

On semantic consistency degrees, question embedding and correlates

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1 Introduction

- Clause type, correlate type, and clausal status are related to semantic consistency degree of the matrix predicate

correlate type <ul style="list-style-type: none">➤ <i>es</i>➤ <i>da-</i>➤ <i>es/da-</i>➤ \emptyset	clause type <ul style="list-style-type: none">➤ declarative<ul style="list-style-type: none">• <i>dass</i>/\emptyset➤ interrogative<ul style="list-style-type: none">• <i>ob-</i><ul style="list-style-type: none">▪ external ob0▪ internal wh1• <i>wh-</i><ul style="list-style-type: none">➤ exhaustive wh1➤ non exhaustive wh2➤ non exhaustive wh3	clausal status <ul style="list-style-type: none">• finite• v-final• v-second• non-finite• ?infinitive• nominal
impact of correlates <ul style="list-style-type: none">➤ <i>es</i>➤ da-cor		

- (1) a. Wir werden (*es*) nicht *verhindern*, dass die Athleten in unserem Sport immer versuchen, leicht zu sein und an Grenzen zu gehen. DWDS BZ 2000
'We won't prevent **it** that the athletes will always try ...'
- b. In der alten Heimat *lästern* sie (**darüber**), dass es dort bestenfalls ein Popcorn-Kino gibt, aber keine Theater.
'... they gossip **about** ...'
- c. Allerdings *glaubt* fast die Hälfte der Chief Executives, daß Perot durchaus Chancen habe, die Wahl im November zu gewinnen,... TIGER
'... nearly half the Chief Executives believe that'
- c'. Noch weniger hätte sie *es* geglaubt, dass sie dabei auch noch so unvergleichliche Lust empfinden und nach mehr und immer mehr verlangen würde. GBS Hoffmann 2007
'... she would not have believed **it** that she ...'
- c". Ich habe noch bis in ein hohes Alter fest *daran* geglaubt, dass ich Wimbledon gewinnen könnte, gesteht Wes Anderson, ... DWDS ZEIT 2001
'... I believed strongly **in** that I could win ...'
- d. Als Meißner ein paar Schritte lang schwieg, wandte sich der Nichtraucher Lautenschläger, unser Ältester, nach uns um und *brummte*, ob uns **denn** heute nichts auffalle. GBS Piontek 1989
'... Lautenschläger ... growled whether we haven't noticed anything.'
- How are clauses linked to their matrix predicate? 2 proposals:
 - ◆ by case
 - *es*: Nominative, Accusative
 - *da-cor*: Oblique Case
 - But, what about if case is not indicated?
 - ◆ by their form
 - verb final
 - complementizers *dass* and *ob*
 - What is the function of the correlates, why can they be optional?

- (2) a. **dass**
glauben 'believe' - see (1a-c)
- b. **dass-ob-wh**
Später hörte ich im Autoradio, dass Rex Gildo in der Nacht gestorben war. DWDS BZ 1999
Die Unterhändler wollten nun von Ross hören, ob der israelische Regierungschef Benjamin Netanjahu ebenfalls zum Einlenken bereit sei, ... DWDS BZ 1998
 'Later, I heard ... that Rex Gildo passed away ...'
Genau, nur diese Person kann es machen", hatte der neue Senderchef Roger Schawinski prophezeit. Jetzt hört man, wer es ist, und denkt: Mhm. DWDS BZ 2003
 'If we will hear, who it is, all will say: ...'
- b' **Familien sollten bedenken, dass bei Kreditfinanzierung über viele Jahre enorme Ausgaben auf sie zukommen.**
Er brauchte zwei Stunden, weil er unterwegs ein paarmal abstieg, um eine Pfeife zu rauchen und zu bedenken, ob er nicht besser umkehren sollte. DWDS Be 1946
Wenn Sie bedenken, wer heute noch von den ehemaligen Mitgliedern des Forums als Minister tätig ist ... kann man doch nicht klagen. DWDS BZ 1994
- c. **dass-ob**
Niemand zweifelt heute, dass Polen zu den ersten neuen Mitgliedern der Europäischen Union gehören wird. DWDS BZ 2000
 'Nobody doubts today that Poland will belong to the first members of the EU'
Experten zweifeln, ob eine "Teillösung" den Spruch des Verfassungsgerichts erfüllt.. DWDS BZ 1994
 'Experts doubt whether ...'
- d. **dass-wh**
Ich bedauere, dass Kenny unseren Sender verlässt. DWDS BZ 1997
 'I regret that Kenny will leave the radio station'
Zugleich muss man bedauern, was für ein langer, teurer, entnervender Weg zurückgelegt werden musste, um am Ende wieder im alten Pott zu landen. DWDS BZ 2005
 '... we have to regret what a long, expensive, enervating way we have covered to ...'
- e. **ob-wh**
Er hatte untersucht, ob Studenten, die tiefgründig studieren, um neue Erkenntnisse zu sammeln, besser bei Examen abschneiden.
 'He has investigated whether students ...'
Wissenschaftler untersuchen dabei, wieviel TNT im Boden geblieben ist. DWDS BZ 1998
 'Scientists investigated how much TNT remained in the soil'
- f. **ob**
 Ø
- g. **wh**
 Ø
- The relevant semantic properties determining the grammatical behavior of the matrix properties are their **consistency degrees**. They are defined on the basis of consistency properties of embedded statements σ .

