

Conditions on Qu-embedding predicates in German

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1 Introduction

- **dass-form, ob-form, wh-form**

A verb dass σ

wissen (know),
zweifeln (doubt),
überrascht sein (be surprised), bedauern (regret)
hoffen (hope), glauben (believe)

A verb ob σ

wissen,
zweifeln,
fragen (ask)

WH (A, verb, σ)

wissen,
überrascht sein,
fragen (ask)

- (1) a. *Frank weiß, dass Maria kommt.*
'F knows that M is coming.'
- b. *Frank weiß, ob M kommt.*
'F knows whether M is coming.'
- c. *Frank weiß, wer kommt.*
'F knows who is coming.'
- (2) a. *Frank zweifelt, dass Maria kommt.*
'F doubts that M is coming.'
- b. *Frank zweifelt, ob M kommt.*
'F doubts whether M is coming.'
- c. **Frank zweifelt, wer kommt.*
'F doubts who is coming.'
- c'. *Frank zweifelt daran, wer kommt.*
'Frank doubts *da-cor* who is coming
- (3) a. *Frank ist überrascht, dass Maria kommt.*
'F is surprised that M is coming.'
- b. **Frank ist überrascht, ob M kommt.*
'F is surprised whether M is coming.'
- c. **Frank ist überrascht, wer kommt.*
'F is surprised at who is coming.'
- c. *Frank ist überrascht darüber, wer kommt.*
'F is surprised at who is coming.'
- (4) a. *Frank hofft, dass Maria kommt.*
'F hopes that M is coming.'
- b. **Frank hofft, ob M kommt.*
'F hopes whether M is coming.'
- c. **Frank hofft, wer kommt.*
'F hopes who is coming.'
- c. *Frank hofft es/darauf, wer kommt.*
'F hopes *es-/da-cor* who is coming.'

- What are the conditions
 - i. for a *verb dass* to allow an *ob*-form,
 - ii. for a *verb ob* to allow a *wh*-form
- Karttunen (1977), Groenendijk & Stokhof (1982), Ginzburg & Sag (2000), Zifonun et al. (1997)
 - Karttunen: not exhaustive (*doubt*, *be surprised* and *refute*); not coherent (*be interested in* is *inquisitive* like e.g. *ask*, and *control* which is classified as a *decision verb* like *decide*)
 - G & S: not exhaustive (*doubt* and *be surprised*)
 - Ginzburg & Sag: do not explain why predicates which operate on facts (*regret*) do not embed *whether*-interrogatives.
 - Zifonun et al.: do not explain why *bestätigen* (*confirm*), *bedauern* (*regret*), and *sich freuen* (*be glad*) can have a *wh*-form

2 Conditions for the *ob*-form

2.1 Verbs with *dass*-form – Objectivity Condition

I **Meaning of the *ob*-form**

(A verb *dass* σ) $\vee$ (A verb *dass* $\neg\sigma$)

II **Semantic verb properties:**

D1: Semi-implicativity

x verb *dass* $\sigma \rightarrow \sigma$ for all $\sigma \in \Phi(\Sigma)$

- *wissen* vs. *glauben*, *überrascht sein*

D2: Anti-implicativity

x verb *dass* $\sigma \rightarrow \neg\sigma$ for all $\sigma \in \Phi(\Sigma)$

- *widerlegen* (refute)

D3: Negation invariance

x verb *dass* $\sigma \leftrightarrow x$ verb *dass* $\neg\sigma$ for all $\sigma \in \Phi(\Sigma)$

- *zweifeln* (doubt)

(5) a. *F weiß, dass M in Paris ist.*

'Frank knows that Maria is in Paris'

$\rightarrow$ Maria is in Paris Cf. (1b)

b. *F ist überrascht, dass M in P ist.*

'F is surprised that Maria is in P.'

$*\rightarrow$ M is in P Cf. (3b)

c. *F glaubt/hofft, dass M in P ist.*

'F believes that Maria is in P.'

$*\rightarrow$ M is in P Cf. (4b)

- (6) a. *F hat widerlegt, dass Max der Täter ist.*
'F has refuted that Max is the offender.'
→ Max is not the offender
- b. *<The witness said whether the ones concerned had paid or not at the time>*
F jedoch widerlegte für jeden, ob er dazu in der Lage war oder nicht.
'F, however, refuted for each person whether she was able to do so or not.'

D4: Witness Independence Condition (WIC)

If $P \text{ verb dass } \sigma \vee P \text{ verb dass } \neg\sigma$ holds in $\mathfrak{K}$, the truth value of $P \text{ verb dass } \sigma$ depends at most on the truth value of σ , but not on σ itself or P .

