



ON THE INFLUENCE OF SUBORDINATORS ON EXTRACTIONS FROM COMPLEMENT CLAUSES

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ABSTRACT

This paper argues for a semantic account of ungrammatical extractions from *ob* ('whether')-complement clauses in German. Relying on *Partition Semantics* for a semantic characterisation of *wh*-questions (cf. e.g. Groenendijk and Stokhof 1984) and the concept of *index dependency* of propositions denoted by [+*wh*]-complement clauses (cf. Groenendijk and Stokhof 1982), it is argued that the ungrammatical extraction constructions are "defective" on logico-semantic grounds as they can get an interpretation under which no alternative answer opened up by the question can be excluded. By relying on e.g. Fox and Hackl's (2006) assumptions on *contextual blindness* (the term being used by Magri 2009), the semantic violation is treated as a constraint that can only be circumvented by evoking contextually invariable means. It is argued that the latter aspect can manifest itself in the occurrence of resumptive pronouns in the extraction domain.

KEYWORDS: Extraction; [+*wh*]-complement clauses; question semantics; resumptive pronouns.

1. Introduction¹

It has been known at least since Ross (1967) that long *wh*-movement (known as *extraction*) is restricted to certain domains in a sentence. (1) to (3) show some classic English examples which illustrate that movement cannot occur from relative clauses (cf. (1)), adjuncts (cf. (2)) or subjects (cf. (3)).

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- (1) *What does Peter know the burglars [who stole ~~what~~]?
- (2) *What does Mary clean the flat [while Fred is reading ~~what~~]?
- (3) *Who did [a picture of ~~who~~] please you?

For decades, especially syntacticians have been formulating principles ruling out unacceptable extraction domains and therefore, there is a huge number of syntactic work on this subject. However, the topic has also been looked at from different perspectives such as information structure, semantics, pragmatics or parsing because the data suggest that there are also factors involved which cannot be argued to be of a syntactic nature in a straightforward way (cf. e.g. Erteschik-Shir 1973; Szabolcsi and Zwarts 1993; Kluender 1991; De Kuthy 2002; Truswell 2007; Abrusán 2008; Comorovski 1996). Non-structural accounts have in most cases been motivated by (un)acceptable extraction data for which it does not seem plausible to argue for structural differences. Erteschik-Shir (1973), which can be considered the first non-structural account on extraction islands, employs the notion of *semantic dominance* in order to capture a large number of classical islands and transparent variants of those. Truswell (2007) develops an *event semantic* account of adjunct islands. De Kuthy (2002) analyses extractions from NPs in terms of information structure. Szabolcsi and Zwarts (1993) develop a semantic version of a *Relativised Minimality* account by showing that when moving a wh-phrase across a scopal element, the wh-phrase binding a variable in the scope of the scopal element, only certain elements are interveners for certain types of moved wh-phrases. They trace this observation back to the participating elements' different algebraic structures. Kluender (1991) applies general assumptions on predicate-argument-structures to extraction constructions. Comorovski (1996) argues in terms of the impossibility of checking certain presuppositions. Abrusán (2008) detects contradictions arising in the case of ungrammatical questions.²

² Especially the last two approaches are of interest for the data under discussion in this article (namely wh-islands). The two theories in a sense function as model for the approach presented here, as they also trace the degradation back to the questions not having (complete) answers. However, those accounts cannot easily be applied to the German data: Comorovski is concerned with wh-islands in Romanian which can become transparent under the occurrence of certain matrix verbs and D-linked properties of the extractee. Abrusán accounts for asymmetries in extractions from wh+*to*-infinitival complements in English (e.g. individual-denoting *who* vs. degree phrase *how tall*). In all respects mentioned, German behaves more restrictively: Matrix verbs do not have an impact on the transparency of [+wh]-complements and asymmetries as noted for English do not occur, either. Besides that, Abrusán does not look at finite wh-complements and the sentences she looks at do not present an option in the German grammar at all as the language does not have wh+*zu*-complement clauses.

The approach presented in the following ties in with non-structural accounts in that the German extraction domains at issue present domains that ought to be the same from a syntactic point of view, but which are nonetheless not equally transparent for extracting constituents and thus pose a problem for purely syntactic accounts of extraction data or at least, motivate and legitimate the consideration of non-structural influence.

Whereas it is acceptable to ask for a constituent contained in a complement clause introduced by the complementizer *dass* (cf. (4i)), it is unacceptable to extract a constituent from the otherwise identical complement clause introduced by the complementizer *ob* (cf. (4ii)). In both cases, the matrix verb selects a CP-complement and *dass* as well as *ob* fill the C-position while Spec CP is not filled by a constituent (cf. the structure in (5)³).

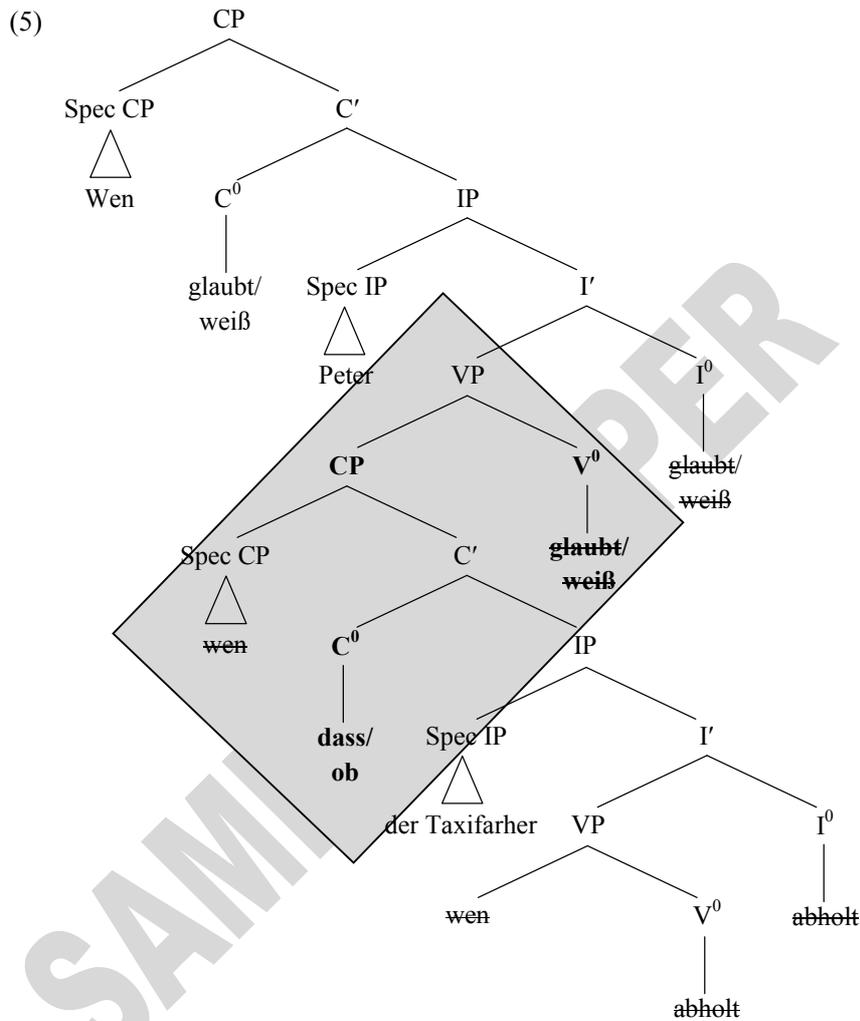
- (4i) Wen glaubt Peter, [dass der Taxifahrer ~~wen~~ abholt]?
 who believes Peter that the taxi driver ~~who~~ picks up
 ‘Who does Peter believe that the taxi driver picks up?’
- (4ii) *Wen weiß Peter, [ob der Taxifahrer ~~wen~~ abholt]?⁴
 who knows Peter whether the taxi driver ~~who~~ picks up
 ‘Peter knows whether the taxi driver picks up who?’ (intended reading)

