Wh-doubling and beyond

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Wh-questions across sign languages
(Cecchetto 2012)

Cross-linguistic tendency to find wh-signs in the right-periphery of the sentence rather than in the left-periphery.

Cross-linguistic tendency to find wh-signs in situ.

Doubling phenomena.
WH-signs in Italian Sign Language (LIS)

Cecchetto et al. (2009) describe a pattern in which some variability is attested.

1) object wh-signs
   a. GIANNI SIGN WHAT  (postverbal position)
   b. GIANNI WHAT SIGN   (preverbal position)
   c. * WHAT GIANNI SIGN (no wh- in sentence initial position)
   “What did Gianni sign?”

2) subject wh-signs
   a. CONTRACT SIGN WHO  (postverbal position)
   b. WHO CONTRACT SIGN  (preverbal position)
   “Who signed the contract?”

Caveat: Cecchetto et al. (2009) claim that the variety of LIS they describe is SOV.
Roadmap

– The LIS corpus and elicited data

– The distribution of wh-signs in the LIS corpus

– Doubling of wh-signs

– Doubling of identical and non-identical wh-elements

– Proposal
Two sets of data:

1. The LIS corpus

2. Elicited data from two native informants
The LIS Corpus

2008-2010: collection of a sociolinguistic corpus of LIS
10 Cities, 165 Deaf people involved

Funded by the Italian National Research Fund “PRIN”.

Three Universities have participated in the project:
– University of Rome-La Sapienza
– University of Milan-Bicocca
– Ca’ Foscari University of Venice

Local branches of the National Deaf Club (Ente Nazionale Sordi) are involved in the project.
Participants’ selection

3 Age groups: from 18 to 30 years old
   from 31 to 54 years old
   55 upwards

Social factors:
   Family background (Deaf parents or siblings)
   Role in the Deaf community
   Education
   Socioeconomic status
   Living in/outside the city
Question-answer elicitation task
Wh-signs in the LIS Corpus

Quantitative finding (Geraci & Bayley 2011): out of 646 sentences containing a wh-phrase

Post-verbal wh-: 60%
Pre-verbal wh-: 27%

a. IX-1 PAY HOW
b. HOW IX-1 PAY

‘How do I pay you?’

New finding:

Doubled wh- 13%

c. HOW IX-1 PAY HOW
Data elicitation from two native informants

Two deaf native signers, both LIS instructors at College level have produced grammaticality judgements on the corpus data and have acted as informants in new data elicitation.

Gabriele: 35 years old, originally from Siracusa (Sicily) studied in Verona and Padua, currently lives in Bologna.

Mirko: 30 years old, originally from Salerno (Campania), studied in Modena and Padua, currently lives in Paris.

Tasks:
- Evaluation of instances of wh-doubling in the corpus
- Elicitation of grammaticality judgments
- Comparison within LIS varieties
Research questions

1) Is wh-doubling possible with all wh-types and grammatical functions?

2) Are the two wh-elements exactly the same or different?

3) Are there restrictions on the order of the two wh-elements?

4) What is the syntactic analysis of wh-doubling?
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4) What is the syntactic analysis of wh-doubling?
All wh-signs and grammatical functions can be doubled

<table>
<thead>
<tr>
<th>3) WHO FAULT WHO</th>
<th>'Whose fault is it?'</th>
</tr>
</thead>
<tbody>
<tr>
<td>4) WHAT ILLNESS WHAT</td>
<td>'What is the sickness?'</td>
</tr>
<tr>
<td>5) WHERE ACCIDENT WHERE</td>
<td>'Where did the accident take place?'</td>
</tr>
<tr>
<td>6) WHEN IX-2 KNOW WHEN</td>
<td>'When did you know it?'</td>
</tr>
<tr>
<td>7) WHY PARIS IX-LOC WHY</td>
<td>'Why was it in Paris?'</td>
</tr>
<tr>
<td>8) WHICH CAR-ACCIDENT WHICH</td>
<td>'Which car was involved in the accident?'</td>
</tr>
<tr>
<td>9) HOW IX-2 CAR HOW</td>
<td>'How were you driving the car?'</td>
</tr>
</tbody>
</table>
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4) What is the syntactic analysis of wh-doubling?
Two types of WH-doubling

– The two wh-items look identical (matching wh-doubling)

– The two wh-items look different (mismatching wh-doubling)
Matching wh-doubling

10) SORRY, IX-2 WHERE PLACE ACCIDENT WHERE IX-2
Doubling and reduced copies

Doubling, as in e.g. left-dislocation or wh-doubling in spoken languages, involves reduced copies:

11) a. lui, je le connais 'him, I know him' (French)
   him I him know

   b. 'sa ta fe' kwzè 'what do you do?' (Milanese dialect)
      what you do what

Reduced copies sometimes look identical:

12) nous, il nous connais 'he knows us' (French)
   us, he us knows
Can duration be predictive?

