizing on Catalan and LSC data that the availability of sloppy reading alone is not enough as a diagnostics for nominal ellipsis, we decided to keep this test in our research. Even if there is no clear explanation for why sloppy readings are not available with null subject in (some) Romance languages, if a language allows for sloppy readings we can at least conclude that subject omission is not of the same type as that found in most Romance languages or the type of radical pro-drop found in Chinese.[6] Also, data from sloppy reading sentences together with data coming from the other tests may provide converging evidence towards one type of pro-drop or another.

[6] Although this is outside the scope of this paper, let us point out that some of the data about sloppy readings reported for Catalan cannot be replicated in Italian (two of the authors are native speakers of Italian), hence suggesting that the grammar of subject omission may undergo micro-variation as suggested in Biberauer et al. (2010).

4 Argument omission in LSF

Although LSF is historically among the most important sign languages in the Western World because it influenced one way or another several European and non European sign languages (Abner et al. 2020; Cantin 2016; Sacks 1990), very little is known about its linguistic properties (for a first general description of the LSF grammar see Millet 2019) and even less is understood at the syntactic level. As for word order, LSF has been described as being both SVO (Bouchard 1996) and SOV (De Langhe et al. 2004). Recently, Santoro (2013) reports that his LSF informant accepts both SVO and SOV orders and that the fine-grained properties of more complex structures like weak cross-over constructions are sensitive to linear order. The variety of LSF that shall be described in this section comes from a native signer who regularly collaborates as a linguistic consultant with our group.[7] Although he accepts both SVO and SOV equally well he has a preference for SVO order. We shall assume this to be the basic word order in our description of subject omission in LSF.

4.1 Methodology

We tested the diagnostic properties described in the previous sections to determine the nature of argument omission in LSF by eliciting the relevant structures from our informant and by assessing their acceptability in later sessions. We opted for this methodology for a number of reasons: (1) as far as we know, there is no large annotated corpus of LSF, (2) no corpus study would allow us to test some specific diagnostics (cf 3); (3) the absence of any literature on these syntactic aspects of LSF made any other methodology difficult to practice.[8]

Following Schlenker et al. (2013)'s guidelines, we collected our data in two steps. In the first step we collected a set of sentences. In this phase, we met our informant and asked him to produce target sentences, which we recorded. For most of the target properties, we gave him a list of signs and asked him to combine them in an LSF sentence. When needed, we started from our informant's own recordings and asked him to explicitly reorganize the sentence either by changing the sign order or by removing specific signs. He was free to change lexical items, word order and localization in space, except when they corresponded to a control factor. The second step of the elicitation procedure, which happened in a separate work session, focused

[7] We are extremely grateful to **FIRST LAST** for his precious help.

[8] An exception concerns null impersonal subjects in LSF, which have been investigated in Kuhn, Mantovan and Geraci (2018), and whose results are consistent with Garcia, Sallandre and L'Huillier (2018).

on rating. The informant was asked to rate previously recorded sentences on a scale from 1 (the lowest) to 7 (the highest). In what follows, we only report acceptability with the standard notation where '*' means unacceptable, and '?' indicates a degraded but still acceptable sentence. We also discussed the possible interpretations of any null argument involved. All the comments, remarks or notes were video recorded, and also taken into account in our final analysis. Only LSF was used in these sessions, and any reference to French was systematically avoided in order to reduce the risk of language interference.

4.2 The data

We used the properties reviewed in the last sections as diagnostics in order to characterize the nature of subject omission in LSF within the typology of pro-drop languages. We thus elicited data on *non thematic subjects* and *first, second and third person omission* to test for partial pro-drop, *verb-type* to test for the role of agreement, *post-verbal subjects* to test for consistent pro-drop, *object omission* to test for radical pro-drop, *subject omission within a syntactic island*, *availability of sloppy reading* and *availability of disjoint readings* to test for the particular subtype of radical pro-drop that is described for Japanese and ASL.

Subject omission is possible with non-thematic subjects (25), and with first and second person (26).

