

# Different reflexes of the same underlying structure: an experimental study on two types of French *wh*-questions

**Ruoxuan Li**, Laboratoire de linguistique formelle, Université Paris Cité  
**Caterina Donati**, Laboratoire de linguistique formelle, Université Paris Cité, CNRS

# Outline

1. Covert dependency and processing of *wh*-in situ questions
2. Our goal and hypothesis
3. Acceptability rating + picture matching experiments: design and materials
4. Results
5. Discussion based on crossing/nested dependencies

# 1. Covert dependency

In-situ *wh*-questions are formed via a **covert dependency** where the *wh*-word (which remains in its initial position) can relate to the left periphery (SpecCP)

Two main approaches to covert dependency :

- Unselective binding (**Pesetsky 1987; Watanabe 1992**) : propose that in situ *wh*-phrases do not move, but instead receive their quantificational force through binding by an operator (**e.g. question particle**) on the clause left periphery.
- L (ogical) F (orm)-movement analysis (**Huang 1982**) : the movement operation of in situ *wh*-questions happens abstractly at Logical Form (LF) while movement in ex situ *wh*-questions happens concretely in overt syntax.
  - Much applied to Mandarin Chinese where there are attested locality conditions (**e.g. island constraints**) (**Huang 1982 ; Cheng, 1991, 2009 ; Aoun & Li, 1993 ; Tsai, 1994**).

## 2. Processing of *wh*-in situ questions

Experimental bases:

-This covert dependency has been confirmed to have a processing cost in Chinese (Xiang et al., 2014, 2015), French (Pablos et al., 2018) and French Sign Language (LSF) (Hauser et al., 2022).

Moreover, *wh*-in situ in LSF shows a **subject advantage** (i.e. subject questions are easier to understand than object questions), which has been widely observed in processing of *wh*-ex situ questions.

**Hypothesis:**

*Wh*-in situ questions in spoken French imply a **covert dependency** and their processing has a cost, which should be reflected in the same **subject advantage** that is reported in *wh*-ex situ questions.

**Methods:**

acceptability judgment + sentence-picture matching task (as comprehension test)

### 3. Our study: design and materials

**2x2x2 design:** in situ/ex situ, subject/object, qui/quel ('who'/'which'), 48 items + 14 fillers (10 grammatical + 4 ungrammatical)

#### **Subject in situ**

**Le monsieur**, **qui/quelle dame** **le** pousse?

the gentleman who/which lady him pushes

#### **Object in situ**

**Le monsieur**, **il** pousse **qui/quelle dame**?

the gentleman he pushes who/which lady

#### **Subject ex situ**

**Le monsieur**, c'est **qui/quelle dame** qui [e] **le** pousse?

the gentleman it's who/which lady that him pushes

#### **Object ex situ**

**Le monsieur**, c'est **qui/quelle dame** qu'**il** pousse [e]?

the gentleman it's who/which lady that he pushes



**Picture illustrating the pushing event**

# Difficulties in preparing items

## (i) Ambiguity in interpretation

i.e. two readings of '**Qui** pousse le monsieur?' :

1. Someone pushes the gentleman; 2. The gentleman pushes someone.

solution → Le monsieur, **qui** le pousse? (topicalization + clitic)

## (ii) Absence of *quel* 'which' questions in subject ex situ conditions

e.g. \***Quelle** dame *est-ce qui* pousse le monsieur? (*Est-ce qui* = question particle in French)

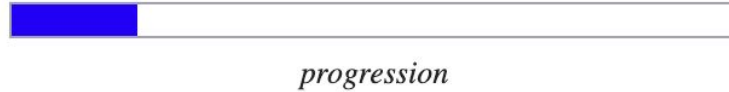
if subject-verb inversion, even less natural : \***Quelle** dame *pousse-t-elle* le monsieur?

solution → C'est **quelle** dame qui \_\_\_ pousse le monsieur? (C'est-cleft)

topicalization → Le monsieur, c'est **quelle** dame qui le pousse?