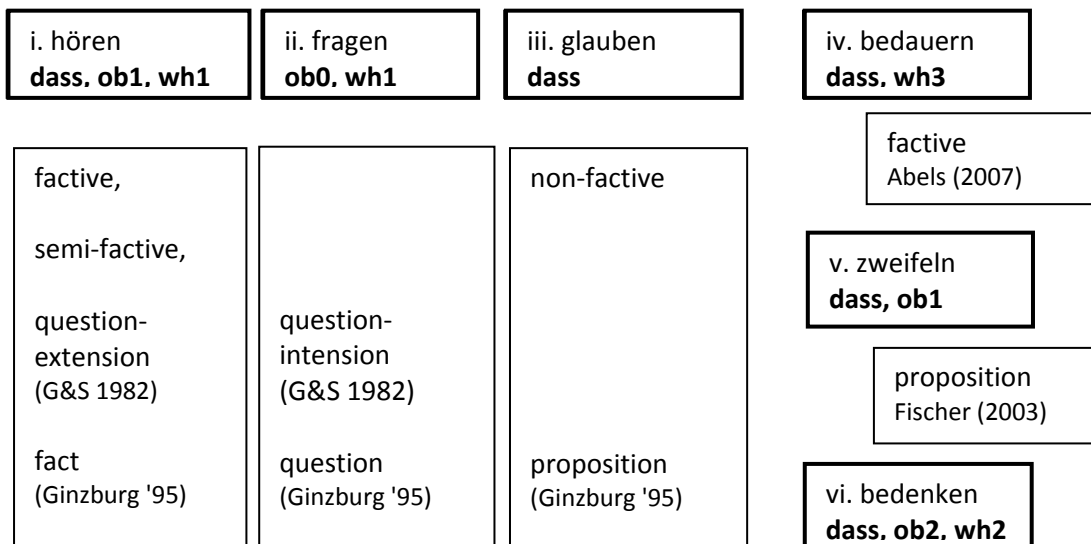
2 Why consistency conditions? Question embedding

