

# Semantics of DP islands\*

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## Abstract

This paper is concerned with the role of the semantics of definite articles in the analysis of e(xtended)NP-island effects. It brings in a new sort of evidence confirming the proposal of [25] for German and [6] for English that the semantics of the so called “strong” articles and demonstratives differs qualitatively from that of “weak” articles and *the* in that the former involves a pronominal element which makes corresponding eNPs directly referential. Islandhood for wh-subextraction thus emerges as a new diagnostic for direct referentiality.

## 1 Introduction

This paper provides a semantic-pragmatic analysis of the ban on wh-subextraction out of a certain type of eNP. Austro-Bavarian German features two distinct definite articles which contrast with respect to the wh-subextraction ban. Namely, wh-subextraction is possible out of a weak-eNP in (1), but leads to ungrammaticality in (2) (in any context).

- (1) Vo wem host du [s Possbldl t] gsegn?  
of whom have you det<sub>w</sub> passport.photo t seen  
‘Who did you see the passport picture of?’
- (2) \*Vo wem host du [des Possbldl t] gsegn?  
of whom have you det<sub>s</sub> passport.photo t seen  
Intended: ‘Who did you see that passport picture of?’ (adapted from [29])

The problem of the impossibility of establishing dependencies between a wh-word and a trace embedded within certain kind of eNPs has been around at least since [4]. In [7], [19], [22], [14] the notions of specificity and definiteness has been proposed as relevant for the wh-subextraction ban. To my knowledge, there has been no investigation as to what goes wrong on the semantic side. I propose that the locus of the contrast between (1) and (2) is the interaction of the semantics of a strong definite article with requirements pragmatically imposed on the set of possible answers to the question. I demonstrate that subextraction out of strong-eNPs results in questions which cannot serve to update the inquirer’s state of knowledge: both the asserted and the presupposed contents of possible answers to such questions have to be part of the inquirer’s knowledge prior to uttering the question. I propose that questions with what I call zero information-seeking potential are ungrammatical, unlike rhetorical and biased questions, which, although not updating the inquirer’s state of knowledge in some contexts, can serve this purpose in others. This project aligns with a number of recent studies of constraints on movement whereby such constraints are analyzed as stemming from semantic-pragmatic constraints on question formation ([9], [24] and references therein), rather than from syntactic factors. The analysis proposed in this paper can be extended onto a number of other languages

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which feature eNPs contrasting with respect to the wh-subextraction possibilities, in particular, onto English, French, Italian, Komi, Russian, and Spanish where demonstrative-eNPs are wh-subextraction islands. Islandhood with respect to wh-subextraction thus emerges as a new diagnostic for direct referentiality.

In the next section I introduce the Austro-Bavarian strong and weak article paradigms followed by the discussion of articles' semantics based on the proposal of [25]. Then I will proceed to the analysis of the interaction of articles' semantics with the semantics of questions.

## 2 Weak and strong definite articles in Austro-Bavarian

Austro-Bavarian is among varieties of German that distinguish between two types of definite articles, the “weak” and the “strong” series ([23], [29]). Throughout this paper I refer to nominal expressions headed by strong and weak articles as strong-eNPs and weak-eNPs respectively.

According to the generalizations made in [25] for Standard German and [29] for Austro-Bavarian, descriptively, a strong article is used in contexts where the eNP in question has an anaphoric or deictic antecedent, as in (3). A weak article is used whenever it is part of the common ground that the eNP has only one possible referent in a given situation, as in (4).

(A points to a house (the only one in the immediate surrounding) and asks B,)

- (3) Gfoit da s' / #des Haus?  
like you det<sub>w</sub> / det<sub>s</sub> house  
'Do you like this house?'

- (4) Wie geht 's 'n **da** / \***dea** Frau?  
how goes it prt det<sub>w</sub> / det<sub>s</sub> woman  
'How is your wife doing?' ([29, 7])

[25] essentially proposes a classic Fregean treatment for the weak article, supplemented with a machinery of domain restrictions, which results in picking out a unique individual with a relevant property within a relevant domain.<sup>1</sup>

- (5)  $\llbracket D_w \rrbracket = \lambda P_{\langle e, t \rangle} : \exists! x [P(x)] . \iota x [P(x)]$  (based on [25])

The strong article crucially, has an “enriched” LF compared to the weak one in that it includes a silent individual pronoun (here it bears the index 1).