(25) **Expletive constructions**

a. MORNING ___ RAIN
'It's raining this morning.'

(26) **First and Second person subject omission**

a. ARRIVE LATE, SORRY
'I am sorry, I arrived late.'

b. NEXT^TIME IF IX-2 ARRIVE LATE, ___ EAT NOTHING
'Next time, if you arrive late, you won't eat anything.

Subject omission is also possible with third person subjects, no matter the verb class: with directional (27), plain (28) and (marginally) with classifier predicates (29). Notice that with plain verbs, there is no need for any particular non-manual marker in order to leave the subject unexpressed.

(27) **Third person subject omission with directional verbs**

Speaker A: YESTERDAY EVENING PIERRE DO WHAT?

'What did Pierre do yesterday evening?'

Speaker B: (YESTERDAY EVENING) $\_\_\__i$ $_i$HIT$_j$ PRINTER$_j$

'He hit the printer.'

(28) **Third person subject omission with plain verbs**

Speaker A: MORNING PIERRE DO WHAT?

'What did Pierre do this morning?'

Speaker B: (MORNING) ___ EAT CHOCOLATE$_{neu}$

'He ate some chocolate.'

(29) **Third person subject omission with spatial classifier predicates**

Speaker A: PIERRE WHERE?

'Where is Pierre?'

Speaker B: MOUNTAIN ___ CL-climb

'He is climbing on the mountain.'

A similar pattern is observed with object omission, as illustrated in (30) with a directional verb and in (31) with a plain verb.

(30) a. **Speaker A:** YESTERDAY EVENING HIT PRINTER$_j$ WHO?

'Who hit the printer yesterday evening?'

b. **Speaker B:** PIERRE$_i$ $_i$HIT$_j$ ___

'Pierre hit it.'

(31) a. **Speaker A:** CHOCOLATE WHERE?

'Where is the chocolate?'

b. **Speaker B:** MORNING PIERRE EAT ___

'Pierre ate it this morning.'

Finally both subject and object can remain unexpressed within the same clause.

(32) **Context:** *This morning I went to the office and I saw that the printer was broken.*

Speaker A: YESTERDAY EVENING PIERRE DO WHAT?

'What did Pierre do yesterday evening?'

Speaker B: YESTERDAY EVENING $\_\_\__i$ $_i$HIT$_j$ $\_\_\__j$

'He hit it.'

(33) **Context:** *Yesterday evening I saw some chocolate on the table.*

Speaker A: (MORNING) PIERRE DO WHAT?

'What did Pierre do in the morning?'

Speaker B: MORNING ___ EAT ___

'He ate it this morning.'

Although LSF is quite flexible in terms of word order, easily allowing for VO and OV alternations, post-verbal subjects are not possible. Not even with unaccusative predicates, as shown in (34).

(34) **Speaker A:** KID IX-3 CRY WHY

'Why is the kid crying?'

Speaker B: * LEAVE PIERRE

✓ PIERRE LEAVE

'Pierre left.'

Summarising so far, the properties described above all seem to show that LSF behaves like a radical pro-drop language.

In order to verify whether it is a radical pro-drop language of the topic-drop type (e.g. Chinese) or whether it displays a pattern akin to ellipsis pro-drop (e.g. Japanese, ASL), we further checked whether we could observe coreference between a topic element and a (null) argument across a wh-island.

Starting with a topic element that is clearly located in the signing space, we found that coreference across a wh-island with a null subject (35a) is slightly more marginal than with an overt pronoun (35b), but basically acceptable. This holds with both plain verbs (35b),(35a) and directional predicates displaying neutral agreement (35c).

However, when the topic element is not localized in space because the sign is articulated on some body location, co-reference with a null argument across a wh-island is impossible both with plain verbs (35d) and directional verbs (35e).

(35) **Coreference, Topic & wh-islands**

a. ?? $\overset{\text{topic}}{\overline{\text{PIERRE IX}_i}}$ IX-1 KNOW ___ EAT WHAT.

b. $\overset{\text{topic}}{\overline{\text{PIERRE IX}_i}}$ IX-1 KNOW IX_i EAT WHAT.

