The syntax of predicate ellipsis in Italian Sign Language (LIS)

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Abstract

We analyze a hitherto undescribed case of ellipsis in Italian Sign Language (LIS) and show that it has common properties with VP ellipsis in languages like English. For example, the ellipsis site can contain a *wh*-trace and semantic restrictions on the type of predicate that can be omitted are only derivative. We thus propose a phonological deletion approach for the LIS construction. We also consider the issue of how the content of the ellipsis site is recovered from its linguistic antecedent. We present new arguments for a syntactic identity condition, although a limited number of mismatches between the ellipsis site and its antecedent, notably including vehicle change cases, must be accommodated.
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1. Introduction

Because of the huge bias toward spoken languages in the existing linguistic literature, no systematic exploration of predicate ellipsis has ever been tried in any sign language, although scattered information on the phenomenon is present. For example, Jantunen (2013:30–31), in a paper mainly devoted to argument ellipsis in Finnish Sign Language, reports three sentences, which are candidate respectively for being cases of gapping, VP ellipsis and sluicing. Quer and Rossello (2013), in a paper on argument drop in Catalan Sign Language, address the issue of predicate ellipsis and Schlenker (2014) discusses possible semantic mismatches between the missing constituent and its antecedent.

In this paper we aim at filling this gap by systematically analyzing an Italian Sign Language (LIS) construction in which a predicate goes unuttered. We will show that this construction has common properties with VP ellipsis as attested in languages like English.

We will focus on two main questions through the paper. Does the ellipsis site contain internal structure? Does ellipsis require an antecedent with the same form or an antecedent with the same meaning? Our account of LIS, which is spelled out in the Principles and Parameters framework, will lead us to answer 'yes' to the first question, while, as far as the second question is concerned, we will favor the identity in form hypothesis but recognize that it raises some non-trivial issues.

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Taken together, the answers to the two questions provide additional evidence from languages in the visual modality in favor of a phonological deletion account of VP ellipsis.

This paper is organized as follows. In section 2 we present some background information about LIS grammar, which will be required later in the paper. In section 3, we explain how we collected the data and give information about our informants. Section 4 introduces the basic properties of predicate ellipsis in LIS. In section 5 we show that genuine cases of VP ellipsis can be found in LIS (in addition to stripping) and in section 6 we argue that two arguments from the spoken language literature can be reproduced in LIS and support a phonological deletion analysis for VP ellipsis. In section 7 we investigate the problem of the recoverability of the content of the ellipsis site and, based on arguments which specifically exploit the simultaneous nature of morphology in sign languages, we conclude that identity of form with a linguistic antecedent is required. Section 8 presents some further thoughts on the issue of recoverability conditions on ellipsis.

2. Essential background information about LIS grammar

In recent years, several aspects of LIS grammar have been investigated fairly extensively, although many areas are still unexplored. In this section we do not aim at offering a comprehensive review of this literature but we give background information on LIS which is required for the discussion about ellipsis.

Although in LIS, like in other sign languages, word order is not rigid, our informants agree that the unmarked word order in simple declarative sentences is S(ubject)–O(bject)–V(erb):[1]

(1)   GIANNI MARIA LOVE
        'Gianni loves Maria'

Functional signs like the modal verb MUST (Fig. 1), the perfective marker DONE (Fig. 2, cf. Zucchi, 2009; Zucchi et al., 2010) and the auxiliary for future (Fig. 3)[2] are postverbal. Manual negation is also found after the verb in LIS (Geraci, 2006), as shown in (2)–(5). When both negation and a modal sign are used, the modal precedes the negative sign as in (6).

(2)   GIANNI APPLY MUST
        'Gianni must apply'
(3)   GIANNI HOUSE BUY DONE
        'Gianni bought a house'
(4)   GIANNI HOUSE BUY FUT[3]
        'Gianni will buy a house'

$$\overline{\quad\quad}^{\text{ neg}}$$
(5)   GIANNI MARIA LOVE NOT
        'Gianni doesn't love Maria'

$$\overline{\quad\quad\quad}^{\text{ neg}}$$
(6)   GIANNI CONTRACT SIGN CAN NOT

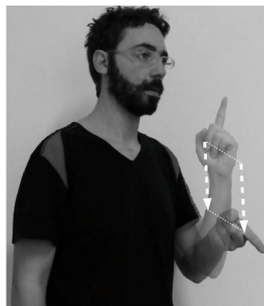Fig. 1. MUST.   Fig. 2. DONE.   Fig. 3. FUTURE marker.

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[1] See Appendix for conventions used in the glosses of LIS sentences.

[2] In the variety of LIS under investigation, tense is not marked by a morpheme on the verb and temporal information is inferred from contextual information when no time adverb or FUT auxiliary is present (see Zucchi, 2009 for a study on tense in another variety of LIS).

[3] The sign glossed here as FUT has been glossed as MUST by Zucchi (2009). The reason for this difference in glossing is that this sign was originally a modal verb of necessity and it is still used like that by some LIS signers. However, at least for our informants, now it is used only as an auxiliary for future. Our consultants use a different sign (glossed here as MUST) for the modal of necessity.

Wh-phrases are found at the right periphery of the sentence (cf. (7) and (8)), cf. Cecchetto et al. (2009). Although it is very rare in spoken languages, systematic clause-final placement is not uncommon in sign languages (cf. Cecchetto, 2012 for an overview of the literature):

(7)   GIANNI BUY WHAT̄ wh
         'What did Gianni buy?'

(8)   HOUSE BUY WHŌ wh
         'Who bought a house?'

There is clear evidence that wh-phrases are 'more peripheral' than modal verbs, negation, DONE and FUT:

(9)   CAKE EAT CAN WHŌ wh
         'Who can eat the cake?'

(10)   CAKE EAT NOT WHŌ wh
         'Who did not eat the cake?'

(11)   HOUSE BUILD DONE WHŌ wh
         'Who built the house?'

(12)   HOUSE BUILD FUT WHŌ wh
         'Who will build the house?'

Research on topicalization in LIS is very limited but two points are clear: (i) topic phrases are found in the left periphery of the clause (unlike *wh*-phrases), (ii) they occur with a specific non-manual-marking (roughly, raised eyebrows). This is illustrated by the example in (13)

(13)   VĀSE GIANNI BREAK̄ raised eyebrows
         'Gianni broke a vase'

Also *yes/no* questions occur with a raised eyebrows non-manual-marking. Indeed, declaratives and *yes/no* questions are distinguished in LIS only by the occurrence of this non-manual-marking, not by a change in word order.
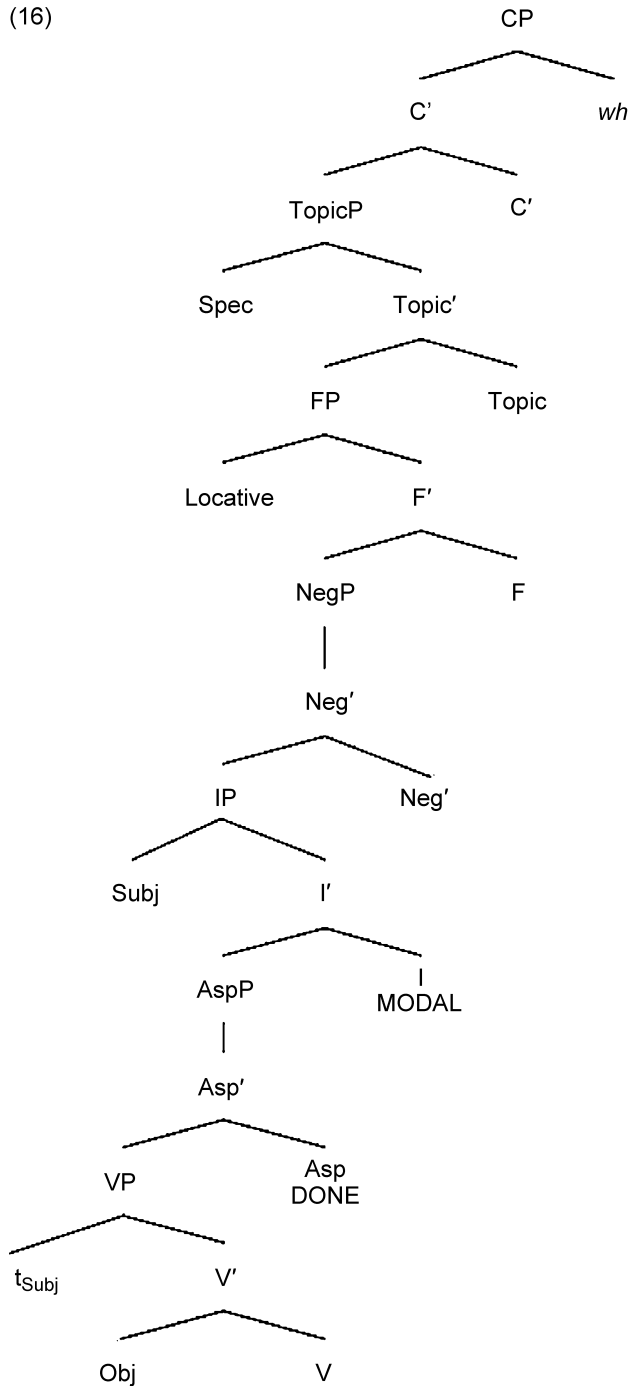
The last aspect of LIS we would like to briefly introduce here concerns locative phrases. Locative phrases will be used in this paper as a way to create a contrast between the antecedent clause and the elliptical clause, an expedient to make ellipsis constructions fully acceptable. When no topicalized element is present, the most natural position of locative phrases is the sentence initial position and the locative phrase co-occurs with raised eyebrows, as in (14a). When both a topic and a locative phrase are present, the natural position of the locative phrase is after the main verb (as in (14b)), although it is also possible to have a topic and a fronted locative phrase. When the latter happens, then the topicalized phrase must precede the locative element, as shown by the contrast in (15)