- (6)  $[1 [D_s \text{ NP}]]$  (based on [25])

The denotation of the strong article differs from (5) in that it involves an individual argument. Namely, the function denoted by the strong article takes a property of individuals P, an individual argument y, and, if defined, returns a unique individual with property P identical to the argument individual y.

- (7)  $\llbracket D_s \rrbracket = \lambda P_{\langle e, t \rangle} . \lambda y : \exists! x [P(x) \ \& \ x = y] . \iota x [P(x) \ \& \ x = y]$  (based on [25])

Notice that (7) can be rewritten equivalently as in (8).

- (8)  $\llbracket D_s \rrbracket = \lambda P_{\langle e, t \rangle} . \lambda y : P(y) . y$

<sup>1</sup>[25] implements his analysis of German articles in the situation semantics framework of [18]. In order to simplify the discussion I omit the situational aspect of Schwarz's (2009) model (undeniably a crucial one for the treatment of weak-eNPs).

In the next section I examine the semantics of wh-subextraction out of a strong-eNP, showing that the crucial property of a strong article is that it makes  $\llbracket i D_s NP \rrbracket^g$ , if defined, to be identical to a particular individual  $g(i)$ .

### 3 Semantics of wh-subextraction out of strong-eNP

In this section I look in detail at how the semantics of articles interacts with the interpretation of questions. I assume that the semantics of questions involves two main ingredients: the semantics of the question word and the semantics of its complement (roughly, TP). I first discuss the contribution of the strong article to the interpretation of the TP, and then show why such a TP cannot be part of a grammatical question.

Given the LF in (6), a question with a strong-eNP has the following LF, assuming that as a result of movement, the wh-phrase becomes a sister to TP, which results in lambda-abstraction over TP.<sup>2</sup>

$$(9) \quad \text{who } \lambda_1 \text{ }_{TP}[\text{you have seen } [2 \text{ }_{des} \text{ passport picture of } t_1]]]$$

Assuming (8), the denotation of the object eNP is as follows.

$$(10) \quad \llbracket 2 \text{ }_{des} \text{ picture of } t_1 \rrbracket^{g,w} \text{ is defined iff } g(2) \text{ is a passport picture of } g(1) \text{ in } w \\ \text{if defined, } \llbracket 2 \text{ }_{des} \text{ picture of } t_1 \rrbracket^{g,w} = g(2)$$

Assuming, as in [12], that presuppositions introduced by constituents become restrictions on the domain of the function denoted by a larger expression, the presupposition introduced by the strong-eNP that *g(2) is a passport picture of g(1)* turns into a restriction on the domain of the function denoted by the whole TP, as shown below.

$$(11) \quad \lambda x . \llbracket \text{you have seen } [2 \text{ }_{des} \text{ picture of } t_1] \rrbracket^{g[1 \rightarrow x],w} = \\ = \lambda x : \text{in } w, g(2) \text{ is a passport picture of } x . \text{ the hearer has seen } g(2) \text{ in } w$$

As a denotation of TP, we obtain a function which, if defined, maps an individual to truth in case the hearer has seen the picture  $g(2)$ . Notice that relative to any given possible world this is a constant function. In what follows I argue that a question has to be formed based on a function with a variable output in a given world.

I assume a version of the semantics of questions of [16], whereby a wh-word such as *what* or *who* denotes a function from open propositions (denotation of the complement of the wh-word, our TP) to a function from worlds to sets of propositions. Each proposition in this set corresponds to the function denoted by the complement of the wh-word with its argument slot filled by some individual from the domain of the wh-word. The following is an adaptation of Karttunen's (1977) wh-semantics.<sup>3</sup>

$$(12) \quad \llbracket who \rrbracket = \lambda f_{\langle s, \langle e, t \rangle \rangle} . \lambda w . \{p : \exists x \in D_e [x \text{ is a person in } w \ \& \ p = \lambda w' . f(w')(x)]\}$$

<sup>2</sup>Both in English and in Austro-Bavarian I assume that the preposition *vo(n)/of* is semantically vacuous. It therefore does not make a semantic difference whether the preposition is stranded, as in English, or carried along with the wh-word, as in Austro-Bavarian. Also, here and throughout the paper, I use English words in LF and semantic formulae for the clarity of exposition.