Thus, assuming that the sentences in (4i) and (4ii) do not differ syntactically in a way that would be relevant for the application of well-known syntactic princi-

³ Assuming this structure for the German sentences is completely uncontroversial: Complements (regardless of their categorial status) are maximal projections and sisters of a head. The same applies to complement clauses. It is equally uncontroversial that *dass* and *ob* as conjunctions are C-type elements in German (cf. the phrase structure in Grewendorf 2002: 35). This assumption has already been made at the times of phrase structure rules (cf. Jungen and Lohnstein 2006, 2007, chapter 7) and in purely linear models such as Drach’s (1937) *Topologisches Feldermodell* (cf. Grewendorf et al. 1990, chapter 7).

⁴ (4i) and (4ii) do not form a true minimal pair as the matrix verb changes. The reason for that is the well-known phenomenon that extractions from *that*-complement clauses are influenced by the matrix verb. So called *bridge verbs* (e.g. *glauben* ‘believe’) allow the extraction from their complement more easily than *non-bridge verbs* (cf. e.g. Erteschik-Shir 1973, 1998, 2007; Cattell 1978; Kluender 1991; Müller 2010). *Wissen* ‘know’ is not a particularly good bridge verb, but although the extraction construction in (4i) is better than (i) below, (i) is still a lot better than (4ii).

- (i) Wen weiß Peter, dass der Taxifahrer abholt?
 who knows Peter that the taxi driver picks up
 ‘Who does Peter know that the taxi driver picks up?’



ples and constraints, such as e.g. Chomsky's (1973) *Subjacency Condition*, Chomsky's (1986) *Barriers*, Rizzi's (1990) *Relativized Minimality* or Chomsky's (2000, 2004, 2008) *Phase Theory*⁵, the account presented intends to argue

⁵ The crucial assumption underlying those theories is that Spec CP is filled by a constituent. Under a (traditional) analysis in which *ob* as a conjunction occupies the C-position (cf. fn. 2), an intermediate movement step to the Spec position should be possible in both cases in (4).

that the contrast between (4i) and (4ii) can be traced back to the different semantic contributions of the two conjunctions. The ungrammaticality of (4ii) is thus due to a semantic violation rather than different structural configurations.

In order to unfold the argumentation, the paper is organised as follows. Section 2 will give a brief presentation of the assumptions of *Partition Semantics* (cf. Groenendijk and Stokhof 1984, 1997; Higginbotham and May 1981; Higginbotham 1991, 1996) and thereby determine the discourse function standardly ascribed to constituent questions. Relying on Groenendijk and Stokhof's (1982) concept of the *index dependency* of propositions expressed by [+wh]-complement clauses, Section 3 will introduce the main semantic difference between *dass*- and *ob*-complement clauses. Section 4 will combine the assumptions on the semantics of questions from Section 2 with the semantics of the two types of complement clauses from Section 3 and it will be argued that the difference between (4i) and (4ii) is due to the fact that the semantic object associated with (4ii) can only be considered a “defective” question which cannot be used in discourse for the communicative purposes questions are usually used. Section 5 looks at the positive influence that resumptive pronouns occurring in the respective complement clauses have on questions such as (4ii). To explain the pronoun's influence on the acceptability of the construction, this account argues that those elements lead to a different, and crucially non-“defective”, interpretation.

2. Questions as partitions

2.1. Short wh-movement: Simple questions

Representatives of partition semantics argue that a question is associated with the set of its answers, the set containing all possible *complete answers* to the question, a complete answer being a *strongly exhaustive* answer. As far as the possible complete answers to (6) are concerned, there are in principle the four complete answers in (7). Thus, restricting the discourse domain to two individuals gives the alternatives that both individuals, only one individual (and not the other one) or none of the individuals are picked up.

- (6) Wen holt der Taxifahrer ab?, $D = \{\text{Hans, Fritz}\}$
 Who picks the taxi driver up
 ‘Who does the taxi driver pick up?’

(7)

Der Taxifahrer holt Hans, Fritz ab.
Der Taxifahrer holt Hans, ¬Fritz ab.
Der Taxifahrer holt ¬Hans, Fritz ab.
Der Taxifahrer holt ¬Hans, ¬Fritz ab. ⁶

Choosing one of those possible answers (e.g. (8)), one of the answers is considered true, the other ones have to be considered false (cf. (9)).

- (8) Der Taxifahrer holt sowohl Hans auch als Fritz ab.
 The taxi driver picks both Hans and Fritz up
 ‘The taxi driver picks up Hans as well as Fritz.’

(9)

Der Taxifahrer holt Hans, Fritz ab.	t
Der Taxifahrer holt Hans, ¬Fritz ab.	f
Der Taxifahrer holt ¬Hans, Fritz ab.	f
Der Taxifahrer holt ¬Hans, ¬Fritz ab.	f

That this situation comes about is due to the fact that the semantic object associated with the question is a partition (cf. (10)).

