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Wh-features and exclamatives in LIS (Italian Sign Language)[1]

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Abstract

This paper offers a description and outlines an analysis of exclamative sentences in LIS. The manual and non-manual markers of exclamative force have been looked for in a corpus of semi-spontaneous sentences elicited by using pictures that triggered reaction of positive or negative surprise. A follow up session including grammaticality judgements allowed to double check the main findings, namely that the main markers of partial exclamatives is furrowed eyebrows and the main markers of total exclamatives is raised eyebrows. As furrowed eyebrows are the marker of wh-interrogatives, LIS can be added to the long list of unrelated languages that can express exclamatives by employing the wh-morphology.

Keywords: LIS, partial exclamatives, partial exclamatives, *wh*-morphology.

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1. Introduction

In the sign language literature, it is common to refer to signs specialized for questions as *wh*-signs and to interrogative constructions as *wh*-constructions. However, it is often left unspecified whether this terminological choice is motivated uniquely by practical considerations (the terminology is very widely used in linguistics and is transparent for most readers) or presupposes that a dedicated *wh*-morphology has been identified in the sign language under investigation.

In fact, there is no reason to presuppose that a language (including a sign language) is necessarily equipped with morpho-phonological features that are specialized for interrogatives. In a wide variety of unrelated languages, indefinites can be used in interrogatives with no special morphological marking (cf. Haspelmath, 1997), a well-known case being *shenme*, which in Chinese can mean 'what' or 'something'.

Our goal in this paper is to investigate whether a dedicated morphology specialized for interrogatives, similar to the *wh*-morphology observed in English, exists in LIS (Italian Sign Language).

A preliminary clarification is in order: some researchers argued that the concept of morpheme and that of phoneme are difficult to distinguish in in sign language because the formational parameters of the sign (the building blocks of the phonological system) may have an intrinsic meaning (cf. Meir, 2012 for review). Here we assume an operative definition according to which a morpheme is a meaningful sub-lexical unit and abstract away from the theoretical issue concerning the (alleged) morphemic value of phonemes in general.

Even a cursory look at the repertoire of interrogative pronouns in LIS suffices to show that there is no obvious manual feature that can be identified as a sub-lexical unit which might play the role of a wh-morpheme. The signs below (Figure 1) do not share location, handshape or any specific movement (there is some dialectal variation but the interrogative signs below are among the most attested ones across Italy).

WHO	WHAT/HOW	HOW
WHERE	WHEN	WHICH

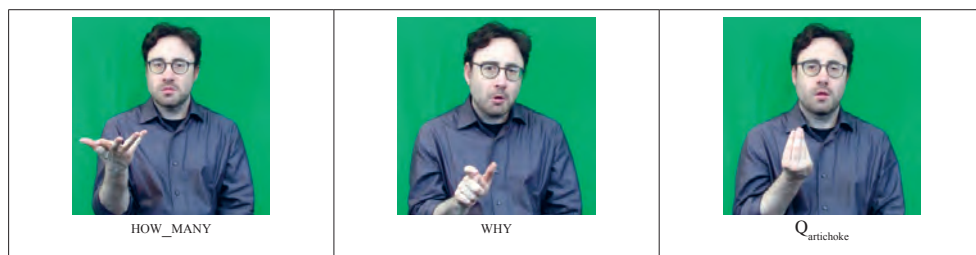|		
HOW_MANY	WHY	$Q_{artichoke}$
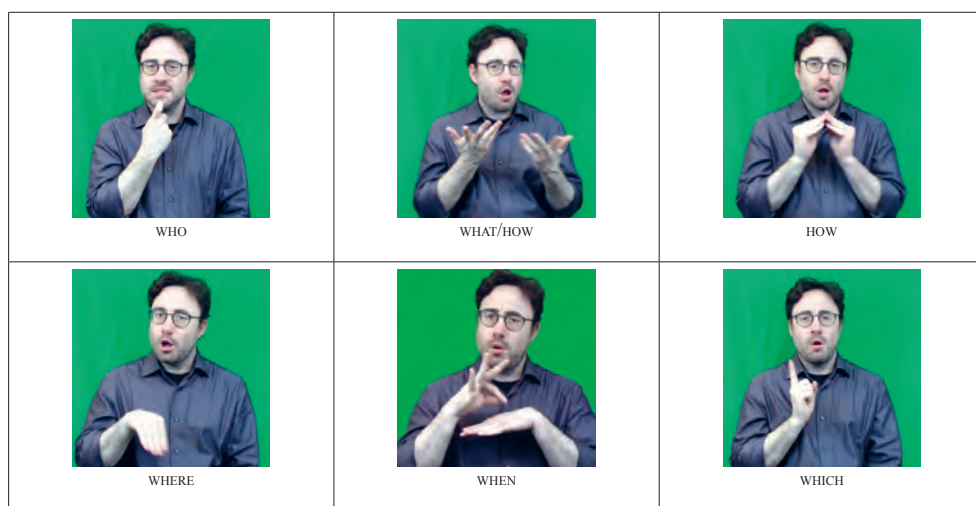
Figure 1: interrogative signs in LIS (images from Mantovan, 2020)