<sup>3</sup>In Karttunen's (1977) original version the answer-set contained only *true* answers. In addition, the original version involves formation of a proto-question, a singleton set containing an (open) proposition corresponding to denotation of TP. The proto-question then serves as an argument to the wh-function. The original version was designed to accommodate cases of multiple wh-words. Since I am not concerned with those here, a simplified version in (12) is enough for the present purposes.

Let us see how this works for the case at hand. Let us assume that the domain  $D_e$  in (2) is a set of three individuals {Hans, Elsa, Otto}. Assuming that  $\llbracket who \rrbracket$  combines with the denotation of its complement by the intensional version of Function Application spelled out in [12, 308] and given (11), we obtain the following extension of the question in a world  $w$  where there are three individuals, Hans, Elsa, and Otto, in the domain of the *wh*-word.

$$(13) \quad \llbracket who \rrbracket^g(\lambda w. (11)) = \{[\lambda w': \text{in } w', g(2) \text{ is a passport picture of } x \text{ . the hearer has seen } g(2) \text{ in } w'] : x \in \{\text{Hans, Elsa, Otto}\}\}$$

Answer-propositions in (13) differ only in the presupposition associated with each of them, whereas their asserted content is identical. Intuitively, it seems that possible answers to a question should differ precisely in what is not yet presupposed. We ended up with possible answers of this sort because the individuals from the domain of the *wh*-word make no semantic contribution to the asserted content of answer-propositions: whatever value is assigned to  $t_1$  when interpreting the object eNP, it ends up denoting the individual  $g(2)$ , by (8).

The question is now what, given the general theory of questions, is wrong with a question all possible answers to which are identical in what they assert? The following discussion consists of two parts. First, I propose that the asserted content of the possible answers gets presupposed by such a question. Second, I demonstrate that accommodation of the presupposed content of the answers cannot be a source of new information either, because inquirers cannot introduce presuppositions they are ignorant about.

### 3.1 Question's "existential" presupposition

When asking the *who*-question in (2), the point of departure for the inquirer is that the hearer has seen someone's picture. Following up on similar intuitions, [13] and [16], among others, assumed that questions carry something like an existential presupposition. A *wh*-question of the form *wh TP* seems to presuppose  $\exists x[\llbracket TP \rrbracket(x) = 1]$ , that is, that there exists an individual which has the property denoted by *TP*. While it was shown that the alleged existential presupposition of an embedded question projects through negation and presuppositional holes, questions do not pass all the presupposition tests in that they are defeasible, [10]. The same is true for Austro-Bavarian. Instead of denying the presence of an existential presupposition in questions altogether, negative answers to *wh*-questions have been taken to convey that the presupposition is not met, as in [5], [20]. I follow [1] who proposed that such defeasible presuppositions are generated every time we deal with a grammatical object whose semantics makes reference to a set of alternatives. The presence of such a set in the semantic representation triggers a default presupposition that a proposition corresponding to the disjunction of the propositions in the alternative set is true. This creates the effect of an existential presupposition.<sup>4</sup>

Let us look from this perspective at (2). The requirement that there be a true answer is satisfied in case (14) is true (existential closure of the presuppositions of possible answers; for at least one answer to be true, the function denoted by at least one answer has to be defined) and (15) is true.

$$(14) \quad \lambda w . \exists x \in \{\text{Hans, Elsa, Otto}\} [\text{in } w, g(2) \text{ is a passport picture of } x]$$

$$(15) \quad \lambda w . \text{the hearer has seen } g(2) \text{ in } w$$

<sup>4</sup>The existential presupposition generated by a question is an implicit part of the analyses of *wh*-island effects which rely on Dayal's (1996) principle of the existence of a maximally true answer, such as [9], [24] and references therein. The requirement that there exist a maximally true answer entails that there must exist a true answer, which is the same as the existential presupposition in the sense of [1].