# Procedure: Acceptability rating

For each trial, participants were required to read or listen to *wh*-questions (recorded by a French native speaker) and rate their acceptability on a 1-7 Likert scale



Le monsieur, c'est qui qu'il pousse?

(très peu naturel)  1  2  3  4  5  6  7 (très naturel)

*Cliquez sur une case.*

# Procedure: Picture selection

They were then asked to answer this question by choosing the right character on a picture.

G: gauche 'left'

D: droite 'right'



*progression*





## Participants:

Studies were hosted on PCibex (<https://farm.pcibex.net/>).

Participants were French natives, came from RISC (Le relais d'information sur les sciences de la cognition, <https://risc.cnrs.fr/>) and social media.

**Experiment 1** (written version): 62 participants including 20 men and 42 women with an average age of 28.27 years old (min: 19, max: 45) ;

**Experiment 2** (oral version): 62 participants (different from those in written version) including 18 men and 44 women. Their average age is 30.58 years old (min: 18, max: 66).

## 4. Results

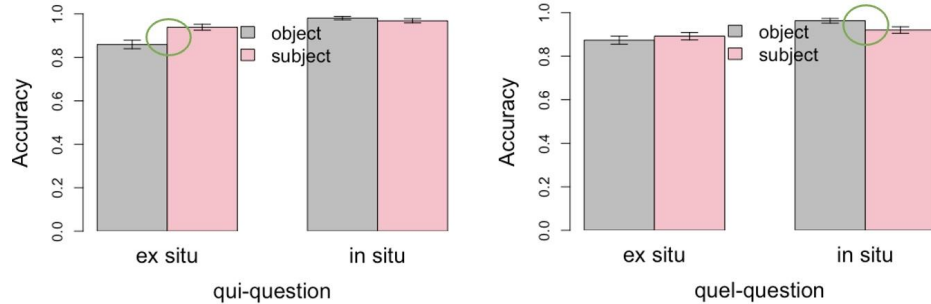


Figure 1 Mean response accuracy of *qui/quel* questions in written version

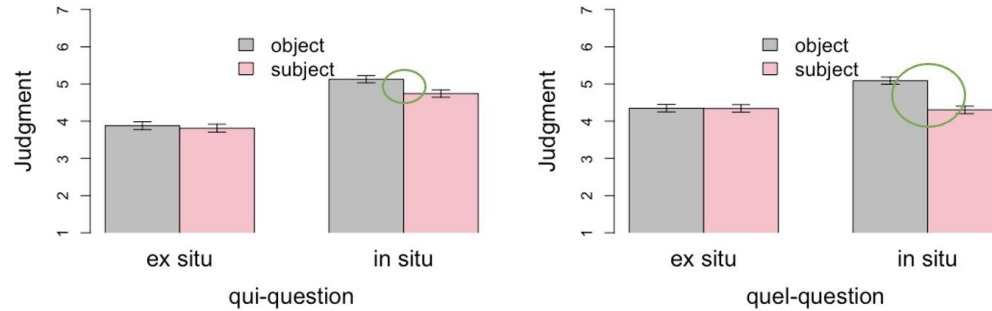


Figure 2 Mean ratings of *qui/quel* questions in written version

Written version:

A subject advantage in ex situ questions ( $p < 0.001$ );

An object advantage in in situ questions ( $p < 0.001$ ).

(analyzed by [Generalized linear mixed models](#) in R)