- (10) Given a nonempty set A , a *partition* of A is a collection of nonempty subsets of A such that
- (1) For any two distinct subsets X and Y , $X \cap Y = \emptyset$.
 - (2) The union of all the subsets in the collection equals A .

Wall (1972:121)

A complete answer thus is a complete answer because it is only compatible with one of the cells and incompatible with all the other ones. However, nothing hinges on this way of determining the complete answer which is due to the definition of a partition as it can also be derived by a *scalar implicature*.⁷ Taking (11) as the answer to (6), a hearer will assume the speaker’s minimal as well as maximal informativeness, i.e. if s/he could have been more informative (which

⁶ As one of the anonymous reviewers seems to assume for e.g. *Hans, Fritz*, this representation is not meant to state that the question has a non-distributive reading. It is only short for *The taxi driver picks up Hans and the taxi driver picks up Fritz*, that is, they do not have to sit in the same taxi at the same time.

⁷ Cf. e.g. Fauconnier (1975), Hirschberg (1985), Harnish (1991) or Primus (1997) on scalar implicatures.

in this case means to say that both individuals are picked up), s/he would have uttered the more informative answer and, therefore, all answers which are more informative than the answer s/he has given are considered false (cf. Beck and Rullman 1999: 294f.).

- (11) Der Taxifahrer holt Hans ab.
 The taxi driver picks Hans up
 ‘The taxi driver picks up Hans.’

By saying (11), the speaker is assumed to say (12).

- (12) Der Taxifahrer holt nur Hans ab.
 The taxi driver picks only Hans up
 ‘The taxi driver picks up only Hans.’

In (7) and (9), each cell contains a proposition which corresponds to a possible complete answer to the question. From the point of view of *possible worlds semantics*, a (wh-)question partitions the logical space, i.e. all possible worlds, into cells which exclude each other, each cell containing that set of worlds in which the respective complete answer to the question is true. But regardless of associating the cells opened up with propositions or the set of worlds which correspond to the propositions, it is decisive for the object associated with the (wh-)question (namely a partition) that the cells exclude each other pair-wise and that the set resulting from joining all single possibilities (i.e. all cells) equals the set containing all logical possibilities.

2.2 Long wh-movement: Complex questions

In analogy to the partition induced by a simple wh-question under the occurrence of short wh-movement, a more complex question such as (13) which involves long wh-movement can be interpreted to partition the matrix subject’s (\approx Peter) system as specified by the matrix predicate (\approx *glaubt*), here the system containing the propositions which Peter believes (under the occurrence of different verbs e.g. the system containing the propositions which the respective subject referent utters in a conversation (*Who does Klaus say that Mary invited?*), dreams (*What does Paul dream that he will win?*) or wishes (*What does Bill wish that he would find?*)).⁸

⁸ Cf. e.g. Giannakidou (1998) on *models* and Farkas (1992) on *individual anchoring* of propositions.

3. Index dependency of [+wh]-complement clauses

Concerning the semantic difference between *that* (*dass*)- and *whether* (*ob*)-complement clauses, Groenendijk and Stokhof (1982) argue that *whether*-clauses, in contrast to *that*-clauses, are *index dependent*. The concept captures the fact that while a *that*-clause denotes the same proposition at every index (or easier: in all possible worlds), the denotation of a proposition expressed by a *whether*-clause depends on the respective state of the world. These facts can be derived from different deductive arguments that are valid when *whether*-complement clauses occur (cf. (17), (18)).

<p>(17)</p> <p>P₁: Peter knows whether Mary is ill. P₂: Mary is ill.</p> <hr style="width: 100%;"/> <p>∴ Q: Peter knows that Mary is ill.</p>	<p>(18)</p> <p>P₁: Peter knows whether Mary is ill. P₂: Mary is not ill.</p> <hr style="width: 100%;"/> <p>∴ Q: Peter knows that Mary is not ill.⁹</p>
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In both examples, the first line represents the sentence whose complement's denotation is being looked for and which opens up the first premise. The second line induces a further premise by establishing a concrete state of the world. The third line indicates the valid argument based on the two premises. If it is e.g. true that Peter knows whether Mary is ill and Mary is indeed ill, then it is also true that Peter knows that Mary is ill, whereas if it is true that Peter knows whether Mary is ill, but Mary is not ill, then it is also true that Peter knows that Mary is not ill.

These two valid arguments show that before the precise form of a proposition expressed in a *whether*-clause can be determined, it has to be known what the world is like. The same does, however, not apply to the proposition expressed by a *that*-complement clause (cf. (19)). Under all circumstances, the proposition expressed in the *that*-clause is the proposition that Mary is ill.

⁹ Such logical deductions are only possible (straightforwardly) with Groenendijk and Stokhof's (1982) *extensional predicates*. By decomposing the "true" *question* embedding verbs (e.g. *ask*, *wonder*) along the lines in (i) and (ii) (cf. e.g. Guerzoni and Sharvit 2007; Boër 1978; Karttunen 1977), parallel deductions are possible.

(i) John wonders whether Alice runs.

(ii) John wants [it to be the case that] if Alice runs then he knows it, and if Alice doesn't run then he knows it. Boër (1978: 322)

Cf. Müller (2010) for the full approach accounting for the occurrence and influence of different verb classes that select *ob*-clauses.

- (19) Peter glaubt, dass Maria krank ist.
 Peter believes that Mary ill is
 ‘Peter believes that Mary is ill.’

A person who utters a sentence such as (20) thus does not decide on the logical value of the proposition expressed in the complement. It can be *p* or not-*p*. And therefore, a speaker who commits himself/herself to a sentence such as (20) commits himself/herself to the disjunction in (21) of which the equivalence in (22) is a more abstract version.

- (20) Peter weiß, ob Maria krank ist.
 Peter knows whether Mary ill is
 ‘Peter knows whether Mary is ill.’
- (21) Peter weiß, dass Maria krank ist oder Peter weiß,
 Peter knows that Mary ill is or Peter knows
 dass Maria nicht krank ist.
 that Mary not ill is
 ‘Peter knows that Mary is ill or Peter knows that Mary isn’t ill.’
- (22) Peter weiß, ob *p*. \leftrightarrow Peter weiß, dass *p*. \vee Peter weiß, dass $\neg p$.
 ‘Peter knows whether *p*. \leftrightarrow Peter knows that *p*. \vee Peter knows that $\neg p$.’