In a study on pronominal pointing in LIS, Bertone and Cardinaletti (2011) found that duration in pointing marks the distinction between full pronouns and weak/clitic pronouns in LIS.

Full pronouns last longer than weak/clitic pronouns.

We therefore measured the duration of $wh_1$ and $wh_2$ in the doubling pattern:

13) $... \text{wh}_1 \ldots \text{PRED} \ldots \text{wh}_2 \ldots$
### Identical WH-items

37 sentences with doubling of two superficially identical wh-items

<table>
<thead>
<tr>
<th>Type</th>
<th>N. of variants</th>
<th>N. of tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>HOW</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>WHAT</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>WHERE</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>WHY</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>WHICH</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>WHEN</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td><strong>37+37 = 74 (wh1+wh2)</strong></td>
</tr>
</tbody>
</table>
Duration of $wh_1$ and $wh_2$: Results

A paired t-test has been performed in order to compare the durations of the two WH-items.

The results showed that the two occurrences of the wh-items have significantly different durations.

- $t_{[df=36]} = -3.2279$, $p = 0.002659$

- Means of the durations:
  - $wh_1 = 0.258$ sec
  - $wh_2 = 0.354$ sec
Discussion

Two possible hypotheses

– H1: The prosodic difference between the two instantiations of wh-items marks the distinction between fully wh-items and their reduced counterparts (much like in the case of pronouns).

– H2: The prosodic difference is the manifestation of a more general phenomenon of phrase-final lengthening (notice that wh₂ are almost always in clause-final position).
H1 vs. H2

In order to discriminate between the two hypotheses:

- We further compared durations of \( \text{wh}_1 \) & \( \text{wh}_2 \) with the durations of wh-items in single wh-constructions.

- We checked whether phrase-final lengthening is a more generalized phenomenon in LIS (as it is in other languages).
wh\textsubscript{1/2} & wh\textsubscript{After/Before}: the pattern

We focused on the full pattern of wh-constructions that emerged from the corpus annotation (Geraci and Bayley 2011, Bayley et al. 2011):

16)  a. \[ \ldots \text{wh}_1 \ldots \text{PRED} \ldots \text{wh}_2 \ldots \]

b. \[ \ldots \text{wh}_\text{Before} \ldots \text{PRED} \ldots \]

c. \[ \ldots \text{PRED} \ldots \text{wh}_\text{After} \ldots \]
\[ \text{wh}_{1/2} = \text{wh}_{\text{Before}/\text{After}} \]

Results of direct comparisons

\text{wh}_1 \text{ is shorter than } \text{wh}_2 \text{ (Paired t-test)}
\text{wh}_{\text{Before}} \text{ is shorter than } \text{wh}_{\text{After}} \ (t_{24.4} = -3.471, \ p = 0.001)

\text{wh}_{\text{Before}} \text{ is not different from } \text{wh}_1 \ (t_{30.8} = 1.021, \ p = 0.3)
\text{wh}_{\text{After}} \text{ is not different from } \text{wh}_2 \ (t_{70.9} = -0.471, \ p = 0.6)

Results support H2: \text{wh}_2 \text{ is longer than } \text{wh}_1 \text{ because of a phrase-final lengthening effect.}
Further supporting evidence

When \( \text{wh}_2 \) is not clause-final, there is not a difference in duration between \( \text{wh}_1 \) and \( \text{wh}_2 \)

<table>
<thead>
<tr>
<th>Item</th>
<th>( \text{wh}_1 )</th>
<th>( \text{wh}_2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOW</td>
<td>138</td>
<td>80</td>
</tr>
<tr>
<td>WHICH</td>
<td>330</td>
<td>160</td>
</tr>
<tr>
<td>WHO</td>
<td>116</td>
<td>158</td>
</tr>
<tr>
<td>HOW</td>
<td>150</td>
<td>390</td>
</tr>
<tr>
<td><strong>Mean in ms</strong></td>
<td><strong>183.5</strong></td>
<td><strong>197</strong></td>
</tr>
</tbody>
</table>
H1 vs. H2

In order to discriminate between the two hypotheses:

– We further compared durations of $wh_1$ & $wh_2$ with the durations of wh-items in single wh-constructions

– We checked whether phrase-final lengthening is a more generalized phenomenon in LIS (as it is in other languages).
Generalized phrase-final lengthening

The aspectual marker DONE (normally occurring in clause-final position) is sometimes found in clause-internal position (Zucchi 2009, Zucchi et al. 2010).