## 4. Results

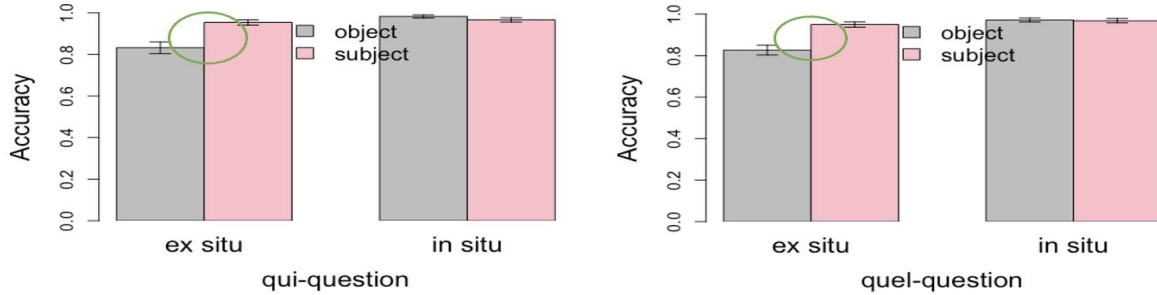


Figure 3 Mean response accuracy of *qui/quel* questions in audio version

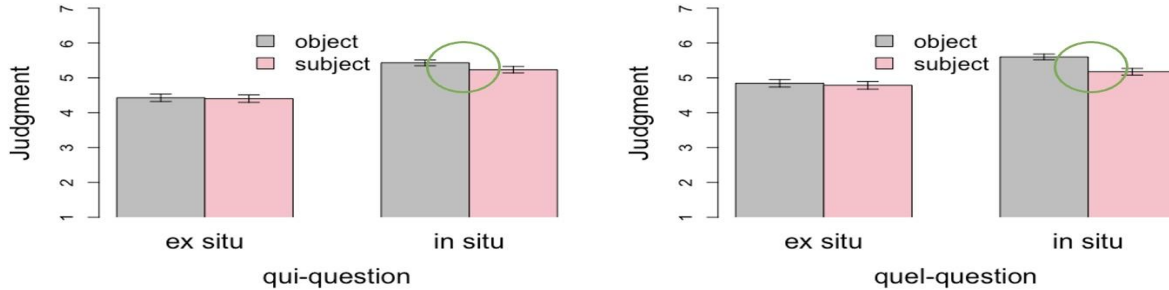


Figure 4 Mean ratings of *qui/quel* questions in audio version

Oral version:

A subject advantage in ex situ questions ( $p < 0.001$ );

An object advantage in in situ questions ( $p < 0.001$ ).

**Results of the two experiments are almost identical.**

## 5. Discussion

**Why a subject advantage in ex situ questions, but an object advantage in in situ questions?**

**a possible explanation:** nested dependencies (b, c) are relatively easier to process than crossing dependencies (a, d) (Fodor, 1978; Frazier & Fodor, 1978; Rochemont & Culicover 1990; Pickering & Barry, 1991). This explains the tendency of the two types of questions.

**a.**

[**FORCE**<sub>Top</sub> **Le monsieur**], [<sub>IntP</sub> **qui/quelle** dame **le** pousse]?

**(subject in situ questions)**

the gentleman who/which lady him pushes

**b.**

[**FORCE**<sub>Top</sub> **Le monsieur**], [<sub>IntP</sub> **il** pousse **qui/quelle** dame]?