'Pierre, I know that he ate.'

c. ?? $\overline{\text{PIERRE IX}_i}^{\text{topic}}$ IX-1 KNOW ___ $_{neu}$LOOK-FOR WHAT.

'Pierre, I know that he is looking for.'

d. * $\overline{\text{FANNY}}^{\text{topic}}$ IX-1 KNOW ___ EAT WHAT.

e. * $\overline{\text{FANNY}}^{\text{topic}}$ IX-1 KNOW ___ $_{neu}$LOOK-FOR WHAT.

Intended: Fanny, I know that she ate.

We interpret these facts as showing that simple coreference with a topic across an island is not possible, unless some kind of space-anchoring strategy is activated. If this interoretation is correct, LSF behaves like a topic pro-drop language of the Chinese type.

Turning finally to interpretation, LSF allows for a sloppy reading of the null subject, as illustrated in (36).

(36) **Context:** *Marie is looking for an apartment in the fifth district of Paris. John is looking for an apartment in the 14th district of Paris. They meet at a party and talk about their findings. They both applied for a flat with an agency and are waiting for an answer.*

a. MARIE THINK POSS$_{Mary}$ APPLICATION NOT GOOD
Marie think her application not good
'Mary thinks that her application is not good.'

b. JOHN IX$_{John}$ THINK ___ NOT GOOD ALSO
John he think ___ not good also
'John also thinks that [{Mary's/John's} application] is not good.

In (36), the null subject can be either interpreted as rigidly coreferent with the antecedent (i.e. Marie's application) or as sloppily coreferent with the other potential possessor (namely John). This behavior is in contrast both with consistent prodrop languages like Italian, and with topic drop languages like Chinese (Takahashi 2008).

As for interpretation under disjunction, on the other hand, null subjects cannot freely pick their referent when two disjoint antecedentw are available in the context. This is true both with directional verbs (37) and with plain verbs (38).

(37) **Context:** *Peter is a very lively kid and touches everything. For this reason he has two babysitters, Marie and Jeanne. At some point...*

a. MORNING MARIE$_a$ OR JEANNE$_a$ $_a$SCOLD$_b$ PIERRE$_b$.
Morning Mary or Jane blame Pierre.
'In the morning, Marie or Jeanne scolded Pierre.'

b. AFTERNOON ___ $_a$SCOLD$_b$ PIERRE$_b$
Afternoon scold Pierre.
'In the afternoon, she scolded Pierre. ' (she = the same person that scolded Pierre in the morning)

(38) **Context:** *Marie and Jeanne are manager of an important company. They have to leave for a business trip. The next in the command line is Pierre who will be made responsible before the departure.*

a. MORNING MARIE OR JEANNE RESPONSIBLE PIERRE.
'This morning either Marie or Jeanne will make Pierre responsible.'

b. AFTERNOON ___ RESPONSIBLE PIERRE.
'In the afternoon she will make Pierre responsible.'
(she = the same person that made Pierre responsible in the morning)

In (38) the null subject must co-refer with the same the individual out of the disjunction who did blame Peter in the morning. The same holds for (37).

These final pieces appear to confirm that LSF null arguments are restricted and interpreted as null arguments in a radical topic drop language, like Chinese.

4.3 Analysis

?? summarizes the results we obtained by testing in LSF the diagnostic properties associated to different types of Pro-drop that we just discussed and illustrated.

	LSF	**Radical topic drop**	**Radical ellipsis-drop**	**Consistent**	**Partial**	**Expletive**	**Non pro-drop**
Null expletives only	no	no	no	no	no[9]	yes	no
Omission only for 1^{st} and 2^{nd} person	no	no	no	no	yes & no	no	no
Rich agreement	no	no	no	yes	yes & no[10]	no	no
Object omission	yes	yes	yes	no	no	no	no
Post-verbal subject	no	no	NA	yes	no[11]	yes[12]	no
Sloppy reading	yes	no	yes	no	yes[13]	no	no
Disjunctive reference	no	no	yes	no	NA	no	no
Co-reference with a topic across an island	no	no	yes	no	no	no	no

Table 3: Summary of the diagnostics applied to LSF compared with the behavior of the various types of subject drop languages.