In fact, LIS is not isolated in this respect. Other sign languages for which a rich repertoire of interrogative pronouns has been described pattern the same, namely no manual component can be identified as a candidate for a *wh*-feature (cf. the Section 3.7.5 of the Lexicon part of the sign language grammars produced by the SIGN-HUB projects and hosted here: https://www.sign-hub.eu/grammar).

However, LIS does not seem to be a Chinese type language either, as interrogative signs and indefinite pronouns are well distinct, as is best illustrated by comparing the sign WHO in Figure 1 and the sign SOMEONE in Figure 2.
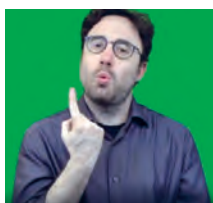

Figure 2: the sign SOMEONE

However, if one looks at non-manual-markers the various interrogative signs all have something in common and this is furrowed eyebrows (indicated as 'fe'). It is therefore very natural to hypothesize that this non-manual component is the manifestation of *wh*-morphology on the interrogative pronoun in LIS (and in other sign languages, as furrowed eyebrows is very common in interrogatives across sign languages, cf. Kelepir, 2021).

In this paper, we offer two types of arguments supporting this conclusion. The first one involves going deep into one aspect of interrogatives in LIS (Section 2), while the second argument (Section 3) capitalizes on the presence of *wh*-morphology in exclamative clauses.

This paper is organized as follows: section 2 is devoted to content questions in LIS, and we argue on the basis of a detailed analysis of a particular sign, $Q_{artichoke}$, that *wh*-morphology exists in LIS and it is typically expressed non manually (through furrowed eyebrows). We then focus on a special interrogative sign glossed $Q_{artichoke}$, which can co-occur with lexical interrogative elements. We argue that 'furrowed eyebrows' and $Q_{artichoke}$ express two different features that are usually conflated in *wh*-morphology: the first expresses the *wh*-feature defining *wh*-structures, and the latter expresses the Q feature associated with questions.

Section 3 is a first exploration of the syntax of exclamatives in LIS, whose pioneering elicitation method is detailed in §3.1. The hypothesis is that if *wh*-features

correspond to furrowed eyebrows, and *wh*-features are a component of the syntax of exclamatives across languages for principled reasons (Zanuttini & Portner, 2003), we should find furrowed eyebrows in exclamatives as well. On the other hand, if $Q_{artichoke}$' is the realization of the +Q feature characterizing questions, it should not appear in exclamatives. The results of our fieldwork appear to meet this prediction (§3.2). An analysis of exclamatives in LIS capitalizing on Zanuttini and Portner's (2003) seminal theory of exclamatives as widening the domain of quantification is sketched. Section 4 briefly concludes the paper.

2. The *wh*-feature in content interrogatives

As we mentioned, our working hypothesis is that the expression of *wh*-morphology in content interrogatives is the non-manual-marking realized as furrowed eyebrows. By doing that, we assume that 'furrowed eyebrows' is a non-manual sub-lexical unit which is shared by all interrogative pronouns. This hypothesis is consistent with a well-established line of research, although recently challenged by some (cf. Sandler, 2010). Still, this proposal needs to be further specified in order to be mantained. On the one hand, 'furrowed eyebrows' can extend to a bigger portion of the interrogative sentence, including signs that are not inherently interrogative, like the verb ARRIVE in sentence (1).