4. “Defective” wh-questions

In the following, an analysis of the space of possible answers associated with an ungrammatical extraction construction is intended to account for the structure’s elimination on semantic grounds. The ungrammaticality of structures such as (4ii) (repeated for convenience in (23)) will be traced back to the “defectiveness” of the space of possible answers that arises when extracting a wh-pronoun from a *whether*-complement clause. It will be shown that a reading for questions such as (23) is possible that is such that due to logical circumstances, the underlying discourse function of a wh-question cannot be fulfilled.

As far as the partition induced by the ungrammatical construction in (23) is concerned, this question can be analysed as opening up the alternatives in (24). Each combination of individuals represents a possible value for the wh-pronoun.

- (27) Peter weiß, ob der Taxifahrer sowohl Hans als auch Fritz abholt.
 \leftrightarrow
 Peter weiß, dass der Taxifahrer sowohl Hans als auch Fritz abholt. \vee
 Peter weiß, dass es nicht der Fall ist, dass der Taxifahrer sowohl Hans
 als auch Fritz abholt.

Changing each simple statement from (26) into such a disjunctive statement, the complex table in (28) is created. As an answer has been given with (25), a decision has been made on the truth of the first cell and the falsity of the second, third and fourth cell and as each cell is just a translation of the *whether*-clause, this decision remains.

(28)	Peter weiß, dass der Taxifahrer Hans, Fritz abholt.	\vee	Peter weiß \neg (dass der Taxifahrer Hans, Fritz abholt).	t
	Peter weiß, dass der Taxifahrer Hans, \neg Fritz abholt.	\vee	Peter weiß \neg (dass der Taxifahrer Hans, \neg Fritz abholt).	f
	Peter weiß, dass der Taxifahrer \neg Hans, Fritz abholt.	\vee	Peter weiß \neg (dass der Taxifahrer \neg Hans, Fritz abholt).	f
	Peter weiß, dass der Taxifahrer \neg Hans, \neg Fritz abholt.	\vee	Peter weiß \neg (dass der Taxifahrer \neg Hans, \neg Fritz abholt).	f

It is important to note that the decision on true and false answers has been made without knowing about a particular state of the world. Thus, all positive and negative answers given respond to two states of the world at the same time as they are given without knowledge of the existing state of the world.

The only statement among the four statements assigned a true logical value is *Peter weiß, ob der Taxifahrer sowohl Hans als auch Fritz abholt.*, but it is still open whether the world is such that the taxi driver picks up Hans and Fritz or that it is not the case that the taxi driver picks up those two individuals. Once a decision has been made for a particular state of the world, the logical values that have been assigned have to remain valid.

As each cell in (28) corresponds to a disjunction consisting of two statements, it is necessary to calculate the truth values of all the statements separately in order to be able to assign the truth value to the whole disjunctive statement.

Assuming the world is such that the taxi driver in fact picks up Hans as well as Fritz, the disjunctive statement in the first cell in (29) has to be true because it

corresponds to the answer given in (25). Due to the valid arguments illustrated in (17) and (18), the first statement in the disjunction in the first cell is assigned a true logical value. The second part of the disjunction has to be considered false because otherwise Peter's epistemic system would contain contradictions. Assuming the truth of the first statement necessarily leads to assuming the falsity of the second statement because the propositions potentially being anchored in Peter's epistemic system contradict each other. Commitment to both statements in the first cell is thus not possible. As the complete statement is true, the situation is in accordance with the decision that the first cell corresponds to the true answer.

The decision on the falsity of the second, third and fourth cell has also already been made (cf. (28)). However, looking at the truth conditions in those cells after having decided on a state of the world, it comes about that the complex statements cannot be considered false (cf. (29)). If Peter has already been ascribed the knowledge that the taxi driver picks up both individuals (first column, first cell), he can neither know as well that the taxi driver picks up only Hans (first column, second cell), nor that he picks up only Fritz (first column, third cell) nor that he picks up nobody (first column, fourth cell), i.e. the first statement in the second, third and fourth cell has to be considered false. However, relying on the knowledge attributed to Peter by the first column in the first cell (namely, he knows that the taxi driver picks up both individuals), it is also true that he knows that it is neither the case that the taxi driver picks up only Hans (second column, second cell), nor that it is the case that he picks up only Fritz (second column, third cell) nor that he picks up nobody (second column, fourth cell). Thus, the second statement of the disjunction has to be assigned a true logical value in the second, third and fourth cell. From that it follows that the complex disjunctive statements all have to be assigned a true logical value.

Based on the assignment of the true logical value to the first statement in the disjunction in the first cell, the calculation of the statements in the remaining space of possible answers shows that in each cell, one statement remains true which leads to the assignment of a true value to the complete disjunctive statement. As each possible answer is assigned the logical value *true*, answering the question in (23) does not create the situation which is found with grammatical questions (cf. (6), (13)), namely that one cell is true and the other ones are false. Although one of the suggested answers is chosen, all possibilities which the questions opens up have to be considered true. As the space of possible answers in (29) shows, the "partition" (see below) does not get reduced by a seemingly complete answer such as (25). On the contrary, after giving the answer, all al-

(29) World: The taxi driver picks up Hans and Fritz.

Peter weiß, dass der Taxifahrer Hans, Fritz abholt.	∨	Peter weiß ¬(dass der Taxifahrer Hans, Fritz abholt).	t
t cf. (17)		f → incompatible with Peter's knowledge	
Peter weiß, dass der Taxifahrer Hans, ¬Fritz abholt.	∨	Peter weiß ¬(dass der Taxifahrer Hans, ¬Fritz abholt).	t
f → incompatible with Peter's knowledge		t → compatible with Peter's knowledge	
Peter weiß, dass der Taxifahrer ¬Hans, Fritz abholt.	∨	Peter weiß ¬(dass der Taxifahrer ¬Hans, Fritz abholt).	t
f → incompatible with Peter's knowledge		t → compatible with Peter's knowledge	
Peter weiß, dass der Taxifahrer ¬Hans, ¬Fritz abholt.	∨	Peter weiß ¬(dass der Taxifahrer ¬Hans, ¬Fritz abholt).	t
f → incompatible with Peter's knowledge		t → compatible with Peter's knowledge	

alternatives opened up by the question remain. As the cells, thus, do not exclude each other, the space of answers that is induced by extracting a *wh*-pronoun from a *whether*-clause in fact is no partition whose main characteristic actually is the pairwise disjunctiveness of the subsets. As the cells from (29) are all true at the same time, this object can at best be considered a *trivial partition*, consisting of only one cell. The four possible answers from (24) in this sense only open up “pseudo”-cells. As Section 2 has shown, the discourse function of constituent questions and their answers is to open up alternatives and reduce them subsequently. As (23) is a question whose alternatives cannot be reduced, the approach presented here argues that an ungrammatical question such as (23) is ungrammatical because it can be associated with a semantic object that cannot ful-

fill a question's discourse function and its ungrammaticality is, therefore, due to a semantic violation.

