Wh-movement and sentence stress

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How do interface mapping principles interact with movement?

Was für ein Buch hat Emma geschrieben?

Is this position relevant for syntax-prosody mapping?

- Can the displaced object exempt the verb from being stressed?
- Default sentence stress is on the object — does that also hold when the object is displaced?
The following mapping constraints are one way to capture the basic prosodic pattern in German and English sentences (Truckenbrodt 1995):

- **Stress-XP**: each lexical **XP needs to be stressed**; within transitive VPs, stressing an object XP is sufficient to satisfy Stress-XP for the VP.
- **HI**: it is preferred to assign sentence stress to the rightmost stressed **element**, which usually is the object in transitive sentences.

**Example**

...dass [ Emma ]<sub>NP</sub> [ ein [ Buch ]<sub>NP</sub> geschrieben ]<sub>VP</sub> hat.
‘...that Emma has written a book.’
Interaction with syntactic movement

When a wh-object is fronted, the question arises if mapping constraints apply in a **surface-oriented** way or traces/lower copies are taken into account, which I will refer to as **prosodic reconstruction**.

**Example**

[ Was für ein Buch ] hat Emma [ {was für ein Buch} geschrieben ]_\text{VP} hat?

- Can the trace/unpronounced copy of the wh-phrase satisfy STRESS-XP for the VP, or does the verb need to be stressed?
- Can the fronted wh-phrase count as “rightmost” for the purpose of HI?
(At least partial) **prosodic reconstruction** has been proposed for...

- **relative clauses** (Bresnan 1971, Truckenbrodt forthcoming)
- **movement to the pref field** in German V2 clauses (Wierzba forthcoming, Korth 2014)
- **wh-movement** (Bresnan 1971, Selkirk 1995)

### Wh-movement data

1. Object NPs, but not pronouns exempt the verb from being stressed:
   a. Helen has written some **book**.
   b. Helen has **written** something.

2. The same pattern is reported for wh-questions (Bresnan 1971):
   a. What **book** has Helen written?
   b. What has Helen **written**?

There are also some approaches that argue for strictly surface-based prosody-syntax mapping, e.g.: Kahnemuyipour (2009).
Interaction with syntactic movement

1. research question: where does sentence stress preferably fall in German wh-questions?

Can the object’s trace satisfy Stress-XP for the VP?

- no: \[ O \ldots S \ldots [ \emptyset V ]_{VP} \]
- yes: \[ O \ldots S \ldots [ \emptyset V ]_{VP} \]

Does the position of the object’s trace count for HI?

- no: \[ O \ldots S \ldots [ \emptyset V ]_{VP} \]
- yes: \[ O \ldots S \ldots [ \emptyset V ]_{VP} \]

sentence stress falls on...

- \[ \ldots \text{the verb} \]
- \[ \ldots \text{the object} \]
- \[ \ldots \text{the subject} \]
2. research question: wh-questions and wh-exclamatives are **structurally similar** in that they both involve a fronted wh-phrase, but **differ in meaning**; does this affect sentence stress placement preferences?

**Example**

[ Was für ein Buch ] hat Emma [ [ was für ein Buch ] geschrieben ]<sub>VP</sub> hat?

[ Was für ein Buch ] Emma [ [ was für ein Buch ] geschrieben ]<sub>VP</sub> hat!
I investigated sentence stress preferences in different wh-constructions in an **acceptability rating experiment** with auditory stimuli.

42 native speakers rated the acceptability of the target utterance (preceded by a short context) on a 1–7 scale.

In total, each participant heard 168 stimuli in randomized order (48 from the experiment described here; most other materials concerned object fronting in declarative V2 clauses).
Manipulated factors:

- **Type of construction**: (1) subordinate clause with canonical word order (baseline), (2) wh-question, (3) split wh-question, (4) wh-exclamative.

- **Position of sentence stress**: (1) on the subject, (2) on the object, (3) on the verb (only tested for some of the structures).