(1) $\overline{\text{ARRIVE WHO}}^{fe}$
       'Who arrives/has arrived?'

This is not expected if 'furrowed eyebrows' is just a sub-lexical feature of interrogative pronouns. A similar observation, namely that non-manual-markers found on interrogatives pronouns can extend to a bigger portion of the sentence, has been reported for several other sign languages (cf. Cecchetto, 2012 and Kelepir, 2021). Therefore, the question is: why should a sub-lexical feature extend to the entire interrogative sentence (or to a syntactically determined portion)?

Furthermore, there is a specific fact about LIS interrogatives that should be taken into account, namely the behavior of the interrogative sign glossed as $Q_{artichoke}$, which is depicted in Figure 3 (cf. Branchini et al., 2013, for a description of $Q_{artichoke}$).

$Q_{artichoke}$ is very special, because it can be used as a lexical variant for any interrogative sign. The polysemy of $Q_{artichoke}$ can be resolved in three different ways:

(i) the context uniquely identifies the syntactic role of $Q_{artichoke}$ (cf. 2, in which it corresponds to the internal argument of the unaccusative verb);

Figure 3: $Q_{artichoke}$

(ii) $Q_{artichoke}$ is combined with partial or total mouthing of an Italian interrogative pronoun (cf. 3, in which $Q_{artichoke}$ is produced simultaneously with the mouthing of [ku], corresponding to the first syllable of the Italian wh- phrase *quando*, 'when');

(iii) $Q_{artichoke}$ combines with another interrogative sign (cf. 4, in which $Q_{artichoke}$ follows the interrogative sign WHO).

As for its position, $Q_{artichoke}$ patterns with other interrogative signs, namely it sits in a dedicated position in the right periphery of the clause.

(2)

    A: ARRIVE $\overline{Q_{artichoke}}^{\text{fe}}$
    B: GIANNI
    'Who arrived? Gianni.'

(3)

    IX$_2$ LEAVE $\overline{Q_{artichoke}}^{\text{fe}}$
    'When are you leaving?'

(4)

    ARRIVE $\overline{\text{WHO } Q_{artichoke}}^{\text{fe}}$
    'Who arrives/has arrived?'

As for the extension of the 'furrowed eyebrows' marking, as we already mentioned, it must occur on the interrogative sign(s) but may spread to a bigger portion of the clause.

Before further elaborating on the role of 'furrowed eyebrows' as *wh*-features, we make clear our assumptions about the formal mechanism underlying *wh*-movement in general. Following fairly standard assumptions in the Minimalist literature (cf. the systematization offered by Adger, 2003), we assume that two features are active in the dependency between the complementizer eventually hosting the interrogative element and determining its scope, and the interrogative phrase. The first one is the *wh*-feature (at least in languages in which this is morphologically expressed). The *wh*-feature alone cannot characterize a clause as interrogative, though. The reason is that this feature can be found in non-interrogative clauses as well (most notably relatives and exclamatives, the latter case to be discussed shortly). Therefore, a second formal feature (let us call it Q) is necessary to mark the clause as interrogative. The mechanism underlying overt *wh*-movement is thus the following: the dedicated C position in the periphery of the clause is marked as interrogative (+Q) while the *wh*-phrase is marked

as +*wh*, in accordance with the hypothesis that the *wh*-feature is a sub-lexical feature shared by all interrogative words. C and the *wh*-phrase enter a long-distance operation of Agree, which eventually triggers *wh*-movement to Spec, CP. As a result of this operation, C is valued +*wh* and the *wh*-phrase is valued +Q.[2] This way the sub-lexical feature of the *wh*-phrase plays a syntactic role because it allows the *wh*-phrase to enter into a long distance dependency with C.