❖ 7 forms

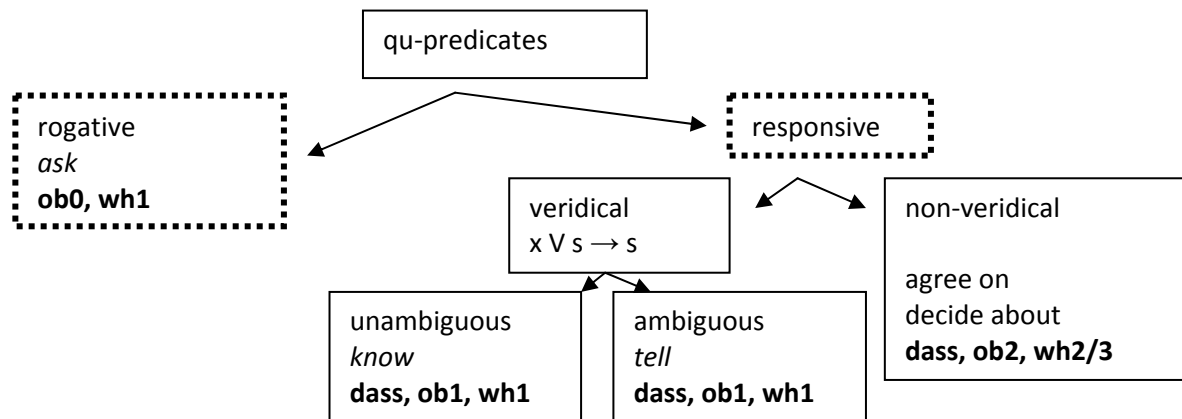
❖

- i. **dass-form**: *glauben* 'believe' (2a-d)
A verb *dass* σ
- ii. **ob-form (ob0)**: *fragen* 'ask' (2e)
A verb *ob* σ
- iii. **external ob-form (ob1)**: *hören* 'hear', *wissen* 'know' (2b)
A verb *ob* $\sigma \leftrightarrow [(A \text{ verb } \textit{dass } \sigma) \vee (A \text{ verb } \textit{dass } \neg\sigma)]$
- iv. **internal ob-form (ob2)**: *bedenken* 'consider' (2b')
A verb *ob* $\sigma \leftrightarrow [A \text{ verb } \textit{dass } (\sigma \vee \neg\sigma)]$
- v. **exhaustive wh-form (wh1)**: *fragen*, *hören* (2b, e)
 $wh (A, \text{verb}, x) \leftrightarrow \forall x [A \text{ verb } \textit{ob } \sigma(x)]$
- vi. **non-exhaustive wh-form (wh2)**: *bedenken* (2b')
 $wh (A, [\text{cor}] \text{verb}, x) \leftrightarrow A \text{ verb } \textit{dass } (\mu \vee \neg\mu)$,
with μ as a contextually given statement
- vii. non-exhaustive wh-form (**wh3**): *bedauern* 'regret', *bedenken*, *hören* (2d)
 $wh (A, [\text{cor}], \text{verb}, x) \leftrightarrow A \text{ verb } \textit{dass } \mu$,
with μ as a contextually given true statement

❖ predicate types (only predicates with an animate subject)



Lahiri (2002), Spector & Egré (2007), Egré (2008),



- "Rogative" and "responsive" are functional categories.
- Non-veridical is not fine-grained enough to describe the grammatical behavior of its members
 - What about *regret* which embeds *wh*-clauses but no *ob*-clauses in contrast to *decide about*?

Schwabe & Fittler (2009)

Question embedding is determined by *consistency degrees*. They are defined on the basis of consistency properties of embedded statements σ .

- ❖ "veridical" *wissen dass* 'know' vs. *erreichen* 'manage'
Both are **semi-implicative** $[(x \text{ verb } \text{dass } \sigma) \rightarrow \sigma]$. But, only *wissen* is consistent with the **Witness Existence Condition (WEC)** $[\exists x (x \text{ verb } \text{dass}/\text{ob } \sigma) \vee \exists x (x \text{ verb } \text{dass}/\text{ob } \neg\sigma)]$ for all σ .
Glauben is consistent with WEC and it is also consistent with semi-implicative. But it is not consistent with WEC and semi-implicative simultaneously.

external ob-form (ob1) and exhaustive wh-form (wh1)
Verb *dass* allows the external *ob*-form (ob1) and the exhaustive *wh*-form (wh1) if it is consistent with semi-implicative & WEC.