5. Resumptive pronouns in the extraction domain

5.1 A non-“defective” reading

Apart from the meaning assigned to the question in (23) by assuming the “partition” in (24) (paraphrasable by (30)), there is also another interpretation conceivable which is paraphrased in (31) and which induces the partition in (32).

- (30) What is the polar question whose true answer Peter knows?, the alternatives being: Does the taxi driver pick up Hans as well as Fritz? Does the taxi driver pick up only Hans? Does the taxi driver pick up only Fritz? Does the taxi driver pick up neither Hans nor Fritz?
- (31) Which are the individuals such that Peter knows the true answer to the polar question of the form: Does the taxi driver pick up this individual?

(32)	Hans as well as Fritz are the individuals, i.e. Peter knows the true answer to the question <i>Does the taxi driver pick up Hans?</i> and Peter knows the true answer to the question <i>Does the taxi driver pick up Fritz?</i>	✓
	Only Hans is the individual, i.e. Peter knows the true answer to the question <i>Does the taxi driver pick up Hans?</i> and Peter does not know the true answer to the question <i>Does the taxi driver pick up Fritz?</i>	✓
	Only Fritz is the individual, i.e. Peter does not know the true answer to the question <i>Does the taxi driver pick up Hans?</i> and Peter knows the true answer to the question <i>Does the taxi driver pick up Fritz?</i>	✓
	Neither Hans nor Fritz is such an individual, i.e. Peter does not know the true answer to the question <i>Does the taxi driver pick up Hans?</i> and Peter does not know the true answer to the question <i>Does the taxi driver pick up Fritz?</i>	

(32) equals (33). Each conjunct can be resolved into a disjunction as in (34).

(33)	Peter weiß, ob der Taxifahrer Hans abholt, und Peter weiß, ob der Taxifahrer Fritz abholt.	v
	Peter weiß, ob der Taxifahrer Hans abholt, und Peter weiß nicht, ob der Taxifahrer Fritz abholt.	v
	Peter weiß nicht, ob der Taxifahrer Hans abholt, und Peter weiß, ob der Taxifahrer Fritz abholt.	v
	Peter weiß nicht, ob der Taxifahrer Hans abholt, und Peter weiß nicht, ob der Taxifahrer Fritz abholt.	

(34)	(Peter weiß, dass der Taxifahrer Hans abholt v Peter weiß, dass der Taxifahrer Hans nicht abholt.) \wedge (Peter weiß, dass der Taxifahrer Fritz abholt v Peter weiß, dass der Taxifahrer Fritz nicht abholt.)	v
	(Peter weiß, dass der Taxifahrer Hans abholt v Peter weiß, dass der Taxifahrer Hans nicht abholt.) \wedge \neg (Peter weiß, dass der Taxifahrer Fritz abholt v Peter weiß, dass der Taxifahrer Fritz nicht abholt.)	v
	\neg (Peter weiß, dass der Taxifahrer Hans abholt v Peter weiß, dass der Taxifahrer Hans nicht abholt.) \wedge (Peter weiß, dass der Taxifahrer Fritz abholt v Peter weiß, dass der Taxifahrer Fritz nicht abholt.)	v
	\neg (Peter weiß, dass der Taxifahrer Hans abholt v Peter weiß, dass der Taxifahrer Hans nicht abholt.) \wedge \neg (Peter weiß, dass der Taxifahrer Fritz abholt v Peter weiß, dass der Taxifahrer Fritz nicht abholt.)	

The crucial aspect for the argumentation of the approach is that the partitions in (32) to (34) are well-formed objects: One cell corresponds to the complete true answer, whereas the other cells are considered false. That (and how) this situation comes about will be illustrated in the following.

A cell from (34) is assigned a true logical value if both conjuncts in the cell are true. Each conjunct is a disjunction. In an overall positive disjunction, one

statement has to be true (as the statements exclude each other, only exactly one statement can be true) in order for the conjunct to be true. If a conjunct which corresponds to an overall negative disjunction should be true, both parts of the disjunction have to be false. If the true answer is e.g. (35) and if the world looks like (36), the distributions in (37) follow.

(35) Only Hans (= Only Hans is the individual for whom Peter knows the true answer to the polar question: Does the taxi driver pick up this individual?)

(36) World: The taxi driver picks up Hans as well as Fritz.

(37)	(Peter weiß, dass der Taxifahrer Hans abholt (t) \vee Peter weiß, dass der Taxifahrer Hans nicht abholt (f.)) \wedge (Peter weiß, dass der Taxifahrer Fritz abholt (f) \vee Peter weiß, dass der Taxifahrer Fritz nicht abholt (f.))	v	f
	(Peter weiß, dass der Taxifahrer Hans abholt (t) \vee Peter weiß, dass der Taxifahrer Hans nicht abholt (f.)) \wedge \neg (Peter weiß, dass der Taxifahrer Fritz abholt (f) \vee Peter weiß, dass der Taxifahrer Fritz nicht abholt (f.))	v	t
	\neg (Peter weiß, dass der Taxifahrer Hans abholt (t) \vee Peter weiß, dass der Taxifahrer Hans nicht abholt (f.)) \wedge (Peter weiß, dass der Taxifahrer Fritz abholt (f) \vee Peter weiß, dass der Taxifahrer Fritz nicht abholt (f.))	v	f
	\neg (Peter weiß, dass der Taxifahrer Hans abholt (t) \vee Peter weiß, dass der Taxifahrer Hans nicht abholt (f.)) \wedge \neg (Peter weiß, dass der Taxifahrer Fritz abholt (f) \vee Peter weiß, dass der Taxifahrer Fritz nicht abholt (f.))		f

The complete statement in the second cell – the true answer – is true as the first conjunct becomes true due to the truth of the disjunction and the second conjunct due to the falsity of the disjunction. The falsity of the conjunctions in the remaining cells can be confirmed by calculating the statement's truth values against the background of the chosen scenario: Only one conjunct is true in the first and fourth cell, even both conjuncts have to be considered false in the third cell. The explanations show that assigning the interpretation paraphrased in (31) instead of the one paraphrased in (30) to the extraction construction which re-

sults in a different space of answers, the semantic “defect” which is made responsible for the ungrammaticality of the question does not arise.