Coming to interrogatives in LIS, we need to specify the nature of $Q_{artichoke}$ and its relation with the other interrogative sign it may co-occur with. The most challenging case is sentences like (4), because, prima facie, two interrogative elements that compete for the same position are present at the same time. There are two ways to go.
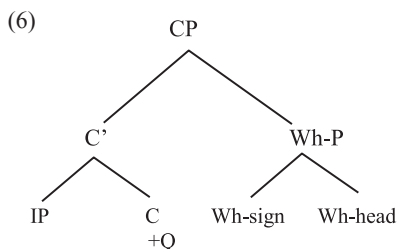
The first possibility is to analyze $Q_{artichoke}$ as an interrogative particle in the C head and the co-occurring interrogative sign as a phrase sitting in Spec, CP. This would easily fix the problem of co-occurrence, but there are at least three concerns with this hypothesis. The first one is that it would go against a typological generalization defended by Cheng (1997) according to which, if a language has a Q particle only in a given type of question, the Q particle is found in *yes/no* questions, not in *wh*-questions. Given that $Q_{artichoke}$ cannot occur in *yes/no* questions, if it were a particle, it would violate Cheng's generalization. A second consideration militating against an analysis of $Q_{artichoke}$ as a question particle is that, when it is not accompanied by another interrogative sign, $Q_{artichoke}$ typically co-occurs with a disambiguating mouthing. This suggests that $Q_{artichoke}$ plays the role of a specific Q-sign ('what', 'where', etc.), not that of an underspecified marker of interrogative force. The third problem relates to the distribution of $Q_{artichoke}$, which does not correspond to that of a complementizer. As thoroughly discussed in Branchini et al. (2013), when $Q_{artichoke}$ and the wh-element co-occur, as in (4), they clear form a constituent to the exclusion of the rest of the clause sitting on their left.

For these reasons, we propose a different analysis, namely we argue that the configuration illustrated by (4) is indeed general: the *wh*-phrase is always formed by two categories, although one of them can remain phonologically null. These two categories are a functional head expressing the *wh*-feature, which is realized as the *wh*-non-manual marking 'furrowed eyebrows', and its complement, corresponding to the interrogative sign(s). This makes the case in (4) similar to cases of clitic doubling, in which a DP is doubled by a functional head (the clitic). The tree in (5) reflects the fact that LIS is head final.

(5)   Wh-P

Wh-signs   Wh-head
        'furrowed eyebrows'
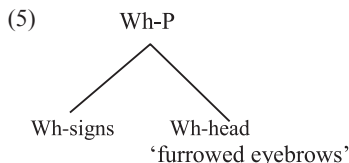
The tree structure in (6) illustrates the position of the *wh*-phrase in the clausal spine: it sits in the specifier position of the C head marked +Q (we assume that Spec, CP branches rightwards in LIS).

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2   Technically, Agree is established through an uninterpretable [*u*wh] feature which is part of C: C[Q, *u*wh:]. Agree values and deletes the uninterpretable feature.

(6)

```
                        CP
                       /  \
                      /    \
                    C'      Wh-P
                   /  \     /   \
                  /    \   /     \
                IP     C  Wh-sign Wh-head
                       +Q
```

We can now go back to the status of $Q_{artichoke}$. Remember that, following standard assumptions in the minimalist literature, we assume that the *wh*-feature is only one of the two features involved in the derivation of interrogative clauses, the other feature being Q. We therefore propose that $Q_{artichoke}$ is the manifestation of the Q feature on the *wh*-phrase. More precisely, remember that the presence of this feature on the *wh*-phrase depends on it establishing an agreement relation with a Q feature in C. A *wh*-item does not need to be interrogative, so it is unvalued with respect to the Q feature. It becomes interrogative only as result of an Agree relation with the C head which is inherently marked +Q. We propose that $Q_{artichoke}$ is a manual expression of this agreement relation on the *wh*-head when it sits in the specifier of a +Q C. Notice that this amount to saying that LIS makes morphologically visible the two features (i.e. the *wh*-feature, expressed by the furrowed eyebrows, and the Q feature, expressed by $Q_{artichoke}$) that are necessarily associated with *wh*-movement in interrogatives, but are usually conflated in spoken languages. The diagram in (7) illustrates this complete picture corresponding to the case in (4), including furrowed eyebrows, $Q_{artichoke}$ and a lexical wh-element.