How does the “existential” presupposition relate to the felicity conditions on the use of the question in (2)? I will make use of Stalnaker’s (1974) notion of a “context set” as a set of possible worlds  $c$  where all the propositions believed to be true by conversation participants, and which form the Common Ground, are true. According to [28, 4], who develops the insight of [27] about “bridging” semantic well-formedness and pragmatic felicity, it is an “irreducible property of natural language” that an utterance is felicitous only in case the function it denotes is defined in all the context set worlds. I assume that Stalnaker’s bridging principle is extendable onto cases of “floating” presuppositions such as the one proposed by [1]. In our specific case, this means that in order for the question in (2) to be asked felicitously, (14) and (15) have to be true in all the worlds in the context set. What makes such a question ungrammatical, I argue, is a conflict between the felicity conditions and some cooperativeness principle such as a version of the Gricean informativeness maxim of the kind “don’t ask a question when no answer will provide you with new information”. This conflict is going to arise in any Common Ground. I will refer to the relevant cooperativeness principle as Question information-seeking potential. I propose that a question has a zero information-seeking potential when no proposition in its denotation can change the inquirer’s state of knowledge in any Common Ground.

We find a similar effect in simple declaratives: an utterance whose asserted content is part of what is required to be part of the Common Ground for the utterance to be felicitous sounds odd, as observed by [2]. On this approach we can explain the infelicity of (16) as arising from the presupposition (that there exist two students, triggered by *both*) entailing the assertion of existence.

(16) \*There are both students.

### 3.2 The presuppositions of the answers

A possible objection to the claim that a question which gives rise to answers with identical asserted content entailed by the Common Ground has zero information-seeking potential is that the informational import of an answer might be in its presuppositional part. It is well known that conversation participants are able to accommodate presuppositions (at least since [27], [15]). In the case at hand one could say that updating of the Common Ground can be achieved not by virtue of adding the asserted content of an answer as such, but a) either by virtue of accommodating the existential presupposition of the question or b) by virtue of accommodating the presuppositional content of the answers.

We can rule out the first option right away since what it means is that it is not part of the Common Ground that there is a true answer to the question. But, according to [1], an expression associated with a set of alternatives automatically makes it part of the Common Ground that one of the alternatives is true. That is, it does not depend on the state of knowledge of a particular inquirer and/or addressee. The second option, namely, updating the Common Ground with answers’ presupposition, requires some more discussion. From looking at (17), we can conclude that presuppositions of all answers have to be entailed by the Common Ground in order for a question to be felicitous: it has to be part of the Common Ground that all individuals in the relevant domain actually have a hat (by virtue of the definedness condition on the function denoted by an eNP with a Saxon genitive that there exists a unique individual with the nominal property which belongs to the possessor).

(17) Among Peter, Bill, and Sam, whose hat do you like best?

Possible answers to (17) are *I like Peter’s hat*, *I like Bill’s hat*, and *I like Sam’s hat*. These

answers presuppose that Peter has a hat, Bill has a hat, and Sam has a hat, respectively. Since it is strange to ask this question with regard to Peter, Bill, and Sam if only the former two have a hat, while Sam does not, we can conclude that possible answers' presuppositions project universally onto the level of question semantics. What is crucial for the current discussion is that the accommodation can happen only on the side of the person to whom the question is addressed, as the infelicity of the following exchange shows where A accommodates that Peter has a hat.

- (18) A: Among Peter, Bill, and Sam, whose hat do you like best? B: Peter's. A: #Oh, I didn't know Peter had a hat.

Getting back to wh-subextraction out of strong-eNP, for the question in (13) to be felicitous in a given Common Ground, the following propositions have to hold: *that g(2) is a passport picture of Hans*, *that g(2) is a passport picture of Elsa*, and *that g(2) is a passport picture of Otto*.<sup>5</sup> While the addressee can still be ignorant the presuppositional content and simply ready to accommodate it, the inquirer cannot be ignorant about a presupposition that he introduces.<sup>6</sup> This rules out the possibility that answers in (13) can be informative for the inquirer by virtue of their presuppositional content. This means that a felicitously uttered question of this kind cannot update the inquirer's state of knowledge in any Common Ground. This makes (2) different from rhetorical and biased questions (e.g. *Did Peter (even) lift a finger to help you?*), which are uninformative only with respect to some Common Grounds ([3], [11]).

We also encounter questions with truly zero information-seeking potential in the case of wh-extraction out of complements of factive verbs which contain the so called "one-time-only" predicates, as discussed in [21].

- (19) #Who does Max know that Alice got married to on June 1st?