5.2 *Contextual blindness* and the interpretive effect of resumptive pronouns

A crucial assumption for the idea to trace back the ungrammaticality of the extraction constructions to the ill-formed semantic object associated with the resulting question is to anchor it on a purely logical level. This assumption is important against the background of the “defect” not having to arise necessarily. As has been shown, a way of partitioning the logical space is possible which prevents the “defect” from coming about.¹¹ The explanation assumed here is therefore formulated in that way that extractions from *whether*-clauses result in ungrammatical structures because, from a logical perspective, it is in principle not possible to **exclude** that the problem described does come about in the space of answers. Along this reasoning, the pure possibility of generating the problem leads to excluding the questions on the semantic level. For the cases in which it is not true that all the cells in the space of answers become true, it is argued that the interpretations hinge on very specific contextual circumstances.¹² Excluding this source of influence, it is assumed that contextual information does not have an impact on the logical calculation of the space of answers. As the constraint on extraction is attributed to the semantic module, excluding the questions takes place on a linguistic level before the context can have an impact. Thus, the system calculating the space of answers does not have knowledge on specific contexts, it does not follow concrete courses of conversation. If a concrete discourse lead to an unproblematic space of answers and the question was, therefore, associated with a well-formed object, this would not influence the logical system that excludes the question because of it not being able to fulfill its discourse function.

¹¹ There are other factors which lead to the “defect” not arising necessarily. On the one hand, this situation can be caused by certain non-factive matrix verbs. On the other hand, *weak exhaustive* readings in the case of certain combinations of verb+wh-complement clauses introduced by wh-pronouns to which the analysis is carried over in Müller (2010) might also prevent the “defective” reading from arising. If the non-“defective” situation can occur, however, this is never the only reading **possible**, that is even then, an interpretation is possible which leads to a “defective” space of possible answers.

¹² For other approaches making use of *contextual blindness* (a term being employed in Magri 2009), cf. e.g. Fox and Hackl (2006: 566ff.), Abrusán (2008: 67), Chierchia et al. (2008: 30f.), Gajewski (2002, 2009).

the reading leading to the ‘defect’ cannot be available, the resulting question should be well-formed.

This prediction is indeed born out as the well-formed question in (41) illustrates.

(41) [Für wen]_i gilt, dass Peter weiß,
for whom applies that Peter knows

ob der Taxifahrer ihn_i abholt?¹³
whether the taxi driver him picks up

‘For whom is it the case that Peter knows whether the taxi driver picks him up?’

This question unambiguously shows the interpretation illustrated by the well-formed partition in (42) (cf. (33)).

(42)	Peter weiß, ob der Taxifahrer Hans abholt, und Peter weiß, ob der Taxifahrer Fritz abholt.	✓
	Peter weiß, ob der Taxifahrer Hans abholt, und Peter weiß nicht, ob der Taxifahrer Fritz abholt.	✓
	Peter weiß nicht, ob der Taxifahrer Hans abholt, und Peter weiß, ob der Taxifahrer Fritz abholt.	✓
	Peter weiß nicht, ob der Taxifahrer Hans abholt, und Peter weiß nicht, ob der Taxifahrer Fritz abholt.	

As the “extraction construction” does not allow the reading under which the “defect” can arise under the occurrence of a resumptive pronoun corresponding to the *wh*-pronoun, and the alternative to the “defective” reading, therefore, does not rely on contextual information, the construction in (42) is well-formed entirely in agreement with the analysis pursued here. Under no circumstances is

¹³ As one of the anonymous reviewers remarks, (41) is of course no extraction construction in a syntactic sense. However *für wen* (exactly as *wen* in (40)) gets interpreted inside the complement. As the account pursued here argues that the reason for the questions’ degradation does not lie in the syntactic module, but is related to the questions’ interpretation, this sentence – on the contrary – provides perfect testing ground for this assumption. It has a different syntax, but it is nonetheless a question which decisively displays that reading that should lead to a well-formed sentence.

it possible that the “defect” arises which has been made responsible for the inacceptability of the extraction construction in (40) which is ambiguous with respect to the two different partitions. As the difference between (40) and (41) is that in (41) the reading made responsible for the “defect” is not available, whereas in (40), the ‘defective’ as well as the reading in (42) is available, the grammatical structure in (41) can be taken as evidence for an analysis which is based on the principle availability of the (potentially) “defective” reading.

Assuming that the intuitions concerning the questions’ meanings as formalised here are correct, the question arises what exactly differentiates the two meanings.

What is at issue is the question where the strong exhaustivity is assumed to hold. Under the reading in (26) (repeated for convenience in (43)), positive and negative instantiations of being picked up are opened up, that is the exhaustive partitioning occurs in the scope of the conjunction (and, thereby, the implicitly occurring disjunction). In (33) (repeated in (44)), on the other hand, the partitioning concerns known and unknown things, that is the exhaustive partitioning occurs above the conjunction (and, therefore, above the disjunction). In case the disjunction scopes over the strong exhaustive partitioning, the defect arises because the question is disjunctively asking simultaneously for the positive and negative instantiation. Deciding on a true conjunct in one cell, leads automatically to the negative instantiations in the other cells becoming true. The known and (possibly) unknown things in the interpretation according to (44) are conjoined conjunctively which is why it does not happen that a complete cell becomes true after having decided on the truth of one cell as in the case of (43).

- | | |
|------|---|
| (43) | Peter weiß, ob der Taxifahrer Hans, Fritz abholt. |
| | Peter weiß, ob der Taxifahrer Hans, ¬Fritz abholt. |
| | Peter weiß, ob der Taxifahrer ¬Hans, Fritz abholt. |
| | Peter weiß, ob der Taxifahrer ¬Hans, ¬Fritz abholt. |
-
- | | |
|------|---|
| (44) | Peter weiß, ob der Taxifahrer Hans abholt, und
Peter weiß, ob der Taxifahrer Fritz abholt. |
| | Peter weiß, ob der Taxifahrer Hans abholt, und
Peter weiß nicht, ob der Taxifahrer Fritz abholt. |
| | Peter weiß nicht, ob der Taxifahrer Hans abholt, und
Peter weiß, ob der Taxifahrer Fritz abholt. |
| | Peter weiß nicht, ob der Taxifahrer Hans abholt, und
Peter weiß nicht, ob der Taxifahrer Fritz abholt. |

Those two possible interpretations are also an issue when it comes to long wh-movement in perfect well-formed sentences such as (45).