(7)

```
                        CP
                       /  \
                      /    \
                    C'      Wh-P
                   /  \     /   \
                  /    \   /     \
                IP     C  Wh-sign Wh-head
                       +Q         'furrowed eyebrows'
                                  Q_artichoke
```
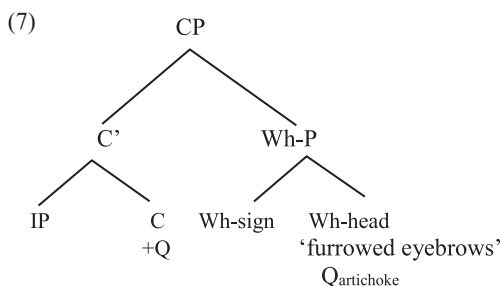
This situation is not unusual for sign languages, which (thanks to the multiplicity of simultaneous articulators they use) often make visible morpho-syntactic features and logical operators that are purely abstract in the spoken modality (cf. Schlenker, 2018). If we are on the right track, we predict that $Q_{artichoke}$ should occur in interrogatives but not in other *wh*-constructions, a point that will become relevant in the next section.

Two issues remain to be discussed, namely the occurrence of mouthing when $Q_{artichoke}$ occurs alone and the spreading of the 'furrowed eyebrows'.

As for the latter point, by following a suggestion that has been proposed for morpho-syntactic features expressed non-manually in other sign languages (cf. Neidle et al., 2000, and Pfau & Quer, 2005), we assume that 'furrowed eyebrows' obligatory spreads over the c-command domain (namely the complement) of the functional head expressing the *wh*-feature. As the *wh*-sign is by definition the complement of the

Wh-head, it follows that it is always articulated with furrowed eyebrows. As for the fact that the *wh*-non manual marking can spread over a bigger portion of the sentence, we refer to Cecchetto et al. (2009), who connect this to the observation that Spec, CP tends to be linearized to the right across sign languages. A similar mechanism of *wh*-feature percolation is necessary to account for pied-piping in spoken languages (see classical studies like Cowper, 1987, Grimshaw, 1991, 2000, Webelhuth, 1992 among many others). The only difference, once again, would be that sign languages make this abstract mechanism of feature percolation visible through the spreading of the non manual marker.

Finally, we interpret the mouthing that can co-occur with $Q_{artichoke}$ as a case of code blending. Code blending is a special type of code mixing in which lexical items belonging to two languages belonging to the spoken and the signed modality are articulated simultaneously (Emmorey, 2005): if $Q_{artichoke}$ occurs alone, mouthing has a disambiguating function, much like what happens when a sign is lexically unspecified and mouthing can disambiguate it (a relevant example is the sign for salt/pepper in LIS, which is disambiguated by the mouthing corresponding to a phonologically salient part of the Italian word). Therefore, mouthing in our analysis is not part of the lexical specification of $Q_{artichoke}$ (see Giustolisi et al., 2017 for an experimental investigation suggesting that mouthing is never part of the lexical specification of a sign, but is a case of code blending).

3. The *wh* feature in exclamatives

In order to verify the validity of our hypothesis that 'furrowed eyebrows' is the non-manual expression of the *wh*-feature, in this section we look at another construction which is known to exhibit a *wh*-morphology across languages, namely exclamatives. For example, *wh*-exclamatives have been identified in the following languages (the list is far from being exhaustive and does not include Indo-European languages in which the phenomenon is systematic): Georgian, Hebrew, Hindi, Korean, Mandarin Chinese, Japanese, Vietnamese, Basque and Turkish (Sadock and Zwicky, 1985, Ono, 2006, Etxepare, 2003, Zevakhina, 2016, and Michaelis, 2001). Furthermore, there are principled reasons that may explain the recruitment of *wh*-morphology in exclamatives, as we discuss shortly.

We reason that, if *wh*-morphology is recruited in exclamatives in LIS and if the expression of *wh*-morphology is indeed furrowed eyebrows, we expect exclamatives to be marked by furrowed eyebrows.

In order to check this prediction we created elicitation contexts that strongly invite the production of sentences expressing surprise, as exclamatives often convey surprise. An important methodological caveat should be kept in mind, for exclamatives as well as for any sentence type (see Donati et al., 2017): if we define sentence type as the form that is conventionally associated to a given illocutionary force, we must always be aware that this link is not rigid. For example, although imperatives are the grammaticalized form for order/invitation, the illocutionary act of ordering can be expressed with a declarative ('It is cold in this room') or with an interrogative ('Can

you close that window?') in addition to using an imperative ('Close that window!'). Likewise, even if exclamation is conventionally associated to a certain grammatical form, for example English sentences with an initial *wh*-phrase but no subject-auxiliary inversion (cf. 8), a declarative can be used to the same goal (cf. 9).