It follows:

WIC → semi-implicative $\vee$ anti-implicative $\vee$ invariant

- *wissen (know), widerlegen (refute), zweifeln (doubt)*
- *wissen (know) vs. beweisen (prove without doubt), are semi-implicative, but *A beweist ob vs. A weiß ob.*

D5: Witness Existence Condition (WEC)

$\exists x (x \text{ verb dass } \sigma) \vee \exists x (x \text{ verb dass } \neg\sigma)$

for all $\sigma \in \Phi(\Sigma)$

- *wissen (know), widerlegen (refute), zweifeln (doubt)*
 - *Beweisen (prove without doubt) is incompatible with WEC*
- (7) *Der Zeuge der Anklage weiß zwar, dass Max der Täter ist, aber es lässt sich nicht beweisen.*
The witness of the prosecution knows that Max is the offender, but it cannot be proven.

D6: Objectivity Condition (for verb *dass*)

- i. Verb *dass* is simultaneously compatible with WEC and with one and only one of the three alternatives in WIC **or**
- ii. NWC holds.¹
 - *wissen* (know), *widerlegen* (refute), *zweifeln* (doubt)
- Verbs *dass* fulfilling the Objectivity Condition are **objective** and allow the *ob*-form meaning *A verb σ*
- **inherently** and **non-inherently** objective verbs
 - Verb *dass* is *inherently objective* if it fulfils WIC and is compatible with WEC
 - *wissen* (know), *widerlegen* (refute), *zweifeln* (doubt)
 - Verb *dass* is *non-inherently objective* if it is compatible both with just one of the three alternative of WIC in conjunction with WEC, *but without WEC it is compatible with more than one of the three alternatives mentioned* – cf. Karttunen (1977) and G&S (1982).
 - *sagen* (say), *hören* (hear), *sehen* (see), ...

(8) *ambiguous*

- a. *Maria sagte, dass Pauline kommt.*

Maria said that Pauline was coming

not ambiguous

- b. *M sagt, dass F kommt und ob P kommt.*

M said that F was coming and whether P was coming

If *ob* is used, the ambiguity disappears.

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NWC stands for *No Witness Condition* which is fulfilled by the artificial verb *stets verneinen* (*deny perpetually*) which is defined for the sake of completeness

2.2 Verbs without dass-form

D7: Negation invariance

$x \text{ verb dass/ob } \sigma \leftrightarrow x \text{ verb dass/ob } \neg \sigma$
for all $\sigma \in \Phi(\Sigma)$

- *fragen (ask), kontrollieren (control)*

D8: Invariant Objectivity Condition

- i. Verb *dass/ob* is negation invariant and consistent with
 $\exists x (x \text{ verb dass/ob } \sigma), \text{ for all } \sigma \in \Phi(\Sigma)$

or

- ii. NWC holds.

- *fragen (ask), zweifeln (doubt), ...*

(9) a. P fragt, ob Schimmel weiß sind.

'Pauline asks whether a white horse is white.'

a'. #P kontrolliert, ob Schimmel weiß sind.

'Pauline checks whether white horses are white'.

3 Verben with *wh*-form

3.1 *Wh*-form of objective verbs

- **Meaning of the *wh*-form**

wh(A, verb, σ) of an objective verb means $\forall x$ (A verb ob σ (x))

D9: *Wh*-form Condition for Objective Verbs

Any objective verb *dass/ob* allows a well-formed *wh*-form *wh*(A, verb, σ) if and only if it is consistent with *wissen ob* or if it is contradictory.

- *wissen* (know), *widerlegen* (refute), *fragen* (ask)
vs. *zweifeln* (doubt)

(10)a. *Frank weiß, wer kommt.*

For all x, Frank knows whether x is coming or not.

b. *Der Detektiv hat widerlegt, wer anwesend war.*

For all x, the detective has refuted whether x was present.

c. *Frank fragt, wer kommt.*

For all x, Frank asks whether x is coming or not.

d. **Frank zweifelt, wer gekommen ist.*

*Frank doubts who has come.

- Non-objective verbs do not allow *wh*(A, verb, σ) meaning $\forall x$ (A verb ob σ (x))

- *bedauern* (regret), *überrascht sein* (be surprised),
glauben (believe), *hoffen* (hope), ...

3.2 Wh-form of non-objective verbs

I Meaning of the wh-form

- (11) a. *Frank bedauert es, wer kommt.*
Frank regrets es-cor who is coming
- b. *Frank ist darüber überrascht, wer kommt.*
Frank is da-cor surprised who is coming.
- c. *Frank kontrolliert es, wer kommt.*
Frank controls es-cor who is coming

(11a, b) are the semantically underspecified forms of:
A correlate verb dass $\mu(A, \text{verb}, \sigma)$, e.g.:

- i. F is surprised at/regrets it ... that only women are coming.
- ii. Frank is surprised at /regrets it ...that Max is coming.