- (45) Wen sagt Peter, dass der Taxifahrer abholt?, $D = \{\text{Hans, Fritz}\}$
 Who says Peter that the taxi driver picks up
 ‘Who does Peter say that the taxi driver picks up?’

Modelling the meaning attributable to this question in terms of partitioning, it is equally possible to come up with (46) or (47).

- (46)
- | |
|---|
| Peter sagt, dass der Taxifahrer Hans, Fritz abholt. |
| Peter sagt, dass der Taxifahrer Hans, ¬Fritz abholt. |
| Peter sagt, dass der Taxifahrer ¬Hans, Fritz abholt. |
| Peter sagt, dass der Taxifahrer ¬Hans, ¬Fritz abholt. |
- (47)
- | |
|---|
| Peter sagt, dass der Taxifahrer Hans abholt, und
Peter sagt, dass der Taxifahrer Fritz abholt. |
| Peter sagt, dass der Taxifahrer Hans abholt, und
Peter sagt nicht, dass der Taxifahrer Fritz abholt. |
| Peter sagt nicht, dass der Taxifahrer Hans abholt, und
Peter sagt, dass der Taxifahrer Fritz abholt. |
| Peter sagt nicht, dass der Taxifahrer Hans abholt, und
Peter sagt nicht, dass der Taxifahrer Fritz abholt. |

(46), which corresponds to (43), presupposes that Peter says something and questions what this is exactly, that is it partitions Peter’s saying model strongly exhaustively (= below the conjunction). (47) corresponds to (44) and divides the logical space into things that Peter says and does not say. Especially when it comes to anchoring negative information, it becomes obvious that two different meanings are expressed by the two partitions. Not saying that something is the case does not mean saying that something is not the case. However, as is the case for (43) versus (44), there is nothing contrainstuitive about assuming those two interpretations.

Taking the two possible readings of (45) as evidence for the assumption that there are two ways for “anchoring” the strong exhaustivity in questions involv-

ing long wh-movement, the question arises whether one can make out constructions in which one reading or the other occurs unambiguously. This would clearly speak for the existence of the respective interpretation.

A case in point independently motivating the ‘high’ exhaustive reading has already been referred to in this section (cf. (48)).

- (48) Für wen gilt, dass Peter weiß,
for whom applies that Peter knows

ob der Taxifahrer ihn abholt?
whether the taxi driver him picks up

‘For whom is it the case that Peter knows whether the taxi driver picks him up?’

(48) cannot be answered by (49), but only by (50).

- (49) Peter weiß, ob der Taxifahrer Hans und nicht Fritz abholt.
Peter knows whether the taxi driver Hans and not Fritz picks up
‘Peter knows whether the taxi driver picks up Hans and does not pick up Fritz.’

- (50) Peter weiß, ob der Taxifahrer Hans abholt und
Peter knows whether the taxi driver Hans picks up and
er weiß nicht ob der Taxifahrer Fritz abholt.
he knows not whether the taxi driver Fritz picks up.
‘Peter knows whether the taxi driver picks up Hans and he does not know whether the taxi driver picks up Fritz.’

The same applies to (51) and the answers provided by (52) and (53).

- (51) Für wen gilt, dass Peter sagt, dass der Taxifahrer ihn abholt?
For whom applies that Peter says that the taxi driver him picks up
‘For whom is it the case that Peter says that the taxi driver picks him up?’

- (52) #Peter sagt, dass der Taxifahrer Hans und nicht Fritz abholt.
Peter says that the taxi driver Hans and not Fritz picks up
‘Peter says that the taxi driver picks up Hans and not Fritz.’

- (53) Peter sagt, dass der Taxifahrer Hans abholt und er sagt nicht,
 Peter says that the taxi driver Hans picks up and he says not
 dass der Taxifahrer Fritz abholt.
 that the taxi driver Fritz picks up.
 ‘Peter says that the taxi driver picks up Hans and he does not say that
 the taxi driver picks up Fritz.’

Having shown that questions such as (48) and (51) in which resumptive pronouns take up the *wh*-pronoun can only be assigned the meaning corresponding to the “high” anchoring of strong exhaustivity, the argument is not complete before a construction has been presented which unambiguously displays the interpretation involving the “low” anchoring of strong exhaustivity. Such a construction is provided in (54).¹⁴

- (54) Wen sag mir doch mal gleich,
 whom tell me MP MP right away
 dass Peter gestern besucht hat.
 that Peter yesterday visited has
 ‘Tell me right away who Peter visited yesterday.’
 Reis and Rosengren (1992: 94)

For sentences such as (54), Reis and Rosengren (1992) argue that the moved *wh*-phrase does not scope over the matrix clause (which is why the sentence is still read as an imperative and not as an interrogative), but only has scope over the embedded clause. Therefore, (54) has the same meaning as (55).

- (55) Sag mir doch mal gleich, wen Peter gestern besucht hat.
 Tell me MP MP right away whom Peter yesterday visited has
 ‘Tell me right away who Peter visited yesterday.’

Reis and Rosengren do not give a formal account of the meaning of (54) (or (55)). However, applying Groenendijk and Stokhof’s and Higginbotham’s semantics for questions to the embedded *wh*-complement in (55), allows paraphrasing (55) by (56), that is interpreting the [+*wh*]-clause strongly exhaustively.

¹⁴ I am grateful to Horst Lohnstein for bringing this construction to my attention.

(56)	Sag' mir doch mal gleich, dass Peter Hans, Fritz gestern besucht hat.	V
	Sag' mir doch mal gleich, dass Peter Hans, ¬Fritz gestern besucht hat.	V
	Sag' mir doch mal gleich, dass Peter ¬Hans, Fritz gestern besucht hat.	V
	Sag' mir doch mal gleich, dass Peter ¬Hans, ¬Fritz gestern besucht hat.	

There are a couple of other peculiarities related to this rather unusual construction in German (cf. Reis and Rosengren 1992); however, it does provide evidence for the assumption that the *wh*-phrase occurring in the left peripheral surface position does not scope over the rest of the sentence, but only over the structure below the matrix verb which is exactly the domain in which the partitioning is assumed to hold in (43) and (46). The respective interpretation of such cases of long *wh*-movement is developed with reference to (54) and (55) in Reis and Rosengren's (1992) approach, however, although excluded for independent reasons (cf. Reis and Rosengren 1992: 114), applying Reis and Rosengren's analysis to (57) against the background of the semantics of questions relied on in this paper, the moved phrase *wem* would also have to scope below the conjunction along the lines of (58).