- ❖ "rogative" *fragen* vs. *kontrollieren*
Fragen is **negation-invariant** $[x \text{ verb } \text{dass}/\text{ob } \sigma \leftrightarrow x \text{ verb } \text{dass}/\text{ob } \neg\sigma]$ and, additionally, it is consistent with WEC.
Kontrollieren 'check' is negation-invariant, but is not consistent with WEC.
- ❖ "non qu-predicates" *zweifeln dass* 'doubt' vs. *bestreiten* 'deny'
Zweifeln is consistent with negation-invariant & WEC, i.e. it is a qu-predicate contrary to *bestreiten*.
- ❖ *fragen* vs. *zweifeln*
Both are consistent with negation-invariant and WEC. But *fragen* contrary to *zweifeln* is consistent with *wissen dass*. – cf. (2c).

ob-form (ob0) and the exhaustive wh-form (wh1)
Verb allows the *ob*-form (ob0) and the exhaustive *wh*-form (wh1) iff it is consistent with negation-invariant & WEC and with *wissen dass*.

Predicates which are consistent either with semi-implicative & WEC or with negation-invariant and WEC are *objective*. They license the non-internal ob-forms (ob0, ob1) . And they license the exhaustive wh-form (wh1) if they are consistent with *wissen dass*.

non-objective predicates:

bedenken 'consider', *hoffen* 'hope', *darüber nachdenken* 'think about', *erreichen* 'manage'. ...

❖ *bedenken* 'consider' vs. *hoffen*

Both *bedenken* and *hoffen* are non-objective. But contrary to *hoffen*, *bedenken* can have the ob-form. The reason for this turns out to be that it can be valid with tautologies – cf. A bedenkt *dass* ($\sigma \vee \neg \sigma$) vs. #A hofft *dass* ($\sigma \vee \neg \sigma$) – cf. (2b').

❖ *bedauern* 'regret' vs. *bedenken* 'consider'

Bedauern, which does not have an ob-form, cannot be valid with tautologies contrary to *bedenken*.

- We ask what properties enable *bedauern* as well as *sich fürchten* 'be afraid' to exhibit the non-exhaustive wh-form – cf. (2d)? The properties in question are particular consistency degrees triggering (at least) a **factive reading** [x (not) verb *dass* σ] \rightarrow σ] for the verb together with a legitimate correlate.

Consistency degrees are defined on the basis of consistency properties of embedded statements σ .

➤ **Absolute consistency conditions**

correlate the possible truth values of the matrix pred with the possible truth values of the embedded σ

➤ **Relative consistency conditions**

correlate the possible truth values of the matrix pred with the embedded σ and the set [KN(x)] of statements τ the subject knows

❖ **Absolute consistency conditions**

• **semi-implicative**

x verb *dass* $\sigma \rightarrow \sigma$

wissen dass 'know', *beweisen dass* 'prove without doubt', *erreichen dass* 'manage', but not *bedauern* 'regret' – cf. Egré (2008)

• **negation-invariant**

x verb *dass* /ob $\sigma \leftrightarrow x$ pred *dass*/ob $\neg \sigma$

untersuchen ob (investigate), ...

• **absolutely consistent**

x verb *dass* $\sigma \rightarrow \sigma$ is consistent [there is a constellation where σ is true]

bedenken dass 'consider', ...

• **absolutely contingent**

x verb *dass* $\sigma \rightarrow \sigma$ is contingent [consistent and not tautological]

bedauern dass 'regret', ...

• **absolutely tautological**

x verb ob $\sigma \leftrightarrow x$ verb *dass* ($\sigma \vee \neg \sigma$)

bedenken ob 'consider', *kontrollieren ob* 'check', ...

• **absolutely intautological**

x verb *dass* $\sigma \rightarrow \sigma$ is not tautological

annehmen dass 'assume', *es glauben dass*, *es denken dass*, ...