**(object in situ questions)**

the gentleman he pushes who/which lady


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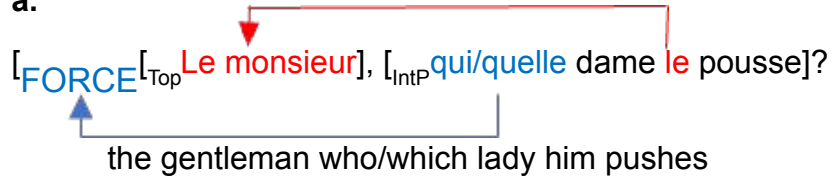
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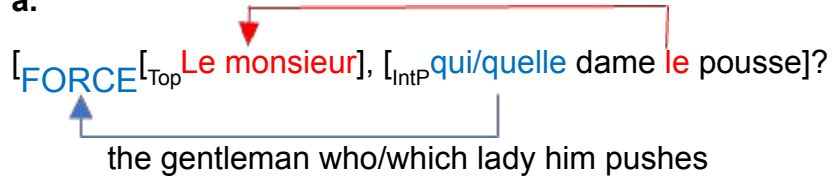
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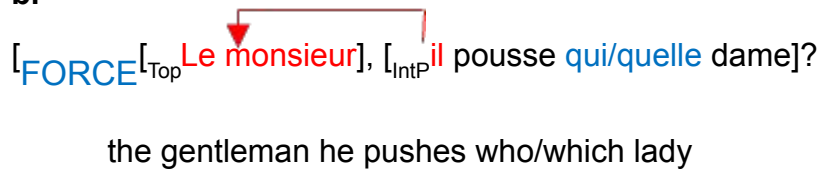
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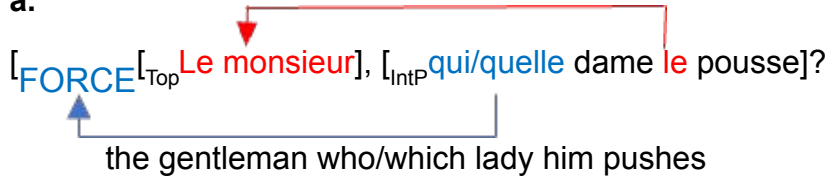
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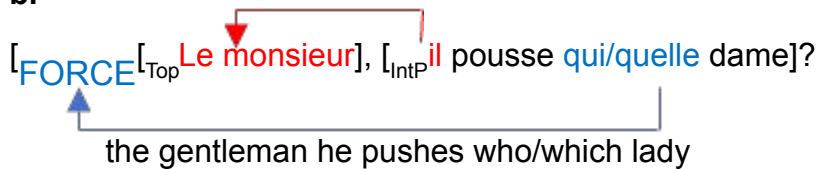
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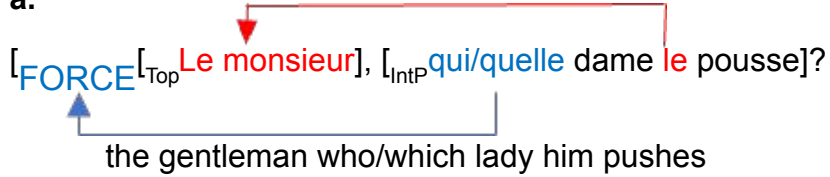


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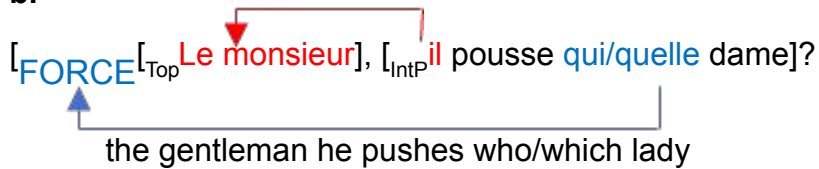
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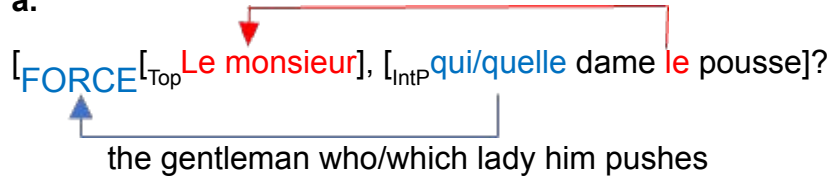
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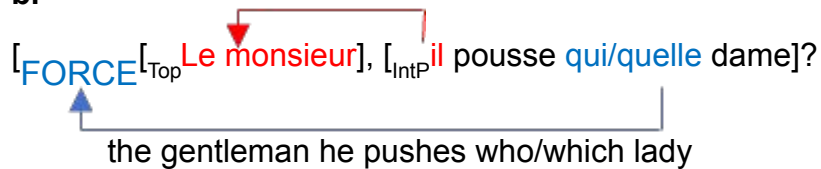
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**c .**

[<sub>Top</sub> **Le monsieur**], c'est **qui/quelle dame** qui [e] **le** pousse?