(8)   What a dangerous person he is!

(9)   He is such a dangerous person!

The issue is further complicated by the fact that exclamatives have never been studied in LIS (and for what matters in any other sign language). Given the methodological caveat introduced above, we do not expect to find a unique grammatical form as a result of elicitation but we do expect that, if a form is specialized for exclamation, this should be prevailing in the data. If this grammaticalized form displays furrowed eyebrows, we have an indirect but strong confirmation of our hypothesis that furrowed eyebrows are the linguistic expression of *wh*-features in LIS.

3.1 Data elicitation

Three native signers and a fourth signer who acquired LIS from birth at the Institute for the Deaf before age six participated. For the elicitation, 23 images were used preceded by a context. Participants were asked to react to the pictures by answering a question by the experimenter. All the elicitation procedure took place in LIS and was conducted by the first author of this paper, who is a LIS interpreter. The following are two representative examples.

(10)

Question associated to the image:
'You meet this girl on the street. She is an old friend of yours and you see that she had a baby. What do you tell her? '

Expected answer:
'What a beautiful baby!' Or: 'You had a baby!'

(11)

Question associated to the image:
 'What is this guy thinking? '

Expected answer:
'How late it is!'

The elicitation first took place in June 2018 at the University of Milan-Bicocca. The 23 pictures were installed into a Power Point, and were presented to each participant individually. Every answer was videotaped. No further precise instruction was given. Therefore, in some cases the answer was long and complex and in others it was very short.

A second session of data collection took place in December 2018 and involved only one of the four informants. This informant was asked for grammaticality judgments on the sentences produced by the participants of the first data collection session.

3.2 Results

69 responses that conveyed an expression of surprise were obtained. These were analyzed and manually glossed with a special attention to non-manual-markers or manual signs that might be markers of exclamative force (cf. https://osf.io/jtmwk/ for the videos of the sentences and Checchetto, 2021, for a list of glosses in Italian). Their distribution across the 69 responses is summarized in Table 1.

Table 1. Distribution of non-manual markers across responses

Non-Manual Marking in the 69 elicited responses
51 out of 69 responses contained a sentence articulated with **furrowed eyebrows**
17 out of 69 responses contained a sentence articulated with **raised eyebrows**
In 4 out of 69 responses there was no identifiable non-manual marker

When non-manual marking occurs, it spreads over the entire sentence. In the following examples, we illustrate the three possibilities reported above with three representative sentences: (12) displays furrowed eyebrows; (13) displays raised eyebrows; (14) is an example without any identifiable non-manual marker.

(12)   <u>   </u>fe
       MONEY RICH
       'How rich you are!'

(13)   <u>   </u>re
       CAKE IX₁ GET-MAD
       'That cake is irresistible'

(14)   VERY LAUGH FUNNY TOILET-PAPER EVERYWHERE
       'Very funny, toilet paper spread everywhere'

As for manual signs which might be functional markers of the exclamative force, two potential candidates were identified. One is the sign VERY, which occurred in eleven out of the 69 sentences; the other is the sign PALM-UP, which occurred in nine sentences.

VERY   PALM-UP
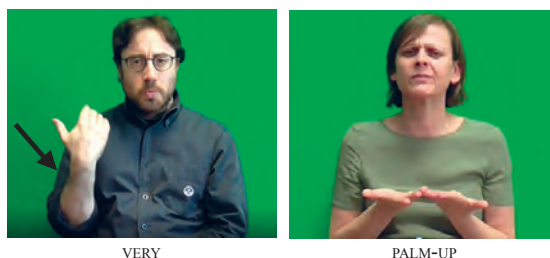
In fact, the status of VERY is dubious. It is a gesture that indicates intensification, which is very common in the Italian culture. Its use by signers might as well be gestural. When explicitly asked after the elicitation, informants said the gesture is not obligatory. Furthermore, it is not consistently associated to a position inside the sentence, which suggests it is used as a gestural intensifier rather than a functional marker of the exclamative force. PALM-UP is a more plausible candidate for a functional sign. It is very similar to the sign glossed B-INDEX which has been identified as a manual marker of the imperative force in LIS by Donati et al. (2017). In imperatives, this sign is sentence-final and it is found in this final position in six out of the nine sentences in which it occurs in our mini-corpus of exclamatives. Its exact nature remains uncertain at this stage, due to a paucity of the relevant data. Finally, $Q_{artichoke}$ is not attested in exclamatives, at least systematically.