(14)   a.   GARDEN IX‑LOC GIANNI VASE BREAK̄ raised eyebrows

       b.   VASE GIANNI BREAK GARDEN IX-LOC̄ raised eyebrows
            'Gianni broke a vase in the garden'

(15)   a.   ? VĀSE raised eyebrows   GARDEN IX‑LOC GIANNI BREAK̄ raised eyebrows
            'Gianni broke a vase in the garden'

       b.   * GARDEN IX‑LOC VASE GIANNI BREAK

Following Cecchetto et al. (2006), we assume that LIS is a head-final language, at least in the clausal domain, since the verb follows the object and the functional heads that host aspectual markers, negation, the auxiliary for future and modals follow the verb. Following Cecchetto et al. (2009), we assume that *wh*-phrases sit in Spec, CP but this position is linearized to the right. Following Geraci et al. (2008), we accommodate topicalized elements in a left-branching specifier of a

dedicated projection. Finally, locative phrases can be either adjoined to a lower position (here we assume it to be VP) or sit in the specifier of a functional projection lower than the projection where topicalized elements normally sit.

The structure in (16) contains a simplified representation of the internal structure of the LIS clause:

(16)

```
                                 CP
                          _____/  _____
                        C'                  wh
                   ____/  \____
               TopicP          C'
            ___/    \___
         Spec          Topic'
                    ___/   \___
                  FP          Topic
              ___/  \___
          Locative       F'
                     ___/  \___
                  NegP          F
                    |
                  Neg'
              ___/    \___
            IP             Neg'
         __/   \__
       Subj       I'
               __/    \__
            AspP          I
              |         MODAL
            Asp'
         __/   \__
       VP        Asp
      /  \       DONE
  t_Subj    V'
           _/  \_
         Obj      V
```

An issue that we must mention because it is relevant for the following discussion is whether V-to-I movement occurs in LIS or not. Although caution is needed here because not much is known on the morphosyntax of LIS, the available data seems to be consistent with the hypothesis that the verb does not leave the VP, since it precedes the functional signs that express aspect, modality, polarity and future tense (recall that the T/INFL node is linearized to the right in LIS). An additional piece

of data supporting the hypothesis that V occupies a relatively low position is provided by example (14b) above. In this example, the verb occurs to the left of the locative phrase, which we take to be right adjoined in the VP periphery.

Embedded questions have not been investigated systematically in the previous literature on LIS, but data elicited for this paper confirm that *wh*-phrases are found in the right periphery also in embedded contexts.

Although the research on subordination and coordination has concentrated only on some types of subordinate clauses (mostly relative constructions), clear diagnostics have been identified that set apart coordinate clauses and relative structures (cf. Branchini and Donati, 2009; Cecchetto et al., 2006). These include specialized functional signs and a specialized non-manual-marking for relative constructions, while coordination is signaled prominently by an intonational break (no specialized sign corresponding to ''and'' is found in the language).

Complement clauses can either precede or follow the main verb, although they never sit in center embedded position, namely between the matrix subject and the matrix verb (cf. Geraci et al., 2008) unless additional mechanisms involving spatial morphology are used (Geraci and Aristodemo, 2015).

Finally, subjects do not need to be phonologically expressed in LIS. They can be null if the linguistic context allows recoverability of their content. No specific research has investigated the issue whether LIS is pro-drop due to (spatial) agreement between verb and subject or whether it is more akin to being a topic-drop language of the Chinese type. Object NPs can be omitted as well, but no research targeting this property has been pursued so far.

3. Methodology of data collection

The data we discuss in this paper come from four deaf native signers of LIS. One, R.O., is from Milan and is 47 years old. A second one, M.P., has lived in Milan since many years but grew up in the North-Eastern part of the country and is 34 years old; a third one, M.S., who is a Ph.D. student in linguistics and is a co-author of this paper, comes from Modena (in the North-central part of the Country) but has lived in Venice for many years and is 32 years old. A fourth signer from Sicily (G.C.) is 38 years old and is currently a LIS instructor at the University of Venice.

We collected the data in several sessions spread over more than one year. Elicitation sessions have been conducted with one informant at a time. In the first part of the investigation we collected data from all four informants making sure that, although they have different backgrounds, they share the same intuitions on the basic facts about the constructions we were looking at. In the later elicitation sessions, we collected data only from the main informant (M.S.), since this part of the elicitation involved subtle judgments about interpretation that are difficult to obtain from non-linguistically trained informants.

A hearing native signer of LIS or a LIS professional interpreter conducted the elicitation sessions directly in LIS. Italian was never used during elicitation sessions. Data have been recorded and annotated with ELAN (Crasborn and Sloetjes, 2010). The videos of the sentences were then played back to the informants to check for consistency of the acceptability judgments they provided during the elicitation. Occasionally, we also asked informants to see each other's production to double check the intuitions.

In order to elicit the intended constructions, contexts making them salient were signed to the informants. To illustrate, in order to elicit the LIS counterpart of 'Gianni broke a vase in the dining room while Mario did (so) in the kitchen', we first described (by using LIS) a scenario in which there are two vases in a house, one in the dining room and the other in kitchen. Gianni broke the one in the dining room, while Mario broke the one in the kitchen. Then we asked the informant to report that situation as if s/he were to tell a friend what happened. Once the first elliptical sentence was obtained, we started asking about possible reorganizations in terms of sign order and possible connections with differences in meaning. Finally, once it was clear that a consistent pattern emerged, more complicated examples were elicited by manipulating the lexical components and the internal structure of the examples.

We do not discuss the linguistic behavior of non-native signers and of hearing native signers, because we did not investigate these varieties. In order to facilitate researchers who want to investigate to which extent the phenomenon we are reporting holds in other varieties of LIS (or in other sign languages), we decided to make available on-line all the videos containing the sentences that we report in this paper. They can be found at the following website: https://sites.google.com/site/thegrammaroflis/home/scientific-papers/syntax/the-syntax-of-ellipsis-in-lis

4. Defining the domain of investigation: predicate ellipsis in LIS

Before considering the LIS data, let us informally introduce the basic typology of constructions that involve complete or partial predicate ellipsis. This spoken language based typology is not intended to be complete, as it is meant to be instrumental only to the discussion of the LIS data that will follow.

The first type of predicate ellipsis that we present here is VP ellipsis. As the name suggests, only the VP undergoes deletion, not the T/INFL node or higher nodes. VP ellipsis was initially identified only in English, where the auxiliary verb (17) and the infinitive particle 'to' (18) survive ellipsis of the verb phrase.

(17)   John broke a vase, and Mary did too
(18)   John broke a vase, but he did not want to

Subsequent research (cf. Goldberg, 2005 and references cited therein) determined that other languages show VP ellipsis, although it is superficially different from the English type. In English, as we just saw, the verb is missing together with other VP internal material. This happens because no V-to-I movement occurs in English (cf. Pollock, 1989), so, when the VP is deleted, the verb is also deleted (for the time being, we are not concerned with the specifics of the operation that is responsible for deletion). However, as Goldberg discusses in much detail, there are languages (Hebrew, Irish, and Swahili a.o.) in which both V-to-I movement and VP deletion occur. In these languages, a finite verb survives VP ellipsis, while all other categories in the VP are elided. A question-answer pair in Hebrew illustrates this type of ellipsis ((19) is from Goldberg, 2005:2, who attributes it to Doron, 1999):

(19)   A.   Šalaxt etmol et ha-yeladim le-beit-ha-sefer?
                 send[Past2Fsg] yesterday ACC the-children to-house-the-book
                 'Did you send the children to school yesterday?'
          B.   Šalaxti.
                 send[Past1sg]
                 'I did'

Following Goldberg's terminology, we call 'Aux-Stranding' the VP ellipsis found in English and 'V-Stranding' the VP ellipsis found in Hebrew, Irish, and Swahili. Although superficially different, Aux-Stranding VP ellipsis and V-Stranding VP ellipsis share a nucleus of core properties that define VP ellipsis as a unitary phenomenon (cf. Goldberg, 2005).
    A different type of ellipsis is "stripping" (cf. Hankamer and Sag, 1976:409 for the initial definition). Under stripping, everything in a clause is deleted under identity with corresponding parts of the preceding clause, except for one constituent and (usually) an adverb or a negative element. Sentence (20) minimally contrasts with the VP ellipsis case in (17), because in (20) the T/INFL node is also deleted.