18) a. GIANNI CALL DONE 3 4 TIME
   b. 3 4 TIME GIANNI CALL DONE
   ‘Gianni called 3 or 4 times’

<table>
<thead>
<tr>
<th></th>
<th>( \text{DONE}_{\text{internal}} )</th>
<th>( \text{DONE}_{\text{final}} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tokens</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Range</td>
<td>60-420 ms</td>
<td>120-560 ms</td>
</tr>
<tr>
<td>Mean</td>
<td>304 ms</td>
<td>420 ms</td>
</tr>
</tbody>
</table>
The duration is significantly different \( (t_{[df=57.4]} = 2.768, p = 0.007) \): Clause final DONE are longer than clause internal DONE.
Research questions

1) Is wh-doubling possible with all wh-types and grammatical functions?

2) Are the two wh-elements exactly the same or different?

3) Are there restrictions on the order of the two wh-elements?

4) What is the syntactic analysis of wh-doubling?
Ordering restrictions in matching WH-doubling

The two identical wh-elements are full copies.

The two copies occur at the left and at the right edge of the clause:

20) \( \text{WH-} \) subj VERB WH
21) * subj WH VERB WH
22) * WH subj WH VERB

Proposal:
The wh-element moves to the right-peripheral Spec,Wh position and is remerged in a left-peripheral position, presumably spec,Focus.
The resulting interpretation is similar to a clefted question.

N.B. FocusP is higher than WhP (Rizzi 2001)
23) WHAT IX-2 SEE DONE WHAT
"What is it that you saw?"
Interim conclusions

– The analysis of doubled wh-signs that look identical revealed a statistically significant difference in duration.

– Wh-signs in clause-final position are significantly longer than wh-signs that are clause-internal.

– This difference can be attributed to a phrase-final lengthening effect.

– This phenomenon seems to be generally present in the language (see DONE).

– The two wh-items are full copies, occurring in the left-periphery and in the right-periphery, respectively.
Two types of WH-doubling

- The two wh-items look identical
- The two wh-items look different
Mismatching WH-doubling

In 12 cases in the corpus, the two wh-items display different lexical realizations.

Generalization: in all cases, one of the two wh-items is what we call the Q ARTICHOKE
24) WHERE PLACE $Q_{\text{artichoke}}$

37
On the default nature of $Q_{\text{artichoke}}$

When used in isolation, the $Q_{\text{artichoke}}$ is a (lexical) variant of all wh-elements:

25) ARRIVE $Q_{\text{artichoke}}$  'Who has arrived?'
26) HAPPEN $Q_{\text{artichoke}}$  'What has happened?'
27) POSS-IX2 CAR BROKEN $Q_{\text{artichoke}}$  'Where is/was your car broken?'
28) IX-2 FINE NOT $Q_{\text{artichoke}}$  'How was it that you felt bad?'
29) URGENT $Q_{\text{artichoke}}$  'Why was it urgent?'
30) IX-1 KNOW $Q_{\text{artichoke}}$  'When was I supposed to know it?'
31) IX-2 MEDICINE TAKE $Q_{\text{artichoke}}$  'Which medicine did you take?'

(from informants)
On the default nature of $Q_{\text{artichoke}}$

In doubling constructions, the $Q_{\text{artichoke}}$ can be combined with all wh-elements:

32) ARRIVE WHO $Q_{\text{artichoke}}$
'Who arrives/is arrived?'

33) IX-2 DO WHAT $Q_{\text{artichoke}}$
'What are you doing?'

34) IX-2 GO WHERE $Q_{\text{artichoke}}$
'Where are you going?'

35) IX-2 EXPLAIN HOW $Q_{\text{artichoke}}$
'How did/do you explain (it)?'

36) IX-2 CRY WHY $Q_{\text{artichoke}}$
'Why are you crying?'

37) IX-2 LEAVE WHEN $Q_{\text{artichoke}}$
'When are you leaving?'