(**subject ex situ questions**)

the gentleman it's who/which lady that him pushes

**d.**

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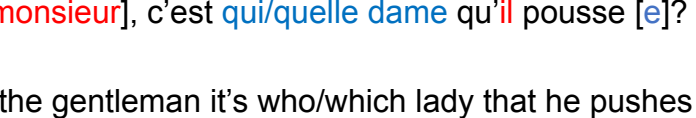
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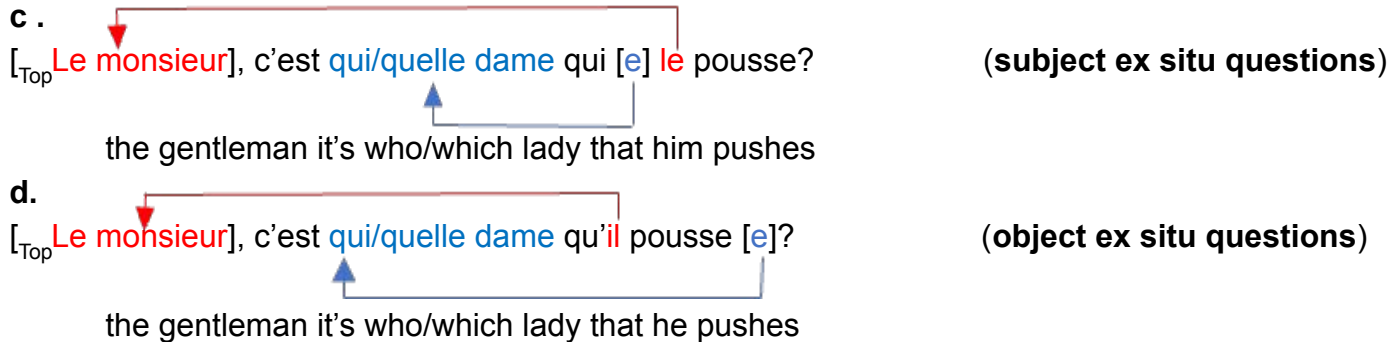
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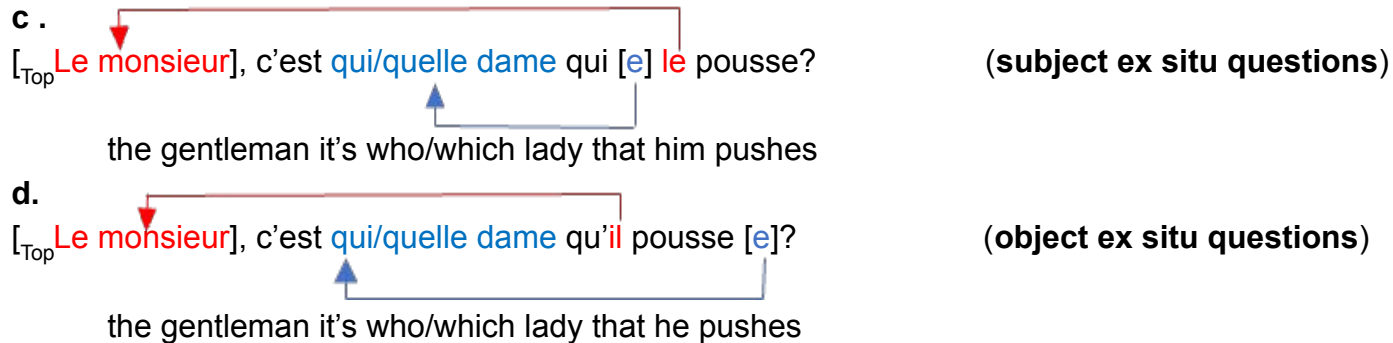
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→ nested dependencies in c are easier to process than crossing dependencies in d

→ an subject advantage in ex situ questions

# Conclusion and extensions

Our results, that are superficially divergent between wh-ex situ and wh-in situ.

However, they eventually confirm that both in situ and ex situ questions involve the same type of covert dependency.

They interact differently with the clitic left dislocation because of linear factors.

Our results are thus a confirmation that covert and overt dependencies are similarly constrained, which might be seen as an evidence in favor of the covert movement analysis.

→ Next step will be to test whether we can observe the same « [object advantage](#) » in wh-in situ questions with topicalizations in other languages (e. g. Chinese).

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