(20)   John broke a vase, and Mary too

Sluicing is still another type of ellipsis relevant for our discussion. In a canonical case of sluicing everything except the *wh*-expression is elided from an interrogative clause:

(21)   Someone broke a vase, but I do not know who

These ellipsis constructions have different properties and have a different distribution, in particular stripping and sluicing are cross-linguistically very common and seem to be more attested than VP-ellipsis (Lobeck, 1995). Other types of ellipsis constructions have been identified in the literature on spoken languages but we do not discuss them here because they are not important to discuss the LIS facts.
    Having set the stage, let us start considering the LIS data. In LIS, a predicate can go unuttered if a suitable antecedent is present (we come back to the issue of what counts as 'suitable antecedent' in section 7). The predicate can be missing if the elliptical clause involves the adverbial signs SAME (Fig. 4) or AS-WELL[4] (Fig. 5), the sign NOT or the sign YES. Some cases of predicate ellipsis are illustrated in (22)–(25).[5]

```
                     raised eyebrows
(22)   DINING-ROOM GIANNI VASE BREAK. MARIO SAME
       'Gianni broke a vase in the dining room and Mario did so too'
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_____

[4] Although they pattern alike in most cases, there are some differences between SAME and AS-WELL. The latter, at least for some consultants, behaves as a positive polarity item, as shown by the contrast between (i) and (ii).

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                 raised eyebrows
(i)    DINING-ROOM MARIA VASE BREAK. PIERO SAME NOT
(ii)   *DINING-ROOM MARIA VASE BREAK. PIERO AS-WELL NOT
```

We do not explore this issue further. For another subtle difference between SAME and AS-WELL, cf. footnote 7.
    [5] As tense is inferred from contextual information and no auxiliary is present in (22)–(25), two analyses are in principle possible, namely VP ellipsis and stripping. Diagnostics to decide between the stripping and VP ellipsis analysis are presented section 5.

‾‾‾‾‾‾‾‾‾‾‾ raised eyebrows
(23)   DINING-ROOM MARIA VASE BREAK. PIERO AS-WELL
        'Gianni broke a vase in the dining room and Piero did so too'

‾‾‾‾‾‾‾‾‾‾‾ raised eyebrows
(24)   DINING-ROOM GIANNI VASE BREAK. PIERO NOT
        'Gianni broke a vase in the dining room while Piero did not'

‾‾‾‾‾‾‾‾‾‾‾ raised eyebrows
(25)   DINING-ROOM GIANNI VASE BREAK NOT. PIERO YES
        'Gianni did not break a vase in the dining room while Piero did'

Fig. 4. SAME.   Fig. 5. AS WELL.

In the examples (22)–(25), the missing constituent in the elliptical clause corresponds to the VP VASE BREAK, which contains the trace of DINING-ROOM (this PP is topicalized in the antecedent clause, as indicated by the topic non-manual-marking). However, the missing constituent can correspond to a smaller category. For example, sentence (26) is also acceptable:

‾‾‾‾‾‾‾‾‾‾‾ raised eyebrows
(26)   DINING-ROOM GIANNI VASE BREAK. MARIO SAME KITCHEN
        'Gianni broke a vase in the dining room. Also Mario did, but in the kitchen'

In (26) the missing category is VASE BREAK, as shown by the fact that it is modified by a locative expression (KITCHEN) different from the locative expression in the antecedent clause (DINING-ROOM). Interestingly, while DINING-ROOM occupies the clause-initial topic position in the antecedent clause, KITCHEN must occupy the clause-final focus position in the elliptical clause. Informants report that the different placement of the locative in the antecedent and in the elliptical clause is necessary to create a contrast between the two clauses and only this contrast allows ellipsis of the lower VP segment VASE BREAK. In fact, if the locative appears in a clause-initial position with raised eyebrows marking topic also in the elliptical clause, then this element cannot be contrasted with the matching topic in the preceding clause. Therefore the sentence in (27) is awkward. This can be interpreted as evidence that, as suggested by Thoms (2013) for English, a VP-adjunct can be left out of the interpretation of the ellipsis site only when it is contrasted with an analogous adjunct in the antecedent.

‾‾‾‾‾‾‾‾‾‾‾ raised eyebrows   ‾‾‾‾‾‾‾‾‾ raised eyebrows
(27)   # DINING-ROOM GIANNI VASE BREAK. KITCHEN MARIO SAME

When no contrast is introduced, the default option is to interpret the ellipsis site as identical to the entire antecedent VP, including (the trace of) the locative expression DINING-ROOM. This creates a clash for the interpretation of (27), because in the elliptical clause it is stated that Mario broke a vase in the kitchen, while, according to the interpretation required by Thoms' constraint, Mario should have broken a vase *in the dining room*. By the way, the pattern in (27) is consistent with the fact that in (22)–(25) only the reading in which the vase has been broken in the dining room is present.

In the sentences considered so far, the antecedent of the missing predicate expresses an action. However, this does not need to be so. First, the ellipsis clause with SAME may have an antecedent clause expressing a non-agentive

predicate (which, probably, should be more properly classified as an unaccusative predicate, but we have to leave a proper classification aside, for reasons of space). So, the antecedent predicate may contain verbs like 'faint' or 'die':

(28)   GIANNI FAINT.PIERO SAME
         'Gianni fainted. Piero did too'
(29)   GIANNI DIE. PIERO SAME
         'Gianni died. Piero did too'

The SAME construction is also compatible with stative predicates. This is shown by examples (30)–(32), where the predicates in the antecedent clause are, respectively, the stative verb LIKE, an adjectival passive and an adjective.[6]

(30)   GIANNI MARIA LIKE. PIERO SAME
         'Gianni likes Maria. Piero does too'
(31)   VASE CRACKED. MUG SAME
         'The vase is cracked. The mug too'
(32)   TABLE RED. CHAIR SAME[7]
         'The table is red. The chair too'

Finally, the ellipsis clause with SAME is compatible with a classifier predicate[8] antecedent:

(33)   WINDOW Cl~rectangular~. DOOR SAME
         'The window is rectangular. The door, too'

Before proceeding toward an analysis, let us exclude a simple hypothesis about the sign SAME and its cognates. One might think that SAME is not an adverb but should be analyzed as the counterpart of a verbal anaphor like 'to do so/to do that'. If so, the structure we are talking about would be a case of predicate anaphora, not of predicate ellipsis. However, there are good reasons to exclude this hypothesis. For example, a verbal anaphor cannot occur with a VP (cf. the sharp ungrammaticality of the English sentence in (34)), while SAME can, as shown by the question–answer pair in (35) below. In (35) the elliptical clause is a *yes/no* question where the category DINING-ROOM VASE BREAK goes unuttered. In the answer, this constituent is expressed together with SAME (the subject is normally left unexpressed in these cases).

(34)   *She did that broke a vase in the dining room

<u>   </u> raised eyebrows   <u>   </u> *y/n*
(35) Q: DINING-ROOM GIANNI VASE BREAK. MARIA SAME
         'Gianni broke a vase in the dining room. Did Maria do that too?'

               <u>   </u> raised eyebrows
    A: YES, DINING-ROOM VASE BREAK SAME
         'Yes, she broke a vase in the dining room as well'

On the other hand, if SAME is an adverb akin to 'as well' the grammaticality of the answer in (35) is expected since of course an adverb like 'as well' can occur with a non-elided VP, much like in the English translation of (35).

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[6] Notice that LIS does not have an overt sign for the copula.
[7] In a sentence like (i), the SAME construction is not felicitous:

(i)   *GIANNI TALL. MARIA SAME

However, the sentence becomes acceptable if the adjective is not vague, as in (ii):

(ii)   GIANNI TALL 150 CM. MARIA SAME
         'Gianni is 150 cm tall. Maria is 150 cm tall as well'

This is probably due to the lexical meaning of the adverbial SAME, which has the morphological make-up of (and is likely derived from) the adjective IDENTICAL. In order to establish that two individuals are identical in the relevant respect, the degree in which they possess a gradable property must be specified. Confirmation for this hypothesis comes from the fact that the adverbial AS-WELL is not similarly restricted, as shown by the grammaticality of (iii):

(iii) GIANNI TALL. MARIA AS-WELL

[8] Classifiers are signs that identify a class of objects and can do so by visually representing some properties that these objects share, i.e. their size, shape, or the way they are handled. In example (33), the shape of the window is specified by using a classifier for rectangular objects.

Furthermore, usually verbal anaphors do not take a stative predicate as an antecedent, as shown by the ungrammaticality of 'John is tired and Mary does that, too' (Lakoff, 1966). However, as we just said, the SAME construction is compatible with stative predicates.

For these reasons, we assume that SAME (and its cognate AS-WELL) is an adverbial expression, which is right adjoined in the VP periphery (or to higher nodes when stripping is involved).

Having made clear that we are dealing with examples of predicate ellipsis and not with cases of predicate anaphora, in the next section we ask what kind of formal analysis these examples should be given.

5. Identifying aux-stranding VP ellipsis in LIS

The examples of ellipsis considered in the preceding section are all susceptible to an analysis in terms of stripping, akin to what is observed in the English sentence 'Gianni broke a vase, and Mario too'. In this section we provide evidence that LIS has genuine cases of VP-ellipsis in addition to cases of stripping. We also argue that LIS is an Aux-stranding VP deletion language and that potential cases of V-stranding ellipsis can be explained in terms of object deletion.