38) IX-2 BUY WHICH $Q_{\text{artichoke}}$
'Which did/do you buy?'

(from informants)
Mismatching wh-doubling and mouthing

When it appears as the only interrogative element, $Q_{\text{artichoke}}$ can be accompanied by mouthing (as all single wh-elements may):

39) a. IX-2 LEAVE $Q_{\text{artichoke}} [p]$ (cf. Italian perché “why”)
    b. IX-2 LEAVE $Q_{\text{artichoke}} [ku]$ (cf. Italian quando “when”)

When it appears in (mismatching) doubling structures, however, it cannot be accompanied by mouthing, while the wh-element can.

40) a. *$Q_{\text{artichoke}} [p]$ IX-2 LEAVE WHY?
    b. $Q_{\text{artichoke}}$ IX-2 LEAVE WHY?

(from informants)
Ordering restrictions in mismatching wh-doubling

Converging elicited data:

(41)  a. subj V WH Q_{artichoke}  
       b. * subj V Q_{artichoke} WH

Diverging elicited data:

Gabriele:  (42)  a. Q_{artichoke} subj V WH Q_{artichoke}  
           IX-2 GO WHERE 'Where are you going?'

Mirko: (43)  b. WH subj V Q_{artichoke}  
              WHERE IX-2 GO Q_{artichoke}

Neither informant accepts an in situ position for either one of the two interrogative items.
The analysis of mismatching wh-doubling

Two possibilities in mismatching wh-doubling (with a different parametrization)

a) subj VERB WH Q_{artichoke}

We suggest a) to be the unmarked position of the two mismatching interrogative elements sitting in the right periphery.

Proposal:
the WH element is moved to the right-peripheral Spec,WhP position where it checks the +wh feature.
The Q_{artichoke} is merged in a head higher than WhP, perhaps ForceP, as an interrogative particle.
a. IX-2 SEE DONE WHAT \( Q_{\text{artichoke}} \)

"What did you see?"
Wh-movement to the right can be coupled with the movement/merging of an element to a higher left-peripheral position (Focus?): either the interrogative particle in one variety (Gabriele) or the (full) wh-element in the other one (Mirko):

\[
b_1) \quad Q_{\text{artichoke}} \quad \text{subj} \quad \text{VERB} \quad \text{WH} \\
b_2) \quad \text{WH} \quad \text{subj} \quad \text{VERB} \quad Q_{\text{artichoke}}
\]

In both cases, the result is something similar to a clefted question.
b₁. \( Q_{\text{artichoke}} \) IX-2 SEE DONE WHAT

"What is it that you saw?"
What is it that you saw?
CONCLUSIONS

1) Wh-doubling is possible with all wh-types and grammatical functions.

2) The two interrogative items can be identical (matching wh-doubling) or different (mismatching wh-doubling).

3) In matching wh-doubling, the two copies are identical: one is moved to the right-peripheral Wh-position, the other one is remerged in a left-peripheral (focus) specifier position.

4) In mismatching wh-doubling, one of the two interrogative items is the underspecified $Q_{\text{artichoke}}$. We analyzed it as an interrogative particle head. Both items can appear in the right periphery (according to a rigid order) or either one of them (depending on the informant's variety) can occupy a left-peripheral (focus) position.
Selected References


Lexical restriction in identical WH-doubling

The lexical restriction can appear in either wh-phrase, but not in both:

41) $\text{WH}_1 + \text{restriction}$

\[[\text{WHERE PLACE}] \text{ACCIDENT WHERE}\]

42) Restriction + $\text{WH}_2$

\[\text{WHICH PAST [MEDICINE WHICH]}\]

The lexical restriction only surfaces in the WH-element:

a. \[[\text{SHAPE HOW}] \text{CAR-GO-CL } Q_{\text{artichoke}}\]
b. $Q_{\text{artichoke}} \text{HAVE [ILLNESS WHICH]}$

(from CORPUS LIS)
A significant preference for doubling with adjuncts as opposed to subjects or objects.

<table>
<thead>
<tr>
<th>Function</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjunct</td>
<td>48</td>
<td>54%</td>
</tr>
<tr>
<td>Subject</td>
<td>22</td>
<td>25%</td>
</tr>
<tr>
<td>Object</td>
<td>18</td>
<td>21%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>88</strong></td>
<td><strong>=</strong></td>
</tr>
</tbody>
</table>

\[
\text{Chi-square}_{\text{df} = 2} = 18.09, \quad p=0.0001
\]