The fact that arguments can be easily dropped with both directional and plain verbs given a little context and without any use of special non-manual agreement markers appears to indicate that argument drop in LSF is contingent on morphological agreement. This in turn appears to indicate that LSF belongs to the radical pro-drop type and not to the consistent pro-drop type. The ban on postverbal subjects goes in the same direction.

Turning to the specification of what type of radical pro-drop is at play in LSF, the data show that LSF patterns overall like a topic-drop type *à la* Chinese rather than like an ellipsis-induced type *à la* ASL or Japanese.

In particular, data from null subjects across wh-islands show that the pattern of argument drop displayed in LSF is intrinsically different from the one described for ASL (Koulidobrova 2017) and Japanese (Sakamoto 2015). Moreover, LSF does not pattern with ASL as far as interpretation under disjunction is concerned, since it does not allow null subjects to freely pick up any antecedent. This appears to confirm that LSF is topic-drop language, like Chinese, and not an ellipsis-drop language, like ASL.

On the other hand, the availability of a sloppy reading for null subjects makes LSF more similar to Japanese and ASL (Saito 2007), than to Chinese (Takahashi 2008). Remember however that the availability of sloppy readings has been recently argued not to be a conclusive diagnostics because sloppy readings are indeed possible under some conditions in a consistent pro-drop language such as Catalan (Quer and Rosselló 2013). Our data appear to go in the same direction, and suggest as well that this test alone is not fully reliable.

5 Sign Languages & the null subject parameter

Going back to the broader picture, we have seen that sign languages fit easily into the typology of prodrop languages that has been established based on spoken languages. LSF is no exception.

The signing modality appears however to display two interesting anomalies within this ty-

[9]For an analysis of null expletives in Hebrew, see Shlonsky, (1990).

[10]Roberts (2016) show that it depend on languages.

[11]This observation was made on Brazilian Portuguese in Do Pilar Pereira Barbosa (2009). Yet, she presents an asymmetry: while post-verbal subjects are ungrammatical with transitive and unergative verbs, it is possible with unaccusatives. The same pattern is observed in Hebrew (Shlonsky, 1990) although other structures can license post- verbal subjects with any kind of verbs (i.e passives).

[12]Prince (1999) show that this is the case of Yiddish, an expletive null subject language.

[13]This phenomenon is described for Finnish and Marathi in Holmberg et al. (2009).

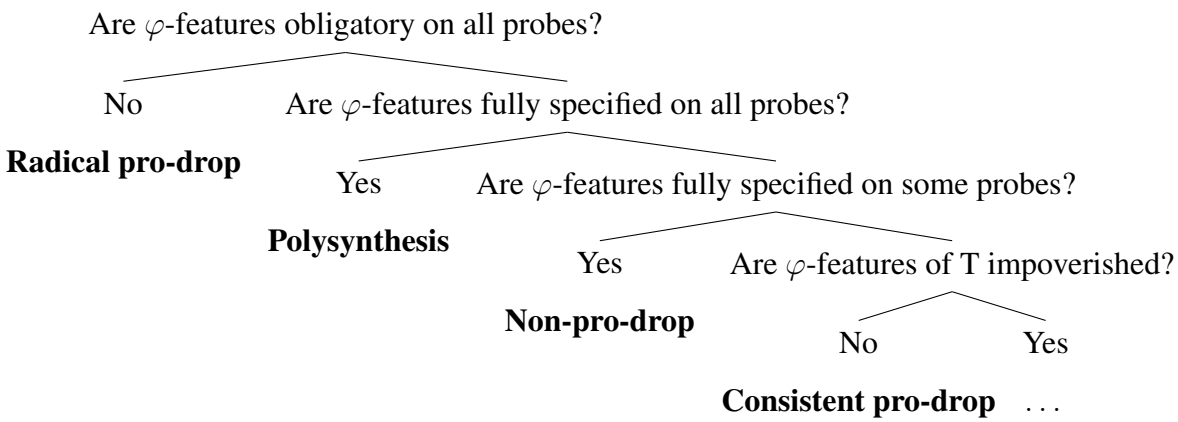
pological picture that call for an explanation. The first, that we have already underlined in the first section, is that there are no attested sign languages that disallow categorically argument dropping. There is in other words a typological gap in the signing modality. Why so? The second anomaly is that many sign languages (but not LSF) display a sort of a double nature, being sensitive to both rich agreement and topic information, depending on whether the predicate is directional or plain. This mixed behavior is at odds with the original characterization of pro-drop as a binary parameter.