We will use three diagnostics to set apart VP ellipsis and stripping. The first diagnostic is the presence of an auxiliary-like element in the elliptical clause. For example, in (36) and (37), a modal or an auxiliary for future can, but does not need to, be omitted in the elliptical clause.

(36)   *a.*   GIANNI BOOK BUY MUST. MARIA SAME
         b.   GIANNI BOOK BUY MUST. MARIA MUST SAME
         'Gianni must buy a book and also Maria must (buy a book)'
(37)   *a.*   GIANNI BEAN EAT FUT. PIERO SAME
         b.   GIANNI BEAN EAT FUT. PIERO FUT SAME
         'Gianni will eat beans and Piero will too'

While the *a*. sentences in (36) and (37) are likely cases of stripping, this analysis cannot be extended to the *b*. sentences, since the INFL/Tense node is not part of the elided structure. A similar point can be made by using the perfective marker DONE. In order to do that, one may contrast the elliptical clause with DONE and an antecedent clause which contains a specialized negative sign glossed as NOT-YET (Fig. 6). The sign NOT-YET conveys the presupposition that the event described in the VP, although it has not taken place, is expected to take place sometime in the future. On the other hand, by using DONE, a signer presents the event described in the VP as concluded, so an elliptical clause with DONE naturally contrasts with an antecedent clause with NOT-YET (cf. (38)).[9]

(38)   ? GIANNI BOOK BUY NOT-YET. PIERO DONE

Fig. 6. NOT-YET.

Since DONE sits in AspP (cf. the tree structure in (16)), (38) must be analyzed as a case of VP ellipsis.

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[9] Although (38) is grammatical, for reasons that are not clear to us, it is felt as less natural than the counterpart in which the positions of DONE and NOT-YET are reversed, namely (i):

(i)   GIANNI BOOK BUY DONE. PIERO NOT-YET

We cannot discuss here the status of NOT-YET, which, although it looks like an adverbial, behaves like the standard clausal negation NOT according to series of diagnostics (see Geraci, 2006). If NOT-YET is an adverbial, as suggested by a reviewer, (i) might be a case of stripping. The same cannot be said of (38), where the T/INFL node is lexically realized.

Another application of the diagnostics in (34)–(37) to distinguish VP ellipsis and stripping involves indirect questions, where, once again, the elliptical clause can contain an auxiliary. In (39)–(41) the indirect question precedes the matrix verb KNOW both in the antecedent and in the elliptical sentence. This is a natural position for embedded clauses in LIS, as we mentioned. Remember that *wh*-phrases are found in the right periphery of the clause in LIS. As it happens, this also holds for the *wh*-sign WHO in the following sentences.

(39)　　BOOK BUY $\overline{\text{WHO}}$ I-KNOW NOT. FUT $\overline{\text{WHO I-KNOW}}^{wh}$
　　　　'I don't know who (already) bought a book but I know who will'
(40)　　BOOK BUY CAN $\overline{\text{WHO}}^{wh}$ I-KNOW NOT. MUST $\overline{\text{WHO}}^{wh}$ I-KNOW
　　　　'I don't know who can buy a book but I know who must (buy a book)'
(41)　　? BOOK BUY NOT-YET $\overline{\text{WHO I-KNOW}}^{wh}$ NOT. DONE $\overline{\text{WHO I-KNOW}}^{wh}$
　　　　'I don't know who has not yet bought a book but I know who already has'

Sentences (39)–(41) are clear cases where the VP constituent is missing but the T/INFL or AspP nodes are overtly visible, as shown by the presence of the auxiliary FUT, the modal MUST and the aspectual marker DONE (the elliptical clause with DONE is slightly degraded, cf. footnote 9).[10]

Two further diagnostics to differentiate stripping and VP ellipsis build on the observation that VP ellipsis, but not stripping, can occur in subordination and allows for backward anaphora (cf. Lobeck, 1995).

We first illustrate the subordination diagnostic in English and then switch to LIS. In English, VP ellipsis can occur in a coordinate (42a) as well as in a subordinate clause (42b)

(42)　　a.　　John left and Mary did too
　　　　b.　　John left, because Mary did

However, stripping can occur in a coordinate (43a), but not in a subordinate clause (43b) and (43c):

(43)　　a.　　 John left and Mary too
　　　　b.　　*John left, because Mary too
　　　　c.　　*John loves Mary. Bill thinks that Piero too

Moving to LIS, we could identify some clear cases of predicate ellipsis in a subordinated clause. In example (44), the elliptical predicate is found inside the complement clause introduced by the verb THINK.[11] Since predicate ellipsis is found in a subordinate clause, (44) is an unlikely case of stripping.

(44)　　GIANNI MARIA$_i$ LOVE. IX-3$_i$ THINK PIERO SAME
　　　　'Gianni loved Maria. She thinks that Piero did too'

The third diagnostic is that backward anaphora is possible with VP ellipsis (cf. (45b)) but not with stripping (cf. (46b)).

(45)　　a.　　John didn't, but Mary bought books
　　　　b.　　 Mary bought books, but John didn't
(46)　　a.　　John bought books, and Mary too
　　　　b.　　*Mary too and John bought books

In LIS we could find examples where the elliptical predicate is embedded within a subordinate clause *and* precedes its antecedent, namely cases where two diagnostics that suggest a VP ellipsis analysis over a stripping analysis are

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[10] Incidentally, sentences like (39)–(41) in the text prompted us to check the presence of sluicing in LIS. In fact, we could find the LIS counterpart of paradigmatic cases of sluicing like (i) and (ii) below. However, we have to leave the study of sluicing in LIS to another occasion.

(i)　　GIANNI SOMEONE MEET. BUT $\overline{\text{WHO}}^{wh}$ I-KNOW NOT
　　　'Gianni met someone but I do not know who'
(ii)　　SOMEONE BOOK BUY. BUT $\overline{\text{WHO}}^{wh}$ I-KNOW NOT
　　　'Someone bought a book but I don't who'

[11] Example in (44) will be discussed again in section 7.3 with a new numeration with reference to the issue of vehicle change.

combined in the same clause. These are sentences like (47) and (48). In LIS the protasis of a conditional is marked by a specific non-manual marking, whose main feature is raised eyebrows (this is indicated by 'if' in (47) and (48)). A sign corresponding to 'if' is optionally available. No matter if the sign IF is present, as in (48), or absent, as in (47), the antecedent clause can contain an elliptical predicate. This clearly contrasts with stripping in English: 'If Piero not, Gianni will go' is not a grammatical sentence.

(47)   a.   if
               PIERO NOT GIANNI GO
               'If Piero does not, Gianni will go'

(48)   a.   if
               IF PIERO NOT GIANNI GO
               'If Piero does not, Gianni will go'

Sentences like (47) and (48) are very implausible cases of stripping, since they have two properties that stripping does not have: the ellipsis site occurs in a subordinate clause and precedes its antecedent.[12]

     By our reasoning, we predict that, if the elliptical clause contains an auxiliary-like element (thus, it is VP ellipsis according to the first diagnostic), it should be possible to embed it and to have backward anaphora. Examples (49) and (50) below show that this is possible. (50) is a particularly strong case for VP ellipsis in LIS, because all the three diagnostics we discussed so far combine in the same sentence: the elliptical clause contains an auxiliary (FUT), it is embedded in a conditional and the anaphoric relation goes backward.

(49)   MARIA GIANNI$_i$ LIFT. IX-3$_i$ THINK PIERO CAN SAME
          'Maria lifted Gianni. He thinks Piero can do that too'

(50)   if
          (IF) PIERO FUT MARIA BEER BRING NEED NOT
           'If Piero will, Maria does not have to bring beer'

     Having established that LIS has genuine cases of VP ellipsis, we go back to a point that we mentioned in the preceding section. We said that VP ellipsis comes in two superficial varieties: Aux-Stranding VP ellipsis (the English type) and V-Stranding VP ellipsis, where the finite verb survives deletion. The sentences we considered up to now are examples of Aux-Stranding VP ellipsis. This is consistent with the (tentative) conclusion we reached in Section 2 that no V-to-I movement occurs in LIS, much like in English.

     To double check the status of V-Stranding VP ellipsis, we asked our informants whether SAME clauses in which the verb survives deletion (cf. (51) and (52)) are grammatical or not:

(51)   ? HIGHWAY GIANNI CAR BREAK, PIERO BREAK SAME BUT LOCAL-ROAD
          'Gianni broke his car on the highway, while Piero car broke his own on a local road'

(52)   ? GIANNI CAR BREAK, PIERO BREAK SAME
          'Gianni broke his car and Piero did too'

Although (51) and (52) are somewhat degraded and definitely worse than SAME clauses where the verb is elided with the rest of the VP, they are still acceptable. On the one hand, their marginal status confirms that the most productive type of predicate ellipsis in LIS is Aux-Stranding VP ellipsis (the English type). On the other hand, it remains to be understood why (51) and (52), although not perfect, are not utterly ungrammatical. We conjecture that this due to the fact that arguments are often left unexpressed in LIS, so it is likely that what happens in (51) and (52) is not VP ellipsis of any type, but object drop.

     In this section, we saw several types of evidence showing that in LIS there are cases of predicate ellipsis that cannot be cases of stripping. First, auxiliaries may be present in the elliptical clause. Second, the ellipsis site may be subordinated and may precede its antecedent, unlike what happens with stripping.