If we assume that it is presupposed that at least one answer in the answer-set is true, in the set corresponding to the denotation of (19) there is only one true answer since there is only one *assertable* answer (e.g. *Max knows that Alice got married to John on June 1st* which presupposes *Alice got married to John on June 1st*), as the presuppositions of the possible answers are mutually exclusive. That is, for (19) to be uttered felicitously, a Common Ground has to entail all the contents of its only assertable answer. [21] dubs such context-independent pragmatic infelicity non-contingent, as opposed to contingent infelicity which obtains only in specific contexts. Wh-subextraction out of strong-eNPs is another case of non-contingent infelicity.

### 3.3 Wh-subextraction out of weak-eNP

Now that the proposal for why it is bad with strong-eNP has been fully fleshed out, let us take a look at the grammatical wh-subextraction out of weak-eNPs in (1). Given (5), the denotation of the TP, combined with the semantics of the wh-word, gives the following denotation for the

<sup>5</sup>Note that in this particular case there is an additional potential source of infelicity, namely that the universal projection of answers' presuppositions entails that *g(2)* is a passport picture of all three, which is pragmatically implausible. However, this cannot be the main source of infelicity as wh-subextraction is still ungrammatical if *passport picture* is replaced with *picture* or with a different noun altogether.

<sup>6</sup>Moreover, as [26, 319] note, "attempts to answer questions using presuppositions ... are typically infelicitous".

(i) Q: *What's the weather like?* A: #*Bob realizes/doesn't realize that it's raining*

Even though technically *Bob realizes that it's raining* is not an answer in Hamblin/Karttunen's sense and the inquirer is not responsible for introducing the presupposition that it's raining, the addressee is still not supposed to convey novel information by making the inquirer accommodate a presupposition.

question with the weak article.

- (20)  $\llbracket(1)\rrbracket = \{[\lambda w' : \text{in } w', \text{ there exists a unique passport picture of } x . \text{ the hearer has seen the unique passport picture of } x \text{ in } w'] : x \in \{\text{Hans, Elsa, Otto}\}\}$

Obviously, these answers assert different things. The requirement that one of the alternatives be true, combined with universal projection of the presuppositions of the answers, amounts in this case to the truth of the following proposition.

- (21)  $\lambda w . \forall x \in \{\text{Hans, Elsa, Otto}\} [\text{there exists a unique passport picture of } x \text{ in } w] \ \& \ \exists x \in \{\text{Hans, Elsa, Otto}\} [\text{the hearer has seen the unique passport picture of } x \text{ in } w]$

This proposition, if entailed by the Common Ground, does not make an answer such as *I have seen the passport picture of Hans* uninformative.

This analysis makes a prediction that if under some conditions strong/demonstrative-eNPs were to behave like weak/*the*-eNPs in that their denotation would be covarying with a quantifier-bound variable, wh-subextraction should be repaired. Such conditions happen to exist, one of them being modification of the head noun by a restrictive relative clause, [17], and the prediction is borne out, as (22) shows, where wh-subextraction out of a strong-eNP is possible.

- (22) Vo wem<sub>1</sub> hot da Hons [des Possbüdl t<sub>1</sub> [was a jo söwa gmocht hot]]  
 of whom has det<sub>w</sub> Hans det<sub>s</sub> passport.pict. t that he prt himself made has  
 brocht?  
 brought  
 ‘Who did Hans bring that picture of that he made himself?’

## 4 Conclusions

I proposed that the key to the pathology of wh-subextraction out of strong-eNPs is the semantics of the strong article in the version of [25], which anchors the denotation of the eNP-of-extraction to a given individual and thus precludes the assertive content of answer-propositions from covarying with the wh-bound variable. From the cross-linguistic perspective, then, the impossibility of wh-subextraction out of certain eNPs can serve as a diagnostic for the semantic nature of the article involved. Namely, the impossibility of wh-subextraction out of a given eNP indicates its direct referentiality. According to my preliminary investigation, eNPs headed by demonstratives are islands for wh-subextraction in English, Italian, Spanish, Russian, French, and Komi. One immediately relevant research area in this respect are the so called referential uses of indefinites, discussed in [8]. Another highly relevant testing ground for the proposal are cases of subextraction out of eNPs in non-questions, such as topicalization and relativization-related movements.

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