(11c) is the semantically underspecified form of
A correlate verb ob $\mu(A, \text{verb}, \sigma)$, e.g.:

- i. Frank controls whether only women are coming.
- ii. Frank controls whether Max is coming.
Cf. (10a)

II Impact of correlates

- (12) a. **Frank bedauert, wer kommt.* cf. (11a)
Frank regrets who is coming
- b. **Frank ist überrascht, wer kommt.* cf. (11b)
Frank is surprised who is coming.
- c. **Frank kontrolliert, wer kommt.* cf. (11c)
Frank controls who is coming

III **Semantic properties of non-objective verb dass allowing the wh-form – es correlate**

(13) **Frank hofft es/darauf, wer kommt.* cf. (11a, b)
Frank hopes es/da-cor who is coming

(14) a. *Frank bedauert, dass Maria kommt.*
Frank regrets that Maria is coming →
 σ is consistent, i.e. not contradictory

➤ *bereuen* (regret)

b. *Frank hofft, dass Maria kommt.*
Frank hopes that Maria is coming →
 σ is non-tautological

➤ *annehmen* (assume), ...

(15) a. *Frank bedauert **es**, dass Maria kommt.*
Frank regrets es-cor that Maria is coming →
(A verb dass σ) & **σ**

b. *Frank hofft **es**, dass Maria kommt.*
Frank hopes that Maria is coming →
(A verb dass σ) & (**σ is consistent**)

- If the verb entails that **σ is consistent**, the use of the **es**-correlate upgrades this verb to a **factive** one.

- A verb is factive if
 $\forall A, \sigma (((A \text{ verb dass } \sigma) \rightarrow \sigma) \& ((A \neg \text{verb dass } \sigma) \rightarrow \sigma))$

(16) *Frank bedauert es nicht, dass Maria kommt.* →
 $\neg(A \text{ verb dass } \sigma) \& \sigma$

- If the verb entails that σ is consistent and the use of the es-correlate upgrades this verb to a factive one, the *wh*-form is possible.

II **Semantic properties of verb dass allowing the wh-form - da-correlate**

(17)a. *Frank freut sich, dass Maria kommt.*

Frank is glad that Maria is coming →
 (A verb dass σ **is compatible** with A weiß dass σ)

➤ *überrascht sein* (be surprised), ...

b. *Frank hofft, dass Maria kommt.*

Frank hopes Maria is coming →
 (A verb dass σ **is incompatible** with A weiß dass σ)

➤ *spekulieren* (speculate)

(18)a. *Frank freut sich **darüber**, dass Maria kommt.*

Frank is glad da-cor that Maria is coming →
 (A verb dass σ) & (**σ follows from what A knows**)

b. *Frank hofft **darauf**, dass Maria kommt.*

Frank hopes da-cor that Maria is coming →
 (A verb dass σ) &
 (**σ is consistent** with what A knows)

- If the verb entails that A verb dass σ is compatible with A weiß dass σ , the use of the da-correlate upgrades this verb to a **cognitive** one (σ follows from what A knows).
- A verb is cognitive if
 $\forall A, \sigma ((A (\neg)\text{verb da-cor dass } \sigma) \leftrightarrow ((\sigma \text{ follows from what A knows}) \& ((\neg) A \text{ verb dass } \sigma)))$
- If the verb entails that A verb dass σ is compatible with A weiß dass σ , the use of the da-correlate upgrades this verb to a **cognitive** one; The wh-form is possible.

III Wh-form condition for non-objective dass/ob verbs

D10: Consistency statements for non-objective dass/ob-predicates allowing the wh-form

For a non-objective

- i. a. **verb-dass** with an **es**-correlate,
the *wh*-form $wh(A, \text{verb es dass}, \sigma)$ is well-formed
if and only if
A *verb dass* σ entails the consistency of σ ,
- b. **verb-ob** with an **es**-correlate,
the *wh*-form is well-formed without any restrictions,
- ii. a. **verb-dass** with a **da**-correlate,
the *wh*-form $wh(A, \text{verb da-cor } \sigma)$ is well-formed if
and only if
A *verb dass* σ is compatible with A *weiß dass* σ ,
- b. **verb-ob** with a **da**-correlate,
the *wh*-form $wh(A, \text{verb da-cor ob}, \sigma)$ is well-
formed without any restrictions.

D11: Wh-form condition for non-objective dass/ob verbs

A non-objective *dass/ob*-verb has a well-formed *wh*-form if and only if it has a *da*-correlate or an *es*-correlate and fulfils the respective consistency statement.

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