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[12] We illustrate the case of backward ellipsis with NOT, because the adverbial SAME does not allow backward ellipsis, as shown by the ungrammaticality if (i) and (ii).

(i)   if
         *PIERO SAME GIANNI GO

(ii)   if
         *IF PIERO SAME GIANNI GO

We suspect that this has to do with the lexical content of the adverb SAME, the rough idea being that one can make a comparison and say that A is identical to B only if B has already been introduced.

We conclude that LIS is an Aux-Stranding VP ellipsis language. Incidentally, we note that Italian, the dominant language in the country where LIS is used, has stripping but does not have VP ellipsis. This is just another case showing that the syntax of LIS (at least the variety of LIS used by deaf native signers) is fully autonomous from the syntax of Italian (questions and relatives clauses, as described in the literature on LIS cited in section 2, are other two cases where the two languages sharply differ).

6. Toward an analysis for VP ellipsis in LIS: phonological deletion or semantic copying?

A big part of the literature on VP ellipsis tries to answer the question whether the missing VP is present in the syntactic component (although it is phonologically null) or it is supplied when the sentence needs to be interpreted (cf. Aelbrecht, 2010; Baltin, 2012; van Craenenbroeck, 2010; Cecchetto and Percus, 2006 for a summary of this debate). In particular, two main families of explanations have been proposed: the phonological deletion approach (Goldberg, 2005; Tancredi, 1992; Fox, 2000; Merchant, 2001) and the semantic copying approach (Hardt, 1993; Lobeck, 1992 a.o.).

According to the phonological deletion approach, a full-fledged VP is present in syntax, although it is unpronounced. According to the semantic copying approach, a silent proform is generated in syntax and is interpreted in the semantic component as having the same meaning as the antecedent VP. Therefore, under the semantic copying approach a full-fledged VP is present at no step of the syntactic derivation.

One argument from the spoken language literature which has been used against the semantic copying approach can be reproduced for LIS. This argument builds on the observation that it is possible to extract a *wh*-phrase from an ellipsis site (cf. Baltin, 2012; Chao, 1987; Fiengo and May, 1994; Tancredi, 1992 for this observation and for further discussion). Let us see why this argument helps us to decide between the two approaches. Under the semantic copying approach, the ellipsis site is treated as a silent anaphora with no internal structure. Simplifying things somewhat, a VP ellipsis case like (53a) is analyzed as in (53b), where the null verbal anaphora is indicated by *e*. On the other hand, under the phonological deletion approach, (53a) is analyzed as in (53c), namely a full VP is structurally present in syntax and is deleted in the phonological component under (near) identity with its antecedent (phonological deletion is indicated by strikethrough).

(53)   a.   John will order a pizza and I will too
        b.   John will order a pizza and I will *e* too
        c.   John will order a pizza and I will ~~order a pizza~~ too

With this in mind, it should be clear why a minimal contrast like the following is a challenge for the semantic copying approach. If the ellipsis site contains a null anaphora, as postulated by the semantic copying approach, it is difficult to explain why (54) is grammatical, since (overt) anaphors do not have internal structure, as confirmed by the ungrammaticality of (55).

(54)   I know which person Mary talked to and which person Bill didn't.
(55)   *I know which person Mary talked to and which person Bill didn't do so

On the other hand, the phonological deletion approach can easily explain why only (54) is grammatical. If the VP is present in the syntactic component, it can contain the trace of the *wh*-phrase.

This may not be a knock-out argument against the semantic copying approach, because a supporter of these approaches might still say that a null anaphora is different from an overt anaphora. However, this stipulation has the flavor of an ad hoc assumption.

Going back to LIS, examples like (56) and (57) show that the ellipsis site can contain a trace.[13]

<div align="center">_____ wh   _____ wh</div>

(56)   IN-THE-PAST GIANNI MEET WHO I-KNOW BUT FUT WHO I-KNOW NOT
        'I know who Gianni met in the past but I do not know who he will meet in the future'

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[13] Cases of sluicing like those introduced in footnote 9, repeated below, are additional evidence that an ellipsis site can contain a trace. Assuming Merchant's (2001) analysis, sluicing involves movement of a wh-phrase out of an IP, followed by phonological deletion of that IP as shown in (ii):

<div align="center">_____ wh</div>

(i)   GIANNI SOMEONE MEET. BUT WHO I-KNOW NOT
        'Gianni met someone but I do not know who'

(ii)   BUT [[$_{IP}$ GIANNI t$_i$ MEET] WHO$_i$] I-KNOW NOT

We observe that if an operation of phonological deletion is independently required by the analysis of sluicing, it is very natural to assume that the same operation is responsible for VP ellipsis.

_____ wh   _____ wh
(57)   GIANNI MEET CAN WHO I-KNOW BUT MUST WHO OF-THEM I-KNOW NOT
        'I know who Gianni can meet but I do not know who he must meet'

We take the elliptical clause in (56) and (57) (the one following BUT) to be a case of VP ellipsis since it contains an auxiliary. Crucially, the elided VP contains the trace of WHO, as schematically represented in (56′) and (57′). As in LIS the subject does not need to be lexically expressed, the subject is null in the elliptical clause (we indicate it with 'pro', although we remain neutral on the exact nature of null subjects in LIS).

(56′)   ... BUT [$_{CP}$ [$_{IP}$ pro FUT [$_{VP}$ t$_i$ MEET]] WHO$_i$] I-KNOW NOT
(57′)   ... BUT [$_{CP}$ [$_{IP}$ pro MUST [$_{VP}$ t$_i$ MEET]] WHO OF-THEM$_i$] I-KNOW NOT

We now introduce another general observation that suggests that the phonological deletion analysis is to be preferred to the semantic copying approach. Remember from section 4 that the SAME construction is not restricted to agentive event predicates but can also occur with stative predicates (cf. (30) repeated below as (58)). However, overt verbal anaphora like *to do so/to do that* are crosslinguistically more constrained (see Culicover and Jackendoff, 2005 a.o.). The English example in (59) shows that an overt verbal anaphora is not felicitous with a stative predicate antecedent:

(58)   GIANNI MARIA LIKE. PIERO SAME
        'Gianni likes Maria. Piero does too'
(59)   ?? Gianni likes Maria. Piero does that/so too.

As we said, the semantic copying approach postulates the presence of a null verbal anaphora. This means that the supporters of this approach must assume that even in this respect the null verbal anaphora is "special", having markedly different properties from its overt counterpart. While it is possible for the overt and null version of the same category to have different properties, one would like to have an explanation for these differences. For example, in pro-drop languages a null subject cannot be focused, unlike its overt pronominal counterpart. However this can be easily accommodated by imposing prosodic constraints on focused elements. It is less obvious to understand why an overt verbal anaphora cannot take a stative predicate as its antecedent while its null counterpart can. On the other hand, no stipulation of this kind is needed under the phonological deletion approach, which assumes no null anaphora to begin with.

In this section, we have argued that two general arguments favor a phonological deletion account of VP ellipsis in LIS. The first one is the observation that the ellipsis site contains structure, since it can accommodate a trace. The second one is that the null verbal anaphora postulated by the semantic copying approach has properties different from clear cases of overt verbal anaphora. We acknowledge that these may not be conclusive arguments but, considering that an operation of phonological deletion is independently needed to explain the occurrence of sluicing in LIS (cf. footnote 13), we assume that the phonological deletion approach is the most adequate.

7. Recoverability of the content of ellipsis: a semantic or a syntactic identity condition?

In the remaining part of the paper, we investigate an issue which is related to, although conceptually distinct from, the question whether the ellipsis site is a proform or contains structured material. This issue is the recoverability condition on the content of the ellipsis site. Clearly, this content must be recoverable from the antecedent. But the question is whether recoverability is due to semantic or morpho-syntactic identity.[14] Some authors take it to be semantic (Merchant, 2001; AnderBois, 2011; Thoms, 2013 a.o.). Under this approach, which for concreteness we call "identity in meaning approach", a category can go unuttered only if it has the same meaning as its linguistic antecedent. Others take the identity condition to be syntactic (Fiengo and May, 1994; Fox, 2000; Chung et al., 1995; Chung, 2006; Merchant, 2013 a.o.). Under this approach, which for concreteness we call "identity in form approach", a category can go unuttered only if it has the same syntactic structure and the same lexical composition as its linguistic antecedent. It should be clear that, if the identity in form approach is assumed, semantic identity still holds, but it is only derivative.

Arguments for the identity in meaning approach are often substantiated by evidence for non-isomorphism between the elided VP and its antecedent. For example, as shown by sentences like (60), voice mismatch is tolerated in some cases of VP ellipsis (cf. Kehler, 2002 for the initial observation and Runner and Dozat, 2011 for additional examples and experimental evidence).

(60)   This problem was to have been looked into, but obviously nobody did

_____

[14] The issue of recoverability and the issue whether the ellipsis site contains structure are connected. Obviously, one can argue that recoverability requires identity in syntactic structure only if (s)he is willing to concede that the ellipsis site contains structure. See Johnson (2001) for further discussion.

However, other ellipsis types are more constrained. For example, voice mismatch is not tolerated in sluicing, as shown by the ungrammaticality of (61):

(61)   The cake was eaten. *Who ~~ate it~~?
         (AnderBois, 2011:452)

Other attested cases of mismatch in VP ellipsis (attributed to Irene Heim, class lectures) have to do with phi features, as shown by the acceptability of (62) under the reading according to which John did *his* homework.