In this section, we shall try to address these two anomalies. Specifically, after briefly laying out Biberauer et al. (2010)'s proposal about the Null Subject Parameter, we shall first explore how this theory captures the mixed behavior of argument omission in sign language. In the last part of this section, we shall speculate on how to explain the typological gap just mentioned.

Working within a revised version of the Principles & Parameters framework, Biberauer et al. (2010) propose to unpack the original Null Subject macro parameter into a set of binary micro-parameters able to capture the full typology of subject omission. The core of their proposal is framed in a Probe-Goal system (Chomsky 2001) and assumes morphological impoverishment and late vocabulary insertion ((Embick and Noyer 2005)). Simplifying a lot, the parameter is analyzed as the result of a set of micro parameters emerging from the interaction of two factors: a definiteness D-feature on the Tense node and a set of standard φ-features carrying person and number information.

Biberauer et al. (2010) proposal is represented in the schema in (39).

(39)



ROBERTS 2010 discusses how the interaction works and how the observed typology is determined by language specific impoverishment rules.

If the grammar of a language does not allow for morphological impoverishment of φ-

features, a D-feature may appear on T. Given the richness of the φ-features and the definiteness of T, the pronominal element valuating these features can be defective and its phonological content may remain unexpressed. This configuration corresponds to consistent pro-drop languages like Italian and Spanish.

If the grammar of a language imposes morphological impoverishment on any of the φ-feature, the D-feature cannot appear on T. Depending on the specific type of impoverishment, the various types of partial pro-drop languages are derived.

If the grammar of a language imposes morphological impoverishment on all φ-features, then non-pro-drop languages are derived.

Finally, if the grammar does not specify φ-features at all, radical pro-drop is derived.

Once viewed in this terms, the possibility of mixed languages is indeed predicted. On the one hand, various degrees of impoverishment might give rise to a fine grained typology of partial pro-drop languages. On the other hand, if the relevant features can be optionally left out, then that language may display patterns that are similar both to partial and to radical pro-drop grammars. This is probably what happens to null arguments in several of the sign languages documented in the literature. The radical pro-drop pattern observed with plain predicates is obtained when no features are present in the derivation. The partial pro-drop pattern observed with directional predicates is determined by the presence of the D-feature and the full set of φ-features in the TP layers. These non-impoverished features act as a probe and can be valued by a defective pronoun, which in turn can be left unpronounced.

Let us now turn to the second anomaly, namely the fact that there seems to be no sign language of the non-pro-drop type (see Table 1).

One way to address the puzzle is to follow Meir et al.'s (2007) intuition that in the signing modality the body of the signer systematically provides the subject argument when it is not explicitly expressed with a nominal element or with a pointing pronoun. More specifically, Meir et al. (2007) argues that with plain verbs that are body anchored like EAT, LOVE, KNOW, SAY and WAKE-UP in ISL and ASL, the body of the signer itself iconically represents the subject. Crucially, the contribution of the signer's body in these cases is not limited to first person (Meir et al. 2007: 543), as the body can act as subject in all persons, at least in ASL and ISL.

Under this perspective, there would be a modality specific iconic contribution of the signer's body to the grammar of sign language that favors subject omission. This in turn would explain

the typological gap we are concerned with. If this is the case, it then becomes important to determine the morpho-syntactic nature of "the body as subject", since its characterization is crucial to establish the typological status of null subjects in sign languages.