- (57) Wem erkundige dich mal,
 Whom inquire yourself MP
 ??dass/??ob er die Rezension anvertraut hat.
 that/whether he the review entrusted has
 Reis and Rosengren (1992:114)

(58)	Erkundige dich mal, ob er die Rezension Hans, Fritz anvertraut hat.	V
	Erkundige dich mal, ob er die Rezension Hans, ¬Fritz anvertraut hat.	V
	Erkundige dich mal, ob er die Rezension ¬Hans, Fritz anvertraut hat.	V
	Erkundige dich mal, ob er die Rezension ¬Hans, ¬Fritz anvertraut hat.	

As the two constructions chosen (resumptive pronouns in (48) and (51), wh-imperatives in (54) and (57)) illustrate, there is good reason to believe that there are in principle two ways to induce partitions in long extraction constructions in order to capture the semantic intuitions that can be made out.

When looking at a question such as (59) or (60), there is nothing which tells whether one or the other reading is meant.

- (59) Wen sagt Peter, dass der Taxifahrer abholt?, D = {Hans, Fritz}
 Who says Peter that the taxi driver picks up
 ‘Who does Peter say that the taxi driver picks up?’
- (60) *Wen weiß Peter, ob der Taxifahrer abholt?
 who knows Peter whether the taxi driver picks up

However, constructions such as (61) and (62) do unambiguously code only one of the two readings.

- (61i) Für wen gilt, dass Peter sagt, dass der Taxifahrer ihn abholt?
 For whom applies that Peter says that the taxi driver him picks up
 ‘For whom is it the case that Peter says that the taxi driver picks him up?’
- (61i) Für wen gilt, dass Peter weiß,
 For whom applies that Peter knows
 ob der Taxifahrer ihn abholt?
 whether the taxi driver him picks up
 ‘For whom is it the case that Peter knows whether the taxi driver picks him up?’
- (62i) Wen sag mir doch mal gleich, dass Peter gestern
 whom tell me MP MP right away that Peter yesterday
 besucht hat.
 visited has
 ‘Tell me right away who Peter visited yesterday.’

- (62ii) Wem erkundige dich mal,
 Whom inquire yourself MP
 ??dass/??ob er die Rezension anvertraut hat.
 that/whether he the review entrusted has

Reis and Rosengren (1992: 94, 114)

6. Conclusion

To sum up, this paper argues that the difference in acceptability between extractions from *dass(that)*- and *ob(whether)*-complement clauses (in German) can be related to the semantics associated with the two conjunctions.

In the case of *ob*-clauses, the extraction construction can be associated with a semantic object that cannot fulfill the discourse function that is usually associated with constituent questions: A reduction of possible (seemingly complete) answers does not happen. On the contrary, all possibilities opened up have to be considered true. The question would, therefore, be a completely uninformative operation in discourse because it is never possible to elicit an answer which due to its assertive illocutionary force fulfils the ultimate purpose of communication, namely to increase the shared information between speaker and hearer.

The semantic constraint formulated in this approach has been shown to be meant as a *look-ahead principle* as it makes reference to the mere **possibility** of the “defective” situation coming about.¹⁵ Another reading which does not lead to the “defect” made out has been shown to be highly dependent on specific contextual information, in this case precise knowledge of a speaker’s intention. By relying on contextual blindness for the logical system calculating the distributions of truth values in the space of possible answers, influence of a contextual nature could be excluded. In agreement with the analysis’ argumentation, evoking the non-“defective” interpretation by contextually invariable means, namely the addition of resumptive pronouns in the extraction domain, leads to grammatical structures. In this case, the non-“defective” interpretation is possible so that the resulting question is always and unequivocally associated with a well-formed semantic object.

¹⁵ As one of the anonymous reviewers criticises assuming this principle (instead of a *don’t look ahead principle*), the same idea motivating this *look-ahead principle* could also be captured by a *don’t look ahead principle*. The construction would then not be excluded because problems could arise at a later stage, but it would be ignored that a positive usage could still occur.

An approach to long extraction that is based on a precise analysis of the meanings attributed to the extraction constructions might open up new research perspectives on data that has been analysed in syntactic terms for decades. It might be worth analysing different extraction data from a semantic perspective as the exclusion of other (seemingly syntactic) extraction domains might also be derivable from the meaning components contributed by the occurring linguistic material.¹⁶

An approach which is concerned with the parts of meaning involved might also yield promising results when looking at factors that have been observed to influence extractions from [+wh]-complement clauses. It is e.g. known from the literature that the complement clause's finiteness (cf. e.g. Chomsky 1986; Abrusán 2008 on English)) as well as certain properties of the extractee (cf. e.g. Kiss 1993 on English; Rizzi 1990; Cinque 1990; Rizzi 2000 on English and Italian) or the matrix verbs (cf. e.g. Comorovski 1996 on Romanian) have an impact on the acceptability of those particular extraction constructions. In the last two cases, the concepts referred to (*specificity*, *D(iscourse) linking*, *referentiality*, *restricted quantification domain* on the one hand, *factivity* on the other hand) obviously rely on aspects of meaning and also the lack of finiteness has been shown to be related to different **modal** readings (cf. e.g. Bhatt 2000; Bolinger 1978).¹⁷

Without having anything insightful to say about those phenomena within the approach presented here, this short mentioning of well-known phenomena within this field of research can nevertheless be taken to show what the prospects for an approach accessing such data from the semantic perspective are. However, further research has to show how one can account for the phenomena mentioned by relying on the semantic perspective and in how far this might be possible within the concrete account presented here which so far can only make the modest claim to be able to account for the resulting ungrammatical questions

¹⁶ Müller (2010) e.g. can show that different readings of extraction constructions and the occurrence of resumptive pronouns are also relevant when it comes to factive islands (*that*-complement clauses) or islands caused by other *non-bridge verbs* (e.g. manner-of-speaking verbs, implicative verbs). Cf. e.g. also Abrusán (2008), Comorovski (1996), Szabolcsi and Zwarts (1993) for semantic analyses of extraction constructions.

¹⁷ One of the anonymous reviewers mentions the sentence in (i) which is a perfect example displaying the aspects mentioned here.

(i) Which book don't you know whether you should read?

The extracted wh-pronoun is D-linked, the finite verb in the complement is a modal verb.

Restricted quantification as well as modality actually also have a very subtle influence on the German data (cf. Müller 2010, to appear).

formed by asking for a constituent contained in a finite non-modalised [+wh]-complement clause in German.

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