(62)   Mary did her homework, and John did too

Interestingly, Schlenker (2014) presents number mismatch cases (and related cases of iconic features mismatch) in predicate ellipsis constructions in ASL (American Sign Language) and LSF (French Sign Language) which are similar to the LIS construction under investigation here.

However, the cases where the missing constituent and its antecedent are not exactly the same do not cancel the fact that the relation between the ellipsis site and its antecedent tends to be strict. So supporters of the identity in form approach have room to maneuver. For example, Merchant (2013) argues that the fact that voice mismatch is tolerated in VP ellipsis, but not in sluicing, is an argument for the syntactic identity condition, under the assumption that the head that determines voice is external to the phrase which is elided in VP ellipsis. As for mismatch in number and gender features, they might be explained by assuming that the syntactic identity requirement holds at a proper level of abstraction.

All in all, the discussion on the recoverability condition on the content of the ellipsis site is still very much open. In this section, we provide new evidence from a visuo-spatial language, since the discussion on identity conditions up to now was mostly based on spoken languages.

7.1. Adverb incorporation as an argument for syntactic identity

In this section, we build an argument for the identity in form approach by capitalizing on a feature of sign languages, namely the fact that adverbs can stand alone (as they normally do in spoken languages) or can be "incorporated" into the verb root. We remain agnostic on whether this phenomenon should be accommodated into Baker's (1988) theory of incorporation, as proposed by Rivero (1992) for adverb incorporation in Modern Greek, and we use the term incorporation in a pre-theoretical sense. We illustrate what we mean by using the adverb QUICKLY as a representative. QUICKLY can be signed as a separate lexical item, as in (63), or can form a single lexical item with the verb it modifies, as in (64). When QUICKLY is incorporated into the verb, the movement of the dominant hand toward the mouth of the signer, characteristic of the sign EAT, is repeated and is articulated more rapidly than in the citation form of the verb. Crucially, (63) and (64) may convey the same meaning, namely that Mario's way of eating meat was quick ((64) has an additional reading, to which we turn shortly).

(63)   MARIO MEAT EAT QUICKLY
         'Mario eats meat quickly'
(64)   MARIO MEAT EAT-QUICKLY
         'Mario eats meat quickly'

We reason as follows: if identity in meaning were enough to license ellipsis, sentences like (65) and (66) below should be on a par with each other, since the antecedent clause in (65) and (66) expresses the same meaning, despite the fact that (65) contains an independent sign for QUICKLY while in (66) QUICKLY is incorporated. However, while (65) is fully acceptable, (66) is sharply ungrammatical with the intended meaning, namely that Gianni eats meat slowly (with another reading, to which we turn shortly, (66) is acceptable, this explains the position of the asterisk).

(65)   MARIO MEAT EAT QUICKLY. GIANNI SAME SLOWLY
         'Mario eats meat quickly. Gianni does that slowly'
(66)   MARIO MEAT EAT-QUICKLY. GIANNI SAME SLOWLY
         *'Mario eats meat quickly. Gianni does that slowly'

On the other hand, if identity in form is required, there is an easy explanation for why (66) is out: since QUICKLY is incorporated into the verb in the antecedent clause, if the ellipsis site is identical in form to its antecedent, there is a clash in

meaning (one cannot eat slowly and quickly at the same time). In (65) there is no clash because the ellipsis site is identical to the constituent MEAT EAT.[15]

This argument targets a semantic account which assumes that the content of the missing constituent can be recovered by filling in any meaning of the appropriate semantic type which is salient in the preceding clause. This argument may not apply to other versions of the semantic identity approach. We give a different argument against these approaches in section 7.2, based on the distribution of strict/sloppy reading.

We have not finished our discussion of adverb incorporation facts yet, though. As already mentioned, sentence (64) is ambiguous in a way that (63) is not. According to the reading we considered up to now, Gianni eats meat quickly (but he does not necessarily eat a big quantity of meat). We now call this ''speed reading'' and stress that this is the reading conveyed by the English sentence 'Gianni is eating meat quickly'. Under a second reading, (64) means that Gianni is eating a lot of meat. This is the ''amount reading''. In (63), where the adverb is not incorporated, only the speed reading is present, probably because ultimately the amount reading is made possible by the fact that the accelerated movement of the dominant hand toward the mouth of the signer may convey the information that much is ingested and not only the information that the eating event happens quickly.

After clarifying the ambiguity of (64), let us consider sentence (66) again. As we said, this sentence cannot be interpreted as meaning that Gianni eats meat quickly. However, as correctly observed by a reviewer, (66) should still be grammatical if the antecedent clause receives the amount reading, because in that case the SAME clause would receive a non-contradictory meaning, namely that Gianni eats a lot of meat (this meaning is recovered from the antecedent clause) but does that slowly (this additional meaning is introduced by the adverb SLOWLY). We double checked if this reading arises with (66) and it turns out that it does.

(66)   MARIO MEAT EAT-QUICKLY. GIANNI SAME SLOWLY
        √ 'Mario eats a lot of meat. Gianni does that slowly'

The amount reading is not the preferred one in (66), but it can be made fully natural by making the amount reading prominent in the antecedent clause. This can be done by introducing a resultative sign like EXHAUST, as in (67). The sign EXHAUST indicates that a huge quantity of food (in this case meat) has been eaten, and this makes the amount reading more salient than the speed reading.

(67)   GIANNI MEAT EAT-QUICKLY EXHAUST. PIERO SAME BUT SLOWLY
        'Gianni eat a lot, finishing the meal, and Piero did that too but slowly'

Let us take stock. We saw that a complex, but consistent, pattern can be explained only if it is assumed that the missing VP is identical *in form* with its antecedent. In particular, if an adverb is incorporated into the verb in the antecedent clause, the same adverb must be incorporated into the verb in the elliptical clause (although invisibly, of course), despite the fact that the relevant meaning can be expressed by a version in which the adverb is a separate sign.

We now introduce some data showing how the speed reading/amount reading ambiguity intersects with the phenomenon of ellipsis. This data show that semantic parallelism holds. The reading that obtains in the antecedent clause in (68) must obligatorily obtain in the SAME clause. If the speed reading is selected in the antecedent clause, the SAME clause receives the speed reading (Piero eats quickly). If the amount reading is selected, the SAME clause receives the amount reading (Piero eats a lot of beans):

(68)   GIANNI BEANS EAT-QUICKLY. PIERO SAME
        √ speed reading in the antecedent /speed reading in the ellipsis
        √ amount reading in the antecedent / amount reading in the ellipsis
        *speed reading in the antecedent / amount reading in the ellipsis
        *amount reading in the antecedent / speed reading in the ellipsis

So, prima facie, a semantic parallelism that goes beyond identity in form seems to be required here. However, two observations are in order in this respect. First, the non-elliptical counterpart of (68), namely (69), although highly redundant, is acceptable and the semantic parallelism that we observe in (68) holds here as well.

(69)   GIANNI BEANS EAT-QUICKLY. PIERO BEANS EAT-QUICKLY SAME

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[15] While the argument in this exact form applies only to sign languages, or (possibly) to the few known spoken languages that have adverb incorporation (cf. Alexiadou, 1997, Chapter 6), it can be reproduced more generally by building on different types of complex words, as the following English examples, pointed out to us by Jason Merchant, show:

(i)   Abby took the exam again and Ben did for the first time
(ii)   ?? Abby retook the exam and Ben did for the first time

Therefore, semantic parallelism, albeit preserved by ellipsis, is not *due* to (the recoverability condition on) ellipsis.[16] The second observation is that it is not obvious that EAT-QUICKLY with the speed reading and EAT-QUICKLY with the amount reading are exactly the same lexical item, as subtle differences (for example in non-manual-marking) might be at play here.

We conclude this section by stressing the adverb incorporation facts provide a clear argument for the approach that assumes that there must be identity in form between the elided VP and its antecedent.

7.2. The distribution of the strict/sloppy reading as an argument for identity in form

As observed by Quer and Rossello (2013), VP ellipsis is often diagnosed by using the availability of the sloppy reading as a test.[17] The contrast between (70) and (71) is supposed to show this. In (70) the sloppy reading (Bill loves Bill's mother) is not available, whereas it is available in the elliptical counterpart (71).

(70)   John loves his mother and Bill loves her too
(71)   John loves his mother and Bill does too

As we argued that the LIS elliptical construction that we are studying is a case of VP ellipsis of the English type, we decided to investigate the distribution of the strict and sloppy reading in this construction. In doing so, we ran across a sign language specific argument for syntactic identity. But let us proceed step by step. In simple cases of ellipsis with SAME like (72), both the strict and the sloppy reading are easily detectable (determiners, including possessives like POSS, are naturally placed after the noun in LIS). By coindexing them, we indicate that POSS and GIANNI are articulated in the same position in the signing space.