3.3 The analysis of exclamatives

Although our study is explorative, we believe that there is enough evidence to conclude that 'furrowed eyebrows' reliably identifies exclamatives, as this marker occurs quite systematically in the context of our elicitation task. Remember that there is no reason to think that all sentences produced with the elicitation method summarized above are exclamatives. Therefore the fact that furrowed eyebrows appear in 51 out of 69 sentences is a solid result.

A non-negligible number of sentences in our mini-corpus, on the other hand, displayed another marker, namely raised eyebrows. As this non-manual-marking is the one occurring with yes-no questions in LIS, we speculate that these sentences

correspond to total exclamatives in Benincà's (1995) classification. Extending a classification that is very common for interrogatives, Benincà introduces a distinction between partial exclamatives (containing a *wh*-expression, in which the exclamation concerns a single constituent) and total exclamatives (those in which the exclamation embraces the whole content of the sentence). The parallelism between total exclamatives and yes-no questions is reinforced by the fact that in many languages, including Italian (cf. 15) and English (cf. 16), this type of exclamatives can be introduced by the complementizer *if/se*, which typically introduces indirect yes-no questions (15 and 16 contain an expletive negation, which makes these sentences unambiguously exclamatives in Italian). From this point of view, the occurrence of raised eyebrows in LIS, which is the morphological marker of yes-no questions, is not surprising.

(15)   Se non si è mangiato tutto!
        If not refl is eaten all
        'He ate it all!'

(16)   Boy, if syntax is not fun!

<div align="right">(Zanuttini & Portner 2003, p. 62)</div>

In the rest of this paper, we focus on exclamatives marked by furrowed eyebrows. Based on our findings, we can conclude that LIS adds to the long list of typologically different (and historically unrelated) languages in which exclamatives and content interrogatives exhibit a *wh*-feature. For reasons related to modality (visuo-spatial as opposed to acoustic) this feature is suprasegmental (a non-manual-marker) in LIS while it is typically segmental in spoken languages.

The next question is: why is the same morphological feature shared by interrogatives and exclamatives? What is the underlying common property that can explain this fact? And, related to this, what is the formal analysis to be given to exclamatives?

We believe that the most adequate framework to address these questions is the one developed by Zanuttini & Portner (2003), which we assume here. Their idea is that exclamative force is not *directly* encoded in syntax, say by an exclamative head, but results from a conspiracy of two factors: factivity and widening. By factivity Zanuttini and Portner mean that the propositional content of an exclamative is presupposed. For example, in order to felicitously utter the sentence 'What a wonderful rainbow!' the speaker must assume that there is indeed a wonderful rainbow in front of him/her.

Zanuttini & Portner further propose that exclamatives widen the domain of quantification for the *wh-* phrase introducing the exclamatives. In this respect their proposal is close to Obenauer's (1994) idea that a *wh*-phrase occurring in an exclamative binds a variable for which an appropriate value cannot be found in the contextually given domain. In order to find the appropriate value, the domain of quantification must be widened to include alternative propositions. For example, by uttering the sentence 'What an apartment (she bought)!' one is extending the domain of quantification to include, in addition to the average apartments, exceptionally good or exceptionally bad ones. This widening mechanism is responsible for those aspects of the meaning of exclamatives that relate to 'surprise', 'unexpectedness', 'extreme degree', etc.
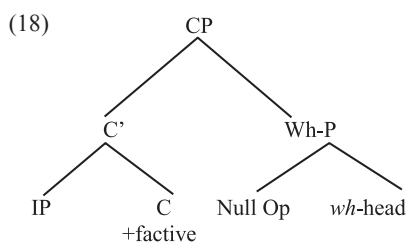
The combination of factivity and widening, Zanuttini and Portner propose, has as a consequence that a sentence combining these two properties cannot be an assertion (you cannot assert a propositional content which is presupposed), nor a question (it is pointless to ask a question whose answer is presupposed) nor an order (you do not give an order about something that is presupposed to be true). Zanuttini and Portner conclude that, if each type of root clause must play an illocutionary function, the function which is left to exclamatives is widening the domain of quantification.