- **Object type**: (1) full phrase, (2) pronoun (only tested for some of the structures) – this is relevant for the predictions of STRESS-XP.

To get a first idea of default preferences, I intended to hold information-structural factors as constant as possible. All items were preceded by a context intended to trigger an all-new reading (e.g., ‘Was there anything interesting on the news?’, ‘You wanted to ask me something?’, ...).
(3) **Subordinate clause:** *subject ≺ object ≺ verb*

a. Ich habe gelesen, dass Emma Anderson ein Buch geschrieben hat.
   I have read that Emma Anderson a book written has
   ‘I read that Emma Anderson has written a book.’

b. Ich habe gelesen, dass Emma Anderson ein Buch geschrieben hat.

c. Ich habe gelesen, dass Emma Anderson ein Buch geschrieben hat.

d. Ich habe gelesen, dass Emma Anderson was geschrieben hat.
Experiment: examples

(4) **Wh-question**: *object ≺ subject ≺ verb*

a. Was für ein Buch hat Emma **Anderson** geschrieben?
   what for a book has Emma Anderson written
   ‘What book has Emma Anderson written?’

b. Was für ein **Buch** hat Emma Anderson geschrieben?

c. Was für ein Buch hat Emma Anderson **geschrieben**?

d. Was hat Emma Anderson **geschrieben**?
(5) **Split wh-question:** *part of the obj. ≺ subject ≺ part of the obj. ≺ verb*

a. Was hat Emma **Anderson** für ein Buch geschrieben?
   what has Emma Anderson for a book written
   ‘What book has Emma Anderson written?’

b. Was hat Emma Anderson für ein **Buch** geschrieben?
(6) **Exclamative:** object $\prec$ subject $\prec$ verb

a. Mann, was für ein Buch Emma Anderson geschrieben hat!
   man what for a book Emma Anderson written has
   ‘Man, what a book Emma Anderson has written!’

b. Mann, was für ein Buch Emma Anderson geschrieben hat!
Experiment: results

- subordinate clause
- wh-question
- exclamative
- split wh-question

Sentence stress on...

Object
- phrase
- pronoun

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Wh-movement and sentence stress
Sentence stress preferably falls on the **object** in **subordinate clauses** when the object is a full phrase.
Object type matters in subordinate clauses: when the object is a pronoun, sentence stress on the verb is preferred.
In **wh-questions** sentence stress preferably falls on the **subject**. This points towards **surface-oriented application of HI**: the rightmost XP on the surface is most prominent.
The difference between object phrases and pronouns is absent in wh-questions, pointing also towards a surface-oriented application of Stress-XP.
However, **sentence stress on the verb is not optimal** as would be expected under completely surface-oriented mapping.
The preference for **object** stress in **split questions** is expected, as the in-situ part of the object is rightmost also underlingly.
Exclamatives show a different pattern than wh-questions, plausibly due to meaning: they express emphasis on the fronted element, which is linked to higher prominence.
Summary of the findings:

- **HI** seems to apply in a **surface-oriented** manner in wh-questions.
- **Exclamatives** show the reverse pattern. Possible explanation: prosody-meaning mapping.
- For **Stress-XP**, there is some evidence for surface-oriented mapping (no effect of object type in questions) but also against it (sentence stress on the verb is not optimal).
Main open issue: it is difficult to enforce an all-new context for questions—wh-questions involve **presuppositions**, which could lead to **accommodation** of further context. This might also be the reason for less pronounced acceptability differences in questions. Directions for further research:

- Try to limit accommodation by providing more **explicit contexts**, leaving less room for interpreting constituents as given/focused.
Open issues

Further open question: Is the difference between **wh-questions and exclamatives** really due to the fact that the fronted wh-element in exclamatives is linked to an emphatic interpretation? Possible follow-up:

- Try to enforce an emphatic interpretation of the subject/object in wh-questions/exclamatives via the context.
- See if the difference fully vanishes or (a part of it) remains.
Thank you for your attention!