Despite its iconic nature, if the signer's body acts as an element of the grammar of sign languages, it is expected to interact with the principles and rules governing that specific part of the grammar, which determine the morpho-syntactic status it receives within a given language.

There are at least two possibilities. One possibility is that the body acts as a special type of overt pronoun; another possibility is that the body offers a privileged anchor for verb agreement, hence acting as an inflectional bound morpheme (i.e. a D-feature in Biberauer et al. (2010)'s terms). Of course, one possibility does not exclude the other, at least from a typological perspective. Indeed, we might find languages where the body of the signer behaves like an overt pronoun and languages where it behaves as part of the verb-inflection.[14] Each option is then expected to interact in a specific way with the pattern of subject omission.

More precisely, if the body as subject is part of inflection in ASL and ISL, then it would qualify as a case of poor inflection as it does not distinguish between the three persons. Given what we know from the typology we discussed in the paper, this poor inflection should not be able to act as a licensor for null subjects. We believe this might be what happens in ASL, where subject omission with plain body anchored verbs is only possible under topic licensing (or with additional non-manual agreement markers).

On the other hand, in DGS and RSL, where the body always receives a first person interpretation, the body seems to act as a sort of logophoric pronoun. If this analysis is correct, then the cases reported as null subjects in Oomen and Kimmelman (2019) should rather be analyzed as involving an overt logophoric first person pronoun. An alternative analysis, which is more in line with what proposed in Oomen and Kimmelman, is that the body acts as a sort of default first person inflectional morpheme, hence unambiguously identifying the first person subject. If this is the right analysis, the cases reported in Oomen and Kimmelman (2019) would be genuine instances of subject omission restricted to first person, in other words a special case of partial pro-drop similar to Finnish. [15]

[14] In this discussion, we gloss over another potential factor that could influence the presence vs. absence of an overt subject, namely role-shift. Role-shift is a grammatical construction, typical of sign languages, where the body of the signer shifts towards a location in space where a previous referent has been established, hence incorporating its role in discourse.

[15] PERHAPS ONLY IN THE LETTER: An anonymous reviewer suggests to investigate possible scenarios that would disentangle if the body acts as an overt pronoun or as part of verbal morphology. These would involve cases of coordination or subordination where the subject of the two predicates must be necessarily different, one

One interesting typological prediction is that, in principle, the body should be able to serve as an overt pronoun for all persons, as suggested in Meir et al. (2007). A sign language of this type would have all the properties of a non-pro drop language, where a sentence always contain an explicit mention of the subject, either in the form of an overt nominal expression or of a pointing sign, or of this special overt body-as-subject pronoun. The only case in which the body should not be able to function as a potential subject is with non-thematic predicates, namely with expletive subjects, hence non-referential. In this case, we would expect the language to obligatorily instantiate a dummy pointing sign. We do not know whether a sign language of this type exists, however, one sign language where overt expletives have been documented is LIS. Bertone and Cardinaletti (2011) report that weather predicates can co-occur with a weak upward pointing sign of very short duration, which they analyze as an overt expletive.[16]

Be as it may, it seems to be the case that sign languages systematically allow subject omission because the signer's body and its iconic prominence can supply the relevant information to the predicate. This source of iconic suppletion has no parallel in spoken languages and, depending on the analysis we give to it, it is only indirectly related to agreement.

Let us notice that the body as subject automatically introduces a huge asymmetry in the grammars of sign languages. In fact, if the signer's body can only fulfill the subject function, as argued in Meir et al. (2007), subject omission should differ from object omission for reasons independent from agreement. Another domain where the body as subject is expected to play a role is that of ergativity. These points open new and wider typological perspectives, which we leave for future research.

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of them overtly expressed and one null. The following example would be an example of this kind of scenario, The reviewer suggests the following example in a context where two individuals, say John and Mary, are part of the discourse:

i. John did this and ___ got pregnant.