(72)   GIANNI$_i$ SECRETARY POSS$_i$ VALUE. PIERO SAME
         Strict reading:
         √ Gianni values his own secretary. Piero values Gianni's secretary
         Sloppy reading:
         √ Gianni values his own secretary. Piero values Piero's secretary

However, the situation changes in an interesting way when the phenomenon of SAME ellipsis intersects with the phenomenon of role shift. Role shift is a strategy common across sign languages in which the signer takes the perspective of the quoted person by slightly shifting his/her body toward the position in the signing space to which the quoted person is associated (role shift usually involves also a change of the position of the head and breaking the eye contact with the addressee). Due to its semantics, role shift has a striking interpretive consequence, namely that indexicals can be interpreted with respect to the context corresponding to the person whose perspective is adopted. We illustrate this phenomenon by using the sentences (73) and (74). In (73) by coindexation we indicate that the pointing sign IX-3 (corresponding to the third person pronoun) refers to the position in the space where the sign GIANNI has been articulated. The non-manual components marking role shift are indicated by a line over the glosses. This line in (74) signals that the signer shifts his/her body toward the position where the sign GIANNI has been articulated. The sentences in (73) and (74) are truth-conditionally equivalent, but role shift takes place only in (74). As a consequence, the subject of the embedded clause has the form of a third person pronoun in (73) while it has the form of a first person pronoun in (74).

(73)   GIANNI$_i$ SAY IX-3$_i$ MARIA KISS

$$\overline{\hspace{4cm}}\text{ rs-i}$$
(74)   GIANNI$_i$ SAY $\overline{\text{IX-1}}_{rs}$ MARIA KISS
         'Gianni said that he kissed Maria'

Before proceeding, we briefly mention that role shift cannot be simply equated to a case of quotation. One reason for thinking this is that role shift can occur even in absence of a verb of saying or of a propositional attitude verb. The sentence in (75), which we took from Zucchi (2004), illustrates this with a LIS sentence. The verb DONATE in LIS is normally

articulated with a movement that starts from the position of the giver and is directed to the position of the receiver. However in (75) since the signer adopts Gianni's perspective and shifts his/her body into the position where the sign GIANNI was articulated, the sign DONATE moves from the signer body toward the position of the addressee.

           _____ rs-i
(75)   GIANNI$_i$ ARRIVE BOOK 1-DONATE-2
        'When Gianni arrives, he will give you the book as a present.'

After introducing this background information about the phenomenon of role shift, we can go back to its interaction with ellipsis. The minimal pair we have to focus on is (76) and (77). The antecedent clause in (76) contains a ''garden variety'' third person pronoun, while the antecedent clause in (77) is a case of role shift, where a first person pronoun is interpreted under role shift as referring to Gianni.

(76)   GIANNI$_i$ SAY IX-3$_i$ MARIA KISS. PIERO$_j$ SAME
       'Gianni said that he kissed Maria. Piero did too'

           _____ rs-i
(77)   GIANNI$_i$ SAY IX-1$_{rs}$ MARIA KISS. PIERO$_j$ SAME
       'Gianni said that he kissed Maria. Piero did too'

There is an important interpretative difference between (76) and (77). The SAME clause in (76) is ambiguous between the strict reading ('Gianni said that Gianni kissed Maria. Piero said that Gianni kissed Maria') and the sloppy reading ('Gianni said that Gianni kissed Maria. Piero said that Piero kissed Maria'). However, the SAME clause in (77) is not ambiguous, since it admits only the sloppy reading.

    How should one account for the contrast in (76) and (77)? Before getting into the details necessary to explain why the identity in form approach can explain the interpretative difference between (76) and (77), let us informally explain why the identity *in meaning* approach has a hard time with (76) and (77). The crucial observation is that, if the SAME clause could just recover a meaning that is contextually salient (with no identity in form required), the strict reading should not be missing in (77). After all, the first sentence in (77) means that Gianni said that Gianni kissed Maria. Therefore, if the SAME clause refers back to a contextually salient *meaning*, there is no reason why it shouldn't be able to refer to the property of saying that Gianni kissed Maria, thus yielding the strict reading.

    We now move to explain why the identity in form approach fares much better. Let us start from (76). Following Fiengo and May (1994) and others, we assume that the third person pronoun IX-3 in first sentence may be represented at LF either as a free variable coindexed with the subject GIANNI, as in (78), or as a variable bound by the λ-operator, as in (79):

(78)   Gianni$_i$ λx$_j$ say (x$_i$ kiss Maria)
(79)   Gianni$_i$ λx$_j$ say (x$_j$ kiss Maria)

If the elliptical constituent is identical in form to the λ-expression in (78), we get the LF representation in (80) below, which corresponds to the strict reading, since the second conjunct contains the variable 'x$_i$' coindexed with 'Gianni$_i$', which presumably requires that their denotation be the same. On the other hand, if the elliptical constituent is identical in form to the λ-expression in (79), we get the LF representation in (81), which corresponds to the sloppy reading, since the property denoted by 'λx$_j$ say (x$_j$ kiss Maria)' is the property one has if he/she says of himself/herself that he/she kissed Maria:

(80)   Gianni$_i$ λx$_j$ say (x$_i$ kiss Maria) & Piero λx$_j$ say (x$_i$ kiss Maria)
(81)   Gianni$_i$ λx$_j$ say (x$_j$ kiss Maria) & Piero λx$_j$ say (x$_j$ kiss Maria)

Now, let's turn to sentence (77). Following Quer (2005), we assume that the non-manual-markings in (77) indicate that the verb SAY in (77) is a context shift operator of the kind described by Schlenker (1999, 2003) for Amharic. In Amharic, we find that first person pronouns in indirect discourse with 'say' may refer to the subject argument of 'say', rather than to the speaker of the context of utterance. Thus, for instance, in Amharic, we find cases like (82), where the first person pronoun refers to John and not to the speaker:

(82)   John Jägna näNN yt-lall
       John hero am-I says-3sg.m
       'John says that he is a hero'

Schlenker's suggestion to account for these cases is that (82) is represented at LF as (83) below, where the SAY operator requires that the context c fixing the denotation of the first person indexical 'I' be a context in which 'I' denotes the individual whom the subject argument of SAY refers to:

(83)   John λx $SAY_{(x,t,w)}$ c hero(I(c), time(c), world(c))

Now, if we suppose that the non-manual-markings in (77) indicate that the LIS verb SAY is Schlenker's SAY operator in (83), we get the following representation for the first sentence in (77):

(84) $Gianni_i$ λx_j $SAY_{(xj,t,w)}$ c (I(c) kiss Maria)

Supposing that the elliptical constituent is identical to the predicate 'λx_j $SAY_{(xj,t,w)}$ c (I(c) kiss Maria)', we get the following LF representation for (77), which yields the desired reading for (77) (the sloppy reading by which Gianni said that Gianni kissed Maria and Piero said that Piero kissed Maria):

(85) $Gianni_i$ λx_j $SAY_{(xj,t,w)}$ c (I(c) kiss Maria) & Piero λx_j $SAY_{(xj,t,w)}$ c (I(c) kiss Maria)

Since, unlike third person pronouns, first person pronouns cannot be directly bound by the λ-operator, this is the only reading predicted to be available for (77).

In conclusion, we need to stress that this result holds only under the assumption that the missing predicate in the SAME clause in (77) has the same form as the antecedent in (77), namely a predicate where role shift has taken place. So, the pattern we just described can be seen as another argument showing that the recoverability condition on ellipsis requires identity in form.[18]

7.3. Vehicle change in LIS

There is a problem for the hypothesis that identity in form is necessary to recover the content of VP ellipsis, though. This is the so-called vehicle change phenomenon, extensively discussed by Fiengo and May (1994) and much following literature. We report the basic facts for English and then switch to discuss their counterpart in LIS.

In this section, we use the subscript letters 'x', 'y' or 'z' as a convenient device to indicate the reading in which a pronoun and a referential expression have the same semantic value. A sentence like (86) is ungrammatical under the intended reading, and this is expected since the elided VP contains a referential expression ('John') which is c-commanded by a coindexed pronoun. This triggers a Principle C violation, as indicated in (86′), where strikethrough indicates the VP which is phonologically deleted.

(86)   * Mary admires $John_x$ and he_x does too.
(86′)   * Mary admires $John_x$ and he_x does ~~admire John~~$_x$ too.

The surprising fact that goes under the name of "vehicle change" is the grammaticality of (87):

(87)   Mary admires $John_x$, and he_x thinks that Sally does too.

(87) should also be a Principle C violation, if the structure before deletion is (87′):

(87′)   Mary admires $John_x$, and he_x thinks that Sally does ~~admire John~~$_x$ too.

In order to make sense of the grammaticality of (87), Fiengo and May suggest that what happens in (87) is that the referential expression 'John' can undergo vehicle change, namely a pronoun replaces the referential expression in the elided VP but preserves its indexical information. So the structure underlying (87) would be (87″), rather than (87′):

(87″)   Mary admires $John_x$, and he_x thinks that Sally does ~~admire him~~$_x$, too

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[18] A reviewer observes that a pattern similar to the one we describe for LIS can be reproduced with direct quotations in spoken language. For example, 'Gianni said "I kissed Maria", and Piero did too' can only get the sloppy reading, where Piero said that he, Piero, kissed Maria too. In principle, this can be explained by following the same line of reasoning adopted for the sign language case. If the missing predicate must have the same form as its antecedent, the meaning of the elliptical sentence must be the meaning of the sentence 'Piero said "I kissed Maria"'. This corresponds to the sloppy reading.