❖ **Relative consistency conditions**

- **relatively cognitent**
 $x \text{ verb dass } \sigma \rightarrow [\text{KN}(x) \rightarrow \sigma]$
darüber nachdenken dass, daran denken dass (think about), ...
- **improperly relatively cognitent**
 $x \text{ verb dass } \sigma \rightarrow [\text{KN}(x) \rightarrow \sigma]$ & σ is intautological
darán denken dass (think about), ...
- **properly relatively cognitent**
 \leftrightarrow relatively cognitent and **not** improperly relatively cognitent
darüber nachdenken dass, ...
- **relatively consistent**
 $x \text{ verb dass } \sigma \rightarrow [\sigma \text{ is consistent with } \text{KN}(x)]$
sich freuen dass (be glad), darüber sprechen dass, ...
- **improperly relatively consistent**
 $x \text{ verb dass } \sigma \rightarrow [\sigma \text{ is consistent with } \text{KN}(x)]$ & σ is intautological
sich freuen dass 'be glad', ...
- **properly relatively consistent**
 $x \text{ verb dass } \sigma \rightarrow [\sigma \text{ is consistent with } \text{KN}(x)]$ & σ is not intautological
darán interessiert sein 'be interested in', darüber sprechen dass, ...
- **relatively contingent**
 $x \text{ verb dass } \sigma \rightarrow [\sigma \text{ is contingent with } \text{KN}(x)]$ (\Rightarrow tautologies are excluded)
sich darauf freuen 'look forward', ...
- **relatively incognitent**
 $x \text{ verb dass } \sigma \rightarrow [\sigma \text{ does not follow from } \text{KN}(x)]$ (\Rightarrow tautologies are excluded)
darauf hoffen dass 'hope for', ...

❖ **Combined consistency conditions**

They have the form $\alpha \# \beta$, where α is an absolute and β is a (proper) relative consistency condition.

- ♦ *hoffen dass (hope)* absolutely contingent # relatively incognitent
 - α : $x \text{ hofft dass } \sigma \rightarrow \sigma \text{ is contingent}$ and
 - β : $x \text{ hofft dass } \sigma \rightarrow [\sigma \text{ does not follow from } \text{KN}(x)]$
 - $\alpha \# \beta$: $x \text{ hofft dass } \sigma \rightarrow (\sigma \text{ is contingent} \vee [\sigma \text{ does not follow from } \text{KN}(x)])$
 -
- absolutely intautological # properly relatively cognitent
denken dass
- absolutely intautological # properly relatively consistent
glauben dass
- absolutely contingent # relatively incognitent
hoffen dass, ...
- absolutely consistent # properly relatively consistent
diskutieren dass/ob, ...

❖ **consistency degree**

The absolute, relative, and combined consistency conditions are partially ordered by **logical implication** \Rightarrow . *Verb* has the **consistency degree** γ iff it satisfies the consistency condition γ and γ is not preceded in the order \Rightarrow by any other consistency condition satisfied by the predicate.

internal ob-form of non-objective verbs

A verb ob $\sigma \leftrightarrow$ A verb dass ($\sigma \vee \neg\sigma$)

- if verb has the consistency degree **absolutely consistent**
(es) *bedenken ob*, but not *bedauern ob* and *beweisen ob*
- if verb has the consistency degree **properly relatively cognitent or consistent**
sich dafür interessieren ob, *darüber spekulieren ob*, but not *darauf bestehen ob* 'insist'
- if both α and β in the combined consistency degree $\alpha\#\beta$ do not exclude tautologies
(es/darüber) *diskutieren ob*, but not (es/darauf) *hoffen ob*

internal ob-form of objective verbs

- if verb exhibits a *da*-correlate and is non-inherently semi-implicative
davon hören ob 'hear about', but not *davon wissen ob* 'know about'

non-exhaustive wh-form (wh2)

wh (A, [cor], verb, x) \rightarrow A verb dass ($\mu \vee \neg\mu$)