We are not sure whether such contexts allow to distinguish between the two alternative analyses. On the one hand, the presence of two separate subjects may induce some contrast which would make subject omission less natural. On the other hand, even in languages like ASL where the body can provide the subject information, it does so optionally, otherwise sentences with plain verbs like (13a) or wh-island interference like (18b) would be grammatical. We leave a detailed study of the interaction of the signer's body with subject omission for future research.

[16] Bertone and Cardinaletti (2011) also observe that this option is not frequent, though, and that normally weather predicates are produced without any overt subject.

6 Conclusions and further perspectives

In this study, we reviewed the typology of argument omission in spoken languages and evaluated which empirical tests can be used to categorize argument omission patterns in sign languages. While presence/absence of that-trace effect does not seem to be a reliable diagnostics because of the lack of clear complementizers in sign languages, we identified a number of syntactic and semantic diagnostics that appear to be exploitable.

We applied these diagnostics to investigate the pattern of subject omission in LSF. We found that both the subject and the object can remain unexpressed with both thematic and non-thematic predicates and in all persons. We showed that argument omission is not sensitive to the directionality of the verb (aka agreement). We also showed that LSF does not tolerate post-verbal subjects. We took all this as evidence that LSF instantiate a case of radical of pro-drop.

We went further and analyzed what type of radical pro-drop LSF displays. We took data from the co-reference between a base-generated topic and a null subject embedded in a wh-island and the unavailability of disjoint reference as evidence that null subjects in LSF are different from those of ASL, an ellipsis-type of radical pro-drop. We then concluded that LSF has the hallmarks to qualify as a radical pro-drop language of the Chinese type. However, we also noticed that differently from Chinese, LSF allows null subjects to generate sloppy readings. Following Quer and Rosselló (2013) we take this as spurious evidence at best.

Finally, we discussed more broadly how sign languages fit into the typology of null subject languages. The discussion started by the previously unnoticed observation that no known sign language has been described as non-pro-drop. We speculated that one possible reason for this fact it that sign languages have a source for subjects that is unavailable to spoken languages, namely the signer's body. We also sketched how the body as subject hypothesis may interact with the verb system of sign languages. Finally, we suggested to classify null subjects with directional verbs not as cases of consistent pro-drop but as cases of partial pro-drop.

In sum, this paper provided a detailed illustration of how properties that are highly reliable diagnostics for pro-drop types in spoken languages can be applied to sign languages to probe the nature of null arguments. We also offered a broad typological perspective in which we tried to shed light on some sign language specific properties like the body as subject and the effect of verbs' directionality. In doing this we left unaddressed some important questions and we uncovered others suggesting that much is still to be studied in the domain of argument

omission. Specifically, we only marginally discussed the role of *loci* and how and why they can be suppressed/ignored when an argument is dropped. We have not discussed at all role-shift and how this phenomenon may interact with subject omission in general and with the body as subject in particular. We identified but did not explore in details the source of a potential major asymmetry between subject and object omission which is introduced by the body as subject hypothesis. We hope to be able to come back to each of these issues in the near future and provide a comprehensive assessment of null arguments in both sign and spoken languages.

Abbreviations and glossing conventions

Sign language abbreviations

ASL = American Sign Language, AUSLAN = Austtralian Sign Language, DGS = German Sign Language, HKSL = Honk Kong Sign Language, ISL = Israeli Sign Language, LIS = Italian Sign Language, LSC = Catalan Sign Language, NGT = Sign Language of the Netherlands, NZSL = New Zealand Sign Language, RSL = Russian Sign Language TİD = Turkish Sign Language.

Glossing conventions

Null arguments are glossed by an empty space in the sentence ('__'). SIGNS are glossed in small capitals with an approximation of their meaning in English, following common convention in the field. Pointing signs are indicated with IX followed by a number referring to the person or a subscript letter for a region in the signing space associated with a particular referent. Classifers are glossed by using CL followed by the element denoted. Non-manual markers are indicated with a line above the glosses over which they scope; *topic* is shorthand for topicalization markers, *y/n* indicates yes/no question, and *h/n* refers to head nodes.

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