Given this account, the *wh*-morphology is expected in exclamatives as a way to signal the operator-variable dependency which is necessary to trigger the widening mechanism.

We are now ready to go back to LIS exclamatives. We build on the fact that LIS content interrogatives do not need to contain an overt *wh*-phrase, as shown in example (17). We assume that the presence of the *wh*-morphology (furrowed eyebrows), which, given the hypothesis summarized in (5), is the non-manual expression of the functional *wh*-head and suffices to license a null *wh*-operator in its complement position.

(17)
       <u>   fe </u>
       TIME
         'What time is it?'

In the same vein, we propose that in exclamatives marked by furrowed eyebrows the functional head which expresses the *wh*-feature is merged with a null operator. There are still two differences with respect to content interrogatives. The first is that the null exclamative operator is specialized to signal that the domain of quantification over which its variable ranges must be widened. The second difference is the attachment site of the *wh*-phrase. This cannot be the C specialized for interrogative, since it is endowed with the +Q feature. Following Zanuttini and Portner, we assume that in exclamatives the *wh*-phrase sits in the Spec position of a C head endowed with the [+factive] feature which indicates that the propositional content of the sentence is presupposed.[3]

(18)
```
                        CP
                      /    \
                   C'        Wh-P
                  /  \       /    \
                IP    C   Null Op  wh-head
                   +factive
```

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3   LIS does not offer direct evidence on how to order the [+Q] head and the [+Factive] head with respect to each other in the extended left periphery identified by Rizzi (1997). However, Zanuttini and Portner (2003) argue that the exclamative head sits in a position that is higher than the interrogative head. They conclude this based on evidence that cannot be reproduced in LIS, i.e. the fact that the Doubly-Filled-COMP filter does not hold in Italian exclamatives and the complementizer follows the *wh*-phrase, as illustrated in (i).
(i) Che freddo che fa!
   What cold that makes
   'How cold it is'

As for the spreading of furrowed eyebrows, there is a difference between exclamatives and content interrogatives, which appears to confirm our hypothesis. In the former, non-manual-marking must occur on the entire sentence, while in the latter it can be limited to the interrogative sign. We assume that this difference is due to the fact that the exclamative operator is null, but the *wh*-feature (being suprasegmental) needs to spread on some manual material. If the functional head expressing the *wh*-feature takes a manual sign as its complement, as in (some) interrogatives, the non-manual-marking can stop there. If the functional head expressing the *wh*-feature takes a null complement, as in exclamatives, we assume that this head projects its feature to the *wh*-phrase in Spec, CP [+factive]. From this position the *wh*-feature spreads over its c-command domain, namely the entire sentence.

4. Conclusion

Our starting point in this paper was the question whether the identification of 'furrowed eyebrows' as a *wh*-feature, which is often assumed without much explicit motivation, resists a closer scrutiny. In order to answer this question, we extended our investigation from content interrogatives to exclamatives, since there is ample evidence that *wh*-exclamatives are systematically present in typologically and historically distant spoken languages.

As for content interrogatives, we proposed that in LIS 'furrowed eyebrows' is the non-manual expression of a *wh*-feature, acting as the head of functional *wh*-projection that can host in its complement position an interrogative pronoun. We also proposed that the other feature involved in interrogatives, namely the Q feature, can be expressed by the sign $Q_{artichoke}$.

As for exclamatives, as no previous research was available, we built a mini-corpus by using a semi-naturalistic elicitation task. Interestingly, the two main strategies identified in this corpus are the non-manual markers corresponding to content and yes-no interrogatives, respectively furrowed and raised eyebrows. We therefore proposed that the distinction between partial (or *wh*) exclamatives and total exclamatives is attested in LIS as well.

Finally, we proposed a formal analysis for *wh*-exclamatives which stems from Zanuttini and Portner (2003) and is minimally different from the analysis that we offered for *wh*-interrogatives.

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