Crucially, the vehicle change analysis can still explain why (86) is ungrammatical in the intended reading. True, if vehicle change applies, (86) stops being a Principle C violation but it becomes a Principle *B* violation, as shown in (86″):

(86″)   *Mary admires John$_z$ and he$_z$ does ~~admire him~~$_z$, too

Vehicle change is a structurally constrained interpretive phenomenon that selectively applies to VP ellipsis, as pointed out by Yoshida et al. (2013). If the SAME construction is the counterpart of VP ellipsis not only functionally but also structurally, we expect vehicle change to pop-up in the LIS construction as well. We investigated this issue and it turns out that it does.

In (88) below the noun phrases that are potential binders for a pronoun are introduced in the discourse before the relevant sentence is uttered, so each noun phrase is associated to a position in the signing space, indicated by the subscript 'h', 'i', and 'j'. The positions are distributed as follows: the position for the sign GIANNI is in the ipsilateral part of the signing space (namely, the part of the space associated with the signing hand), the location of the sign MARIA is in the central part of the signing space, while the position for the sign PIERO is in the controlateral part and closer to the signer's body.

(88)   IX-1 GIANNI$_h$ MARIA$_i$ PIERO$_j$ MEET DONE...
        'I met Gianni, Maria and Piero'

Suppose that after (88) is uttered, (89) is uttered.

(89)   GIANNI$_h$ MARIA$_i$ LOVE. IX-3$_i$ SAME[19]

Not surprisingly (89) cannot mean that Maria loved herself and this is expected, since the relevant reading would trigger a Principle C violation, as shown in (89′):[20]

(89′)   GIANNI$_h$ MARIA$_i$ LOVE. IX-3$_i$ ~~MARIA$_i$~~ ~~LOVE~~ SAME

The crucial example is (90). As indicated by the translation, (90) can mean that Gianni loved Maria and Maria thinks that Piero loved her (=Maria).

(90)   GIANNI$_h$ MARIA$_i$ LOVE. IX-3$_i$ THINK PIERO$_j$ SAME
        'Gianni loved Maria and she thinks that Piero did too'

The availability of this reading shows that vehicle change takes place, as shown in (90′). As a matter of fact, without vehicle change the intended reading of (90) would elicit a Principle C violation, as shown in (90″).

(90′)   GIANNI MARIA$_i$ LOVE. IX-3$_i$ THINK PIERO$_j$ ~~IX-3$_i$~~ ~~LOVE~~ SAME
(90″)   GIANNI MARIA$_i$ LOVE. IX-3$_i$ THINK PIERO$_j$ ~~MARIA$_i$~~ ~~LOVE~~ SAME

Let us take stock. A first important observation is that, since vehicle change is a subtle interpretive effect, its presence in the SAME construction seems to us as a very strong evidence that the same general constraints on anaphoric relations hold in spoken and sign languages alike. *The basic principles of binding theory are cross-modal*, and they are a strong candidate for being a language universal and a core part of the language faculty, in striking contrast with the claim that sign languages pose a special challenge to universalist views (cf. Evans and Levinson, 2009).

Having said that, and going back to the question of the proper characterization of VP ellipsis, the existence of vehicle change poses a problem for the identity in form approach. At the very least, vehicle change indicates that VP ellipsis does not require *strict* morpho-syntactic identity between the ellipsis site and its antecedent, as a pronoun is not morphologically identical to a referential expression. So, either the condition of syntactic identity is weakened or, more radically, it is abandoned. For example, Merchant (2001) builds on vehicle change facts to argue that the ellipsis and its

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[19] In the video associated to the sentences in (89), the pointing sign is oriented toward the location where the sign MARIA is located. However, it does not target the exact location of the sign MARIA. We assume that the signer is adopting some sort of blending space, where the exact spatial reference of the "actors" is not crucial (Liddell, 2003). The same holds in (90).

[20] Sentence (89) has an additional reading, which is irrelevant for our present purposes. Under this reading, Gianni loves Maria and Maria loves Gianni.

antecedent must hold a mutual entailment relation that is stated in terms of semantics, not in terms of morpho-syntax. In the next section we offer some remarks on this issue.

7.4. Conclusions on the recoverability condition

We examined the issue of the recoverability condition on ellipsis from the point of view offered by Italian Sign Language. Evidence is not univocal, as some arguments suggest that lexical and morpho-syntactic identity (identity in form) is required while others suggest that a properly defined version of semantic identity is enough. As far as LIS is concerned, facts regarding adverb incorporation and the distribution of the strict/sloppy reading under role shift clearly militate for the identity in form requirement while vehicle change suggests otherwise. We note that, while the vehicle change argument is based on the fact that the same data are attested both in languages using the visuo-spatial modality and in spoken languages, the arguments supporting the identity in form approach are newer, as they build on modality specific aspects of the language (the availability of simultaneous morphology, exploited by adverb incorporation and role shift).

Although we acknowledge that the question of the proper formulation of the recoverability condition is far from being settled, our temporary conclusion about LIS is that identity in meaning is *not* enough. For example, it does matter whether the very same meaning is conveyed by an adverb as a separate sign or by incorporating it in the verb stem. Similarly, it does matter whether the signer reports the content of a propositional attitude by shifting into the role of the quoted person or not (although the sentences with or without role shift are truth-conditionally equivalent).

Still, strict morpho-syntactic identity is not obligatory for ellipsis to take place, given the availability of vehicle change. Interestingly, our data on vehicle change parallels Schlenker's (2014) data, where it is shown that some feature mismatch is tolerated between the missing constituent and its antecedent in ASL and LSF. Schlenker proposes a principle that has the effect that, if within its local context a complex expression *E* has the same denotation as a structurally simpler expression *E'*, then *E* can be replaced with *E'* for purposes of ellipsis resolution. Under the natural assumption that a pronoun is simpler than a full referential expression, Schlenker's principle might be extended to cover the vehicle change facts in LIS. This would allow us to amend the identity in form condition and make it compatible with the only case of mismatch we observed (vehicle change). At the best of our current knowledge on ellipsis in sign languages, such amended version of the identity in form approach is the most adequate formulation of the recoverability condition.

8. Conclusion

In this paper, we have identified a LIS construction in which a category goes unuttered if its meaning is recoverable. After establishing that this construction is akin to Aux-Stranding VP ellipsis of the English type, since an auxiliary-like category can sit in the elliptical clause, we ascertained that the elliptical site has internal structure. We did so by eliciting sentences in which the site contains a *wh*-trace.

We saw that the hypothesis that the ellipsis site can be analyzed as a phonologically null verbal anaphor is made unlikely by several considerations, including the fact that ellipsis is not restricted to agentive predicates, as verbal anaphors typically are.

In the second part of the paper we moved to the long standing issue of recoverability of the ellipsis content. Should this condition be intended as semantic or morpho-syntactic? We presented two new arguments (based on adverb incorporation and role shift, both very productive operations in sign languages) that clearly favor the first option, although facts concerning vehicle change remain a challenge.

We are well aware that the research on ellipsis in sign languages is still at an early stage. We just began scratching the surface, so there are important issues that we left unexplored. We mention one in conclusion. In addition to the recoverability condition, ellipsis has to be licensed in a specific structural configuration. As we mentioned, VP ellipsis has a limited cross-linguistic distribution and is rarer than sluicing (Lobeck, 1995). What determines that VP ellipsis is grammatical in some languages, say English and LIS, but not in other languages, say Italian? Various hypotheses have been advanced (cf. Aelbrecht, 2010 for discussion), but we have to leave these questions to future work, partly because at this stage too little is known about the fine-grained structure of the LIS sentence. However, we hope to have shown that investigating ellipsis in sign languages can contribute important information not only on the structures of these languages but also on the general theory of ellipsis. In particular, new arguments that are at least partially modality-specific can contribute evidence on long standing issues that, after decades of research, are still at the heart of the debate in the field.

Acknowledgements

Appendix

Following standard practice in the sign language literature, we use capital letters to indicate signs. For convenience we use capitalized English words to indicate LIS signs.

A continuous line over the sign(s) indicates the presence of the non-manual marker which has a grammatical import. In this paper, we adopt the following conventions:

____ wh   non-manual-marking occurring on wh-signs
____ yes/no non-manual-marking occurring on *yes/no* questions
____ topic   non-manual-marking occurring on a topicalized phrase
____ re   non-manual-marking occurring on the protasis of a conditional
____ rs-i   role shift non-manual-marking, which occurs when the signers moves his/her body towards
the participant signed in the position 'i' and assumes the role of that participant

For convenience we indicate the intonational break which signals a clause boundary by a using a punctuation mark.

We indicate pointing signs which correspond to pronouns as: IX-1 (first person pronoun, pointing sign toward the signer's body), IX-2 (second person pronoun, pointing sign toward the addressee), IX-3 (third person pronoun, pointing sign toward a different position in the signing space).

Classifier elements are indicated as Cl accompanied by a subscript in which its meaning is provided in English. For instance the gloss 'Cl$_{rectangle}$ means' a classifier sign is used and the meaning is 'rectangular object'.

Coreference between a full NP and a pronoun is normally established by directing the pronoun (a pointing sign) toward the position in the signing space associated with the NP. Subscript sharing the same index are meant to indicate spatial coreference and a fortiori establish NP-pronoun coreference.

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