- if verb allows an internal *ob*-form

non-exhaustive wh-form (wh3) wh (A, cor, verb, x) \rightarrow A verb dass μ

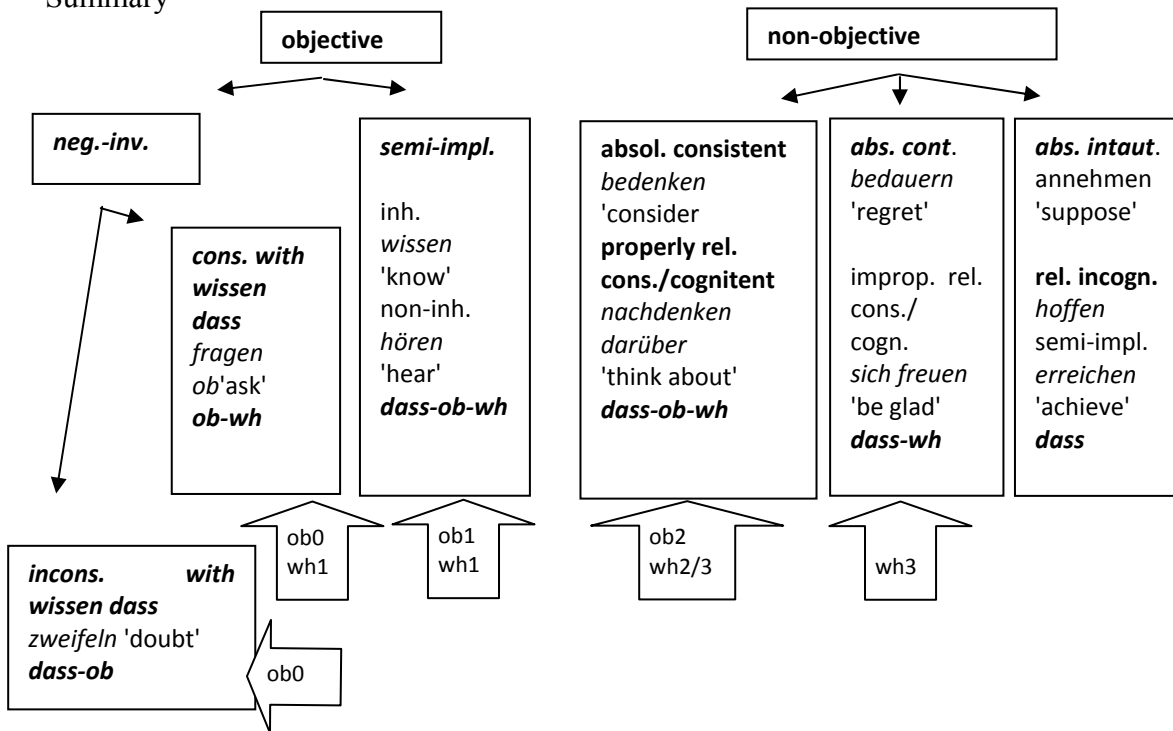
if verb has the consistency degree

- absolutely contingent or consistent
bedauern 'regret', *bedenken* 'consider'
- relatively consistent
sich freuen 'be glad'

and gets a factive reading in the presence of the legitimate correlate or if the verb is

- relatively cognitent
darüber nachdenken 'think about', ...

Summary



3 Consistency degrees and correlates

- Semantic licensing conditions

es-correlates are licensed if *verb*

- ♦ is non-objective and has an absolute or combined consistency degree or
- ♦ is objective and (non-)inherently semi-implicative

da-correlates are licensed if *verb*

- ♦ is non-objective and has a relative or combined consistency degree
- ♦ is objective and deductively open and has an absolute consistency degree (objective case)

Correlate impact

They modify the consistency degree of the predicate by narrowing down the range of its validity

➤ *es-correlate*

▪ **non-objective predicates**

absolutely contingent/consistent

▶ semi-implicative, factive

Frank bedauert/bedenkt es, dass Max kommt.
(*F regrets/considers it that M is coming*)

absolutely intautological # properly relatively consistent

▶ absolutely contingent

F glaubt es, dass Maria kommt.

▪ **objective predicates**

(non-)inherently semi-implicative and absolutely consistent

▶ factive

*merken, sehen, hören, wissen, *sagen, *lesen*

➤ *da-correlate*

▪ **non-objective predicates**

improperly relatively consistent

▶ improperly relatively cognitent,

cognitive $(\neg)x \text{ pred dass } \sigma \leftrightarrow (\neg)[x \text{ pred dass } \sigma] \rightarrow [\text{KN}(x) \rightarrow \sigma]$

Frank freut sich darüber, dass Maria kommt. (F is glad about that ...)

absolutely contingent # properly relatively consistent

▶ properly relatively consistent

Frank glaubt daran, dass Maria kommt

▪ **objective predicates**

(non-)inherently semi-implicative (deductively open and absolutely consistent

▶ cognitive and deductively closed

*hören, wissen, ... (*merken, *sehen, *sagen, *lesen, ...)*

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